


Non-communicable disease management in the public health system of Lesotho

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ABBREVIATIONS

ANC	Antenatal Care
ART	Antiretroviral treatment
CBL	Central Bank of Lesotho
CCM	Chronic care model
CCMDD	Central chronic medicines dispensing and distribution
CHAL	Christian Health Association Lesotho
CHWs	Community health workers
CLAS	Comités Locales de Administración de Salud (Local Health Management Committees)
COPD	Chronic obstructive pulmonary disease
CVD	Cardiovascular disease
DHMIO	District health management information officer
DHMTs	District Health Management Teams
DMO	District medical officer
EML	Essential medicines list
EMR	Electronic medical record
EMU	Estate management unit
EU	European Union
GOL	Government of Lesotho
HIS	Health Information System
HIV	Human immunodeficiency virus
HMIS	Health management and information system
HREC	Health Research Ethics Committee
HRH	Human resources for health
HSIS	Health System Information System
ICCC	Innovative care for chronic conditions

ICDM	Integrated chronic disease model
ICT	Information and communication technology
IDF	International Diabetes Federation
ISI	Institute of Scientific Information
LDL	Low-density lipoprotein
LPPA	Lesotho Planned Parenthood Association
LRCS	Lesotho Red Cross Society
MCA	Millennium challenge account
MCH	Mother and child health
MCST	Ministry of Communications Science and Technology
MoFDP	Ministry of Finance and Development Planning
MHealth	Mobile health
MHWs	Maternal health workers
MOH	Ministry of Health, Lesotho
MOHSW	Ministry of Health and Social Welfare, Lesotho
MUSA	Medicine Usage in South Africa
NCDs	Non-communicable diseases
NCDCP	Non-communicable diseases control and prevention
NHIS	National Health Insurance Scheme
NDoH	National Department of Health
NDSO	National Drug Supply Organisation, Lesotho
NEMLs	National essential medicines lists
NGO	Non-governmental organisation
NHMIS	National Health Management and Information System
NUL	National University of Lesotho
NWU	North-West University
OPDs	Outpatient departments

OOPE	Out-of-pocket expenditure
PEPFAR	President's Emergency Plan for AIDS Relief
PHC	Primary healthcare
PMTCT	Prevention of mother-to-child transmission
PPP	Public-private partnership
PSI	Population Services International
QMMH	Queen Mmamohato Memorial Hospital
RAAS	Renin-angiotensin-aldosterone system
RHNP	Regenerative Health and Nutrition Programme
SACU	South African Customs Unions
SADC	Southern Africa Development Community
SHA	System of Health Accounts
SMAART™	Sustainable, Multisector, Accessible, Affordable, Reimbursable, and Tailored framework
SMS	Short message service
STGs	Standard treatment guidelines
STIs	Sexually transmitted infections
TFDA	Tanzania Food and Drug Authority
UHC	Universal Health Coverage
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
VCT	Voluntary counselling and testing
WHO	World Health Organization

GLOSSARY

Adverse drug reaction monitoring	Adverse drug reaction monitoring occurs when unwanted effects suspected to be caused by medicine use are continuously monitored (WHO, 2006a:22).
Adverse drug reaction recording	Adverse drug reaction recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (WHO, 2006a:41), thus generating suspected case reports of adverse drug reactions.
Adverse drug reaction reporting	Adverse drug reaction reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (WHO, 2006a:24).
Attrition rate	Attrition rate refers to employees voluntarily resigning from the health facilities (NGDATA, 2017).
Clinical skills	Clinical skills consist of components such as procedural knowledge (how to perform the skill), declarative knowledge that justifies this procedural knowledge (such as underlying anatomy and physiology), and clinical reasoning (including diagnostic reasoning and clinical decision-making) (Michels <i>et al.</i> , 2012:e580).
Clinical supervision	<i>“Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive.”</i> (Powell & Brodsky, 2004:11).
Community health workers	Community health workers are members of the communities in their work area. They are appointed by the communities, accountable to the communities for their activities and assisted by the health system. However, they are not necessarily a part of its organisation, and have short informal training provided by nurses at the healthcare centres (WHO, 2007b:2).
Cost-benefit analysis	Cost-benefit analysis is a cost analysis technique for enumerating and evaluating the total costs and total benefits

associated with an undertaking (WHO, 1998a:20; WHO, 2003b:27). A cost-benefit analysis involves *“costs and benefits to be included; evaluation of costs; interest rate to be used for assessing the relative weight to give to the parts of the stream of present and future costs and benefits arising in the undertaking; and constraints to be recognised within the analysis which may affect the overall feasibility or impact of the undertaking or the actual distribution of costs and benefits.”* (WHO, 1998a:20-21).

Cost-effectiveness analysis

Cost-effectiveness analysis is a cost analysis technique that takes into consideration the level of providing goods or services achieved from a given level of inputs (WHO, 1998a:21; WHO, 2003b:26). Cost-effectiveness analysis is used to assess *“undertakings where it is not possible to use CBA which normally requires that the value of both the inputs and the outputs is put in money terms.”* (WHO, 1998a:21).

Cost-utility analysis

Cost-utility analysis is a cost analysis technique used to determine the cost in terms of utilities, especially quantity and quality of life (WHO, 2003b:27). Cost-utility analysis compares two different drugs or procedures whose benefits may be different (WHO, 2003b:27).

Drug supply management tools

Drug supply management tools are records used when managing drug stock and they include stock (bin) cards, drug registries, dispensing tally sheets, daily use/cash record books, and inventory forms (WHO, 2004a:31-44).

Evaluation

The process of determining the significance of an activity, policy, or programme. It is a systematic and objective assessment of an ongoing or completed development intervention (OECD, 2002:27; WHO, 1998a:34).

Fragmented risk-pooling

In fragmented risk pooling, fragmentation occurs where a series of independent risk pools (such as local governments or employer-based pools) exist (Smith & Witter, 2004). Individuals are assigned to particular pools depending on where they live, the nature of their employment, and

personal characteristics such as age and health.

Healthcare professionals

A healthcare professional is a person who has been accredited by a professional body after completing a health-related course of study to practice a health-related profession such as medicine, pharmacy, and nursing (ISMA, 2013:1).

Healthcare services

Healthcare services are services carried out by healthcare professionals or by others through the direction of healthcare professionals promote, maintain or restore health (WHO, 2004b:30).

Healthcare workers

Healthcare workers, also known as healthcare personnel, are all people employed or contracted to provide healthcare services (WHO, 2004b:29). They are primarily concerned with the protection and improvement of the health of their community.

Health equity

Health equity means that every person should ideally have a fair opportunity to attain their full health potential (WHO, 2018a). Also, an individual's health should not be compromised or disadvantaged because of their race, ethnicity, gender, income, sexual orientation, neighbourhood, or other social conditions (Boston Public Health Commission, 2018).

Health information

Health information is patient information collected by the healthcare service providers about a patient's health or disability and any information collected about healthcare services a patient has received (OAIC, 2018). Health information includes information about symptoms, diagnosis, treatment, test results, appointments, prescriptions, genetic information, and other information such as race, sexuality, or religion.

Health needs

"The need for health services as recognised by health professionals from the point of view of the benefit obtainable from advice, preventive measures, the management or specific therapy." (WHO, 2011c).

Health promotion	Health promotion is a process that enables individuals and communities to engage in healthy lifestyles and make changes that reduce the risk of developing diseases and other comorbidities (WHO, 1998a:43).
Health system	A health system includes all organisations, people, and activities whose main purpose is to promote, restore or maintain health (WHO, 2000:5).
Integrated risk-pooling	In integrated risk-pooling, fragmented risk pools are compensated for the variations in risk to which they are exposed (Smith & Witter, 2004).
Management	Management involves planning, organising, operating, and evaluating components of a health system and the personnel involved in the management task. (WHO, 1998a:49-50).
Management skills	Management skills are skills that enable a person to manage others effectively. Management skills include interpersonal skills (an affective and emotional skill that allows working with other people), information management (enables the collection, organisation and interpretation of information), analytical skills (enables the use and incorporation of new information and use for planning purposes or for creating a system of planning), and action skill (enables planning, directing and implementing actions) (Slipicevic & Masic, 2012).
Medical device	Medical devices are “ <i>any instrument, apparatus, implement, machine, appliance, implant, or reagent for in vitro use, software, or material intended by the manufacturer to be used alone or in combination for diagnosis, prevention, monitoring, treatment, or alleviation of disease.</i> ” (Global Harmonization Task Force, 2012:6).
Monitoring	Monitoring refers to a process where a systematic collection of data on specific indicators is carried out. The data are used to provide ongoing or completed development intervention with progress and achievement (OECD,

	2002:27; WHO, 1998a:52).
Monitoring of non-communicable diseases	Monitoring of NCDs is the periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).
Mosothe	A member of Basotho people living in Lesotho.
Non-communicable diseases	Non-communicable diseases are diseases of long duration; such as cardiovascular diseases, cancers, chronic respiratory diseases and diabetes; which are not transmissible and are generally of slow progression (WHO, 2017d).
No risk-pooling	In no risk-pooling, all expenditure liability lies with the individual to cover certain healthcare services (Smith & Witter, 2004).
Nurse clinician	A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration, and supervision duties (MOHSW, 1980:75-77).
Prevention or primary prevention	Prevention or primary prevention activities are intended to protect patients and the general public from actual or potential health risks and their consequences through the provision of information on nutrition, and behavioural and medical health risks; consultations; and measures to decrease health risks at the personal and community level (WHO, 2017c).
(Primary) healthcare centres	(Primary) healthcare centres are centres that provide services from general practitioners, dentists, nurses, pharmacists, and midwives; it is usually the first point of contact with a health professional (WHO, 2009a:240).

Risk pooling	Pooling is whereby collected health revenues are transferred to procuring organisations and ensures that the risk related to financing health interventions is endured by all the members of the pool, not by each contributor individually (Smith & Witter, 2004).
Rotation system	A rotation system is a system used to move health professionals from one healthcare setting to another after spending a specific period in a particular setting. Health professionals rotate to different settings of healthcare, such as outpatient departments, medical wards, and healthcare centres, within a stipulated time (Business Dictionary, 2017).
Professional	A professional is a person who has a job that needs a high level of training or education (Cambridge dictionary, 2017).
Technical skills	Technical skills are practical and often pertain to mechanical or scientific subjects that is, allow a person to complete a designated task in real-life situations and not theoretically (Mack, 2017). Technical skills refer to the ability to perform a specific task (blood glucose level monitoring, blood pressure monitoring) that requires the use of specific tools (glucometer, blood pressure machine).
Transmitting data	Transmitting data is a process of sending data over a communication medium (such as a computer) to one or multiple recipient devices such as a computer or server (Technopedia, 2017).
Unitary risk-pooling	In unitary risk pooling, revenue generated by taxation, social insurance, healthcare insurance, or user charges is placed in a single central pool that covers certain healthcare services (Smith & Witter, 2004).

ABSTRACT

The general aim of the study was to investigate and propose a model for the optimal disease management of non-communicable diseases (NCDs) in the public health system of Lesotho. To achieve this general aim, specific aims were formulated: (i) to assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities; (ii) to assess the role of the pharmacist in the national, district and primary healthcare (PHC) levels in the health system of Lesotho concerning the management of hypertension, diabetes mellitus, asthma, and epilepsy, and to (iii) develop a potential non-communicable disease (NCD) management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

To attain the aims for the study, a literature review about chronic disease management models and the health system of Lesotho was performed, followed by an empirical investigation into the human resources, medication and medical devices, health management and information system (HMIS), healthcare financing, health infrastructure and equipment, and role of the pharmacist at the national, district and PHC levels of Lesotho's public health system using self-administered structured questionnaires. The study followed a cross-sectional design. The study population included all employees in managerial positions and/or those in acting managerial positions at the Pharmaceutical Directorate, NCD unit, District Health Management Teams (DHMTs), outpatient departments (OPDs) in district hospitals, and the healthcare centres involved in the management of NCDs during the study period. Data were collected from December 2018 to June 2019. Six managers at the Ministry of Health (MOH), nine managers at DHMTs, 16 managers at OPDs, and 86 managers at healthcare centres participated in the study.

Because of the low overall response rate (28.9%) and variance in the number of responses to questions, data were analysed descriptively. The results of this study portray the perception of the managers on the management of NCDs.

Assessment of the public health system in Lesotho in terms of health service delivery showed that some health facilities in Lesotho's public health system had pharmacists, pharmacy technicians, nurses, medical doctors, nursing assistants, public health nurses and community health workers (CHWs). Some of these health workers performed health promotion activities within their community. Some public health facilities collaborated with private health facilities on NCD management; however, some public health facilities did not collaborate with traditional healers. Public health facilities mainly had medicines and equipment used in the management

of NCDs and some health workers were trained on how to use this equipment. However, some of the pharmaceutical and non-pharmaceutical staff at health facilities were not trained in drug and medical supply management, indicating a need for NCDs' health service delivery strengthening. Assessment of the role of the pharmacist in the different PHC levels showed that pharmacists at the national, district and the PHC levels (except in healthcare centres) had roles to perform in the prevention and management of NCDs; thus, they work as part of a healthcare team at different levels of Lesotho's health system. Finally, to develop the proposed NCD management structure for Lesotho's public health system, the results on perceptions of respondents on the management of NCDs in the public health system of Lesotho and literature review about chronic disease management models and the health system of Lesotho were integrated. In conclusion, the different elements of the health system of Lesotho need strengthening. Also, the proposed structure could be used to improve the already existing structure and also serve as baseline for further research on certain aspects of the public health system of Lesotho.

KEYWORDS: Healthcare services, medicines for non-communicable diseases management, medical devices, the role of the pharmacist, non-communicable diseases, chronic disease models, health system of Lesotho

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CHAPTER 1: STUDY INTRODUCTION AND METHODOLOGY

1.1 Chapter introduction

This chapter focuses on the background, research questions, general aims and the specific objectives of the study. A detailed overview of the empirical investigation will also be provided.

1.2 Background and rationale for the study

The World Health Organization (WHO, 2002) described a health system as “*all the activities whose primary purpose is to promote, restore or maintain health.*” This definition was further expanded by the WHO in 2007 explaining a health system as involving “*all organisations, people and actions whose primary intent is to promote, restore or maintain health*” (WHO, 2007a:2). The aims of health systems include the advancement of health and health equity in a manner that is responsive, financially fair, and make the most efficient use of available resources (WHO, 2002). For a health system to function effectively, there are six building blocks it has to satisfy. These include healthcare service delivery, human resources, health information, essential medical products and medical devices, health financing, and leadership and governance (WHO, 2007a:3).

Healthcare service delivery plays a vital role in an effective health system as it is essential in achieving good health outcomes. Healthcare services should provide effective, safe, quality health interventions to people who need them with minimum waste of resources (WHO, 2007a:3). Hence, healthcare service delivery consists of access and use of health facilities, provision of quality care to produce health benefits, and efficient use of limited resources. Health systems source and distribute resources, and develop and manage healthcare service delivery mechanisms which result in improved health outcomes (Berman *et al.*, 2011:1). Basic elements that have to be present for quality healthcare services to be accessible and provided by healthcare workers include adequate finances, human resources, infrastructure and equipment (Bold *et al.*, 2011:4). Healthcare service delivery performance has to be monitored and evaluated; thus indicators to be used in assessing healthcare service delivery performance have to be developed. The study by Bold *et al.* (2011:22-30) showed that healthcare service delivery indicators might include infrastructure, medical equipment, stock-out of drugs, absence rate of healthcare workers, diagnostic accuracy in outpatient consultations, health expenditure reaching healthcare centres and delay in healthcare workers’ salaries. Healthcare service delivery can be affected negatively by shortage and maldistribution of qualified healthcare workers (especially at the primary healthcare level), low healthcare workers’ salaries and a lack

of motivation, weak technical guidance for programme management and supervision, insufficient level of drugs and medical supplies, lack of equipment and infrastructure, and poor accessibility of healthcare services (Mills, 2014:554). Some interventions that could be implemented to improve healthcare service delivery include the provision of incentives to healthcare workers for proper service delivery to encourage performance (Bold *et al.*, 2011:4); task-shifting to address lack of qualified healthcare workers (Low *et al.*, 2014); use of mobile technology-based interventions to improve service delivery (Free *et al.*, 2013); and integration of healthcare services such as non-communicable disease (NCD) and human immunodeficiency virus (HIV) programmes to improve healthcare service delivery (Topp *et al.*, 2010).

The most important component of the health system in achieving health is human resources. Human resources should consist of workers responsive to people's needs and expectations to achieve the best outcomes with available resources and circumstances (WHO, 2010a). A well-functioning health system improves health outcomes through proper healthcare service delivery. The following factors should be taken into consideration: finances, training of qualified healthcare workers, performance and distribution of healthcare workers in health facilities. However, the shortage of healthcare workers is a concern worldwide. According to Liu *et al.* (2017:7), there will be a net worldwide demand-based shortage of 15 million healthcare workers by 2030. Some of the challenges to the shortage of healthcare workers especially in the public sector include poor work environments and a lack of strategies to improve career structures for healthcare workers. This leads to the migration of health professionals from the public to the private sector. In rural areas, healthcare is faced with the challenges such as a lack of transportation, the difficulty of attracting and retaining human resources, poor communication and lack of access to information, thus resulting in the migration of healthcare workers (Sporrong *et al.*, 2016:8).

Additionally, low satisfaction, heavy workload, poor working conditions, and lack of professional advancement and educational programmes are some of the challenges that lead to healthcare workers' migration, as was shown in the Ghanaian health sector (Kwansah *et al.*, 2012:669). Shortage of healthcare workers can be overcome by training together with appropriate governance and regulatory reforms to ensure the quality and appropriate skills of healthcare workers (Reich *et al.*, 2016:815), funding for human resources (Bowser *et al.*, 2014:995), healthcare workers motivation and retention (Shah *et al.*, 2016:472), and healthcare workers distribution. For instance, the Global Fund donated funding for training, salary support and recruitment to Bangladesh, Ethiopia, Indonesia, Malawi, Ukraine and Honduras for improvement of human resources for health (HRH) (Bowser *et al.*, 2014:995). Furthermore, countries studied by Bowser *et al.* (2014:995), in an attempt to support and increase the number of healthcare

workers, also used innovative financing mechanisms such as salary increase (Malawi), performance incentives (Indonesia, Bangladesh), additional compensation for healthcare workers to work overtime at non-governmental organisations facilities (Ukraine, Honduras), and contracting of healthcare workers to work part-time (Bangladesh, Ethiopia).

Health information is a component that provides information on health determinants, health status and performance of the health system. A health information system should produce, analyse and disseminate useful quality data to be used for improving the effectiveness and efficiency of healthcare services at all levels of healthcare (WHO, 2007a:19). The health information system includes the collection and processing of data and reporting and use of information obtained for making decisions at the different levels of the health system (WHO, 2007a:18). However, there are instances where data are kept on shelves or in databases and not used appropriately in policy and programme development, improvement and strategic planning and advocacy (Nutley & Reynolds, 2013:2). Health information in decision-making entails data reviews, monitored use of data, and tools to summarise data and guide decision-making (Mutale *et al.*, 2013:5). There is a need for improved data-informed decision-making in health systems. Activities to strengthen demand for and use of data stated in Nutley and Reynolds (2013:3) include assessment and improvement of data use, engagement of data users and producers, improvement of data quality and availability, and identification of information needs. A health information system should have the necessary privacy and security protections that enable the free flow of patient health information among healthcare providers, clients, payers and researchers (Thorpe *et al.*, 2016:596). According to Bosworth *et al.* (2016:2-5), the challenges of health information technology include interoperability, connectedness and reciprocity of systems and devices, inconsistent data definitions, inability to use national drug codes effectively and capturing of medication management therapy. Other challenges to health information systems include lack of infrastructure and integration software development, low internet connectivity, and lack of common standards on health information technology and software leading to challenges in data management and sharing of information among different databases as was shown in Bangladesh (Islam & Tabassum, 2015:807). For effective and efficient functioning of health information systems, some factors need improvements such as data capturing, transfer and feedback systems, which will assist in strengthening the delivery of health programmes by improving the quality of information used in planning and decision-making in the national, district and the primary healthcare levels (Ledikwe *et al.*, 2014:7).

Medicines and medical products are some of the largest components of the healthcare budget and the private health expenditure in low- and middle-income countries (LMICs) (WHO, 2010a). Systems used for medicine supply management (financing, selection, procurement, storage and

distribution) include public systems, mixed systems and private systems. In public systems, medicine supply management is carried out by a central government unit (WHO, 1997:12). In private systems, patients or private insurance systems reimburse all costs of medicines obtained from private healthcare facilities (WHO, 1997:12). In mixed systems, patients and private healthcare facilities are reimbursed with public funding from central budgets, or government medical stores and health facilities supply medicines which are paid for by patient fees (WHO, 1997:14).

The availability of medicines use in the treatment of chronic diseases is very important because morbidity and mortality due to chronic diseases can be decreased through utilising appropriate pharmacological treatment. Low medicines' availability restricts medicine access. A study by Cameron *et al.* (2011:413), comparing the availability of medicines for chronic and acute conditions in 40 developing countries, shows that in the public sector, fewer generic medicines for chronic conditions (36.0%) were available as compared to generic medicines for acute conditions (53.5%). The low availability of drugs in the public sector can be due to scarce funding, failure to forecast drug needs and maintain drug stocks, ineffective purchasing and distribution systems, and leakage of medicines for private resale (Cameron *et al.*, 2009:247). Public healthcare facilities procure medicines on the national essential medicines list (EML), so the low availability of medicines in the public sector could be due to variations in the products included in national EML or poor compliance with their recommendations (Cameron *et al.*, 2009:247). Medicine shortages are a concern in public healthcare facilities and this can lead to increased costs for health systems due to high prices of substitute medicines, medication errors, consequences of delayed therapy, and prescribers and dispensers substituting medicines that are not clinically appropriate (Iyengar *et al.*, 2016:1; McLaughlin *et al.*, 2013:783). Strategies that improve access to essential medicines include effective use of updated standard treatment guidelines (STGs) and EML, effective procurement, timely distribution and appropriate storage of essential medicines (Joshua *et al.*, 2016:543).

The goal of health financing is to improve healthcare by reducing inequalities in access to healthcare and removing financial barriers for poor populations (WHO, 2010a). Proper health financing ensures that people can utilise healthcare services, and are secured from financial devastation or poverty related to paying for healthcare services. Public healthcare financing is structured around an annual budget cycle (including budget formulation, budget execution and budget monitoring) meant to ensure that public expenditure on healthcare is well planned and implemented. Effective and efficient healthcare spending depends on reliable data on health financing which will enable the assessment of resource utilisation for improving healthcare. Countries such as Ireland and the United Kingdom (UK) have implemented the System of

Health Accounts (SHA) in 2011, enabling these countries to monitor their healthcare spending estimates (Central Statistics Office of Ireland, 2015; Office of National Statistics of the UK, 2016). Sustainable health financing for universal health coverage (UHC) can be achieved by implementing financing mechanisms such as contributory (social health insurance) and non-contributory (general government revenues) mechanisms. In Kenya, Okungu *et al.* (2017:6) assessed the financial requirements of both contributory and non-contributory mechanisms to financing UHC. The authors revealed that population coverage is likely to rise to 98% in the second year of application of the non-contributory mechanism because it includes everyone and is easily implementable compared to the contributory mechanism. In their study population coverage increased from 19.5% at the starting point to 68.5% in the 10th year of application of the contributory mechanism and about 98% universal coverage was reached in the 17th year of application of the contributory system (Okungu *et al.*, 2017:6).

The component of leadership and governance ensures strategic policy frameworks and effective oversight of the health system, coalition building and accountability, regulation, and attention to the overall design of the health system (WHO, 2007a:3). The national level of health systems carries out the activities of leadership and governance and involves government entities and other stakeholders. Government entities include politicians, policy-makers and other government officials with central entities being the Ministry of Health (MOH), health and social insurance agencies, and public pharmaceutical procurement and distribution entities (Brinkerhoff & Bossert, 2014:686). Other stakeholders include health service providers, service users, the general public and organised civil society (Brinkerhoff & Bossert, 2014:686-687). Attainment of UHC introduces the provision of equal and quality healthcare services for the population as a whole. However, the implementation of UHC depends on designing sound health insurance systems that are influenced by good leadership and governance. Zaman and Hossain (2017:19) show that for developing countries to attain UHC, governance and leadership are vital in maintaining activities of the health system (such as healthcare service delivery systems and health financing systems) effectively. Good governance is a public health priority (Brand, 2007:541). Factors affecting health systems governance performance include policies and provision of oversight, stakeholder participation, health system responsiveness, accountability and regulation (Senkubuge *et al.*, 2014:4). An effective health system governance engages the civil society (Brown, 2014:892-894), and the participation of healthcare users in decision-making and policy development (Conklin *et al.*, 2015:163).

Good health systems present a solution to combating disease burden, thus resulting in accessible drugs, vaccines, information and preventive measures, care, and treatment at reasonable costs. In sub-Saharan countries, poor health indicators are worsened by persistent

challenges of health systems (Oyibo & Ejughemre, 2013:153). Some of the challenges are scarce resources for healthcare service delivery, the lack of expertise to address the burden of diseases, poor health system financing, inadequate health legislations worsened by poor administration and corruption in health policy implementation and governance (Oyibo & Ejughemre, 2013:153). Lesotho, being one of the sub-Saharan countries, has gaps and challenges in its health system. These include acute shortages of human resources, an inability to absorb funds into the health sector, out-dated health legislation, inequalities and inequities in service delivery, and the steep geographical landscape (WHO, 2014b).

Health systems world-wide are burdened by the increasing prevalence of non-communicable diseases (NCDs) (Kankeu *et al.*, 2013:9), contributing to the rise in mortality in the world. According to the WHO (2017e), 40 million people die yearly of NCDs with cardiovascular diseases responsible for 17.7 million deaths, cancer 8.8 million, respiratory diseases 3.9 million, and diabetes 1.6 million deaths. From 1980 to 2014, the number of people living with diabetes increased from 108 million to 422 million globally (WHO, 2014a; WHO, 2016a:25). Additionally, the global prevalence of diabetes has doubled since 1980 from 4.7% to 8.5% in adults (WHO, 2016a:6). Diabetes mellitus prevalence has increased faster in LMICs than in high-income countries (WHO, 2016a:26). For example, the International Diabetes Federation (IDF) shows that in LMICs, 77% more of people had diabetes (IDF, 2014:10) compared to high-income countries. The IDF (2014:10) also projected that by 2035, 592 million people would have diabetes.

Asthma is also an NCD of public health concern with both resource-rich and resource-poor countries having a high prevalence of asthma (To *et al.*, 2012:1). The WHO (2017a) estimates that 235 million people worldwide have asthma. To *et al.* (2012:3) show the prevalence of asthma globally in adults as 4.5% and varying largely amongst the 70 partaking countries, ranging from 1.0% in Vietnam to 21.5% in Australia, depicting a 21-fold global variation. Asthma occurs mostly in children with the average annual asthma prevalence being higher in children (9.5%) than in adults (7.7%) (Loftus & Wise, 2016:245).

Epilepsy is a common neurological disease with 50 million people worldwide living with epilepsy of which 80% reside in LMICs (WHO, 2017b). Additionally, 2.4 million people are diagnosed with epilepsy each year with new cases between 30 and 50 per 100 000 people in high-income countries (WHO, 2017b). Ngugi *et al.* (2013:258-259) show that there is a difference in the prevalence of active convulsive epilepsy in the sub-Sahara African countries as a result of differences in risk factors of epilepsy. The prevalence trends of epilepsy in sub-Sahara African countries show a peak of active epilepsy at age 20-29 years and 40-49 years across the

lifespan and when looking at the pattern of lifetime epilepsy, a peak was seen at age 20-29 years (Paul *et al.*, 2012).

An effective health system in managing diseases requires trained and motivated healthcare workers that can carry out the tasks and build the system (Wade, 2015). Adequate coverage for important primary healthcare interventions relies on the availability of healthcare professionals. Countries with less than 23 healthcare professionals per 10 000 populations will not be able to attain sufficient coverage for these interventions (WHO, 2009b:95). Lesotho has one doctor and six nursing and midwifery personnel per 10 000 populations while pharmaceutical personnel is significantly fewer to serve the population (WHO, 2011a:118). According to The United Nations Conference on Trade and Development (UNCTAD, 2012), the African regional ratio of staffing to the population in major healthcare providers averages two; the Lesotho ratio averages 0.850. The majority of Lesotho's population, furthermore, resides in mountainous terrains and this becomes problematic when both patients and staff have to access health facilities (Wade, 2015). As a result, some of the challenges include the retention of healthcare workers and the shortage of qualified healthcare professionals.

The health sector of Lesotho was improved by projects funded by the Millennium Challenge Corporation in collaboration with other stakeholders. Some of the activities carried out by these projects included building healthcare centres, antiretroviral (ART) clinics and a national laboratory (also known as a central laboratory) (Central Bank of Lesotho (CBL), 2007). These projects renewed and extended 138 healthcare centres country-wide and 14 hospital outpatient departments (Wade, 2015). Currently, there is one leading statutory body established as a trading account of the MOH in Lesotho, which is the National Drug Service Organisation (NDSO) (Wade, 2015). This organisation acts as a central medical store. Some of its responsibilities include procurement, storage and distribution of medicines and medical consumables for public health facilities in the country. This organisation is overwhelmed with the increasing demand for medicines and the government delaying reimbursement for their services (Wade, 2015).

According to the WHO (2007a:1), the main challenges for health systems include access to drugs, information and other forms of prevention, and timely and reliable care or treatment in sufficient quantities and at a reasonable cost to those who need them. In order to address challenges, a reliable assessment is needed. There is a lack of research on the assessment of the health system in Lesotho to provide healthcare services to patients with NCDs. To fill this research gap, this study assessed the health system of Lesotho in delivering healthcare services to patients with hypertension, diabetes mellitus, asthma and epilepsy.

The literature shows that limited access to essential healthcare and preventive measures, lack of essential medicines and poor quality service contribute to the weak health profile of Lesotho. Therefore, the significance of this study is to identify key elements of the health system in terms of NCD management in Lesotho that need empowerment. Based on the preceding discussion the following research questions were formulated for this study:

- How is the public health system in Lesotho structured to support the delivery of NCD management to outpatients in Lesotho?
- What is the existing practice in the public healthcare sector when providing services for outpatients with NCDs in Lesotho?
- What is the role of pharmacists in the public health system for NCD management in Lesotho?

1.3 Research aim and specific objectives

1.3.1 General aim

The general aim of this study was to investigate and propose a model for the optimal disease management of NCDs in the public health system in Lesotho. To achieve this general aim, specific aims were formulated:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities.
- To assess the role of the pharmacist in the national, district and PHC levels in the health system of Lesotho concerning the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

1.3.2 Specific objectives

The study objectives for two phases of the study, namely: Literature Review and Empirical Investigation are stated below.

1.3.2.1 Literature review

The specific research objectives for the literature review include the following:

- To determine different health system structures for NCD management;
- To determine how the different health system structures for NCD management progressed from older structures to cater for the increasing prevalence of NCDs;
- To describe NCD management structures in the health system of both developing and developed countries;
- To investigate the expanding role of pharmacists in the management of NCDs, and
- To describe the health system of Lesotho in relation to health service delivery in public health facilities in the management of NCDs.

1.3.2.2 Empirical investigation

The specific objectives for the empirical investigation were divided into objectives for human resources, medication and medical devices, health management and information system (HMIS), healthcare financing, health infrastructure and equipment, and role of the pharmacist in the different levels of healthcare. These objectives focused on the public health facilities in Lesotho.

1.3.2.2.1 Human resources

- For the human resources, the specific objective is to assess the human resources at the national, district and PHC levels in the public health facilities in Lesotho in terms of:
 - i) The profile of health personnel managing NCDs in each health facility;
 - ii) Strategies used for hiring and retention of health personnel in health facilities;
 - iii) Available human resource management systems that include support, clinical supervision and performance monitoring, and
 - iv) Collaborative activities among public and private health facilities, including the community in relation to NCD management.
- To assess the human resources at the national and the district level in the public health facilities in Lesotho in terms of:
 - i) The capacity of the public and private sector in addressing the number of health personnel in NCD management;
 - ii) Guidelines on roles of community health workers in NCD management, and

- iii) Integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.

1.3.2.2.2 Health promotion

- The specific objective on health promotion is to describe health promotion at the district and PHC levels in the public health facilities in Lesotho in terms of conduction of health promotion activities by health workers in health facilities.

1.3.2.2.3 Continuing education and training of health workers in non-communicable diseases

- Another specific objective is to assess continuing education and training of health workers in NCDs at the district and the PHC level in the public health system of Lesotho in terms of:
 - i) The availability of professional development and continuing education support for health workers on NCD management at health facilities, and
 - ii) The availability of training on NCD management for health workers at health facilities.

1.3.2.2.4 Medicines for non-communicable disease management

- The other specific objectives are to describe medicines for NCD management at the district and PHC levels in the public health facilities in Lesotho in terms of:
 - i) Types and availability of medicines used in NCD management at the health facilities;
 - ii) Availability of NCDs STGs and EML at the health facilities, and
 - iii) The availability of drug supply management tool(s).
- To assess medicines for NCD management at the national level in the public health facilities in Lesotho in terms of:
 - i) Updating the national EML so that it is in line with the prevailing burden of NCDs, and
 - ii) Guidelines on quality control, selection, procurement, storage and distribution of drugs.

1.3.2.2.5 Health management and information systems

- In the health management and information systems (HMIS) at the district and PHC levels in the public health facilities in Lesotho, the specific objectives are to describe it in terms of:
 - i) The level of recording and reporting of information on outpatients with NCDs;
 - ii) Factors influencing recording and reporting of information on outpatients with NCDs;
 - iii) The type of data collected and kept at the health facilities on NCDs, and
 - iv) The use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.

- To assess the HMIS at the national level in the public health facilities in Lesotho in terms of:
 - i) The profile of personnel responsible for NCD management data;
 - ii) The use of data on NCDs from health facilities countrywide to inform decision-making at the national level;
 - iii) The availability and application of the National Health Management and Information System (NHMIS) policy in governing data for NCDs, and
 - iv) Structures in place to lead and manage health system information system (HSIS) in the management of NCDs.

1.3.2.2.6 Healthcare financing

- With regard to healthcare financing, the specific objectives are to describe healthcare financing at the district and PHC levels in the public health facilities in Lesotho in terms of:
 - i) The process of budget allocation in different levels of healthcare towards medication and medical devices used in diagnosis and management of NCDs, and
 - ii) Payment for some of the services provided at the health facilities by outpatients with NCDs.
- To assess healthcare financing at the national level in the public health facilities in Lesotho in terms of resources allocation procedures at the national level for NCD management.

1.3.2.2.7 Health infrastructure and equipment

- In the health infrastructure and equipment, the specific objective is to describe health infrastructure and equipment in the public health facilities in Lesotho in terms of:
 - i) Restoration of health infrastructure and equipment at different levels of healthcare, and
 - ii) Availability and management of infrastructure and equipment for NCDs at health facilities.

1.3.2.2.8 Role of the pharmacist in the different levels of healthcare

- The last specific objective is to assess the role of the pharmacist at the national, district and PHC levels in the public health facilities in Lesotho, in terms of:
 - i) The profile of pharmacists in the management of NCDs, and
 - ii) The role of pharmacists in the management of NCDs.

1.4 Methodology

The following methodology was followed during the conduction of the study to assess the above-mentioned specific objectives.

1.4.1 Study design

An observational cross-sectional study design was employed. An observational cross-sectional study is a snapshot that gives a picture of what the researcher wants to study (Connelly, 2016:369). This study design provided current information on healthcare service delivery and the role of the pharmacist in the management of NCDs in the health system of Lesotho.

1.4.2 Study setting

The health system of Lesotho is divided into three levels which are the national, district, and PHC levels (refer to Chapter 3, Section 3.2.2). The study was conducted in all three levels of healthcare because the levels are dependent on each other for healthcare service delivery to outpatients with NCDs. A detailed description of the roles and responsibilities of the national, district and PHC levels have been well-defined in Chapter 3, Sections 3.2.2.1, 3.2.2.2 and 3.2.2.3, respectively.

1.4.3 Target and study population

The target population included all employees in managerial positions and/or those acting in managerial positions at the pharmaceutical directorate, NCD unit, DHMTs, OPDs in district hospitals and the healthcare centres involved in the management of NCDs in public health facilities during the study period. The study population consisted of those employees complying with the following inclusion criteria during the study period:

- All employees in managerial positions for more than six months at the pharmaceutical directorate, NCD unit, DHMTs, OPDs in district hospitals, and the healthcare centres, and
- Employees who have been holding acting managerial positions in unfilled positions for more than six months.

The basis of the inclusion criteria was that employees holding managerial positions or acting as such will have appropriate, relevant and consistent information on how NCD management is carried out in the public health system of Lesotho, and what the current practices are. Therefore, they were in the best position to have reliable and valid information concerning different health system elements in the management of NCDs.

Employees holding managerial positions who were absent during the data gathering were excluded from the study.

1.4.4 Sampling

No sampling was done. The total population consisting of potential participants with experience and knowledge in managing NCDs in the health system of Lesotho was invited to partake in the study. Self-administered structured questionnaires were distributed to all potential participants in or acting in managerial positions for more than six months at the pharmaceutical directorate, NCD unit, DHMTs, OPDs in district hospitals, and the healthcare centres involved in the management of NCDs in public health facilities in Lesotho. The potential participants were selected based on the inclusion criteria set for this study (refer to paragraph 1.4.3).

1.4.5 Determination of the sample size

Sections 1.4.5.1–1.4.5.3 focus on how the sample size at different levels of Lesotho’s public health system was determined.

1.4.5.1 Study population at national level

At national level, the sample size included a total of nine potential participants (six potential participants in the pharmaceutical directorate and three in the NCD unit), who were invited to partake in the study. Table 1-1 shows the study population at the pharmaceutical directorate and the NCD unit.

Table 1-1: Study population at the national level

Type of facility	Number of potential participants in managerial positions	Sample size
Pharmaceutical directorate	6	6
NCD unit	3	3
Total	9	9

1.4.5.2 Study population at the district level

The sample at the district level included a total of 30 potential participants in the DHMTs. Table 1-2 shows the study population at the district level.

Table 1-2: Study population at the district level

Type of facility	Type of professionals in managerial positions	Number of potential participants in managerial positions	Sample size
DHMT	Public health nurse	10	10
DHMT	Pharmacist	10	10
DHMT	District health manager	10	10
Total		30	30

1.4.5.3 Study population at health facility level (outpatient departments in district hospitals and primary healthcare level)

Table 1-3 shows the study population at the PHC level. The sample size included 366 potential participants from OPDs in district hospitals and healthcare centres. Of the 366 potential participants, 90 were from the OPDs in district hospitals and 276 from the healthcare centres.

Table 1-3: Study population at the primary healthcare level

Type of facility	Type of professionals in managerial positions	Number of potential participants in managerial positions	Sample size
OPDs in district hospitals	Medical superintendents	18	18
OPDs in district hospitals	Matrons	18	18
OPDs in district hospitals	Hospital manager for nursing services	18	18
OPDs in district hospitals	Head pharmacists	18	18
OPDs in district hospitals	Pharmacists	18	18
Healthcare centres	PHC managers	138	138
Healthcare centres	Nurse practitioners	138	138
Total		366	366

1.4.6 Data-collection tools

Four self-administered structured questionnaires were used to collect data from potential participants in the three levels of the study (refer to Annex A-D), where two questionnaires were for the health facility level (each for OPDs and healthcare centres). The type of data collected was quantitative. A direct method of distribution was used where hard copies were handed out to potential participants. This method was used because most study settings were found in

remote rural areas where there is a lack of internet access. The structured questionnaires consisted of seven sections that addressed the objectives of the study, namely:

- demographic information,
- human resources,
- medication and medical devices,
- health management and information system,
- health financing,
- health infrastructure and equipment, and
- role of the pharmacist in the different levels of healthcare.

1.4.6.1 Questionnaire design

Sections of the self-administered structured questionnaires were developed using the six building blocks of the WHO health system framework (refer to Chapter 2, Section 2.2). The building blocks framework was modified to develop the self-administered structured questionnaires specific to hypertension, diabetes mellitus, asthma and epilepsy. Questions were mainly developed based on similar studies, such as Bitton *et al.* (2017), Schindel *et al.* (2017), WHO (2003a), WHO (2011b), and Wendt (2012), that investigated NCD management models. Table 1-4 shows additional references and literature sources considered during the development of the self-administered structured questionnaires.

Table 1-4: Literature sources used to decide which information to include in the self-administered structured questionnaires

Type of information	References
Information on the state of NCDs, the health system of Lesotho and services provided to patients with NCDs in Lesotho	Lesotho Health Sector Strategic Plan 2012/13-2016/17 (GOL, 2013); Lesotho Health Policy 2011 (MOHSW, 2011a); Lesotho Primary Healthcare Revitalisation Action Plan 2011-2017 (MOHSW, 2011b).
Different NCD models to assess how NCD models evolved to accommodate the increasing incidence of NCDs worldwide	Barr <i>et al.</i> (2003); Epping-Jordan <i>et al.</i> (2004); Glasgrow <i>et al.</i> (2001); Oprea <i>et al.</i> (2009); Solberg <i>et al.</i> (1997); Solberg <i>et al.</i> (1998); Solberg, Kottke & Brekke (1998); Wagner <i>et al.</i> (2001); WHO (2001); WHO (2002).
NCD models used in developed and developing countries to observe how different countries used different NCD models to suit their country needs	South Africa (2011); European Union countries (Nolte <i>et al.</i> , 2014); Australia (Australian Institute of Primary Care, 2008); Canada (Martin, 2007; Wagner, 1998).

The self-administered structured questionnaires developed consisted primarily of closed-ended questions. Closed-ended and open-ended questions were utilised to limit the disadvantages of

each form of a question. With closed-ended questions, potential participants were provided with possible answers and asked to select appropriate ones. Open-ended questions allowed the researcher to get opinions of potential participants without any influence by the researcher avoiding the bias that may result from suggested responses as in the case of closed-ended questions. This was because open-ended questions provided potential participants with the possibility of giving spontaneous responses.

Table 1-5 shows the advantages and disadvantages of closed-ended and open-ended questions, adapted from studies by Reja *et al.* (2003); FluidSurveys (2013) and McLeod (2014).

Table 1-5: Advantages and disadvantages of closed-ended and open-ended questions

Advantages	Disadvantages
Closed-ended questions	
<ul style="list-style-type: none"> • Closed-ended questions provide large amounts of research data for relatively low costs. • The data can be quickly obtained as closed questions are easy to answer (usually just ticking a box). • The questions are standardised. All respondents are asked the same questions in the same order. • A questionnaire can be replicated easily to check for reliability. 	<ul style="list-style-type: none"> • Closed-ended questions lack detail because the responses are fixed. • There is less scope for respondents to give answers which reflect their genuine opinions on a topic.
Open-ended questions	
<ul style="list-style-type: none"> • Rich qualitative data are obtained as open questions allow the respondent to elaborate on their answer. • The researcher can find out why a person holds a certain attitude. 	<ul style="list-style-type: none"> • It takes longer for the respondent to complete open questions. • It takes longer for the researcher to analyse qualitative data as they have to read the answers and try to put them into categories by coding, which is often subjective and challenging.

The variables, description of variables and the research objectives for the self-administered structured questionnaires in all levels of the study are shown in Table E-1 (refer to Annex E).

1.4.7 Validity and reliability of questionnaires

Sections 1.4.7.1 and 1.4.7.2 discuss the validity and reliability of self-administered structured questionnaires, respectively.

1.4.7.1 Validity of questionnaires

Validity is the extent to which an instrument measures what it is supposed to measure (Cohen *et al.*, 2007:134). Face and content validity were used to validate questionnaires in this study.

1.4.7.1.1 Face validity

Face validity is the extent to which an instrument that was used looks valid. This type of validity cannot be measured or investigated, but an instrument is examined by specialists in the field to ensure a high degree of face validity (Wood & Ross-Kerr, 2011:203). The specialists who determined whether the measurement tools sufficiently dealt with the content and represented the measurement of interest included the study promoters and a statistician at the NWU.

1.4.7.1.2 Content validity

Content validity refers to the degree to which a measurement tool can be interpreted as reflecting a particular content it was designed to measure (Kimberlin & Winterstein, 2008:2279). Content validity is demonstrated by conducting an extensive literature review of similar studies using specific measuring instruments (refer to paragraph 3.2.1.6.1).

In this study, content validity was established as follows: 1) an extensive literature review was conducted to select questions pertinent to NCD management; and 2) structured questionnaires used in different credible studies (Bitton *et al.*, 2017; Schindel *et al.*, 2017; WHO, 2003a; WHO, 2011b; Wendt, 2012) were used to develop structured questionnaires to be used in the three levels of the study. Throughout the process of designing questionnaires, discussions with promoters and a statistician at the NWU for the selection of questions were conducted.

1.4.7.2 Reliability of questionnaire

Reliability is the extent to which an instrument is repeatable and consistent (Cohen *et al.*, 2007:148). The following methods were carried out to increase the reliability of the questionnaires:

- different preliminary versions of questionnaires were developed and evaluated by study promoters, healthcare personnel in Lesotho, and university personnel at the National University of Lesotho (NUL) before the final versions were developed;
- consideration was taken to ensure that each measure or question indicates only one concept, and

- attention was paid to measuring constructs at the most precise level possible.

At this point, final versions of self-administered structured questionnaires were ready to be used in the data collection process.

1.4.8 Data-collection process

The following subsections outline the processes of seeking permission to conduct the study, recruitment of participants and administration of the questionnaires.

1.4.8.1 Permission to conduct the study

Ethical approval was sought from the NWU Health Research Ethics Committee (HREC) (NWU-00048-18-A1) and the Ministry of Health Ethics Committee and Review Board of Lesotho (ID120-2018) (refer to Annex Q-R). Permission was obtained from the Director of the Pharmaceutical Directorate, manager of the NCD unit, district health managers at the DHMTs and the CHAL (refer to Annex M-P).

In all the levels of the study, the researcher explained the study using an executive summary of the study proposal and provided copies of letters of preliminary permission from the NWU HREC, and ethical approval from the Ministry of Health Ethics Committee and Review Board of Lesotho. When permission to recruit was granted to the researcher, final ethical approval was sought from the NWU HREC. Dates for recruitment were set after final approval by HREC.

1.4.8.2 Recruitment of participants and administration of the self-administered structured questionnaires

After the necessary ethics approval and permissions were obtained, training of an independent research assistant and other independent persons, recruitment of participants, and implementation of the study at the different levels commenced.

1.4.8.2.1 Appointment and training of independent research assistant and independent persons

Before the recruitment and administration of self-administered structured questionnaires, one independent research assistant was appointed. The independent research assistant was a lecturer in the Pharmacy Department at the NUL. The PHC managers were asked to act as independent persons in their different healthcare centres. The independent research assistant

and independent persons signed confidentiality agreements before starting with their roles in the study (refer to Annex K-L).

- **Appointment of the independent research assistant**

A meeting was held between the researcher and all lecturers in the Pharmacy Department at the NUL. In the meeting, discussions about the study and the role of an independent research assistant were done. The lecturers were also informed that their services as an independent research assistant were voluntary. Time was given to all lecturers to ask questions about the study and their role as independent research assistants. One lecturer volunteered because one of his/her research interests was health systems. The independent research assistant was used because he/she was not able to influence potential participants during the distribution of informed consent forms and self-administered structured questionnaires as power imbalances had been avoided.

- **Appointment of independent persons**

At a quarterly meeting for PHC managers at the DHMTs, PHC managers were requested by the independent research assistant to act as independent persons to implement the study in their healthcare centres. The PHC managers are based at the DHMTs and are responsible for supervision and mentoring of nurses working in healthcare centres in their district. To avoid power imbalances, the PHC managers left the informed consent forms and questionnaires at healthcare centres and returned to the DHMTs. Therefore, participants were able to complete the forms privately. The PHC manager was responsible for explaining the study, the distribution of self-administered structured questionnaires and informed consent forms to nurse practitioners working in their healthcare centres. The reason for this was the topography of the country that limited travelling for the researcher and the independent research assistant to the different healthcare centres as most healthcare centres in the mountains of Lesotho were not easily accessible by road. The independent research assistant informed the PHC managers that their services as independent persons were voluntary.

After the appointment of independent research assistants and independent persons, their roles were to introduce the study, assist with the administration of informed consent forms and self-administered structured questionnaires and collection of boxes containing informed consent forms and self-administered structured questionnaires.

- **Training of independent research assistant and independent persons**

The independent research assistant was trained by the researcher using role-play on the administration of informed consent forms and self-administered structured questionnaires. Role-playing enabled the independent research assistant to become more familiar with the contents of both informed consent forms and self-administered structured questionnaires thus increasing self-confidence. Also, knowing the study enabled the independent research assistant to respond to questions potential participants might have regarding the study. The independent research assistant used the same role-play method to train independent persons who introduced the study, distributed and collected informed consent forms and self-administered structured questionnaires from potential participants at the healthcare centres.

1.4.8.2.2 Recruitment of participants

Informed consent was acquired from potential participants before the implementation of the study at different levels (refer to Annex F-J). Table 1-6 shows the recruitment and implementation processes at the different levels of the study.

Table 1-6: Recruitment and implementation process at the different levels of the health system of Lesotho

Level of the study	Study setting	Recruitment process	Implementation process
National level	Pharmaceutical Directorate	<p>Ethics approval (final or provisional, depending on HREC) was first obtained from HREC and the National Review Board and Ethics Committee, Ministry of Health, Lesotho. Additionally, permission was sought from the director-general at the MOH before permission from the pharmaceutical directorate was sought.</p> <p>After ethics approval, the researcher requested a formal meeting with the manager of the pharmaceutical directorate to introduce the study and to obtain permission (refer to Annex M) from the manager of the pharmaceutical directorate to implement the study in the pharmaceutical directorate.</p> <p>After permission was obtained, the manager was asked to allow that the independent research assistant introduces the study to members of the pharmaceutical directorate at an existing meeting.</p> <p>One private/access-controlled room was requested from the manager of the pharmaceutical directorate to be used for all the signing of informed consent forms.</p> <p>A list of staff members of the pharmaceutical directorate who comply with the inclusion criteria and their telephone numbers was requested from the manager.</p> <p>The independent research assistant introduced the study and encouraged the participation of members of the pharmaceutical directorate who complied with the inclusion criteria. The independent research assistant emphasised that participation was voluntary and that anyone could withdraw. The process that should be followed to obtain informed consent was explained to attendees.</p> <p>Obtaining informed consent</p> <p>During the meeting with members of the pharmaceutical directorate, two copies of the informed consent form (refer to</p>	<p>After recruitment, the independent research assistant scheduled appointments with participants telephonically for the distribution of the self-administered structured questionnaire (refer to Annex A).</p> <p>The independent research assistant explained the self-administered structured questionnaire to participants at the pharmaceutical directorate and distributed the questionnaires.</p> <p>The self-administered structured questionnaires were lengthy, so participants were given three days to complete the self-administered structured questionnaires in the privacy of their offices and homes.</p> <p>Participants were informed that they were free not to participate or could withdraw at any time from the study before submission of the self-administered structured questionnaires.</p> <p>Participants handed in their self-administered structured questionnaires at the receptionist area at the pharmaceutical directorate in a sealed box labelled 'self-administered structured questionnaires'. The sealed box was tamper-proof and sealed with a slot where forms could be put into.</p> <p>Participants were asked to submit both completed and uncompleted self-administered structured questionnaires. The independent research assistant took the boxes to the researcher's office at the Pharmacy Department at the NUL for storage inside a locked cabinet on the fourth day. Only the researcher had access to the locked cabinet.</p> <p>The completed self-administered structured questionnaires were taken from the boxes and numbered consecutively starting from one. This number was used to</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>Annex F) were distributed by the independent research assistant to each member who complied with the inclusion criteria. They were able to take it home to read it thoroughly.</p> <p>The independent research assistant was available for the next two days (after 24 hours) in the specific private room at the offices of the pharmaceutical directorate.</p> <p>Participants willing to participate made an appointment with the independent research assistant the next day (after 24 hours) where the participant asked any further questions they had.</p> <p>Once the potential participant was ready, the independent research assistant and the potential participant signed the informed consent. Participants kept one of the signed copies of the informed consent form.</p> <p>After signing the informed consent form, the independent research assistant scheduled appointments with participants telephonically for the distribution of self-administered structured questionnaires (refer to Annex A).</p>	<p>denote a particular participant, to guarantee anonymity to participants.</p>
National level	NCD unit	<p>Ethics approval (final or provisional, depending on HREC) was first obtained from HREC and the National Review Board and Ethics Committee, Ministry of Health, Lesotho.</p> <p>Additionally, permission was sought from the director-general at the MOH before permission from the NCD unit was sought.</p> <p>After ethics approval, the researcher requested a formal meeting with the manager of the NCD unit to introduce the study and to obtain permission (refer to Annex N) from the manager of the NCD unit to implement the study in the NCD unit.</p> <p>After permission was obtained, the manager was asked to allow that the independent research assistant introduces the study to members of the NCD unit at an existing meeting.</p> <p>One private/access-controlled room was requested from the manager of the NCD unit to be used for all the signing of</p>	<p>After recruitment, the independent research assistant scheduled appointments with participants telephonically for the distribution of the self-administered structured questionnaire (refer to Annex A).</p> <p>The independent research assistant explained the self-administered structured questionnaire to participants at the NCD unit and distributed the questionnaires.</p> <p>The self-administered structured questionnaires were lengthy, so participants were given three days to complete the self-administered structured questionnaires in the privacy of their offices and homes.</p> <p>Participants were informed that they were free not to participate or could withdraw at any time from the study before submission of the self-administered structured</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>informed consent forms.</p> <p>A list of staff members of the NCD unit who complied with the inclusion criteria and their telephone numbers was requested from the manager.</p> <p>The independent research assistant introduced the project and encouraged the participation of members of the NCD unit who complied with the inclusion criteria. The independent research assistant emphasised that participation was voluntary and that anyone could withdraw. The process that should be followed to obtain informed consent was explained to attendees.</p> <p>Obtaining informed consent</p> <p>During the meeting with members of the NCD unit, two copies of the informed consent form (refer to Annex G) were distributed by the independent research assistant to each member who complied with the inclusion criteria. They were able to take it home to read it thoroughly.</p> <p>The independent research assistant was available for the next two days (after 24 hours) in the specific private room at the offices of the NCD unit.</p> <p>Participants willing to participate made an appointment with the independent research assistant the next day (after 24 hours) where the participant asked any further questions they had.</p> <p>Once the potential participant was ready, the independent research assistant and the potential participant signed the informed consent. Participants kept one of the signed copies of the informed consent form.</p> <p>After signing the informed consent form, the independent research assistant scheduled appointments with participants telephonically for the distribution of self-administered structured questionnaires (refer to Annex A).</p>	<p>questionnaires.</p> <p>Participants handed in their self-administered structured questionnaires at the receptionist area at the NCD unit in a sealed box labelled 'self-administered structured questionnaires'. The sealed box was tamper-proof and sealed with a slot where forms could be put into.</p> <p>Participants were asked to submit both completed and uncompleted self-administered structured questionnaires. The independent research assistant took the boxes to the researcher's office at the Pharmacy Department at the NUL for storage inside a locked cabinet on the fourth day. Only the researcher had access to the locked cabinet.</p> <p>The completed self-administered structured questionnaires were taken from the boxes and numbered consecutively starting from one. This number was used to denote a particular participant, to guarantee anonymity to participants.</p>

Level of the study	Study setting	Recruitment process	Implementation process
District level	DHMT	<p>After ethics approval, the researcher requested a formal meeting with each of the 10 DHMT managers where the study was introduced. Permission (refer to Annex O) from each DHMT manager to implement the study in the specific district was requested.</p> <p>After permission had been obtained:</p> <p>The DHMT manager was asked to allow that the study be introduced to members of the DHMT at an existing meeting.</p> <p>A list of possible participants who complied with the inclusion criteria with names and telephone numbers was requested from each DHMT manager for the preparation of the distribution of self-administered structured questionnaires.</p> <p>One private/access-controlled room was requested from the manager of the DHMT to be used for the signing of informed consent forms.</p> <p>The independent research assistant introduced the study and encouraged the participation of members of the DHMT; however, she/he emphasised that participation was voluntary.</p> <p>Specific issues regarding the withdrawal from the study were also discussed. The process that should be followed was explained to attendees.</p> <p>Obtaining informed consent:</p> <p>During the meeting, the independent research assistant distributed two informed consent forms (refer to Annex H) to the staff members of each DHMT who complied with the inclusion criteria. They were able to take it home to read it thoroughly.</p> <p>The independent research assistant was available for the next two days at each specific DHMT office in the specific private room.</p> <p>Participants willing to participate made an appointment with the independent research assistant the next day (after 24</p>	<p>After recruitment, the independent research assistant scheduled appointments telephonically for the distribution of self-administered structured questionnaires (refer to Annex B) with participants who complied with the inclusion criteria and who signed and submitted the informed consent form.</p> <p>The independent research assistant explained and distributed the self-administered structured questionnaire to participants at the DHMT.</p> <p>The self-administered structured questionnaires were lengthy so participants were given three days to complete the self-administered structured questionnaires in the privacy of their offices and homes.</p> <p>Participants were informed that they were free not to participate or could withdraw at any time from the study before submission of the self-administered structured questionnaires.</p> <p>Participants handed in their self-administered structured questionnaires at the receptionist area in a sealed box labelled 'self-administered structured questionnaires'. The sealed box was tamper-proof and sealed with a slot where forms could be put into.</p> <p>Participants were asked to submit both completed and uncompleted self-administered structured questionnaires. The independent research assistant took the boxes to the researcher's office at the Pharmacy Department at the NUL for storage inside a locked cabinet on the fourth day. Only the researcher had access to the locked cabinet.</p> <p>The completed self-administered structured questionnaires were taken from the boxes, and numbered consecutively starting from one. This number was used to denote a particular participant, to guarantee anonymity to participants.</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>hours) where the participant asked any further questions they had.</p> <p>Once the potential participant was ready, the independent research assistant and the potential participant signed the informed consent. Participants kept one of the signed copies of the informed consent form.</p> <p>After signing the informed consent form, the independent research assistant scheduled appointments with participants telephonically for the distribution of self-administered structured questionnaires (refer to Annex B).</p>	
Primary healthcare level	OPDs in district hospitals	<p>After ethics approval, the researcher requested a formal meeting with each of the 18 district hospital managers where the study was introduced. Permission from each district hospital manager to implement the study in the specific district hospital was requested.</p> <p>After permission had been obtained:</p> <p>The district hospital manager was asked to allow that the study is introduced to members of the OPDs in district hospitals at an existing meeting.</p> <p>A list of possible participants who complied with the inclusion criteria with names and telephone numbers was requested from each district hospital manager for the preparation of the distribution of self-administered structured questionnaires.</p> <p>One private/access-controlled room was requested from the manager of the district hospital to be used for the signing of informed consent forms.</p> <p>The independent research assistant introduced the study and encouraged the participation of members of the OPDs in district hospitals; however, she/he emphasised that participation was voluntary.</p> <p>Specific issues regarding the withdrawal from the study were also discussed. The process that should be followed was</p>	<p>After recruitment, the independent research assistant scheduled appointments telephonically for the distribution of self-administered structured questionnaires (Annex C) with participants who complied with the inclusion criteria and who signed and submitted the informed consent form.</p> <p>The independent research assistant explained and distributed the self-administered structured questionnaires to participants at the OPDs in district hospitals.</p> <p>The self-administered structured questionnaires were lengthy so participants were given three days to complete the self-administered structured questionnaires in the privacy of their offices and homes.</p> <p>Participants were informed that they were free not to participate or could withdraw at any time from the study before submission of the self-administered structured questionnaires.</p> <p>Participants handed in their self-administered structured questionnaires at the receptionist area in a sealed box labelled 'self-administered structured questionnaires'. The sealed box was tamper-proof and sealed with a slot where forms could be put into.</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>explained to attendees.</p> <p>Obtaining informed consent: During the meeting, the independent research assistant distributed two informed consent forms (refer to Annex I) to the staff members of each OPDs in district hospitals who complied with the inclusion criteria. They were able to take it home to read it thoroughly.</p> <p>The independent research assistant was available for the next two days at each specific district hospital office in the specific private room.</p> <p>Participants willing to participate made an appointment with the independent research assistant the next day (after 24 hours) where the participant asked any further questions they had.</p> <p>Once the potential participant was ready, the independent research assistant and the potential participant signed the informed consent. Participants kept one of the signed copies of the informed consent form.</p> <p>After signing the informed consent form, the independent research assistant scheduled appointments with participants telephonically for the distribution of self-administered structured questionnaires (refer to Annex C).</p>	<p>Participants were asked to submit both completed and uncompleted self-administered structured questionnaires. The independent research assistant took the boxes to the researcher's office at the Pharmacy Department at the NUL for storage inside a locked cabinet on the fourth day. Only the researcher had access to the locked cabinet.</p> <p>The completed self-administered structured questionnaires were taken from the boxes, and numbered consecutively starting from one. This number was used to denote a particular participant, to guarantee anonymity to participants.</p>
Primary healthcare level	Healthcare centres	<p>PHC managers: After ethics approval, the researcher requested a formal meeting with each DHMT manager where the study was introduced (the same meeting as for the district level). Permission (refer to Annex O) from each DHMT manager was requested to implement the study in the different healthcare centres in each district.</p> <p>After permission was obtained, the DHMT manager was asked to allow that the study be introduced to PHC managers at an existing quarterly meeting.</p>	<p>Distribution of the self-administered structured questionnaires</p> <p>After signing the informed consent form the independent research assistant explained and distributed self-administered structured questionnaires (refer to Annex D) to the participant to complete.</p> <p>Participants were asked to take the questionnaires with them back to the healthcare centres where participants would complete them.</p> <p>A sealed box in which participants were to place both</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>The independent research assistant encouraged the participation of PHC managers from healthcare centres in the district.</p> <p>At a quarterly meeting, an independent research assistant introduced the study to PHC managers. PHC managers came from different healthcare centres that provide primary healthcare services to patients with NCDs throughout the district. Some of the healthcare centres were not accessible by road, targeting a quarterly meeting was, therefore, be a more manageable option for the researcher.</p> <p>The independent research assistant emphasised that participation was voluntary and the process of withdrawal was explained.</p> <p>Obtaining Informed consent:</p> <p>During the quarterly meeting, the independent research assistant distributed two informed consent forms (refer to Annex J) to all possible participants. They were able to take it home to read it thoroughly.</p> <p>The independent research assistant was available for the next two days at each specific DHMT office in the specific private room to explain uncertainties on the informed consent form and to sign the informed consent form.</p> <p>Potential participants willing to participate made an appointment with the independent research assistant during the next two days (after 24 hours).</p> <p>Once the potential participant was ready, the independent research assistant and the potential participant signed the informed consent in the private room. Participants kept one of the signed copies of the informed consent form.</p> <p>Participants were informed during the meeting that they were free not to participate or could withdraw at any time.</p>	<p>completed and uncompleted questionnaires was kept at the healthcare centre secretary's office labelled 'self-administered structured questionnaires'. The sealed box was tamper-proof and sealed with a slot where forms could be put into.</p> <p>Gathering of completed questionnaires:</p> <p>The PHC manager sent the box containing both completed and uncompleted self-administered structured questionnaires to the DHMT during the following monthly delivery of medicines to the healthcare centre.</p> <p>The DHMT informed the researcher that the boxes from all healthcare centres were ready for collection. The independent research assistant collected all the boxes from the DHMT.</p> <p>The anonymous (without the name of the healthcare centre) sealed boxes were opened by the researcher in her office in Maseru at the NUL in the Pharmacy Department.</p>
	Healthcare	Nurse practitioners:	Distribution of self-administered structured

Level of the study	Study setting	Recruitment process	Implementation process
	centres	<p>The independent research assistant was also requested to act as a facilitator for this process.</p> <p>At the same quarterly meeting (as described for the PHC manager) PHC managers were requested by the independent research assistant to act as independent persons to implement the study in their specific healthcare centres.</p> <p>The PHC manager was responsible for explaining and distributing informed consent forms (refer to Annex J) and self-administered structured questionnaires (refer to Annex D) to nurse practitioners working in their healthcare centres and to explain the study. The reason for this was the topography of the country that limited travelling for the researcher and independent research assistant to the different healthcare centres as most healthcare centres in the mountains of Lesotho were not easily accessible by road.</p> <p>The independent research assistant asked permission from each PHC manager to act as an independent person to implement the study in their healthcare centres. The independent research assistant also informed them that participation was voluntary. To address issues of power imbalance, the PHC managers left the informed consent forms and questionnaires with potential participants after introducing the study and went back to the DHMTs.</p> <p>The independent research assistant provided each PHC manager, who signed the confidentiality agreement form, enough informed consent forms and self-administered structured questionnaires for the total number of nurse practitioners in their specific healthcare centre.</p> <p>During the afternoon of the day of the meeting, the independent research assistant trained all the PHC managers who signed the confidentiality agreement form on how to obtain informed consent and how to distribute and collect self-administered structured questionnaires (refer to paragraph 4.2.8.2.1).</p>	<p>questionnaires:</p> <p>The PHC manager acting as an independent person explained and distributed self-administered structured questionnaires (refer to Annex D) to the nurse practitioners in the healthcare centre.</p> <p>The nurse practitioners were informed that they were free not to participate or could withdraw at any time before they submitted the self-administered structured questionnaires in the sealed box.</p> <p>Completed questionnaires were placed in a separate sealed box labelled 'self-administered structured questionnaires' in the secretary's office. To maintain anonymity, the nurse practitioner was asked to place both completed and uncompleted questionnaires in the sealed box.</p> <p>Gathering of signed informed forms and completed questionnaires:</p> <p>The PHC manager sent both boxes containing completed and uncompleted informed consent forms and self-administered structured questionnaires to the DHMT during the following monthly delivery of medicines to the healthcare centre.</p> <p>The DHMT informed the researcher that the boxes from all healthcare centres were ready for collection. The independent research assistant collected all the boxes from the DHMT.</p> <p>The anonymous (without the name of the healthcare centre) sealed boxes were opened by the researcher in her office in Maseru at the NUL in the Pharmacy Department.</p> <p>Excess or uncompleted questionnaires and informed consent forms were rejected. The researcher only took the same number of completed questionnaires from the</p>

Level of the study	Study setting	Recruitment process	Implementation process
		<p>The independent research assistant provided each PHC manager with two sealed boxes, one for the informed consent forms (labelled 'informed consent forms') and one for both completed and uncompleted questionnaires (labelled 'self-administered structured questionnaires'). The sealed boxes were tamper-proof and sealed with a slot where forms could be put into.</p> <p>Obtaining informed consent:</p> <p>At a meeting in the specific healthcare centre, the PHC manager who acted as an independent person introduced the study and also discussed the informed consent form with nurse practitioners.</p> <p>The PHC manager distributed the two informed consent forms (refer to Annex J) to the nurse practitioners and asked them to read and sign them if they want to participate in the study.</p> <p>The independent research assistant signed the informed consent forms before distributing them to the PHC managers who acted as independent persons in the healthcare centres. This was because the healthcare centres were found in rural areas where the independent research assistant could not reach due to a lack of transport.</p> <p>After completion of informed consent forms, participants were requested to place one copy of the signed informed consent form in a sealed box in the secretary's office of the PHC manager and kept the other copy.</p>	<p>box as the number of signed informed consent forms.</p>

During administration of self-administered structured questionnaires, participants completed the questionnaires; however, the respondent was not able to consult other sources of information. The advantage of self-administration in all levels of the study was that potential participants used their own time to complete the questionnaires, while a disadvantage is that the response rate for self-administration might be low (Bowling, 2005:284-285). The reason for self-administration for the PHC level was that some of the healthcare centres were not accessible by road and it was difficult to visit every healthcare centre.

1.4.8.2.3 Anonymity and confidentiality

Confidentiality was maintained through confidentiality agreements between the independent research assistant, independent persons, potential participants and the researcher. All potential participants were treated with respect and autonomy by an independent research assistant, independent persons and researcher. They were able to sign the informed consent forms and complete the self-administered structured questionnaires in the privacy of their offices and homes. Both uncompleted and completed informed consent forms and self-administered structured questionnaires were placed in boxes by potential participants and collected by the independent research assistant and independent persons to maintain confidentiality. The boxes were tamper-proof and sealed, with a slot where forms could be put into. Boxes collected were opened by the researcher only, in the privacy of the researchers' office at the NUL. The informed consent forms and the self-administered structured questionnaires were stored in a locked cabinet in the researcher's office at the NUL. The same number of corresponding completed self-administered structured questionnaires as completed informed consent forms were taken from the questionnaire boxes, and numbered consecutively starting from one. This number was used to denote a particular potential participant, to guarantee anonymity to potential participants.

1.4.8.2.4 Risk-benefit ratio analysis

The study participants had to complete self-administered structured questionnaires; thus, it did not cause harm to potential participants as it was not invasive to the human body. Additionally, the study did not involve patients. Therefore, the risk-level descriptor of this study was the minimum risk.

After the conclusion of the data collection process, the collected data from the questionnaires were captured using Microsoft Excel® spread-sheet and cleaned.

1.4.8.2.5 Data capturing and cleaning

Once data collection had ended at all levels of the study, data from self-administered structured questionnaires were entered into a Microsoft Excel® spread-sheet and all entries were checked to make sure that information on the questionnaire was the same as the data captured on the Microsoft Excel® spread-sheet. Data capturing was checked after every tenth entry. If an error was found then, every fifth entry was checked if there were still errors found, then every entry was checked.

Data capturing and cleaning were followed by statistical analysis of the captured data.

1.4.9 Statistical analysis

The Statistical Package for Social Sciences (SPSS®) version 25 was used to analyse data. The analysis included descriptive statistics.

1.4.9.1 Descriptive statistics

Descriptive statistics were used to summarise variables. Frequencies and percentages (%) were used to describe categorical data, whereas continuous variables were described using means and standard deviations and 95% confidence intervals (CI) as well as frequencies and percentages (%). Table U-1 summarises how the data were analysed (refer to Annex U).

1.5 Thesis layout

The layout of the thesis is in the form of chapters. There are six chapters in total, including Chapter one. Chapter one focuses on the background and rationale of the study, research questions, research aims and specific objectives, as well as methodology. Chapter two includes a detailed discussion of the specific literature review objectives (refer to paragraph 1.3.2.1). Chapter three entails a full description of the health system of Lesotho. Chapter four entails the presentation of study findings and the discussion of these findings. Chapter five entails the development of a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho. Chapter six focuses on conclusions and recommendations based on the general aims, as well as limitations of the study.

Annexures are as follows:

- Annexure A–D: Self-administered structured questionnaires

- Annexure E: Study variables
- Annexure F–J: Informed consent forms
- Annexure K–L: Confidentiality agreement
- Annexure M–P: Permission letters
- Annexure Q–R: Ethical approval letter
- Annexure S: Example of a completed informed consent form
- Annexure T: Example of a completed questionnaire
- Annexure U: Statistical analysis table

1.6 Chapter summary

The background and rationale for the study were discussed in detail and an outline of the aims and specific objectives of the study was provided together with a detailed description of the empirical investigation. Chapter two will discuss specific objectives related to the literature review (refer to paragraph 1.3.2.1).

CHAPTER 2 CHRONIC DISEASE MANAGEMENT MODELS

2.1 Chapter Introduction

This chapter provides detailed information on the components of health systems and the specific research objectives for the literature review which were stated in Chapter one, paragraph 1.3.2.1.

2.2 Components of the Health System

According to the World Health Organization (WHO, 2007a:2), health systems are interconnecting networks consisting of organisations and people designed for promoting, restoring and maintaining health. A well-performing health system should have effective procurement and distribution systems, sufficient healthcare workers, and sustainable financial and health information systems to provide quality healthcare (WHO, 2007a:vi). For the health system to achieve the functions mentioned above, the six building blocks from the WHO framework for health systems (WHO, 2007a:3) should be satisfied. The six building blocks are healthcare service delivery, healthcare workers, health information, medicines and medical devices, healthcare financing, and leadership and governance (refer to Figure 2-1, adapted from WHO, 2007a:3). These building blocks provide an understanding of the functions, challenges and priorities of the health system to the increasing burden of acute and chronic conditions. Therefore, the six building blocks are interdependent with a common outcome of providing affordable and quality healthcare services. A discussion on each of these building blocks ensues in subsequent paragraphs.

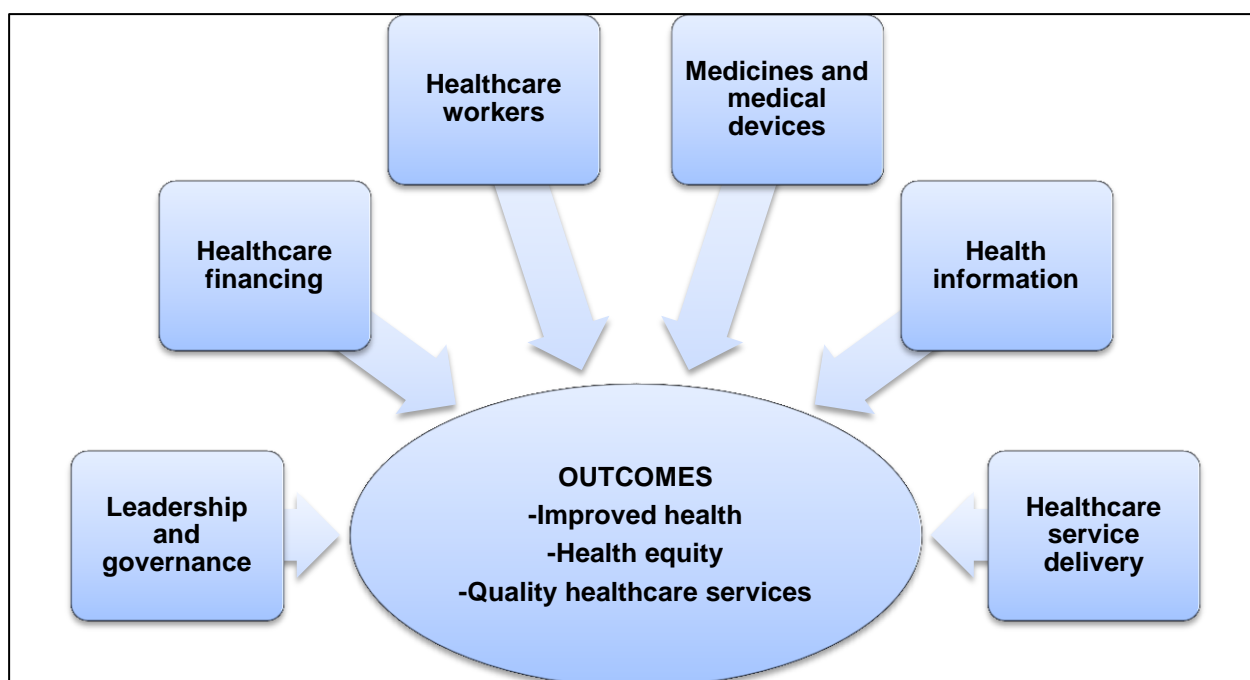


Figure 2-1: The World Health Organization health system framework: six building blocks

2.2.1 Healthcare service delivery

Healthcare service delivery in non-communicable disease (NCD) management includes prevention, diagnosis, treatment and control of NCDs in healthcare facilities and the community. Healthcare utilisation by patients and the community is highly influenced by good healthcare service delivery (Gage *et al.*, 2018:1). Healthcare service delivery depends on the availability and affordability of quality healthcare services, healthcare workers, medication, and diagnostic and monitoring equipment used in NCD management.

- ***The availability and accessibility of healthcare services***

Healthcare services for NCDs should be available, accessible and affordable to all patients, including those patients in underprivileged populations. These services should be available in all public healthcare facilities. In reality, diagnostic and management services for NCDs are not readily available in all public healthcare facilities (Marquez & Farrington, 2013:55-57). This statement is supported by Getachew *et al.* (2017:386), as in Ethiopia, diabetes healthcare services were less available in public healthcare facilities (19%) as compared to private healthcare facilities (26%). Thus, the availability and affordability of healthcare services for the underprivileged community remain a challenge. Katende *et al.* (2015:1392) showed that primary healthcare (PHC) centres in Uganda are underutilised due to a lack of standard treatment

guidelines, diagnostic devices and medicines. Availability of standard treatment guidelines, medical devices and medicines are essential for delivering quality healthcare services related to NCDs. The unavailability of the factors, as mentioned earlier, leads to patient referral to outpatient departments (OPDs) which poses a challenge to underprivileged communities, especially if transportation and fees for services are needed. Public healthcare facilities in rural areas in Malaysia have shortages of necessary diagnostic equipment, medicines and medical doctors (Risso-Gill *et al.*, 2015:8-9). These problems affect healthcare service delivery to patients with hypertension because diagnostic devices, medication and qualified health professionals are vital in the detection, management and control of hypertension.

- ***The affordability of healthcare services***

The existence of health insurance within the health system can influence the accessibility and affordability of health services. Patients without health insurance could experience financial difficulties in accessing healthcare services as they would have to pay for the services themselves (out-of-pocket expenses) (National Academy of Sciences, 2002:57). For example, as was shown by Bhattacharyya *et al.* (2016:99-100), patients with healthcare insurance can access healthcare services from neighbouring healthcare facilities. The findings by Bhattacharyya *et al.* (2016:99-100) suggest that irrespective of the socioeconomic status of the patient, health insurance influenced the decision to access outpatient healthcare to seek treatment.

Lack of funds to pay for health insurance is another factor that influences the affordability of healthcare service delivery to the underprivileged community. As stated in Bhattacharyya *et al.* (2016:99-100), NCD treatment is mainly financed by out-of-pocket expenses in Udipi Taluk (India) with about 45% of respondents having no form of health insurance. Countries offering state funded health insurance for disadvantaged populations should educate the population about this intervention as this will improve the affordability and utilisation of healthcare services.

- ***The availability of skilled healthcare workers to manage non-communicable diseases***

The availability of skilled healthcare workers in the management of NCDs is vital for quality healthcare service delivery. Healthcare workers should be able to provide education on the prevention of NCDs and medication usage. They should also be able to diagnose and monitor people with NCDs through the provision of pharmacological treatment of NCDs and the use of diagnostic and monitoring equipment. Kien *et al.* (2018:6) state that in Hanoi (Vietnam), insufficient and misallocated NCDs healthcare workers at commune health stations created

discrepancies in funding and technical support for primary healthcare service delivery for NCDs. A commune is equivalent to wards and towns, forming divisions in a district (Kien *et al.*, 2018:2). Without qualified healthcare workers with NCD-specific training and skills, the provision of NCD services will be unavailable, which will be detrimental to healthcare service delivery.

- ***The availability of essential medicines and medical devices***

Essential medication used in the management of NCDs should always be available in public healthcare facilities since people measure good healthcare service delivery by the availability of medication (Elias *et al.*, 2018:10). Additionally, frequent stock-out of essential medicines leads to poor control of conditions, complications with even more expenses as well as death. According to Elias *et al.* (2018:5), the unavailability of medicines in public healthcare facilities in Talukas (India) increased the use of private healthcare facilities which led to a perception of poor healthcare service delivery in public healthcare facilities. One of the most critical elements in healthcare service delivery is for patients to always leave the healthcare facility carrying prescribed medicines. In Eswatini (previously known as Swaziland), Shabangu and Suleman (2015:e5) conducted a study on medicine availability and its impact on patients with NCDs and revealed that 50.7% of the patients did not receive all of their prescribed medications during monthly refills. Because patients might not be able to procure medicines from private pharmacies, they may be non-adherent leading to the development of complications relating to chronic conditions (Shabangu & Suleman, 2015:5). Once patients go home without having all their prescribed medicines in-hand, they question the quality of services provided to them, develop complications leading to hospitalisation, and refrain from getting their NCD services from the healthcare facility.

Healthcare service delivery relies on healthcare facilities being able to provide NCD diagnostic and monitoring services using appropriate equipment. The availability of functioning diagnostic equipment will help with the screening of NCDs in both healthcare facilities and during community outreach activities. Screening of NCDs in healthcare facilities and the community will assist with both preventive and treatment measures to be taken when dealing with NCDs. A study by Khanal *et al.* (2017:3) showed that a lack of government-sponsored screening programmes in Nepal led to poor NCDs diagnosis in early disease stages. The most reliable way of diagnosing NCDs early is by using appropriate and functional diagnostic equipment such as a sphygmomanometer for measuring blood pressure in hypertension diagnosis instead of only relying on physical examination, and medical and medication histories. The unavailability of suitable and functional equipment used in the diagnosis and management of NCDs in public healthcare facilities is a factor of poor healthcare service delivery (WHO, 2010b:35).

- ***Interventions used to improve healthcare service delivery***

Interventions that could be used to improve healthcare service delivery for patients with NCDs include the use of mobile technology and the integration of healthcare services. Advancing technology in healthcare leads to the development of mobile technology-based interventions to improve service delivery. Mobile technology-based interventions can improve healthcare service delivery processes between healthcare workers and patients. Free *et al.* (2013:17) reveal that mobile technology has benefits in clinical diagnosis and management, enhanced communication between surgeons and nurses, and increased clinic attendance by patients due to short message service (SMS) reminders. Mobile health (mHealth) is advantageous in that it can be used by community health workers (CHWs) to collect complete high-quality NCDs data, to assist CHWs education and training, and to facilitate professional networks among CHWs and their supervisors (Braun *et al.*, 2013:4). The use of mHealth by CHWs can improve healthcare service delivery for NCDs especially in resource-limited settings where CHWs form a linkage between the health system and the community.

Additionally, enabling resources such as stable communication networks, accessible maintenance services, and regulatory policies on data protection should be in place for mHealth interventions to function effectively (Opoku *et al.*, 2017:8). Consistency in the use of mHealth interventions is essential and relies heavily on communication networks and maintenance services. Inconsistency will cause interruptions in service delivery processes which will influence the quality of healthcare services delivery.

Integration of healthcare service programmes (such as human immunodeficiency virus and acquired deficiency syndrome (HIV/AIDS) and NCDs programmes) within the health systems can help improve healthcare service delivery. According to Duffy *et al.* (2017:928), integration models that can be used include:

- NCD services integrated into healthcare facilities initially providing HIV/AIDS care and
- NCD and HIV/AIDS care and treatment.

The above-mentioned integration models can be simultaneously introduced and integrated during outreach or at the same healthcare facility (Duffy *et al.*, 2017:928). HIV/AIDS programmes are well established in many developing countries. Some of the approaches used in the prevention and management of HIV/AIDS include defaulter tracking, use of community engagement, supply chain management, and referrals and linkages to healthcare (Topp *et al.*,

2010:10). Prevention and management of NCDs can integrate some of the aforementioned approaches which are useful in HIV/AIDS prevention and management.

In conclusion, healthcare service delivery is vital in NCD management and relies on the other five building blocks which are healthcare workers, health information, medicines and medical devices, healthcare financing, and leadership and governance.

2.2.2 Healthcare workers

Healthcare workers are a vital component of the health system since the other five building blocks need qualified, competent and responsive healthcare workers to achieve the best health outcomes. The availability of qualified healthcare workers in healthcare facilities is key to providing good healthcare services for NCDs.

- ***The shortage of human resources in non-communicable disease management***

Currently, shortages, unbalanced distribution and performance of healthcare workers are challenges faced in the prevention and management of NCDs in low- and middle-income countries (LMICs) (McPake *et al.*, 2013:841). Liu *et al.* (2017:6) predict a net shortage of 15 million healthcare workers by 2030 with the highest deficits occurring in upper-middle-income countries followed by LMICs due to high economic growth rates and population ageing. In contrast, sub-Saharan countries will have a surplus of healthcare workers (0.8 million) due to limited posts or posts not filled by healthcare workers (Liu *et al.*, 2017:6). Katende *et al.* (2015:1392) reveal that staffing levels for nurses and nursing staff in hospitals and healthcare centres in Uganda were below recommended levels by the Ministry of Health (MOH) guidelines. The low levels of staffing in healthcare facilities depict a shortage of healthcare workers which affects healthcare service delivery (Katende *et al.*, 2015:1393). Without the availability of trained or qualified healthcare workers in NCD management and control, the growing NCD burden will not be curbed (WHO, 2014d:23). In India, PHC facilities have a shortage of laboratory technicians, medical doctors, health educators and nutritionists (Pakhare *et al.*, 2015:3) for delivering NCDs healthcare services. Lack of laboratory technicians affects the generation of laboratory data that assists in assessing whether NCDs are controlled or managed correctly (Pakhare *et al.*, 2015:5,7). The shortage of doctors affects the diagnosis and management of NCDs, and the scarcity of healthcare educators and nutritionists affects both the prevention and management of NCDs as health promotion activities, targeting lifestyle modifications, will be lacking (Pakhare *et al.*, 2015:5). Also, there is a shortage of qualified and experienced healthcare workers in rural areas as compared to urban areas (Pakhare *et al.*, 2015:5).

- **Addressing the shortage of human resources**

Notwithstanding the predicted shortages and unbalanced distribution of healthcare workers, a solution for increasing the availability of healthcare workers includes training and increasing funding for public sector employment (McPake *et al.*, 2013:843). For example, Ethiopia has developed and implemented education and training through curriculum review of the undergraduate pharmacy programme (Sporrong *et al.*, 2016:5-6). Ethiopia has also introduced in-service training for health workers in health posts, healthcare centres and hospitals in health supply chain management (Sporrong *et al.*, 2016:5-6). Health workers are staff members that manage NCDs in health posts, healthcare centres and hospitals. Training them in health supply chain management controls stock-outs of medicines and other health commodities used in the prevention and management of NCDs. Medicines are vital and should be readily available to patients as an interruption in medicine supply will cause uncontrolled NCDs.

Community health workers have a role to play in the prevention and management of NCDs. A study by Abdell-All *et al.* (2017:7), on cardiovascular diseases (CVD), hypertension, diabetes, showed that CHWs with insufficient formal education could be trained adequately for CVD prevention and management. The CHWs are found amongst communities. Training CHWs in the prevention and management of NCDs is advantageous for underprivileged communities where healthcare centres are far. Community health workers can deliver these services to the community as opposed to the community going to healthcare centres.

- **Motivation and retention of healthcare workers**

Healthcare workers' performance in providing healthcare service delivery can be affected by their motivation and retention, which can be achieved through financial and non-financial incentives and salary adjustments (Global Health Workforce Alliance, 2008:11). This was shown by Shah *et al.* (2016:472), where financial incentives, salary revisions and provision of career development opportunities improved the motivation and retention of doctors in Pakistan. Kwansah *et al.* (2012:674) indicated that retention of nurses in Ghana could be achieved through learning opportunities, access to training, and effective implementation of promotion and posting policies.

When healthcare workers are allowed to grow professionally through training and learning opportunities, promotions may result. These opportunities, in turn, motivate them to stay in their current jobs. Human resources financing for training is essential to combatting healthcare worker shortages. Countries such as Bangladesh, Ethiopia, Indonesia, Malawi, Ukraine and

Honduras use Global Fund funding for healthcare workers' training, salary support and recruitment of healthcare workers (Bowser *et al.*, 2014:995). Bowser *et al.* (2014:995); however, point out that Global Fund investments are disease-specific. Availability of funds for human resource training enables the health system to train healthcare workers in NCD prevention and management; thus, eliminating the shortage of staff possessing skills targeted at preventing, managing and controlling NCDs.

- ***Task-shifting in the management of non-communicable diseases***

Task-shifting, through the engagement of unqualified healthcare workers, can link the health system and the community as well as address the lack of qualified healthcare workers. Community health workers can be engaged to remedy the shortage of qualified healthcare workers in PHC services. The involvement of CHWs improves the acceptability and accessibility of healthcare services. The employment of CHWs is cost-effective (Vaughan *et al.*, 2015:13) and they have a respected position in their communities (Mishra *et al.*, 2015:3). Lack of funds to effectively manage health systems, as well as shortages of healthcare workers, calls for interventions such as task shifting where cheap labour will be used to carry out duties for qualified healthcare workers (European Commission, 2019:19; WHO, 2016b:7; WHO, 2018b:1). The engagement of CHWs is one of these interventions where they are trained to perform activities specific for the prevention and management of NCDs in their communities (WHO, 2016b:7; WHO, 2018b:1). With extensive training, CHWs can be effective in the prevention and control of NCDs (Jeet *et al.*, 2017:16), and can conduct health promotion activities, train village health workers and hold community health education workshops on NCD prevention and management (Low *et al.*, 2014:6). Community health workers can bring NCD-related healthcare services close to the community. The CHWs are a bridge connecting the community to the healthcare centre. Community health workers can be trained to appropriately screen for, and identify people at high risk of CVD in countries such as Bangladesh, Mexico, Guatemala and South Africa (Gaziano *et al.*, 2015:e561). Bangladesh, Mexico, Guatemala and South Africa are part of the global network of United States National Heart, Lung and Blood Institute and UnitedHealth Group centres of excellence for chronic diseases (Gaziano *et al.*, 2015:e557). Therefore, CHWs can be tasked with the abovementioned activities to reduce the workload of healthcare workers and this will improve healthcare service delivery in PHC.

Task-shifting, by adding nurse-led NCD prevention and management at the PHC level can also be useful in settings with limited availability of doctors (Some *et al.*, 2016:7). Fairall *et al.* (2016:22) show that PHC clinics in South Africa had adopted the Primary Care 101 programme

consisting of educational outreach to nurses, despite the lack of effect on treatment intensification in patients with NCDs.

Mass education through health promotion activities provided to the community by CHWs can significantly influence the prevention and treatment of NCDs. For instance, Pakhare *et al.* (2015:5) showed that CHWs can be trained to provide health education and dietary and physical activity advice to patients with NCDs. The ability of CHWs to give education about lifestyle modification activities relieves the healthcare centre staffs' workload, increases the frequency of conducting health promotion activities, and brings services closer to the community. Khanal *et al.* (2017:3) revealed that it was difficult to change the attitudes of people about healthy lifestyles and diet in Nepal due to limited health promotion activities in the community that focused on detecting NCDs, dietary and lifestyle modifications. Task shifting by using CHWs to increase the rate of health promotion activities for patients with NCDs and the community brings positive change in people's attitudes towards incorporating lifestyle modification activities such as diet and exercise into their daily lives. This positive change in the attitudes of people is greatly enhanced by the fact that CHWs are respected members of the community, so the community listens and implements what has been taught or recommended by CHWs.

Even though CHWs' integration in the prevention and management of NCDs is advantageous in resource-limited settings, some barriers need to be addressed. Barriers include lack of formal education on NCDs, poor healthcare infrastructure, community poverty, lack of communication between CHWs and primary care teams, limited healthcare resources, shortage of financial support, and absence of assistance and support for CHWs from medical personnel (Grossman-Kahn *et al.*, 2017:315-315; Ojo *et al.*, 2017:6; Ozano *et al.*, 2018:6-7; Salehi Zalani *et al.*, 2016:1403-14-5). These barriers could be overcome by outsourcing funding within the health system to strengthen CHWs' activities through training and infrastructure. The relationship between CHWs and other health professionals has to be strengthened as this will avail assistance and support to CHWs from health professionals.

In summary, healthcare workers are an essential component of the health system as they are responsible for the functionality of other elements of the health system. These elements depend on the availability of qualified, motivated and high-performing healthcare workers. The shortage of qualified health professionals is a challenge at PHC level. Task-shifting can be implemented at health facilities where unqualified healthcare workers can be provided with frequent in-service training, support and supervision. Medicines and medical devices are other essential elements in the diagnosis and management of NCDs.

2.2.3 Medicines and medical devices

- ***The availability of essential medicines used in the management of non-communicable diseases***

Essential medicines used for treating NCDs should always be available and affordable in healthcare facilities as uninterrupted access to medicines for NCDs control is important. An essential medicine list (EML), standard treatment guidelines (STGs) and data on NCDs medicines consumption rates are tools used in the procurement and distribution of medicines for NCDs to avoid unavailability and unaffordability of medicines in healthcare facilities. Bazargani *et al.* (2018:3) state that in LMICs, main medicine classes for the management of hypertension were found in the national essential medicines lists (NEMLs). Public healthcare facilities are allowed to procure medicines available only in the NEML, so the availability of main medicine classes used in the management of hypertension on the NEML guarantees that these medicines will be available for patients with hypertension. In the study by Bazargani *et al.* (2018:3), 32 countries (94%) selected thiazide diuretics (hydrochlorothiazide), renin-angiotensin-aldosterone system (RAAS) inhibitors (enalapril or valsartan), selective beta-blockers (metoprolol) and dihydropyridine calcium channel blockers (amlodipine) for the management of hypertension. The aforesaid medicines are the primary medicines used in hypertension management, and their availability in the NEML ensures the selection of medicines is not a limiting factor in accessing medicines for NCDs. In contrast, not all NCD medicines stated in EML or STGs will be found in public healthcare facilities. For example, Elias *et al.* (2018:8) note that PHC centres in south India did not procure commonly used diabetes and hypertension medicines mentioned in the state's STGs such as enalapril, losartan, atorvastatin, pioglitazone, glimepiride and insulin. Weak medicine supply chain due to limited finances and trained healthcare workers are some of the reasons for the interrupted supply of NCD medicines to patients leading to the underutilisation of healthcare services provided in public healthcare facilities.

Limited availability and affordability of medicines used to treat NCDs is a barrier to accessing treatment for NCDs in public healthcare facilities in LMICs (Armstrong-Hough *et al.*, 2018:8; Cameron *et al.*, 2012:964; Elias *et al.*, 2018:10; Ewen *et al.*, 2017:7; Kankeu *et al.*, 2013:8; Maher *et al.*, 2012:5; Robertson *et al.*, 2015:5; Rockers *et al.*, 2018:5). For instance, Cameron *et al.* (2012:964) show that the availability of generic antiepileptic medicines, except the diazepam injection, was less than 50% for all medicines (carbamazepine, phenobarbital, phenytoin, valproic acid and diazepam) in the public sector. Generic medicines are cheaper than their corresponding brand medicines. Low availability of generic anti-epileptic medicines in

public healthcare facilities is a disadvantage for the poor who use public healthcare facilities as patients with epilepsy have to be put on continual life-long treatment. Ewen *et al.* (2017:7) also reveal that median generic availability of NCD medicines for low- (40.2%), lower-middle- (54.6%) and upper-middle-countries (56.7%) was below the WHO's target of 80% availability of affordable essential medicines. Thus, availability of generic NCD medicines in low-, lower-middle- and upper-middle-countries is below the WHO's target of 80% availability leading to poorly managed NCDs.

In their study about availability and affordability of antiepileptic drugs in 46 countries (low-, lower-middle, upper-middle and high-income countries) Cameron *et al.* (2012:967) reveal that in countries where the public sector charges patients for their medicines, the cost of lowest-priced generics was four times more than the international reference price, with phenytoin costing about 18 times more. Also, in countries where medicines are provided free of charge or at a lower cost in the public sector, patients with epilepsy may be forced to buy medicines from the private sector at unaffordable prices due to reduced availability (Cameron *et al.*, 2012:967). Poor availability perpetuates uncontrolled epilepsy due to breaks in medicine consumption by patients (Cameron *et al.*, 2012:967). Availability and affordability of CVD medication (such as statins, angiotensin-converting enzyme (ACE) inhibitors, beta-blockers and aspirin) are more problematic in middle-income countries than in high-income countries and most problematic in low-income countries (Khatib *et al.*, 2016:65-66). Non-communicable disease essential medicines use is likely to increase if improvement strategies (such as policies making essential NCD medicines available and affordable, and monitoring medicine consumption) in the availability and affordability of these medicines can be implemented.

- ***Stock-outs of essential medicines used in the management of non-communicable diseases***

Interruption in NCDs' medicines supply to both healthcare facilities and patients is a source of uncontrolled NCDs. Thus, frequent stock-outs of medicines in public healthcare facilities should be avoided to enable continuous medicines supply to patients with NCDs. In south India, PHC centres did not have metformin (30%) and glibenclamide (33%) for more than six months, and only 5% of PHC facilities had statins (Elias *et al.*, 2018:7-8). This disturbance in the management of NCDs due to lack of essential medicines is a concern as these chronic diseases requiring consistent medicine consumption. Public healthcare facilities in Lusaka (Zambia) had a 30 days' stock-out of essential antihypertensive medicines ((furosemide injection (92%), hydralazine injection (83%), atenolol tablets (40%), amiloride-hydrochlorothiazide tablets (33%) and nifedipine tablets (7%)) and antidiabetic medicines

((insulin short-acting (92%), insulin long-acting (69%), glibenclamide tablets (47%), and metformin tablets (47%)) (Kalungia *et al.*, 2017:144). Thus, the availability of essential medicines for hypertension and diabetes is a challenge in public healthcare facilities in Lusaka which could have an implication on the quality of healthcare management of hypertension and diabetes (Kalungia *et al.*, 2017:147).

Uganda uses the push-and-pull system to supply essential medicines to public healthcare facilities leading to a shortage of essential medicines used for treating NCDs in PHC facilities (Armstrong-Hough *et al.*, 2018:5-8). As a result, the type of distribution system used to distribute medicines from national medical stores to public healthcare facilities in a particular country affects the availability of essential medicines. Frequent NCDs' medicines stock-outs can be avoided by training pharmacy personnel on drug supply management, and the use of procurement tools such as bin cards, medicines requisition forms and dispensing tally sheets.

- ***Essential equipment and laboratory services used in the management of non-communicable diseases***

Medical devices are also a necessity in the diagnosis and management of NCDs. Diagnostic equipment and laboratory services used in NCD management in healthcare facilities should be available, functional and regularly serviced. A list of essential equipment that should be available in public healthcare facilities in low-resource settings includes a blood pressure measurement device, measuring tape, scale, peak flow meters, spacers for inhalers, glucometer, urinary protein and ketone testing strips, and blood glucose test strips (WHO, 2010b:36).

The availability of basic medical devices needed for diagnosis and management of hypertension, diabetes mellitus and asthma improves service delivery in healthcare facilities. That is, early diagnosis and monitoring of patients with hypertension, diabetes mellitus and asthma is feasible due to the availability of the necessary medical equipment. This, in turn, improves healthcare service delivery and availability of updated NCDs prevalence data. Healthcare facilities offering diabetes mellitus services in Ethiopia had adequate necessary medical equipment such as blood pressure apparatus (93%), adult weighing scale (76%), height board or stadiometer (49%), glucometer (40%), urine protein test (56%), and urine glucose test (52%) (Bekele *et al.*, 2017:112). Healthcare facilities in Ethiopia were adequately equipped with the necessary medical equipment for the diagnosis and management of diabetes mellitus, thus, improving diabetes mellitus service delivery to patients with diabetes mellitus (Bekele *et al.*, 2017:116). On the other hand, basic diagnostic equipment such as measuring tapes,

glucometers, stadiometers and scales, glucose test strips, urinary protein strips, and urinary ketone strips were insufficient in primary health centres in Madhya Pradesh (India), except for a sphygmomanometer (Pakhare *et al.*, 2015:3-6). Therefore, primary health centres in Madhya Pradesh (India) are not prepared for the prevention, early diagnosis and management of NCDs due to a lack of necessary equipment for diagnosis and management of NCDs (Pakhare *et al.*, 2015:7).

Medical equipment has to be used by healthcare workers for the diagnosis and management of NCDs and they have to be able to use this equipment confidently. During the procurement process of NCDs' medical equipment, training of healthcare workers on how to use the equipment should be initiated. Equipment specification should be aligned to available infrastructure, maintenance capacity and device servicing. For instance, 38.3% of equipment in developing countries was not serviced mainly due to a lack of healthcare workers' training, health technology management and infrastructure (Perry & Malkin, 2011:719). In developing countries, most of the medical equipment is donated. These donations come without the training of healthcare workers on servicing and maintenance of medical equipment. The technology used in some equipment and infrastructure needed is too expensive to be catered for by the health system. Thus, the medical equipment remains out of service and the diagnosis and management of NCDs become a challenge affecting healthcare service delivery.

Lack of equipment used for the diagnosis and monitoring of NCDs in healthcare facilities affects healthcare service delivery. Wollum *et al.* (2018:10) state that a survey in South African hospitals and community healthcare centres showcased a lack of blood glucose test strips or plasma glucose tests while PHC centres lacked total cholesterol tests and low-density lipoprotein (LDL) cholesterol tests. Thus, there were high rates of undiagnosed hypercholesterolemia, including poor control of hypercholesterolemia, hypertension, and diabetes (Wollum *et al.*, 2018:10-13). In Malawi, the majority of rural healthcare centres lacked basic diabetes diagnostic equipment where only 38.2% of healthcare centres had glucometers and 23.6% had glucose urine dipsticks (Chikowe *et al.*, 2018:2). Thus, lack of basic equipment for the screening, diagnosis and treatment of diabetes impedes the effective management of the increasing diabetes burden (Chikowe *et al.*, 2018:2-4). Basic equipment used for diagnosis and monitoring of diabetic patients on treatment has to be available and functional in all public healthcare facilities. This equipment assists healthcare workers to assess if diabetes is being controlled or not, in diabetic patients who are on treatment. This shows that a lack of medical equipment delays the diagnosis and management of NCDs as patients have to be sent to healthcare facilities with functional equipment. Some patients lack finances to pay for transport and tests. This, in turn, affects healthcare service delivery.

In conclusion, the availability of essential medicines is a major problem in public healthcare facilities in low-income countries as compared to wealthy countries, thus, affecting the control of NCDs. Medicines procurement tools such as EML, STGs and NCD medicines consumption data should be utilised by trained healthcare workers to guarantee an uninterrupted supply of NCD medicines. Lack of medical equipment and first-line medicines used in NCD management will lead to decreased use of public healthcare facilities. Therefore, functional, easy-to-use medical equipment should be available in all public healthcare facilities to improve healthcare service delivery.

The health system relies heavily on health information to provide good healthcare services to patients with NCDs and the community. Health information, as one of the six building blocks for healthcare service delivery, is addressed in the subsequent section.

2.2.4 Health information

Health Information Systems (HIS) should produce data that will be used in policymaking, and by decision-makers at all levels of the health system for improving the effectiveness and efficiency of healthcare services in public healthcare facilities (WHO, 2008a:9). The data include clinical data, diagnostic and laboratory information and recorded information on patients for certain diseases (Hong *et al.*, 2018:176; Tan *et al.*, 2015:546-547). Health information system activities include the collection of data, processing, reporting and use of information by decision-makers and in policy-making (WHO, 2008a:12). The following sections will address policy, financing and implementation of HIS as well as NCD data processing and compilation, and interventions used to strengthen HIS.

- ***Implementation of health information systems***

With health information technology, there is a move from a system-centred disease prevention model of care to a more patient-centred health promotion approach where, patients use patient portals and electronic mail in the HIS of health facilities to access their health records (Nimkar, 2016:744). Krist *et al.* (2014:420) in a study conducted at practices in the Virginia Ambulatory Care Outcomes Research Network in the United States showed that 25.6% of patients used an interactive preventive health record, with an increasing monthly rate of 1.0% per month over 31 months. Patients are the most important part of the health system thus; they are involved in information technology. Acceptance and use of technology by patients in light of their health and wellness is a positive direction towards health information technology as their health records are in an electronic form.

There is an increased acceptance and use of measures of health information technology which include electronic prescribing, electronic mail with patients and the use of electronic health records to collect clinical quality data in primary healthcare in the United States (Rittenhouse *et al.*, 2017:59). Some developing countries such as Kenya (academic medical record system), Peru (Partners in Health-electronic medical records (EMR)), Haiti (HIV-EMR), Uganda (Careware), Malawi (Lilongwe EMR), and Brazil (computerised system for the control of drug logistics) have developed and implemented information systems irrespective of difficulties in setting up information systems in developing countries (Fraser *et al.*, 2005:85-87). In contrast, Odekunle *et al.* (2017:63) state that sub-Saharan African countries are not implementing electronic health records because of high initial and on-going maintenance costs, lack of financial incentives for adoption, inadequate electricity supply, lack of internet connectivity, and low computer literacy level. To combat the lack of health information in LMICs, Kroll *et al.* (2015:10-11) suggest that improving sentinel surveillance at PHC level by the introduction of standardised EMR system together with the use of periodic population-based surveys could increase data availability and quality. Health information systems in facilities allow for a wide range of relevant NCD information to be captured routinely. Consequently, systems such as EMR should be standardised to avoid data quality issues through reporting inconsistencies.

- ***Non-communicable diseases data processing and compilation***

Data source mapping is an important issue that has to be addressed when strengthening HIS (WHO, 2008a:39-40). In data source mapping, HIS containing NCD data from different health system levels should be connected to enable data to move from one level of the health system to another. Wandai *et al.* (2017:335-336) suggest that NCDs data sources, their risk factors, and conditions, should be synchronised to eliminate gaps and to provide good quality data to help monitor the progress of NCDs in South Africa.

The monitoring of NCDs enables the health system to assess if the increasing burden of NCDs is being controlled or not. The availability of useful quality data on NCDs will enable this assessment to be carried out without any biases in the information system. Thus, NCD indicators should be clearly defined. The WHO (2017a:7) has developed ten monitoring indicators to observe progress achieved by countries in controlling NCDs and their risk factors. Progress monitoring indicators include national NCD targets, mortality data, risk factor surveys, national integrated NCD policy/strategy/action plans, tobacco demand-reduction measures, harmful use of alcohol reduction measures, unhealthy diet reduction measures, public education and awareness campaigns on physical activity, guidelines for the management of cancer, CVD, diabetes and chronic respiratory diseases, and drug therapy (WHO, 2017f:212-230). These

NCD indicators developed by the WHO will assist countries in establishing and integrating surveillance and monitoring systems for NCDs into the HIS to monitor the progress of NCDs. For example, Gouda *et al.* (2015:6) noted that in monitoring NCDs, the Pacific region learned that it was important to integrate NCD monitoring strategies into existing HIS in coordination with existing data strengthening efforts (such as civil registration and vital statistics). This lesson will enable other countries to have a well-functioning HIS to monitor the progress of NCDs.

- ***Health information system financing***

A well-functioning HIS is essential for mining good quality health information to be used in decision making (MEASURE Evaluation, 2016:3; WHO, 2008a:45). The health information system needs to have stable financial backing for it to function consistently (MEASURE Evaluation, 2016:2). For example, HIS in a few healthcare facilities in Cambodia had a patient treatment adherence monitoring system and recall system for defaulters (Jacobs *et al.*, 2016:5). The HIS in these facilities was highly compromised due to inadequate financial resources; thus, management practices in relation to NCDs were unfavourable (Jacobs *et al.*, 2016:9).

The health information system has to run continuously for clinical and non-clinical data capturing; therefore, finances for maintenance of the HIS are a necessity. Interruption in the functioning of HIS due to financial difficulties will lead to the omission of essential data that could be useful in decision making and policy-making.

- ***Health information system policy***

Policies on HIS have to be developed and implemented to guide different healthcare levels on the use of information technology. For instance, Okpetu *et al.* (2018:8) show that reporting of NCDs from primary healthcare facilities was poor due to surveillance officers emphasising communicable diseases and the absence of NCD indicators in the strategic health development plan of Federal Capital Territory in Nigeria. Non-communicable disease indicators are important in monitoring NCDs so the inclusion of NCD indicators in the strategic health development plan would provide direction to the health system on what information to observe.

- ***Interventions used to strengthen health information systems***

Interventions can be put in place to strengthen HIS to improve data availability in healthcare facilities. One of the interventions includes the use of mobile technology where mobile phones can be used in health information. Mobile phones are widely available so mHealth can be applied in resource-limited settings to assist with data capturing. For example, CHWs could use

mHealth to collect complete good quality data on NCDs in healthcare facilities and the community (Braun *et al.*, 2013:4). Another intervention is the use of portable health information kiosks called Sustainable, Multisector, Accessible, Affordable, Reimbursable, and Tailored framework (SMAART™) programme in a community setting to assess NCDs risk factors and to examine knowledge of patients with NCDs, attitudes, and practices towards self-management of NCDs in the community (Joshi *et al.*, 2017:153). SMAART™ was implemented in India where participants showed a high acceptance of a portable health information kiosk, as they were able to navigate the programme easily and found the electronic SMAART™ health card feedback helpful (Joshi *et al.*, 2017:164). SMAART™ was used in the community to identify the burden of risk factors of chronic diseases-related comorbidities including providing a combination of self-report data such as recording blood pressure and weight scale through physiological sensors (Joshi *et al.*, 2017:166). Thus, SMAART™ helped deliver preventive and self-management tools to populations living in underserved settings in India by integrating social determinants of health data with clinical data for optimal interventions in NCD prevention and management (Joshi *et al.*, 2017:165).

Health information is very important in health systems, as it monitors the effectiveness and efficiency of healthcare services. Health information can be used to make informed decisions at all levels of the health system. Therefore, adequate financing, qualified personnel and functioning information technology are essential for the proper functioning of health information systems.

Healthcare financing is crucial in a well-functioning health system because all the building blocks (refer to Figure 2-1) need financial support. The subsequent section discusses healthcare financing for health systems.

2.2.5 Healthcare financing

Health system performance is mainly dependent on healthcare financing. Healthcare financing is a driving force behind the availability of healthcare workers, medicines and medical devices, useful health information systems and good healthcare services. Therefore, to attain Universal Health Coverage (UHC), sustainable healthcare financing has to be established. In LMICs, healthcare financing comes from the government's domestic resources and donor funds (Mcintyre *et al.*, 2017:127-128; Norwegian Government *et al.*, 2018:1; Shaw *et al.*, 2015:82-84). Government domestic financing for healthcare services requires combined strategies within strengthened public financing to attain UHC (Makinen *et al.*, 2018:1-8; Kutzin *et al.*, 2017:17-19; Yang *et al.*, 2016:4-5). For example, the growth of government revenues through effective tax

collection and combating tax evasion can increase resources for healthcare services (International Monetary Fund, 2011:19).

- ***The availability of finances for non-communicable disease management***

Funding is critical in the management of NCDs used for training of healthcare workers, purchasing NCD medicines and medical devices, and funding the HIS. Hence, an insufficient budget for NCDs hinders access to comprehensive treatment. To improve NCD healthcare services, sufficient budgets should be allocated for NCD management at all levels of the health system at the national level (WHO-Europe, 2014:28).

Inadequate or absence of budgets for the NCD management in healthcare facilities contributes to poor service delivery and underutilisation of healthcare facilities by patients. For instance, healthcare facilities at the district level in Cambodia had a minimal annual government budget for NCDs, where one provincial health department was allocated US\$1600, a provincial hospital US\$2400, a district hospital US\$1800, and two healthcare centres US\$2000 each (Jacobs *et al.*, 2016:6). Thus, the minimal budget at the district and provincial levels were worrisome because there were shortages of essential medicines for NCDs in health facilities (Jacobs *et al.*, 2016:8-9).

Also, funding needs to be specific. For example, Okpetu *et al.* (2018:10) pointed out that a lack of specific funding for NCDs in the Federal Capital Territory in Nigeria leads to the weak capacity of the PHC level to implement NCDs interventions which, in turn, caused neglect of the increasing prevalence of NCDs. Funds are spent on communicable diseases, and budgetary allocations are determined by political officers without taking into consideration the disease burden (Okpetu *et al.*, 2018:11-12). This skewed spending and allocation of funds leave NCD prevention and management unattended.

- ***Health insurance coverage***

According to the WHO (2020a:1) and the World Bank (2020:1), UHC entails the use of promotive, preventive, curative, rehabilitative and palliative health services by all people and communities, while also ensuring that the use of these services is affordable and reduces the financial burden that may be experienced by the user. Expansion of health insurance coverage is one of the strategies used to ensure UHC; hence; a steady flow of resources to finance healthcare services is required.

For example, Achoki and Lesego (2016:908) show that in the proposed health financing reforms, Botswana planned to expand health insurance coverage as this will increase population access and the use of healthcare services. A large health insurance pool will be possible provided robust policies and regulations are put in place (Achoki & Lesego, 2016:908). Some of the outcomes for expanding health insurance coverage in Botswana include lower administrative costs, better bargaining and purchasing options for providers and an efficient option of pooling resources (Achoki & Lesego, 2016:909). Also, in South Africa, the government, MOH as well as stakeholders and the Presidential Health Compact are working together in a national effort to create one health system and introduce UHC in the form of National Health Insurance (NHI) (UCH2030, 2019:1). Thus, all people will have access to healthcare services (UCH2030, 2019:1). These outcomes will increase the utilisation of healthcare services since these services will be affordable to all populations, irrespective of their economic status.

In contrast, Alami (2017:175) states that health insurance reforms in Arab countries (Algeria, Egypt, Jordan, Lebanon, Liberia, Morocco, Turkey, Tunisia, Iran, Iraq, Syria, West Bank and Gaza, Yemen) were not a solution for UHC due to developmental model and politics that ignored the causal precursors of health inequities. The developmental model included non-inclusive economic frameworks that neglect the creation of jobs, poverty and social policies while politics tolerated inequities and social injustice (Alami, 2017:175). Thus, a fundamental change is required for developmental model and politics to view health as a beneficial investment in human capital (Alami, 2017:175). As a result, health insurance coverage expansion can be a solution for providing UHC in some countries provided good policies and regulations are in place to overcome disadvantages it may cause. In some countries such as Jordan, Syria, Egypt, Lebanon and Morocco, health insurance coverage expansion would not ensure UHC due to political instabilities (Alami, 2017:165-169).

Health insurance coverage could be a solution to the affordability of healthcare services. Healthcare services are still not affordable to the underprivileged population due to the lack of healthcare insurance coverage (Escobar *et al.*, 2010:17-19; Tolbert *et al.*, 2019:2-11). For example, most patients (86.4%) in Udipi Taluk (India) used out-of-pocket expenditure (OOPE) to pay for NCDs treatment, where the major contribution was from household income and savings (57.1%), followed by funds from friends and relatives (17.8%) (Bhattacharyya *et al.*, 2016:98). As per Bhattacharyya *et al.* (2016:100), OOPEs were still high with about 45% respondents lacked any form of health insurance due to lack of public knowledge about health insurance. Thus, a lack of public knowledge about health insurance led to the increased use of OOPE to pay for NCDs treatment. Wang *et al.* (2015:6) showed that many patients with NCDs

(65.8%) using public healthcare facilities in Malawi faced high OOPE. The public health facilities in Malawi do not provide all NCD-related essential services; thus, if patients need essential NCD-related services not available in public health facilities, patients will utilise private health facilities resulting in the use of OOPE (Wang *et al.*, 2015:10). Though public health facilities should provide services free of charge, OOPE payments introduce a considerable financial burden on rural households, especially among the poorest due to the unavailability of services in public health facilities (Wang *et al.*, 2015:10-12). The increased OOPE for NCD patients could be due to the weak health system that does not allocate sufficient funds for NCD management.

In conclusion, healthcare financing is a cornerstone of all health system elements as, without sufficient financing for healthcare workers, medicines, and medical devices and health information systems, healthcare service delivery would be ineffective. The main component that needs to be in place and very sturdy is leadership and governance as this is the driving force behind a well-functioning health system. This component is discussed in more detail in the following paragraphs.

2.2.6 Leadership and governance

Development and implementation of policies specific for NCDs prevention, control and management are important as they guide all levels of the health system on how to deal with NCDs in healthcare facilities and the community (Magnusson *et al.*, 2018:108; WHO, 2017g:3-7). Leadership and governance activities such as the development of policies, regulation and oversight of the health system are done at the national level by government entities and other stakeholders (WHO, 2007a:23; WHO, 2010c:86; WHO, 2014f:18-20). The MOH is the focal entity, and other stakeholders include the ministry of finance, non-governmental organisations (NGOs) representatives and other policymakers (WHO; 2007a:23; WHO, 2014f:18-20). For instance, Juma *et al.* (2018:8) in a study about NCD prevention policy reveal that in Kenya, Nigeria and South Africa, the Ministries of Health lead policy formulation processes.

- ***Absence of non-communicable disease policy***

Absence of national policies, strategies, treatment guidelines, and surveillance and monitoring systems for NCDs are characteristics of health systems in many developing countries. For instance, the burden of NCDs and cardiovascular diseases (CVD) in Kenya is significant, where heart diseases cause 25% of hospital admissions and 13% of deaths (World Heart Federation, 2019:1; WHO, 2018e:1). In response to the increasing burden of NCDs in Kenya, the MOH, with the support of the WHO, introduced national guidelines for the prevention and management of

cardiovascular diseases (WHO, 2018e:1). Also, Asiki *et al.* (2018:4) reveal that specific policies for CVD prevention, control and management at the PHC level in Kenya were absent. However, specific policy aspects were covered in the Kenya Health Policy (2014-2030) and Kenya National Strategy for the prevention and control of NCDs (2015). There is, therefore, a need to strengthen the PHC system in Kenya to include CVD (Asiki *et al.*, 2018:7).

Tapia-Conyer *et al.* (2017:343) suggest that screening policies for NCDs should include the following aspects of primary and secondary prevention: a) population-based targets should be used to measure screening programmes; b) screening policies should consider the importance of confirming diagnoses and incorporating patients with NCDs into healthcare centres, and c) screening policies should accomplish the goal of prevention of NCDs and related complications. Without NCD-specific policies at the PHC level, it will be challenging to allocate budgets and healthcare workers, install HIS, and procure medicines and diagnostic equipment for NCDs services (WHO, 2010b:45-48).

- ***Implementation of non-communicable disease-related policy***

In countries such as Kenya, South Africa, Cameroon, Nigeria, Malawi (Juma *et al.*, 2018:9-11) and Bangladesh (Biswas *et al.*, 2017:8) where specific policies for NCDs exist, the government has to have adequate planning, implementation, and monitoring systems in place to make sure that the population benefits. Without the aforementioned systems, the performance of healthcare service delivery for NCDs will not be assessed and, therefore, the practicality of NCD-specific policies in healthcare facilities cannot be determined. For instance, Bangladesh has policy documents specific to NCDs. However, lack of enforcement, monitoring and supervision of these policies makes it difficult to ensure proper implementation at PHC level (Biswas *et al.*, 2017:8).

In summary, policies and laws have to be established by governments to guide and ensure effective prevention, management, and control of NCDs at all levels of the health system. Functional monitoring systems have to be in place to assess the implementation process of these policies and laws at the PHC level.

This section has outlined different elements of the health system. These elements are dependent on each other to accomplish the outcome of providing good equity healthcare services delivery at all levels of the health system. In NCD management, effective chronic disease management models have to be developed and incorporated into the health system to

ensure the prevention, management and control of NCDs. These models will be discussed in the subsequent section.

2.3 Chronic disease management models

In this section, the following specific objectives will be focused on: 1) to determine different health system structures for NCD management, and 2) to determine how the different health system structures for NCD management progressed from older structures to cater to the increasing prevalence of NCDs.

2.3.1 Non-communicable disease management structures and how they improved over time

Good health systems have to be in place to combat the NCD burden in the world. The existence of good health systems will result in the accessibility of drugs, preventive measures, care and treatment of NCDs at reasonable costs. All health systems have functions to perform to achieve their goals. They have to provide services, develop health workers and other vital resources, mobilise and allocate finances, and ensure health system leadership and governance (WHO, 2007a:3). There are, therefore, different models used to manage chronic diseases that can be incorporated into health systems. The different chronic disease management models, thus, the chronic care model (CCM) (Wagner *et al.*, 1999; Wagner *et al.*, 2001), the preventive system (Solberg, Kottke, Brekke *et al.*, 1998), the expanded chronic care model (expanded CCM) (Barr *et al.*, 2003), and the innovative care for chronic conditions (ICCC) framework (WHO, 2002) are discussed in this section.

2.3.1.1 Chronic care model

The prevalence of chronic diseases is growing worldwide and this poses a heavy burden on health systems. The first model for improving outcomes in chronic diseases developed by Wagner *et al.* (1996:518) consisted of five elements (refer to Figure 2-2). According to this model, evidence-based planned care should be implemented within a health system with guidelines and a plan to assist healthcare workers to comply with guidelines, training of healthcare workers and availability of HIS (Wagner *et al.*, 1996:519).

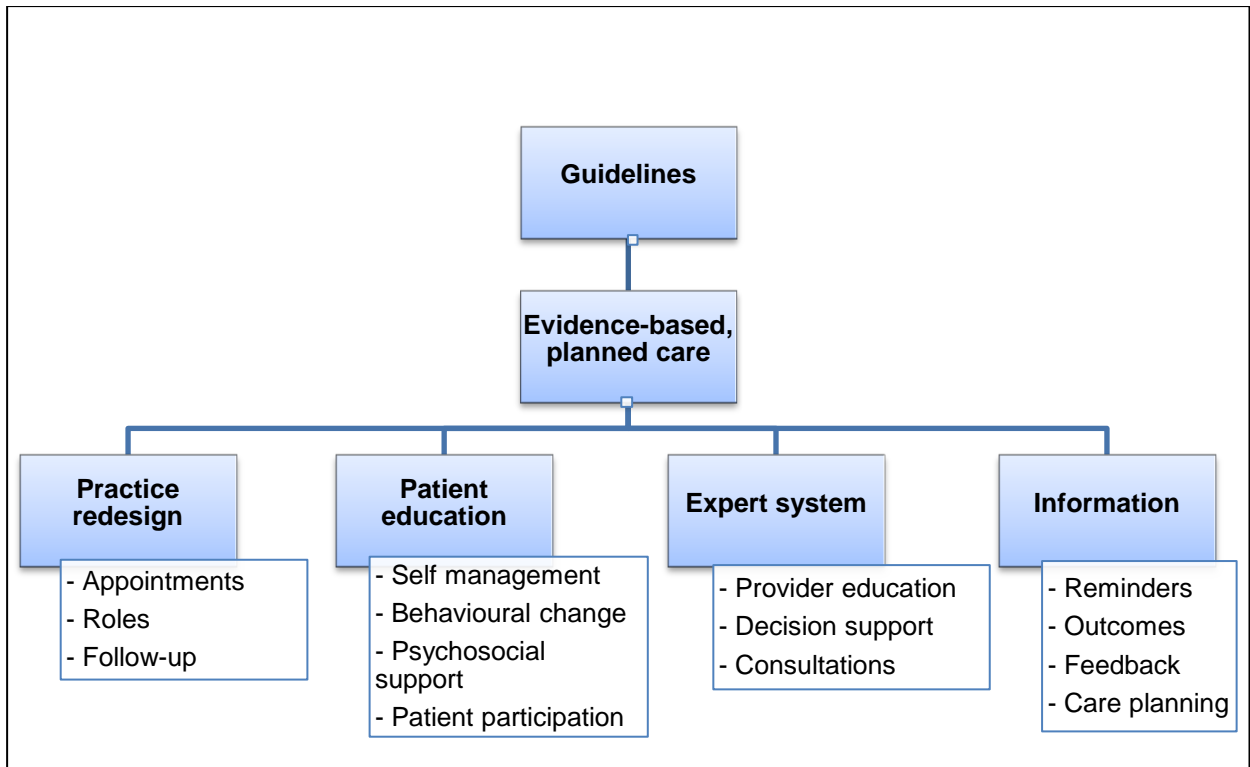


Figure 2-2: First model for improving outcomes in chronic diseases

This first model by Wagner *et al.* (1996:518) for improving outcomes in chronic diseases was revised to address its shortfalls. Additionally, the need for providing quality healthcare services for patients with chronic diseases in light of financial constraints, performance expectations and increasingly informed patients led to the development of the CCM (Wagner *et al.*, 1999:56). Intensive examination of literature which revealed improved chronic disease management as a result of successful practice and health system changes and experts' reviews were used to develop the CCM (Wagner *et al.*, 1996:518-528; Wagner *et al.*, 1999:57). Experts reviewing the first model suggested the addition of the community and self-management support which were lacking in the first model (Wagner *et al.*, 1999:57). The CCM has six elements which include healthcare organisation, self-management support, decision support, delivery systems design, clinical information systems and community resources and policies (Wagner *et al.*, 1999:57-59; Wagner *et al.*, 2001:69-70).

Figure 2-3 shows the six elements of the CCM which will be discussed subsequently.

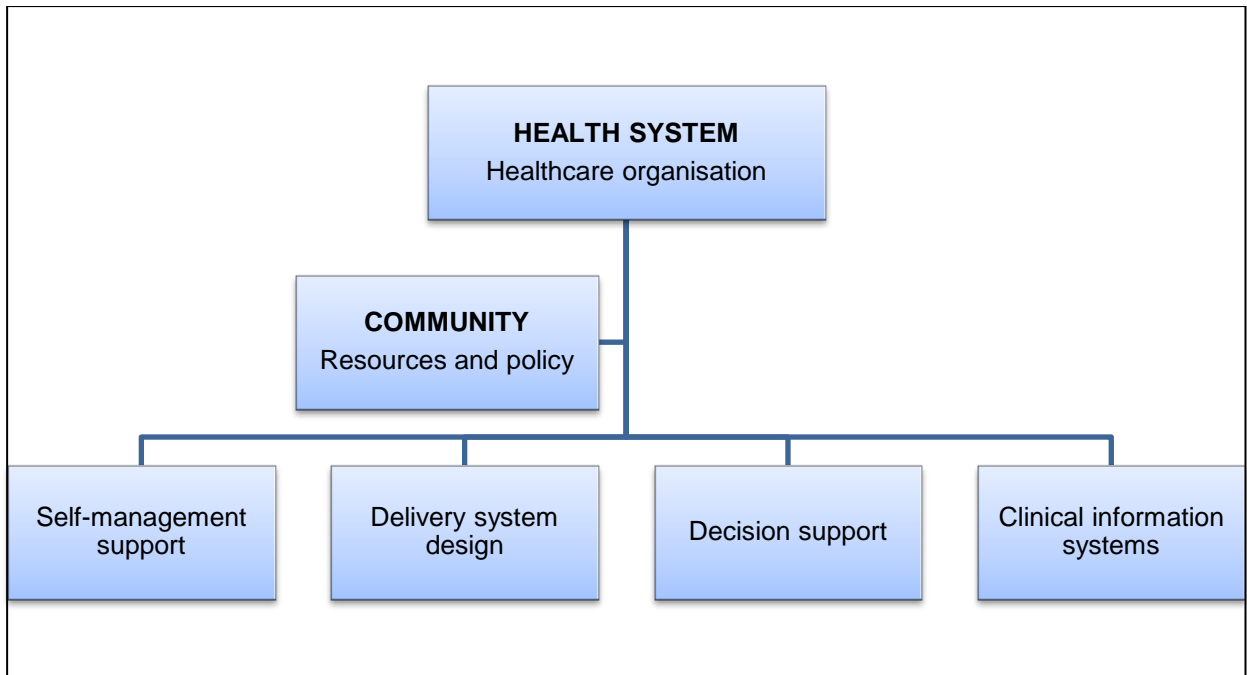


Figure 2-3: The revised model for effective chronic diseases care

2.3.1.1.1 Health system: healthcare organisation

Healthcare organisation is a priority within the health system, and innovation in chronic care cannot occur unless this is recognised. It entails programme planning that includes measurable goals for better care of NCDs (Barr *et al.*, 2003:74). A shift from acute NCDs care to chronic NCDs care should occur in healthcare services delivery to effectively prevent, manage and control NCDs. Therefore, an environment should be established in which organised efforts to improve healthcare for chronically ill patients are systematically supported and encouraged. Essential components of this environment include making chronic illness care a primary goal of the organisation, commitment and visible involvement of leadership, instilling support for change and quality improvement trials, and realigning or creating incentives for health workers and patients to improve care and follow evidence-based guidelines (Barr *et al.*, 2003:74; Glasgow *et al.*, 2001:585).

There is a link between community organisations and healthcare organisations through community resources and policies (Glasgow *et al.*, 2001:589-590). This link strengthens NCD management as NCDs within the community are managed using the support of community organisations (Glasgow *et al.*, 2001:590).

2.3.1.1.2 Community resources and policies

Community resources and policies recognise the importance of community organisations in healthcare organisations. It entails partnerships developed with community organisations that support and meet patients' needs (Barr *et al.*, 2003:74) through the provision of critically supportive or educational services unavailable in health systems (Wagner *et al.*, 1999:59). As stated by Glasgow *et al.* (2001:589-590), the establishment of links with community resources relevant to chronic illness care (such as peer support, exercise, or long-term care) can improve the performance of health systems. Community resources are essential when targeting vulnerable populations such as the elderly, low-income, and underserved populations (Glasgow *et al.*, 2001:590). In summary, the community forms and plays a significant role in NCDs' prevention, management and control as input from the community addresses situations such as referral of NCDs patients to relevant community-based services.

Patients with NCDs are part of the community. This makes self-management support an important element that aims at involving the patient in their chronic care.

2.3.1.1.3 Self-management support

Self-management support highlights the importance of the role the patient plays in living with and managing their NCDs (Barr *et al.*, 2003:74; Epping-Jordan *et al.*, 2004:300; Wagner *et al.*, 1999:59). Effective collaboration between patients and healthcare workers is critical as it will enable both parties to describe problems, set priorities, establish goals, identify barriers, create treatment plans, and solve problems (Glasgow *et al.*, 2001:588; Wagner *et al.*, 1999:59). Patients become actively involved in their chronic care. Thus, there is a shift from acute care to chronic care of patients with NCDs. Patients are better able to perform and monitor their physical activity, nutrition, lifestyle modifications, reduction of salt intake and others, depending on the type of NCD they have. To ensure effective patient involvement in their care, the following have to be in place: availability of appropriately personalised educational resources, skills training and psychosocial support (Barr *et al.*, 2003:74; Glasgow *et al.*, 2001:588). Also, patients should be included in the management of NCDs through participation in focus groups, advisory councils and governing boards (Wagner *et al.*, 1999:59). Patient involvement will help improve NCD management as the perspective of the patients will be taken into consideration when designing self-management care programmes.

2.3.1.1.4 Decision support

Decision support involves interventions used to improve healthcare workers' knowledge about NCD prevention, management and control.

Decision support includes interventions (such as STGs) used by healthcare workers to improve their NCDs knowledge and skills (Wagner *et al.*, 2001:69). In primary healthcare, healthcare workers such as CHWs may be less familiar with NCD management due to task-shifting; thus, evidence-based guidelines should be used by healthcare workers (Barr *et al.*, 2003:74; Epping-Jordan *et al.*, 2004:300; Wagner *et al.*, 1999:59). The guidelines will assist them with diagnosis, treatment initiation and treatment change in NCD management. In addition, healthcare workers should have reliable access to experienced professionals for their clinical expertise in NCD management to address medical questions they may have (Barr *et al.*, 2003:74; Epping-Jordan *et al.*, 2004:300; Glasgow *et al.*, 2001:588; Wagner *et al.*, 1999:59). As a result, NCD evidence-based guidelines should be distributed to every healthcare facility and education on the use of these guidelines should be provided to healthcare workers (Barr *et al.*, 2003:74).

2.3.1.1.5 Delivery system design

Delivery system design focuses on teamwork between healthcare workers such as doctors, nurses, pharmacists, CHW and others.

In delivery system design, teamwork between doctors and other healthcare workers is crucial to ensure the delivery of planned multidisciplinary care to patients with NCDs. It involves task-shifting by the delegation of NCDs care from doctors to nurses, health educators and CHWs, and possessing NCD management knowledge to perform some NCDs-related clinical tasks (Wagner *et al.*, 1999:59; Wagner *et al.*, 2001:70). Task-shifting in primary healthcare addresses the shortage of qualified personnel and thus improves healthcare service delivery. The roles of healthcare workers in healthcare facilities should be clearly defined in the management of NCDs (Epping-Jordan *et al.*, 2004:300; Wagner *et al.*, 1999:59) to facilitate productive interactions between all healthcare workers (both qualified and non-qualified). There has to be enough time for healthcare workers to assess and interact with patients to ensure good NCD management, so innovations such as planned visits and sustained follow-up (Barr *et al.*, 2003:74; Wagner *et al.*, 1999:59) can be utilised in healthcare facilities.

To conclude, healthcare workers (such as doctors, nurses, health educators, pharmacists, and CHWs) should have clearly defined roles to facilitate effective communication between one another which will improve healthcare services for patients with NCDs.

2.3.1.1.6 Clinical information systems

Clinical information systems contain patient information that is crucial for decision-makers, policymakers, healthcare workers and patients. Clinical information systems appreciate how essential information technology is in optimising patient care. Clinical information systems should contain relevant individual patients and population of patients' data which can be accessed quickly and timeously (Wagner *et al.*, 2001:70) by healthcare workers and decision-makers to assess the performance of healthcare facilities. Information systems can either be handwritten or computerised (Epping-Jordan *et al.*, 2004:300; Wagner *et al.*, 2001:70). A registry for diseases or a database that identifies the population to be served and also contains information on the performance of various aspects of guideline-informed care should be incorporated into clinical information systems (Epping-Jordan *et al.*, 2004:300; Glasgow *et al.*, 2001:586; Wagner *et al.*, 1999:59). In this regard, patients on the registry can be assisted with their specific needs and healthcare professionals are enabled to deliver proactive care. Healthcare professionals will be able to receive feedback on performance, generate personalised treatment planning, and produce personalised patient or provider messages to facilitate care and self-care (Epping-Jordan *et al.*, 2004:300; Glasgow *et al.*, 2001:586; Wagner *et al.*, 1999:59). Barr *et al.* (2003:74) state that clinical information systems should contain surveillance systems that provide signals, recalls and information on follow-up. This will help remind both healthcare workers and patients with NCDs about patient clinical visits for follow-up information on patients' disease status.

A useful clinical information system will assist with the dissemination and use of information, and the provision of feedback on the quality of care provided. This information and feedback can be utilised at the national level for decision-making and policy development to guide and evaluate the performance of healthcare services delivery at the primary healthcare level.

2.3.1.2 The preventive system

Advancement in literature brought about a re-evaluation of the six elements of the CCM (Wagner *et al.*, 2001:72). Solberg *et al.* (cited by Glasgow *et al.*, 2001:601-602) developed a preventive system that focuses mainly on clinical preventive services thus improving preventive care performance. The preventive system and the CCM are complementary in that the CCM describes practice systems characteristics associated with improved preventive care whereas the preventive system indicates specific elements of preventive care (Glasgow *et al.*, 2001:602). Therefore, the preventive system improves the CCM. The preventive system shows the sequence of care processes that need organised systems in place in healthcare facilities to

ensure successful prevention (Glasgow *et al.*, 2001:601-602; Solberg, Kottke, Brekke *et al.*, 1998:36-38). The ten component processes in the prevention system need to be well integrated to effectively support the delivery of clinical preventive services (Glasgow *et al.*, 2001:602; Solberg, Kottke, Brekke *et al.*, 1998:33-34). Table 2-2 shows the ten component processes in the preventive system.

If the component processes are fragmented, the delivery of clinical preventive services will be low (Glasgow *et al.*, 2001:602; Solberg, Kottke, Brekke *et al.*, 1998:36-38; Solberg *et al.*, 2001:124-125). For instance, Solberg, Kottke, Brekke *et al.* (1998:35) stated that when looking at processes of a preventive system in PHC clinics, follow-up, clinic-wide guidelines and resources were in place while other processes were variable and fragmented among the primary healthcare clinics. To avoid fragmentation of component processes in healthcare facilities, several types of office system interventions for clinical visits and community outreach have to be developed and used. Office system interventions for clinical visits include medical record checklist, audit feedback, nurse-initiated reminders and computer-generated reminders (Arditi *et al.*, 2017:13; Flottorp *et al.*, 2010:7; McPhee & Detmer, 1993:1100; Nuti *et al.*, 2015:4-22). Community outreach office system interventions include reminder postcards, letters and telephone calls (Arditi *et al.*, 2017:13; Flottorp *et al.*, 2010:7; McPhee & Detmer, 1993:1100; Nuti *et al.*, 2015:4-22). Clinical visit interventions are directed at both patients and doctors while community outreach interventions target patients only.

Table 2-1: Component processes in the prevention system

Component processes	Explanations
Guidelines	Sex-specific, clinic-wide guidelines including at least the minimum age at which and frequency that specific preventive services should be provided
Screening system	A routine way for staff to identify whether a service is needed for a patient during normal clinic visits
Status summaries	A routine way to summarise the status of preventive services on a patient's chart (e.g., chart labelling or a special card or flowsheet)
Reminders	A routine way for staff to bring the need for a particular service to the attention of the clinician during a typical clinic visit
Resources	Patient education materials or other teaching tools that are easily accessible to the clinician during a normal clinic visit
Follow-up	A routine way for patients to obtain all test results and follow-up help as needed shortly after results are available
Counselling	A clinic employee other than the physician who is available to provide patients with information and problem-solving assistance regarding risk factors (e.g., diet changes or smoking cessation)
Outreach	A routine way to invite relatives of a patient with a risk factor to obtain the preventive services for that factor
Prevention visits	Visits focused on preventive services (either in addition to or separate from routine examinations)

Component processes	Explanations
Patient activation	Methods that help patients to recognise their need for preventive services and take action on their own to obtain them

The preventive system primarily looks at changes in clinical behaviour associated with better performance and identifies care systems for clinical preventive services (Glasgow *et al.*, 2001:601-602; Solberg, Kottke, Brekke *et al.*, 1998:36-38; Solberg *et al.*, 2001:124-125). For instance, clinics with preventive services systems in place had high rates of delivery of clinical preventive services compared to low rates of delivery in clinics lacking such systems (Solberg *et al.*, 2001:124). Furthermore, PHC clinic teams have to be trained and provided with assistance to establish operational teams that will increase the presence of functional preventive system processes in clinical settings (Solberg, Kottke & Brekke, 1998:623).

In addition to the preventive system, the expanded CCM was developed to incorporate population health promotion to improve the CCM. A discussion on this model ensues in subsequent paragraphs.

2.3.1.3 The expanded chronic care model

Population health promotion can be integrated within the prevention and management of chronic diseases (Barr *et al.*, 2003:73) which will broaden the CCM by strengthening the community-resources and policy-linkage components of the CCM through the introduction of health promotion (Barr *et al.*, 2003:73-74; Glasgow *et al.*, 2001:589-590). An improved version of the CCM, the expanded CCM, was developed to cater for population health promotion (Barr *et al.*, 2003:73).

Five health promotion action areas (develop personal skills, re-orient health services, build healthy public policy, create supportive environments and strengthening community action) stated by the Ottawa Charter for Health Promotion (WHO-Europe, 1986:1-5) were merged with the CCM (Barr *et al.*, 2003:77) to incorporate population health promotion. All these additional elements added to the CCM to create the expanded CCM are represented in Figure 2-4.

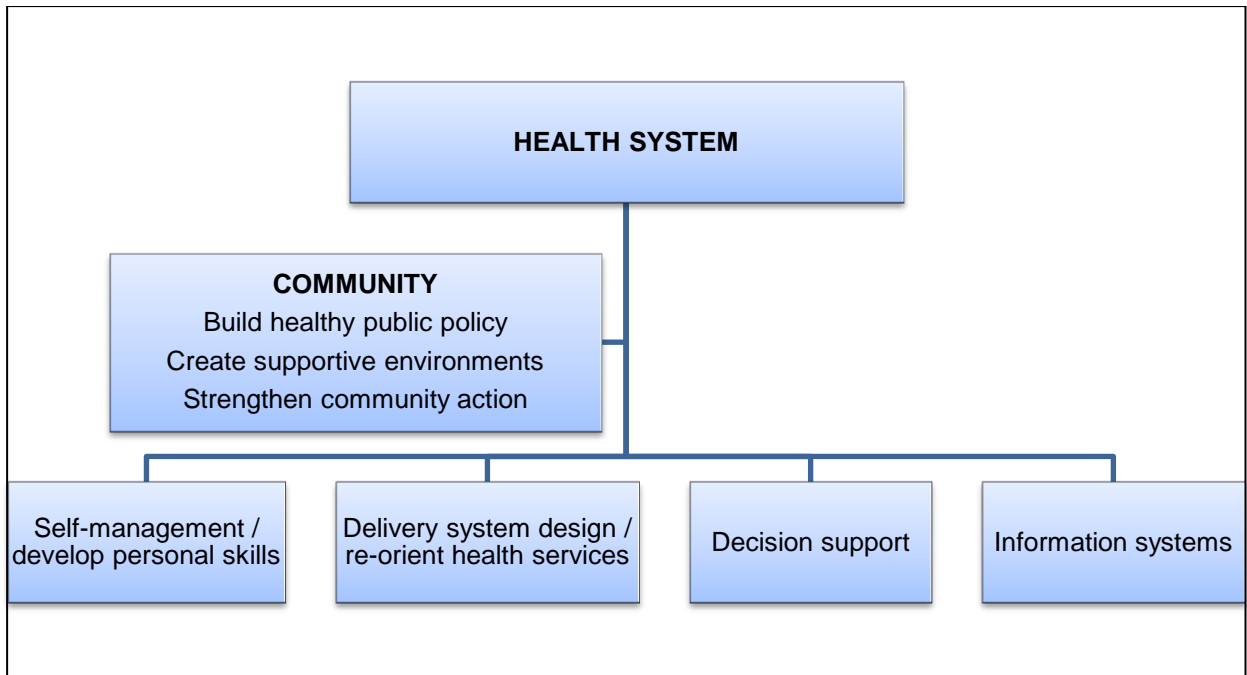


Figure 2-4: Integration of population health promotion into the chronic care model

The incorporation of population health promotion in the CCM by the addition of five health promotion action areas shows apparent associations between the health system and the community (Barr *et al.*, 2003:76). The expanded CCM aims at providing healthcare services to individuals, communities and populations to prevent, manage and control NCDs (Barr *et al.*, 2003:76). The components of the expanded CCM are explained in subsequent paragraphs.

2.3.1.3.1 Self-management/develop personal skills

Self-management or developing personal skills deals with self-management in coping with a disease and developing personal skills (Barr *et al.*, 2003:77) to control and manage NCDs. Self-management is mainly applicable in preventive interventions involving lifestyle modifications (Glasgow *et al.*, 2001:589) such as smoking cessation, dietary and physical activity changes, decreased alcohol consumption rate, and reduced salt intake. Also, self-management entails providing information, health education and life skills enhancement (WHO-Europe, 1986:3) which will enable people to have control over their health and their environments.

Health education on lifestyle modifications in a form of community outreach can be used to instil changes such as smoking cessation, physical activity and nutrition in patients and the community to have control over their health and their environment when dealing with NCDs. These lifestyle changes are important in population health promotion because they are not disease-specific (McCurdy *et al.*, 2008:14). For example, nutrition and physical activity are

essential for patients and communities to know and implement to prevent, manage and control most NCDs and their predisposing factors. Additionally, patient educators should be trained in patient empowerment and behaviour change strategies (New Brunswick, 2010:16) to be able to enable patients to be more involved in maintaining their health and wellness through developing necessary lifestyle modifications.

2.3.1.3.2 Delivery system design/re-orientation of health services

Concerning delivery system design, Wagner *et al.* (1996:520) state that effective chronic disease management involved making changes to acute care visit and care delivery models which affected practice team organisation and allocation of tasks, patients' appointments and follow-up visits. The expanded CCM introduces population health promotion by adding re-orientation of healthcare services which encourages a mandate to support the needs of individuals and communities for a healthier life in addition to providing clinical and curative services (Barr *et al.*, 2003:77-78; Epping-Jordan *et al.*, 2004:300; McCurdy *et al.*, 2008:14). This responsibility for health promotion is shared among individuals, community groups, healthcare professionals, healthcare service institutions and governments (WHO-Europe, 1986:3). Therefore, re-orienting health services facilitate connections within the healthcare sector, and broader social, political, economic and physical environments (Barr *et al.*, 2003:78; WHO-Europe, 1986:3). Health research and changes in professional education and training are essential in re-orienting health services (WHO-Europe, 1986:3). This will assist in the provision of care that is culturally appropriate, and in offering expanded clinical and curative services in a holistic mandate where health, not illness, underpins healthcare services (Barr *et al.*, 2003:78; New Brunswick, 2010:16).

2.3.1.3.3 Decision support

Treatment guidelines, research evidence and expert advice from medical specialists are used in treatment decision-making by healthcare providers at the PHC level (Epping-Jordan *et al.*, 2004:300; Glasgow *et al.*, 2001:588). In the expanded CCM, decision support involves gathering evidence on the disease, treatment and strategies for promoting health and wellbeing (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14). As a result, healthcare professionals will use current information gained from research, evidence-based guidelines and medical specialists in managing and controlling NCDs while also informing patients about the guidelines. This can be achieved by having evidence-based guidelines readily available at healthcare facilities, reinforcing healthcare workers' education and inclusion of specialists support such as health promotion professionals to assist with community-based practices (New Brunswick, 2010:17).

Thus, the work of both doctors and specialists can be paired in healthcare organisations; doctors can also partner with health promotion professionals in the community to deliver community-based NCD management.

2.3.1.3.4 Information systems

New Brunswick (2010:18) states that the information system in the form of a registry is a requirement in the management of NCDs or preventive care as it tracks individual patients as well as populations of patients in programmes that employ population-based approaches. The expanded CCM model uses population-based approaches through the inclusion of population health promotion. Hence, information systems have been expanded to include a wide range of users such as community programmes and municipalities in addition to the healthcare organisation (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14).

Information gathered from population health promotion is vital to users as it will assist in planning for programmes and making policies that are NCDs-based. In the expanded CCM, information systems are, therefore, able to provide information on demographics, population health, and population health promotion (Barr *et al.*, 2003:78). In summary, continual surveillance through the use of information systems helps inform all users in the health system about quality improvement in the prevention, management and control of NCDs in both clinical settings and communities.

2.3.1.3.5 Build healthy public policy

Population health promotion in the expanded CCM expands healthcare to include the development and implementation of government policy and legislation to decrease social inequity and health inequalities (Barr *et al.*, 2003:78; New Brunswick, 2010:18). This approach combines complementary approaches such as legislation, fiscal measures, taxation and organisational change to promote health at the individual, organisational and governmental levels (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14; WHO-Europe, 1986:2). Therefore, policies and legislation will make healthier choices the more natural choices for individuals, companies, organisations and governments (Barr *et al.*, 2003:78; New Brunswick, 2010:18; WHO-Europe, 1986:2).

The existence of policies and laws on NCD prevention and management will create supportive environments where conducive conditions enabling optimum levels of health will be formed in the social, community and natural biophysical environments.

2.3.1.3.6 Create supportive environments

Supportive environments include having living and working environments that are safe, stimulating, satisfying and enjoyable (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14; WHO-Europe, 1986:2). It expands to strategies to foster conditions for optimal levels of health in social and community environments (Rootman *et al.*, 2001:10) in addition to measures to protect and sustain the quality of the natural biophysical environment (Barr *et al.*, 2003:78). Supportive environments should address health inequalities related to housing and employment in addition to developing safe social environments through suitable roads and public transportation (New Brunswick, 2010:19). For that reason, patients and populations should be linked to the health system, each other and their natural environment.

Creative, supportive environments involve both patients and the community so, community action has to be strengthened to enable people to manage the health of their community.

2.3.1.3.7 Strengthening community action

Population health promotion works through community action in setting priorities, making decisions, planning strategies and implementing them to achieve better health (New Brunswick, 2010:19; WHO-Europe, 1986:3), hence, supporting people in managing the health of their community using their ways (Barr *et al.*, 2003:79). This way, communities and community groups are empowered and mobilised to advocate for and to create healthy environments (McCurdy *et al.*, 2008:14). Moreover, healthcare workers can become active advocates for disadvantaged populations (New Brunswick, 2010:19) in NCD prevention, management, and control by identifying and eradicating barriers to healthy living and quality of life (Barr *et al.*, 2003:79).

More effective strategies for the prevention and management of NCDs are necessary to curb the burden of NCDs. The CCM provides effective, relevant solutions to this challenge. However, this is not enough, it is challenging to use the CCM for preventive and health promotion purposes because it is inclined to clinically oriented systems; therefore, the expanded CCM was developed.

2.3.1.4 The innovative care for chronic conditions framework

The applicability of CCM in developing countries was a challenge and this resulted in the development of a new model named the innovative care for chronic conditions (ICCC) framework (WHO, 2002). In the ICCC framework, a more extensive policy environment is

included which encompasses patients and their families, healthcare organisation and communities (WHO, 2002:43). This model includes components at the micro- (patient and family), meso- (healthcare organisation and community), and macro-levels (policy) (Epping-Jordan *et al.*, 2004:301; WHO, 2002:41). The ICCC framework closely follows the international healthcare context thus emphasising different aspects of good care for chronic conditions (Epping-Jordan *et al.*, 2004:301). Figure 2-5 shows the expansion of the CCM to include patient and family, healthcare organisation and community, and policy.

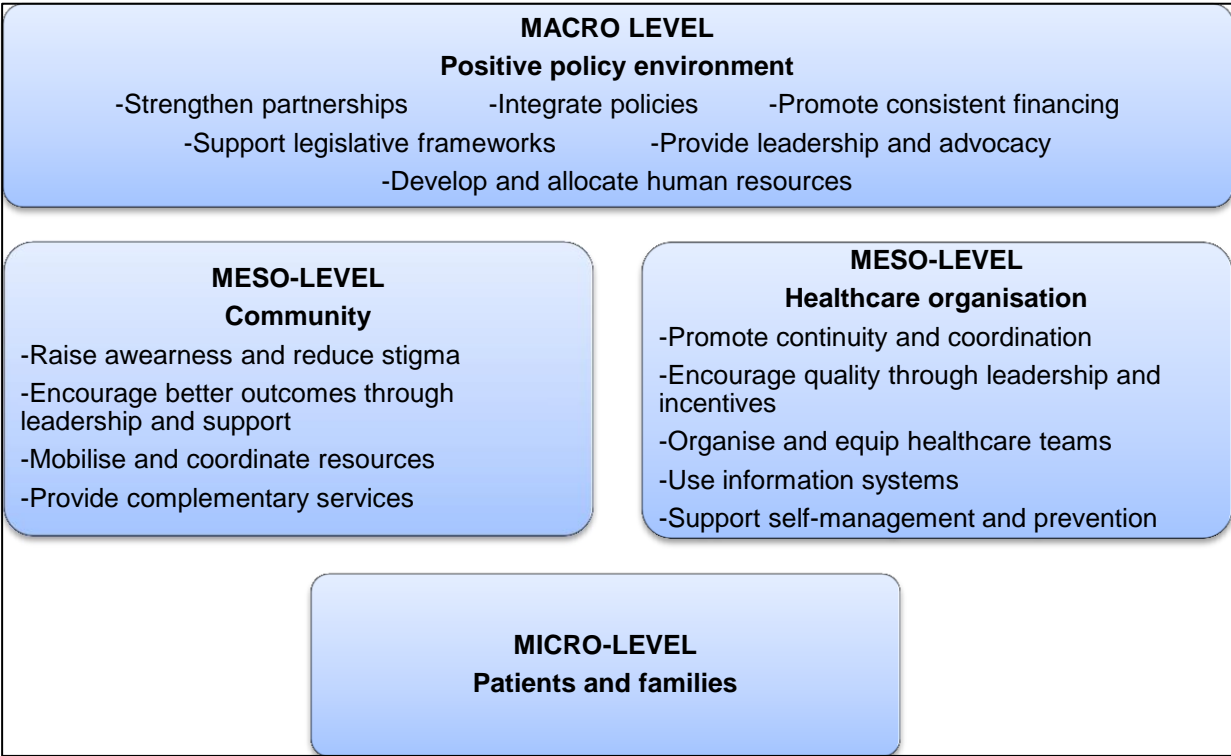


Figure 2-5: The expansion of the chronic care model to include patient and family, healthcare organisation and community, and policy

The macro-, meso- and micro-levels in the ICCC framework are dependent on each other (WHO, 2002:30). Therefore, these levels should be integrated to provide improved healthcare services, as fragmentation will lead to a decrease in the performance of healthcare services delivery (WHO, 2002:42-45). These levels work together and dynamically influence each other. The ICCC framework focuses on all phases in the prevention and management of chronic conditions such as health promotion and prevention, diagnosis, treatment, care, rehabilitation and palliative care (Nuño *et al.*, 2012:60). The following sections will include discussions on the micro-, meso- and macro-levels of the ICCC framework.

2.3.1.4.1 Micro-level: patient interaction level

The CCM shows an association between patients and healthcare workers (Barr *et al.*, 2003:75). In this association, patients go to health facilities for services to be provided by healthcare workers. The association between patients and healthcare workers in the CCM excludes the role of the community and community partners in NCD management (Barr *et al.*, 2003:75). The association between patients and healthcare workers as per the CCM is not enough to help combat the increasing rates of chronic diseases. Thus, the ICCC framework addresses this shortfall in the CCM by including community partners and healthcare organisations. As a result, a partnership triad unique for chronic diseases consisting of patient and family, community partners, and the healthcare team forms the micro-level in the ICCC framework (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:60; WHO, 2002:46). The partnership triad expands the role of patient and family by associating them with the communities they dwell in and healthcare organisations they utilise (WHO, 2002:46).

For the triad to function effectively, patients and family, community partners, and the healthcare team should communicate and collaborate about patient-specific issues and healthcare in general (Epping-Jordan *et al.*, 2004:301; WHO, 2002:46). All members of the triad (patient and family, community partners, and the healthcare team) should be informed, motivated and prepared with skills necessary to prevent, manage and control chronic diseases (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:60; WHO, 2002:46). Firstly, patients and families have to be informed about NCDs, motivated to change and maintain healthy behaviours, adhere to medication and self-manage NCDs, and be equipped with behavioural skills to manage NCDs at home (WHO, 2002:46). Secondly, healthcare teams include different types of healthcare workers at a clinical site. The teams should know and accept their roles and responsibilities for carrying out tasks following their professional strengths and capacities (WHO, 2002:46) when dealing with the prevention, management and control of NCDs. Lastly, community partners should be equipped with information and skills related to prevention, management and control of NCDs to prepare them for performing tasks that were traditionally assigned to qualified healthcare workers (WHO, 2002:47). This enables the health system to use community resources such as community health workers to provide NCD-related healthcare services to the community. Additionally, a shortage of qualified healthcare workers is addressed through task-shifting some of their responsibilities and roles to community healthcare workers.

2.3.1.4.2 The meso-level: the healthcare organisation and the community

The other important component in the ICCC framework is the meso-level which includes the healthcare organisations and the community.

a) The healthcare organisation

Components of the healthcare organisation in the ICCC framework include:

- promote continuity and coordination,
- encourage quality through leadership and incentives,
- organise and equip healthcare teams,
- use information systems, and
- support self-management and prevention (WHO, 2002:48-53).

These components are related to healthcare organisations in the CCM although some have been reformulated to apply in the context of developing countries (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:60). These components will be discussed in the following paragraphs.

- ***Promote continuity and coordination***

Coordination has to exist across all levels of healthcare (primary, secondary and tertiary) and across different healthcare providers to provide efficient, good quality healthcare services to patients with chronic diseases. For instance, there is a challenge of coordination between public primary healthcare services and specialised or private healthcare providers in developing countries (Epping-Jordan *et al.*, 2004:301). This leads to fragmentation in the provision of healthcare services across all healthcare providers (both private and public). Good communication should exist between all healthcare workers (professional and non-professional healthcare workers, and medical specialists) involved with the management of chronic diseases. Continuity of care for patients with chronic conditions is essential. Thus, care should be planned and followed through in healthcare facilities. For instance, follow-up visits should be scheduled which can assist in the early detection of complications (WHO, 2002:50).

- ***Encourage quality through leadership and incentives***

Healthcare leaders and other leaders involved in healthcare should support healthcare organisation through outsourcing sponsorships that will be used to improve care for patients with chronic diseases (WHO, 2002:50). Additionally, on-going quality monitoring and

improvement projects among healthcare workers should be routinely practiced and that will guide the administration of incentives to reward both healthcare workers and patients (WHO, 2002:50) who excellently participated in the management and prevention of chronic diseases. Incentives will motivate healthcare workers to provide good healthcare services to patients with chronic diseases. Incentives are a motivation to patients as well as they will excel in practising non-pharmacologic and pharmacologic treatment for chronic diseases and thus improving their quality of life. In San Francisco, a programme called Action Point provided a cash incentive of \$10 weekly to patients who used their services at least once a week (Bamberger *et al.*, 2000:700). The offering of incentives to patients by this programme resulted in improved living conditions.

- ***Organise and equip healthcare teams***

In managing chronic diseases, doctors and other healthcare workers have to work cooperatively with one another. Good communication among healthcare workers is vital for information exchange and sharing of decision-making with patients. Healthcare teams should be equipped with communication skills and team-building competencies. These will enable healthcare teams to know and carry out their roles depending on their level of training in the prevention and management of chronic diseases. Healthcare teams should also be provided with essential supplies, medical equipment, laboratory access, essential medications, standard treatment guidelines, and diagnostic and treatment algorithms (WHO, 2002:51) to be used in the prevention and management of chronic diseases.

- ***Use information systems***

The collection and utilisation of information about patients and the population of patients with chronic diseases are important in health systems. Information systems will provide information such as epidemiology, treatment, and healthcare outcomes when looking at chronic diseases (WHO, 2002:53). This information generated by information systems can be used in planning and decision-making at all levels of healthcare to improve the prevention and management strategies used in the management of chronic diseases. Information systems can either be paper-based or computer-based. Simple information systems such as patient registries can assist healthcare teams to schedule patients for clinical visits, follow-up on defaulted patients, send clinical visit reminders to patients, and monitor patient treatment responses. This was evidenced by Bamberger *et al.* (2000:700) where the Action Point project gave telecommunication devices (beepers) to their clients to remind them to take their medication. Although on-going evaluation is needed to determine if adherence improved due to this

telecommunication device, patient laboratory information showed significant viral suppression which implies that patients had been taking their medication as instructed.

- **Support self-management and prevention**

Self-management and prevention involve lifestyle modification activities such as regular exercise, good nutrition, tobacco and alcohol cessation, medication storage and adherence. These activities are taught to patients and reinforced by healthcare workers at every healthcare worker-patient encounter. Effective self-management assists patients together with their families to adhere to lifestyle modifications, thus minimising complications, symptoms and disability due to chronic diseases (WHO, 2002:51).

b) The community

Patients with chronic diseases mostly spend their time living within their communities. Therefore, community resources can complement healthcare organisations to fill gaps in services that are not provided by healthcare facilities. Community resources can assist patients with NCDs with services such as knowledge about their conditions and treatment including medication adherence. For instance, the Action Point project has helped poor patients with HIV infection residing in urbanised areas, to adhere to their medication in San Francisco (Bamberger *et al.*, 2000:701). Components of the community level include:

- raise awareness and reduce stigma,
- encourage better outcomes through leadership and support, and
- mobilise and coordinate resources, and
- provide complementary services (WHO, 2002:55-57).

These components will be discussed subsequently.

- **Raise awareness and reduce stigma**

Patients with chronic diseases live within communities that can stigmatise patients with chronic conditions together with their families. To reduce stigmatisation, educational events that teach the community about NCDs, diagnosis, prevention and management could be held at local community centres. Also, the community should be made aware of chronic conditions and their associated risk factors to reduce the increasing prevalence of chronic diseases. To raise awareness and sensitise the community about chronic diseases, leaders of local and

international organisations, NGOs, and support and women's groups can be used (WHO, 2002:55).

- ***Encourage better outcomes through leadership and support***

Community leaders, community development boards, health boards, or village development groups, should be identified and assisted to improve care for patients with chronic diseases (WHO, 2002:55). These leaders are in a position to use their leadership skills and support systems by aligning their policies and practices with the prevention and management of chronic diseases. The Ndola Catholic Home-Based Care (HBC) programme in Zambia provides care for patients with chronic diseases through trained community volunteers, religious leaders and community nurses (Nsutebu *et al.*, 2001:242). This programme increased the coverage of community-care to patients at an early stage of their diseases.

Religious leaders, mayors, and village chiefs are highly respected people in communities (Chigwata, 2016:78-84; Molenaar *et al.*, 2019:26-27). These people should be equipped with knowledge about the burden of chronic diseases and strategies for prevention because communities listen to and believe in well-respected community leaders (Chigwata, 2016:78-84; Molenaar *et al.*, 2019:26-27). Therefore, if religious leaders, mayors, or village chiefs talked about the importance of healthcare services related to chronic conditions offered in healthcare facilities, the community would utilise these healthcare services thus improving chronic disease outcomes.

- ***Mobilise and coordinate resources***

Chronic disease-related activities such as health promotion, prevention activities, training of community health workers, and supply of necessary equipment to healthcare facilities can be mobilised through local groups (WHO, 2002:56). These activities can be achieved through the generation of funds and the use of available resources in the community to help with the prevention and management of chronic diseases. Funds and resources can be raised and financial schemes identified by the local community through community leaders from local and international organisations, NGOs, community support groups and women's groups (WHO, 2002:56). For instance, the Comités Locales de Administración de Salud (CLAS) in Peru is a private non-profit community-administered institution created and found near the healthcare centre or community members to improve the quality and coverage of ambulatory services at PHC level (Cotlear, 2000:5). Cotlear (2000:5) further states that the CLAS collaborates with healthcare providers to develop local health plans, define the budget for health plan implementation, and monitor expenditures and healthcare services delivery to the community.

The Ndola Catholic Diocese HBC programme in Zambia is a Catholic Church group in partnership with NGOs, community groups, DHMT and private and government hospitals to provide care for patients with chronic diseases in the community (Nsutebu *et al.*, 2001:241).

- ***Provide complimentary service***

Duplication of healthcare services should be avoided in health systems. The healthcare organisation and the community should provide complementary healthcare services to patients with chronic conditions as well as the community. The community should bridge the service gap between the healthcare facilities and the patients including their families, by providing services that are not available in healthcare organisations (Epping-Jordan *et al.*, 2004:301; WHO, 2002:57). Communities in developing countries have providers such as CHWs and village health workers (VHWs) who make valuable contributions to the prevention and management of chronic diseases in the community. These CHWs and VHWs are used by healthcare organisations and NGOs to establish secure connections with the community (WHO, 2002:57). Hence, training for CHWs and VHWs on the provision of essential services to patients with chronic diseases as well as in health promotion activities and self-management is essential. Training will enable them to carry out their duties in the community efficiently.

The most important component of the ICCC framework is the macro-level, which focuses on the positive policy environment.

2.3.1.4.3 The macro-level: positive policy environment

Planners and decision-makers can impact the health of the population by using policies and plans. Policies are essential in reducing the burden of chronic diseases as they aid with organising values, principles, and general strategies of governments or administrative divisions (WHO, 2002:58). In chronic disease prevention and management, policies specific to different chronic diseases, such as NCDs-specific policies are essential in the reduction of NCDs prevalence. Policy activities that take place at the meso-level include legislation, leadership, policy integration, partnerships between all stakeholders, financing, and allocation and development of human resources (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:59) all of which are essential in reducing the burden of chronic diseases. Components of a positive policy environment include:

- provide leadership and advocacy,
- integrate policies,
- promote consistent financing,

- develop and allocate human resources,
- support legislative frameworks, and
- strengthen partnerships (WHO, 2002:58-62).

These elements will be elaborated on in the following paragraphs.

- ***Providing leadership and advocacy***

Political leaders play a vital role in leadership and advocacy for chronic diseases. Thus, political leaders should be motivated to establish a positive environment for patients, their communities and healthcare organisations involvement with managing chronic diseases (WHO, 2002:58). Decision-makers such as ministries of health are thus best positioned to influence political leaders to improve the prevention and management of chronic diseases. Policymakers, healthcare leaders, healthcare workers, community, patients and families are other groups that can be influenced by decision-makers thus increasing awareness of prevention and management of chronic diseases (Epping-Jordan *et al.*, 2004:301, WHO, 2002:58). These other groups can, in turn, influence political leaders to create conducive conditions for a positive policy environment that supports the management of chronic diseases (Epping-Jordan *et al.*, 2004:301).

Different strategies can be used to increase advocacy in the prevention and management of chronic diseases. Strategies include the use of credible spokespersons to talk about chronic diseases (WHO, 2002:58), and the use of all forms of media (Epping-Jordan *et al.*, 2004:301, WHO, 2002:58) to educate and provide self-management skills to the public. For instance, Soul City (a real-life television drama that focuses on health and development issues that mirror those of the South African population) uses drama, entertainment, and mass media communication vehicles for advocacy of life and health of people through strengthening individuals and communities (Soul City Institute for Health and Development Communication, 2018).

- ***Integration of policies***

Redundancies and fragmentation of management of chronic diseases occur in health systems and lead to financial resources wastage. This can be controlled through the integration of policies for chronic diseases. For policies to be effective, they should cut across boundaries of specific diseases, emphasise management of a defined population, make clear links to other government programmes and community-based organisations, and include prevention, promotion and control of chronic diseases (Epping-Jordan *et al.*, 2004:302, WHO, 2002:59).

Policies should be incorporated across different disease categories such as HIV/AIDS and diabetes (Epping-Jordan *et al.*, 2004:302) together with other chronic diseases such as hypertension, asthma, depression and epilepsy. It must be integrated across different levels of healthcare and healthcare settings such as PHC and hospital-based care (Epping-Jordan *et al.*, 2004:302). For instance, in 1990, the new mental health legislation in Finland introduced co-operation and synergy between specialised healthcare and PHC, and between healthcare and social welfare service to establish a functional mental health service system (Lehtinen & Taipale, 2001:2).

- ***Promoting consistent financing***

Policies and plans for chronic disease management and prevention need consistent financing to be put into practice at different levels of healthcare. Financing decisions should be based on principles of equity and effectiveness to ensure the beneficial allocation of resources in the health system (Epping-Jordan *et al.*, 2004:302, WHO, 2002:60). Financing components such as funding, resource allocation, contracting and reimbursement should be used as measures for encouraging the application of innovative healthcare strategies (Epping-Jordan *et al.*, 2004:302, WHO, 2002:60). In Costa Rica, for instance, the Costa Rican Society Security Fund has been purchasing PHC services from Costa Rica Cooperative through contracting, use of performance indicators and an evaluation plan to improve coverage, quality and efficiency of PHC services (Abramson, 2001:410-411). This programme resulted in expanded healthcare services coverage, improved quality of care and cost minimisation for underserved populations. Also, healthcare financing in Finland has been decentralised to municipalities to purchase needed healthcare services and to impose income taxes (Lehtinen & Taipale, 2001:2). The municipalities know the needs and circumstances of their population, so, this initiative resulted in resource allocation improvement.

- ***Development and allocation of human resources***

Well-trained healthcare workers are essential for the effective prevention and management of chronic diseases. For that reason, education on chronic diseases is essential in higher education institutions and in-service training of healthcare workers. As a result, education authorities such as Ministries of Education can enhance the prevention and management of chronic diseases through participating in the update of medical and nursing schools' curricula to address the needs of patients with chronic diseases (WHO, 2002:60). The curricula should include courses such as the role of behaviour in health and illness, basic principles of screening, brief intervention and facilitating behaviour change in patients with chronic diseases

in addition to pharmacotherapy (Epping-Jordan *et al.*, 2004:302). Continuing education or in-service training for healthcare workers in specific areas of chronic disease management should be mandatory as this will enhance healthcare service delivery (WHO, 2002:60). Epping-Jordan *et al.* (2004:302) also state that policymakers should establish postgraduate continuing training and systems for disseminating research findings and other relevant information to healthcare providers. This will help with the availability of relevant information on chronic diseases that can be used in the monitoring and management of these diseases.

Development and allocation of human resources, as well as direct healthcare service providers, entail policy and service planners, researchers, information technology designers and support personnel (Epping-Jordan *et al.*, 2004:302, WHO, 2002:61). Also, new categories of healthcare workers such as self-management counsellors (Epping-Jordan *et al.*, 2004:302, WHO, 2002:61) can bridge the gap of healthcare worker shortages and meet the increasing demands of chronic disease management. Nurse-led NCD service using stepwise diagnostic and treatment protocols in the resource-limited area of South Africa enabled nurses in PHC clinics to control clinical conditions of patients with hypertension (68%), non-insulin-dependent diabetes (82%) and asthma (84%) (Coleman *et al.*, 1998:637). Thus, nurses have demonstrated the ability to manage and control chronic diseases in resource-limited settings where there is a lack of doctors.

- ***Supporting legislative frameworks***

Legislation and regulations can decrease the burden of chronic diseases as well as protect the rights of people with chronic diseases (WHO, 2002:62). Supportive legislative frameworks can control predisposing factors to chronic diseases and promote the prevention of chronic diseases. For example, laws and regulations that restrict tobacco and alcohol sales to youth, and those that limit or ban tobacco advertising (Epping-Jordan *et al.*, 2004:302, WHO, 2002:62) can moderate consumption and access to tobacco and alcohol by both youth and adults. Tobacco and alcohol are predisposing factors to chronic diseases such as hypertension so restricting accessibility to them will assist with the reduction of the burden of chronic diseases. Hence, the WHO's framework convention on tobacco control states that countries should implement price and tax measures, and ban advertising, promotion and sponsorship to reduce tobacco consumption (WHO, 2003c:7&11).

Unhealthy eating also disposes people to chronic diseases, such as CVDs and diabetes, so regulations for informative food labelling should be taken into consideration (WHO, 2002:62). For example, a European Commission press release states new European Union (EU) food

labelling rules that will ensure that consumers get clearer, comprehensive and accurate information on food content thus helping them make informed choices (European Commission, 2014:1). Regulations and laws that protect human rights, healthcare institutions and healthcare workers should be developed and enforced (Epping-Jordan *et al.*, 2004:302, WHO, 2002:62). The laws and regulations should state that every patient has a right to accessible, affordable and good quality healthcare services. Thus, human rights in healthcare include access to care and voluntary treatment (WHO, 2002:62).

- ***Strengthening partnerships***

Patients with chronic diseases spend most of their life within a community in a specific environment and not in healthcare facilities. Inter-sectoral partnerships with other governmental sectors, the private health sector, and community groups and organisations should be developed and coordinated by health policymakers (Epping-Jordan *et al.*, 2004:302, WHO, 2002:62). Policymakers support the development of community groups and NGOs; thus, they can make sure that community groups and NGOs partake in policymaking and planning of healthcare services (Epping-Jordan *et al.*, 2004:302). The rationale is that community groups and NGOs are based within communities where patients with chronic diseases spend most of their lives. Thus, they are in a better position to provide information at the community level concerning the prevention and management of chronic diseases.

Strong partnerships among governmental sectors can potentially influence health and chronic diseases (WHO, 2002:62). Some of the government sectors include agriculture, labour, education and transportation as they can influence the prevention and management of chronic diseases (WHO, 2002:62). For example, agriculture can have policies that address poverty, malnutrition and stunting in a particular country while education can influence the upgrading of curricula and continuing education of healthcare workers in the prevention and management of chronic diseases. Labour can introduce a policy on the availability of healthy meals in cafeterias and the availability of gymnasias on premises or issuing of gymnasias membership as an employee benefit by organisations. Furthermore, connections with district, municipal or local government and community entities such as religious groups, schools and employees should be looked at and strengthened where necessary (Epping-Jordan *et al.*, 2004:302; WHO, 2002:63) because these groups play a significant role in the prevention, management and control of chronic diseases.

In an efficient and effective healthcare system, the micro-, meso- and macro-levels have to work well within and concerning each other. This is not always the case in healthcare for chronic

conditions; dysfunction in the health system is typical (WHO, 2002:31). The reaction of patients to the health system will be due to the healthcare services provided in healthcare facilities. Policies guide healthcare organisations and communities on how to offer excellent healthcare services which in turn influence patients to use healthcare facilities (WHO, 2002:30).

Different chronic disease management models have been discussed above. The next section will critically compare and analyse the already discussed models (refer to Sections 2.3.1.1; 2.3.1.2; 2.3.1.3; 2.3.1.4).

2.3.2 Critical analysis and comparison of non-communicable disease management models

This section focuses on comparing different models for NCD management. Table 2-2 compares the first model for improving outcomes in chronic diseases, CCM, to the expanded CCM, and the ICC framework (Barr *et al.*, 2003; Wagner *et al.*, 1996; Wagner *et al.*, 1999; Wagner *et al.*, 2001; WHO, 2002).

Table 2-2: Comparison of different models used in the management of chronic diseases

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
Evidence-based, planned care and guidelines	Evidence-based, planned care should be eased by working within a care system or group practice that values guidelines and has created a plan at the organisational level to assist practitioners in their efforts to comply with guidelines.	Health system: Healthcare Organisation	Programme planning that includes measurable goals for better care of chronic diseases.			Healthcare organisation: (a) Promote continuity and coordination	Existence of coordination across all levels of healthcare (primary, secondary and tertiary) and different healthcare providers to provide efficient good quality healthcare services. Care should be planned and followed through to ensure continual care for patients with chronic diseases in healthcare facilities.
			To complement the first model, the CCM introduces critical elements such as leadership, incentives for both healthcare workers and patients, making chronic disease care the primary goal of the organisation, and introducing support of improvements provided by senior leadership.				

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
							improvement of care for patients with chronic diseases. Provision of incentives to both healthcare workers and patients as motivation for excelling in chronic disease management.
						(c) Organise and equip healthcare teams	Healthcare teams should be equipped with communication skills, team-building skills, and necessary supplies (medical equipment, laboratory access, and diagnostic and treatment algorithms). These skills and supplies will enable healthcare teams to know and carry out their roles depending on their level of training in the management of chronic diseases.

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
						(d) Use information systems	Collection and utilisation of information through the use of information systems will provide information on epidemiology, treatment, and healthcare outcomes. This information can be used in planning and decision-making at all levels of healthcare.
						(e) Support self-management and prevention	Involves lifestyle modification activities (regular exercise, proper nutrition, tobacco and alcohol cessation, and medication storage and adherence) which are taught to patients and reinforced by the healthcare worker at every healthcare worker-patient encounter.

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
Patient self-management and behavioural change support	Reducing complications and symptoms from most chronic diseases requires changes in lifestyle and the development of self-management competencies by the patient and family.	Self-management support	Emphasis on the importance of the central role that patients have in managing their care.	Self-management/develop personal skills	Enhancing skills and capacities for personal health and wellness	Patients and families	Involves formation of a partnerships triad unique for chronic diseases consisting of patient and family, community partners, and the healthcare team. All members of the triad should be informed, motivated and prepared with skills necessary to prevent, manage and control chronic disease.
Expert system	Integration of provider education, use of evidence-based guidelines in making clinical decisions and consultation with medical specialists to achieve better outcomes in chronic diseases.	Decision support	Integration of evidence-based guidelines into daily clinical practice.	Decision support	Integration of strategies for facilitating the community's abilities to stay healthy.		

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
Practice redesign	This includes the organisation of the practice team and the allocation of tasks among them, the management of patient contact (appointments, follow-up), and the use of other health professionals.	Delivery system design	Focus on teamwork and an expanded scope of practice to support chronic care.	Delivery system design/Re-orient health services	Expansion of mandate to support individuals and communities more holistically.		
Information	Developing information systems (computer-based or paper-based) containing information about patients, their care, and their outcomes. This is an essential ingredient of all population-based	Clinical information systems	Developing information systems based on patient populations to provide relevant client data.	Information systems	Creation of broadly based information systems to include community data beyond the healthcare system.		

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
	strategies to improve chronic disease care.						
		Community resources and policies	Developing partnerships with community organisations that support and meet patients' needs.	The community: (a) Build healthy public policy	Development and implementation of policies designed to improve population health.	The community: (a) Raise awareness and reduce stigma	Leaders of local and international organisations, NGOs and support and women's groups can be used to raise awareness and sensitise the community about chronic diseases.
			(b) Create supportive environments	Generating living and employment conditions that are safe, stimulating, satisfying and enjoyable.	(b) Encourage better outcomes through leadership and support	Community leaders together with structures such as community development boards, health boards or village development groups should be identified and supported to improve care for patients with chronic diseases.	

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
				(c) Strengthen community action	Working with community groups to set priorities and achieve goals that enhance the health of the community.	(c) Mobilise and coordinate resources	Funds and resources used in chronic diseases related activities such as health promotion, prevention activities, training of CHW, and supply of basic equipment to healthcare facilities can be raised and mobilised through local groups. The local community can identify financial schemes through community leaders from local and international organisations, NGOs, community support groups and women's groups.
						(d) Provide complimentary service	The community bridges the service gap between the healthcare facilities and the patients as well as their families by providing services related to

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
							chronic disease management that are not available in healthcare organisations.
						Positive policy environment: (a) provide leadership and advocacy	Political leaders should play an essential role in leadership and advocacy for chronic diseases. Thus, decision-makers, policy-makers, healthcare leaders, healthcare workers, community, patients and families can influence political leaders to create conducive conditions for a favourable policy environment that supports the management of chronic diseases.

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
						(b) Integrate policies	Policies should be integrated across different disease categories such as HIV/AIDS, diabetes, hypertension and other chronic diseases. Also, policies should be integrated across different levels of healthcare and healthcare settings such as PHC and hospital-based care.
						(c) Promote consistent financing	Consistent financing is needed to put into practice policies and plans for chronic disease management and prevention at different levels of healthcare.
						(d) Develop and allocate human resources	Development and allocation of healthcare workers involve updating medical and nursing schools' curricula, and the provision of

First model for improving outcomes in chronic diseases		Components of the chronic care model		Components of the expanded chronic care model		Components of the innovative care for chronic conditions framework	
Component	Explanation	Component	Explanation	Component	Explanation	Component	Explanation
							in-service training or continuing training for healthcare workers to address the needs of patients with chronic diseases.
						(e) Support legislative frameworks	Supportive legislative frameworks can control predisposing factors to chronic disease and promote the prevention of chronic diseases.
						(f) Strengthen partnerships	Strong partnerships among governmental sectors such as agriculture, labour, education, and transportation can influence the prevention and management of chronic diseases.

2.3.2.1 Critical analysis of different non-communicable disease management models

Different elements of NCD management models are compared and contrasted to assess if more recent models such as the expanded CCM and the ICCC framework better address NCD management as compared to the older models such as the first model for improving outcomes on chronic diseases and the CCM. The following studies were used to develop the comparisons: Barr *et al.* (2003); Epping-Jordan *et al.* (2004); Glasgow *et al.* (2001); Wagner *et al.* (1996); Wagner *et al.* (1999) and WHO (2002).

2.3.2.1.1 Healthcare organisation

The first model for improving outcomes in chronic diseases emphasises the use of guidelines and evidence-based care. A plan should thus be in place at the healthcare organisation level, which will help healthcare workers to comply with evidence-based care and guidelines in the management of chronic diseases (Wagner *et al.*, 1996:519). The CCM, in addition to the use of guidelines and evidence-based care, complements the first model for improving outcomes in chronic diseases by insisting on programme planning that includes measurable goals for better care of chronic diseases (Barr *et al.*, 2003:74).

The first model for improving outcomes in chronic diseases concentrated solely on compliance of healthcare workers with guidelines and evidence-based care (Wagner *et al.*, 1996:519) without measuring the impact they had on the outcome of chronic diseases. In contrast, the CCM uses measurable goals (Barr *et al.*, 2003:74) to assess the outcome of the use of evidence-based care and guidelines. The CCM includes critical elements such as leadership, availability of incentives for both healthcare workers and patients, and support of developments provided by senior leadership to improve outcomes of chronic disease management (Barr *et al.*, 2003:74; Glasgow *et al.*, 2001:585). These elements are lacking in the first model for improving outcomes in chronic diseases.

Healthcare organisation is one of the meso-level components together with the community in the ICCC framework. The ICCC framework expands on the healthcare organisation element in the CCM by introducing the promotion of coordination across all levels of healthcare and different healthcare providers. This is possible through leadership enhancement, which will include both healthcare leaders and other leaders together with equipping healthcare workers with communication skills and team-building competencies. Leaders will collectively outsource sponsorships and funding to be used in the improvement of care for patients with chronic diseases (WHO, 2002:50) while healthcare workers will gain communication skills and team-building to enable them to perform their roles based on their level of training or expertise in the

management of chronic diseases. When looking at the first model for improving outcomes in chronic diseases and the CCM, the inclusion of leadership and training of healthcare workers on communication skills and team-building are absent. These deficiencies promote uncoordination within and across all levels of healthcare including different healthcare providers.

Another critical aspect of a healthcare organisation in the ICCC framework is health information where collection and utilisation of health information in planning and decision-making at all levels of healthcare are vital in the management of chronic diseases. Health information will provide decision-makers with information on epidemiology, treatment and healthcare outcomes (WHO, 2002:53), thus leading to informed decision-making. Lastly, the ICCC framework also has self-management and prevention through lifestyle modification activities within the healthcare organisation component. Self-management and prevention assist patients, as well as their families, to minimise or avoid complications, symptoms and disability due to chronic diseases (WHO, 2002:51) in addition to safeguarding against predisposing factors.

Based on the discussion above, the ICCC framework healthcare organisation element is more suitable in the management of chronic diseases as compared to the first model for improving outcomes in chronic diseases and the CCM. This is because it considers most factors that can influence the management of chronic diseases which include leadership, health information, training of healthcare workers, use of guidelines as well as lifestyle modification activities.

2.3.2.1.2 Self-management support

Self-management support is a common element in the first model for improving outcomes in chronic diseases (Wagner *et al.*, 1996:523), the CCM (Wagner *et al.*, 1999:57-59; Wagner *et al.*, 2001:69-70) and the expanded CCM (Barr *et al.*, 2003:77). In contrast, the ICCC framework has incorporated self-management support together with prevention in the healthcare organisation component at the meso-level (WHO, 2002:48-53). Self-management support involves both patient and family where they are provided with lifestyle modification skills to reduce complications and symptoms in patients with chronic diseases, and to prevent family members from developing chronic diseases (Glasgow *et al.*, 2001:589; Wagner *et al.*, 1996:523; WHO, 2002:51).

The ICCC framework, on the other hand, has noticed the importance of other partners such as the community partners (WHO, 2002:56). In this instance, the community partners can collaborate with healthcare teams by providing complementary healthcare services not provided in healthcare settings. The ICCC framework also has a micro-level consisting of a patient and family components and includes a partnership triad composed of patient and family, community

partners and the healthcare team (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:60; WHO, 2002:46). This is because these three parties are involved with chronic disease prevention, management and control in the patient's home, the community and the healthcare facilities. The ICCC framework emphasises that all members of the triad should be informed, motivated and prepared with skills necessary to prevent, manage and control chronic diseases (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:60; WHO, 2002:46). In contrast, self-management support only concentrates on instilling lifestyle modification activities in patients and families for personal health and wellness, as reflected in the first model for improving outcomes in chronic diseases (Wagner *et al.*, 1996:523), the CCM (Wagner *et al.*, 1999:57-59; Wagner *et al.*, 2001:69-70) and the expanded CCM (Barr *et al.*, 2003:77).

In conclusion, the ICCC framework complements the other models of chronic disease management. In addition to enhancing lifestyle modification skills and competencies, patients will know about chronic diseases, be motivated to adopt, implement and maintain health behaviours, and adhere to their chronic disease medications. The triad members in the micro-level will be equipped with information and skills related to the prevention, management and control of chronic diseases. This will enable patients and families to manage, prevent and control chronic diseases at home, and community partners to perform tasks that are traditionally assigned to qualified healthcare workers.

The following section will compare and contrast decision support, as stated in the different models of chronic disease management.

2.3.2.1.3 Decision support

Decision support, referred to an expert system in the first model for improving outcomes in chronic diseases (Wagner *et al.*, 1996:519), focuses on combining healthcare workers' education, utilisation of evidence-based guidelines and consultation with medical specialists into the daily practice of chronic disease management (Wagner *et al.*, 1996:526-527). This combination ensures the availability of healthcare workers with expertise in chronic disease management at the PHC level. The expanded CCM compliments the older models (i.e. the first model for improving outcomes in chronic diseases and the CCM) by introducing health promotion, where doctors can partner with health promotion professionals in the community to deliver community-based chronic disease management (New Brunswick, 2010:17).

In contrast, the ICCC framework does not have decision support as a stand-alone component. As an alternative, the ICCC framework incorporates activities such as healthcare workers' education or training, use of evidence-based guidelines, medical specialists' consultation and

health promotion at the meso-level (i.e. both the community and healthcare organisation components). Firstly, healthcare workers' education or training and the use of evidence-based guidelines are embedded in healthcare organisation under the element 'organise and equip healthcare teams' (WHO, 2002:51). Secondly, medical specialists' consultation is in the healthcare organisation component under the element 'promote continuity and coordination' (Epping-Jordan *et al.*, 2004:301). Lastly, health promotion is shown in the community component under the element 'raise awareness and reduce stigma' where the community is made aware of chronic diseases and their associated risks through education campaigns (WHO, 2002:55).

Decision support is mainly focused on the utilisation of a combination of strategies such as healthcare workers' training/education, evidence-based guidelines, consultation with medical specialists and health promotion. These strategies will assist with improving the quality of healthcare services provided to patients, their families and the community pertaining to chronic diseases. The delivery system design will be expanded on in the following section.

2.3.2.1.4 Delivery system design

The first model for improving outcomes in chronic diseases, the CCM, and the expanded CCM focus on establishing practice teams, allocation of roles for each team member, and managing patient contact through appointments and follow-up (Barr *et al.*, 2003:74; Epping-Jordan *et al.*, 2004:300; Wagner *et al.*, 1996:520; Wagner *et al.*, 1999:59). These models share the same ideology in delivery system design to ensure good chronic disease management. The CCM and the expanded CCM compliments the first model for improving outcomes in chronic disease by including task-shifting. In task-shifting, chronic disease care is delegated from doctors to nurses, health educators, and CHWs to perform some chronic disease-related clinical tasks (Wagner *et al.*, 1999:59; Wagner *et al.*, 2001:70).

The expanded CCM introduces population health promotion (Barr *et al.*, 2003:77-78; Epping-Jordan *et al.*, 2004:300; McCurdy *et al.*, 2008:14) in addition to practice teams, allocation of roles, managing patient contact, and task-shifting by adding re-orientation of healthcare services to delivery system design. Health promotion facilitates a connection between healthcare facilities and the community (WHO-Europe, 1986:3); thus, it improves both the first model for improving outcomes in chronic diseases and the CCM. The ICC framework incorporates practice team formation, role allocation of each team member, patient contact with the healthcare facility, task-shifting, and population health promotion at the meso-level (the healthcare organisation and the community). For instance, elements such as 'to promote continuity and coordination', and 'organise and equip healthcare teams' in the healthcare

organisation component focus on practice teams, their roles and patient contact (Epping-Jordan *et al.*, 2004:301; WHO, 2002:50-51). An element, 'mobilise and coordinate resources' in the community component concentrates on health promotion, prevention activities, and task-shifting (WHO, 2002:56).

In summary, the ICCC framework improves other chronic disease models as it emphasises the provision of healthcare services as well as complementary healthcare services to patients, including the community. This will enable the productive conduction of activities related to chronic disease management such as health promotion, prevention activities, training of CHWs, and supply of necessary equipment to healthcare facilities (WHO, 2002:56), together with traditional healthcare services provided to patients at healthcare facilities.

2.3.2.1.5 Information systems

Information systems in the first model for improving outcomes in chronic diseases and the CCM entail the development of information systems in healthcare facilities that include information about individual patients and the patient population to improve chronic disease care (Wagner *et al.*, 1996:527; Wagner *et al.*, 2001:70). In the expanded CCM, the information system includes community data beyond the healthcare system (Barr *et al.*, 2003:78) which was lacking in the first model for improving outcomes in chronic diseases and the CCM. It incorporates information on population health promotion thus broadening users to include not only the healthcare organisation but also the community programmes and the municipalities (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14). The information system in the expanded CCM improves information systems in the first model for improving outcomes in chronic diseases and the CCM by providing information on population health promotion in addition to demographics and population health.

The information system in the ICCC framework is at the meso-level (the healthcare organisation). Information on epidemiology, treatment, and healthcare outcomes is provided by the information system (WHO, 2002:53). This information is essential in developing countries as it will assist with decision-making and programme planning when dealing with matters related to chronic diseases such as the procurement of medicines. The ICCC framework information system strengthens other chronic disease model information systems by providing information on epidemiology and treatment of chronic diseases in addition to demographics, population health, and population health promotion.

In conclusion, the information generated by information systems in all above mentioned chronic disease models can be used in planning and decision-making at all levels of healthcare. The following section will concentrate on the component known as the community.

2.3.2.1.6 The community

The first model for improving outcomes in chronic diseases does not take into consideration the role played by the community in chronic disease management. It only focuses on patients with chronic diseases and healthcare teams providing healthcare services to these patients. The CCM improves this model by introducing community resources and policies components. This component focuses on developing partnerships with community organisations and on meeting patients' needs in the community (Barr *et al.*, 2003:74). Community organisations provide supportive or educational services that are unavailable in the health system (Wagner *et al.*, 1999:59). Thus, creating partnerships between the health system and community organisations improves the prevention, management and control of chronic diseases.

Although the CCM caters to the role of the community in the management of chronic diseases, this component lacks certain aspects related to the community. These aspects include the existence of supportive environments within the community, implementation of government policies and strengthening community actions in managing chronic diseases. The expanded CCM improves the CCM by including the aforementioned aspects within its community component. The development and implementation of government policy and legislation in light of population health promotion which lacked in the CCM are emphasised by the 'build healthy public policy' element in the expanded CCM (Barr *et al.*, 2003:78; New Brunswick, 2010:18). The 'creation of supportive environments' element in the expanded CCM introduces the generation of safe and satisfying living and working environments within the community which can also affect the management of chronic diseases (Barr *et al.*, 2003:78; McCurdy *et al.*, 2008:14; WHO-Europe, 1986:2). The 'strengthen community action' element of the expanded CCM compliments the CCM community component by including population health promotion which works through community action (Barr *et al.*, 2003:79; New Brunswick, 2010:19; WHO-Europe, 1986:3). Due to the importance and inclusion of the said aspects in the expanded CCM, communities and community groups have to be empowered and mobilised to advocate for healthy environments in chronic disease prevention, management, and control.

The ICCC framework expands the expanded CCM by including issues such as raising awareness and stigma reduction, leadership and support, resource coordination and mobilisation, and harmonising provision of healthcare services within its community component. Raising awareness and reducing stigma is vital as patients with chronic diseases, together with

their families, can be stigmatised by the community they live within. The community has to be made aware of chronic diseases and their associated risks with the assistance of leaders of local and international organisations, NGOs, and support and women's groups (WHO, 2002:55) to reduce stigma. This could improve the management of chronic diseases as patients with chronic diseases spend most of their time within the community.

The ICCC framework brings in the aspect of community leaders and other stakeholders such as community development boards. These leaders and other stakeholders were not taken into consideration by the CCM or the expanded CCM. The involvement of community leaders and other stakeholders in the prevention and management of chronic diseases prompts for the provision of information about chronic diseases to these leaders to improve care for patients with chronic diseases. Equipping these leaders and stakeholders with information about chronic diseases will enable them to align their policies and practices with the prevention and management of chronic diseases (WHO, 2002:55) as they would be well informed of strategies to be used in combatting the increasing burden of chronic diseases.

The 'mobilisation and coordination of resource' element in the management of chronic diseases in the community is absent in both the CCM and the expanded CCM. Funds and resources used for chronic disease management activities such as health promotion, prevention activities, CHWs' training, and necessary equipment supply to healthcare facilities should be planned and harmonised within both the community and the healthcare facilities (WHO, 2002:56). This will help eradicate duplication of healthcare services in healthcare facilities and the community, which leads to wastage of resources. Thus, chronic disease management activities and healthcare services provided by both the community and healthcare facilities should be complementary.

The last component to be critically analysed is the positive policy environment.

2.3.2.1.7 Positive policy environment

The positive policy environment is a broad element in the macro-level of the ICCC framework. The CCM and the expanded CCM also have a limited scope of policy within the community component. For instance, the 'build healthy public policy' in the expanded CCM is about the development and implementation of government policy and legislation in the management of chronic diseases (Barr *et al.*, 2003:78; New Brunswick, 2010:18). The ICCC framework improves the CCM and expanded CCM policy by introducing policy activities such as legislation, leadership, policy integration, financing, human resources allocation and development, and partnerships between all stakeholders (Epping-Jordan *et al.*, 2004:301; Nuño *et al.*, 2012:59).

Firstly, the leadership component takes note of the importance of including political leaders in chronic disease management. Political leaders can create a conducive policy environment that caters to the prevention, management, and control of chronic diseases in patients, their families and communities, as well as healthcare organisations (WHO, 2002:58). Political leaders can advocate for the establishment of policies specific to the management of different chronic diseases leading to the containment of the increasing burden of chronic diseases (WHO, 2002:55). This is because political leaders can be influenced by decision-makers such as ministries of health who are in turn influenced by policymakers, healthcare leaders and workers, community, patients, and families to improve the prevention and management of chronic diseases (Epping-Jordan *et al.*, 2004:301; WHO, 2002:58).

Health policies should take into consideration inter-sectoral partnerships with other governmental sectors, the private health sector, and community groups and organisations (Epping-Jordan *et al.*, 2004:302, WHO, 2002:62). These partnerships are important because patients with chronic diseases are mostly found within a community. The community groups and NGOs found within communities where patients live are in a better position to provide information concerning the prevention and management of chronic diseases at the community level. Due to these reasons, the 'strengthening of partnerships between stakeholders' component is noteworthy. For instance, governmental sectors such as agriculture, labour and education can influence the prevention and management of chronic diseases (Epping-Jordan *et al.*, 2004:302; WHO, 2002:62). In contrast, the CCM and the expanded CCM limit development of partnerships to include only partnerships between community organisations and healthcare organisations (Barr *et al.*, 2003:74-79; New Brunswick, 2010:19; WHO-Europe, 1986:3).

Secondly, policy integration in the ICCC framework focuses on integrating policies across different disease categories such as HIV, diabetes and other chronic diseases, and across different levels of healthcare (Epping-Jordan *et al.*, 2004:302; WHO, 2002:59). The integration of policies lacks in both the CCM and the expanded CCM. Integration of policies will assist with curbing financial resources wastage caused by redundancies and fragmentation in managing chronic diseases. The ICCC framework also takes into consideration supportive legislative frameworks that can control predisposing factors and promote the prevention of chronic diseases (WHO, 2002:62). Legislation in the ICCC framework incorporates the protection of the rights of patients with chronic diseases (Epping-Jordan *et al.*, 2004:302; WHO, 2002:62). This legislation states that every patient has a right to accessible, affordable and good quality healthcare services. The ICCC framework includes supportive legislative frameworks such as laws that restrict tobacco and alcohol sales to youth that can be used to control predisposing factors to chronic disease and to prevent chronic diseases (Epping-Jordan *et al.*, 2004:302;

WHO, 2002:62). The expanded CCM advocates for the development and implementation of government policy and legislation at a limited scope. Therefore, supportive environments with conducive conditions that enable optimum levels of health will be formed at the social and community levels.

Thirdly, the promotion of consistent financing is also vital when dealing with a positive policy environment. Policies for chronic disease management, therefore, need permanent financing to be implemented at different levels of healthcare (Epping-Jordan *et al.*, 2004:302; WHO, 2002:60). This will ensure consistent availability of healthcare services as money allocated for offering healthcare services specific to chronic disease management will continually be injected into healthcare facilities.

Lastly, human resources are essential in chronic disease management. The ICCC framework focuses on the development and allocation of human resources in different healthcare settings. Healthcare workers' education has been touched on in the decision support component of the CCM and the expanded CCM (Barr *et al.*, 2003:74; New Brunswick, 2010:17). The ICCC framework improves healthcare workers' education by including updating of medical and nursing schools' curricula, and provision of in-service or continuing training for healthcare workers to improve chronic disease management (Epping-Jordan *et al.*, 2004:302; WHO, 2002:60).

In light of the health system having a good compatible chronic disease management model incorporated in it, there is a need to learn about these models and how they have been implemented in both developing and developed countries. Therefore, the next section focuses on NCDs' management structures in developed and developing countries.

2.4 Non-communicable disease management structures in the health system of developing and developed countries

This section provides information on the literature review for the following specific objective: to describe NCD management structures in the health system of developing and developed countries.

2.4.1 Non-communicable disease management models in developed countries

Countries that will be focused on in this section include the United States of America (USA), United Kingdom (UK), European countries, Australia, and Canada, respectively. These countries were selected because they are burdened with an increasing prevalence of NCDs.

Also, these countries show a close to an ideal situation in the development and implementation of the different NCD management models in the health systems.

2.4.1.1 The United States of America

The USA uses the CCM to manage NCDs (Goodwin, 2006:17), where care is based mainly at the PHC level as the first point of entry into healthcare services. Piatt *et al.* (2006:815) studied the use of the CCM in Pennsylvania, revealing that implementation of the CCM improved clinical, behavioural, psychological/psychosocial, and diabetic knowledge outcomes in patients with diabetes. In Geisinger, patients with type 2 diabetes enrolled in the CCM-based models of care received patient-centred, high quality and collaborative care as compared to patients, not in the CCM-based models of care (Stock *et al.*, 2014:1544-1545). This study proves that the implementation of the CCM regardless of differences in the healthcare system results in the provision of quality healthcare services to patients with NCDs.

Non-communicable disease-specific policies are necessary for the management of different NCDs as they guide different levels of healthcare on how to prevent, control and manage NCDs. The USA Department of Health uses the CCM in policies such as the National Service Frameworks (NSFs) for coronary heart disease (CHD) and diabetes, which provides guidelines for the management of CHD and diabetes (Goodwin, 2006:17-18).

The CCM highlights the importance of forming links between community resources and healthcare services, and the establishment of self-management support (Glasgow *et al.*, 2001:589-590). Community resources, such as community programmes relevant to NCDs, can improve health system performance. In the USA, doctors can refer patients with NCDs to community programmes such as the Chronic Disease Self-management Programme and the National Diabetes Programme (Bauer *et al.*, 2014:50). These programmes assist healthcare facilities by delivering community customised lifestyle interventions and knowledge and skills necessary to effectively manage NCDs in patients (Bauer *et al.*, 2014:50). Self-management and community partnerships with healthcare service providers allow patients to become actively involved in their care which results in the prevention of disease progression and complications, and improvement of quality of life.

2.4.1.2 The United Kingdom

The UK has implemented a variety of models for managing NCDs. These include the CCM (Ham, 2009:191) and the National Health Service (NHS) and Social Care model (United Kingdom. Department of Health, 2005:8). Additionally, the development of policies related to NCD management guide different levels of healthcare on how to prevent, diagnose and treat

NCDs. The UK has a comprehensive policy on the management of chronic diseases known as the English national service frameworks (NSFs) (McKee & Nolte, 2004:339). The English NSFs provide national guidelines on healthcare service delivery that should be made available for chronic disease in healthcare settings (McKee & Nolte, 2004:339).

The NHS and Social Care model strengthens the CCM because it aims to improve the health and quality of life of people with NCDs by personalised, on-going support in NHS and social care systems (United Kingdom. Department of Health, 2005:8). This model focuses on the identification of people with NCDs, expert patients programme and community matrons, and the formation of working relationships among healthcare workers, patients with NCDs and their families (Nolte *et al.*, 2008:32). Identification of people with NCDs entails developing strategies that will help identify every person with NCDs so that they can be incorporated into healthcare services based on their needs. Moreover, expert patient programmes will assist with the expansion of self-management education while community matrons, referred to as specialist nurses or nurse-led care, will conduct case management of patients with complicated NCDs.

The NHS also recognised the importance of community-based care where care shifts from the provision of healthcare services in healthcare facilities towards community-based services. This is because patients with NCDs spend most of their lives within their communities. As a result, health and social care services provided in community settings will be integrated and built around individual patients and not service providers ((United Kingdom. Department of Health, 2006:17). These health and social care services include social care, primary care, and community services.

2.4.1.3 European countries

European countries are committed to providing universal and equitable healthcare for people with chronic diseases (European Commission, 2017:22; European Parliament, 1998:9; Nolte *et al.*, 2014:24). In trying to combat the burden of chronic diseases, European countries have several different care models for populations with distinct conditions such as type 2 diabetes, asthma/chronic obstructive pulmonary disease (COPD), cardiovascular disease, cancer and mental health (Nolte *et al.*, 2014:30). Different health finance systems are in place to achieve universal and equitable healthcare services which include the use of tax-funded systems, statutory health insurance and private insurance systems (Nolte *et al.*, 2014:24). Fragmentation of care in chronic disease management at different levels of the health system is a concern. European countries developed regulatory and policy frameworks aiming at promoting approaches that integrate care and improve coordination between different levels of care (Nolte *et al.*, 2014:25). For instance, Austria has a financial pool at the federal state level regulated by

the Federal Hospital Act to promote coordination of and corporation between ambulatory and hospital care (Bachner *et al.*, 2018:51-53). The Health Care Reform Act of Germany has provisions that develop integrated care structures thus linking the ambulatory care and hospital sectors (Busse & Blümel, 2014:78-79; Busse & Riesberg, 2004:198-203).

2.4.1.4 Australia

In Australia, the Australian National Chronic Disease Strategy was developed as a result of the increasing burden of chronic disease (Dennis *et al.*, 2008:S53). This strategy encompasses principles on organisation and deliverance of care to patients with chronic diseases through the provision of evidence-based care, coordinating care in all healthcare settings, and self-management (Dennis *et al.*, 2008:S53). The health system of Australia is composed of the primary healthcare system and the Medicare universal insurance coverage scheme (Browning & Thomas, 2015:1).

In addition to universal insurance, policy and legislation are essential in the management and prevention of chronic diseases. Policies serve as guiding tools on how services related to chronic diseases should be delivered at all levels of healthcare. The National Strategic Framework for Chronic Conditions is a policy aimed to enable the successful prevention and management of chronic conditions for all Australians (Australian Health Ministers' Advisory Council, 2017:14). The strategic framework is composed of eight guiding principles which should be evident in the planning, design and implementation of policies, strategies, actions and services for prevention and management of chronic conditions (Australian Health Ministers' Advisory Council, 2017:14). The eight guiding principles include equity, collaboration and partnerships, access, evidence-based, person-centred approaches, sustainability, accountability and transparency, and shared responsibilities.

Control, prevention and management of chronic diseases have also been carried out through health promotion and prevention activities. Programmes such as Health-way in Western Australia and Obesity Prevention and Lifestyle in South Australia are used in health promotion and prevention of chronic diseases (Browning & Thomas, 2015:1).

2.4.1.5 Canada

In Canada, there is a serious challenge of the personal and economic burden of chronic diseases. Health system redesign is emphasised by public policy concerning chronic diseases (Martin, 2007:2086). The redesign should introduce a sequence of different health system models to improve population-based prevention and chronic disease management (Wagner,

1998:2; Wolbeck *et al.*, 2006:1). Family medicine is the primary provider of chronic care in Canada. Thus, it is pushed to address these challenges. Most provinces in Canada have adopted and adapted the CCM (Martin, 2007:2087) and family medicine is to be integrated into the CCM to address chronic diseases. Family medicine addresses chronic diseases with longitudinal care that is patient-centred, relationship-based, integrated, and community-oriented (Martin, 2007:2087). Thus, the Canadian health system is composed of primary healthcare which is aligned with both the CCM and family medicine (Martin, 2007:2087).

The Government of British Columbia, one of the provinces in Canada, has implemented a chronic disease management programme using the expanded CCM which incorporates health promotion and chronic disease prevention (Nolte *et al.*, 2008:164). This programme uses chronic disease registries to publish data on prevalence, incidence, patient survival and cost (Nolte *et al.*, 2008:164). This information assists in making informed decisions at all levels of healthcare based on reliable, useful quality data. A website is also used to provide patients and healthcare professionals with information and tools used in chronic disease management (Nolte *et al.*, 2008:164).

Most provinces in Canada have policies that include aspects of chronic disease self-management (Liddy & Mill, 2014:56). Self-management uses strategies that allow patients and their families to prevent, manage and control their chronic diseases effectively, thus, improving outcomes. Other policies include the Integrated Pan-Canadian Healthy Living Strategy, Canadian Diabetes Strategy, Federal Tobacco Control Strategy, and the Office of Nutrition Policy and Promotion (Nolte *et al.*, 2008:162-163). These policies and initiatives target both healthy lifestyle promotion and prevention of chronic disease.

2.4.2 Non-communicable disease management models in developing countries

Weak health systems in developing countries are hindrances to strengthening interventions to achieve internationally agreed goals such as the Millennium Development Goals (MDGs) (WHO, 2007a:1). The increasing burden of chronic diseases can be curtailed with known and affordable strategies such as medicine, information and prevention interventions. However, due to failing health systems in developing countries, these technologies are available in insufficient quantity.

2.4.2.1 Sub-Saharan Africa countries

The increase in chronic diseases in sub-Saharan Africa creates a long-term demand on the healthcare systems due to continuing management for chronic diseases. Health systems should

strategise for the increasing burden and complex care of chronic diseases. Health systems are inclined towards the management of acute diseases, thus presenting a challenge because chronic conditions include both acute and chronic care. Chronic conditions create severe economic and social consequences in all regions and threaten healthcare resources in every country (Adeyi *et al.*, 2007:17). Thus if the chronic conditions are not effectively managed, they will become the most expensive problem faced by health systems (Bischoff *et al.*, 2009:2260). For instance, Abegunde *et al.* (2007:1929) demonstrate that the poorest people have the highest risk of developing a chronic condition, and they are the least able to cope with a chronic condition. This is because they lack resources to prevent chronic diseases as well as finances to treat and keep chronic diseases under control once they have acquired them.

The sub-Saharan countries that will be focused on in the following sections include South Africa, Ghana, Cameroon and Lesotho. These countries were selected because of similarities in their health systems, and an increasing prevalence of NCDs.

2.4.2.1.1 South Africa

An Integrated Chronic Disease Management (ICDM) model was developed, by Mahomed and Asmall (2015:3) to address an increasing burden of chronic diseases in South Africa. According to Mahomed and Asmall (2015:11), the ICDM model was developed based on the CCM (Wagner *et al.*, 1999:57-59) and the WHO ICC framework (WHO, 2002:41). This model was implemented at the PHC level.

The components of the ICDM model include human resources, health information, pharmaceutical supply and management, equipment, and mobile technology (Mahomed & Asmall, 2015:9; Mahomed *et al.*, 2016:2). Figure 2.6 shows the interconnected components of the ICDM model. Additionally, the ICDM model has four inter-related phases which are facility reorganisation, clinical management support, assisted self-management, and health promotion and population screening (Republic of South Africa Department of Health, 2011:11-12). These inter-related phases are dependent on strong stewardship and ownership at the levels of the health system (Republic of South Africa, Department of Health, 2011:11-12).

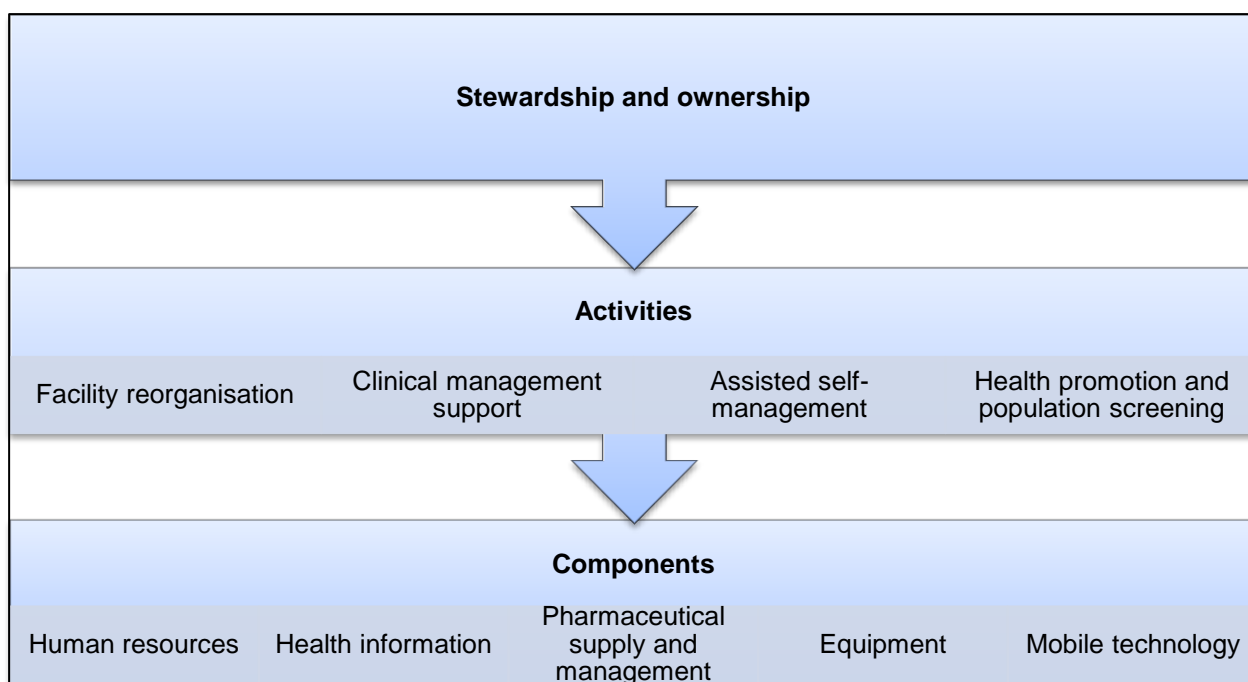


Figure 2-6: Components of the integrated chronic disease management model

In implementing the ICDM model, service delivery has to be improved by strengthening the health system. Health system strengthening would be achieved through the use of technical intervention and strengthening of external support systems and structures to improve the quality of care for patients with chronic diseases (Republic of South Africa Department of Health, 2011:129). The health system components to be strengthened include human resources, health information, medicine supply and management, equipment supply and mobile technology (Republic of South Africa Department of Health, 2011:129).

Firstly, human resources should be strengthened to have skilled healthcare professionals in the management of patients with chronic diseases (Republic of South Africa Department of Health, 2011:130). This could be achieved by training, task sharing and shifting, and supervising and monitoring healthcare workers at healthcare facilities. For instance, Maimela *et al.* (2015:9) reveal that healthcare workers in rural South Africa lacked knowledge and were poorly trained in chronic disease management. There was also a shortage of medication for chronic diseases, lack of supervision by the district and provincial health managers, and lack of CHWs in the management of chronic diseases in healthcare facilities in rural South Africa (Maimela *et al.*, 2015:9). These led to an interruption in medication usage and limited self-management and prevention of NCDs by both patients and their caretakers due to lack of education on NCDs through health promotion activities provided by healthcare workers and CHWs.

Secondly, the ICDM model had implemented a data collection tool that facilitates the collection of outcome data that will be used to observe chronic disease management programme performance (Republic of South Africa, Department of Health, 2011:135). Programme performance monitoring will enable the healthcare organisation to assess improvement in the quality of care for patients with chronic diseases. Health information is collected from facilities through the DHIS (Republic of South Africa, Department of Health, 2011:135). Also, mobile technology through the use of mobile phones and other wireless technology at the healthcare facility and community level in the chronic healthcare programme will assist with data collection. This technology, as stated by the Republic of South Africa, Department of Health (2011:148) will help with the availability of a continuous patient record while also providing instant patient information at the healthcare facility level. Healthcare workers and patients could use mobile technology as reminders for clinical visits, for consultations, and as reminders for patients to take their medicines. At the community level, it will allow for health promotion messages to be broadcasted to patients and their families.

Thirdly, the uninterrupted supply of NCD medicines is paramount in controlling chronic diseases. An effective medicine management system is essential in all healthcare levels; without medication, patients' outcome is affected, patients' confidence in the health sector is lost, and healthcare workers become demotivated (Republic of South Africa, Department of Health, 2011:142). Central chronic medicines dispensing and distribution (CCMDD) programme was implemented to improve medicines accessibility to patients with NCDs requiring chronic therapy in the public healthcare system in South Africa (Magadzire *et al.*, 2015:8; Meyer *et al.*, 2017:7). In the CCMDD, stable patients with NCDs are identified, registered and their prescriptions served. The prescriptions are then distributed to different service points within reach of these patients ready for pick-up by patients during scheduled dates. The CCMDD programme thus helps improve medicine accessibility and use, which will result in better patient adherence to medicines.

Lastly, for healthcare workers to determine control of NCDs in patients on or not on medication, medical devices are crucial. The availability of appropriate medical devices to be used in screening, diagnosis and control of chronic disease is important. As stated by the Republic of South Africa Department of Health (2011:147), the availability of medical devices is vital for the optimum management of chronic diseases and prevention of disease, disability and death. Medical devices such as blood pressure machines, glucometers, weighing balance and other equipment help monitor patients' responses to their pharmacological and non-pharmacological treatments. This equipment will provide information to both healthcare providers and patients about the health status of the patient, thus improving chronic care.

2.4.2.1.2 Ghana

There are three systems in play in the management of chronic diseases in Ghana. These systems are the biomedical, ethnomedical, and faith-healing systems (Aikins *et al.*, 2010:5). The systems have strengths and weaknesses in managing chronic diseases that stem from the technical or practical knowledge of chronic diseases, technological expertise, accessibility, and ethics (Aikins *et al.*, 2010:5). Atobrah (2012:51) highlights that young Ghanaian adults diagnosed with a particular chronic disease by biomedical practitioners seek confirmatory diagnosis from spiritual sources. They go there to try and find out if the disease was due to human causation and to search for a cure (Atobrah, 2012:51). Kratzer (2012:41) also showed that poor infrastructure, inadequate training of healthcare workers on chronic disease and financial burden are challenges experienced in chronic disease management in Ghana.

Ghana has policies and chronic disease programmes in place as efforts in combating the burden of chronic diseases. Ghana has a national policy for the prevention and control of chronic NCDs (Republic of Ghana, 2012:2). This NCD policy contributes to reducing NCD-related morbidity and mortality through health promotion, provision of human resources and an enabling environment, strengthening of health systems, and partnerships and empowerment (Republic of Ghana, 2012:9). The Non-Communicable Diseases Control and Prevention (NCDPC) Programme was established in 1992 by the Ghana MOH at that time (Aikins *et al.*, 2010:6; Bosu, 2012:70). The NCDPC programme focuses on chronic diseases with shared risk factors such as cardiovascular diseases, diabetes, cancers and chronic respiratory diseases (Aikins *et al.*, 2010:6; Bosu, 2012:70). There is a National Health Insurance Scheme (NHIS) that was implemented in 2006 by the MOH (Aikins *et al.*, 2010:7). The insurance scheme includes medicines for hypertension, diabetes and cancer (Aikins *et al.*, 2010:7). The MOH also established the Regenerative Health and Nutrition Programme (RHNP) in 2006 which focuses on behavioural change communication, creating enabling environments, capacity building and training, and partnerships and networking (Bosu, 2012:71; Republic of Ghana, 2012:2).

2.4.2.1.3 Cameroon

Cameroon has two systems for managing chronic diseases which are the biomedical or the traditional medicine systems (Aikins *et al.*, 2010:9). Awah (2014:5) illustrates that aetiologies of diabetes emerging from patients, and the community include "natural" diabetes, "ancestral" diabetes and "man-made" diabetes. "Natural" diabetes is lifestyle-induced; "ancestral" diabetes is caused by ancestors, and "man-made" diabetes is due to witchcraft (Awah, 2014:5). Awah *et al.* (2008:5) also depicted that there are biomedical therapy and traditional medicine which are both valued by patients when treating diabetes. An informal referral system where patients are

directed to traditional healers from health facilities and vice versa (Mbeh *et al.*, 2010:24) exists, which forms part of the traditional medicine system. Due to this informal referral system, traditional healers were trained on diabetes prevention and management (Mbeh *et al.*, 2010:24) which assisted them to refer patients for blood glucose testing at biomedical health facilities (Echouffo-Tcheugui & Kengne, 2011:6). Policy structure on chronic disease management is limited, but there are operational policies or strategies for reducing physical inactivity and/or promote physical activity, reducing the burden of tobacco use, and reducing unhealthy diet and/or promote healthy diets (WHO, 2014e:1).

2.4.2.1.4 Lesotho

The health system of Lesotho is divided into three levels which are the national, district and PHC levels. The CCM is used in the management of chronic diseases and is composed of human resources, medication and medical supplies, health information and research, health financing, health infrastructure and equipment. The health system of Lesotho will be discussed in detail in Chapter three.

Pharmacists are health professionals extremely involved in the management and prevention of chronic diseases. This has expanded the role of pharmacists in NCD management, prevention and control, which will be addressed in detail in the following section.

2.5 Expanding roles of pharmacists in the management of non-communicable diseases

This section focuses on the following specific objective: to investigate the expanding role of pharmacists in the management of NCDs. Chronic diseases can be prevented or controlled through health promotion which results in the reduction of risk factors such as sedentary lifestyle, poor nutrition, tobacco use and excessive alcohol consumption (Barrett *et al.*, 2016:137-138). Dietz *et al.* (2016:1) state that in the USA broader preventive measures focusing on the social and environmental determinants of chronic diseases (such as smoking, obesity, physical inactivity and poor nutrition) are necessary. In Saguenay, Quebec, Canada, a study conducted by Fortin *et al.* (2019:6) on chronic disease prevention and management services in primary care reveals an increased awareness and knowledge, improved self-management, adoption of healthy behaviours, increased fruit and vegetable consumption and physical activity among patients as well as improve quality of life.

The management of NCDs includes detection, screening and treatment of NCDs and these can be provided at the PHC level to strengthen early detection and timely treatment (WHO, 2020b:1). Effective management of chronic diseases needs good communication and teamwork among pharmacists, other healthcare workers, patients and the community (Rosen *et al.*,

2018:438-440; Systems for Improved Access to Pharmaceuticals and Services (SIPAS), (SIPAS, 2014:10; WHO, 2018c:8). Thus, the health sector should recognise that pharmacists play an essential role as part of the healthcare team because they are readily accessible healthcare professionals in a community (SIPAS, 2014:10; WHO, 2018c:8).

Pharmacists are critical in the course of chronic disease management as long-term use of medicines is necessary. The functions of pharmacists in NCD management include pharmacy-based screening and monitoring of NCDs, counselling on healthy lifestyle, self-management and prevention, patients and caregivers support in understanding management of NCDs and use of monitoring devices, dispensing of medicines, and therapy and disease management (FIP, 2019:6-7; Steep & Ramaswamy, 2019:2-3; WHO, 2011d:318-323). For instance, pharmacists in Nepal can screen and monitor NCDs, dispense medicines, provide lifestyle counselling, public health and health promotion activities and medication therapy management in the prevention and management of NCDs (Khanal *et al.*, 2016:657-658). Pharmacists in Zimbabwe carry out activities such as supply chain management, health information provision, therapy monitoring, healthy lifestyle promotion, and chronic disease screening and monitoring (Mdege *et al.*, 2016:879-881). In Sudan, community pharmacists provide services such as tobacco cessation, contraception, diet and lifestyle counselling, and obesity and weight reduction advice (Mohamed *et al.*, 2013:393).

Subsequent sections will discuss the role of the pharmacist at the national, district and PHC levels.

2.5.1 Role of the pharmacist at the national level

The national level is responsible for making policies, legislation and guidelines to be used in the management of chronic diseases. These tools will guide how to prevent, manage and control chronic diseases at different levels of healthcare. Thus, pharmacists are involved in the development and implementation of policies, legislation and guidelines related to chronic disease management. The WHO (1994:5-6) states that pharmacists hold essential government posts involving quality control of drugs, legislation concerned with pharmacy, formulating and advising on drug policy, and assuring the operation of national essential drug programmes.

At the national level, pharmacists are involved in the drug supply chain where they work in collaboration with the central medical store to ensure that medicines used to manage chronic diseases are readily available in healthcare facilities and at affordable prices (WHO, 1994:5-6). The National Pharmaceutical Company of Zimbabwe in Zimbabwe is the national drug supplier working together with the Ministry of Health and Child Welfare and supplies pharmaceutical

products to government health facilities (Mdege *et al.*, 2016:879). In Lesotho, the National Drug Service Organisation (NDSO) is the central medical store working with the pharmaceutical directorate and is responsible for procurement, storage and distribution of medicines and medical consumables for public health facilities in the country (Government of Lesotho (GOL), 2016:29; Wade, 2015:7).

Pharmacists are also responsible for forecasting and budgeting for drugs to be consumed during every financial year (ASHP, 2008:527; Bernard *et al.*, 2010:330; OECD, 2019:10-15). They monitor the movement and availability of medicines through health information systems (ASHP, 2008:536-537; Bigdeli *et al.*, 2014:97-98). In this case, all healthcare levels use data collection tools, either electronic or paper-based, to provide information about drug consumption to the national level (Bhawalkar & Taddese, 2014:11-15).

The role of a pharmacist at the district level will be discussed in subsequent paragraphs.

2.5.2 Role of the pharmacist at the district level

The South African Pharmacy Council (SAPC) states that a district pharmacist is responsible for supervising and monitoring healthcare workers on drug-related matters in healthcare facilities (SAPC, 2004:29). District pharmacists are not expected to work at health facilities but to contribute to the district management team (DMT) through planning, coordination and monitoring of pharmaceuticals (Bradley *et al.* 2015:4-5). Task-shifting in healthcare centres resulted in the allocation of non-pharmaceutical staff certain functions such as dispensing and inventory control. In Tanzania, healthcare centres and dispensaries employed nurses, medical attendants, or clinical officers to manage medicines (Wiedenmayer *et al.*, 2015:3-4). The non-pharmaceutical staff has to be supervised, supported and monitored by a district pharmacist to achieve effective essential pharmaceutical services (SAPC, 2004:29). This is evidenced by WHO (1994:5) which states that pharmacists at the district level have administrative and educational roles. They are also involved with providing supervision, support and training to both pharmacists and non-pharmaceutical staff delivering pharmaceutical services to the public (WHO, 1994:5). As a result, pharmacists provide training to both pharmaceutical and non-pharmaceutical staff working in pharmacies in healthcare facilities on drug supply management and management of chronic diseases. Bheekie and Bradley (2016:245) indicate that a pharmacist at the district level would be responsible for training clinical staff and adherence counsellors on chronic medication therapy management for NCDs.

In summary, district pharmacists support and supervise the PHC level regarding the management of pharmaceuticals. The next section addresses the role of a pharmacist in PHC.

2.5.3 Role of a pharmacist at the primary healthcare level

In light of the increasing burden of NCDs, pharmaceutical services need to better support primary prevention and NCD management by providing affordable, good quality medicines to treat and control NCDs (SIAPS, 2014:2). Pharmacists are part of healthcare teams involved in the prevention, management, and control of NCDs in primary care (FIP, 2019:6; Morrison *et al.*, 2012:2). In the USA, the National Center for Disease Prevention and Health Promotion (CDC) developed guidelines for partnering with a pharmacist in the prevention and control of chronic diseases (Morrison *et al.*, 2012:8-12). As part of healthcare teams, pharmacists provide pharmaceutical care to patients with NCDs. Pharmacists deliver patient-centred services which include pharmaceutical care activities such as the provision of medication-related care to patients and health promotion and lifestyle modification activities (SIAPS, 2014:5-8). In Western Nepal, community pharmacy-based intervention improved patients with hypertension's knowledge and lifestyle practices and there was a reduction in patients' blood pressure (Sharma *et al.*, 2014:307).

Community pharmacists also play an essential role in population-based screening programmes or those targeting populations with risk behaviours and/or profiles (George & Zairina, 2016:3). Pharmacists in Nepal screen and monitor NCDs, provide lifestyle counselling, offer medication therapy management, and are involved with public health and health promotion in addition to traditional dispensing services (Khanal *et al.*, 2016:657-658). In Iran, a community pharmacy-based cardiovascular risk screening service has the potential to identify patients with high cardiovascular risk factors (Jahangard-Rafsanjani *et al.*, 2017:4-5). Pharmacists involved in screening and monitoring of NCDs are in a better position to detect NCDs at an early stage, refer patients to physicians, and assess if NCDs are well controlled by medication and lifestyle modification.

The educational role of pharmacists in NCD management is also vital as it leads to patients who are well informed about their NCDs in terms of the disease itself, medication and lifestyle practices. Community pharmacists in Nepal provided education on hypertension and lifestyle modification practice to patients with hypertension which resulted in improved patients' knowledge-practice scores ($p < 0.01$) (Sharma *et al.*, 2014:307). There was a significant reduction in mean systolic/diastolic blood pressure from 150.1 (7.8)/104 (9.5) mmHg to 137.7 (9.9)/94.5 (7.8) mmHg after the intervention ($p < 0.01$) (Sharma *et al.*, 2014:307). In India, non-adherence to medication due to COPD patients' carelessness during medication consumption was reduced by pharmacists' educational intervention about medication adherence (Abdulsalim *et al.*, 2018:913). There was an increase in medication adherence after pharmacist intervention

in the intervention group from 49% at baseline to 80% after 24 months ($p < 0.001$) (Abdulsalim *et al.*, 2018:913).

Pharmacists educate patients with chronic diseases about self-management. They provide patients with information on lifestyle modifications to implement in their lives depending on the type of chronic disease the patient has. Wong *et al.* (2011:5) show that in Hong Kong, pharmacists believed they were capable of providing self-management skills to patients with chronic diseases as well as health education, lifestyle modifications, monitor disease conditions, and manage drug issues. In stroke prevention clinics in Edmonton, Alberta, pharmacist-led case management improved blood pressure and lipid level control at six months among patients who had experienced a stroke (McAlister *et al.*, 2014:580-582). In Penang, Malaysia, there was limited public knowledge and awareness of cardiovascular diseases and its risk factors and the public had trust in the role of pharmacists in disease prevention and management (Sarriff *et al.*, 2014:361-363).

Health promotion is another role of pharmacists at PHC level where they provide information on the prevention and management of chronic diseases, the storage of medicines, information about side effects, and the importance of adherence to medicines used in the management of chronic diseases. The WHO (1998b:7) states that pharmacists are involved in health promotion where they screen patients, increase awareness and discuss healthy lifestyle choices for preventing diseases. They also screen the community to help identify people with chronic diseases within the community and refer them to healthcare facilities (WHO, 1998b:7). Khanal *et al.* (2016:657-658) state that pharmacists in Nepal provide lifestyle counselling, medication therapy management, and are involved with public health and health promotion. In Zimbabwe, public health-oriented services conducted by pharmacists include pharmaceutical products supply chain management, provision of medicines and other pharmaceutical products to patients, therapy monitoring, identification and monitoring of chronic diseases, provision of information and training of pharmacists (Mdege *et al.*, 2016:879).

In summary, pharmacists have roles to perform at different levels of the health system. Chapter three will entail a detailed description of the health system of Lesotho.

2.6 Chapter summary

Specific research objectives for the Literature Review as outlined in Chapter one (see paragraph 1.3.2.1) were discussed in detail. The main focus of the literature review was on the different health system structures for NCDs and the expanding role of the pharmacist in the management of NCDs. The health system of Lesotho will be discussed in Chapter three.

CHAPTER 3 THE HEALTH SYSTEM OF LESOTHO

3.1 Chapter introduction

This section mainly focuses on the specific objective; to describe the health system of Lesotho in relation to health service delivery in public health facilities in the management of NCDs.

3.2 Background of Lesotho

Lesotho is a small, mountainous country that is enclosed by the Republic of South Africa. The country is divided into 10 administrative districts namely Butha-Buthe, Leribe, Berea, Maseru, Mafeteng, Mochale's Hoek, Quthing, Qacha's Nek, Thaba-Theka and Mokhotlong. Lesotho is facing an increasing burden of NCDs where deaths due to diabetes were 4%, cardiovascular diseases (14%), chronic respiratory diseases (4%), and other NCDs were 7% in 2016 (WHO, 2018d:1). Policies related to NCDs in Lesotho were developed and implemented in an attempt to control the rising burden of NCDs. Non-communicable disease-related policies include Lesotho Health Policy 2011 (Ministry of Health and Social Welfare (MOHSW), 2011), PHC Revitalisation Action Plan 2011-2017 (MOHSW, 2011a), National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of NCDs 2014-2020 (MOH, 2014b) and National Health Strategic Plan 2017-2022 (MOH, 2016b).

The Lesotho Health Policy 2011 aims to reduce mortality, morbidity and disability caused by NCDs (MOHSW, 2011a:32). This aim will be achieved through the promotion of lifestyle modifications and healthy environments, surveillance and interventions against NCDs, health promotion activities, and integration of physical, mental and social rehabilitation activities in control measures (MOHSW, 2011a:32). The PHC Revitalisation Action Plan 2011-2017 states that at the community and PHC level empowerment to prevent NCDs will be improved through the promotion of preventive interventions and healthy lifestyles (MOHSW, 2011a:22). However, the National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of NCDs 2014-2020 focuses on the integration of plans and strategies for both communicable and NCDs to improve prevention and control of both diseases (MOH, 2014b:28). The National Health Strategic Plan 2017-2022 advocates for the following strategies to improve NCD management: coordination and linkage between sexual and reproductive health, HIV, gender-based violence, nutrition and NCDs (MOH, 2016b:40), strengthening of interventions for NCDs risk factors reduction (MOH, 2016b:42), and establishment of clear guidelines and legislation on prevention, control and management of NCDs (MOH, 2016b:45).

The Lesotho health service delivery is conducted at three levels of care which are primary, secondary and tertiary. These levels of care will be discussed in Section 3.2.1.

3.2.1 Lesotho health service delivery

The health system of Lesotho consists of a total of 372 health facilities which includes one referral hospital, two speciality hospitals, 18 hospitals, three filter clinics, 188 health centres, 48 private surgeries, 66 nurse clinics and 46 pharmacies (GOL, 2016:9). Table 3-1 shows the number of districts and the number of health facilities in Lesotho (Bureau of Statistics, 2013:24).

Table 3-1: Number of districts and health facilities in Lesotho

District	Health facilities	
	OPDs in district hospitals	Healthcare centres
Maseru	4	27
Leribe	2	29
Mafeteng	1	11
Mohale's Hoek	1	12
Berea	2	12
Butha-Buthe	2	6
Quthing	1	10
Thaba-Tseka	2	11
Qacha's Nek	2	10
Mokhotlong	1	10
Total	18	138

There are non-governmental organisations (NGOs) that also help with providing health services and they include the Christian Health Association of Lesotho (CHAL), Lesotho Planned Parenthood Association (LPPA), Lesotho Red Cross Society (LRCS), and Population Services International (PSI) (GOL, 2013:9; GOL, 2016:10). As a result, the LPPA has 10 clinics in urban areas around Lesotho, the LRCS has four clinics and the PSI has five voluntary counselling and testing (VCT) centres.

The LPPA mainly offers family planning including VCT, sexually transmitted infections (STI) management as well as cancer screening (MOHSW, 2010:79). It also carries out outreach programmes with the aid of community-based activities targeting specifically factory workers, villagers and the youth. The services provided by the LRCS are primary prevention, curative services and rehabilitation (MOHSW, 2010:79). These services also cater to chronic diseases. Additionally, the LRCS conducts a preventive HIV initiative through training of peer educators, production and dissemination of HIV/AIDS material, distribution of condoms and provision of

counselling, and home-based care services to infected and affected people (MOHSW, 2010:80).

A memorandum of understanding between the Government of Lesotho, CHAL and LRCS was established where an agreement to provide free services at the clinic level and apply uniform costs in CHAL hospitals was made (Wade, 2015:6). As a result, the Government pays CHAL salaries and compensates for basic healthcare services provided. The Government administers 42% of healthcare centres and 58% of hospitals while CHAL administers 38% of healthcare centres and 38% of hospitals (GOL, 2016:10). Figure 3-1 shows the hierarchy of the Lesotho health service delivery.

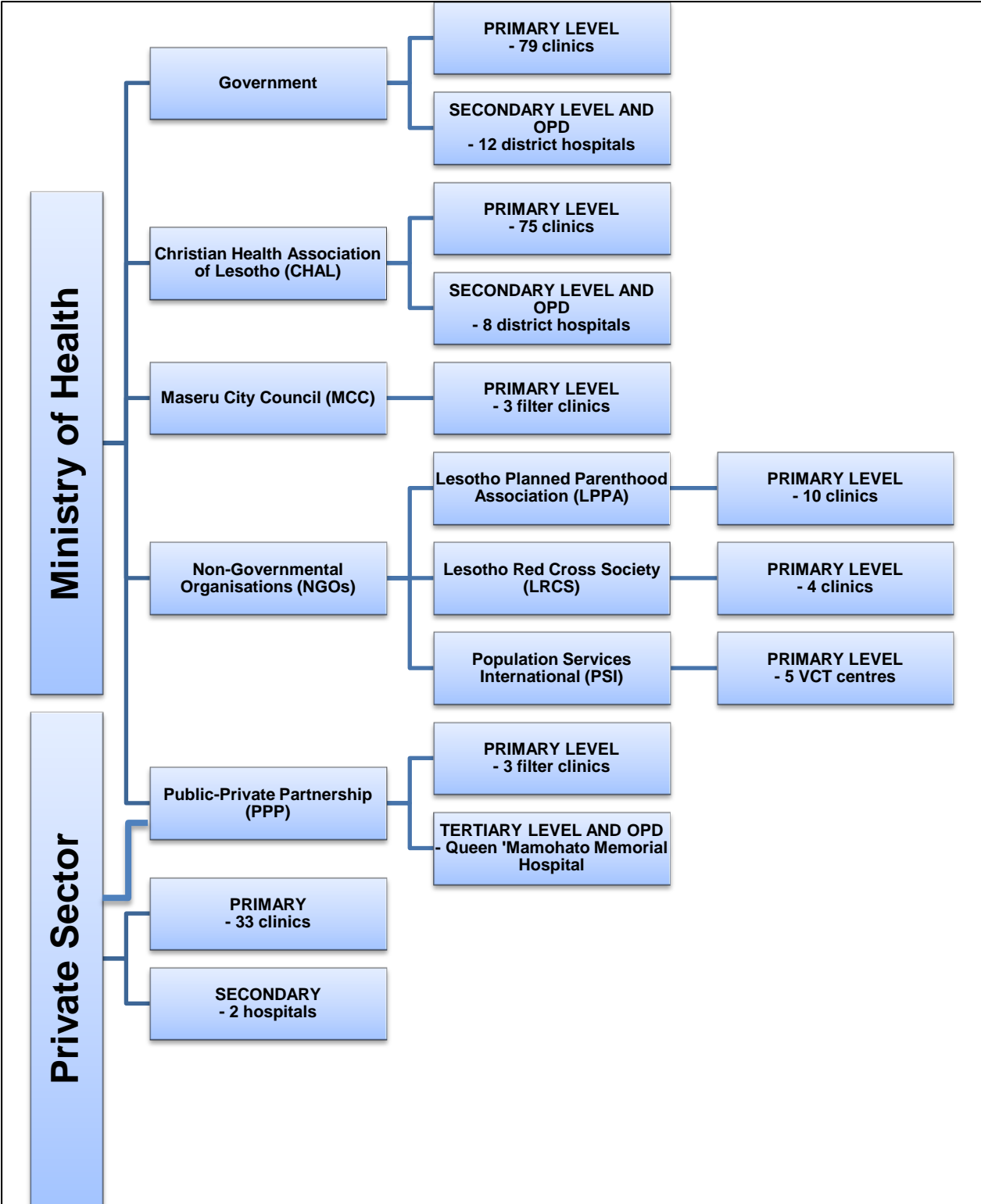


Figure 3-1: Hierarchy of the Lesotho health service delivery

The Queen Mmamohato Memorial Hospital (QMMH) is a referral hospital in Maseru, Lesotho which replaced Queen Elizabeth II Hospital. The hospital was built through a public-private partnership (PPP) agreement together with three filter clinics and one outpatient department

(OPD) (World Bank, 2016:1). The QMMH is managed by a South African private healthcare provider called Netcare (World Bank, 2016:1). The QMMH, OPD and the three filter clinics make up the Lesotho health network PPP which has impacted the health budget of Lesotho (World Bank, 2016:1). The health service delivery is divided into three levels which are primary, secondary and tertiary as shown in Table 3-2 (MOHSW, 2010:80; MOH, 2016a:24). The primary level is the first level of care which is deliberated in subsequent paragraphs.

Table 3-2: Structure of the healthcare service delivery system

Level	Facility type	Structure
Primary level	Health posts	-Based at community level -Form the basis of outreach for communities
	Healthcare centres	-186 facilities nationwide -The first contact of the formal health system
Secondary level	District hospitals	-District focal point for management and service delivery
	Filter clinics	-Essentially 'mini hospitals' -Relieve the load on the district hospitals
Tertiary level	Referral hospitals	-Queen Mmamohato Memorial Hospital (QMMH). National Referral Hospital (absorbs the bulk of general referrals) -Mohlomi Mental Hospital -Bots'abelo Leprosy Hospital -Senakatana AIDS Clinic
Quaternary level	South Africa	-Referral through QMMH National Referral Hospital

3.2.1.1 Primary healthcare or community level of care

The primary level provides basic health services which also include diagnosis, treatment and management of patients with chronic diseases (GOL, 2016:10). This level of care consists of healthcare centres, health posts and all community-level initiatives (GOL, 2016:10). These health facilities provide basic healthcare services to between 6000 and 10 000 people (GOL, 2013:9). Human resources in these facilities include clinicians, nurses, or nursing assistants who diagnose and treat common conditions including chronic disease (GOL, 2013:9). Services at this level are free of charge for both the CHAL and the government-owned facilities. These facilities are mostly based in rural areas where coverage by other public facilities is limited. The absence of fees and availability of services in rural areas has led to an increase in the utilisation of healthcare services.

The health posts are managed by volunteers (CHWs, traditional birth attendants) and provide community outreach services such as health promotion, and preventive and health education gatherings on issues related to chronic diseases (GOL, 2016:10; MOH, 2016a:25). The CHWs/VHWs at the community level form a network of more than 6000 volunteers who manage health posts and receive an incentive from the government (GOL, 2016:10; GOL, 2013:9). The CHWs/VHWs are trained and supervised by nurses at the healthcare centres (GOL, 2016:10). The CHWs are a linkage between the community and healthcare centres. Thus, they refer cases to healthcare centres as the first point of professional care.

The second level of care is the district or secondary level.

3.2.1.2 District or secondary level of care

The district or secondary level of care is made up of filter clinics and district hospitals where the filter clinics are the first point of care meant to relieve the district hospitals. These clinics function as mini-hospitals providing curative and preventive services and limited inpatient care (MOH, 2016a:24). In comparison with healthcare centres, filter clinics are staffed with doctors and pharmacy technicians (MOH, 2016a:24). There is a district hospital in every district that serves as a referral facility for filter clinics and healthcare centres (GOL, 2016:10). The situation in the Maseru district, however, is different. There is no district hospital in Maseru, so the national referral hospital also acts as a district hospital; as a result, there is congestion of patients (GOL, 2016:10; GOL, 2013:10).

The district hospitals have both inpatient and OPDs and the services provided depend on the availability of financial resources, equipment and human resource (MOH, 2014a:9). The district hospitals offer complex treatment and diagnostic services as compared to filter clinics and healthcare centres. Therefore, they provide operative services, ophthalmic care, mental health services, dental services, and specialised care for tuberculosis (TB), human immunodeficiency virus (HIV) infection and NCDs (MOH, 2014a:9). The district hospitals refer cases to the national referral hospital for further management. Clients who utilise district hospitals pay subsidised fees for both inpatient and outpatient services (GOL, 2016:10; GOL, 2013:10). The OPDs offer free PHC services because people residing in towns do not have access to free services offered in the healthcare centres (GOL, 2016:10; GOL, 2013:10).

3.2.1.3 Tertiary level of care

There is one national referral hospital namely Queen Mmamohato Memorial hospital and two specialised hospitals namely Mohlomi Mental Hospital and Bots'abelo Leprosy Hospital (GOL,

2016:10; GOL, 2013:10) are found in Maseru district. Through the QMMH, complex cases for the national referral hospital are referred to as South Africa for quaternary care (GOL, 2016:11; GOL, 2013:10).

The health system of Lesotho is divided into the national, district and PHC levels. These levels are deliberated on in Section 3.2.2.

3.2.2 Management levels of the health system of Lesotho

The health system of Lesotho is divided into three levels namely: national, district and PHC levels shown in Figure 3-2.

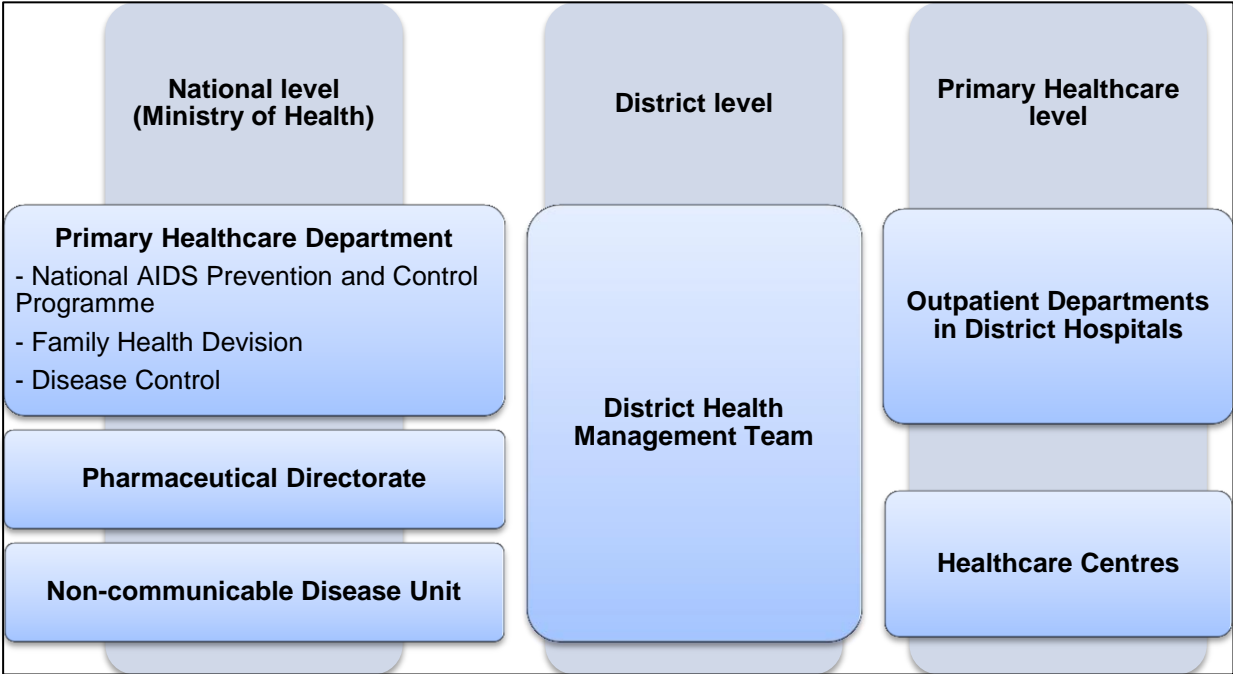


Figure 3-2: Management levels of the health system of Lesotho

3.2.2.1 The National level

The national level is composed of the Ministry of Health (MOH) which is responsible for health issues such as the development of health policies, provision of a legal framework, development of standards and guidelines, mobilisation of health resources, and monitoring and evaluation of health sector interventions in Lesotho (GOL, 2013:8). Thus, this level oversees the running of the country’s healthcare services. The MOH uses a decentralised approach in managing healthcare service delivery in Lesotho. As a result, there are several PHC programmes mandated to coordinate planning and budgeting functions for PHC and they include the National AIDS Prevention and Control Programme, Family Health Division and Disease Control

(MOHSW, 2010:85-86). These programmes are managed under the PHC department at the MOH and control activities in the ministry and nationally.

The main objective of the National AIDS Prevention and Control Programme is to coordinate the strengthening of the national response to the HIV/AIDS pandemic (MOHSW, 2010:86). The activities carried out in this programme include the development of guidelines related to HIV/AIDS and strengthening VCT, prevention of mother-to-child transmission (PMTCT), paediatric AIDS and antiretroviral treatment (ART) services at all levels of the health system (MOHSW, 2010:86). Implementation methods used in these activities include counselling and community-based programmes, behavioural change and communication, clinical care services, and research and surveillance.

The goal of the Family Health Division is to reduce infant, child and maternal morbidity and mortality rates (MOHSW, 2010:86). This division consists of reproductive health (RH), child survival, nutrition, and community-based health (MOHSW, 2010:86). Initially, the Disease Control programme was focused on TB, sexually transmitted diseases and leprosy which later expanded to include HIV/AIDS and NCDs (MOHSW, 2010:86). The NCD unit ensures that an operational multi-sectoral national policy, strategy or action plan that integrates several NCDs and shared risk factors (WHO, 2014g:34) exists. It is also responsible for the development and revision of guidelines used in the management of NCDs.

The pharmaceutical directorate, which is the body that manages pharmaceutical services in Lesotho, is responsible for policy formulation, regulatory activities, and production and management of drug supply (MOHSW, 2005:10). Currently, there is one leading statutory body established as a trading account of the MOH in Lesotho which is the National Drug Service Organisation (NDSO) (GOL, 2016:29; Wade, 2015:7) working with the pharmaceutical directorate. This organisation acts as a central medical store. Some of its responsibilities include procurement, storage and distribution of medicines and medical consumables for public health facilities in the country (GOL, 2016:29; Wade, 2015:7).

The next level is the district level which is answerable to the national level.

3.2.2.2 The district level

The management structure at the district level is the DHMTs (GOL, 2016:11). There are 10 DHMTs and most of them have core staff in dedicated offices (MOHSW, 2011a:14). The DHMT is responsible for managing healthcare service delivery at healthcare centres and community-level health interventions (MOHSW, 2011a:41; GOL, 2013:40). It is managed by the district

medical officer (DMO) (GOL, 2013:40). The healthcare centre manager reports to the DHMT on all issues related to service delivery including data on chronic diseases, human resources, budget and medication (GOL, 2013:40). The responsibilities of the DHMT include the provision of leadership for district healthcare service delivery, planning and resource mobilisation, monitoring and evaluation, capacity building among healthcare workers, human resource management and development, and financial management (GOL, 2013:40).

3.2.2.3 The primary healthcare level

The PHC level is the first level of care and includes OPDs in district hospitals and healthcare centres (GOL, 2013:10). All district hospitals offer PHC services offered by healthcare centres and health posts because people living in towns do not have access to free primary-level health services (GOL, 2016:10). The healthcare centres are managed by a nurse and the district hospital is managed by the medical superintendent. Refer to Section 3.2.1.1 above for more details about PHC.

3.2.3 Components of the Lesotho health system

In 2008 international conferences on PHC and health systems in Africa were held in Ouagadougou, Burkina Faso and Cameroon which were organized by the World Health Organization Regional Office for Africa (WHO, 2008b:1-9; WHO, 2010d:1). In these conferences, all the African region member states adopted and signed the Ouagadougou Declaration on Primary Health Care and Health Systems in Africa (WHO, 2008b:1-9; WHO, 2010d:1). Thereafter, the member states requested for the development of an implementation framework to assist with effecting the Ouagadougou Declaration which is to be adopted and adapted depending on specific country situations (WHO, 2010d:1). This framework takes into account existing policies and strategies as well as priority areas highlighted in the Ouagadougou Declaration (WHO, 2008b:1-9, WHO, 2010d:4-12) such as:

- leadership and governance for health,
- health service delivery,
- human resources for health,
- health financing,
- health information,
- health technologies,
- community ownership and participation,
- partnerships for health development and
- research for health.

As a result, the six building blocks of the Lesotho health system were developed taking into consideration the Ouagadougou framework for PHC, community ownership and participation (MOH, 2016b:14). The six building blocks include leadership and governance; human resources for health; medicines, medical devices and health technologies; health infrastructure and equipment; health information and research; and health financing (MOH, 2016b:14-30) (refer to Figure 3-3). Individual building blocks are discussed in the sections below.

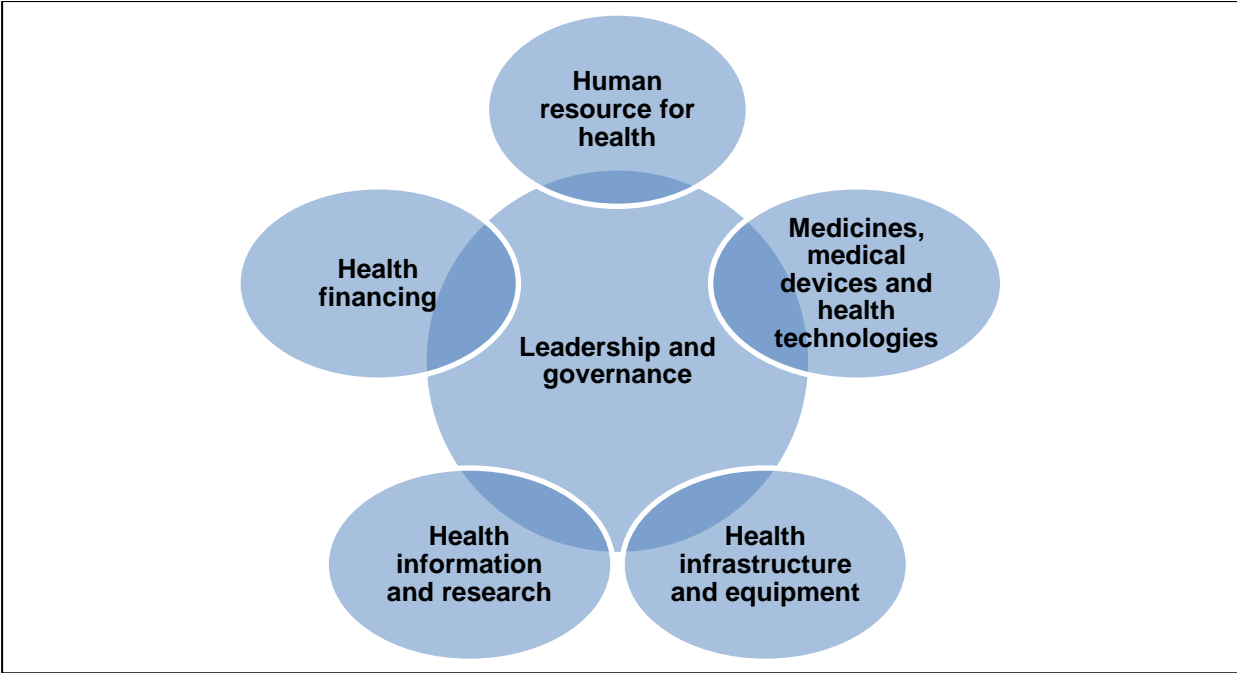


Figure 3-3: Modified building blocks framework with reference to the World Health Organization health system framework

3.2.3.1 Human resources for health

For satisfactory healthcare service delivery, qualified human resources have to be in place. A focus on human resources for health (HRH) in the context of NCD control is necessary for health system change, especially during a shift from the care of acute infectious diseases to chronic conditions that entail a reorientation of health systems for which human resources are essential (Nishtar & Ralston, 2013:895). For instance, HIV programmes have employed non-traditional human resource strategies such as engagement with non-governmental organisations (NGOs), service recipients, peer educators, treatment partners and expert clients; thus, in the context of NCD management, human resources can be strategically used similarly to reorient health systems towards chronic care (Nishtar & Ralston, 2013:895).

Human resources for health in Lesotho are trained internationally and nationally. The health sector has 8600 personnel where 44% work in the formal sector run by the government, CHAL,

NGOs and the private sector (MOHSW, 2005:3-1). Of these, 75% are based in the government, 22% in CHAL, and 3% in NGOs and the private-for-profit sector (GOL, 2013:17). Less than 20% of the healthcare workers work at the PHC level, 46% at the secondary level of care and 24% at the tertiary level of care (GOL, 2013:18). The Ministry of Public Service uses the establishment list produced based on the MOH's proposed numbers of human resource positions across all government health facilities as a guide for staffing norms for MOH facilities (World Bank, 2017:21). The establishment list of 1966 entails staffing norms for health workers in the public health system of Lesotho (World Bank, 2017:21). The establishment list indicates a fixed range of nursing positions at healthcare centres while government hospitals have a flexible number of established positions not based on either bed-based norms or staffing demand (World Bank, 2017:21).

There is a general shortage of staff in Lesotho, where 73.3% of the personnel in the MOH are nurses, 6% physicians, and pharmacists and other health cadres have the lowest percentage (GOL, 2013:17). Therefore, the nursing cadre is the largest in the health sector. There are 1123 nurses employed throughout the sector accounting for approximately 33% of the total labour supply and 90% of all personnel being directly engaged in healthcare service (MOHSW, 2005:3-4). Coverage rates of professional nurses in healthcare services range from 1.22 nurses per 1000 population in Thaba-Tseka to 0.71 per 1000 in Maseru, to 0.36 in Mokhotlong, and 0.10 in Semonkong (MOHSW, 2005:3-4). The health sector also consists of nursing assistants and their role include health promotion, outpatient screening, information processing and basic support care for dressings and injections at OPDs and healthcare centres under the direct supervision of nursing officers (MOHSW, 2005:3-4). These nursing assistants have been assigned responsibilities that exceed their pre-service training, particularly within the curative sector. Nursing assistants learned these responsibilities informally whilst working in this environment thus suggesting an emergence of a new nursing occupation filled by the more experienced nursing assistants (MOHSW, 2005:3-4).

The second-largest healthcare professional cadre after nurses is medical doctors (specialists and medical officers). They account for 2.9% of all health sector employees and 8% of all employees directly engaged in healthcare services (MOHSW, 2005:3-6). The healthcare service area coverage rates for doctors in Lesotho range from 0.16 medical doctors per 1000 population in Maseru, to 0.07 per 1000 in Thaba-Tseka, to 0.02 in Mphahle's Hoek, and zero in Qacha's Nek (MOHSW, 2005:3-6). Lesotho depends highly on non-local staff in the medical doctor labour market.

Pharmacists and pharmacy technicians manage drugs for hospitals, whereas at healthcare centres, this may be the responsibility of a nurse clinician, nurse-in-charge, or sometimes a pharmacy technician (MOHSW, 2005:2-10). Pharmacy staff accounts for 1.6% of the total health sector labour with limited coverage of 0.03 pharmacy personnel per 1000 population (MOHSW, 2005:3-10). Most pharmacy personnel are employed in the Maseru district.

Availability, functionality and maintenance of medicines, medical supplies and health technology are vital in healthcare service delivery.

3.2.3.2 Medicines, medical supplies and health technologies

The management of NCDs requires patients to take their medicines regularly over a long time; however, ineffective systems of medicine supply and insufficient financing can disrupt access to quality medicines (WHO-Europe, 2014:25). Cost-effective medicines to treat NCDs are not accessible and affordable to populations in low- and middle-income countries (LMICs) where the prevalence of NCDs is increasing (Beran *et al.*, 2019:3; Husain *et al.*, 2020:10-11; WHO, 2011e:36-37). Thus, global and country-level efforts are required to provide essential medicines for NCDs in the public sector at affordable prices and in the required quantities (Beran *et al.*, 2019:3; Husain *et al.*, 2020:12). The Department of Pharmaceutical Services at the MOH is authorised to manage pharmaceutical services throughout the country (MOHSW, 2005:2-10). The department carries out functions such as policy formulation, regulatory activities, and production and drug supply management (MOHSW, 2005:2-10). The National Drug Supply Organisation (NDSO) has been delegated to manage the national drug supply and is headed by a pharmacist (MOHSW, 2005:2-10).

The NDSO is responsible for procurement, storage and distribution of medicines, and medical supplies for both CHAL and government healthcare facilities (GOL, 2016:29; GOL, 2013:16). Nonetheless, CHAL facilities also have the option of procuring their pharmaceuticals from private wholesalers (MOHSW, 2010:62). Healthcare facilities use the NDSO product catalogue in placing orders. Additionally, healthcare facilities have developed order preparation schedules to assist with placing orders at NDSO (MOHSW, 2010:62). The NDSO has developed its order delivery schedule by region which is in line with healthcare facilities' order preparation schedules depending on the lead time. The NDSO uses this schedule to deliver ordered goods to healthcare facilities.

The process of ordering medicines and medical supplies from NDSO is shown in Figure 3-4. The ordering process starts with health posts ordering medicines and medical supplies from healthcare centres, followed by healthcare centres ordering the commodities from NDSO

through the DHMTs. Lastly, the DHMTs send healthcare centres orders to NDSO and, in some cases, together with orders from the district hospitals.

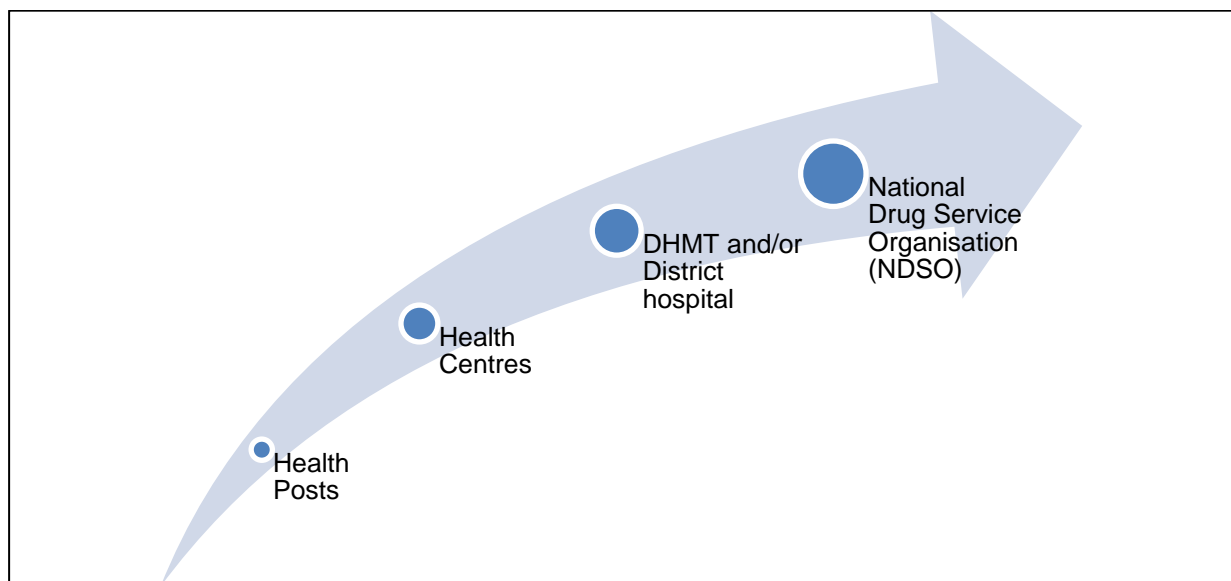


Figure 3-4: Process of ordering medicines and medical supplies from National Drug Service Organisation

The delivery of orders is the reverse of the ordering process where NDSO delivers the commodities to the district hospitals, healthcare centres or the DHMTs depending on the availability of storage at the DHMTs (GOL, 2013:16). The DHMTs or the district hospitals, in turn, have a responsibility to deliver the goods to the healthcare centres. Some of the reasons for the shortage of medicines and medical supplies at the district and the primary healthcare level include maladministration and shortage of pharmacy staff (GOL, 2013:17).

Health information and research is a driving force for the health system as information generated will help in decision making and policy formulation.

3.2.3.3 Health information and research

Information on the performance of all levels of the health system is critical if the response to the burden of NCDs is to be adequate, timely and cost-effective (WHO, 2011e:3; WHO-Europe, 2014:27). The Lesotho Health Management and Information System (HMIS) is a system used for data capturing for the MOH. It provides information on the performance of healthcare services. Lesotho has the following policies and legislation for HMIS: The Lesotho Bureau of Statistics Act (2001), Information Communication Technology (ICT) Policy Guidelines 2003 (MOHSW, 2003a), HMIS Guidelines Policy 2003 (MOHSW, 2003b), and the HMIS Strategic Plan 2013-2017 (MOH, 2013).

The Lesotho Bureau of Statistics Act (2001) is a legal document ensuring that all statistics are produced in an objective, scientific and unbiased way. The ICT policy guidelines 2003 states that the ICT team will work closely with the HMIS team at the MOH. This will, in turn, ensure the interoperability of databases and coordination of the development of an integrated and unified data management system that communicates and exchanges information (MOHSW, 2003a:9). The ICT will provide internet, and support connectivity, information systems and training (MOHSW, 2003a:8). The HMIS guidelines policy 2003 guides the health sector with health data gathering, processing and use of information to improve healthcare service delivery (MOHSW, 2003b:6-7). Objectives of the HMIS guidelines policy 2003 are a collection of relevant and reliable statistical health data, production and dissemination of statistical reports, and corporation between users and producers of health statistics through meetings, seminars, training and publications (MOHSW, 2003b:8). The HMIS strategic plan 2013-2017 focuses on the availability of relevant, accurate and complete health information through the use of trained and motivated staff with necessary resources and appropriate technology (MOH, 2013:14).

The HMIS in Lesotho is a hybrid with a mixture of integrated and stand-alone data systems whereby the integrated HMIS software is a web-based system hosted by the Ministry of Communications Science and Technology (MCST) (MOH, 2013:7). Table 3-3 shows current data systems in Lesotho which consist of integrated systems, vertical systems, and partial or no systems (MOHSW, 2010:95; MOH, 2013:6-7).

Table 3-3: Current Lesotho data systems

Data systems	Places where data systems are found
Integrated systems	Outpatients departments
	Inpatient departments
	Delivery
	Mental health
	Antenatal care
	Oral health
	Mother and child health (MCH)
	Children under age five
Vertical systems	HIV (ART)
	TB
	Notifiable diseases
	Family planning
Partial or no systems	Finances
	Human resources for health
	Drug and logistics management
	Laboratory services

The CHAL and the GOL's memorandums of understanding support routine reporting for healthcare facilities where CHAL healthcare facilities use standardised data collection tools

developed by the Ministry of Health (MOHSW, 2010:94). The MOH and the CHAL collect data using standard registers and forms (GOL, 2013:21).

Data has to flow from the community level to the MOH. Data from the community level and health posts are sent to healthcare centres where all data are aggregated and sent to the DHMTs. The data from healthcare centres are in paper form. These data are then entered at the district level (DHMTs) into a web-based data entry template by the District Health Management Information Officer (DHMIO) (GOL, 2013:21). The DHMIO then submits the data to the MOH headquarters (GOL, 2013:21). Quarterly reports are generated from the data and shared in the health sector for the assessment of progress in the implementation of interventions.

Information systems required for chronic disease management should have the capability of tracking patients over the long term. Information on drugs and laboratory supplies are crucial in the long-term management of chronic diseases. An integrated computerised pharmaceutical management system, RxSolution[®], is a stand-alone system currently used in district hospitals. The RxSolution[®] programme is designed to manage pharmaceuticals and medical supplies, from procurement to dispensing to patients (MOH, 2013:9). The electronic medical record (EMR) system in Lesotho OPDs is yet to be implemented (MOH, 2013:9). This system includes a pharmacy management system, a chronic disease clinic management system, and data management solutions and services.

A well-functioning health system relies mainly on consistent health financing.

3.2.3.4 Health financing

Financial and non-financial barriers to health services prevent effective delivery of core interventions and services (WHO-Europe, 2014:28). Investing in NCDs is essential; thus, countries battling with the increasing burden of NCDs should include NCDs as strategic priorities in health sector plans and build health system capacity to promote better overall health and prevent many NCDs and related diseases (Nugent, 2015:7). Also, multilateral bodies should serve as coordinating venues, and national health strategies should be used to provide donors with clear governmental priorities for NCD capacity building (Nugent, 2015:7).

The public sector revenue in Lesotho is centralised within the Ministry of Finance and Development Planning (MOFDP). The Government of Lesotho is the major financier for the health system of Lesotho with significant contributions from development partners including international NGOs (MOHSW, 2010:15). The government revenues spent on health mainly

come from South African Customs Unions (SACU) followed by tax revenue, non-tax revenue and grants (GOL, 2013:20; MOHSW, 2010:19).

The Lesotho government contributed 60.7% of the total health spending between 2004/2005 and 2008/2009 with private sources (households and companies) contributing 25.1% and donors 14.2% (GOL, 2013:20). There is a memorandum of understanding between the CHAL and the MOH which aims at harmonising healthcare service provision, provide salaries and client fees (MOHSW, 2010:39). The government has not introduced a social health insurance scheme although the MOH eliminated client fees at the primary level and introduced standardised fees at the secondary level (GOL, 2016:18).

The flow of finances has been decentralised though; the local authorities are not yet responsible for health system management (MOHSW, 2010:31). Firstly, upon approval of the MOH budget by the Parliament, the MOFDP issues a warrant to spend (MOHSW, 2010:31) which allows the MOH to gain access and spend its funds. The MOFDP transfers the funds to the MOH headquarters. The money is transferred quarterly based on the approved budget of the MOH for all cost centre programmes including the districts and the CHAL (MOHSW, 2010:31). The MOH transfers the funds to the various cost centres and keeps the funds allocated for the MOH headquarters cost centres (MOHSW, 2010:31). A diagrammatic presentation of central budget allocation for health in decentralised systems is depicted in Figure 3-5.

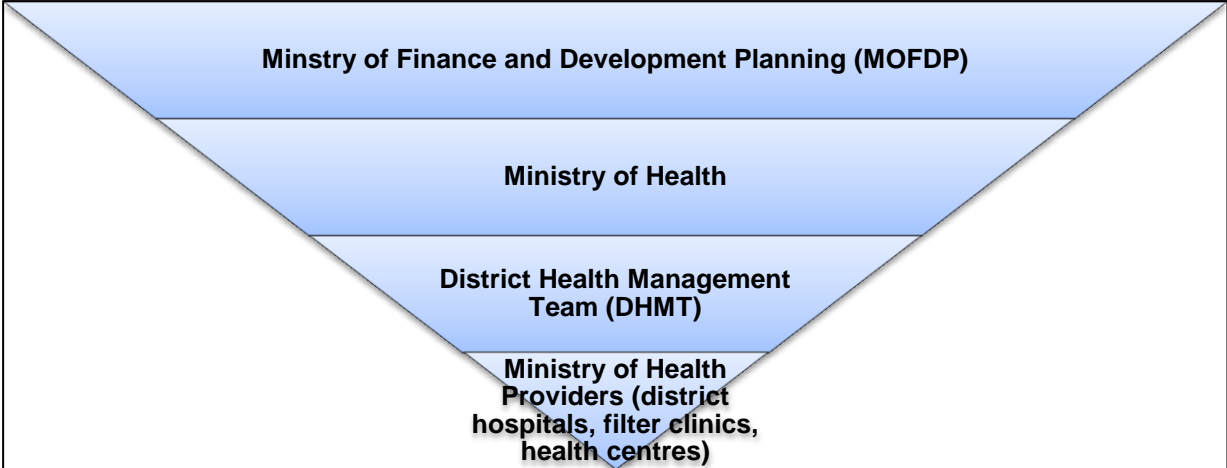


Figure 3-5: Central budget allocation for the Ministry of Health in decentralised systems

The tertiary and district hospitals have been granted various degrees of independence on making decisions on expenditures or inputs. The hospitals have independence in the procurement of supplies, gasoline and medicines (MOHSW, 2010:36). On the other hand,

healthcare centres and filter clinics do not have any independence in expenditure or inputs including planning and budgeting (MOHSW, 2010:36). These healthcare facilities receive their requested goods and services from district hospitals or DHMTs.

The delivery of healthcare services and recurrent stock-out at the district level is a challenge (MOHSW, 2010:32). The proposed solution to this problem was to centralise drug and medical supplies payment at the MOH. However, it cannot be concluded whether this strategy was successful to limit stock-outs due to lack of documented research findings. In the centralised payment system, firstly, NDSO and facilities prepare a budget for drugs and medical supplies for the upcoming financial year (MOHSW, 2010:32). This budget mainly addresses the requirements listed in the essential medicines list or NDSO's product catalogue (MOHSW, 2010:32). Take note that the NDSO's distribution information of each healthcare facility is helpful in budget preparation (MOHSW, 2010:32).

Secondly, consolidation of the national budget for the essential medicines is carried out by the NDSO, the office of the Director of Pharmaceuticals and the financial controller (MOHSW, 2010:32). Once this is done, the consolidated budget is ready for presentation with other MOH budgets to the MOFDP. The NDSO then uses forecasts from the budget to float a national tender for essential medicines (MOHSW, 2010:32). This tender should be ready by March every year. Upon approval of the budget, funds would be deposited or credited into the NDSO account quarterly (MOHSW, 2010:32). The NDSO is then able to pay for contracts it made with suppliers and also pay itself for the services of procurement, storage, and distribution (MOHSW, 2010:32). Quarterly credit information for each healthcare facility for both drugs and medical supplies is prepared by NDSO (MOHSW, 2010:32). The healthcare facilities make requests based on their requirements and the NDSO distribution schedule. Thirdly, the NDSO supplies the healthcare facilities based on their requisitions and the delivery schedule (MOHSW, 2010:32). Upon delivery, delivery notes are endorsed by the healthcare facilities as proof of delivery and for reconciliation purposes.

Lastly, a quarterly reconciliation process is carried out by the NDSO, the Director of Pharmaceuticals and the financial controller to reconcile the funds transferred to the NDSO, the requisitions made by each healthcare facility, and the deliveries NDSO made to those healthcare facilities (MOHSW, 2010:32). The reconciliation report is presented to the National Drug Service Committee, senior management of the MOH and any other relevant authorities within the health system (MOHSW, 2010:32).

Health infrastructure and equipment is another important component used in healthcare service delivery.

3.2.3.5 Health infrastructure and equipment

The Global Action Plan for the Prevention and Control of NCDs (WHO, 2013:41) emphasised the importance of medical equipment by stating that 80% of the affordable basic technology essential to treat major NCDs should be available in both public and private health facilities. The WHO had developed and implemented the package of essential non-communicable (PEN) disease interventions for PHC in low-resource settings to help strengthen the health services delivery by providing guidance on essential equipment for the diagnosis and treatment of NCDs, while also taking into consideration the affordability of the equipment (WHO, 2010b:31). However, it cannot be concluded whether Lesotho followed this package due to lack of documented research findings.

The Millennium Challenge Corporation in collaboration with other stakeholders funded projects to enhance the health sector in Lesotho by implementing the following activities: building healthcare centres, ART clinics and a national laboratory (Central Bank of Lesotho, 2007). This project rehabilitated and expanded 138 healthcare centres countrywide, expanded 14 hospital OPDs, and constructed a laboratory and blood transfusion service (Wade, 2015:6). Even though the Millennium Challenge Project has enhanced the health sector by constructing new healthcare facilities, there is a problem of inadequate space for pharmaceuticals (GOL, 2013:17). The space is still inadequate for pharmaceuticals because the storage areas of these healthcare facilities have not been extended.

The MOH maintains and repairs healthcare facilities when needed. The healthcare centres are maintained by the MOH technicians based in the district hospitals (GOL, 2013:19). The technicians in the Estate Management Unit (EMU) are mostly on contracts and this unit is highly understaffed (GOL, 2013:19). Consequently, there is a lack of institutional capacity to manage infrastructure planning, programming, design, procurement and maintenance by the EMU (GOL, 2013:20).

The Millennium Challenge Account (MCA) has also supplied new equipment in all the healthcare centres that the MCA has constructed or refurbished but there is still a need for equipment in hospitals (GOL, 2013:20). There was a budget for maintaining and purchasing new equipment but it could not cover costs and the ministry does not have specialised personnel to maintain specialised equipment (GOL, 2013:20). As a result, if a machine breaks, it takes a long time for it to be repaired thus affecting healthcare service delivery. The vehicles used for the community level or supportive supervision are either old or non-existent thus lack of transport leads to a deficiency in community-level support and supervision (GOL, 2013:20).

All the components of the health system depend on leadership and governance.

3.2.3.6 Leadership and governance

It is crucial for countries experiencing an increasing prevalence of NCDs to develop and implement policies specific for NCDs prevention, control and management to guide all levels of the health system on how to deal with NCDs in healthcare facilities and the community (Magnusson *et al.*, 2018:108; WHO, 2017g:3-7). Leadership and governance activities include the development of policies, regulation and oversight of the health system, which are carried out at the national level by government entities and other stakeholders (WHO, 2007a:23; WHO, 2010c:86; WHO, 2014f:18-20).

A functional health system needs a strong policy and regulatory environment. Leadership and governance are carried out by the MOH where it ensures the formulation of national health policy and strategic plans (GOL, 2016:14). The MOH has developed the National Health Policy (NHP) 2016 and the National Health Strategic Plan (NHSP) 2017-2022 to ensure a functional, accountable, transparent and equitable health system (GOL, 2016:14). There is a challenge with the development, revision and approval of policies together with health bills that have not been passed into the law (GOL, 2016:15). This makes it difficult for healthcare facilities to provide equitable access to healthcare services because of a lack of direction through policies and law. The existing institutional structures in the MOH are not able to enforce laws, regulations, policies and standards thus contributing to non-achievement of health outcomes (GOL, 2016:15). This is because laws, regulations, policies and standards guide to other levels of the health system including health facilities on how to deliver affordable, quality and equitable healthcare services to clients which will, in turn, improve health outcomes.

For the health system to function well, all components of the health system have to run efficiently as they are dependent on each other to achieve health outcomes. Chapter four focuses on results presentation and discussion.

3.3 Chapter summary

The health system of Lesotho together with its different components was discussed in this chapter. The following chapter will concentrate on the presentation and discussion of the results of the study.

CHAPTER 4 RESULTS AND DISCUSSION

4.1 Chapter introduction

This chapter entails a presentation of results and discussions that address the following aims of the study:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities, and
- To assess the role of the pharmacist in the national, district and primary healthcare (PHC) levels in the health system of Lesotho concerning the management of hypertension, diabetes mellitus, asthma and epilepsy.

4.2 Notes pertaining to the interpretation of the results of the empirical investigation

Results of the empirical investigation of the study were divided into the following sections: demographic information, human resource (HR), health promotion, continuing education support and training for healthcare workers, medicines for non-communicable disease (NCD) management, health management information systems (HMIS), healthcare financing, health infrastructure and equipment, and the role of the pharmacist. The results in the different sections were further divided into the Ministry of Health (MOH), district level, and PHC level (refer to Table 4-1). These different levels of the health system of Lesotho were described in section 3.2.2 (Chapter three). Figure 4-1 is an organogram of the structure of the MOH of Lesotho (MOHSW, 2005:2-7; MOHSW, 2010:123).

Table 4-1: Sections of the levels of the health system Lesotho

Levels of the health system	Sections
National level	Ministry of Health: <ul style="list-style-type: none">• Pharmaceutical directorate (part of pharmaceutical services)• NCD unit (part of disease control)
District level	District Health Management Teams (DHMTs)
PHC level	Outpatient departments (OPDs) in district hospitals
	Healthcare centres

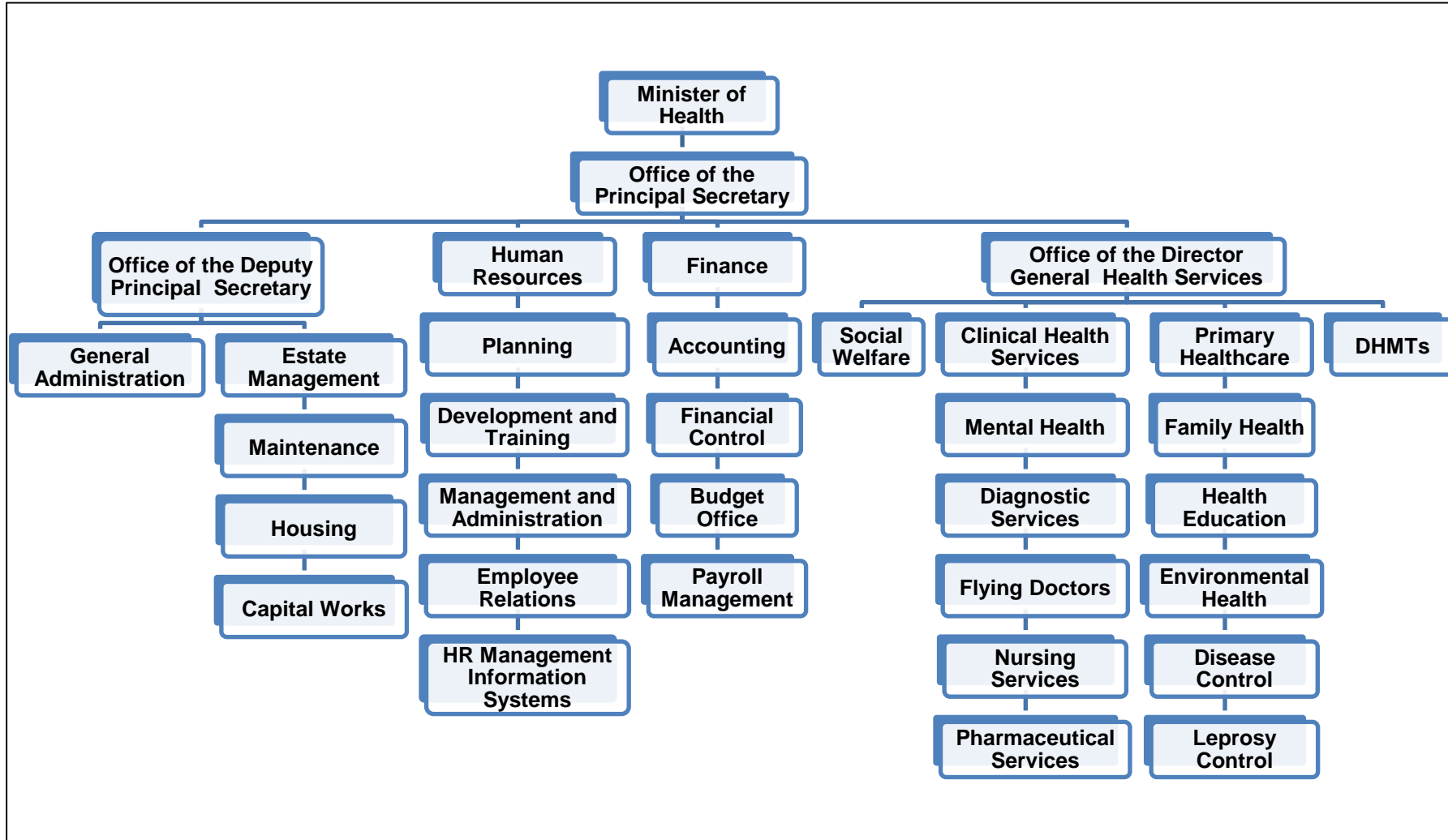


Figure 4-1: Organogram of the structure of the Ministry of Health of Lesotho

- The **perceptions** of managers at the MOH (Annexure A), District Health Management Teams (DHMTs) (Annexure B), outpatient departments (OPDs) in district hospitals (Annexure C) and the healthcare centres (Annexure D) were assessed. Managers that responded at the MOH were from the Pharmaceutical Directorate, a subdivision of the Pharmaceutical Services and the NCD unit, a sub-division of the Disease Control.
- Questions in the sections of the questionnaires were not answered by all the respondents (i.e. respondents were allowed to skip questions), thus not all sections equal the total number of respondents. Frequencies were used to present results regarding managers' perceptions at the MOH, DHMTs and OPDs because of a low response rate, whereas results arising from managers' perceptions at the healthcare centres were presented using frequencies and percentages. Frequencies and/or percentages for missing responses were included in the presentation of results.
- Synonyms for perception used in this chapter were awareness, opinion, thought, viewpoint, noted, and felt.
- The following working definitions pertain to this chapter:
 - Managerial position: This is a job title in which an employee with this job title oversees the responsibilities of a group of individuals involved in the management of NCDs (Free Management Library, 2021:1).
 - Respondents: These are those who participated and answered a specific question. The respondents were allowed to skip questions. Therefore, not all respondents answered all questions, i.e. the number of respondents who replied may not accrue to the total number for each question.
 - N: Indicates the total population (population size).
 - n: Indicates the number of responses.

4.3 Demographic information

This section entails the demographic profile of the respondents. A total of 117 out of 405 (28.9%) respondents participated (refer to section 1.4.5, Chapter one for the target and study population). Based on the level of healthcare services, six out of nine (66.7%) respondents were from the MOH (refer to Table 1-1, Section 1.4.5.1, Chapter one), nine out of 30 (30.0%) from DHMTs (refer to Table 1-2, Section 1.4.5.2, Chapter one), 16 out of 90 (17.8%) from OPDs (refer to Table 1-3, Section 1.4.5.3, Chapter one), and 86 out of 276 (31.2%) were from

healthcare centres (refer to Table 1-3, Section 1.4.5.3, Chapter one). The low response rate at the DHMTs, OPDs and the healthcare centres were due to the following:

- Respondents wanted remuneration as they did not believe that a non-governmental organisation (NGO) did not fund the study. Most respondents ended submitting unanswered questionnaires which affected the response rate.
- A lack of personnel at the DHMTs, OPDs, and healthcare centres led to a reduced response rate.
- Staff transfers from one health facility to the other led to respondents not complying with the inclusion criteria (refer to Section 1.4.3, Chapter one) because they had less than six months working in the new health facility.

4.3.1 The Ministry of Health

The demographic information of respondents from the MOH is indicated in Table 4-2. The MOH is divided into the Pharmaceutical Directorate with four managers and the NCD unit with two managers. Four of the six respondents had a service record of more than five years, with one person being in the position for more than 10 years. Three managers were women and slightly younger (mean age: 45.50 ± 19.1 years) than their male counterparts (mean age: 48.00 ± 8.5 years). In line with the respondents' professional qualifications, two managers were pharmacists. Four respondents had at least a bachelor's degree, with the highest education level amongst the respondents being a master's degree.

Table 4-2: Ministry of Health respondents' demographic information

Demographic information	Description	Respondents at MOH (N = 6), n	Missing responses (n)
Gender	Male	2	1
	Female	3	
Age, years mean ± SD, (95% CI)	Mean age	46.8 ± 12.2 (27.4-66.1)	0
	Males	48.0 ± 8.5	
	Females	45.5 ± 19.1	
Professional qualification	Biomedical scientist	1	1
	Nurse midwife	1	
	Pharmacist	2	
	Pharmacy technologist	1	
MOH division	Pharmaceutical	3	

Demographic information	Description	Respondents at MOH (N = 6), n	Missing responses (n)
	directorate		1
	NCD unit	2	
Position held in MOH division	Principal medical scientist NCDs	1	1
	Senior nursing officer	1	
	Pharmacist	2	
	Principal pharmacy technician	1	
Years of employment	1–5	1	1
	6–10	3	
	>10	1	
Educational level	Diploma	1	1
	Bachelor's degree	3	
	Master's degree	1	

MOH = Ministry of Health; NCD = non-communicable disease

4.3.2 The district level

The demographic information of respondents from the DHMTs (N = 9) is represented in Table 4-3. There were more female managers (n = 5) than male managers (n = 4). Women (mean age: 43.3 ± 15.3 years) were older than men (mean age: 32.5 ± 2.1 years). More than one respondent was mainly from the DHMT of the following districts: Mokhotlong (n = 2), Thaba-Tseka (n = 2) and Mohale's Hoek (n = 2) districts. Four respondents were pharmacists by profession. Respondents mainly held managerial positions of public health nurse (n = 3) and district logistics officer (n = 3). Only one respondent had been in the managerial position for more than five years, and six had bachelor's degrees.

Table 4-3: District health management teams respondents' demographic information

Demographic information	Description	Respondents at DHMTs (N = 9), n	Missing responses (n)
Gender	Male	4	0
	Female	5	
Age in years, mean ± SD, (95% CI)	Mean age	39.7 ± 13.1 (25.9-53.4)	0
	Males	32.5 ± 2.1	
	Females	43.3 ± 15.3	
Professional	Nurse	1	

Demographic information	Description	Respondents at DHMTs (N = 9), n	Missing responses (n)
qualification	Pharmacy technologist	1	1
	Pharmacist	4	
	Public health nurse	1	
	Medical doctor	1	
Managerial position held at DHMT	District medical officer	1	0
	District pharmacist	1	
	Public health nurse	3	
	Principal pharmacy technician	1	
	District logistics officer	3	
Years of employment	1–5	3	5
	6–10	1	
Educational level	Diploma	2	0
	Postgraduate diploma	1	
	Bachelor's degree	6	
District in which DHMT is found	Leribe	1	0
	Butha-Buthe	1	
	Mokhotlong	2	
	Thaba-Tseka	2	
	Qacha's Nek	1	
	Mohale's Hoek	2	
<i>DHMTs = District Health Management Teams</i>			

4.3.3 The primary healthcare levels

The respondents at OPDs (N = 16) were composed of eight women and seven men. Women (mean age: 41.0 ± 11.3 years) were marginally older than men (mean age: 40.0 ± 9.9 years) (refer to Table 4-4). Seven respondents were pharmacists by profession of whom five held the position of head pharmacist. Four of the 10 respondents worked at the OPDs for more than five years, but no one's employment exceeded 10 years. The majority of respondents had a bachelor's degree (n = 10) at the time of the study. Three respondents at OPDs worked in the district hospital of Thaba-Tseka district and four worked in a district hospital of Mafeteng district. The respondents were mainly from the pharmacy department (n = 8) within the OPDs (Table 4-4). The majority of district hospitals were owned by the Government of Lesotho (n = 11).

There were more female respondents (80.2%, n = 69) in healthcare centres compared to males (19.8%, n = 17) (refer to Table 4-4). Women (mean age: 40.1 ± 11.5 years) were older than

men (mean age: 31.2 ± 6.4 years). Respondents at healthcare centres were mainly nurses (44.2%, $n = 38$) and nurse-midwives (32.6%, $n = 28$) by profession. Most respondents held managerial positions of a nurse (39.5%, $n = 34$) or nurse in charge (33.7%, $n = 29$). About a third of respondents had been employed as managers for one to five years (30.4%, $n = 26$), with a further 11 employed for more than 10 years. The respondents mainly had diplomas (69.8%, $n = 60$). The healthcare centres in which respondents worked were mainly found in Leribe (22.1%, $n = 19$), Thaba-Tseka (16.3%, $n = 14$) and Mafeteng districts (14.0%, $n = 12$). More than half of the healthcare centres belonged to the CHAL (55.8%, $n = 48$).

Table 4-4: Outpatients departments and healthcare centres respondents' demographic information

Demographic information	Description	Respondents at OPDs (N = 16), n	Missing responses, n	Respondents at healthcare centres (N = 86), n (%)	Missing responses n (%)
Gender	Male	7	1	17 (19.8)	0
	Female	8		69 (80.2)	
Age in years, mean \pm SD, (95% CI)	Mean age	40.5 ± 10.2 (34.6-46.4)	0	38.1 ± 11.2 (35.1-41.1)	0
	Males	40.0 ± 9.9		31.2 ± 6.4	
	Females	41.0 ± 11.3		40.1 ± 11.5	
Professional qualification	Medical doctor	2	1	0	13 (15.1)
	Pharmacist	7		1 (1.2)	
	Nurse	5		38 (44.2)	
	Pharmacy technologist	1		0	
	Nurse clinician	0		3 (3.5)	
	Nurse midwife	0		28 (32.6)	
	Nursing assistant	0		3 (3.5)	
Managerial position held	District medical officer	1	2	0	2
	Head pharmacist	5		0	
	Pharmacist	2		0	
	Matron	2		0	
	Hospital manager for nursing services	3		0	
	Medical	1		0	

Demographic information	Description	Respondents at OPDs (N = 16), n	Missing responses, n	Respondents at healthcare centres (N = 86), n (%)	Missing responses n (%)
	superintendent				
	Nurse in charge	0		29 (33.7)	
	Nurse clinician	0		18 (20.9)	
	Nurse	0		34 (39.5)	
	Pharmacy technician	0		2 (2.3)	
	Nursing sister	0		1 (1.2)	
Years of employment	1–5	6	6	26 (30.4)	39 (45.3)
	6–10	4		10 (11.7)	
	>10	0		11 (13.1)	
Educational level	Junior certificate	0	1	1 (1.2)	0
	Certificate in nursing assistant	0		2 (2.3)	
	Diploma	1		60 (69.8)	
	Bachelor's degree	10		23 (26.7)	
	Honours degree	2		0	
	Master's degree	2		0	
District in which health facility is found	Maseru	2	0	16 (18.6)	0
	Berea	2		2 (2.3)	
	Leribe	0		19 (22.1)	
	Buthat-Buthe	2		6 (7.0)	
	Mokhotlong	1		4 (4.7)	
	Thaba-Tseka	3		14 (16.3)	
	Qacha's Nek	0		5 (5.8)	
	Mohale's Hoek	2		8 (9.3)	
	Mafeteng	4		12 (14.0)	
Organisation that owns your health facility	Government of Lesotho	11	0	37 (43.0)	1 (1.2)
	CHAL	5		48 (55.8)	
Outpatient department you work in	Pharmacy	8	3	0	0
	Nurses	5		0	

Demographic information	Description	Respondents at OPDs (N = 16), n	Missing responses, n	Respondents at healthcare centres (N = 86), n (%)	Missing responses n (%)
<i>CHAL = Christian Health Association of Lesotho; OPDs= Outpatient departments</i>					

4.4 Human resources

The results and discussion of opinions of the managers at the MOH, district and the PHC levels about human resources were sectioned based on the specific objective, to describe the human resources at these levels in the public health facilities in Lesotho in terms of (refer to Section 1.3.2.2.1, Chapter one):

- The profile of health personnel managing NCDs (only the number and type of health professionals available at different levels of the health system were assessed. The questions in the questionnaire did not cater for how the health professionals differed in qualifications and scope of practice);
- Strategies used for hiring and retention of health personnel in health facilities;
- Available human resource management systems that include support and clinical supervision and performance monitoring;
- Collaborative activities among public and private health facilities, including the community in relation to NCD management;
- The capacity of the public and private sector in addressing the number of health personnel in NCD management;
- Guidelines on roles of community health workers (CHWs) in NCD management, and
- Enhancement of health promotion in NCD management by integrating traditional leaders, community and traditional healers with healthcare.

Section 4.4.1 describes the opinions of respondents about the profile of health personnel managing NCDs at district and PHC levels.

4.4.1 The profile of health personnel managing non-communicable diseases

The respondents' perception about the profile of health personnel in the management of NCDs entailed information about the number of health professionals to be allocated employment

positions at the DHMTs, OPDs and healthcare centres. The perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about the current status of vacancies at the district and PHC levels was also assessed. Respondents who gave their opinion at the MOH were from the Pharmaceutical Directorate, a subdivision of the Pharmaceutical Services and the NCD unit, a sub-division of the Disease Control (refer to Figure 4-1). The results were further divided into the MOH, district level and the PHC level.

4.4.1.1 The Ministry of Health-level

The perceptions of respondents from the MOH (N = 6) regarding the number of health professionals allocated at the DHMTs and PHC level (OPDs and the healthcare centres) as per the district health plan are presented in Table 4-5. The responses were generated from question 2.17 (Annexure A). This question determined the number of health professionals to be employed at the different levels. These health professionals are not appointed or employed. The question only determines the number of posts available at different levels of the health system.

Three of the six respondents perceived that the DHMTs should be allocated one pharmacist, one public health nurse, and one medical doctor (refer to Table 4-5). Three out of six respondents perceived that nurse clinicians and nursing assistants should not be allocated employment positions at the DHMTs (refer to Table 4-5). Table 4-5 indicated that one respondent perceived that OPDs should be allocated at least three pharmacists, six pharmacy technicians, four nurses, 11 nursing assistants, three public health nurses, and five medical doctors. Three respondents perceived that nurses should not be allocated employment positions at OPDs and two respondents also indicated that public health nurses should not be allocated. Two out of six respondents perceived that healthcare centres should be allocated one pharmacy technician and one nurse clinician (refer to Table 4-5). Also, two respondents were of the opinion that pharmacists and public health nurses should not be allocated employment positions at healthcare centres and, three respondents felt that medical doctors should not be allocated positions at healthcare centres (refer to Table 4-5).

Table 4-5: The perception of respondents at the Ministry of Health on the number of health professionals to be allocated to the district and primary healthcare levels

HPs	Perception of respondents at MOH (N = 6)						
	DHMTs		OPDs		Healthcare centres		Missing responses
	No. of HPs	No. of MOH that selected the option	No. of HPs	No. of MOH that selected the option	No. of HPs	No. of MOH that selected the option	
Pharmacists	1	3	0	1	0	2	3
			3	1	1	1	
			5	1	0	0	
Pharmacy technicians	0	0	0	1	0	1	3
	0	1	6	1	1	2	
	1	2	8	1	0	0	
Nurses	0	1	0	1	0	1	3
	2	1	4	1	3	1	
	4	1	11	1	5	1	
Nurse clinicians	0	3	0	3	0	1	3
					1	2	
Nursing assistants	0	3	2	2	1	1	3
	0	0	11	1	2	2	
Public health nurses	1	3	0	2	0	2	3
	0		3	1	3	1	
Medical doctors	1	3	0	1	0	3	3
	0	0	5	1	0	0	
	0	0	10	1	0	0	

HPs	Perception of respondents at MOH (N = 6)						
	DHMTs		OPDs		Healthcare centres		Missing responses
	No. of HPs	No. of MOH that selected the option	No. of HPs	No. of MOH that selected the option	No. of HPs	No. of MOH that selected the option	
<i>DHMTs = District Health Management Teams; OPDs= Outpatient departments; No. = number; HPs = Healthcare professionals</i>							

Table 4-6 shows the perception of respondents at the MOH about the current status of vacancies at the district and PHC levels before the data collection period, in correspondence to question 2.18 (Annexure A). Only two respondents completed question 2.18 (refer to Table 4-6).

The two respondents at the MOH perceived that all vacancies of pharmacists, nurses, public health nurses, and medical doctors were occupied at DHMTs (refer to Table 4-6). One respondent thought that posts of nursing assistants were not occupied at DHMTs (refer to Table 4-6). The reason for vacant nursing assistants' posts at the DHMTs could be that nursing assistants were not allocated posts at the DHMTs (refer to Table 4-5). The two respondents indicated that vacancies for pharmacists at OPDs were occupied, but that posts for nurses, nursing assistants, and medical doctors were not (refer to Table 4-6). The two respondents further perceived that posts for pharmacists and nurse clinicians were vacant at healthcare centres (refer to Table 4-6).

Table 4-6: The perception of respondents at the Ministry of Health on the current status of vacancies at district and primary healthcare levels

Posts of health professionals at DHMTs, OPDs and healthcare centres		Perception of respondents at MOH (N = 6), n		Missing responses (n)
District and PHC levels	Health professionals	Yes	No	
DHMTs	Pharmacists	2	0	4
	Pharmacy technicians	1	1	4
	Nurses	2	0	4
	Nursing assistants	0	1	5
	Public health nurse	2	0	4
	Medical doctors	2	0	4
OPDs	Pharmacists	2	0	4
	Pharmacy technicians	1	1	4
	Nurses	0	2	4
	Nursing assistants	0	2	4
	Medical doctors	0	2	4
Healthcare centres	Pharmacists	0	2	4
	Pharmacy technicians	1	1	4
	Nurses	1	1	4
	Nurse clinicians	0	2	4
	Nursing assistants	1	1	4
	Public health nurse	0	1	5

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs= Outpatient departments; PHC =

Posts of health professionals at DHMTs, OPDs and healthcare centres	Perception of respondents at MOH (N = 6), n	Missing responses (n)
<i>Primary Healthcare Level</i>		

4.4.1.2 The district level

The perception of respondents at the DHMTs about the number of currently available qualified healthcare personnel at OPDs and healthcare centres prior to the study's data collection is presented in Table 4-7. The managers responded to questions 2.20 and 2.21 in the questionnaire, respectively (refer to Annexure B). Most missing responses were found in question 2.20 where seven respondents did not answer the question about the number of available nurses, and nurse clinicians, respectively, and six respondents did not answer the question about medical doctors at OPDs.

Four respondents at the DHMTs were of the viewpoint that one pharmacist was employed at OPDs, three thought that five pharmacy technicians were employed, and two respondents perceived that two nurse clinicians were employed at OPDs (refer to Table 4-7). Eight out of nine respondents perceived that pharmacists and medical doctors were not employed at healthcare centres, and six respondents thought that pharmacy technicians were not employed (refer to Table 4-7). Three respondents were of the opinion that there were at least two nurses currently employed at healthcare centres and, five respondents indicated that one nurse clinician was currently employed at healthcare centres (refer to Table 4-7).

Table 4-7: The perception of respondents at the District Health Management Teams on currently employed health professionals at the primary healthcare level

HPs	Perception of respondents at DHMTs, n (N = 9)					
	OPDs			Healthcare centres		
	Number of HPs	Number of DHMTs that selected the option	Missing responses	Number of HPs	Number of DHMTs that selected the option	Missing responses
Pharmacists	1	4	4	0	8	1
Pharmacy technicians	5	3	1	0	6	3
Nurses	3	1	7	0	1	1
	11	1		2	3	
				3	1	

HPs	Perception of respondents at DHMTs, n (N = 9)					
	OPDs			Healthcare centres		
	Number of HPs	Number of DHMTs that selected the option	Missing responses	Number of HPs	Number of DHMTs that selected the option	Missing responses
				4	2	
				30	1	
Nurse clinicians	2	2	7	0	2	2
				1	5	
				10	1	
Medical doctors	2	1	6	0	8	1
	4	1				
	6	1				

DHMTs = District Health Management Teams; OPDs= Outpatient departments; HPs = Health Professionals

Respondents also answered question 2.22 in the questionnaire, which asked whether health facilities were adequately staffed with healthcare personnel for NCD management (refer to Annexure B). One respondent perceived that OPDs were adequately staffed with healthcare personnel, while two other respondents indicated that OPDs were somewhat adequately staffed. However, two respondents felt that OPDs were not adequately staffed. Also, most of the respondents (n = 5) perceived that healthcare centres were not adequately staffed with healthcare personnel, whereas three respondents perceived that healthcare centres staffing were somewhat adequate.

The perception of respondents on reasons for inadequate staffing at OPDs and healthcare centres is presented in Table 4-8 (refer to question 2.22.3, Annexure B). Although most respondents did not answer question 2.22.3, four respondents thought that OPDs and healthcare centres were inadequately staffed because some facilities were understaffed with pharmacists, pharmacy technicians, and nurse clinicians (refer to Table 4-8).

Table 4-8: The perception of respondents at the District Health Management Teams on reasons for inadequate numbers of health professionals at the primary healthcare level

Cadre of health professionals and reasons why their number is inadequate	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
"The nurses are not specifically assigned to undertake the management of NCDs only. They offer integrated services	1	8

Cadre of health professionals and reasons why their number is inadequate	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
daily.”		
“Not all healthcare centres have pharmacy technicians. Those with pharmacy technicians, they are not deployed by the government but NGOs on contract.”	2	7
“Pharmacists, pharmacy technicians, nurse clinicians. Some facilities are understaffed.”	4	5
“Old establishment list”	1	9
<i>DHMTs = District Health Management Teams; NGOs = Non-governmental organisations</i>		

4.4.1.3 The primary healthcare level

The opinions of respondents at OPDs about the status of health professionals' employment at OPDs (question 2.17, Annexure C) are presented in Table 4-9.

Seven of the 16 respondents perceived that there was one pharmacist employed at OPDs, four indicated that four pharmacy technicians and two nurses were employed, and six respondents thought that three medical doctors were employed at OPDs (refer to Table 4-9). However, nine respondents were of the view that there were no nurse clinicians currently employed at OPDs.

Table 4-9: The perception of respondents at outpatient departments on currently employed health professionals at outpatient departments

Health professionals	Perception of respondents at OPDs, n (N = 16)		
	Number of health professionals	Number of OPDs that selected the option	Missing responses
Pharmacists	1	7	6
	2	3	
Pharmacy technicians	3	2	6
	4	4	
	5	2	
	6	2	
Nurses	0	1	7
	2	4	
	3	1	
	4	2	
	5	1	
Nurse clinicians	0	9	5
	1	1	
	3	1	

Health professionals	Perception of respondents at OPDs, n (N = 16)		
	Number of health professionals	Number of OPDs that selected the option	Missing responses
Medical doctors	2	2	4
	3	6	
	4	1	
	6	3	
<i>OPDs= Outpatient departments</i>			

Figure 4-2 presents perceptions of respondents at OPDs about the type of health professionals available at OPDs (refer to question 2.16, Annexure C). Despite a few missing responses, the majority of respondents at OPDs responded to question 2.16 (refer to Figure 4-2). Twelve respondents were of the opinion that cadres of health professionals found at OPDs were pharmacists. Thirteen of the 16 respondents further thought that pharmacy technicians, nurses, and medical doctors were found at OPDs. However, seven respondents perceived that nurse clinicians were not available at OPDs.

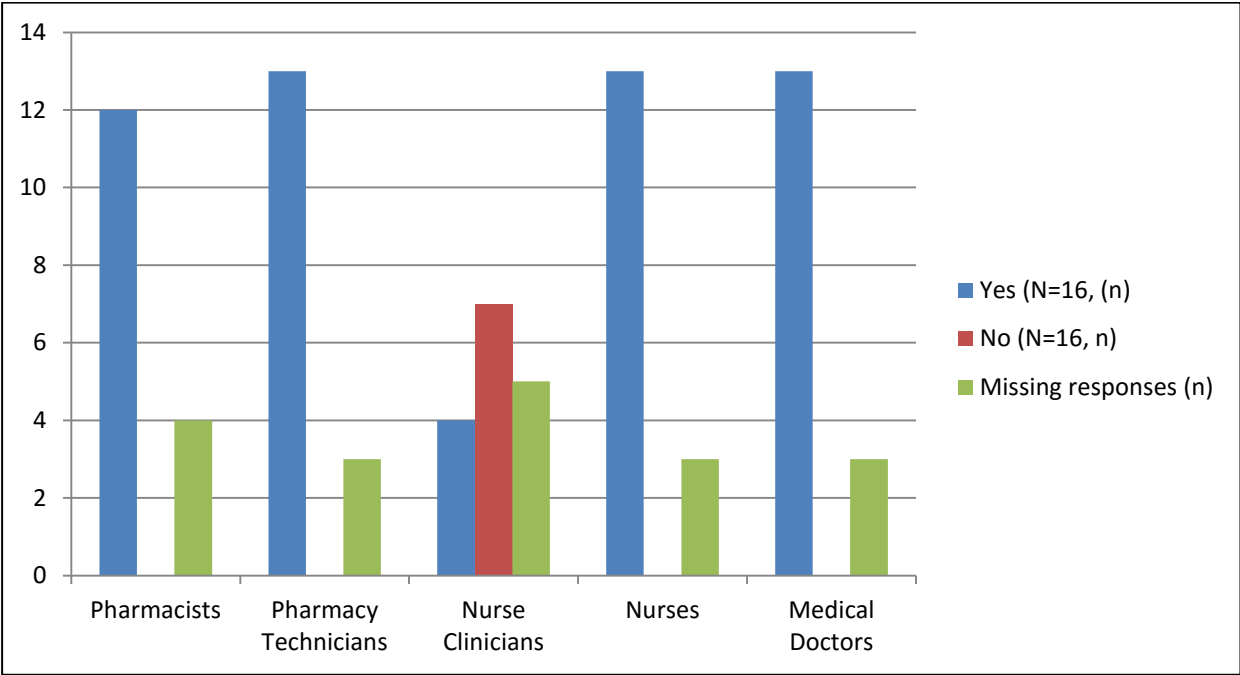


Figure 4-2: The perception of respondents at outpatient departments on the type of health professionals available at outpatient departments

The opinions of respondents at OPDs presented in Figure 4-3 were responses to question 2.18 (Annexure C), asking managers whether OPDs were adequately staffed with healthcare personnel for NCD management or not. Five respondents did not complete question 2.18. Five respondents perceived that OPDs were adequately staffed with pharmacists, whereas another

five respondents were of the opinion that OPDs were not. Six respondents perceived that OPDs were adequately staffed with pharmacy technicians and medical doctors. Although two respondents perceived that OPDs were adequately staffed with nurses and nurse clinicians, eight or more respondents thought that OPDs were not adequately staffed with nurses and nurse clinicians (refer to Figure 4-3).

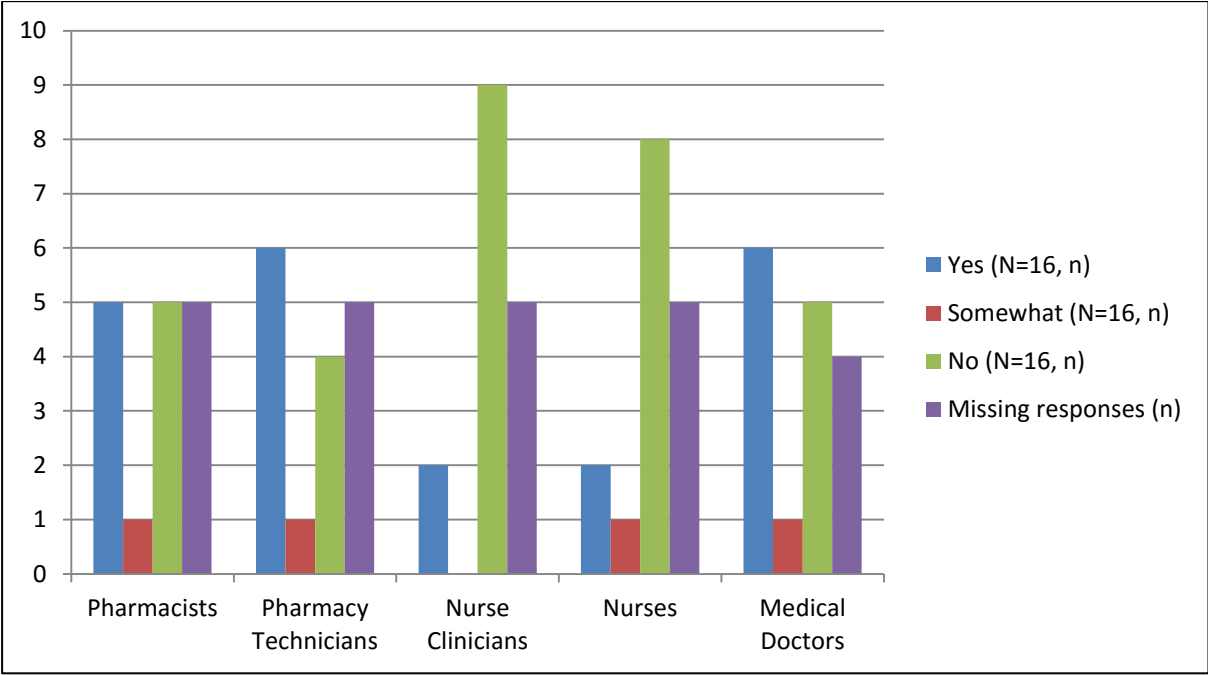


Figure 4-3: The perception of respondents at outpatient departments on adequate staffing of outpatient departments with healthcare personnel

The perception of respondents at OPDs about possible reasons why OPDs were not adequately staffed with health professionals is indicated in Table 4-10 (refer to question 2.19, Annexure C). More than 12 respondents did not respond to question 2.19 (refer to Table 4-10). Four respondents thought that understaffing of nurses and nurse clinicians, loss of interest or no motivation, and use of the establishment list of 1966 were possible reasons for inadequate staffing at OPDs. Also, three respondents were of the opinion that OPDs were manned by one pharmacist, four pharmacy technicians, no nurse clinician, four nurses and three or sometimes one medical officer. These numbers are inadequate as a result of a high volume of patients at OPDs, where a minimum of 120 patients are seen on daily basis (refer to Table 4-10).

Table 4-10: The perception of respondents at outpatient departments on reasons for inadequate staffing at outpatient departments

Reasons for inadequate staffing at OPDs	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
“Understaffing (nurse clinicians, nurses) is a challenge in the country. Loss of interest or no motivation, and use of the establishment list of 1966.”	4	12
“Six doctors, failure of government to employ.”	1	15
“One pharmacist also does management duties and health centres duties so she/he does not have enough time to work in OPDs. There is no nurse clinician.”	1	15
“The OPDs is manned by one pharmacist, four pharmacy technicians, no nurse clinician, four nurses and three or sometimes one medical officer. These numbers are inadequate as a result of high volume of patients at OPDs, where a minimum of 120 patients are seen on daily basis.”	3	13
“Pharmacist – there are no posts for pharmacists.”	1	15
<i>OPDs= Outpatient departments</i>		

- **Discussion of results for the profile of health personnel managing non-communicable diseases**

This section discusses results regarding the perception of managers at the MOH, DHMTs, OPDs and healthcare centres about the profile of health personnel managing NCDs (refer to Section 4.4.1).

According to the World Health Organization, NCDs are a public health concern causing the demise of 41 million people each year, equivalent to 71% of all deaths globally (WHO, 2018g:1). Member States in the WHO Regional Office for Africa (AFRO) have similar health systems; thus, health systems of most African countries have elements such as human resources, service delivery, health information, financing, leadership and governance, and medical products, vaccines and technologies (WHO AFRO, 2012:1-2).

The study findings indicated that the health system of Lesotho is staffed with pharmacists, pharmacy technicians, nurse clinicians, nurses, nursing assistants, public health nurses and medical doctors (refer to Section 4.4.1.1, Table 4-5 & Table 4-6; Section 4.4.1.2, Table 4-7; Section 4.4.1.3, Table 4-9 & Figure 4-2). Similar to the type of health professionals available in the health system of Lesotho (refer to Section 4.4.1), the health systems of Uganda (WHO, 2017:12), Ghana (Ministry of Health Ghana, 2014:8-11), Kenya (Republic of Kenya, 2014a:10-

15), Botswana (Nkomazana *et al.*, 2014:E3-4) and South Africa (African Institute for Health and Leadership Development, 2015:4; Department of Health Republic of South Africa, 2011:21) have medical doctors, nurses and midwives, pharmacists and allied health professionals. Therefore, these countries' health systems have qualified health professionals possessing skills and competencies critical in the management of NCDs.

From the viewpoint of respondents at the MOH (refer to Section 4.4.1.1, Table 4-6), DHMTs (refer to Section 4.4.1.2, Table 4-7) and OPDs (refer to Section 4.4.1.3, Table 4-9 and Figure 4-3), there was a shortage of health professionals involved in the management of NCDs in some OPDs and healthcare centres. The ratio of doctors to population (0.9 per 10 000) and nurse-midwives to population (10.2 per 10 000) in Lesotho are below the World Health Organization Africa (WHO AFRO) average for doctors (2.6 per 10 000) and distribution of health workers (12.0 per 10 000) (UNICEF, 2017a:3; World Bank, 2017:21). Scheffler *et al.* (2016:6) estimated a global needs-based shortage of healthcare workers in 2013 at 17.4 million of whom 2.6 million are doctors, 9 million are nurses and midwives, and the remainder is all other health worker cadres. The largest needs-based shortages of health workers are in South-East Asia at 6.9 million and Africa at 4.2 million (Scheffler *et al.*, 2016:6).

Although only a few respondents answered, the findings of this study indicated that some of the reasons for the shortage of health professionals in OPDs and healthcare centres were understaffing, lack of motivation and use of the establishment list of 1966 (refer to Section 4.4.1.2, Table 4-8; Section 4.4.1.3, Table 4-10). The Ministry of Public Service uses the establishment list produced based on the MOH's proposed numbers of human resource positions across all government health facilities as a guide for staffing norms for MOH facilities (World Bank, 2017:21). The establishment list of 1966 entails staffing norms for health workers in the public health system of Lesotho (World Bank, 2017:21). The establishment list indicates a fixed range of nursing positions at healthcare centres while government hospitals have a flexible number of established positions not based on either bed-based norms or staffing demand (World Bank, 2017:21).

Section 4.4.2 presents the results of the specific objective to assess strategies for hiring and retention of health personnel in health facilities.

4.4.2 Strategies used for hiring and retention of health personnel in health facilities

This section consists of a detailed presentation of the perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about strategies used for hiring and retaining health

personnel in health facilities. The presentation of these strategies was divided into the MOH, district level and the PHC level.

4.4.2.1 The Ministry of Health

The opinion of respondents at the MOH (N = 6) pertaining to the existence of health workforce planning (questions 2.1 and 2.2, Annexure A) is presented in Table 4-11. Question 2.1 asked about the existence of a stable and coordinated health workforce planning for NCD management. More than half of the respondents did not respond to question 2.2 (refer to Table 4-11).

Four out of six respondents at the MOH perceived that regular and coordinated health workforce planning for NCD management existed at the national level, and three respondents felt the same about the district level, PHC level, and development partners (refer to Table 4-11). However, two respondents thought that health workforce planning excluded the Department of Education and Academic Institutions at the MOH. Also, three of the six respondents indicated that the health workforce planning excluded the Department of Finance (refer to Table 4-11).

Table 4-11 further indicate that two respondents were of the opinion that there was a joint annual human resource planning process that involves key stakeholders, there were policies regarding employing and firing personnel, employee discipline, paying and rewarding workers, promotion, and distributing workers. Two respondents further perceived that there were organisational models used to project, monitor, and evaluate staffing requirements.

Table 4-11: The perception of respondents at the Ministry of Health on health workforce planning for non-communicable disease management in the health system levels or departments

Existence of regular and coordinated health workforce planning for NCD management in the health system levels or departments	Perception of respondents at MOH (N = 6), n		
	Yes	No	Missing responses
National level	4	0	2
District level	3	1	2
PHC level	3	1	2
Education including academic institutions	1	2	3
Finance	0	3	3
Private sector actors (role-players)	2	2	2
Development partners	3	1	2
WHO	1	0	5

Existence of the following for regular and coordinated health workforce planning for NCD management	Yes	No	Missing responses
Availability of joint annual human resource planning process that involves key stakeholders.	2	0	4
Existence of policies used to employ, lay off, discipline, pay, reward, promote, and deploy workers.	2	0	4
Existence of organisational models used to project, monitor, and evaluate staffing requirements.	2	0	4
Public Service Act 2005 and Public Service Regulations.	1	0	5
<i>MOH = Ministry of Health; WHO = World Health Organization</i>			

Only half (n = 3) of the respondents answered question 2.9 (Annexure A) about high attrition rates of health professionals at the district and primary healthcare levels (refer to Figure 4-4). Two respondents perceived that the DHMTs and OPDs did not have high attrition rates compared to one respondent who was of the opinion that they do. Two respondents, however, were of the view that healthcare centres had high attrition rates (refer to Figure 4-4).

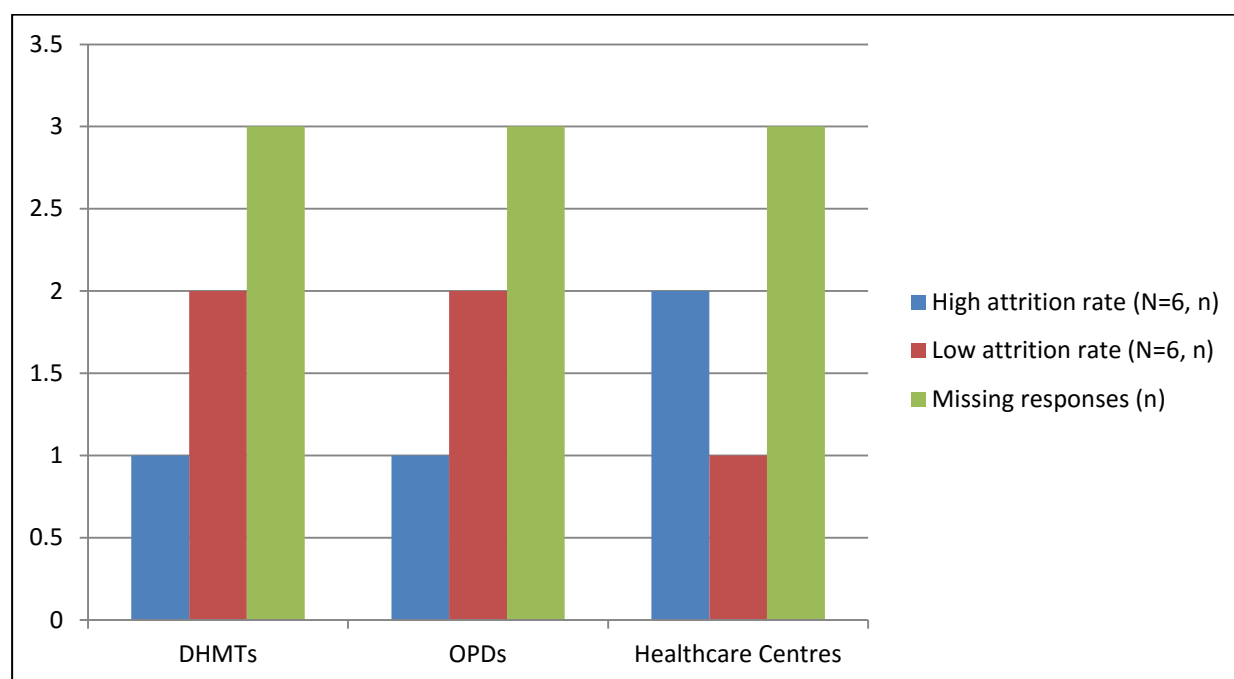


Figure 4-4: The perception of respondents at the Ministry of Health on attrition rates of health professionals at the district and primary healthcare levels

Question 2.10 (Annexure A) in the questionnaire was an open question that required respondents who answered “yes” to question 2.9 to provide reasons for high attrition rates at DHMTs, OPDs and healthcare centres. Only one out of six respondents replied to question 2.10 stating that: “*Most health workers seek greener pastures at partner organisations such as Elizabeth Glaser Paediatric AIDS Foundation (EGPATH), Partners in Health (PIH) and some*

oversees through recruitment agencies.” The respondent ascribed the high attrition rate to a lack of incentive packages and healthcare centres being located in hard to reach places (rural areas in the mountains).

Table 4-12 presents the perceptions of respondents at MOH on cadres of healthcare personnel with high attrition rates at district and PHC levels (Annexure A). More than half of the respondents did not complete question 2.11. Two MOH respondents perceived that pharmacists did not have high attrition rates at the DHMTs, whereas one manager indicated that there were no high attrition rates among district health managers (refer to Table 4-12). Two respondents were of the opinion that attrition rates were low for pharmacists, the hospital manager for nursing services, matrons, and pharmacy technicians at OPDs. Two respondents perceived that nurses and nurses in charge had high attrition rates at healthcare centres (refer to Table 4-12).

Table 4-12: The perception of respondents at the Ministry of Health on cadres of healthcare personnel with high attrition rates at the district and primary healthcare levels

Cadres of healthcare personnel with high attrition rates at DHMTs, OPDs and healthcare centres		Perception of respondents at MOH (N = 6), n		Missing responses (n)
District and PHC levels	Cadre of healthcare personnel	Yes	No	
DHMTs	District health managers	0	1	5
	Pharmacists	0	2	4
	Public health nurse	1	1	4
OPDs	Pharmacists	0	2	4
	Hospital manager of nursing services	0	2	4
	Matrons	0	2	4
	Medical superintendents	0	1	5
	Nurses	1	1	4
	Pharmacy technicians	0	2	4
Healthcare centres	Nurses in charge	2	0	4
	Nurse clinicians	1	1	4
	Nurses	2	0	4

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.4.2.2 The district level

In response to question 2.9 (refer to Annexure B) asking whether there were high attrition rates at PHC level (refer to Annexure B), five respondents were of the opinion that there were no attrition rates at PHC level.

The perception of respondents at DHMTs on the availability of employees' benefits at district and PHC levels (refer to question 2.14, Annexure B) is presented in Table 4-13. From the nine respondents at DHMT, three were of the opinion that rotation systems were not available to employees. Other benefits not available at the DHMTs from the viewpoint of respondents included medical aids (n = 6) (refer to Table 4-13). Five respondents did, however, perceived that training plans were available to personnel. Five respondents thought that housing was not available to employees. Also, three respondents thought that there were incentives for employees at DHMTs (refer to Table 4-13). Three respondents perceived that employees at DHMTs had promotion opportunities.

Although more than three-quarters of respondents did not respond, one of the nine respondents perceived that employees at OPDs had rotation systems and housing whereas two respondents thought that training plans were available to personnel (refer to Table 4.13). However, two respondents were of the opinion that employees at OPDs did not have medical aids (refer to Table 4.13). Similarly, more than three-quarters of the respondents did not reply to the question of whether benefits were available to employees at healthcare centres. Out of the nine respondents, two perceived that employees at healthcare centres had rotation systems and a training plan (refer to Table 4-13). However, two respondents were of an opinion that employees at healthcare centres did not have medical aids.

Table 4-13: The perception of respondents at the District Health Management Teams on availability of employees benefits at the district and primary healthcare levels

Benefits for employees	Perception of respondents at DHMTs (N = 9), n								
	DHMTs			OPDs			Healthcare centres		
DHMTs	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Rotation systems	3	2	4	0	1	8	1	2	6
Training plan	0	5	4	0	2	7	0	2	7
Housing for personnel	5	1	3	0	1	8	0	1	8
Incentives	2	3	4	1	0	8	1	0	8
Promotion opportunities	3	3	3	1	1	7	1	1	7
Medical aids	6	0	3	2	0	7	2	0	7

DHMTs = District Health Management Teams; OPDs= Outpatient departments

In response to question 2.19 (Annexure B), three out of nine respondents at the DHMTs perceived that healthcare personnel at OPDs and healthcare centres were satisfied with their working conditions. However, five respondents perceived that healthcare personnel at healthcare centres were not satisfied with their working conditions while two respondents felt that healthcare personnel at OPDs were not satisfied.

Five DHMT respondents also provided their opinion on reasons why the healthcare personnel were not satisfied with working conditions (refer to question 2.19.3, Annexure B), stating that healthcare personnel in healthcare centres were not satisfied with their working conditions because of "*Workload and inadequate human resources.*"

4.4.2.3 The primary healthcare level

The perception of respondents at OPDs and healthcare centres about the availability of benefits for employees at OPDs and healthcare centres is presented in Table 4-14 (refer to question 2.12, Annexure C). At least five or more respondents at OPDs did not respond to question 2.12 (refer to Table 4-14). Out of 16 respondents, nine thought rotation systems were available to employees. Six respondents indicated that employees were given incentives. Eight respondents perceived that employees also had housing and a training plan. However, 10 out of the 16 respondents were of a viewpoint that employees did not have medical aids and seven respondents also indicated that employees did not have promotion opportunities (refer to Table 4-14).

Question 2.18 in the healthcare centres' questionnaire asked about benefits available to employees at healthcare centres (refer to Annexure D). Out of 86 respondents at healthcare centres, 49 (57.0%) respondents perceived that employees had rotation systems, 59 (68.6%) thought they were provided with housing, and 46 (53.5%) felt that employees were given incentives (refer to Table 4-14). However, 41 (47.7%) respondents were of the opinion that employees at healthcare centres did not have a training plan, 58 (67.4%) thought there were no promotion opportunities, and 63 (73.3%) perceived that employees did not have medical aids (refer to Table 4-14).

Table 4-14: The perception of respondents at health facilities on availability benefits for employees benefits at outpatient departments and healthcare centres

Benefits for employees	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
Rotation systems	1	9	6	22 (25.6)	49 (57.0)	37 (43.0)
Training plan	3	8	5	41 (47.7)	26 (30.2)	60 (69.8)
Housing for personnel	2	8	6	9 (10.5)	59 (68.6)	27 (31.4)
Incentives	3	6	7	25 (29.1)	46 (53.5)	40 (46.50)
Promotion opportunities	7	3	6	58 (67.4)	12 (14.0)	74 (86.0)
Medical aids	10	0	6	63 (73.3)	11 (12.8)	75 (87.2)
Free medical services for staff	0	1	15	0	0	0

OPDs= Outpatient departments

- **Discussion of results on strategies used for hiring and retention of health personnel in health facilities**

Results on the assessment of strategies used for hiring and retention of health personnel in health facilities stated in Section 4.4.2 are discussed in this subdivision.

Health workforce planning

Health professionals are crucial for providing health services to patients with NCDs because health systems cannot function effectively in the absence of qualified health professionals (FIP, 2019:4-5). Health workforce planning assists governments and health respondents to develop human resources (WHO, 2010a:4). According to the respondents at the MOH, Lesotho has regular and coordinated health workforce planning for NCD management in different health system levels or departments (refer to Section 4.4.2.1, Table 4-11). The WHO (2010a:4) furthermore stated that planning for health workforce development needs to be formulated through a collaborative process between the ministries of health and other key stakeholders. The present study's findings indicated that the health workforce planning excluded stakeholders such as finance, education, and academic institutions (refer to Section 4.4.2.1, Table 4-11). This exclusion of other stakeholders creates a challenge as NCD management involves numerous

parties that bring differing contributions in the form of finances, skills, competencies, and health workers' production.

Attrition rates of healthcare workers at health facilities

The findings of this study further revealed that there were high attrition rates of health professionals, such as nurses in charge and nurses in healthcare centres (refer to Section 4.4.2.1, Figure 4-4 and Table 4-12). The high attrition rates of these healthcare professionals were due to healthcare centres being located in rural areas, inadequate incentives packages and healthcare professionals seeking greener pastures at partners' organisations and overseas (refer to Section 4.4.2.1). Ethiopia, India, Pakistan and Lesotho are countries with similarities in their health systems. Health professionals in public health centres in West Ethiopia were not satisfied with their current job (Deriba *et al.*, 2017:7) in contrast; health professionals in public health facilities in Punjab, India were satisfied with their jobs (Singh *et al.*, 2020:3272). Job satisfaction is a contributing factor to decreasing attrition rates of healthcare professionals at health facilities. Job satisfaction is vital for effective health service delivery and depends on the motivation of health professionals which could be in the form of benefits and incentives (Global Health Workforce Alliance, 2008:11). Similarly, respondents at DHMTs perceived that healthcare personnel at healthcare centres in Lesotho were not satisfied with their working conditions because of the workload and inadequate human resources (refer to Section 4.4.2.2). Similar to these study findings, health professionals in the public sector in Pakistan were not satisfied with their job (Kumar *et al.*, 2013:3). Thus, job dissatisfaction is a cause for concern because it could affect the overall efficiency, effectiveness and sustainability of the Pakistan health system (Kumar *et al.*, 2013:3). Job dissatisfaction leads to poor service delivery and high attrition rates of health professionals in healthcare centres in Lesotho and other countries.

Benefits for employees

The study findings also indicated that some respondents perceived that employees at the district and PHC levels in the health system of Lesotho had benefits from job contracts such as rotation systems, training plans, housing for personnel, incentives and promotion opportunities (refer to Section 4.4.2.2, Table 4-13; Section 4.4.2.3, Table 4-14). Availability and improvement of these benefits could remedy the high attrition rates of nurses and nurses in charge in healthcare centres. Deriba *et al.* (2017:4-5) assessed the level of job satisfaction at public health centres in West Ethiopia and indicated that factors that could increase health professionals' job satisfaction included salary, incentives, developmental opportunities, recognition by management and patient appreciation. Therefore, job satisfaction was associated

with employees' compensation, recognition by management, opportunity for development, increase in salary, and incentives (Deriba *et al.*, 2017:4-5). Increased job satisfaction among health professionals, in turn, improves staff performance and patient satisfaction.

The following section presents the results emanating from the specific objective that assessed available human resource management systems that include support, clinical supervision and performance monitoring.

4.4.3 Available human resource management systems that include support, clinical supervision and performance monitoring

This section entailed perceptions of managers at the MOH, DHMTs, OPDs and the healthcare centres about available human resource management systems that include support, clinical supervision and performance monitoring. To assess the perception of managers on the number of clinical supervisions conducted at health facilities, the norm for clinical supervision visits in Lesotho was used. The norm for clinical supervision visits at health facilities at the PHC level of Lesotho is that DHMTs should carry out at least one clinical supervisory visit at a health facility per month (UNICEF, 2017b:43). Thus, in six months, the DHMTs should have carried out at least six clinical supervisory visits in health facilities.

This section was divided into the MOH, district level and the PHC level.

4.4.3.1 The Ministry of Health

Table 4-15 presents the perception of respondents at MOH on the availability of job descriptions for healthcare workers at DHMTs, OPDs and healthcare centres (see question 1.9, Annexure A). All respondents perceived that the district health manager, pharmacists, and public health nurse at DHMTs had job descriptions (refer to Table 4-15). All respondents indicated that pharmacists, hospital respondents for nursing services, matrons, and nurses at OPDs had job descriptions whereas five respondents were of the opinion that medical superintendents or the medical doctors at OPDs also had job descriptions. All respondents perceived that nurses and nurse clinicians at healthcare centres had job descriptions (refer to Table 4-15).

Table 4-15: The perception of respondents at the Ministry of Health on the availability of job descriptions for healthcare workers at the district and primary healthcare levels

District and PHC levels	Availability of job descriptions for the following healthcare workers	Perception of respondents at MOH (N = 6), n	Missing responses (n)
DHMTs	District health manager	6	0
	Pharmacists	6	0
	Public health nurse	6	0
OPDs	Pharmacists	6	0
	Hospital manager for nursing services	6	0
	Matrons	6	0
	Medical superintendents	5	1
	Medical doctors	5	1
Healthcare centres	Nurses	6	0
	Nurse clinicians	6	0
	Nurses	6	0

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs= Outpatient departments

Question 1.10 (Annexure A) inquired as to whether NCD management was included in the job descriptions of health professionals at DHMTs, OPDs and healthcare centres. The responses of respondents are presented in Table 4-16. More than half of the respondents at the MOH perceived that the management of NCDs was included in the job descriptions of healthcare workers at DHMTs, OPDs and healthcare centres (refer to Table 4-16).

Table 4-16: The perception of respondents at the Ministry of Health on the inclusion of non-communicable disease management in the job description of healthcare workers

District and PHC levels	Healthcare workers at DHMTs, OPDs and healthcare centres	Perception of respondents at MOH (N = 6), n	Missing responses (n)
DHMTs	District health manager	3	3
	Pharmacists	4	2
	Public health nurse	4	2
OPDs	Pharmacists	5	1
	Hospital manager for nursing services	3	3
	Matrons	4	2
	Medical superintendents	3	3
	Medical doctors	3	3

District and PHC levels	Healthcare workers at DHMTs, OPDs and healthcare centres	Perception of respondents at MOH (N = 6), n	Missing responses (n)
	Nurses	4	2
Healthcare centres	Nurse clinicians	4	2
	Nurses	4	2

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs= Outpatient departments

The perception of respondents at the MOH on district health management structures in Lesotho's public health system is presented in Table 4-17 (refer to question 1.8, Annexure A). All respondents at the MOH perceived that DHMTs were in place in Lesotho and three respondents thought that the District Health Committee was in place. Three respondents also perceived that DHMTs were led by guidelines on its functions. Four respondents thought that DHMTs was authorised to decide on the district health plan and purchase of drugs and medical supplies (refer to Table 4-17). Furthermore, five respondents indicated that DHMTs had the authority to decide on the district health budget whereas three respondents felt that DHMTs was authorised to decide on human resources.

Table 4-17: The perception of respondents at the Ministry of Health on the district health management structures in place in Lesotho

Description of the district health management structures	District health management structures	Perception of respondents at MOH (N = 6), n	Missing responses (n)
District health management structure in place in Lesotho	District Development Committee	1	5
	District Health Committee	3	3
	DHMTs	6	0
District health management structures have guidelines on its functions	District Development Committee	1	5
	District Health Committee	2	4
	DHMTs	3	3
Authority to make decisions on the district health plan	District Development Committee	2	4
	District Health Committee	1	5
	DHMTs	4	2
Authority to make decisions on the district health budget	District Development Committee	0	6
	District Health	1	5

Description of the district health management structures	District health management structures	Perception of respondents at MOH (N = 6), n	Missing responses (n)
	Committee		
	DHMTs	5	1
Authority to make decisions on human resources	District Development Committee	0	6
	District Health Committee	0	6
	DHMTs	3	3
Authority to make decisions on the purchase of drugs	District Development Committee	0	6
	District Health Committee	1	5
	DHMTs	4	2
Authority to make decisions on the purchase of medical supplies	District Development Committee	0	6
	District Health Committee	0	6
	DHMTs	4	2
Number of health facilities with a district health plan	Not sure	1	5
	All health facilities in the country	1	5
<i>MOH = Ministry of Health; DHMTs = District Health Management Teams</i>			

The opinion of managers at the MOH on processes to strengthen clinical supervision is presented in Table 4-18 (refer to question 2.6, Annexure A). Three respondents perceived that clinical supervision visits to healthcare centres were planned for the next year. Four respondents of the six perceived that CHWs did not receive clinical supervisory visits in the past six months before this study's data collection. Three respondents thought that senior staff at PHC facilities did not receive in-service management training with nationally approved curricula on NCD management in the past year prior to this study's data collection. Two respondents perceived that clinical supervisory visits to healthcare centres were not conducted for which data are available in the last year before the data collection of this study but, one respondent thought that they were (refer to Table 2-18).

Table 4-18: The perception of respondents at the Ministry of Health on processes in place to strengthen clinical supervision

Processes in place to strengthen clinical supervision	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
In the past year, did health service providers at PHC facilities receive clinical supervision on NCD management?	2	2	2
In the past year, did senior staff at PHC facilities receive in-service management training on NCD management?	2	2	2
Did the senior staff at PHC facilities receive work-related management training with NCD management curricula that was approved nationally in the past year?	3	0	3
In the past six months, did CHWs receive clinical supervision on NCD management?	4	0	2
In the last year, were clinical supervision visits to healthcare centres conducted for which data are available?	2	1	3
In the next year, are there planned clinical supervision visits to healthcare centres?	1	3	2
<i>MOH = Ministry of Health</i>			

The respondents responded to question 1.12 about NCDs studies carried out in the districts in the past five years (refer to Annexure A). Two out of six respondents at the MOH perceived that capacity study to support NCDs was conducted in Lesotho in the past five years and one respondent further indicated that health system research and household surveys were conducted.

4.4.3.2 The district level

In question 1.12, managers at the DHMTs had to indicate if they had job descriptions or not (refer to Annexure B). Five respondents perceived that job descriptions were available for managers at DHMTs. One respondent also thought that an NCDs study conducted in the districts in the past five years prior to the data collection of this study was a household survey (refer to question 1.10, Annexure B).

The opinion of respondents at DHMTs about DHMT structure in Lesotho's public health system is presented in Table 4-19. Eight respondents perceived that a DHMT structure is in place in Lesotho and had guidelines on its functions and responsibilities. Seven respondents believed that the DHMT had the authority to make decisions on the district health plan, district health budget and purchase of drugs. Six respondents thought that the DHMT had the authority to make decisions on the purchase of medical supplies (refer to Table 4-19).

Table 4-19: The perception of respondents at the District Health Management Teams on District Health Management Team structures in Lesotho

District Health Management Team structures in Lesotho	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
Is the DHMT structure in place in Lesotho?	8	1
DHMT has guidelines on its functions and responsibilities.	8	1
Authority of DHMT structure to make decisions on district health plan.	7	2
Authority of DHMT structure to make decisions on district health budget.	7	2
Authority of DHMT structure to make decisions on human resources.	1	8
Authority of DHMT structure to make decisions on purchase of drugs.	7	2
Authority of DHMT structure to make decisions on purchase of medical supplies.	6	3
<i>DHMT = District Health Management Team</i>		

Six respondents perceived that DHMTs carried out clinical supervision in healthcare centres but, one respondent was of the opinion that DHMTs did not conduct clinical supervision at healthcare centres. One respondent felt that DHMTs sometimes carried out clinical supervision at healthcare centres (refer to question 2.1, Annexure B).

Seven out of nine respondents at DHMTs noted that they used supervision checklists, five indicated that they used supervision plan or schedule, and six felt they used reports of past supervision visits during clinical supervisory visits at healthcare centres. However, one respondent was of the opinion that supervision checklists were not used whereas two thought that supervision plans or schedules were not used (refer to question 2.2, Annexure B).

Table 4-20 presents the response of managers to question 2.3 (Annexure B) where they had to state the number of clinical supervisory visits conducted in healthcare centres in the past six months prior to the date of data collection of this study. Of the nine respondents, one perceived that three or more clinical supervisory visits were conducted in healthcare centres in the past six months before the date of data collection of this study, whereas, two respondents thought that four clinical supervisory visits were carried out.

Table 4-20: The perception of respondents at the District Health Management Teams on the number of clinical supervisory visits conducted by the District Health Management Teams in healthcare centres

Number of clinical supervisory visits carried out in healthcare centres in the past six months prior to the date of data collection of this study by the DHMTs	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
3	1	8
4	2	7
18	1	8
37	1	8
39	1	8

DHMT = District Health Management Teams

Responses to questions 2.3.1 and 2.3.2 in the questionnaire about the implementation of recommended changes during clinical supervisory visits at healthcare centres (refer to Annexure B) are presented in Table 4-21. Six respondents perceived that changes recommended by DHMTs during clinical supervisory visits were implemented at healthcare centres. One out of the nine respondents thought that examples of changes made as a result of clinical supervisory visits on NCD management included “Updating registries on daily basis”, another felt changes included “Established consumption of medicines”, the other respondent perceived changes to include “Adhere to STGs when treating NCDs”, and another indicated that “Referrals of chronic hypertension” were implemented (refer to Table 4-21).

Table 4-21: The perception of respondents at the District Health Management Teams on changes implemented by healthcare workers after clinical supervisory visits in healthcare centres

Changes recommended by DHMTs during clinical supervisory visits on NCD management were implemented at healthcare centres	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
Yes	6	3
No	0	0
Examples of changes that made in healthcare centres as a result of clinical supervisory visits on NCD management.		
“Updating registries on a daily basis.”	1	8
“Established consumption of medicines.”	1	8
“Adhere to STGs when treating NCDs.”	1	8
“Referrals of chronic hypertension.”	1	8

DHMT = District Health Management Teams; STGs = Standard treatment guidelines

4.4.3.3 The primary healthcare level

The managers at the OPDs responded to question 2.1 where they had to indicate whether the DHMTs conducted clinical supervisory visits at OPDs (refer to Annexure C). Three respondents perceived that the DHMTs conducted clinical supervision at OPDs but, two respondents indicated they did not conduct clinical supervisory visits. Four respondents thought that DHMTs sometimes carried out clinical supervisory visits at OPDs.

Four respondents at OPDs were of the opinion that DHMTs used supervision checklists whereas one of the 16 respondents indicated that DHMTs used a supervision plan or schedule (refer to question 2.2 Annexure C). However, two respondents felt that DHMTs did not use a supervision plan or schedule during clinical supervision at OPDs.

The managers at healthcare centres responded to question 2.1 in the questionnaire (refer to Annexure D). Sixty-three (73.3%) respondents perceived that DHMTs used supervision checklists. A further 40 (46.5%) respondents thought that a supervision plan or schedule was used. However, 12 (14.0%) respondents thought supervision checklists were not used during clinical supervision visits at healthcare centres and a further 19 (22.1%) respondents perceived that a supervision plan or schedule were not used.

Table 4-22 presents the managers' opinion at OPDs (refer to question 2.3, Annexure C) and healthcare centres (refer to question 2.2, Annexure D) about the number of clinical supervisory visits conducted at PHC level in the past six months before the date of data collection of this study. Of the 16 respondents at OPDs, 14 did not complete question 2.3 (refer to Table 4-22). One respondent perceived that both DHMT pharmacist and the laboratory technician conducted one clinical supervisory visit and, three respondents were of the opinion that a public health nurse conducted one clinical supervisory visit at the respective OPDs (refer to Table 4-22).

The respondents at healthcare centres responded poorly to question 2.2 (refer to Table 4-22). Twenty-three (26.7%) respondents were of the opinion that DHMT pharmacists did not conduct clinical supervisory visits at healthcare centres (refer to Table 4-22). Twenty-nine (33.7%) respondents also perceived that clinical supervisory visits at healthcare centres were not conducted by the public health nurse. Two (2.3%) respondents at healthcare centres further pointed out that medical doctors conducted six clinical supervisory visits.

Table 4-22: The perception of respondents at health facilities on the number of clinical supervisory visits carried out at outpatient departments and healthcare centres

Healthcare workers who conduct clinical supervisory visits at OPDs and healthcare centres	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	Number of clinical supervisory visits	Number of OPDs that selected the option	Missing responses	Number of clinical supervisory visits	Number of healthcare centres that selected the option	Missing responses
DHMT pharmacists	1	1	14	0	23 (26.7)	25 (29.1)
				1	4 (4.7)	
				2	19 (22.1)	
				3	7 (8.1)	
				4	2 (2.3)	
				5	1 (1.2)	
				6	5 (5.8)	
Public health nurse	1	3	12	0	29 (33.7)	24 (27.9)
				1	6 (7.0)	
				2	22 (25.6)	
				3	4 (4.7)	
				6	1 (1.2)	
Medical doctor	0	0	0	5	1 (1.2)	83 (96.5)
				6	2 (2.3)	
Information officer	0	0	0	1	1 (1.2)	85 (98.8)
Laboratory technician	1	1	14	0	0	0

DHMTs = District Health Management Teams; OPDs= Outpatient departments

The managers at OPDs (questions 2.3.1 and 2.3.2, Annexure C) and healthcare centres (questions 2.2.1 and 2.3, Annexure D) responded to questions in the questionnaires where they indicated whether recommendations were made by DHMTs during clinical supervisory visits and if those changes were implemented at health facilities. The majority of respondents at OPDs did not respond to question 2.3.1 (n = 13) and question 2.3.2 (n = 12). Two respondents perceived that DHMTs provided recommendations during clinical supervisory visits at OPDs but, one respondent felt that no recommendations were provided by DHMTs. Although two respondents felt that the recommended changes were implemented at OPDs another two perceived that the recommended changes were not implemented. More than two-thirds of respondents at healthcare centres did not answer questions 2.2.1 and 2.3. Forty-two (48.8%) respondents perceived that DHMTs gave recommendations during clinical supervisory visits at healthcare centres, and 39 (45.3%) indicated that recommended changes were implemented. However, other respondents (23.3%, n = 20) perceived that DHMTs did not provide recommendations during clinical supervisory visits. Eighteen respondents (20.9%) further stated that where DHMTs did provide recommendations, those recommendations were not implemented at healthcare centres.

The managers at healthcare centres provided a list of changes implemented at healthcare centres after clinical supervisory visits (refer to question 2.4, Annexure D). Seven (8.1%) of the respondents perceived that some of the changes included “*Usage of STGs*”, whereas six (7.0%) respondents listed “*Drug supply management*” as a change affected after clinical supervisory visits (refer to Table 4-23).

Table 4-23: The perception of respondents at healthcare centres on examples of changes implemented after clinical supervisory visits in healthcare centres

Examples of changes that were made in healthcare centres as a result of clinical supervisory visits on NCD management	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses (n, %)
“Usage of STGs.”	7 (8.1)	79 (91.8)
“Provide services for mental health and diabetes medication refills. Provide check-ups for hypertension and asthma.”	1 (1.2)	85 (98.8)
“Assessment of blood pressure, weight and blood tests every six months or when necessary to detect complications.”	4 (4.7)	82 (95.3)
“Appointment record-keeping for hypertension and diabetes mellitus. Schedule health talks.”	1 (1.2)	85 (98.8)
“Re-enforce education on behavioural change and lifestyle modifications.”	2 (2.3)	84 (97.7)

Examples of changes that were made in healthcare centres as a result of clinical supervisory visits on NCD management	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses (n, %)
"Drug supply management"	6 (7.0)	80 (93.0)

- **Discussion of results for available human resource management systems that include support, clinical supervision and performance monitoring**

Section 4.4.3 presented results on human resource management systems which are discussed below.

The findings of this study indicated that the District Health Committee, DHMTs and the District Development Committee were the district health management structures in place in Lesotho (refer to Section 4.4.3.1, Table 4-17; Section 4.4.3.2, Table 4-19). These district health management structures had the authority in the health system of Lesotho where the DHMTs had the authority to make decisions on the district health plan and budget, human resources, and purchase of drugs and medical supplies (refer to Section 4.4.3.1, Table 4-17; Section 4.4.3.2, Table 4-19). The District Development Committee had the authority to make decisions on the district health plan (refer to Section 4.4.3.1, Table 4-17). In support of this study finding, the district level (district health system) of the health system of Lesotho is composed of DHMT responsible for managing healthcare service delivery at healthcare centres and community-level health interventions (GOL, 2013:40; MOHSW, 2011:41). South Africa has a District Health System which is the preferred government mechanism for health provision within a PHC approach (African Institute for Health and Leadership Development, 2015:3). In Botswana, the MOH provides PHC services through DHMTs responsible for running a network of health facilities, hospitals, clinics, health posts, and community-based preventative and promotive services (Government of Botswana, 2021:1). Also, Burundi has introduced a district health system responsible for the coordination and efficient performance of the district office as an integrated department within the health system (Nsengiyumva & Musango, 2013:3). Nsengiyumva and Musango (2013:4) further indicated that the district management teams within the district health system in Burundi were functional and efficient.

The findings of the study indicated that DHMTs conducted clinical supervisory visits at OPDs and healthcare centres at PHC level (refer to Section 4.4.3.2, Table 4-20; Section 4.4.3.3, Table 4-22). The norm for clinical supervision visits at health facilities at the PHC level of Lesotho was that DHMTs should carry out at least one clinical supervisory visit at a health facility per month (UNICEF, 2017b:43). Thus, in six months, the DHMTs should have carried out at least six clinical supervisory visits in health facilities. The frequency of conducting clinical supervisory

visits at PHC level in Lesotho is similar to that of South Africa, where supportive monitoring visits at the PHC facility is done at least once a month to support personnel, monitor the quality of service and identify needs and priorities (National Department of Health: Assurance Directorate, 2009:1:2). At the PHC level of the health system of Lesotho, most DHMTs conducted a minimum of four clinical supervisory visits in the past six months prior to the date of data collection of this study as per the opinion of respondents at the DHMTs (refer to Section 4.4.3.2, Table 4-20). Although DHMTs conducted clinical supervisory visits at PHC level, the number of clinical supervisory visits was below the norm of conducting at least six visits in six months.

Additionally, an evaluation of PHC supervision services in the Mpumalanga Province (South Africa) was conducted by Jacobs *et al.* in 2014. This evaluation revealed that more than one-third of PHC supervisors conducted PHC supervision visits monthly while others quarterly using a supervisory tool such as a checklist (red flag and regular review) to ensure that all critical areas were covered during PHC supervision (Jacobs *et al.*, 2014:7-8). Likewise, the findings of this study indicated that DHMTs conducted clinical supervisory visits at OPDs and healthcare centres at PHC level in Lesotho (refer to Section 4.4.3.3, Table 4-22), and made use of documents such as supervision checklists during clinical supervisory visits (refer to Section 4.4.3.3).

The subsequent section outlines the results of the specific objective that assessed collaborative activities among public and private health facilities, including the community with NCD management.

4.4.4 Collaborative activities among public and private health facilities, including the community concerning non-communicable disease management

In this section, the thoughts of managers at the MOH, DHMTs, OPDs and the healthcare centres pertaining to collaborative activities among public and private health facilities as well as the community are presented and discussed in detail. This section is divided into responses at the MOH, district level and the PHC level.

4.4.4.1 The Ministry of Health

Three respondents at the MOH perceived that there was no governmental structure for a community-focused service delivery system in NCD management, compared to one respondent who was of the opinion that this structure existed (refer to Annexure A, question 2.14).

Responses of respondents to questions 2.15 and 2.16 (refer to Annexure A) are presented in Figure 4-5. Question 2.15 required managers to indicate if there were CHWs working together with healthcare centres at PHC level. Three of the respondents perceived that no CHWs were working together with healthcare centres at PHC level whereas two did (refer to Figure 4-5). Although more than half of the respondents did not respond to question 2.16 (refer to Annexure A), three respondents perceived that CHWs were funded by the government of Lesotho, and two respondents thought that CHWs were not funded by the community members (refer to Figure 4-5).

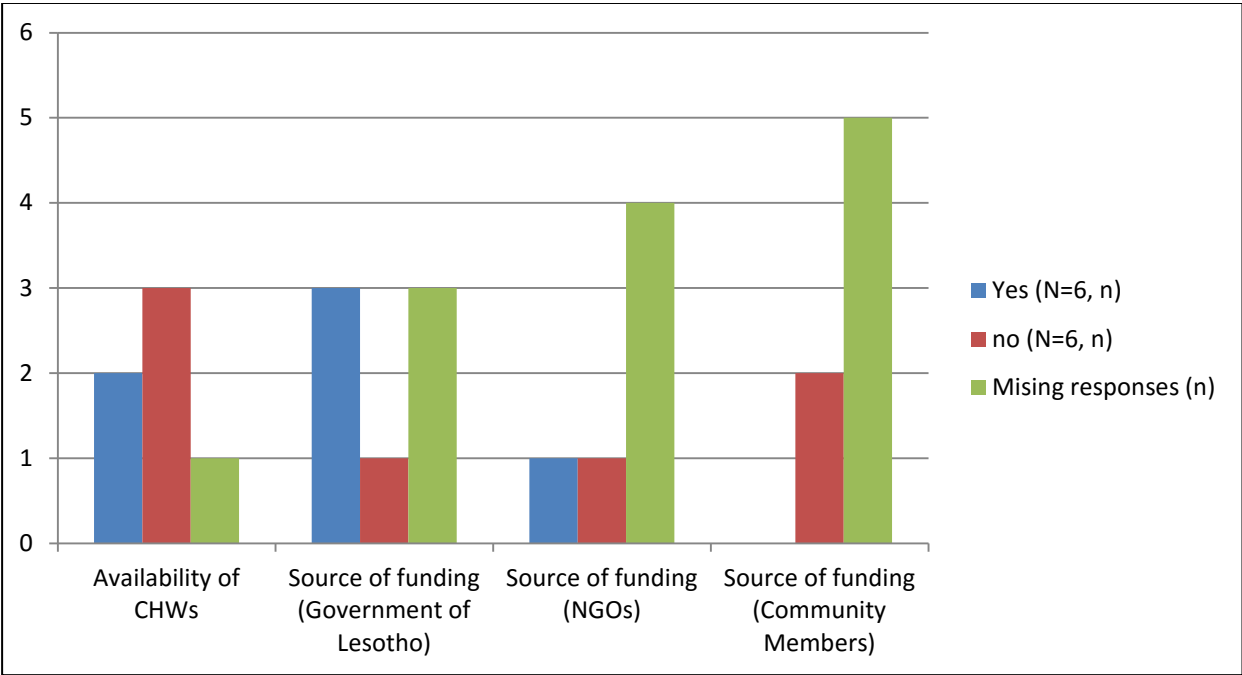


Figure 4-5: The perception of respondents at the Ministry of Health on availability of community health workers at primary healthcare level

4.4.4.2 The district level

These perceptions of managers at DHMTs about collaborative activities between DHMTs and private health services were responses to questions 2.12 and 2.13 (refer to Annexure B). In response to question 2.12, four respondents perceived that there was collaboration between DHMTs in specific districts of Lesotho and private health services on NCD management but, four respondents also were of the view that collaboration was non-existent between DHMTs and private health services.

The perception of managers at the DHMTs about arrangements in place for the private health facilities in relation to NCD management is presented in Figure 4-6. Three respondents did not reply to question 2.13 (refer to Figure 4-6). Two respondents perceived that agreement on the

referral of a patient with NCDs and submission of reports for health information systems (1 respondent) were in place.

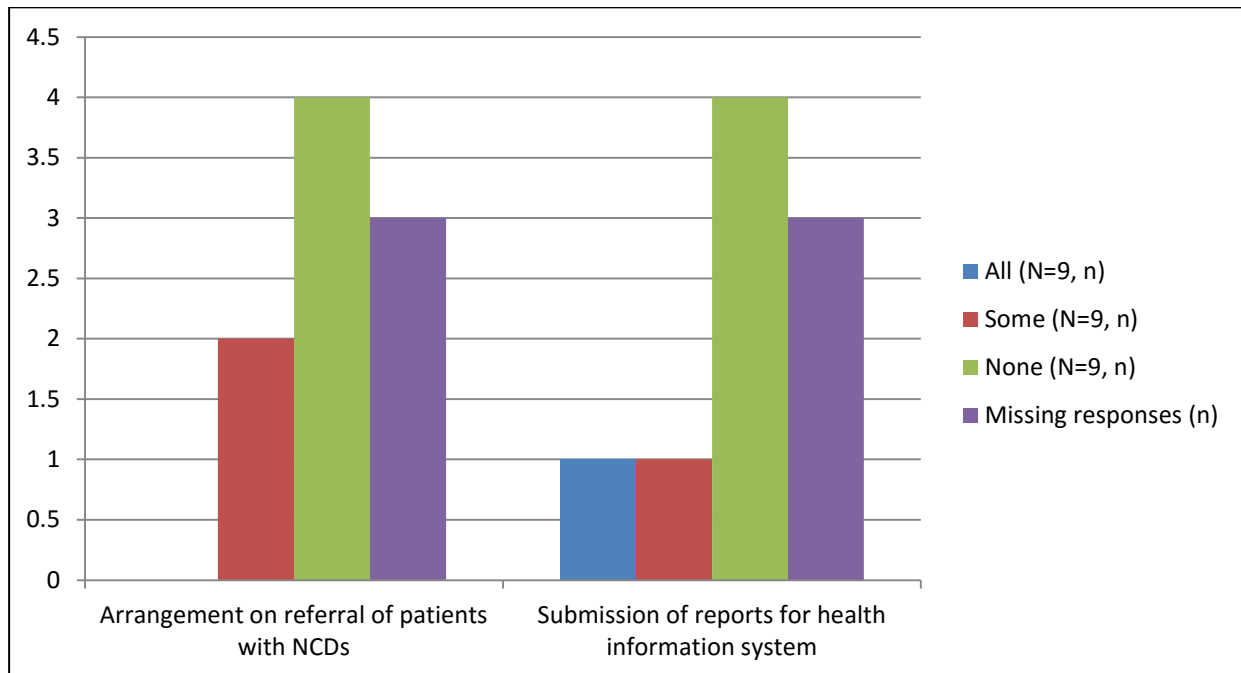


Figure 4-6: The perception of respondents at the District Health Management Teams on collaborative activities between District Health Management Teams and private health services on non-communicable disease management

Responses to questions in the DHMTs questionnaire which asked about the availability of CHWs at healthcare centres (question 2.4) and activities carried out by CHWs in the community (question 2.7) (refer to Annexure B) are presented in Table 4-24. Five respondents perceived that CHWs were not available but, four respondents were of the opinion that CHWs working together with healthcare centres on NCD management were available.

Of the respondents who responded to question 2.7, six thought that CHWs carried out health talks on prevention of NCDs, seven respondents listed lifestyle modification, and five indicated that health talks on medication use were conducted (refer to Table 4-24). However, five respondents were of the opinion that CHWs did not use peak flow meters to monitor asthma control, and they did not carry out therapeutic drug level monitoring for epileptic patients (refer to Table 4-24). Three respondents thought that CHWs in certain healthcare centres monitor blood pressure and blood glucose.

Table 4-24: The perception of respondents at the District Health Management Teams on availability of community health workers in primary healthcare

Availability of and activities performed by CHWs	Perception of respondents at DHMTs (N = 9), n		Missing responses (n)
	No	Yes	
Availability of CHWs working together with healthcare centres on NCD management	5	4	0
Community activities related to NCD prevention and management carried out by CHWs	No	Yes	
Health talks on prevention of NCDs	1	6	2
Health talks on lifestyle modifications for patients with NCDs	0	7	2
Health talks on medication use	2	5	2
Blood pressure monitoring	3	3	3
Blood glucose level monitoring	3	3	3
Use of peak flow meter to monitor asthma control	5	1	3
Therapeutic drug level monitoring for epileptic patients	5	2	2
<i>DHMTs = District Health Management Teams; CHWs = Community health workers</i>			

When responding to question 2.8 (refer to Annexure B) about sources of funding for CHWs, six respondents at the DHMTs perceived that CHWs were funded by the government of Lesotho but, one respondent felt that the government of Lesotho only sometimes funded CHWs. Five respondents were of the opinion that community members did not fund CHWs, two respondents felt that CHWs were sometimes funded by NGOs, while one respondent pointed out that NGOs funded CHWs.

Question 2.18 asked whether staff at the PHC level conducted health promotion activities within the community (Annexure B). Four respondents were of the opinion that staff at OPDs conducted health promotion activities within the communities whereas six respondents thought that personnel at healthcare centres conducted health promotion activities. However, one respondent perceived that staff at OPDs and healthcare centres did not conduct health promotion activities within the community. Furthermore, two respondents felt that staff at OPDs sometimes carried out health promotion activities within the community also; one respondent indicated that staff at healthcare centres sometimes carried out health promotion activities.

In response to open question 2.18 (refer to Annexure B), four respondents perceived that staff at OPDs and healthcare centres carried out health promotion activities such as “*outpatients*

health education sessions", whereas two thought "*outreach services*" was performed. One respondent thought that "*health talks*" were performed.

4.4.4.3 The primary healthcare level

The managers at OPDs responded to question 2.4 about the collaboration of the hospital with traditional healers on NCD management (refer to Annexure C). Eight respondents did not answer question 2.4. Seven respondents perceived that there was no collaboration between the hospital and traditional healers on NCD management but, one respondent felt that the collaboration existed. The respondents at OPDs also had to indicate collaborative activities undertaken by the hospital and traditional healers in NCD management when completing question 2.5 (refer to Annexure C). More than three-quarters of the respondents did not respond to question 2.5. Of the respondents who responded, three perceived that traditional healers did not refer patients with NCDs to the hospital, and five felt that hospitals did not refer patients with NCDs to traditional healers. However, one respondent was of the opinion that traditional healers referred patients with NCDs to the hospital.

Question 2.10 asked managers at healthcare centres to state whether healthcare centres collaborated with traditional healers on NCD management or not (refer to Annexure D). Twenty-six (30.2%) respondents perceived that healthcare centres and traditional healers collaborated on NCD management and, 22 (25.6%) respondents thought that healthcare centres and traditional healers sometimes collaborated. However, 36 (41.9%) respondents were of the opinion that there was no collaboration between healthcare centres and traditional healers on NCD management. The managers further answered question 2.11 where they indicated which collaborative activities healthcare centres and traditional healers participated in (refer to Annexure D). Twenty-four (27.9%) respondents perceived that traditional healers did not refer patients with NCDs to healthcare centres. Fifty-two (60.5%) respondents indicated that healthcare centres did not refer patients to traditional healers compared to 5 (5.8%) respondents who thought on the contrary. However, 22.1% (n = 19) of respondents felt that traditional healers referred patients with NCDs to healthcare centres and 20.9% (n = 18) respondents pointed out that traditional healers sometimes referred patients to healthcare centres.

The perception of managers at healthcare centres on the availability of CHWs at healthcare centres is presented in Table 4-25 (refer to Annexure D, question 2.5). Eighty (93.0%) of respondents perceived that CHWs working together with healthcare centres on NCD management were available. Responses of the managers at healthcare centres responding to

question 2.8 (refer to Annexure D) are presented in Table 4-25. Missing responses to question 2.8 were less than one-third (refer to Table 4-25). More than half of the respondents perceived that CHWs carried out health talks on prevention of NCDs (59.3%, n = 51), lifestyle modification (55.8%, n = 48) and health talks on medication use (65.1%, n = 56) (refer to Table 4-25). Forty-eight (55.8%) respondents were of the opinion that CHWs did not monitor blood pressure and glucose level (refer to Table 4-25). Sixty-four (74.4%) respondents perceived that CHWs did not monitor asthma control using peak flow meters. Sixty-two (72.1%) respondents further indicated that CHWs did not carry out therapeutic drug level monitoring for epileptic patients (refer to Table 4-25).

Table 4-25: The perception of respondents at healthcare centres on availability of community health workers working together with healthcare centres

Availability of and activities carried out by CHWs	Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses
Availability of CHWs working together with healthcare centres on NCD management	6 (7.0)	80 (93.0)	0
Community activities related to NCD prevention and management carried out by CHWs	No	Yes	Missing responses
Health talks on prevention of NCDs	6 (7.0)	51 (59.3)	29 (33.7)
Health talks on lifestyle modifications for patients with NCDs	8 (9.3)	48 (55.8)	30 (34.9)
Health talks on medication use	10 (11.6)	56 (65.1)	20 (23.3)
Blood pressure monitoring	48 (55.8)	19 (22.1)	19 (22.1)
Blood glucose level monitoring	48 (55.8)	16 (18.6)	22 (25.6)
Use of peak flow meters to monitor asthma control	64 (74.4)	2 (2.3)	20 (23.3)
Therapeutic drug level monitoring for epileptic patients	62 (72.1)	7 (8.1)	17 (19.8)
<i>CHWs = Community health workers</i>			

In response to question 2.9 (refer to Annexure D), 61.6% (n = 53) of respondents perceived that CHWs were mainly funded by the government of Lesotho and 19.8% (n = 17) thought that the government of Lesotho sometimes funded CHWs (refer to Figure 4-7). Twenty-six (30.2%) respondents perceived that CHWs were not funded by NGOs whereas 15 (17.4%) respondents thought otherwise. Thirty-seven (43.0%) respondents perceived that community members did not fund CHWs (refer to Figure 4-7).

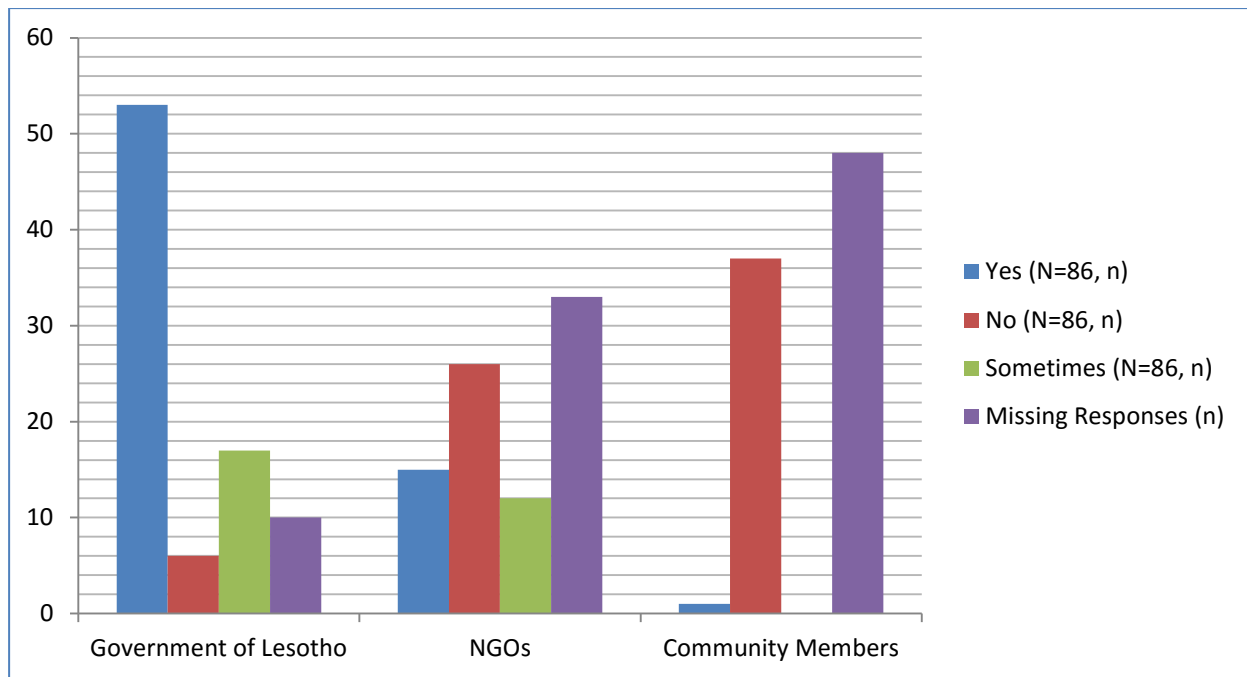


Figure 4-7: The perception of respondents at healthcare centre on sources of funding for community health workers

The managers at OPDs responded to question 2.6 about carrying out health promotion activities on the prevention and management of NCDs for patients and the community in the six months before the date of data collection of this study (refer to Annexure C). More than half of the managers did not respond to question 2.6. Three respondents at certain OPDs perceived that health promotion activities on prevention of NCDs were conducted whereas another three respondents thought that it was not. One respondent was also of the opinion that health promotion activities were only sometimes carried out for patients and the community. Two respondents at OPDs pointed out that health promotion activities on NCD management were carried out but, three respondents were of the view that these activities were not conducted for patients and the community.

Question 2.12 required managers at healthcare centre to indicate whether health promotion activities were carried out in a form of village gatherings on NCD prevention and management in the six months before the date of data collection of this study (refer to Annexure D). Thirty-seven (43.9%) respondents perceived that health promotion activities on prevention of NCDs were carried out in the form of village gatherings compared to 35 (40.7%) who thought otherwise. Thirty-three (38.4%) respondents indicated that health promotion activities on NCD management were carried out whereas 37 (43.0%) respondents felt that they were not carried out.

The opinion of managers at OPDs on topics covered during health promotion activities, when responding to questions 2.7 and 2.8 (refer to Annexure C), is presented in Table 4-26. Of respondents who responded, three perceived that topics covered in NCD prevention included “*hypertension and diabetes health talks*”, whereas two thought “*management and prevention of diabetes mellitus*” was covered.

Table 4-26: The perception of respondents at outpatient departments on topics covered in health promotion activities on prevention and management of non-communicable diseases

Topics covered on prevention and management of NCDs in health promotion activities by staff at OPDs	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
NCD prevention topics		
“Hypertension and diabetes health talks.”	3	13
“Management and prevention of diabetes mellitus.”	2	14
“Lifestyle modifications.”	1	15
NCD management topics		
“Hypertension and diabetes mellitus.”	1	15
“Management and prevention of diabetes mellitus.”	2	14
“Importance of medication adherence.”	1	15
“Hypertension, diabetes mellitus and asthma.”	1	15
<i>OPDs= Outpatient departments</i>		

The managers at healthcare centres provided their opinion on topics covered in health promotion activities on the prevention and management of NCDs when responding to questions 2.13 and 2.14 (refer to Annexure D and Table 4-27). More than three-quarters of managers did not respond to questions 2.13 and 2.14 (refer to Table 4-27). Nineteen respondents (22.1%) perceived that “*lifestyle modifications*” a topic was covered in NCD prevention activities, whereas 14 respondents (16.3%) perceived it was covered during management topics (refer to Table 4-27).

Table 4-27: The perception of respondents at healthcare centres on topics covered in health promotion activities on prevention and management of non-communicable diseases

Topics covered on prevention and management of NCDs in health promotion activities by staff at healthcare centres	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
NCD prevention topics		
“Lifestyle modifications.”	19 (22.1)	67 (77.9)
“Management and prevention of hypertension	9 (10.5)	77 (89.5)

Topics covered on prevention and management of NCDs in health promotion activities by staff at healthcare centres	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
and diabetes.”		
“Management and causes of hypertension.”	2 (2.3)	84 (97.7)
“Hypertension and epilepsy.”	1 (1.2)	85 (98.8)
“Hypertension, diabetes mellitus, epilepsy, asthma.”	2 (2.3)	84 (97.7)
NCD management topics		
“Importance of medication adherence.”	10 (11.6)	76 (88.4)
“Management of hypertension and diabetes mellitus.”	8 (9.3)	78 (90.7)
“Lifestyle modifications.”	14 (16.3)	72 (83.7)
“Management of diabetes mellitus and asthma.”	1 (1.2)	85 (98.8)
“Hypertension and epilepsy.”	1 (1.2)	85 (98.8)

The perception of managers at OPDs and healthcare centres on the availability of private healthcare providers within the catchment areas of OPDs and healthcare centres (refer to Annexure C, question 2.9) are presented in Table 4-28. More than half of the managers did not answer question 2.9 (refer to Table 4-28). Five respondents at OPDs perceived that private clinics were found within the catchment areas of OPDs whereas four respondents indicated that community pharmacies were found within the catchment areas of OPDs (refer to Table 4-28). Responses of managers at healthcare centres (refer to question 2.15, Annexure D) are presented in Table 4-28. More than half of the respondents indicated that there were no private clinics (54.7%, n = 47), NGOs (57.0%, n = 49) and community pharmacies (68.6%, n = 59) found in the catchment areas of healthcare centres.

Table 4-28: The perception of respondents at health facilities on the availability of private healthcare providers within catchment areas of outpatient departments and healthcare centres

Private healthcare providers	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
Private clinics	2	5	9	47 (54.7)	29 (33.7)	10 (11.6)
NGOs	2	2	12	49 (57.0)	29 (33.7)	8 (9.3)
Community pharmacies	2	4	10	59 (68.6)	16 (18.6)	11 (12.8)

OPDs= Outpatient departments; Non-governmental organisations

Question 2.10 in the OPDs questionnaire (Annexure C) and question 2.16 in the healthcare centres questionnaire (refer to Annexure D) required managers at OPDs and healthcare centres to indicate whether the hospital or healthcare centres undertook collaborative activities related to NCD management with private healthcare services in their area.

Table 4-29 presents the perception of managers at OPDs and healthcare centres. More than three-quarters of managers at OPDs did not respond to question 2.10 (refer to Table 4-29). Four respondents at OPDs perceived that there was no collaboration between the hospital and private clinics, and three respondents also thought that the hospital did not collaborate with community pharmacies on NCD management (refer to Table 4-29). However, three respondents were of the view that the district hospitals collaborated with NGOs on NCD management.

The perception of respondents at healthcare centres on collaborative activities between healthcare centres and private healthcare providers on NCD management is presented in Table 4-29 (refer to question 2.16 (Annexure D)). Half of the respondents did not respond to this question. Thirty-four (39.5%) respondents perceived that healthcare centres did not collaborate with private clinics. Twenty-three (26.7%) respondents indicated a lack of collaboration between healthcare centres and NGOs. Thirty-three (38.4%) respondents further perceived that healthcare centres did not collaborate with community pharmacies on NCD management.

Table 4-29: The perception of respondents at health facilities on collaborative activities between health facilities and private healthcare providers on non-communicable disease management

Private healthcare providers	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Private clinics	4	2	0	10	34 (39.5)	8 (9.3)	4 (4.7)	40 (46.5)
NGOs	1	3	0	12	23 (26.7)	18 (20.9)	4 (4.7)	41 (47.7)
Community pharmacies	3	1	0	12	33 (38.4)	6 (7.0)	3 (3.5)	44 (51.2)
<i>OPDs= Outpatient departments; Non-governmental organisations</i>								

With regard to collaborative activities between the hospital and private healthcare providers (refer to Annexure C question 2.11,), one OPD respondent (N = 16) perceived that collaborative activities on NCD management between the hospital and private healthcare providers included “*referral of NCD patients from healthcare centre by NGOs to district hospital for further management*” and “*lectures about hypertension facilitated by NGOs.*” Seven healthcare respondents (8.1%) at healthcare centres further perceived that these centres and private healthcare providers collaborated on “*referrals, transfers and provision of treatment*” in NCD management (refer to Annexure D, question 2.17).

- **Discussion of results on collaborative activities among public and private health facilities**

This section entails the discussion of results presented in Section 4.4.4.

Community-level prevention and control of NCDs in resource-limited settings is crucial for the continuity of care, thus CHWs can provide NCD care within communities while also connecting individuals to the formal healthcare system (Puoane *et al.*, 2017:176). Provision of NCD care by CHWs within the community is important in trying to decrease the prevalence of NCDs. The South-East Asian countries (Bangladesh, China, Nepal and Vietnam) (Abdullah *et al.*, 2019:1-3) and Lesotho (WHO, 2018d:1) are experiencing an increasing burden of NCDs. According to Abdullah *et al.* (2019:1), CHWs are recognised as frontline health workers supporting governments to combat NCDs, as strengthening services and health workforce at PHC level is one of the interventions that can help curb the increasing burden of NCDs. Therefore, in the four South-East Asian countries, CHWs are crucial health workers delivering NCD-related services at PHC level (Abdullah *et al.*, 2019:5). Comparatively, the study findings indicated that CHWs were working with healthcare centres on NCD management and prevention at PHC level (refer to Section 4.4.4.1, Figure 4-5; Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25).

South Africa, in comparison to Lesotho, is a sub-Saharan African country battling an increasing prevalence of NCDs (WHO, 2014a:11-13; WHO, 2018d:1). In Khayelitsha (Cape Town, South Africa), Tsolekile *et al.* (2018:3-4) assessed the roles of CHWs in diabetes and hypertension and noted that the roles of CHWs included the distribution of medication, dietary advice, blood pressure measurement and conducting physical activity sessions. These roles performed by CHWs assisted patients with NCDs with self-management of diabetes and hypertension, which is an important element of NCD management (Tsolekile *et al.*, 2018:5). With extensive training, CHWs can be effective in the prevention and control of NCDs (Jeet *et al.*, 2017:16), and can conduct health promotion activities, train village health workers, and hold community health

education workshops on NCD prevention and management (Low *et al.*, 2014:6). Similarly, CHWs in healthcare centres in Lesotho carried out activities such as health talks on prevention of NCDs, lifestyle modifications, medication use, and monitoring of blood pressure and blood glucose levels (refer to Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25).

Uganda, as one of the developing African countries, experiencing an increasing burden of NCDs has engaged CHWs also known as village health teams (VHTs) in NCD management at PHC level (Ojo *et al.*, 2017). Some of the barriers faced by VHTs in NCD management in Uganda were the lack of education on NCDs, poor healthcare infrastructure, and lack of assistance and support for VHTs from medical personnel (Ojo *et al.*, 2017:6). The VHTs believed that if they were provided with training on NCDs, basic diagnostic and monitoring equipment, they would be able to fulfil their roles in NCD prevention and management (Ojo *et al.*, 2017:9). Likewise, this study revealed that CHWs in healthcare centres in Lesotho could not use peak flow meters to monitor asthma control or carry out therapeutic drug level monitoring for epileptic patients (refer to Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25). Thus, the findings of this study suggest that CHWs were not able to screen and monitor asthma in healthcare centres which could be due to a lack of basic diagnostic equipment and a lack of education on NCDs. Also, therapeutic drug level monitoring for epileptic patients involved drawing of blood which is not one of the roles performed by CHWs.

Public-private partnerships in the health sector are important in NCD management. The Organization for Economic Co-operation and Development (OECD) and middle-income countries have adopted the Private Finance Initiative model where the private sector is responsible for providing infrastructure and equipment to hospitals while the public sector is responsible for providing health services (Thadani, 2014:308). Public-private partnerships also include civil society and community-based partnerships in the health sector thus, extending health services in collaboration with the public and private entities (Thadani, 2014:309). The findings of the study indicated that there was collaboration on NCD management between DHMTs and private health facilities at the district level as well as between OPDs and private health facilities at the PHC level (refer to Section 4.4.4.2, Figure 4-6; Section 4.4.4.3, Table 4-28 and Table 4-29). Some respondents at healthcare centres also perceived that healthcare centres collaborated with private health facilities at PHC level on the management of NCDs (refer to Section 4.4.4.3, Table 4-28 & Table 4-29).

According to Krah *et al.* (2018:161), most of the burden of healthcare rests on traditional healers in rural Ghana; so, traditional healers should be incorporated into the national healthcare delivery system. The reason being that the integration of traditional and biomedical health

systems could be an effective and sustainable way of expanding the reach and improving outcomes of healthcare in Ghana (Krah *et al.*, 2018:161). Taking into consideration that traditional medicine is also widespread in Lesotho, the findings of this study revealed that there was collaboration between public health facilities at PHC level and traditional healers on NCD prevention and management (refer to Section 4.4.4.3). Traditional healers serve as the first point of entry into the public health system. Thus, the collaboration between traditional healers and public health facilities will improve both health service delivery and the health outcomes of patients with NCDs. In South Africa, the collaboration between allopathic and traditional health practitioners was hindered by the negative attitudes of both the allopathic health practitioners and traditional healers towards each other (Nemutandani *et al.*, 2016:6; Van Rooyen *et al.*, 2015:6). The negative attitudes included the unscientific methods used by traditional health practitioners in treating patients, interference of traditional healers with the efficacy of hospital treatments, and the traditional healers' delays in referring patients to the hospital (Nemutandani *et al.*, 2016:6; Van Rooyen *et al.*, 2015:6). On the contrary, Zuma *et al.* (2016:11) indicated that traditional health practitioners in rural KwaZulu-Natal (South Africa) said that they referred patients with problems not within the scope of traditional healing to western biomedical facilities so that patients can receive appropriate healthcare.

The next section presents the results for the specific objective which assessed the capacity of the public and private sector in addressing the number of health personnel in NCD management.

4.4.5 The capacity of the public and private sector in addressing the number of health personnel in non-communicable disease management

The viewpoints of managers at the MOH about the public and private sector being able to address the number of health personnel in NCD management are outlined in this section.

4.4.5.1 The Ministry of Health

The perception of managers at the MOH about skills necessary for NCD management is presented in Table 4-30. The managers answered question 2.4 (Annexure A) which asked whether health sciences students (students who will be healthcare professionals after graduation) in the Lesotho higher education institutions graduate with skills to be used in NCD management. Five respondents perceived that students from the National University of Lesotho (NUL), National Health Training College (NHTC) and the Christian Health Association of Lesotho (CHAL) Nursing College graduated with the clinical, technical and management skills to be used for the management of NCDs (refer to Table 4-30).

Table 4-30: The perception of respondents at the Ministry of Health on skills necessary for non-communicable disease management

Health sciences students (students who will be healthcare professionals after graduation) in the Lesotho higher education institutions graduate with the necessary skills for NCD management.	Perception of respondents at MOH (N = 6), n								
	NUL			NHTC			CHAL Nursing College		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Clinical skills	0	5	1	0	5	1	0	5	1
Technical skills	0	5	1	0	5	1	0	5	1
Management skills	0	5	1	0	5	1	0	5	1
<i>MOH = Ministry of Health; NUL = National University of Lesotho; NHTC = National Health Training College; CHAL = Christian Health Association of Lesotho</i>									

The managers at the MOH also responded to question 2.3 in the MOH questionnaire about the cadre of healthcare professionals produced by the NUL, NHTC and the CHAL Nursing College (refer to Annexure A) (refer to Table 4-31). Six respondents perceived that the NUL produced pharmacists and nurses. All respondents at the MOH were of the opinion that students who graduated from the NHTC included pharmacy technicians and nurses whereas five respondents indicated that nurse clinicians were graduates from the NHTC (refer to Table 4-31). Three respondents further perceived that students graduated as nursing assistants at the NHTC. Six respondents perceived that graduates from the CHAL Nursing College included nurses and nursing assistants (refer to Table 4-31).

Table 4-31: The perception of respondents at the Ministry of Health on the cadre of health professionals produced nationally

Cadre of health professionals	Perception of respondents at MOH (N = 6), n								
	NUL			NHTC			CHAL Nursing College		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Pharmacists	0	6	0	4	0	2	4	0	2
Pharmacy technicians	4	0	2	0	6	0	4	0	2
Nurses	0	6	0	0	6	0	0	6	0
Nurse clinicians	4	0	2	0	5	1	5	0	1
Nursing assistants	4	0	2	2	3	1	0	6	0
Medical doctors	4	0	2	3	1	2	5	0	1

MOH = Ministry of Health; NUL = National University of Lesotho; NHTC = National Health Training College; CHAL = Christian Health Association of Lesotho

Responses of managers to question 2.5.4 (refer to Annexure A) indicated that three respondents perceived that the Lesotho MOH collaborated with South African Development Community (SADC) countries regarding the training of healthcare personnel, whereas one respondent felt that there was no collaboration.

- **Discussion of results on the capacity of the public and private sector in addressing the number of personnel in non-communicable disease management**

This section provides a discussion of results generated from a specific objective that assessed the capability of the public and private sectors in addressing human resources (refer to Section 4.4.5).

The WHO (2014d:23) states that the quantity, distribution and training of human resources significantly affect the ability of the health system to respond effectively to NCDs because NCDs require on-going relationships between patients and providers and motivation of people to change their behaviour. Also, there is a shortage of clinical specialists in most low-income countries, which may be due to a scarcity of academic teaching facilities, and the absence of formalised and accredited medical residency programmes (Evans *et al.*, 2016:21). As per the findings of this study, respondents at the MOH (refer to Section 4.4.1.1, Table 4-6), DHMTs (refer to Section 4.4.1.2, Table 4-7) and OPDs (refer to Section 4.4.1.3, Table 4-9 and Figure 4-3) perceived that there was a shortage of health professionals involved in the management of NCDs in health facilities. A few respondents further indicated that some of the reasons for the shortage of health professionals in health facilities were understaffing, lack of motivation and use of the establishment list of 1966 (refer to Section 4.4.1.2, Table 4-8; Section 4.4.1.3, Table 4-10). Based on the perception of managers at the MOH, the study findings indicated that higher education institution in Lesotho generated health professionals such as pharmacists and nurses from the NUL, pharmacy technicians, nurses, nurse clinicians and nursing assistants from the NHTC, and nurses and nursing assistants from the CHAL Nursing College (refer to Section 4.4.5.1, Table 4-31). These higher education institutions will assist the public service in increasing the number of health professionals to be involved with NCD management in the public health facilities in Lesotho. Also, increased numbers of health professionals involved in NCD management at PHC level will solve the shortage and maldistribution of health personnel. Health personnel with needed competencies and skills to manage NCDs are essential thus; the managers at the MOH perceived that students at the NUL, NHTC and the CHAL Nursing College graduated with clinical, technical and management skills necessary to be used in NCD management (refer to Section 4.4.5.1, Table 4-30). Additionally, there was a collaboration between the MOH of Lesotho with SADC countries about the training of healthcare personnel

(refer to Section 4.4.5.1). Thus, the public service and the private sector were able to address numbers of health professionals in NCD management as perceived by managers at the MOH.

Section 4.4.6 outlines results emanated from the specific objective which assessed guidelines on roles of CHWs in NCD management.

4.4.6 Guidelines on roles of community health workers in non-communicable disease management

This section provides a detailed presentation and discussion of results about guidelines on roles of CHWs in NCD management as per the thoughts of managers at the MOH, DHMTs and the healthcare centres.

4.4.6.1 The Ministry of Health

The opinion of managers at the MOH about the availability of guidelines for CHWs (refer to Annexure A, question 2.15.1) is presented in Table 4-32. Half of the respondents responded to this question and, two out of three respondents perceived that guidelines that stated the relationship between CHWs and healthcare centres at the PHC level were available (refer to Table 4-32).

With regard to the major issues covered by these guidelines (refer to Annexure A, question 2.15.2), one respondent perceived that home visits, lifestyle counselling on NCDs, and nutrition education were issues addressed in the guidelines (refer to Table 4-32).

Table 4-32: The perception of respondents at the Ministry of Health on availability of guidelines for community health workers

CHWs guidelines	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Availability of guidelines stating the relationship between CHWs and the healthcare centres at PHC level.	1	2	3
Issues covered by the guidelines in terms of the relationship between the healthcare centres and the CHWs in managing NCDs.	No	Yes	Missing responses
Home visits.	0	1	5
Lifestyle counselling on NCDs.	0	1	5
Nutrition education.	0	1	5
<i>MOH = Ministry of Health; CHWs = Community health workers</i>			

4.4.6.2 The district level

The perception of managers at DHMTs on the availability of guidelines for CHWs (refer to Annexure B, questions 2.5 and 2.6 showed that only three respondents perceived that guidelines stating the relationship between CHWs and healthcare centres were available (refer to Table 4-33). Three respondents perceived that the guidelines covered issues such as home visits, lifestyle counselling on NCDs, nutrition education, health promotion activities on NCDs, recording and reporting of NCDs to a healthcare centre, and screening of NCDs (refer to Table 4.33).

Table 4-33: The perception of respondents at the District Health Management Teams on availability of guidelines for community health workers

CHWs guidelines	Perception of respondents at DHMTs (N = 9), n		
	No	Yes	Missing responses
Availability of guidelines stating the relationship between CHWs and the healthcare centres at PHC level.	0	3	6
Issues covered by the guidelines in terms of the relationship between the healthcare centre and the CHWs in managing NCDs.	No	Yes	Missing responses
Home visits.	0	3	6
Lifestyle counselling on NCDs.	0	3	6
Nutrition education.	0	3	6
Health promotion activities on NCDs.	0	3	6
Palliative care for patients with NCDs.	1	1	7
Recording of NCDs to the healthcare centre.	0	3	6
Reporting of NCDs to the healthcare centre.	0	3	6
Collection of medication for patients with NCDs from the healthcare centre.	0	3	6
Screening of NCDs.	0	3	6
Monitoring of NCDs.	1	2	7
<i>DHMTs = District Health Management Teams; CHWs = Community health workers</i>			

4.4.6.3 The primary healthcare level

Responses to questions 2.6 asked about the availability of guidelines stating the relationship between CHWs and healthcare centres in NCD management (refer to Annexure D) are presented in Table 4-34. Compared to 24.4% (n = 21) of respondents who perceived no guidelines were stating the relationship between CHWs and healthcare centre, 64.0% (n = 55) believed that these guidelines were available (refer to Table 4-34).

More than one-quarter of the respondents did not answer question 2.7 (Annexure D) (refer to Table 4-34). More than half of respondents indicated that the guidelines addressed home visits (59.3%, n = 51), lifestyle counselling (53.5%, n = 46), nutrition education (61.6%, n = 53) and health promotion activities on NCDs (53.5%, n = 46) (refer to Table 4-34).

Table 4-34: The perception of respondents at healthcare centres on the availability of guidelines for community health workers

CHWs guidelines	Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses
Availability of guidelines stating the relationship between CHWs and the healthcare centres at the PHC level.	21 (24.4)	55 (64.0)	10 (11.6)
Issues covered by the guidelines in terms of the relationship between the healthcare centre and the CHWs in managing NCDs.	No	Yes	Missing responses
Home visits.	4 (4.7)	51 (59.3)	31 (36.0)
Lifestyle counselling on NCDs.	9 (10.5)	46 (53.5)	31 (36.0)
Nutrition education.	3 (3.5)	53 (61.6)	30 (34.9)
Health promotion activities on NCDs.	6 (7.0)	46 (53.5)	34 (39.5)
Palliative care for patients with NCDs.	13 (15.1)	38 (44.2)	35 (40.7)
Reporting of NCDs to the healthcare centre.	12 (14.0)	40 (46.5)	34 (39.5)
Collection of medication for patients with NCDs from the healthcare centre.	11 (12.8)	40 (46.5)	35 (40.7)
Monitoring of NCDs.	15 (17.4)	37 (43.0)	34 (39.5)
<i>CHWs = Community health workers</i>			

- **Discussion of results for guidelines on roles of community health workers in non-communicable disease management**

Results on the availability of guidelines and roles of CHWs in the management of NCDs presented in Section 4.4.6 are discussed in this subsection.

Achieving universal health coverage by engaging CHWs into the health system requires that policies and strategies that emphasise effective multisectoral planning and collaboration for NCD management include CHWs to ensure continuity of care within the chronic care model,

thus improving access to health care (Abdullah *et al.*, 2019:9; Scott *et al.*, 2018:13). Also, Mishra *et al.* (2015:3) pointed out that governments, together with key stakeholders, such as clinical regulatory and health professional bodies, need to establish national guidelines and regulations under which CHWs operate. The guidelines and regulation of CHW activities will ensure that CHWs are appropriately trained and supervised to safeguard against the possibility of reducing the quality of health services in NCD management (Mishra *et al.*, 2015:3). Scott *et al.* (2018:12) also indicated that CHWs perform many roles within health systems and contribute to improving a range of health outcomes thus, CHW tasks should be clearly defined and should require a time commitment appropriate to the incentives/remuneration and support provided. Comparatively, the study findings revealed that guidelines stating the relationship between CHWs and healthcare centres at the PHC level were available (refer to Section 4.4.6.1, Table 4-32; Section 4.4.6.2, Table 4-33; Section 4.4.6.3, Table 4-34). These guidelines addressed issues on home visits, lifestyle counselling on NCDs, nutrition education, health promotion activities, recording and reporting of NCDs to healthcare centres, palliative care for patients with NCDs, collection of medicines for patients with NCDs from healthcare centres, and screening and monitoring of NCDs (refer to Section 4.4.6.1, Table 4-32; Section 4.4.6.2, Table 4-33; Section 4.4.6.3, Table 4-34).

4.4.7 Integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in non-communicable disease management

In this section, perceptions of managers at the MOH and the DHMTs about the incorporation of traditional leaders, healers, and the community with healthcare are outlined in detail. The section is divided into the MOH and the district level.

4.4.7.1 The Ministry of Health

The perception of managers at the MOH about the community participation and community members involved in decision-making and in improving service quality in NCD management is presented in Table 4-35 (refer to Annexure A, question 2.12). Three respondents did not complete this question (refer to Table 4-35). Two respondents were of the view that the community participated in decision-making on NCD management at the district and PHC levels. Also, the viewpoint of two respondents was that the community participated in improving service quality on NCD management at the national, district and PHC levels (refer to Table 4-35).

Table 4-35: The perception of respondents at the Ministry of Health on the participation of the community in deciding on and strengthening service quality

Participation of the community in decision-making on NCD management at the national, district and PHC levels.	Perception of respondents at MOH (N = 6), n			
	No	Yes	Sometimes	Missing responses
National level	1	1	1	3
District level	1	2	0	3
PHC level	1	2	0	3
Participation of the community in improving service quality on NCD management at the national, district and PHC levels.	No	Yes	Sometimes	Missing responses
National level	0	2	1	3
District level	0	2	1	3
PHC level	0	2	1	3

MOH = Ministry of Health; PHC = Primary healthcare

The perception of managers at the MOH (refer to Annexure A, question 2.13) is presented in Table 4-36. Only three respondents answered question 2.13 which required managers to indicate the type of community that participated in making decisions on and strengthening service quality at the national, district and PHC levels (refer to Annexure A).

Three respondents felt that chiefs contributed to decision-making at the district and PHC levels (refer to Table 4-36). Two respondents also indicated that chiefs participated in improving service quality at the district and PHC levels. Two respondents perceived that priests participated in deciding on and in strengthening service quality on NCD management at the district and PHC levels. Two respondents at the MOH further perceived that traditional healers participated in decision-making and improving service quality at the district and PHC levels (refer to Table 4-36).

Two respondents were of the opinion that “community-based organisations/networks meaningfully involved in policy-making processes at the national level” were involved in making decisions and in enhancing service quality on NCD management at the national level (refer to Table 4-36). Three respondents thought that “committees/forums where community members can engage with and influence decisions affecting the health system” were involved in making decisions and in service quality improvement at the national level.

Three respondents thought that “community-based organisations/networks meaningfully involved in policy-making processes at the PHC level” partook in making decisions and in

strengthening service quality on NCD management at PHC level. Also, two respondents perceived that “community-based organisations/networks meaningfully involved in policy-making processes at the district level” contributed to making decisions and in enhancing service quality at the district level (refer to Table 4-36).

Table 4-36: The perception of respondents at the Ministry of Health on type of community involved in decision-making and in improving service quality

The community involved in decision-making and in improving service quality.	Perception of respondents at MOH (N = 6), n								
	National level			District level			PHC level		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Type of community involved in decision-making on NCD management at national, district and PHC levels.									
Chiefs	0	1	5	0	3	3	0	3	3
Priests	1	0	5	1	2	3	0	2	4
Traditional healers	1	1	4	1	2	3	0	2	4
Availability of committees/forums where community members can participate in and influence decisions affecting the health system.	0	3	2	0	0	0	0	0	0
Community-based organisations/networks relevantly involved in making policies at the national level.	1	2	3	0	0	0	0	0	0
Community-based organisations/networks relatedly involved in making policies at the district level.	0	0	0	0	2	4	0	0	0
Community-based organisations/networks relevantly involved in policy-making processes at the PHC level.	0	0	0	0	0	0	0	3	3
Type of community involved in improving service quality on NCD management at national, district and PHC levels.									
Chiefs	0	0	0	0	2	4	0	2	4

The community involved in decision-making and in improving service quality.	Perception of respondents at MOH (N = 6), n								
	National level			District level			PHC level		
Priests	0	0	0	0	2	4	0	2	4
Traditional healers	0	1	5	0	2	4	0	2	4
Availability of committees/forums where community members can participate in and influence decisions affecting the health system.	0	3	3	0	0	0	0	0	0
Community-based organisations/networks relevantly involved in making policies at the national level.	1	2	3	0	0	0	0	0	0
Community-based organisations/networks relatedly involved in making policies at the district level.	0	0	0	1	1	4	0	0	0
Community-based organisations/networks relevantly involved in policy-making processes at the PHC level.	0	0	0	0	0	0	0	3	3
<i>MOH = Ministry of Health; PHC = Primary healthcare</i>									

4.4.7.2 The district level

This section outlines the thoughts of managers at the DHMTs about community participation and member of the community involved in making decisions and in strengthening service quality at the district and the PHC levels.

Question 2.10 asked managers at DHMTs whether there was community participation at district and PHC levels in decision-making and in improving service quality (refer to Annexure B, Table 4-37). Three respondents perceived that community participation in decision-making at the district and PHC levels was absent (refer to Table 4-37). Five respondents also indicated that the community participated in improving service quality at the district and PHC levels.

Table 4-37: The perception of respondents at the District Health Management Teams on the participation of the community in making decisions and in strengthening service quality at the district and primary healthcare levels

Participation of the community in decision-making on NCD management at the district and PHC levels	Perception of respondents at DHMTs (N = 9), n			
	No	Yes	Sometimes	Missing responses
District level	3	2	2	2
PHC level	3	2	1	3
Participation of the community in improving service quality on NCD management at the district and PHC levels	No	Yes	Sometimes	Missing responses
District level	2	5	0	2
PHC level	0	5	1	3

DHMTs = District Health Management Teams; PHC = Primary healthcare

Questions 2.11 and 2.11.1 asked managers to indicate the type of community involvement in making decisions and in strengthening service quality at the district and PHC levels, respectively (refer to Annexure B). Four respondents perceived that chiefs and traditional healers did not participate in decision-making at the district and PHC levels (refer to Table 4-38). Six respondents were of the opinion that chiefs participated in improving service quality at the district and PHC levels (refer to Table 4-38). Five respondents perceived that priests did not participate in decision-making at the district and PHC levels. Four respondents believed that priests contributed to improving service quality at the district and PHC levels (refer to Table 4-38). Four respondents also perceived that traditional healers participated in improving service quality at the district level and the other two respondents felt they contributed at the PHC level (refer to Table 4-38).

Three respondents perceived that “committees/forums where community members can engage with and influence decisions affecting the district and PHC levels” did not participate in decision-making at the district level although, four respondents thought that these committees/forums participated in decision-making at PHC level (refer to Table 4-38). Five respondents were of the opinion that “committees/forums where community members can engage with and influence decisions affecting the district and PHC levels” participated in improving service quality at the district and PHC levels. Six respondents thought that “community-based organisations/networks meaningfully involved in policy-making processes at national, district and PHC levels” participated in improving service quality at the district level whereas five respondents indicated that these organisations/networks contributed at the PHC level (refer to Table 4-38).

Table 4-38: The perception of respondents at the District Health Management Teams on type of community involved in making decisions and in strengthening service quality at the district and primary healthcare levels

Type of community involved in decision-making on NCD management at the district and PHC levels.	Perception of respondents at DHMTs (N = 9), n					
	District level			PHC level		
	No	Yes	Missing responses	No	Yes	Missing responses
Chiefs	4	2	3	4	3	2
Priests	5	0	4	5	1	3
Traditional healers	4	1	4	4	1	4
Availability of committees/forums where community members can participate in and influence decisions affecting the district and PHC levels.	3	2	4	3	4	2
Community-based organisations/networks relevantly involved in making policies at national, district and PHC levels.	3	3	3	3	3	3
Type of community involved in improving service quality on NCD management at the district and PHC levels	No	Yes	Missing responses	No	Yes	Missing responses
Chiefs	0	6	0	1	6	2
Priests	1	4	4	2	4	3
Traditional healers	0	4	5	1	2	6
Availability of committees/forums where community members can participate in and influence decisions affecting the district and PHC levels.	0	5	4	1	5	3
Community-based organisations/networks relevantly involved in making policies at national,	0	6	0	1	5	3

Type of community involved in decision-making on NCD management at the district and PHC levels.	Perception of respondents at DHMTs (N = 9), n					
	District level			PHC level		
	No	Yes	Missing responses	No	Yes	Missing responses
district and PHC levels.						
<i>DHMTs = District Health Management Teams; PHC = Primary healthcare</i>						

- **Discussion of results on integration of traditional leaders, community and traditional healers with healthcare**

This section discusses results presents in Section 4.4.7 about the incorporation of traditional leaders and healers including the community with healthcare to enhance health promotion in NCD management.

Government entities involved in decision-making and in improving service quality in the health system include politicians, policy-makers, MOH, health and social insurance agencies, public pharmaceutical procurement and distribution entities, health service providers, service users, general public and organised civil society (Brinkerhoff & Bossert, 2014:686-687). Civil society organisations working in health and health systems can improve policy-making, service delivery and governance (WHO/Europe, 2017:12). An effective health system governance engages the civil society (WHO/Europe, 2017:12), and the participation of healthcare users in decision-making and policy development (Conklin *et al.*, 2015:163).

In South Africa, the Traditional Health Practitioners Act (22 of 2007) states that one of the functions of the Traditional Health Practitioners Council is to promote and regulate, liaison between traditional health practitioners and other health professionals registered under any law in the interest of the public. This Act enables traditional healers to participate in decision-making and in improving service quality in the health system of South Africa. In Malawi, Walsh *et al.* (2018:6) noted that traditional leaders had an important role in supporting maternal, neonatal and child health service utilisation, through mobilisation for maternal, neonatal and child health campaigns thus, encouraging women to give birth at the health facility rather than at home or in the community setting. The involvement of traditional leaders in maternal, neonatal and child health was to try to improve national maternal and neonatal survival in resource-limited-service contexts where community conditions are of extreme poverty, and poor women's health status (Walsh *et al.*, 2018:7). Similarly, the study findings indicated that chiefs, priests, traditional healers, committees or forums where community members participated in and influenced decisions affecting the health system, and community-focused organisations or networks relevantly involved in making policies at national, district and PHC levels participate in making

decisions and in strengthening service quality on NCD management at national, district and PHC levels (refer to Section 4.4.7.1, Tables 4-35 and 4-36; Section 4.4.7.2, Table 4-37 and Table 4-38).

The following section present and discuss results concerning health promotion activities on NCD prevention and management at the PHC level.

4.5 Health promotion

In this section, the viewpoint of managers at the DHMTs, OPDs and the healthcare centres about carrying out health promotion activities on prevention and management of NCDs by staff in health facilities are the main focus. This section is divided into the district level and the PHC level.

4.5.1 The district level

Question 2.18 required managers at DHMTs to indicate whether staff in health facilities conducted health promotion activities within their communities on NCD management (refer to Annexure B). Four out of nine respondents perceived that employees at OPDs conducted health promotion activities within their communities and five respondents thought that personnel at healthcare centres also conducted these activities (refer to Figure 4-8).

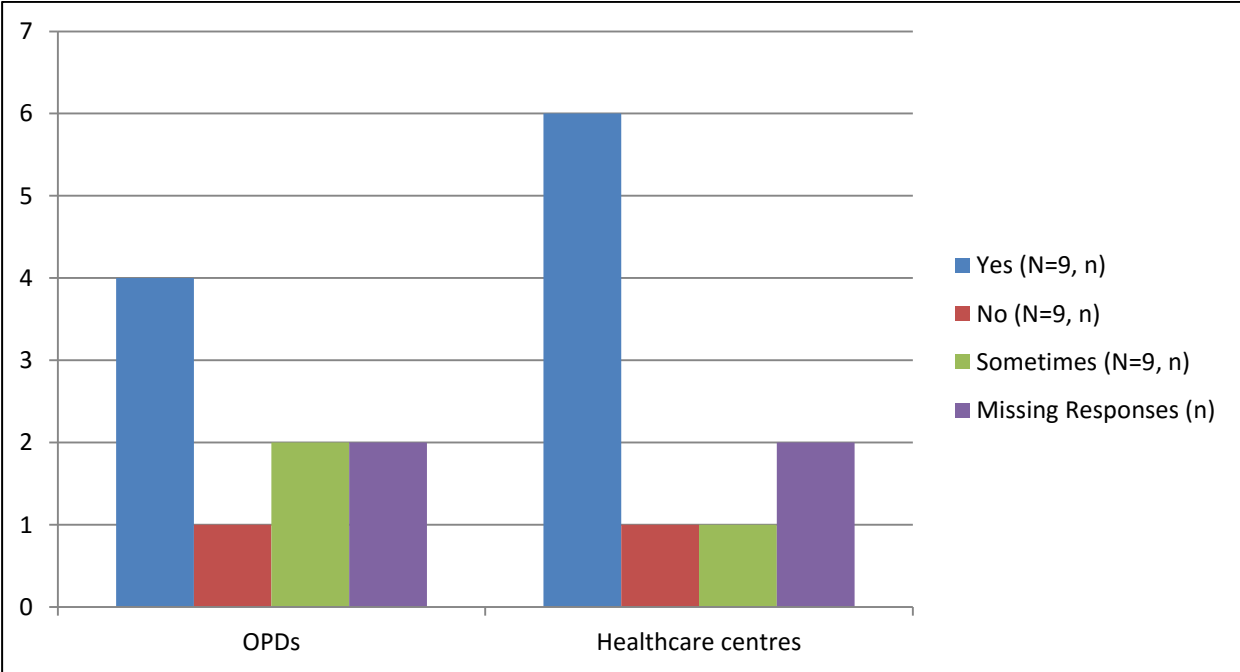


Figure 4-8: The perception of respondents at the District Health Management Teams on conducting health promotion activities on non-communicable disease management by staff at primary healthcare level

The managers at the DHMTs responded to question 2.18.3 (refer to Annexure B), and they mostly felt that staff at both OPDs and healthcare centres carried out health promotion activities on NCD prevention and management within the communities they were found in. Four respondents indicated that staff at OPDs and healthcare centres held outpatients' health education sessions, two respondents thought they conducted outreach services, and another respondent felt that health talks were carried out.

4.5.2 The primary healthcare level

Questions 2.6 (refer to Annexure C) and 2.12 (refer to Annexure D) were about the conduction of health promotion activities by staff at OPDs and healthcare centres within the community. Three respondents at OPDs were of the opinion that staff at OPDs carried out health promotion activities on the prevention of NCDs within the community (refer to Figure 4-9). Three respondents at OPDs perceived that staff at OPDs did not conduct health promotion activities on NCD management. Thirty-seven (43.0%) respondents at healthcare centres perceived that healthcare centres' personnel conducted health promotion activities on the prevention of NCDs (refer to Figure 4-9). Also, most respondents (43.0%, n = 37) were of the view that staff at healthcare centres did not conduct health promotion activities on NCD management.

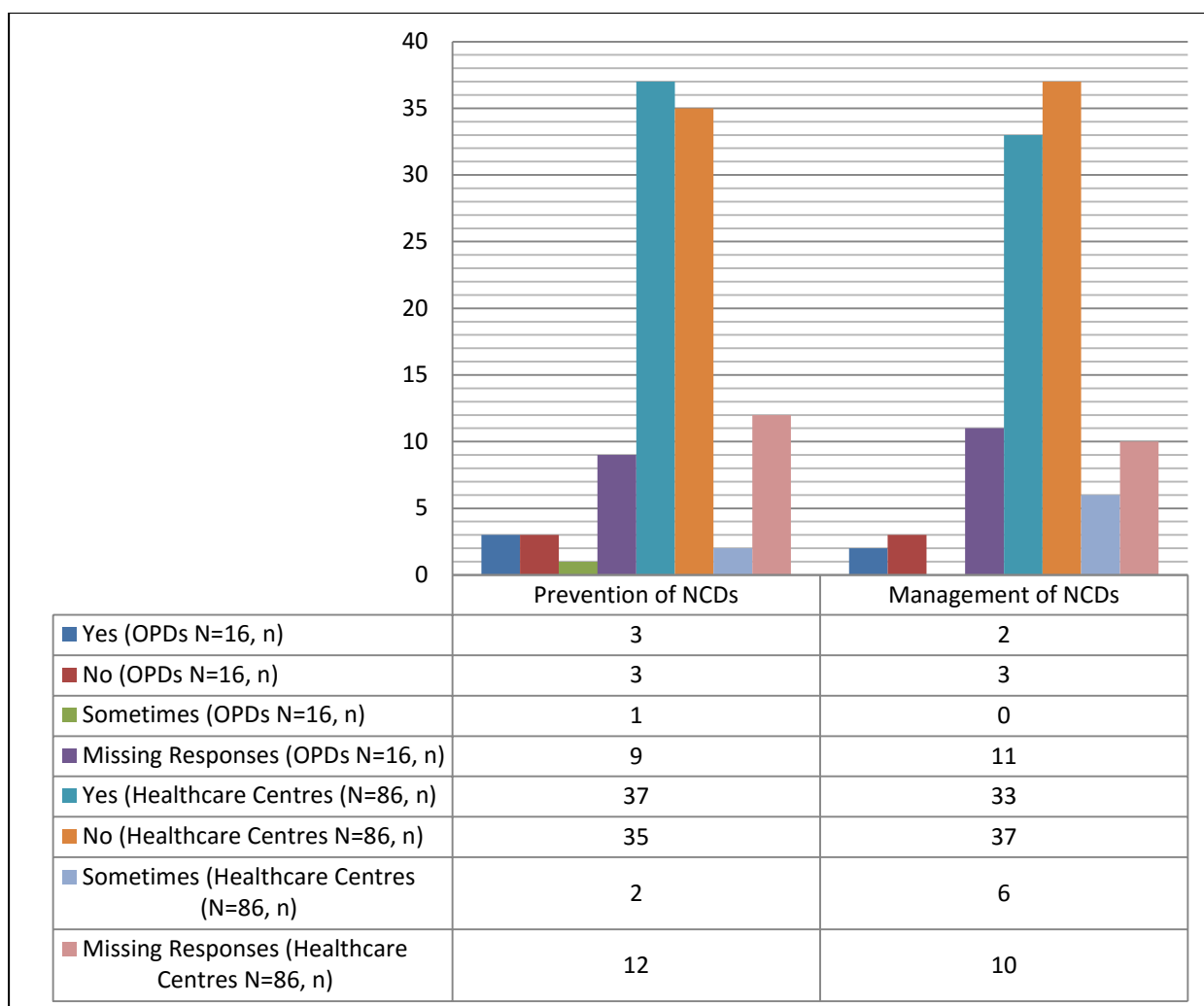


Figure 4-9: The perception of respondents at health facilities on conduction of health promotion activities by staff at outpatient departments and healthcare centres

Questions 2.7 and 2.8 (Annexure C) required managers at OPDs to state topics covered during health promotion activities on the prevention and management of NCDs within the community, respectively. More than 80% of respondents at OPDs did not answer questions 2.7 and 2.8 (refer to Table 4-39). Three respondents thought that staff at OPDs mainly covered “*hypertension and diabetes health talks*” during health promotion activities on NCD prevention. Two respondents stated that health promotion activities in NCD management mainly covered the “*management and prevention of diabetes mellitus*” (refer to Table 4-39).

Table 4-39: The perception of respondents at outpatient departments on topics covered during health promotion activities by staff at outpatient departments

Topics covered by staff at OPDs on prevention of NCDs during health promotion activities in the community.	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
"Hypertension and diabetes health talks."	3	13
"Management and prevention of diabetes mellitus."	2	14
"Lifestyle modifications."	1	15
Topics covered by staff at OPDs on the management of NCDs during health promotion activities in the community NCD management topics.		
"Hypertension and diabetes mellitus."	1	15
"Management and prevention of diabetes mellitus."	2	14
"Importance of medication adherence."	1	15
"Hypertension, diabetes mellitus and asthma."	1	15
<i>OPDs = Outpatient departments</i>		

The viewpoint of managers at healthcare centres presented in Table 4-40 came from responses of managers to questions 2.13 and 2.14 (refer to Annexure D) about topics covered during health promotion activities on NCD prevention and management. More than three-quarters of respondents did not answer questions 2.13 and 2.14 (refer to Table 4-40). Nineteen (22.1%) respondents perceived that staff at healthcare centres mainly covered "*lifestyle modifications*" during health promotion activities on NCD prevention, and fourteen (16.3%) indicated that this topic was also covered during health promotion activities on NCD management (refer to Table 4-40).

Table 4-40: The perception of respondents at healthcare centres on topics covered in health promotion activities by staff at healthcare centres

Topics covered by staff at healthcare centres on prevention of NCDs during health promotion activities in the community.	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
"Lifestyle modifications."	19 (22.1)	67 (77.9)
"Management and prevention of hypertension and diabetes."	9 (10.5)	77 (89.5)
"Management and causes of hypertension."	2 (2.3)	84 (97.7)
"Hypertension and epilepsy."	1 (1.2)	85 (98.8)
"Hypertension, diabetes mellitus, epilepsy, asthma."	2 (2.3)	84 (97.7)
Topics covered by staff at healthcare	Perception of respondents at	Missing

centres on management of NCDs during health promotion activities in the community NCD management topics.	healthcare centres (N = 86), n (%)	responses, n (%)
“Importance of medication adherence.”	10 (11.6)	76 (88.4)
“Management of hypertension and diabetes mellitus.”	8 (9.3)	78 (90.7)
“Lifestyle modifications.”	14 (16.3)	72 (83.7)
“Management of diabetes mellitus and asthma.”	1 (1.2)	85 (98.8)
“Hypertension and epilepsy.”	1 (1.2)	85 (98.8)

- **Discussion of results on health promotion activities**

The discussion of results on health promotion activities carried out by healthcare workers at health facilities (refer to Section 4.5) is the main focus in this subsection.

Lesotho has a National multi-sectoral integrated strategic plan for the prevention and control of NCDs (2014-2020) which recognises health promotion as the best tool for NCD prevention and control thus, individuals, families and communities have to be made aware and knowledgeable of the risk factors and the need for early identification of NCDs through screening (MOH, 2014:39). Similarly, the Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-17 of South Africa (South Africa, 2013:40-41) highlights the importance of developing health promotion material encompassed within the principles of the Integrated Chronic Disease Management Model (ICDM) which will be incrementally implemented in districts. The Republic of Moldova also has a National Health Promotion Programme that focuses on healthy behaviours through the modification of attitudes and improvement of knowledge among adults, adolescents and youth (Sécula *et al.*, 2020:2). The principal focus of this programme is the capacity-building of health and education specialists on planning and implementing health promotion actions at the national and local level of the health system of the Republic of Moldova (Sécula *et al.*, 2020:2). In Kenya, the Kenya Health Sector Strategic and Investment Plan 2014–2018 (KHSSP) specifically mentions health promotion for the prevention of NCDs as it recognises NCDs as the leading contributor to the high burden of disease in Kenya (Asiki *et al.*, 2018:5). The programme and strategic plans of NCDs in the Republic of Moldova, South Africa, Kenya and Lesotho recognise that health professionals have to conduct health promotion activities at PHC level and within the community to combat the increasing burden of NCDs (Asiki *et al.*, 2018:5; MOH, 2014:39; Republic of South Africa, 2013:40-41; Sécula *et al.*, 2020:2).

In light of the availability of strategic plans and programmes supporting health promotion, the study findings revealed that some health personnel at OPDs and healthcare centres in Lesotho

performed health promotion activities on prevention and management of NCDs within the community (refer to Section 4.5.1, Figure 4-8; Section 4.5.2, Figure 4-9). These health promotion activities were in the form of outpatients' health education sessions and outreach services (refer to Section 4.5.1). Some of the topics covered during health promotion activities were lifestyle modifications, prevention and management of diabetes mellitus, and health talks on hypertension and diabetes mellitus (refer to Section 4.5.3, Table 4-40).

Section 4.6 focuses on continuing education support and training of health workers involved with NCD management.

4.6 Continuing education and training of health workers in non-communicable diseases

The results and discussions about continuing education and training of health workers in NCDs are sectioned based on the specific objective, to assess continuing education and training of health workers in NCDs at the district and the PHC level in the public health system of Lesotho in terms of:

- The availability of professional development and continuing education support for health workers on NCD management at health facilities, and
- The availability of training on NCD management for health workers at health facilities.

4.6.1 The availability of professional development and continuing education support for health workers on non-communicable disease management at health facilities

This section entails the perceptions of managers at the MOH and the DHMTs on continuing educational support for health workers involved with NCD management in health facilities. This section is divided into the MOH and the district level.

4.6.1.1 The Ministry of Health

Table 4-41 portrays the perceptions of managers at the MOH concerning professional development and continuing education support for healthcare workers on NCD management. In question 2.7, managers were asked to indicate whether healthcare workers, in the different levels of the health system, received adequate professional development or continuing education support on NCD management (refer to Annexure A). More than two-thirds of the managers did not respond to question 2.7 (refer to Table 4-41).

One respondent perceived that professional development on NCD management was somewhat provided to healthcare workers at DHMTs and healthcare centres was moderate. One respondent felt that healthcare workers at OPDs did not receive any professional development (refer to Table 4-41). Two respondents perceived that healthcare workers at OPDs did not receive continuing education support (refer to Table 4-41).

Table 4-41: The perception of respondents at the Ministry of Health on professional development and continuing education support for health workers on non-communicable disease management

Delivery of professional development on NCD management for health workers in different levels of the health system.	Perception of respondents at MOH (N = 6), n			
	Yes	Somewhat	No	Missing responses
DHMTs	0	1	0	5
OPDs	0	0	1	5
Healthcare centres	0	1	0	5
Delivery of continuing education support on NCD management for health workers in different levels of the health system.				
DHMTs	1	0	1	4
OPDs	0	0	2	4
Healthcare centres	0	1	1	4

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs= Outpatient departments

Responses to question 2.8 on available supporting tools that assisted with professional development and continuing education (refer to Annexure A) are portrayed in Table 4-42. More than two-thirds of the managers did not respond to question 2.8 (refer to Table 4-42). Two respondents at the MOH thought that study leaves and funding for tuition fees were supporting tools that assisted with professional development and continuing education support (refer to Table 4-42).

Table 4-42: The perception of respondents at the Ministry of Health on supporting tools for professional development and continuing education support

Type of supporting tools for professional development and continuing education support	Perception of respondents at MOH (N = 6), n		
	Yes	No	Missing responses
Existence of a formal work-related training component for all levels of staff.	0	1	5
Existence of a harmonised system of work-related training or continuing education across the MOH.	1	0	5
Existence of study leave.	2	0	4

Type of supporting tools for professional development and continuing education support	Perception of respondents at MOH (N = 6), n		
Existence of funding for tuition fees.	2	0	4
<i>MOH = Ministry of Health</i>			

4.6.1.2 The district level

This section outlines the viewpoint of managers at the DHMTs about professional development and continuing education support for healthcare workers on NCD management at the PHC level. The managers responded to questions 2.15, 2.16 and 2.17 on the provision of professional development and continuing education support at health facilities (refer to Annexure B). More than 50% of the managers at DHMTs did not respond to questions 2.15 (refer to Table 4-43), 2.16 (refer to Table 4-44), and question 2.17 (refer to Table 4-45).

Three respondents thought that professional development was available to employees at healthcare centres (refer to Table 4-43). Two respondents thought that continuing education support was provided to health workers at OPDs, and four respondents felt that continuing education support was provided to health workers at healthcare centres (refer to Table 4-43).

Table 4-43: The perception of respondents at the District Health Management Teams on the provision of professional development and continuing education support for health workers at primary healthcare

Delivery of adequate professional development on NCD management for health workers at PHC level	Perception of respondents at DHMTs (N = 9), n			
	No	Yes	Sometimes	Missing responses
OPDs	1	1	2	5
Healthcare centres	1	3	1	4
Delivery of continuing education support on NCD management for health workers at PHC level				
OPDs	0	2	2	5
Healthcare centres	0	4	1	4
<i>DHMTs = District Health Management Teams; OPDs= Outpatient departments</i>				

Four respondents at the DHMTs perceived that supporting tools for professional development and continuing education support included formal work-related training components for all levels of staff (refer to Table 4-44). Three respondents indicated a harmonised system of work-related training or continuing education across OPDs as a supporting tool. Five respondents also believed that a harmonised system of work-related training or continuing education across

healthcare centres was a supporting tool for professional development and continuing education support (refer to Table 4-44).

Table 4-44: The perception of respondents at the District Health Management Teams on type of supporting tools for professional development and continuing education support for health workers at primary healthcare

Type of supporting tools for professional development and continuing education support for health workers at OPDs and healthcare centres	Perception of respondents at DHMTs (N = 9), n		
	Yes	No	Missing responses
A formal work-related training component for all levels of staff.	4	1	4
A harmonised system of work-related training or continuing education across the OPDs in district hospitals.	3	1	5
A harmonised system of work-related training/continuing education across the healthcare centres.	5	0	4
Learning and sharing during PHC meetings.	1	0	8
<i>DHMTs = District Health Management Teams; OPDs= Outpatient departments; PHC = Primary healthcare</i>			

Table 4-45 presents that two respondents at DHMTs perceived that the main topic covered during in-service training or continuing education support on NCD management was “*diagnosis and management of hypertension, congestive heart failure*”.

Table 4-45: The perception of respondents at the District Health Management Teams on topics covered during in-service training or continuing education support on non-communicable disease management

Topics covered during in-service training or continuing education support on NCD management.	Perception of respondents at DHMTs (N = 9), n	Missing responses (n)
“Diagnosis and management of hypertension, congestive heart failure.”	2	7
“Hypertension.”	1	8
“Management of NCDs, drug adverse effects of communicable disease drugs, emergencies of NCDs.”	1	8
<i>DHMTs = District Health Management Teams</i>		

- **Discussion of results on the availability of professional development and continuing education for healthcare workers**

The main focus of this subsection is to discuss results outlined in Section 4.6.1 on the availability and type of professional development and continuing education for healthcare workers at health facilities on NCD management.

Non-communicable diseases are a concern worldwide and training and experience in prevention and management of NCDs among public health workers are important especially in low- and middle-income countries (Davila *et al.*, 2015; Heller *et al.*, 2019; Schmidt, 2018). The training and experience of health workers in the prevention and management of NCDs will assist with the improvement of health services provided to patients with NCDs. Musango *et al.* (2020:13) assessed challenges and opportunities of the health system of Mauritius in NCD management and revealed that the Mauritius Institute of Health (MIH) created opportunities for continuing education for cadres of health workers to develop new competencies and skills. The development of new competencies and skills in NCD management makes health workers eligible for internal promotions and career advancement (Musango *et al.*, 2020:13). Also, nurses working in healthcare facilities in remote and rural parts of India reported that their clinical competencies require strengthening in the management of NCDs so, continuing professional development priorities should focus on managing NCDs and medical emergencies for NCDs (Macaden *et al.*, 2017:941).

Similarly, the findings of this study indicated that there was adequate professional development provision for health workers at healthcare centres and, adequate continuing education support for health workers at both OPDs and healthcare centres (refer to Section 4.6.1.1, Table 4-41; Section 4.6.1.2, Table 4-43). Continuing education support and professional development for health professionals will enable health workers in public health facilities of Lesotho to improve their skills and gain new competencies needed in NCD management which will lead to good quality service delivery to both patients with NCDs and the community.

According to Evans *et al.* (2016:21), health workers with significant working experience are in a better position to contribute to the cost of their education and/or be sponsored by their employer, thus changing the affordability and profitability prospects significantly in comparison to pre-service training. To make sure that continuing education and professional development took place at PHC level in Lesotho, respondents at the MOH and the DHMTs perceived that there were supporting tools in place that enabled the provision of professional development and continuing education support for health professionals at PHC level in Lesotho (refer to Section 4.6.1.1, Table 4-42; Section 4.6.1.2, Table 4-44). The supporting tools included:

- Existence of study leave,
- Existence of funding for tuition fees, and
- Existence of a harmonised system for work-related training or continuing education across MOH, OPDs and healthcare centres. However, respondents at the DHMTs perceived that there was a formal work-related training component for all levels of staff (refer to Section

4.6.1.2, Table 4-44), in contrast, respondents at the MOH thought that in-service training was not available (refer to Section 4.6.1.1, Table 4-42).

4.6.2 The availability of training on non-communicable disease management for health workers at health facilities

The perception of managers at the DHMTs, OPDs and the healthcare centres on available training on NCD management for health workers at the PHC level are outlined in this section, divided into the district and the PHC level.

4.6.2.1 The district level

Table 4-46 depicts the perception of managers at DHMTs concerning training of health professionals on how to use the equipment for diagnosis and management of NCDs (refer to Annexure B, question 6.6).

Three respondents perceived that health professionals at OPDs were trained on how to use thermometers, stethoscopes, sphygmomanometers, measuring tapes, weighing scales, glucometers, blood glucose test strips and urine protein test strips (refer to Table 4-46). Also, two respondents thought that health professionals were trained on the use of spacers for inhalers and urine ketones test strips. Two respondents were of the view that health professionals at OPDs were not trained on how to use peak flow meters, and therapeutic drug level monitoring for epileptic patients (refer to Table 4-46).

Five respondents thought that health professionals at healthcare centres were trained on the use of thermometers, stethoscopes, sphygmomanometers, measuring tapes, weighing scales, and blood glucose test strips (refer to Table 4-46). Four respondents felt that they were trained on the use of glucometers and urine protein test strips. Three out of nine respondents perceived that health professionals at healthcare centres were taught how to use urine ketones test strips. However, four respondents believed that health professionals at healthcare centres were not trained on how to use peak flow meters compared to one respondent who thought on the contrary (refer to Table 4-46). Three respondents perceived that personnel at healthcare centres were also not taught how to use spacers for inhalers whereas two respondents thought otherwise. Five respondents further indicated that they were not taught about therapeutic drug level monitoring for epileptic patients (refer to Table 4-46).

Table 4-46: The perception of respondents at the District Health Management Teams on the training of healthcare professionals in primary healthcare on the use of equipment for non-communicable disease management

Equipment used in NCD diagnosis and management at OPDs and healthcare centres.	Perception of respondents at DHMTs (N = 9), n		
	Yes	No	Missing responses
OPDs			
Thermometer	3	0	6
Stethoscope	3	0	6
Sphygmomanometer	3	0	6
Measurement tape	3	0	6
Weighing scale	3	0	6
Peak flow meter	1	2	6
Spacers for inhalers	2	0	7
Glucometer	3	0	6
Blood glucose test strips	3	0	6
Urine protein test strips	3	0	6
Urine ketones test strips	2	1	7
Therapeutic drug level monitoring for epileptic patients	1	2	6
Healthcare centres			
Thermometer	5	0	4
Stethoscope	5	0	4
Sphygmomanometer	5	0	4
Measurement tape	5	0	4
Weighing scale	5	0	4
Peak flow meter	1	4	4
Spacers for inhalers	2	3	4
Glucometer	4	0	5
Blood glucose test strips	5	0	4
Urine protein test strips	4	1	4
Urine ketones test strips	3	2	4
Therapeutic drug level monitoring for epileptic patients	0	5	4
<i>DHMTs = District Health Management Teams; OPDs= Outpatient departments</i>			

The managers at DHMTs responded to question 3.18 about the training of non-pharmaceutical staff on drug and medical supply management in the past 6 months before the date of data collection of this study (refer to Annexure B). In Table 4-47, four respondents perceived that

non-pharmaceutical staff at OPDs was not trained on drug supply management and two respondents thought that they were not trained on medical supplies management. Four out of nine respondents perceived that non-pharmaceutical staff at healthcare centres was trained on medical supplies management.

Table 4-47: The perception of respondents at the District Health Management Teams on training for non-pharmaceutical staff on drug supply and medical supplies management at health facilities

Health facilities	Type of training	Perception of respondents at DHMTs (N = 9), n		
		No	Yes	Missing responses
OPDs	Drug supply management	4	1	4
	Medical supplies management	2	1	6
Healthcare centres	Drug supply management	3	3	3
	Medical supplies management	2	4	3

DHMTs = District Health Management Teams; OPDs = Outpatient departments

In question 3.18.1 (refer to Annexure B), managers at DHMTs were asked to indicate the number of training conducted on drug and medical supply management for non-pharmaceutical staff at health facilities in the past six months before the date of data collection of this study. Two-quarters of the managers did not answer question 3.18.1 (refer to Table 4-48). One respondent perceived that one training session on drug and medical supply management was conducted for non-pharmaceutical staff at OPDs (refer to Table 4-48). Three respondents thought that one training session was conducted on drug and medical supply management for non-pharmaceutical staff at healthcare centres (refer to Table 4-48).

Table 4-48: The perception of respondents at the District Health Management Teams on the number of training sessions conducted for non-pharmaceutical staff on drug supply and medical supplies management

Type of training	Perception of respondents at DHMTs (N = 9), n					
	Number of training sessions	Number of OPDs that selected the option	Missing responses	Number of training	Number of healthcare centres that selected the option	Missing responses
Drug supply management	0	1	7	1	3	5
	1	1		2	1	
Medical supplies	0	1	7	1	3	5

Type of training	Perception of respondents at DHMTs (N = 9), n					
	Number of training sessions	Number of OPDs that selected the option	Missing responses	Number of training	Number of healthcare centres that selected the option	Missing responses
management	1	1		2	1	

DHMTs = District Health Management Teams; OPDs= Outpatient departments

The managers at DHMTs, furthermore, responded to questions 3.18.2 and 3.18.3 about topics covered during drug and medical supply management training sessions (refer to Annexure B). More than 50% of the managers did not respond to these questions. Three respondents were of the opinion that “*good inventory management, good storage practice and supply chain management*” was covered during drug supply management whereas two respondents also had the same opinion about topics covered during medical supplies management training.

Although more than 50% of the DHMT managers did not respond to questions 3.18.4 and 3.18.5 (refer to Annexure B) about changes made as a result of drug and medical supply management training sessions in health facilities, three were of the opinion that changes due to training sessions were implemented at health facilities. Three respondents perceived that changes made as a result of drug supply management training include “*Maximum stock levels are never exceeded, and minimum stock levels are never passed*”. One respondent thought that changes made due to training in medical supplies management were “*Labelling of shelves in the store room and application of first-in-first-out and first-expiry-first-out*” and “*Stock levels are well maintained*”.

The managers at DHMTs were asked about the conduction of drug and medical supply management training sessions for pharmaceutical staff in the past six months before the date of data collection of this study in questions 3.17, and 3.17.3–3.17.7 (refer to Annexure B). More than one-third of the managers did not respond to these questions.

The perception of respondents at DHMTs on the conduction of training of pharmaceutical staff at OPDs on drug and medical supply management is presented in Table 4-49. Three respondents perceived that pharmaceutical staff at healthcare centres received training on drug and medical supply management.

Table 4-49: The perception of respondents at the District Health Management Teams on the training of pharmaceutical staff on drug supply and medical supplies management in the past six months

Health facilities	Type of training	Perception of respondents at DHMTs (N = 9), n		
		No	Yes	Missing responses
OPDs	Drug supply management	1	1	7
	Medical supplies management	1	1	7
Healthcare centres	Drug supply management	2	3	4
	Medical supplies management	2	3	4

DHMTs = District Health Management Teams; OPDs= Outpatient departments

Table 4-50 displays the perception of managers at DHMTs on the number of training sessions conducted on drug and medical supply management for pharmaceutical staff at health facilities in the past six months before the date of data collection of this study. Two respondents perceived that four training sessions on drug and medical supply management were conducted at OPDs. Two out of nine respondents thought that at least one training session on drug and medical supply management was carried out for pharmaceutical staff at healthcare centres (refer to Table 4-50).

Table 4-50: The perception of respondents at the District Health Management Teams on the number of training sessions conducted on drug supply and medical supplies management for pharmaceutical staff

Type of training	Perception of respondents at DHMTs (N = 9), n					
	Number of training sessions	Number of OPDs that selected the option	Missing responses	Number of training	Number of healthcare centres that selected the option	Missing responses
Drug supply management	0	1	6	1	2	4
	4	2		2	1	
	0	0		4	2	
Medical supplies management	0	1	6	1	2	4
	4	2		2	1	
	0	0		4	2	

DHMTs = District Health Management Teams; OPDs= Outpatient departments

Five respondents perceived that “*Good inventory management, good storage practice and supply chain management*” was covered during drug supply management training for pharmaceutical staff at health facilities in the past six months. Four respondents similarly

thought that *“Good inventory management, good storage practice and supply chain management”* was taught during medical supplies management training.

Four respondents thought that changes recommended as a result of drug supply management training for pharmaceutical staff were implemented at health facilities, whereas two respondents felt that recommended changes during medical supplies management training were implemented. One respondent further indicated that these changes due to drug supply management training were sometimes implemented and another three respondents believed that changes recommended during medical supplies management training were sometimes implemented. Three respondents perceived these changes made in health facilities to include *“improved data and availability of medicines, bin cards for medical supplies were created, and good storage practices were in place”*.

4.6.2.2 The primary healthcare level

Question 2.13 (Annexure C) and question 2.19 (Annexure D) asked managers at these settings, respectively, to indicate whether a training plan existed or not. Eleven out of 16 respondents at OPDs perceived that a training plan did not exist while one respondent felt that it did. Seventy-three (84.9%) respondents at healthcare centres believed that there was no training plan but, 10 (11.6%) respondents thought that there was.

Responses to question 2.14 (Annexure C) and question 2.20 (Annexure D) about topics covered in training sessions of NCD management are presented in Table 4-51. More than two-thirds of managers at OPDs and healthcare centres did not answer these questions (refer to Table 4-51).

The majority of respondents at OPDs perceived that all topics on NCD management were covered during healthcare workers training although; medication storage and lifestyle modifications for patients with NCDs were the least taught topics (refer to Table 4-51). The respondents at the healthcare centres perceived that all topics on NCD management were taught during the training of healthcare workers in healthcare centres (refer to Table 4-51).

Table 4-51: The perception of respondents at health facilities on topics covered during training on non-communicable disease management at primary healthcare

Topics during training for health workers on NCD management at OPDs and healthcare centres.	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	Yes	No	Missing responses	Yes	No	Missing responses
Topics on hypertension	4	1	11	19 (22.1)	1 (1.2)	66 (76.7)
Topics on diabetes mellitus	4	1	11	19 (22.1)	1 (1.2)	66 (76.7)
Topics on asthma	2	2	12	13 (15.1)	3 (3.5)	70 (81.4)
Topics on epilepsy	4	1	11	16 (18.6)	2 (2.3)	68 (79.1)
Topics on medication use for patients with NCDs	2	3	11	17 (19.8)	2 (2.3)	67 (77.9)
Topics on medication storage for patients with NCDs	1	4	11	16 (18.6)	2 (2.3)	68 (79.1)
Topics on lifestyle modifications for patients with NCDs	1	4	11	16 (18.6)	2 (2.3)	68 (79.1)
Topics on prevention of NCDs	2	3	11	19 (22.1)	1 (1.2)	66 (76.7)
Topics on management of NCDs	2	3	11	18 (20.9)	1 (1.2)	67 (77.9)

OPDs= Outpatient departments

Table 4-52 displays responses of managers at OPDs and healthcare centres to question 2.15 (refer to Annexure C) and question 2.21 (refer to Annexure D) about how often training sessions on NCD management were held in health facilities. More than three-quarters of managers at OPDs and healthcare centres did not answer questions 2.15 and 2.21, respectively (refer to Table 4-52).

Two respondents at OPDs perceived that training sessions on NCD management were held every six months in health facilities (refer to Table 4-52). The majority (10.5%, n = 9) of respondents at healthcare centres felt that training sessions were held once a year, whereas five respondents (5.8%) thought that they were conducted every six months. Eight respondents (9.3%) were of the opinion that training sessions were never held (refer to Table 4-52).

Table 4-52: The perception of respondents at health facilities on the frequency of holding training sessions on non-communicable disease management in health facilities

Frequency of holding training sessions for health workers at OPDs and healthcare centres on NCD management	Perception of respondents at OPDs (N = 16), n	Missing responses at OPDs (n)	Perception of respondents at healthcare centres (N = 86), %	Missing responses at healthcare centres, n (%)
Every 6 months	2	14	5 (5.8)	81 (94.2)
Once a year	1	15	9 (10.5)	77 (89.5)
Never	0	0	8 (9.3)	78 (90.7)
Sometimes	1	15	0	0
Monthly health education	0	0	1 (1.2)	85 (98.8)
Every quarter by the DHMT in PHC meetings	0	0	1 (1.2)	85 (98.8)
Weekly	0	0	2 (2.3)	84 (97.7)
Once in two years	0	0	1 (1.2)	85 (98.8)
<i>OPDs= Outpatient departments</i>				

The perception of managers at OPDs and healthcare centres on training of healthcare workers on the use of equipment for diagnosis and management of NCDs (question 6.5, Annexure C and Annexure D) is portrayed in Table 4-53.

The majority of respondents at OPDs were of the opinion that healthcare workers were trained on the use of thermometers, stethoscopes, sphygmomanometers, glucometers, blood glucose test strips, urine protein test strips, measuring tapes and weighing scales (refer to Table 4-53). Six respondents further perceived that healthcare workers were not trained on the use of peak flow meters and spacers for inhalers. Ten respondents also felt that health workers were not taught about therapeutic drug level monitoring for epileptic patients compared to three respondents who thought they were taught (refer to Table 4-53).

Most respondents at healthcare centres perceived that healthcare workers at healthcare centres were trained on the use of stethoscopes (89.5%, n = 77), sphygmomanometers (89.5%, n = 77), glucometers (89.5%, n = 77), blood glucose test strips (89.5%, n = 77), urine protein test strips (89.5%, n = 77), thermometers (91.9%, n = 79), measuring tapes (90.7%, n = 78), weighing scales (90.7%, n = 78) and urine ketone test strips (84.9%, n = 73) (refer to Table 4-53).

However, most respondents were also of the view that healthcare workers were not trained on the use of peak flow meters (69.8%, n = 60), spacers for inhalers (66.3%, n = 57) and therapeutic drug level monitoring for epileptic patients (72.1%, n = 62) (refer to Table 4-53).

Table 4-53: The perception of respondents at healthcare centres on training of health workers in primary healthcare on the use of equipment for diagnosis and management of non-communicable diseases

Equipment used for diagnosis and management of NCDs at OPDs and healthcare centres	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
Thermometer	1	12	3	3 (3.5)	79 (91.9)	4 (4.7)
Stethoscope	1	12	3	5 (5.8)	77 (89.5)	4 (4.7)
Sphygmomanometer	1	12	3	3 (3.5)	77 (89.5)	6 (7.0)
Measurement tape	1	11	4	3 (3.5)	78 (90.7)	5 (5.8)
Weighing scale	1	11	4	3 (3.5)	78 (90.7)	5 (5.8)
Peak flow meter	6	4	6	60 (69.8)	14 (16.3)	12 (14.0)
Spacers for inhalers	6	5	5	57 (66.3)	18 (20.9)	11 (12.8)
Glucometer	1	12	3	4 (4.7)	77 (89.5)	5 (5.8)
Blood glucose test strips	1	12	3	4 (4.7)	77 (89.5)	5 (5.8)
Urine protein test strips	1	12	3	3 (3.5)	77 (89.5)	6 (7.0)
Urine ketones test strips	1	12	3	4 (4.7)	73 (84.9)	9 (10.5)
Therapeutic drug level monitoring for epileptic patients	10	3	3	62 (72.1)	16 (18.6)	8 (9.3)

OPDs= Outpatient departments

The managers at OPDs responded to questions 3.19–3.24, 3.24.1, and question 3.25 (refer to Annexure C) about the training of pharmaceutical staff on drug and medical supply management. Seven respondents perceived that training for pharmaceutical staff at OPDs on drug and medical supply management was not conducted in the past six months before the date of data collection of this study whereas three respondents thought that these training sessions were offered.

Table 4-54 indicates the perception of respondents at OPDs on the number of training sessions held on drug and medical supply management for pharmaceutical staff at OPDs. There were 16 missing responses (refer to Table 4-54). Two respondents perceived that two training sessions on drug supply management were held for pharmaceutical staff at OPDs (refer to Table 4-54). One respondent thought that at least one training session on medical supplies management was conducted for pharmaceutical staff at OPDs.

Table 4-54: The perception of respondents at outpatient departments on the number of training sessions conducted on drug supply and medical supplies management for pharmaceutical staff at outpatient departments

Type of training	Perception of respondents at OPDs (N = 16), n		
	Number of training sessions	Number of OPDs that selected the option	Missing responses
Drug supply management	2	2	13
	6	1	
Medical supplies management	1	1	13
	2	1	
	6	1	

OPDs= Outpatient departments

Two respondents at OPDs thought that topics mostly covered during drug supply management training sessions were “*Supply chain management, medical supply management and standard operating procedures for health professionals*” whereas two respondents felt that “*Supply chain management*” was mostly covered during medical supplies management training sessions. Also, two respondents thought that changes resulting from drug supply management training were not implemented at OPDs while three respondents also shared the same thought about changes resulting from medical supplies management training. However, one respondent believed that these changes were implemented at OPDs. One respondent perceived that these changes implemented by pharmaceutical staff at OPDs were “*improved inventory management*” and “*improved and effective and supply management*”.

Figure 4-10 depicts that four respondents believed that refresher training sessions for drug supply management were held once a year and three respondents perceived that they were never held. Three respondents thought that refresher training sessions on medical supplies management were held once a year but two respondents felt that these training sessions were never held for pharmaceutical staff at OPDs (refer to Figure 4-10).

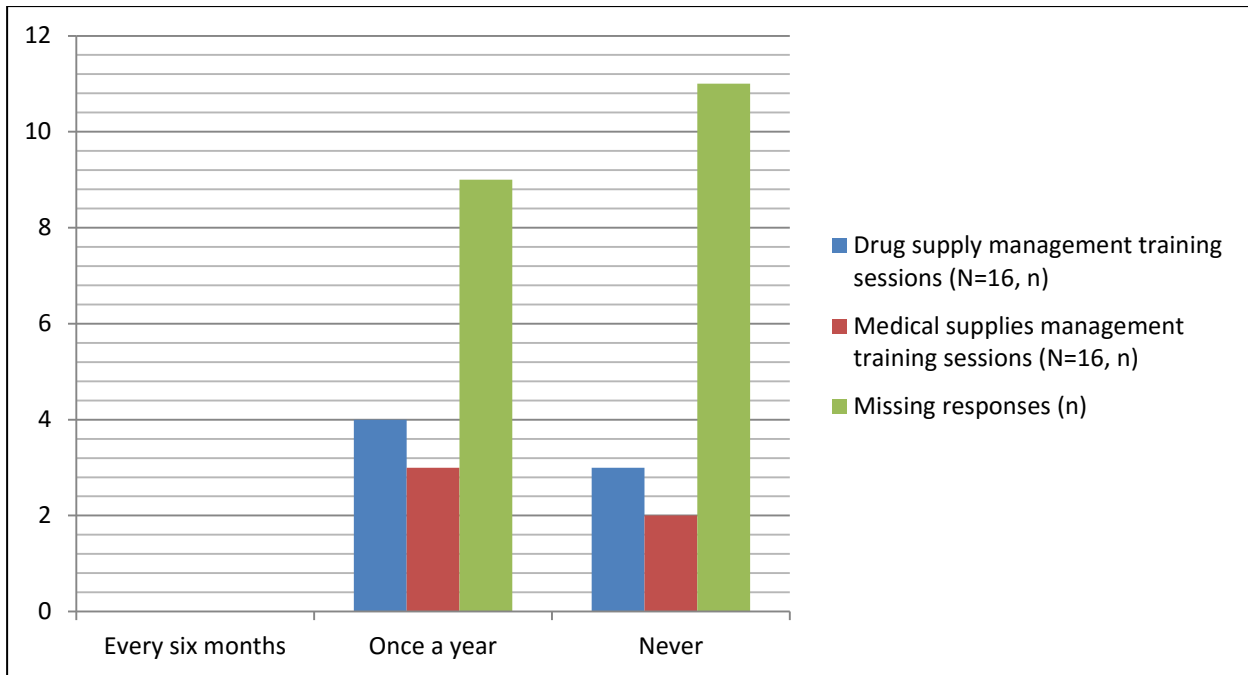


Figure 4-10: The perception of respondents at outpatient departments on refresher training sessions on drug supply and medical supplies management for pharmaceutical staff at outpatient departments

The managers at healthcare centres had an opinion on the training of non-pharmaceutical staff at healthcare centres on drug and medical supply management in the past six months before the date of data collection of this study. The opinion resulted from responses to questions 3.14–3.19, 3.19.1, and question 3.20 (refer to Annexure D).

Fifty (58.1%) respondents at healthcare centres perceived that training sessions for non-pharmaceutical staff at healthcare centres on drug supply management were not conducted whereas thirty-six (41.9%) respondents felt that training on medical supplies management was not held (refer to Figure 4-11).

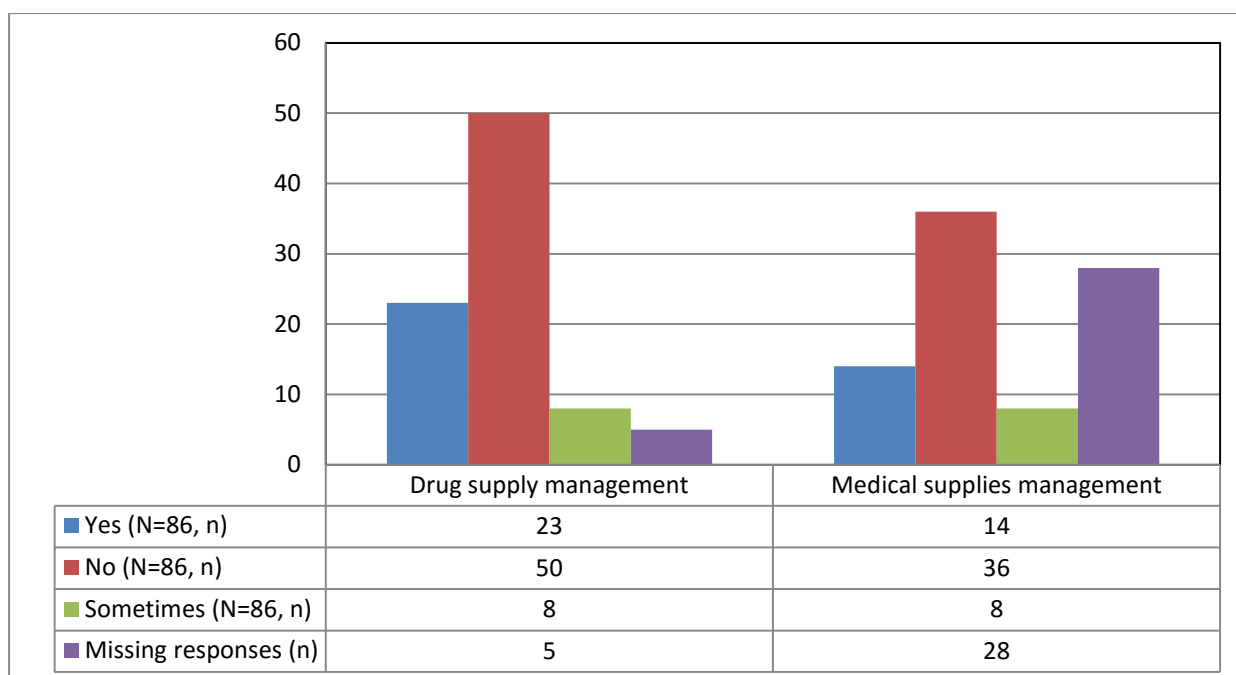


Figure 4-11: The perception of respondents at healthcare centres on training of non-pharmaceutical staff at healthcare centres on drug supply and medical supplies management

The perception of respondents at healthcare centres on the number of training sessions offered to non-pharmaceutical staff at healthcare centres in the past six months before the date of the data collection of this study is presented in Table 4-55. Missing responses from respondents were more than 50% (refer to Table 4-55). Nineteen (n = 19) respondents perceived that at least one training session on drug supply management was held for non-pharmaceutical staff at healthcare centres (refer to Table 4-55). Also, 20.9% (n = 18) of respondents thought that at least one training session on medical supplies management was offered to non-pharmaceutical staff at healthcare centres.

Table 4-55: Number of training sessions conducted on drug supply and medical supplies management for non-pharmaceutical staff in healthcare centres

Type of training	Number of training sessions	Perception of respondents at OPDs (N = 86), n (%)	
		Number of healthcare centres that selected the option	Missing responses
Drug supply management	0	11 (12.8)	50 (58.1)
	1	19 (22.1)	
	2	3 (3.5)	
	3	1 (1.2)	
	4	2 (2.3)	
Medical supplies	0	12 (14.0)	51 (59.3)

Type of training management	Number of training sessions	Perception of respondents at OPDs (N = 86), n (%)	
		Number of healthcare centres that selected the option	Missing responses
	1	18 (20.9)	
	2	4 (4.7)	
	4	1 (1.2)	

Ten (11.6%) respondents at healthcare centres were of the view that the most covered topics during drug supply management training were “Stores management, requisition of medicines and calculation of average monthly consumption” whereas five (5.8%) respondents shared the same view about topics covered in medical supplies management training sessions (refer to Table 4-56).

Table 4-56: The perception of respondents at healthcare centres on topics covered in drug supply and medical supplies management training sessions for non-pharmaceutical staff at healthcare centres

Topics covered in drug supply management training for non-pharmaceutical staff at healthcare centres.	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
“Stores management, requisition of medicines and calculation of average monthly consumption.”	10 (11.6)	76 (88.4)
“Drug supply management.”	1 (1.2)	85 (98.8)
“Drug toxicity.”	3 (3.5)	83 (96.5)
“How to use bin cards, tally sheets and order books.”	3 (3.5)	83 (96.5)
Topics covered in medical supplies management training for non-pharmaceutical staff at healthcare centres		
“Medical supply management.”	1 (1.2)	85 (98.8)
“Stores management, requisition of medical supplies and calculation of average monthly consumption.”	5 (5.8)	81 (94.2)
“Handling of expired supplies,”	1 (1.2)	85 (98.8)

Figure 4-12 portrays that 14.0% (n = 12) of respondents perceived that changes made during training sessions on drug and medical supply management were sometimes implemented at healthcare centres.

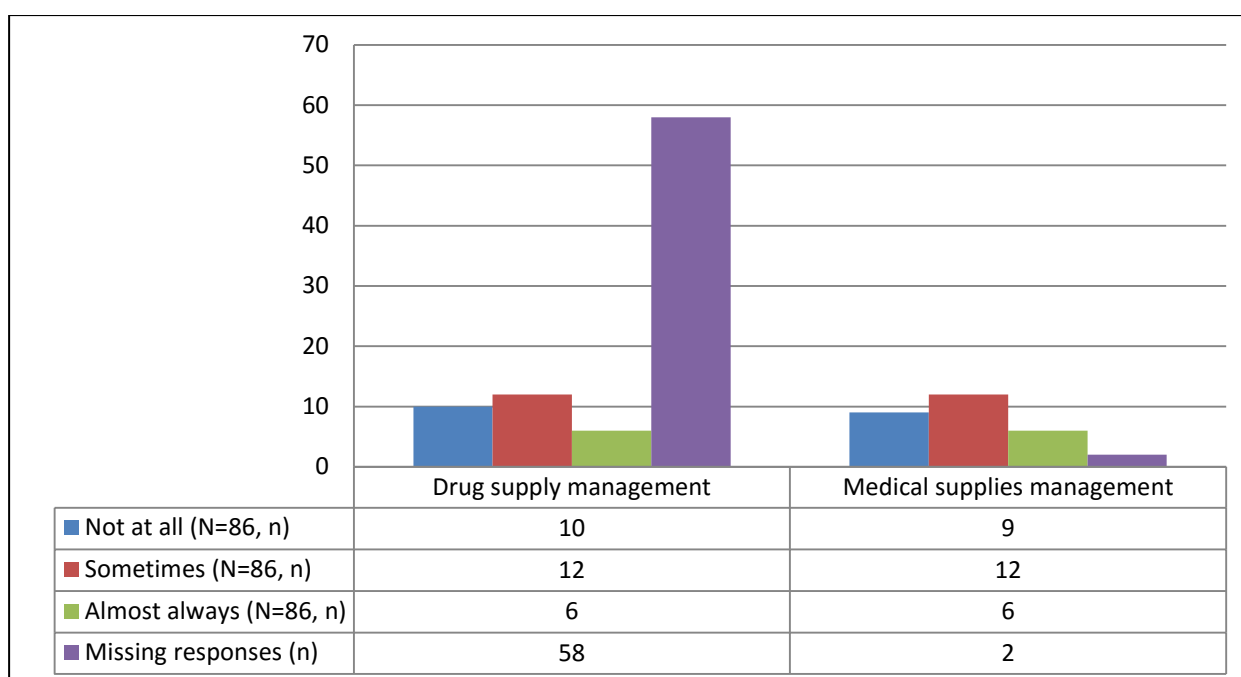


Figure 4-12: The perception of respondents at healthcare centres on changes made in health facilities as a result of drug supply and medical supplies management training sessions at healthcare centres

Although there were more than 90% missing responses, six (7.0%) respondents perceived that changes implemented at healthcare centres after training sessions on drug supply management were “*proper management of store rooms*” whereas five (5.8%) respondents thought changes implemented were “*filling bin cards correctly when issuing and receiving medical supplies*” (5.8%, n = 5) (refer to Table 4-57).

Table 4-57: The perception of respondents at healthcare centres on examples of implemented changes at healthcare centres as a result of training sessions on drug supply and medical supplies management

Examples of changes implemented due to training sessions on drug and medical supply management	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
Drug supply management		
Proper management of store rooms.	6 (7.0)	80 (93.0)
Filling bin cards and updating bin cards correctly.	1 (1.2)	85 (98.8)
Ordering and receiving drugs.	2 (2.3)	84 (97.7)
Medical supplies management		
Filling bin cards correctly when issuing and receiving medical supplies.	5 (5.8)	81 (94.2)
Proper and controlled management of medical supplies.	3 (3.5)	83 (96.5)

Twenty (23.3%) respondents at healthcare centres were of the opinion that refresher training sessions on drug supply management were never held for non-pharmaceutical staff at healthcare centres whereas 17 (19.8%) respondents thought likewise about refresher training sessions on medical supplies management (refer to Figure 4-13).

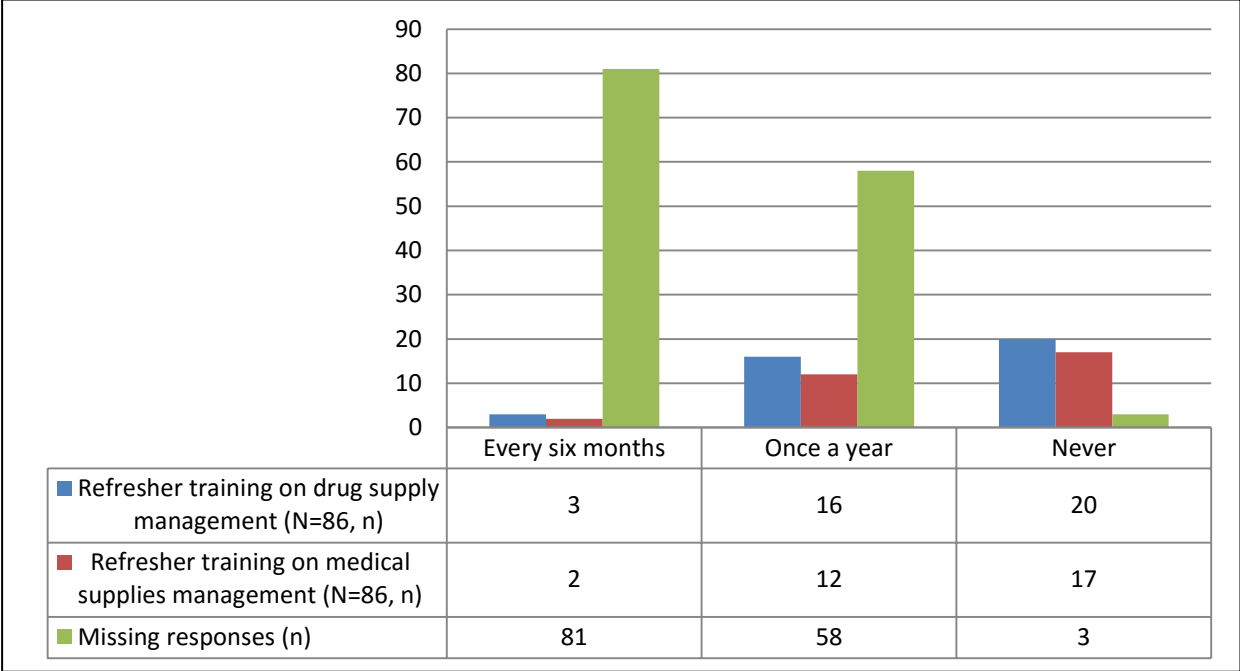


Figure 4-13: Refresher training sessions for non-pharmaceutical staff on drug supply and medical supplies management at healthcare centres

- **Discussion of results on training of healthcare workers at health facilities**

Results presented in Section 4.6.2 are discussed in this subsection. The discussion includes training of healthcare workers at health facilities on drug and medical supply management as well as on the use of equipment for diagnosis and monitoring of NCDs.

Training health professionals on how to use basic equipment for diagnosis and monitoring of NCDs will enable patients with NCDs to be treated in health facilities close to them and will help to enhance the utilisation of primary care services (WHO, 2010b:35). The findings of the study revealed that healthcare professionals at PHC were trained on the use of basic equipment for diagnosis and management of NCDs such as a thermometer, stethoscope, sphygmomanometer, measurement tape, weighing scale, glucometers, blood glucose test strips, urine protein test strips and urine ketone test strips (refer to Section 4.6.2.1, Table 4-46; Section 4.6.2.2, Table 4-53). Also, health facilities in Ilam and Kailali districts (Nepal) had a smaller number of the trained health workforce in the management of NCDs although, health workers need to be able to assess, diagnose, manage and refer patients appropriately (Aryal *et*

al., 2018:153). Health workers need to acquire the appropriate skills to deliver quality services. Thus, the government of Nepal has developed the PEN Training Package to prepare health workers to diagnose and manage NCDs (Aryal *et al.*, 2018:153).

Although training on the use of basic diagnostic equipment is important in NCD management, in north-western Tanzania, most outpatient services for NCDs were provided in hospitals instead of health centres because of inadequate training of health professionals in hypertension and diabetes diagnosis and management (Peck *et al.*, 2014:e289). Nonetheless, strengthening of management systems for NCDs to provide regular training and supervision will ensure that sufficient knowledge and experience related to NCDs is gained by healthcare workers (Peck *et al.*, 2014:e291). Comparatively, healthcare professionals in health facilities at the PHC level in Lesotho were not trained on how to use peak flow meters, spacers for inhalers and therapeutic drug level monitoring for epileptic patients (refer to Section 4.6.2.1, Table 4-46; Section 4.6.2.2, Table 4-53). The implication of a lack of training on how to use this equipment could be misdiagnosis and mismanagement of asthma and epilepsy at PHC level.

Pharmaceutical staff encompasses pharmacists and pharmacy technicians who are qualified health professionals in pharmaceuticals supply management. In addition to pre-service training in pharmaceutical supply management, the pharmaceutical staff has to be provided with continuing professional education and in-service training on pharmaceutical supply management to improve their skills and competencies (Rouse *et al.*, 2016:5-6). Respondents in this study finding perceived that drug supply and medical supply management training was conducted for pharmaceutical staff in health facilities in the past six months before the date of data collection (refer to Section 4.6.2.1, Table 4-49, Table 4-50; Section 4.6.2.2, Table 4-54, Figure 4-10). Topics that were implemented by pharmaceutical staff in health facilities included good inventory management, good storage practice and supply chain management (refer to Section 4.6.2.1; Section 4.6.2.2). A refresher training programme on drug supply and medical supplies management was held once a year at OPDs (refer to Section 4.6.2.2, Figure 4-10).

The increasing burden of NCDs in Nepal poses challenges to the health system of Nepal which is already experiencing a shortage of health workers and inadequate essential medicines coverage thus, the government has decided to provide free medicines for NCDs (Bhuvan *et al.*, 2015:3). In light of providing free medicines for NCDs which will put extra strain on the essential medicines programme, the government needs to introduce training programmes for the existing non-pharmaceutical staff at PHC to rationally dispense and distribute NCDs medicines without compromising quality (Bhuvan *et al.*, 2015:3). Lesotho is also experiencing a shortage of health workers, leading to non-pharmaceutical staff carrying out pharmaceutical services in healthcare

centres at PHC level. Thus, drug supply and medical supplies management training for non-pharmaceutical staff were conducted at healthcare centres in the past six months before the date of data collection as perceived by some of the respondents at the DHMTs and healthcare centres (refer to Section 4.6.2.1, Table 4-47, Table 4-48; Section 4.6.2.2, Figure 4-11, Table 4-55). These training sessions covered topics such as good inventory management, good storage practice and supply chain management, which were implemented in healthcare centres by non-pharmaceutical staff (refer to Section 4.6.2.2, Tables 4-72–4-74). In contrast, other respondents perceived that refresher training on drug supply and medical supplies management for non-pharmaceutical staff in healthcare centres were never held (refer to Section 4.6.2.2, Figure 4-12). Similarly, there is a shortage of pharmaceutical staff in Tanzania thus, pharmaceutical services are provided by non-pharmaceutical staff (Wiedenmayer *et al.*, 2015:5-6). Medicine management in the public health facilities of Dodoma region in Tanzania is informally shifted to clinical staff without policy guidance, explicit job descriptions, supervision and without the necessary support through training (Wiedenmayer *et al.*, 2015:5-6). Therefore, there is a shortage of medicines in health facilities without pharmaceutical staff (Wiedenmayer *et al.*, 2015:6).

The next section entails a presentation and discussion of perceptions of managers generated from specific objectives of medicines for NCD management.

4.7 Medicines for non-communicable disease management

The results and discussions about medicines for NCD management were sectioned based on the specific objective, to assess medicines for NCD management at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

Types and availability of medicines used in NCD management at the health facilities;

- Availability of NCDs standard treatment guidelines (STGs) and essential medicines list (EML) at the health facilities;
- The availability of drug supply management tool(s);
- Updating the national EML so that it is in line with the prevailing burden of NCDs, and
- Guidelines on quality control, selection, procurement, storage and distribution of drugs.

4.7.1 Types and availability of medicines used in non-communicable disease management at health facilities

The perception of managers at the DHMTs, OPDs and the healthcare centres about the types and availability of medicines used to manage NCDs in health facilities at PHC level was the

main focus. To evaluate the availability of medicines used in NCD management, the Lesotho EML 2017 (MOH, 2017) and the WHO Model List of Essential Medicines 21st list 2019 (WHO, 2019) were used (refer to Table 4-58).

Table 4-58: List of medicines used in the management of non-communicable diseases as per the Lesotho essential medicines list 2017

List of medicines	Lesotho EML 2017	WHO Model List of Essential Medicines 21st list 2019 (WHO, 2019)
Hypertension		
Hydrochlorothiazide	X	X
Atenolol	X	
Indapamide	X	
Hydralazine	X	X
Methyldopa	X	X
Nifedipine	X	
Perindopril	X	
Captopril	X	
Enalapril	X	X
Carvedilol	X	
Diabetes mellitus		
Gliclazide	X	X
Glibenclamide	X	
Glimepiride	X	
Metformin	X	X
Protaphane	X	X
Actraphane	X	X
Actrapid	X	X
Asthma		
Salbutamol tablets	X	X
Salbutamol inhaler	X	X
Beclomethasone inhaler	X	X
Aminophylline	X	
Epilepsy		
Phenytoin	X	X
Phenobarbitone	X	X
Sodium valproate	X	X
Carbamazepine	X	X

List of medicines	Lesotho EML 2017	WHO Model List of Essential Medicines 21st list 2019 (WHO, 2019)
Diazepam		X
<i>EML = Essential medicines list</i>		

This section is subdivided into the district level and the PHC level.

4.7.1.1 The district level

Results of the perception of managers at the DHMTs about procurement of medicines used in NCD management are presented in Table 4-59. The perception of managers was a result of managers' responses to questions 3.6 and 3.7 (refer to Annexure B).

One respondent perceived that OPDs ordered medicines used in the management of NCDs once every month (refer to Table 4-59). Also, one respondent was of the opinion that it took one week to receive their ordered medicines from the supplier. Six respondents perceived that healthcare centres ordered medicines for NCD management once every month (refer to Table 4-59). Two respondents were of the view that healthcare centres received their ordered medicines from the supplier in one to two weeks.

Table 4-59: The perception of respondents at the District Health Management Teams on ordering and delivery of medicines used in non-communicable disease management at primary healthcare

Frequency of ordering medicines used in the management of NCDs by OPDs and healthcare centres from the supplier.	Perception of respondents at DHMTs (N = 9), n		
	OPDs	Healthcare centres	Missing responses
Once every month	1	6	2
Twice every month	1	0	8
Once every two months	0	0	0
Quarterly	1	1	7
Time it takes for OPDs and healthcare centres to receive their orders for medicines from the supplier.			
One week	1	0	8
One to two weeks	0	2	7
Two to three weeks	1	0	8
Three to four weeks	0	3	6
Two months	1	1	7
<i>DHMTs = District Health Management Teams; OPDs = Outpatient departments</i>			

The managers at the DHMTs responded to question 3.3 (refer to Annexure B) about suppliers of medicines to healthcare centres. Eight respondents perceived that the main supplier of medicines used for NCD management at healthcare centres was the National Drug Supply Organisation (NDSO). Similarly, NDSO has been delegated to manage national drug supply for both CHAL and government healthcare facilities (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10).

The respondents at DHMTs responded to question 3.19 about the availability of an order preparation schedule prepared by the DHMT, and question 3.20 about the availability of the NDSO order delivery schedule at health facilities (refer to Annexure B). Four respondents perceived that an order preparation schedule prepared by the DHMT and the NDSO order delivery schedule was available at OPDs. Seven respondents, furthermore, perceived that healthcare centres had an order preparation schedule prepared by the DHMT and the NDSO order delivery schedule.

Question 3.4 and question 3.5 were questions that required managers at DHMTs to provide their opinion on the process of requisition and deliveries of medicines for NCDs (refer to Annexure B). Four respondents thought that the process used by DHMTs to request medicines for NCDs was *“Healthcare centres produce the requisition, sends to DHMTs for checking and approval and DHMTs send to supply chain MOH for order processing.”* Five respondents perceived that the process used by DHMTs to deliver medicines for NCDs to healthcare centres was *“The NDSO is responsible for delivering drugs to healthcare centres. The DHMTs deliver drugs for mental health to healthcare centres. The Lesotho flying doctors fly airplanes carrying drugs to too hard to reach healthcare centres.”*

When responding to question 3.9 (refer to Annexure B), six out of nine respondents were of the opinion that the DHMT pharmacist determined the maximum and minimum drug stock levels for healthcare centres under its supervision compared to one respondent that felt the DHMT pharmacist did not.

The perception of respondents at DHMTs on the procedure for calculating maximum and minimum stock levels for medicines for NCDs at healthcare centres was asked in questions 3.10 and 3.11 (refer to Annexure B). Three respondents perceived that the DHMTs pharmacist calculated the maximum medicines stock levels for healthcare centres under their supervision as follows: *“Consider lead time set by the supplier, buffer stock and minimum stock, maximum stock level is three months”*, and *“Based on average monthly consumption (AMC).”* Three

respondents were of the view that DHMTs pharmacist determined the minimum stock levels of medicines for NCDs by “*Minimum stock equals to one month stock.*”

The respondents responded to questions 3.8 and 3.9 (refer to Annexure B). Two respondents perceived that when transport for delivering medicines to OPDs was not available due to bad weather conditions in the mountains, “*the OPDs are being covered up by three months buffer stock.*” One respondent perceived that “*the drugs are being stored temporarily at DHMTs, while awaiting for the weather to improve and roads accessible*” during the unavailability of transport for medicines to healthcare centres due to bad weather conditions in the mountains.

The perception of managers at DHMTs about medicines for NCDs that were out-of-stock in the past three months before the date of data collection of this study is presented in Figure 4-14 (refer to question 3.12, Annexure B). One-third of the respondents did not answer question 3.12 (refer to Figure 4-14). Three out of nine respondents were of the view that medicines used in the management of diabetes mellitus, hypertension and epilepsy were not out-of-stock whereas four respondents perceived that medicines for asthma management were available (refer to Figure 4-14).

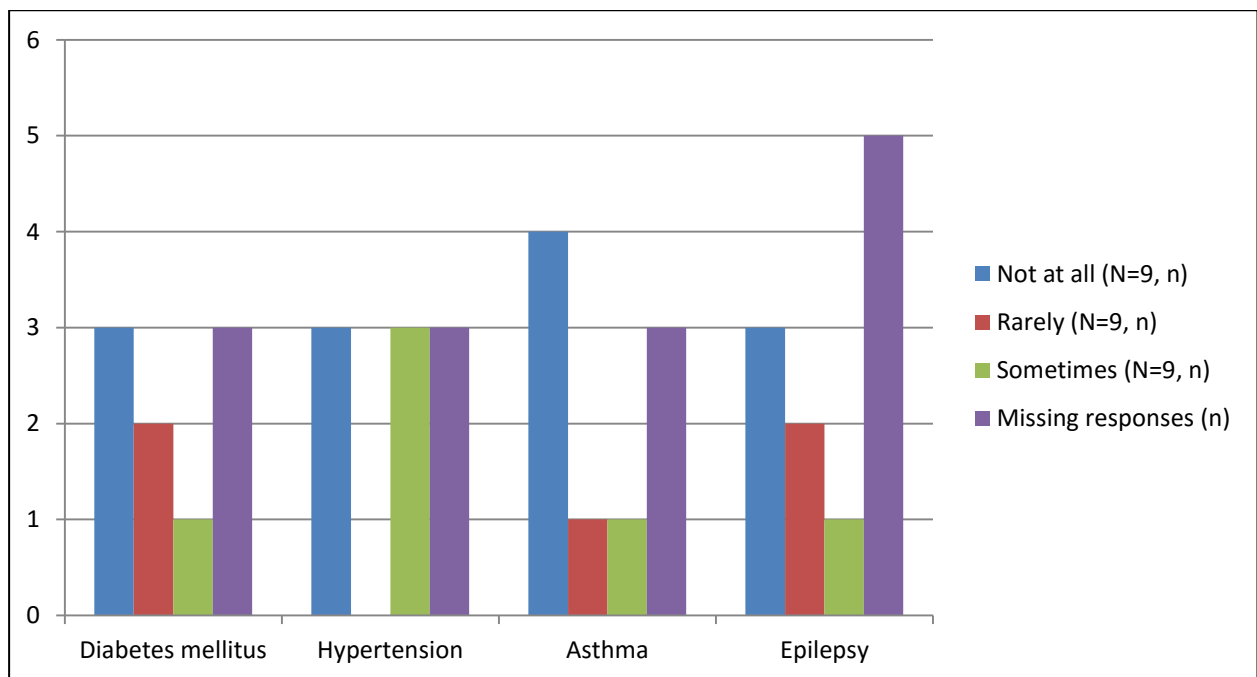


Figure 4-14: The perception of respondents at the District Health Management Teams on non-communicable disease medicines out-of-stock in the past three months

One respondent perceived that the reasons for the unavailability of medicines for NCDs at healthcare centres in the past six months before the date of the data collection were “*delayed*

processing of requisition and stock-outs at supplier”, “irrational use of drugs and increases in the monthly consumption”, and “poor reporting from the health facilities leading to stock-outs.” The perception of respondents was a response to question 3.13 (refer to Annexure B). The respondents responded to question 3.14 where they stated actions taken when medicines for NCDs were not available in the past six months before the date of the data collection (refer to Annexure B). Two respondents perceived that the following action was taken; *“redistribution from other government-owned healthcare centres and borrowing from district hospital.”*

4.7.1.2 The primary healthcare level

This section contains a detailed outline of the thoughts of managers at OPDs and healthcare centres about the type, availability and procurement of medicines used for NCD management at the PHC level.

The respondents at OPDs responded to questions 3.6 and 3.7 (refer to Annexure C) about ordering and receiving medicines for NCDs. Eleven respondents perceived that medicines for NCDs were ordered once a month at OPDs (refer to Table 4-60). Six respondents were of the opinion that it took the supplier one to two weeks.

Table 4-60: The perception of respondents at outpatient departments on ordering and delivery of medicines used in non-communicable disease management at outpatient departments

Frequency of ordering medicines used in the management of NCDs by OPDs from the supplier	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
Once every month	11	5
Twice every month	0	0
Once every two months	0	0
Quarterly	1	15
Time it takes for OPDs to receive orders for their medicines from the supplier		
One week	0	0
One to two weeks	6	10
Two to three weeks	2	14
Three to four weeks	2	14
<i>OPDs = Outpatient departments</i>		

The respondents at OPDs (n = 14) perceived that the main supplier of medicines for NCDs to OPDs was the NDSO, as their response to question 3.5 (refer to Annexure C). The respondents at healthcare centres (94.2%, n = 81) also were of the opinion that the main supplier of

medicines for NCDs to healthcare centres was the NDSO, as they responded to question 3.5 (refer to Annexure D).

Questions 3.26 and 3.27 (refer to Annexure C) and questions 3.21 and 3.22 (refer to Annexure D) were about the availability of an order preparation schedule prepared by the DHMT pharmacist and availability of the NDSO order delivery schedule at OPDs and healthcare centres. Ten respondents at OPDs perceived that an order preparation schedule prepared by the DHMT pharmacist was available at OPDs whereas 15 respondents thought the NDSO order delivery schedule was available. Seventy-one (82.6%) respondents at healthcare centres were of the opinion that an order preparation schedule prepared by the DHMT pharmacist was available at healthcare centres whereas 75 (87.2%) respondents felt that the NDSO order delivery schedule was also available.

Responses of respondents at OPDs to question 3.14 (refer to Annexure C) and of respondents at healthcare centres to question 3.9 (refer to Annexure D) about places where patients with NCDs can purchase medicines are displayed in Table 4-61. More than 50% of respondents at OPDs and healthcare centres did not respond to questions 3.14 and 3.9, respectively (refer to Table 4-61).

Five respondents at OPDs perceived that patients with NCDs purchased their medicines from public health facilities whereas six respondents thought patients bought their medicines from community or retail pharmacies (refer to Table 4-61).

Of the 86 respondents at healthcare centres, 17 (19.8%) perceived that patients did not purchase their medicines from a community pharmacy, 21 (24.4%) thought they did not get their medicines from a not-for-profit hospital, and 18 (20.9%) indicated that patients did not obtain their medicines from a not-for-profit clinic (refer to Table 4-61). In contrast, 15.1% (n = 13) of respondents perceived that patients bought their medicines from a community pharmacy. Eighteen (20.9%) respondents at healthcare centres were of the opinion that patients with NCDs purchased their medicines from a public health facility (refer to Table 4-61).

Table 4-61: The perceptions of respondents at health facilities on purchase of medicines for non-communicable diseases by patients

Places where patients with NCDs can purchase medicines for NCD management	Respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Public health facility	1	5	0	10	17 (19.8)	18 (20.9)	4 (4.7)	47 (54.7)
Community or retail pharmacy	1	6	3	6	17 (19.8)	13 (15.1)	8 (9.3)	48 (55.8)
Not for profit hospital (e.g. mission, NGO)	3	3	0	10	21 (24.4)	13 (15.1)	1 (1.2)	51 (59.3)
Not for profit clinic (e.g. mission, NGO)	3	3	0	10	18 (20.9)	14 (16.3)	2 (2.3)	52 (60.5)

OPDs = Outpatient departments; NGO = Non-governmental organisation

In question 3.8 (refer to Annexure C), managers at OPDs were asked to indicate if the pharmacist calculated the maximum and minimum stock levels for medicines for NCDs or not. Twelve respondents were of the opinion that the pharmacist calculated the maximum stock level for medicines for NCDs at OPDs whereas 11 respondents perceived that the pharmacist calculates the minimum stock level.

Eight respondents at OPDs (refer to Annexure C, questions 3.9 and 3.10) perceived that the maximum stock level was determined by “*Using formula average monthly consumption multiplied by three*”, whereas four respondents believed that the minimum stock level was calculated by “*Using formula average monthly consumption multiplied by two.*”

Table 4-62 presents the perception of respondents at OPDs and healthcare centres on medicines for NCDs that was out-of-stock in the past three months before the date of data collection of this study (refer to Annexure C, question 3.11). Ten respondents at OPDs perceived that medicines for diabetes mellitus were not out-of-stock, nine respondents each thought medicines for hypertension and asthma were available, and eight respondents felt that medicines for epilepsy management were not out-of-stock (refer to Table 4-62). In response to question 3.6 (refer to Annexure D), most respondents at healthcare centres were of the opinion that medicines for diabetes mellitus (73.3%, n = 63), hypertension (62.8%, n = 54), asthma (68.6%, n = 59) and epilepsy (61.6%, n = 53) were not out-of-stock (refer to Table 4-62).

Table 4-62: The perception of respondents at health facilities on non-communicable disease medicines out-of-stock in health facilities

NCDs	Respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), %			
	Not at all	Rarely	Sometimes	Missing responses	Not at all	Rarely	Sometimes	Missing responses
Diabetes mellitus	10	1	1	4	63 (73.3)	10 (11.6)	8 (9.3)	5 (5.8)
Hypertension	9	1	2	4	54 (62.8)	15 (17.4)	12 (14.0)	5 (5.8)
Asthma	9	1	2	4	59 (68.6)	16 (18.6)	7 (8.1)	4 (4.7)
Epilepsy	8	0	4	4	53 (61.6)	13 (15.1)	11 (12.8)	9 (10.5)

OPDs = Outpatient departments

Question 3.4 required managers at OPDs to indicate medicines for NCDs that were available or not available in the past six months before the date of data collection of this study (refer to Annexure C). Six respondents at OPDs perceived that gliclazide was available to manage diabetes mellitus at OPDs, 12 respondents each also indicated the availability of glibenclamide, metformin, and actraphane whereas another 11 respondents felt that protaphane and actrapid were available to manage diabetes mellitus (refer to Table 4-63). Ten respondents perceived that antihypertensive medicines available at OPDs include hydralazine whereas 12 respondents thought that hydrochlorothiazide, atenolol, methyldopa, nifedipine and captopril were also available (refer to Table 4-63). Eleven respondents perceived that available anti-asthmatic medicines included salbutamol tablets and beclomethasone inhalers whereas 12 respondents thought salbutamol inhaler and prednisolone tablets were available (refer to Table 4-63). Eleven respondents also indicated that anti-epileptic medicines available were phenytoin and carbamazepine whereas 12 respondents felt that phenobarbitone, sodium valproate, and diazepam were available (refer to Table 4-63). These medicines are in line with the Lesotho EML 2017 (refer to Table 4-58).

One respondent each at OPDs further felt that antidiabetic medicines out-of-stock at one point in time at OPDs were gliclazide and protaphane whereas three respondents indicated the unavailability of glimepiride (refer to Table 4-63). Three respondents perceived that antihypertensive medicine, perindopril, was out-of-stock, two respondents thought hydralazine ran out of stock and another respondent believed that indapamide and captopril were not available (refer to Table 4-63). One respondent was of the opinion that anti-asthmatic medicines not available at OPDs included salbutamol inhalers and salbutamol tablets (refer to Table 4-63). Three respondents perceived that carbamazepine used to manage epilepsy was out-of-stock at one point in time at OPDs while two respondents indicated the unavailability of diazepam tablets (refer to Table 4-63).

Table 4-63: The perception of respondents at outpatient departments on type of medicines that were available and out-of-stock in the past three months at outpatient departments

NCDs	Type of medicine used for NCD management	Perception of respondents at OPDs (N = 16), n					
		Available			Out-of-stock		
		No	Yes	Missing responses	No	Yes	Missing responses
Diabetes mellitus	Gliclazide	3	6	7	4	1	11
	Glibenclamide	0	12	4	6	0	10
	Glimepiride	8	0	8	0	3	13
	Metformin	0	12	4	6	0	10
	Protaphane	1	11	3	5	1	10
	Actraphane	0	12	4	6	0	10
	Actrapid	0	11	5	6	0	10
Hypertension	Hydrochlorothiazide	0	12	4	6	0	10
	Atenolol	0	12	4	6	0	10
	Indapamide	6	3	7	2	1	13
	Hydralazine	1	10	5	6	2	9
	Methyldopa	0	12	4	6	0	10
	Nifedipine	0	12	4	6	0	10
	Perindopril	7	0	9	0	3	13
	Captopril	1	12	3	5	1	10
Asthma	Salbutamol tablets	1	11	4	4	1	11
	Salbutamol inhaler	0	12	4	5	1	10

NCDs	Type of medicine used for NCD management	Perception of respondents at OPDs (N = 16), n					
		Available			Out-of-stock		
		No	Yes	Missing responses	No	Yes	Missing responses
	Beclomethasone inhaler	0	11	5	5	0	11
	Prednisolone tablets	0	12	4	5	0	11
Epilepsy	Phenytoin	0	11	5	6	0	10
	Phenobarbitone	0	12	4	6	0	10
	Sodium valproate	0	12	4	6	0	10
	Carbamazepine	0	11	5	3	3	10
	Diazepam	0	12	4	4	2	10

OPDs = Outpatient departments

Table 4-64 show that most respondents at healthcare centres perceived that glibenclamide (98.8%, n = 85), metformin (95.3%, n = 82) and actraphane (61.6%, n = 53) was available for the management of diabetes mellitus. However, 64.0% (n = 55) of respondents indicated that gliclazide was out-of-stock, 65.1% (n = 56) believed glimepiride was not available, 58.1% (n = 50) felt that protaphane was also out-of-stock whereas another 48.8% (n = 42) of respondents thought actrapid was not available (refer to Annexure D, question 3.4).

All respondents (100.0%, n = 86) at healthcare centres thought that hydrochlorothiazide and methyldopa were available to manage hypertension at healthcare centres (refer to Table 4-64). Eighty-five (98.8%) respondents perceived that atenolol and nifedipine were not out-of-stock whereas 84 (97.7%) respondents indicated that captopril was also available to manage hypertension (refer to Table 4-64). In contrast, 65.1% (n = 56) of respondents were of the opinion that indapamide and perindopril were out-of-stock, and 38.4% (n = 33) of respondents indicated that hydralazine was not available (refer to Table 4-64).

Eighty-three (96.5%) respondents were of the view that salbutamol and salbutamol inhalers were not out-of-stock whereas 82 (95.3%) respondents thought that prednisolone tablets were available to manage patients with asthma at healthcare centres but, 37 (43.0%) respondents felt that beclomethasone inhalers were not available (refer to Table 4-64). Also, most respondents perceived that anti-epileptics available to manage epilepsy were phenytoin (86.0%, n = 74), phenobarbitone (90.7%, n = 78), sodium valproate (80.2%, n = 69), carbamazepine (94.2%, n = 81) and diazepam (89.5%, n = 77) (refer to Table 4-64).

The medicines used to manage diabetes mellitus, hypertension, asthma and epilepsy are in line with the Lesotho EML 2017 in Table 4-58.

Table 4-64: The perception of respondents at healthcare centres on the type of medicines available and out-of-stock at healthcare centres

NCDs	Type of medicine used for NCD management	Perception of respondents at healthcare centres (N = 86), n (%)					
		Available			Out-of-stock		
		No	Yes	Missing responses	No	Yes	Missing responses
Diabetes mellitus	Gliclazide	55 (64.0)	4 (4.7)	27 (31.4)	6 (7.0)	7 (8.1)	73 (84.9)
	Glibenclamide	0	85 (98.8)	1 (1.2)	39 (45.3)	0	47 (54.7)
	Glimepiride	56 (65.1)	4 (4.7)	26 (30.2)	6 (7.0)	7 (8.1)	73 (84.9)
	Metformin	3 (3.5)	82 (95.3)	1 (1.2)	38 (44.2)	1 (1.2)	47 (54.7)
	Protaphane	50 (58.1)	10 (11.6)	26 (30.2)	8 (9.3)	7 (8.1)	71 (82.6)
	Actraphane	21 (24.4)	53 (61.6)	12 (14.0)	24 (27.9)	8 (9.3)	54 (62.8)
	Actrapid	42 (48.8)	22 (25.6)	22 (25.6)	11 (12.8)	7 (8.1)	68 (79.1)
Hypertension	Hydrochlorothiazide	0	86 (100.0)	0	37 (43.0)	4 (4.7)	45 (52.3)
	Atenolol	0	85 (98.8)	1 (1.2)	38 (44.2)	3 (3.5)	45 (52.3)
	Indapamide	56 (65.1)	2 (2.3)	28 (32.6)	2 (2.3)	8 (9.3)	76 (88.4)
	Hydralazine	33 (38.4)	30 (34.9)	23 (26.7)	15 (17.4)	11 (12.8)	60 (69.8)
	Methyldopa	0	86 (100.0)	0	40 (46.5)	0	46 (53.5)
	Nifedipine	1 (1.2)	85 (98.8)	0	37 (43.0)	2 (2.3)	47 (54.7)
	Perindopril	56 (65.1)	4 (4.7)	26 (30.2)	5 (5.8)	9 (10.5)	72 (83.7)
	Captopril	1 (1.2)	84 (97.7)	1 (1.2)	38 (44.2)	3 (3.5)	45 (52.3)
Asthma	Salbutamol tablets	2 (2.3)	83 (96.5)	1 (1.2)	34 (39.5)	3 (3.5)	49 (57.0)
	Salbutamol inhaler	2 (2.3)	83 (96.5)	1 (1.2)	33 (38.4)	5 (5.8)	48 (55.8)

NCDs	Type of medicine used for NCD management	Perception of respondents at healthcare centres (N = 86), n (%)					
		Available			Out-of-stock		
		No	Yes	Missing responses	No	Yes	Missing responses
	Beclomethasone inhaler	37 (43.0)	33 (38.4)	10 (11.6)	11 (12.8)	16 (18.6)	59 (68.6)
	Prednisolone tablets	1 (1.2)	82 (95.3)	3 (3.5)	34 (39.5)	1 (1.2)	51 (59.3)
Epilepsy	Phenytoin	10 (11.6)	74 (86.0)	2 (2.3)	30 (34.9)	7 (8.1)	49 (57.0)
	Phenobarbitone	6 (7.0)	78 (90.7)	2 (2.3)	31 (36.0)	8 (9.3)	47 (54.7)
	Sodium valproate	9 (10.5)	69 (80.2)	9 (10.5)	26 (30.2)	11 (12.8)	49 (57.0)
	Carbamazepine	3 (3.5)	81 (94.2)	2 (2.3)	34 (39.5)	3 (3.5)	49 (57.0)
	Diazepam	8 (9.3)	77 (89.5)	1 (1.2)	31 (36.0)	11 (12.8)	44 (51.2)

The managers at OPDs responded to questions 3.12 and 3.13 about reasons for the unavailability of medicines for NCDs and actions taken during the period when this medicine was not available (refer to Annexure C). Although more than two-thirds of the managers did not respond to questions 3.12 and 3.13, four respondents perceived that medicines for NCDs were not available at OPDs because medicines were “*out of stock from supplier and we rely on one supplier*”, and five respondents pointed out that they “*borrow from other health facilities and wait until contributing factor was resolved*” when medicines for NCDs were not available.

Questions 3.7 and 3.8 required managers at healthcare centres to provide reasons for unavailability of medicines for NCDs and actions taken during unavailability of this medicine (refer to Annexure D, Table 4-65). More than 80% of managers at healthcare centres did not answer questions 3.7 and 3.8 (refer to Table 4-65). The respondents (4.7%, n = 4) thought that medicines for NCDs were not available at healthcare centres because “*no delivery from NDSO despite order request done*” (refer to Table 4-65). When medicines for NCDs were not available at healthcare centres, 18.6% (n = 16) of respondents perceived that they “*borrowed from other health facilities*” (refer to Table 4-65).

Table 4-65: The perception of respondents at healthcare centres on reasons for unavailability of medicines at healthcare centres

Reasons for unavailability of medicines used in the management of diabetes mellitus, hypertension, asthma and epilepsy in the past three months in healthcare centres.	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
“No delivery from NDSO despite order request done.”	4 (4.7)	82 (95.3)
“The Ministry of Health did not have funds to purchase drugs.”	3 (3.5)	83 (96.5)
“Drugs were out of stock at the supplier (NDSO).”	6 (7.0)	80 (93.0)
“Delay in receiving an order from NDSO.”	4 (4.7)	82 (95.3)
“Understocking of healthcare centre.”	2 (2.3)	84 (97.7)
Actions taken when medicines used in the management of diabetes mellitus, hypertension, asthma and epilepsy were out-of-stock in the past three months in healthcare centres.		
“Follow up from NDSO and procurement unit for clarifications, bought some from Tripharm®.”	1 (1.2)	85 (98.8)
“Borrowed from other health facilities.”	16 (18.6)	70 (81.4)
“Notified DHMTs.”	5 (5.8)	81 (94.2)
<i>DHMTs = District Health Management Teams; NDSO = National Drug Supply Organisation</i>		

- **Discussion of results for types of medicines used to manage non-communicable diseases**

This discussion mainly focuses on results presented in Section 4.7.1 on types and the availability of medicines used in NCD management at health facilities.

Non-communicable diseases are life-long diseases that require continual use of medication. Thus, medicines for NCDs must always be available in health facilities. Availability of NCD medicines in public health facilities found in six regions of Bangladesh (Dhaka, Sylhet, Chittagong, Dinajpur, Khulna and Barisal) was significantly less as compared to the availability of medicines for infectious diseases (Kasonde *et al.*, 2019:10). However, some medicines such as chlorpheniramine maleate, ranitidine, omeprazole, and losartan were widely available (Kasonde *et al.*, 2019:10). Compared to the availability of medicines for NCDs in health facilities in Lesotho which is also battling with an increasing burden of NCDs, the study findings indicated that medicines used in the management of diabetes mellitus, hypertension, asthma and epilepsy were not out-of-stock in the three months before the date of data collection at OPDs and healthcare centres (refer to Sections 4.7.1.1, Figure 4-14; Section 4.7.1.2, Tables 4-62–4-64). Similarly, Fernandopulle *et al.* (2019:4) indicated that prescribers in health facilities in Sri Lanka, a country also burdened by the increasing prevalence of NCDs, aligned to medicines for NCDs that were included in the list of priority drugs to manage NCD at primary-level healthcare institutions (published in 2013) or the list of price-regulated drugs published in 2017. Thus, patients with NCDs were prescribed more available and more affordable medicines so, patient experiences in Sri Lanka showed good availability and access to NCD medicines in Sri Lanka (Fernandopulle *et al.*, 2019:6).

The WHO Model List of Essential Medicines 21st list 2019 (WHO, 2019) is a guide for the development of national and institutional essential medicine lists which list good quality, readily available, and affordable drugs necessary for the management of NCDs and other diseases. The medicines for NCDs available for managing hypertension, diabetes mellitus, asthma and epilepsy in the public health system of Lesotho were as per the WHO Model List of Essential Medicines 21st list 2019 (refer to Section 4.7.1, Table 4-58; Section 4.7.1.2, Table 4-63 and Table 4-64), and the reason could be that Lesotho is one of the WHO countries that used the WHO Model List of Essential Medicines 21st list 2019 as a guide to develop the Lesotho EML 2017. Thus, the findings of the study revealed that the type of medicines for NCDs available in public health facilities in Lesotho was in line with the Lesotho EML 2017.

The type of medicines for NCDs that were not available at OPDs in the past six months before the date of data collection included antidiabetic medicines (gliclazide, glimepiride and protaphane), antihypertensive medicines (perindopril, indapamide, hydralazine and captopril), anti-asthmatic medicines (salbutamol inhaler and salbutamol tablets), and anti-epileptic medicines (carbamazepine and diazepam tablets) (refer to Section 4.7.1.2, Table 4-63). The following NCDs medicines were not available at healthcare centres in the past six months before the date of data collection. Diabetes mellitus medicines included gliclazide, glimepiride, protaphane and actrapid (refer to Section 4.7.1.2, Table 4-64). Hypertension medicines included indapamide, hydralazine and perindopril (refer to Section 4.7.1.2, Table 4-64). Asthma medicines included beclomethasone inhalers (refer to Section 4.7.1.2, Table 4-64).

Likewise, Malawi, a country with a health system similar to that of Lesotho, is experiencing an increasing prevalence of NCDs (Khuluza & Haefele-Abah, 2019). Khuluza and Haefele-Abah (2019:11) indicated widely available medicines for NCDs in public health facilities in Malawi as follows: anti-epileptics included phenobarbital sodium tablets, carbamazepine and diazepam injection, and antihypertensive included hydrochlorothiazide, and these medicines were listed in the Malawi EML. Also, thirty-two countries (94%) in the study of Bazargani *et al.* (2018:3) selected thiazide diuretics (hydrochlorothiazide), renin-angiotensin-aldosterone system (RAAS) inhibitors (enalapril or valsartan), selective beta-blockers (metoprolol) and dihydropyridine calcium channel blocker (amlodipine) for the management of hypertension. These medicines for hypertension were selected using international treatment guidelines for cardiovascular diseases (CVD) management such as WHO guidelines (Bazargani *et al.*, 2018:2).

There were instances when medicines for NCDs were out-of-stock in the past three months before the date of data collection in health facilities at PHC level of the health system of Lesotho (refer to Section 4.7.1.2, Table 4-63 and Table 4-64). One way of reducing the burden of NCDs is through the availability of medicines for NCDs. Shabangu and Suleman (2015:5) assessed medicines availability at Raleigh Fitkin Memorial Hospital in Manzini (eSwatini) in which patients with NCDs reported not receiving all of the medicines prescribed when presenting for a refill in the three months before the study, and no patient reported always receiving all their medicines at every refill visit. Patients not receiving their medicines for NCDs could result in complications of their conditions, hospitalisation, expensive treatment for complications and loss of income due to hospitalisation (Shabangu & Suleman, 2015:5). Also, Onyango *et al.* (2018:4) assessed perceptions of adult patients from Kenya on the access to medicines for NCDs and found that most adult patients with NCDs in Kenya perceived that medicines were not available at the government health facilities. Unavailability of medicines in government health facilities

forced adult patients with NCDs to buy the medicines at private facilities and pharmacies (Onyango *et al.*, 2018:4).

Likewise, the findings of this study indicated that the medicines for NCDs that were out-of-stock during one point in time at OPDs within the past three months before the date of data collection included antidiabetics (gliclazide, glimepiride and protaphane), antihypertensives (perindopril, indapamide, hydralazine and captopril), anti-asthmatics (salbutamol inhalers and salbutamol tablets), and anti-epileptics (carbamazepine and diazepam) (refer to Section 4.7.1.2, Table 4-63). Medicines not available at healthcare centres within the past three months before the date of data collection were antidiabetics (gliclazide, glimepiride, protaphane, actraphane and actrapid), antihypertensives (hydrochlorothiazide, atenolol, perindopril, indapamide, hydralazine, nifedipine and captopril), anti-asthma (salbutamol inhalers, salbutamol tablets, beclomethasone inhalers and prednisolone tablets), and anti-epileptics such as phenytoin, phenobarbitone, sodium valproate, carbamazepine and diazepam (refer to Section 4.7.1.2, Table 4-64). The NCDs are chronic diseases that are managed continually with medication specific to a particular NCD a patient suffers from, thus, unavailability of these medicines means an interruption in the management of NCDs which could lead to complications of NCDs as well as a financial complication for patients with NCDs.

As per the perceptions of respondents at health facilities in Lesotho, some of the reasons OPDs and healthcare centres ran out of medicines for NCDs in the past three months before the date of data collection were irrational drug use which increased the monthly consumption rate, delayed drug requisitions and stock-outs at the supplier, and poor reporting from health facilities (refer to Section 4.7.1.2). These findings were similar to those in Shabangu and Suleman (2015:5) where the reason for the unavailability of some of the medicines for NCDs at Raleigh Fitkin Memorial Hospital in Manzini, Eswatini was due to the medicines being out-of-stock at the central medical store. Thus, the Ministry of Health in Swaziland needs to assess and improve the availability of medicines in health facilities so that, at the least, the essential medicines for primary care are available at all times (Shabangu & Suleman, 2015:5). Likewise, medicine shortage in health facilities is a challenge in South Africa, and the study by Modisakeng *et al.* (2020:6) that explored experiences of pharmacists with medicines shortages in South Africa revealed that challenges with the procurement process were the cause of medicines shortage. These challenges included non-payment of suppliers, poor supplier performance, a lengthy buy-out process, and a shortage of active pharmaceutical ingredients (APIs) (Modisakeng *et al.*, 2020:6). Modisakeng *et al.* (2020:8) recommended that the South African National Department of Health has to strengthen the process of awarding contracts to the supplier as well as

payment of suppliers and should make sure that tenders are awarded for all medicines on the EML to minimise buy-outs.

Currently, there is one leading statutory body established as a trading account of the MOH in Lesotho, which is the National Drug Supply Organisation (NDSO) which has been delegated to manage national drug supply (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10). The NDSO is responsible for the procurement, storage and distribution of medicines and medical supplies for both CHAL and government healthcare facilities (GOL, 2013:16; GOL, 2016:29). The study findings also revealed that the main supplier of medicines for NCDs at OPDs and healthcare centres was the NDSO. The situation of Lesotho is similar to that in Zimbabwe where the National Pharmaceutical Company of Zimbabwe is the national drug supplier working together with the Ministry of Health and Child Welfare and supplies pharmaceutical products to government health facilities (Mdege *et al.*, 2016:879).

To assist with the procurement of medicines from NDSO, healthcare facilities had developed order preparation schedules (MOHSW, 2010:62). The NDSO has also developed its order delivery schedule by region which is in line with healthcare facilities' order preparation schedules depending on the lead time and uses this schedule to deliver ordered goods to healthcare facilities (MOHSW, 2010:62). In light of this, the findings of this study indicated that the respondents at health facilities perceived that the OPDs and healthcare centres had order preparation schedules and NDSO order delivery schedules (refer to Section 4.7.1.2). Also, the NDSO was responsible for delivering medicines to healthcare centres, DHMTs delivered medicines for mental health while the Lesotho flying doctors flew aeroplanes carrying medicines too hard to reach healthcare centres (refer to Section 4.7.1.2).

In the event of medicines for NCDs not being available at public health facilities of Lesotho, the population around health facilities could obtain or purchased medicines for NCDs from the community or retail pharmacies, or other public health facilities (refer to Section 4.7.1.2, Table 4-61). Comparatively, adult patients with NCDs in Kenya perceived that they bought their medicines for NCDs from private pharmacies when they were not available in government health facilities (Onyango *et al.*, 2018:4). Additionally, the findings of this study also revealed that actions were taken by health workers at health facilities during the unavailability of medicines for NCDs in the past three months included redistribution of medicines for NCDs from other government-owned healthcare centres and borrowing from other health facilities (refer to Section 4.7.1.2, Table 4-65). This was done to prevent an interruption in medicine consumption by patients with NCDs, which could cause mismanagement of NCDs and the occurrence of complications of NCDs.

The subsequent section focuses on the results for the specific objective that described the availability of STGs for NCD management and EML at PHC level.

4.7.2 Availability of non-communicable diseases standard treatment guidelines and essential medicines list at the health facilities

The perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about the availability of EML and STGs used in the management of NCDs at health facilities is discussed, subdivided into the MOH, district level and the PHC level.

4.7.2.1 The Ministry of Health

The managers at the MOH answered question 3.1 where they indicated the availability of STGs (refer to Annexure A). Six respondents perceived that STGs for the management of hypertension, diabetes mellitus and asthma were available, and five respondents thought that STGs for epilepsy were available.

Six respondents at the MOH perceived that an EML was available at DHMTs and OPDs, and five respondents thought that it was available at healthcare centres (Annexure A, question 3.2).

Regarding the existence of national medicines policy, national STGs and national EML (refer to Annexure A, question 3.3), three respondents perceived that there was a National Medicines Policy, among the three respondents, two thought that the policy was published in 2005 (refer to Table 4-66). Six respondents thought that national STGs existed, and five respondents were of the view that the national STGs were published in 2017 (refer to Table 4-66). Six respondents perceived that there was a national EML published in 2017 (refer to Table 4-66). Also, six respondents thought that there was a functional national committee in charge of managing the process of updating a national medicines list (refer to Table 4-66).

Table 4-66: The perception of respondents at the Ministry of Health on the existence of a National Medicines Policy, national standard treatment guidelines and national essential medicines list

Existence of documents assisting with managing medicines for NCDs	Perception of respondents at MOH (N = 6), n					
	No	Yes	Missing responses	Year of publication	Perception of respondents at MOH (n = 6)	Missing responses (n)
Existence of a published national medicines policy and year of the last update	1	3	2	2005	2	3
	0	0		2006	1	

Existence of documents assisting with managing medicines for NCDs	Perception of respondents at MOH (N = 6), n					
	No	Yes	Missing responses	Year of publication	Perception of respondents at MOH (n = 6)	Missing responses (n)
Existence of a published national STGs and year of the last update	0	6	0	2005	1	0
	0	0		2017	5	
Existence of a published national list of essential medicines and year of the last update	0	6	0	2017	6	0
Existence of a functional national committee in charge of managing the process of updating a national medicines list	0	6	0			
	0	0				
<i>MOH = Ministry of Health</i>						

4.7.2.2 The district level

Questions 3.2 and 3.2.1 were about the availability of an EML in healthcare centres (refer to Annexure A). Seven respondents perceived that there was an EML at healthcare centres which included medicines used to manage hypertension, diabetes mellitus, asthma and epilepsy.

Table 4-67 portrays the perception of managers at DHMTs about the availability of STGs for managing NCDs at healthcare centres. The respondents responded to question 3.1 (refer to Annexure B). Seven respondents perceived that STGs for the management of diabetes mellitus and hypertension were available at healthcare centres, and five respondents thought that these STGs were in use (refer to Table 4-67). Six respondents thought that STGs used when managing asthma and epilepsy were available at healthcare centres (refer to Table 4-67). Also, three respondents perceived that STGs for asthma and epilepsy were in use at healthcare centres.

Table 4-67: The perception of respondents at the District Health Management Teams on the availability and use of standard treatment guidelines in healthcare centres

Standard treatment guidelines	Perception of respondents at DHMTs (N = 9), n						
	Available			In use			
	No	Yes	Missing responses	No	Yes	Sometimes	Missing responses
Management of diabetes mellitus	0	7	2	0	5	0	4
Management of hypertension	0	7	2	0	5	0	4
Management of asthma	1	6	2	0	3	1	5
Management of epilepsy	1	6	2	0	3	2	4

DHMTs = District Health Management Teams

As presented in Table 4-68, two respondents at DHMTs perceived that health workers at OPDs mainly used the South African Medicines Formulary to diagnose and manage NCDs at OPDs (refer to Annexure B, question 3.2.2). Three respondents perceived that health workers at healthcare centres used the Lesotho Medicines Formulary to diagnose and manage NCDs at healthcare centres (refer to Table 4-68). Also, two respondents thought that the South African Medicines Formulary and the British National Formulary were not used by health workers at healthcare centres to diagnose and manage NCDs (refer to Table 4-68).

Table 4-68: The perception of respondents at the District Health Management Teams on reference books used in non-communicable disease management at primary healthcare

Reference books used by health workers at health facilities	Perception of respondents at DHMTs (N = 9), n			
	No	Yes	Sometimes	Missing responses
OPDs				
Lesotho Medicines Formulary	1	1	0	7
South African Medicines Formulary	0	2	0	7
British National Formulary	1	0	0	8
Healthcare centres				
Lesotho Medicines Formulary	0	3	1	5
South African Medicines Formulary	2	0	0	7
British National Formulary	2	0	0	7

DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.7.2.3 The primary healthcare level

The respondents at OPDs responded to questions 3.3 and 3.3.1 about the availability of an EML at OPDs (refer to Annexure C). Fourteen respondents at OPDs perceived that an EML was available at OPDs compared to one respondent who perceived the contrary. Also, 14 respondents at OPDs were of the opinion that the EML included medicines for the management of diabetes mellitus, hypertension, asthma and epilepsy.

Responses to questions 3.3 and 3.3.1 (refer to Annexure D) indicated that 88.4% (n = 76) of respondents at healthcare centres perceived that there was an EML at healthcare centres but, 8.1% (n = 7) respondents were of the view that an EML was not available. Also, 90.7% (n = 78) of respondents at healthcare centres thought that the EML included medicines used to manage diabetes mellitus, 93.0% (n = 80) indicated that it included medicines for hypertension, another 87.2% (n = 75) of respondents perceived that medicines for asthma and epilepsy were included.

The perception of respondents at OPDs on the availability of STGs at OPDs, in response to question 3.1 (refer to Annexure C), is displayed in Table 4-69. Fourteen respondents perceived that STGs for the management of hypertension were available at OPDs whereas 13 respondents each thought that they were available to manage diabetes mellitus, asthma and epilepsy (refer to Table 4-69). Also, nine respondents thought that STGs for diabetes mellitus, hypertension, asthma and epilepsy were used at OPDs

Table 4-69: The perception of respondents at outpatient departments on availability and use of standard treatment guidelines in outpatient departments

Standard treatment guidelines	Perception of respondents at OPDs (N = 16), n						
	Available			In use			
	No	Yes	Missing responses (n)	No	Yes	Sometimes	Missing responses (n)
Management of diabetes mellitus	1	13	2	0	9	3	4
Management of hypertension	0	14	2	1	9	3	3
Management of asthma	1	13	2	0	9	3	4
Management of epilepsy	1	13	2	0	9	3	4
<i>OPDs = Outpatient departments</i>							

The perception of managers at healthcare centres on the availability of STGs at healthcare centres is portrayed in Table 4-70. Seventy (81.4%) respondents responding to question 3.1 (refer to Annexure D), perceived that STGs for the management of diabetes mellitus were

available at healthcare centres. Seventy-three (84.9%) respondents further thought that STGs for hypertension were available, 67.4% (n = 58) of respondents indicated that STGs for asthma management were available and another 72.1% (n = 62) of respondents felt that STGs for epilepsy were available at healthcare centres.

The majority of respondents at healthcare centres were of the opinion that STG for managing diabetes mellitus (47.7%, n = 41), hypertension (45.3%, n = 39), asthma (43.2%, n = 32) and epilepsy (40.7%, n = 35) were in use at healthcare centres (refer to Table 4-70).

Table 4-70: The perception of respondents at healthcare centres on availability and use of standard treatment guidelines in healthcare centres

Standard treatment guidelines	Perception of respondents at healthcare centres (N = 86), n (%)						
	Available			In use			
	No	Yes	Missing responses, n (%)	No	Yes	Sometimes	Missing responses, n (%)
Management of diabetes mellitus	10 (11.6)	70 (81.4)	6 (7.0)	0	41 (47.7)	4 (4.7)	41 (47.7)
Management of hypertension	7 (8.1)	73 (84.9)	6 (7.0)	0	39 (45.3)	6 (7.0)	41 (47.7)
Management of asthma	17 (19.8)	58 (67.4)	11 (12.8)	5 (5.8)	32 (37.2)	7 (8.1)	42 (48.8)
Management of epilepsy	15 (17.4)	62 (72.1)	9 (10.5)	3 (3.5)	35 (40.7)	6 (7.0)	42 (48.8)

The managers at OPDs responded to question 3.2 (refer to Annexure C,) and managers at healthcare centres responded to question 3.2 (refer to Annexure D) about reference books used by health workers at OPDs and healthcare centres when diagnosing and managing NCDs.

Seven respondents at OPDs perceived that health workers at OPDs used the Lesotho Medicines Formulary and eight respondents indicated that they used the South African Medicines Formulary (refer to Table 4-71). The majority of respondents (67.4%, n = 58) at healthcare centres perceived that the Lesotho Medicines Formulary was mainly used by health workers at healthcare centres (refer to Table 4-71).

Table 4-71: Reference books used in non-communicable disease management at primary healthcare

Reference books	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Lesotho Medicines Formulary	1	7	1	7	11 (12.8)	58 (67.4)	2 (2.3)	15 (17.4)
South African Medicines Formulary	2	8	0	6	19 (22.1)	4 (4.7)	4 (4.7)	59 (68.6)
British National Formulary	4	4	0	8	20 (23.3)	1 (1.2)	1 (1.2)	64 (74.4)

OPDs = Outpatient departments

- **Discussion of results on availability of standard treatment guidelines and essential medicines list**

Section 4.7.2 presented results generated from a specific objective that assessed the availability of STGs and EML used in the management of NCDs. These results are discussed in detail in this subsection.

The Republic of South Africa is one of the African countries battling the increasing burden of NCDs (WHO, 2018d:1). Thus, South Africa has an EML and STG that guide health professionals in the management of NCDs and in the referral of patients with NCDs who have developed complications to health facilities with resources to manage those complications (Republic of South Africa, 2018:xviii-xxii). The primary healthcare STGs and EML list 6th edition 2018 of the Republic of South Africa shows the management and the list of medicines used in hypertension, diabetes mellitus, epilepsy and asthma (Republic of South Africa, 2018:4.16,9.5,15.5,17.3). Also, the primary healthcare system in the Republic of Moldova is faced with an increasing prevalence of NCDs, and Blake *et al.* (2019:9) when assessing the quality of care for NCDs in PHC facilities indicated that an EML was available in almost all facilities. Although, facility-in-charges said that the current EML was partially appropriate for NCDs because of the lack of full-compensation for medicines, the absence of other important chronic diseases from the list, and the lack of efficacy of some of the medicines (Blake *et al.*, 2019:9). The absence of some of the NCDs, as well as lack of full compensation for medicines for NCDs in the current EML in PHC facilities, could mean that NCDs were likely to be mismanaged leading to patients developing complications and financial constraints. In comparison to the NCDs situation in Lesotho, the study findings indicated that EML and STGs used in the management of hypertension, diabetes mellitus, asthma and epilepsy were available and in use at health facilities at PHC level (refer to Section 4.7.2.1; Section 4.7.2.2, Table 4-67; Section 4.7.2.3, Table 4-69, Table 4-70). Thus, suggesting that these NCDs were well managed at the PHC level because medicines and guides on NCD management were available and being used by health workers at the PHC level in Lesotho. The study findings showed that health workers in health facilities at PHC level in Lesotho used other reference books in addition to the EML and STGs such as the South African medicines formulary and the Lesotho medicines formulary when managing NCDs (refer to Section 4.7.2.2, Table 4-68; Section 4.7.2.3, Table 4-71).

4.7.3 The availability of drug supply management tool(s)

This section present and discuss the thoughts of managers at the DHMTs, OPDs and healthcare centres about drug supply management tools employed in managing medicines used in the management of NCDs at the PHC level. In practice, drug supply management tools that should be available at health facilities include stock cards, dispensing tally sheets, stock count sheets and requisition forms. This section is divided into the district and the PHC levels.

4.7.3.1 The district level

The perceptions of managers at the DHMTs about the use of drug supply management tools in managing medicines for NCDs are presented in Figure 4-15. The managers responded to question 3.15 (refer to Annexure B). Six respondents perceived that healthcare centres used stock (bin) cards and requisition forms, and five respondents thought that healthcare centres used dispensing tally sheets and stock count sheets (refer to Figure 4-15).

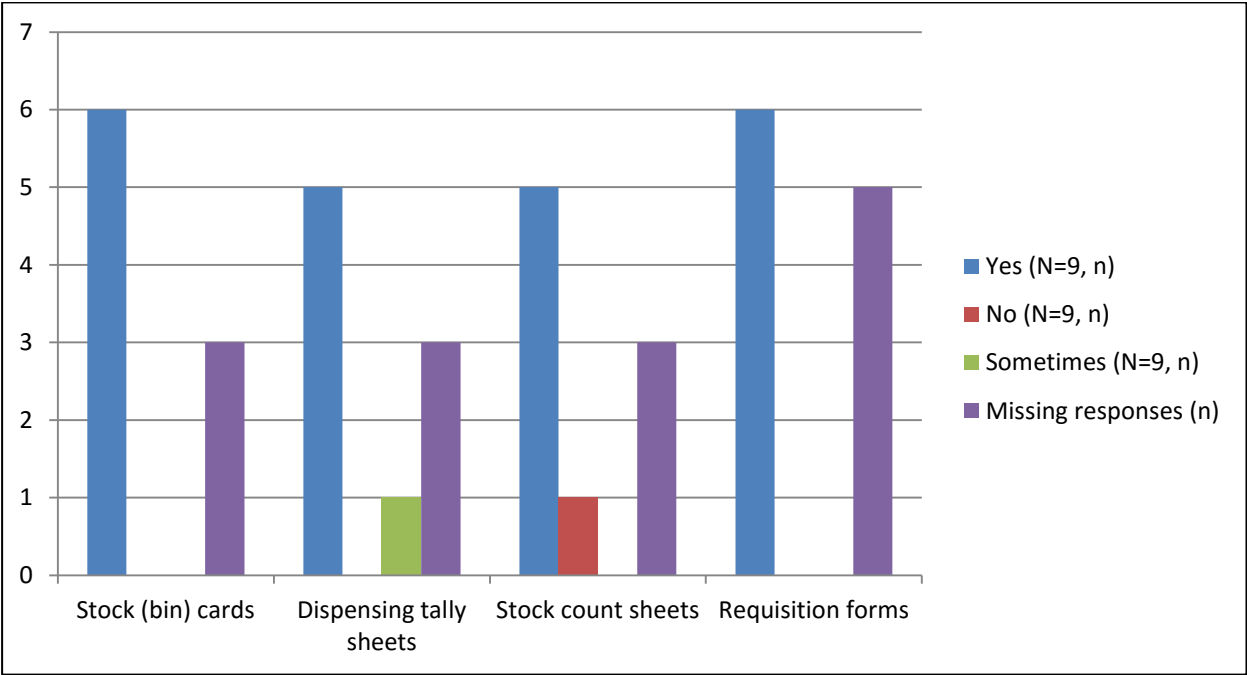


Figure 4-15: The perception of respondents at the District Health Management Teams on drug supply management tools used at healthcare centres

Three respondents at the DHMTs responding to question 3.16 (refer to Annexure B) perceived that the drug supply management tools reach healthcare centres by “DHMTs distribute drug supply management tools to healthcare centres”.

Questions 3.16.1 and 3.16.2 about the unavailability of drug supply management tools at healthcare centres (refer to Annexure B). Four respondents perceived that stock (bin) cards and

requisition forms were hardly ever out-of-stock at healthcare centres whereas, three respondents indicated that dispensing tally sheets and stock count sheets were hardly ever out-of-stock (refer to Figure 4-16).

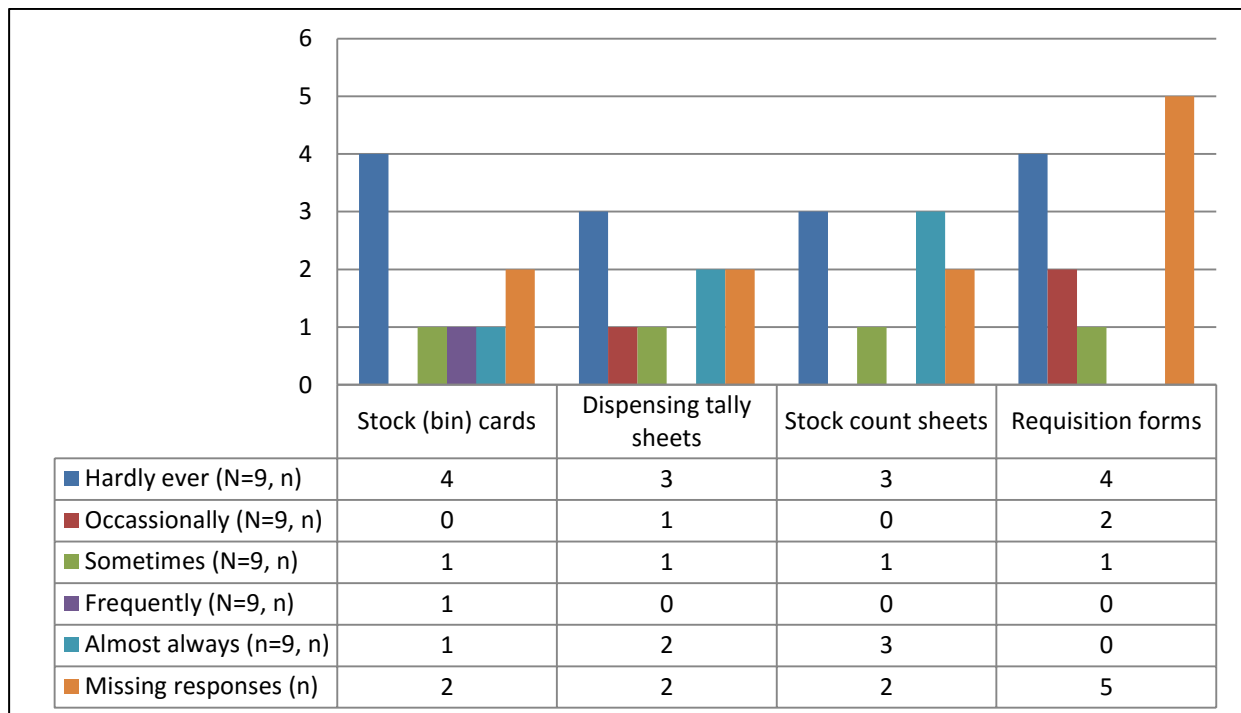


Figure 4-16: The perception of respondents at the District Health Management Teams on the unavailability of drug supply management tools in healthcare centres

Two DHMT respondents responding to question 3.16.2 (refer to Annexure B), perceived that they “procure drug supply management tools for healthcare centres using DHMTs allocated funds” during the unavailability of drug supply management tools.

4.7.3.2 The primary healthcare level

This section focus on the perceptions of managers at OPDs and healthcare centres on drug supply management tools used in the management of medicines for NCDs at OPDs and healthcare centres. The managers at OPDs responded to question 3.15 (refer to Annexure C) and managers at healthcare centres responded to question 3.10 (refer to Annexure D) about the use of drug supply management tools at health facilities. Their perception is presented in Table 4-72.

Fourteen respondents at OPDs perceived that OPDs used stock (bin) cards and requisition forms when managing medicines for NCDs, 15 respondents thought dispensing tally sheets were used whereas 12 respondents felt that stock count sheets were also used (refer to Table

4-72). Most respondents at healthcare centres thought that stock (bin) cards (98.8%, n = 85), requisition forms (93.0%, n = 80), dispensing tally sheets (84.9%, n = 73) and stock count sheets (72.1%, n = 62) were used at healthcare centres (refer to Table 4-72).

Table 4-72: The perception of respondents at health facilities on drug supply management tools used at health facilities

Drug supply management tools	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Stock (bin) cards	1	14	0	1	0	85 (98.8)	1 (1.2)	0
Dispensing tally sheets	1	15	0	0	4 (4.7)	73 (84.9)	9 (10.5)	0
Stock count sheet	2	12	0	2	15 (17.5)	62 (72.1)	6 (7.0)	3 (3.5)
Requisition forms	1	14	0	1	0	80 (93.0)	4 (4.7)	2 (2.3)

OPDs = Outpatient departments

Concerning how drug supply management tools reached OPDs (refer to Annexure C, question 3.16); three respondents at OPDs perceived that “*drug supply management tools are procured*” and two respondents thought that “*drug supply management tools are supplied by the pharmacy.*”

Question 3.11 required respondents at healthcare centres to state how drug supply management tools reached healthcare centres (refer to Annexure D), and 66.8% (n = 57) respondents perceived that “*they are brought by DHMTs.*”

The managers at OPDs (refer to Annexure C, question 3.17) and at healthcare centres (refer to Annexure D, question 3.12) indicated if drug supply management tools were out-of-stock in the past three months before the date of data collection of this study. Eleven respondents at OPDs were of the view that OPDs hardly ever ran out of drug supply management tools (refer to Table 4-73). The respondents at healthcare centres mainly perceived that healthcare centres hardly ever ran out of drug supply management tools (55.8%, n = 48) (refer to Table 4-73).

Table 4-73: The perception of respondents at health facilities on the unavailability of drug supply management tools in health facilities

Frequency of unavailability of drug supply management tools	Perception of respondents at OPDs (N = 16), n	Missing responses at OPDs (n)	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses at healthcare centres, n (%)
Hardly ever	11	5	48 (55.8)	38 (44.2)
Occasionally	1	15	20 (23.3)	66 (76.7)
Sometimes	0	0	15 (17.4)	71 (82.6)
Frequently	0	0	1 (1.2)	85 (98.8)
<i>OPDs = Outpatient departments</i>				

The respondents at healthcare centres (9.3%, n = 8) perceived that measures taken during unavailability of drug supply management tools at healthcare centres (refer to Annexure D, question 3.13) included “*request from the district hospital and DHMTs.*”

- **Discussion of results on the availability of drug supply management tools**

This subsection discusses results on availability of drug supply management tools such as stock (bin) cards, dispensing tally sheets, stock count sheets and requisition forms at health facilities (refer to Section 4.7.3).

According to Clark and Barraclough (2010:8:23) stock records are essential in maintaining a sufficient stock of medicines because the availability of medicines at a health facility meant that patients received medicines promptly. Stock-outs are prevented even when deliveries to the store were delayed (Clark & Barraclough, 2010:8:23). Stock records used in inventory management of medicines included bin cards, stock cards, stock ledgers, and computer files, all of which are used to record all transactions for medicine, including receipts, issues, stock balances, and stock losses (Clark & Barraclough, 2010:8:24). Standardised inventory management tools developed by the Ministry of Health of Ethiopia to be used by public health facilities throughout the country either manually or by using logistics management information system (LMIS) (Federal Democratic Republic of Ethiopia Ministry of Health, 2010:34; Kefale & Shebo, 2019:2), has proven effective in maintaining appropriate stock levels at health facilities to meet the needs of patients and helps to reduce shortages, oversupply, and expiry of commodities (Federal Democratic Republic of Ethiopia Ministry of Health, 2010:34). These inventory management tools were bin card, stock card, internal facility request, issue and receipt voucher, facility combined report and requisition form, and record for returning unusable commodities (Federal Democratic Republic of Ethiopia Ministry of Health, 2010:35; Kefale & Shebo, 2019:2). Similar to the Ethiopian Ministry of Health, the findings of the study revealed that public health facilities in Lesotho used drug supply management tools such as bin cards, dispensing tally sheets, stock count sheets and requisition forms (refer to Section 4.7.3.1, Figure 4-15; Section 4.7.3.2, Table 4-72). The DHMTs distributed drug supply management tools to healthcare centres while they were procured by district hospitals for OPDs (refer to Section 4.7.3.2). Also, healthcare centres and OPDs hardly ran out of drug supply management tools (refer to section 4.7.3.1, Figure 4-16; Section 4.7.3.2, Table 4-73).

4.7.4 Updating the national essential medicines list so that it is in line with the prevailing burden of non-communicable diseases

In this section, the viewpoint of managers at the MOH pertaining to updating the national EML is the main focus.

4.7.4.1 The Ministry of Health

The perception of managers at the MOH on medicine selection for NCD management (refer to Annexure A, question 3.4) is presented in Figure 4-17. Six respondents at the MOH thought that medicine selection for the management of NCDs at OPDs was in line with the national EML, and six respondents perceived that medicine selection was also in line with the national EML at healthcare centres.

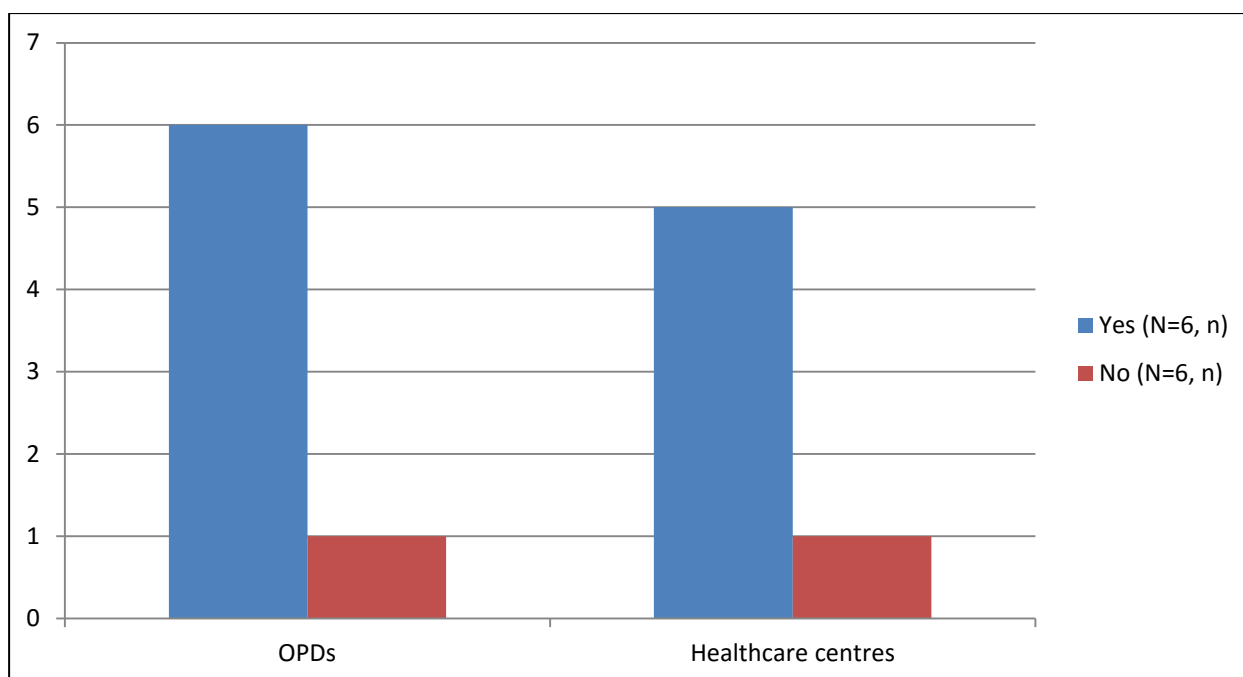


Figure 4-17: The perception of respondents at the Ministry of Health on medicine selection for the management of non-communicable diseases

- **Discussion of results on the updating of the national essential medicines list**

The main focus is on discussing results presented in Section 4.7.4 about the updating of the national medicines list so that it is in line with the prevailing burden of NCDs.

National Essential Medicines Lists (EMLs) are important policy tools in NCD management that indicate which medicines are prioritised as essential within a country's health system (Jarvis *et al.*, 2019:2). Thus, Jarvis *et al.* (2019:5) assessed a selection of WHO-recommended essential medicines for NCDs on national EMLs of 137 countries ranging from low- to upper-middle-income countries and revealed that the majority of priority medicines for NCDs described within key WHO NCD technical packages were listed on almost all national EMLs across these countries. Similarly, the findings of the study showed that NCDs medicines selection at OPDs and healthcare centres was in line with the national EML. Therefore, medicines for NCD management were available to patients at PHC level in Lesotho. In contrast, Bissell *et al.* (2019:8) determined how many low- and middle-income countries had essential asthma medicines on their EMLs and national reimbursement list (NRL), and found that many countries did not have the WHO-recommended essential asthma medicines on their national EMLs and NRL. Thus, patient access to medicines was a challenge that could perpetuate the under prescription and underuse of asthma medicines, so these low- and middle-income countries

have to ensure that essential medicines for asthma feature on their national medicines lists, with the correct dosages (Bissell *et al.*, 2019:11).

4.7.5 Guidelines on quality control, selection, procurement, storage and distribution of drugs

The perception of managers at the MOH about the procurement system for medicines for NCDs is discussed in this section.

4.7.5.1 The Ministry of Health

This section focuses on the perception of managers at the MOH about guidelines on quality control, selection, procurement, storage and distribution of medicines used in NCD management.

Responses of respondents at the MOH to question 3.6 about the method of quantification used to make forecasts of drug needs or consumption at the national level (refer to Annexure A) are presented in Table 4-74. Five respondents at the MOH perceived that methods of quantification used for drug needs or consumption forecasting included the consumption method, whereas two respondents were of the opinion that the morbidity method, service-level projection of budget requirements and informed push system were also used (refer to Table 4-74).

Table 4-74: The perception of respondents at the Ministry of Health on the method of quantification used for drug needs or consumption forecasting

Method of quantification	Perception of respondents at MOH (N = 6), n					
	Hardly ever	Occasionally	Sometimes	Frequently	Almost always	Missing responses
Consumption method	0	0	0	1	5	0
Morbidity method	0	0	0	2	2	2
Proxy consumption method	0	0	0	2	0	4
Service-level projection of budget requirements	0	0	0	1	2	3
Informed push system	0	0	0	0	2	4

MOH = Ministry of Health

Question 3.7 asked managers at the MOH to indicate the accuracy of the forecasts of drug needs or consumption (refer to Annexure A). Four respondents perceived that the forecasts of drug needs or consumption were accurate but, one respondent was of the opinion that they were inaccurate.

The respondents at the MOH also responded to questions 3.8 and 3.8.1 (refer to Annexure A) asking whether the procurement process at the MOH of Lesotho was efficient i.e. getting drugs of good quality at affordable prices at the right time. Only one respondent was of the opinion that it was efficient whereas three respondents were uncertain of the efficiency of the procurement system at the MOH. Two respondents, however, thought that the procurement process was inefficient. Only two respondents responded to question 3.8.1 (refer to Annexure A) and thought that the procurement process was inefficient because *“Government health facilities are allowed to procure from one supplier, NDSO, who’s pricing for drugs is not controlled by the government”* and *“NDSO also has frequent stock-outs”*.

Table 4-75 displays the opinion of respondents at the MOH on tools supporting the management of the procurement system. The opinion was due to respondents responding to question 3.8.2 (refer to Annexure A). Three respondents perceived that tools supporting procurement system management were medicines procurement policies that specify very cost-effective medicines, and standard operating procedures (SOPs) on procurement of medicines that specifies very cost-effective medicines

Table 4-75: The perception of respondents at the Ministry of Health on tools supporting the management of the procurement system at the national level

Tools supporting the management of the procurement system	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Existence of medicines procurement policies specifying very cost-effective medicines.	1	3	2
Existence of standard operating procedures (SOPs) on procurement of medicines specifying very cost-effective medicines.	1	3	2
Existence of legislative provisions to permit generic substitution in the public sector.	3	1	2
Existence of legislative provisions to promote generic substitution in the public sector.	3	1	2

MOH = Ministry of Health

Also, respondents at the MOH responded to question 3.9 where they had to indicate whether guidelines for monitoring medical products were there or not (refer to Annexure A). Figure 4-18

portrays that four respondents perceived that guidelines for monitoring products for proper labelling, expiration, damage and tampering existed at the MOH.

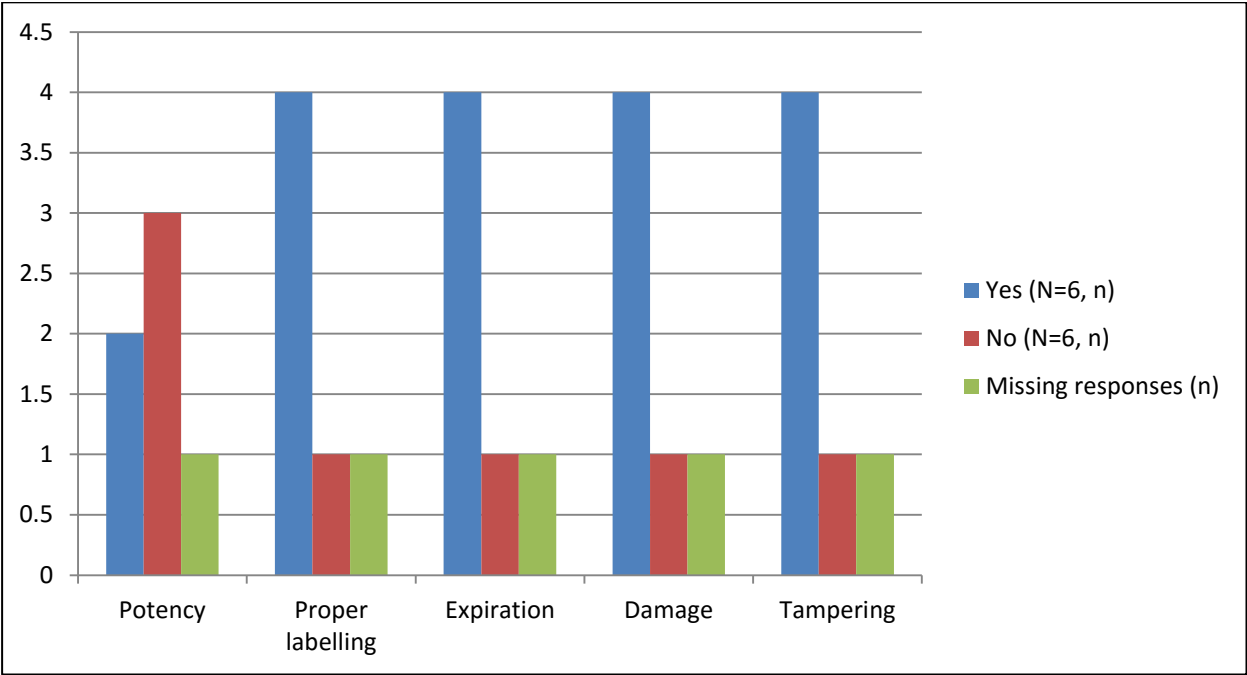


Figure 4-18: The perception of respondents at the Ministry of Health on guidelines for monitoring medical products

Question 3.10 required managers at the MOH to indicate available quality and safety monitoring systems at the national level (refer to Annexure A). Three out of five respondents perceived that quality control standard procedures for receiving health products at the national level, and post-marketing surveillance data collection system existed at the national level.

The thoughts of managers at the MOH about the type of procurement method used to purchase medicines and medical devices at the national level are presented in Table 4-76. The managers responded to question 3.11 (refer to Annexure A). Three respondents at the MOH perceived that procurement methods mainly used in medicines and medical devices purchase included restricted tender whereas two perceived that it was directly procured (refer to Table 4-76).

Table 4-76: The perception of respondents at the Ministry of Health on type of procurement method for medicines and medical devices

Procurement method	Perception of respondents at MOH (N = 6), n					
	Hardly ever	Occasionally	Sometimes	Frequently	Almost always	Missing responses
Open tender (public and unrestricted bid)	1	1	0	0	1	3
Restricted tender (suppliers must be registered and approved in advance)	0	0	0	0	3	3
Negotiated procurement (suppliers are well known and can be approached directly)	1	0	1	0	1	3
Direct procurement (suppliers' wholesale or retail prices are used directly)	0	0	1	0	2	3
<i>MOH = Ministry of Health</i>						

- **Discussion of results on the procurement system for medicines for non-communicable diseases**

The results on guidelines for quality control, selection, procurement, storage and distribution of medicines for NCDs is discussed in this subsection (refer to Section 4.7.5).

The findings of the study indicated that methods of quantification used for drug needs or consumption at the national level of the public health system of Lesotho included the consumption method, morbidity method, informed push system and service-level projection of budget requirements (refer to Section 4.7.5.1, Table 4-106). The national level mostly used the consumption method (refer to Section 4.7.5.1, Table 4-106). Similar methods of quantification are used by the Ministry of Public Health (MoPH) in Afghanistan in that, the MoPH used consumption, morbidity, proxy consumption, and service-level budget projection methods with the consumption method being the most utilised method of quantification (Islamic Republic of Afghanistan Ministry of Public Health, 2014:11). The use of these quantification methods by the MoPH ensured access to safe, effective, and quality essential medicines for patients, as the availability of essential medicines improved the health of patients (Islamic Republic of Afghanistan Ministry of Public Health, 2014:11).

Also, respondents at the MOH perceived that the forecasts of drug needs or consumption at the national level of the public health system were accurate (refer to Section 4.7.5.1). In contrast, Wouters *et al.* (2019:368) indicated that forecasts of drug needs or consumption by the South

African government were not accurate, as the estimated quantities in tender contracts sometimes far exceed the amounts needed, whereas in other cases they fell well short of the required quantities. These discrepancies between estimated and procured quantities were observed for cholesterol-reducing and antihypertensive drugs as well as antipsychotic medicines (Wouters *et al.*, 2019:368). Therefore, the poor demand forecasts could make it difficult for suppliers to plan production and delivery schedules, which may raise the risk of supply disruptions and unavailability of medicines in health facilities (Wouters *et al.*, 2019:368).

The findings of this study revealed that tools in place to support the procurement system management included medicine procurement policies and SOPs that specified cost-effective medicines (refer to Section 4.7.5.1, Table 4-75). The respondents at the MOH perceived that the procurement process at the MOH was inefficient because government health facilities were mainly allowed to procure from one supplier, NDSO, whose pricing for drugs is not controlled by the government (refer to Section 4.7.5.1). The NDSO, however, has frequent stock-outs (refer to Section 4.7.5.1). Similarly, Magadzire *et al.* (2017:582) assessed causes of medicines stock-outs in Western Cape Province (South Africa) and perceived that the procurement process was inefficient thus, causing stock-outs of medicines for the treatment of NCDs in the public sector. Magadzire *et al.* (2017:582-583) further indicated that the stock-outs were due to the delay in award of pharmaceutical tenders, removing national contracts for certain medicines on provincial code lists, and supplier failure to meet contract obligations. The implication of unavailability of medicines for NCDs as a result of the inefficient procurement process is that patients with NCDs will develop NCD complications which may lead to hospitalisation as well as financial constraints due to hospitalisation and treatment of these complications (Magadzire *et al.*, 2017:584).

The findings of this study also indicated that the procurement methods mainly used in medicines and medical devices purchase for health facilities in Lesotho included restricted tender and direct procurement (refer to Section 4.7.5.1, Table 4-76). The service delivery structure of the health system of Gambia is similar to that of Lesotho, so the National Pharmaceutical Services of Gambia also uses procurement methods such as open and restricted tendering and direct or single procurement for the purchase and supply management of medicines and medical supplies for public health facilities, including government hospitals (Sine *et al.*, 2019:30).

4.8 Health management and information systems

This section focuses on the results generated from the specific objectives of health management and information system (HMIS). The results and discussions about HMIS are sectioned based on the specific objective, to describe the HMIS at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The level of recording and reporting of information on outpatients with NCDs;
- All factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively;
- The type of data collected and kept at the health facilities on NCDs;
- The use of data on NCDs by health workers for decision-making at the district and PHC levels;
- The profile of personnel responsible for NCD management data;
- The use of data on NCDs from health facilities countrywide to inform decision-making at the national level;
- The availability and application of a National Health Management and Information System (NHMIS) policy in governing data for NCDs, and
- Structures in place to lead and manage the health system information system (HSIS) in the management of NCDs.

The subsequent paragraphs focus on the level of recording and reporting of information on outpatients with NCDs.

4.8.1 The level of recording and reporting of information on outpatients with non-communicable diseases

This section discusses perceptions of managers at the DHMTs, OPDs and the healthcare centres about recording and reporting of information of patients with NCDs at health facilities. This section is subdivided into the district and the PHC levels. Figure 4-19 shows the levels of reporting health information at different levels of the public health system of Lesotho (MOHSW, 2010:95).

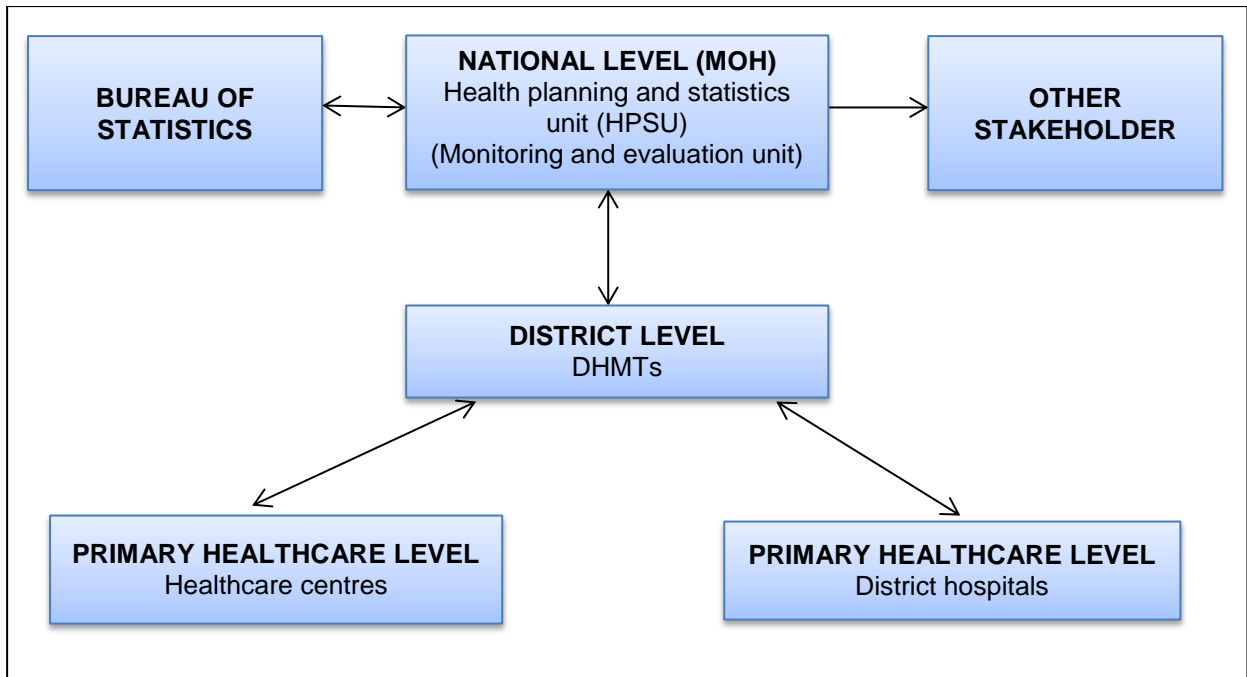


Figure 4-19: Structure of levels of reporting health information in the public health system of Lesotho

4.8.1.1 The district level

This section presents the perception of managers at the DHMTs about available indicators for NCDs and submission of NCDs data by the DHMTs and the health facilities.

Table 4-77 displays the submission of health statistics on NCDs to the national level. The managers at DHMTs responded to questions 4.1 and 4.2 (refer to Annexure B). More than two-quarters of managers did not respond to questions 4.1 and 4.2 (refer to Table 4-77). Two respondents perceived that they submitted NCDs statistics to the national level. Two respondents perceived that DHMTs submitted all health statistics reports on NCD management in the past six months before the date of data collection of this study to the national level and that they kept copies of reports of the health statistics reports on NCDs they submitted (refer to Table 4-77). This was in line with the levels of reporting health information in the public health system of Lesotho (refer to Figure 4-19).

Table 4-77: The perception of respondents at the District Health Management Teams on submission of health statistics on non-communicable diseases by the District Health Management Teams

Submission of health statistics on NCDs	Perception of respondents at DHMTs (N = 9), n			
	No	Yes	Sometimes	Missing responses
Do you submit health statistics on NCD management to the national level?	2	2	0	5
Have you submitted all health statistics reports on NCD management in the past six months to the national level?	1	2	0	6
Have you had any shortage of health statistics forms for NCDs in the last six months?	2	0	1	6
Do you keep copies of reports of the health statistics reports on NCDs you submit?	1	2	0	6
<i>DHMTs = District Health Management Teams</i>				

Question 4.3 required respondents at DHMTs to list the indicators available in the health information statistics regarding NCDs (refer to Annexure B). One respondent perceived that indicators available for NCD management were “*number of NCDs managed according to the Lesotho STGs*”, and “*new cases of hypertension and diabetes mellitus*”.

In response to question 4.11 (refer to Annexure B), two respondents perceived that they did not provide feedback to healthcare centres, and one respondent thought that they did not provide feedback to the OPDs, in response to submitted NCD management reports. However, one respondent believed that they sometimes provided feedback to OPDs and healthcare centres in response to submitted NCD management reports.

Also, three respondents at DHMTs perceived that the DHMTs did not receive any feedback from the national level in response to reports that were submitted regarding NCDs in the past six months before the date of data collection of this study (refer to Annexure B, question 4.13).

4.8.1.2 The primary healthcare level

In this section, the viewpoint of managers at OPDs and healthcare centres on data collectors, data collection tools and submission of NCDs data at the PHC level are presented and discussed (refer to question 4.6 in Annexure C and Annexure D). The perception of managers at OPDs and healthcare centres are presented in Table 4-78. Missing responses of managers at OPDs and healthcare centres were less than two-thirds (refer to Table 4-78).

Five respondents at OPDs perceived that nurses always collected data on NCDs at OPDs, four respondents thought that nursing assistants were the ones who always collected data and six respondents felt that data collection clerks always collected data (refer to Table 4-78). Also, four respondents at OPDs thought that pharmacists, pharmacy technicians and medical doctors did not collect data on NCDs at OPDs, five respondents also perceived that receptionists did not collect data whereas three respondents felt that CHWs did not collect data on NCDs (refer to Table 4-78).

Forty-nine (57.0%) respondents at healthcare centres perceived that nurses always collected data on NCDs at healthcare centres, 48.8% (n = 42) of respondents thought that nursing assistants always collected data whereas 51.2% (n = 44) of respondents indicated that data collection clerks always carried out data collection (refer to Table 4-78).

Table 4-78: The perception of respondents at health facilities on non-communicable diseases data collectors in health facilities

Data collectors	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	Not at all	Sometimes	Almost always	Missing responses	Not at all	Sometimes	Almost always	Missing responses
Nurse	2	1	5	8	4 (4.7)	17 (19.8)	49 (57.0)	16 (18.6)
Nursing assistants	2	1	4	9	4 (4.7)	19 (22.1)	42 (48.8)	21 (24.4)
Data collection clerk	1	0	6	9	14 (16.3)	5 (5.8)	44 (51.2)	23 (26.7)
Pharmacist	4	0	2	10	27 (31.4)	1 (1.2)	3 (3.5)	55 (64.0)
Pharmacy technician	4	1	1	10	20 (23.3)	5 (5.8)	11 (12.8)	50 (58.1)
Medical doctor	4	1	2	9	19 (22.1)	12 (14.0)	3 (3.5)	52 (60.5)
Receptionist	5	0	1	10	30 (34.9)	0	1 (1.2)	55 (64.0)
CHWs	3	1	2	10	20 (23.3)	10 (11.6)	7 (8.1)	55 (64.0)

OPDs = Outpatient departments; CHW = Community health workers

In response to question 4.7 (refer to Annexure C), five respondents perceived that OPDs always had data collection tools for NCDs, and one respondent thought that OPDs sometimes had data

collection tools but, three respondents were of the opinion that OPDs did not have data collection tools.

Also, respondents (88.4%, n = 76) at healthcare centres responded to question 4.7 (refer to Annexure D) by perceiving that healthcare centres always had data collection tools for NCDs but, 4.7% (n = 4) thought that healthcare centres did not have these data collection tools.

The perception of managers at OPDs and healthcare centres about the format of NCDs data collection tools is displayed in Table 4-79. The managers at OPDs responded to question 4.7.1 (refer to Annexure C), and managers at healthcare centres responded to question 4.7.1 (refer to Annexure D). Seven respondents at OPDs perceived that data collection tools for NCDs were paper-based (registries). Seventy-one (82.6%) respondents at healthcare centres thought that NCDs data collection tools were in a form of paper-based (registries) at healthcare centres (refer to Table 4-79).

Table 4-79: The perception of respondents at health facilities on the format of non-communicable diseases data collection tools

Data collection tools	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
Paper-based (registries)	0	7	9	2 (2.3)	71 (82.6)	13 (15.1)
Electronic	1	4	11	9 (10.5)	54 (62.8)	23 (26.7)
Paper-based outpatient medical files	1	5	10	12 (14.0)	22 (25.6)	52 (60.5)
<i>OPDs = Outpatient departments</i>						

Submission of health statistics on NCDs by health facilities was addressed in questions 4.1 and 4.2 (refer to Annexure C) and questions 4.1 and 4.2 (refer to Annexure D).

Eight respondents at OPDs perceived that OPDs submitted health statistics on NCDs (refer to Table 4-80). Eight respondents were also of the opinion that OPDs submitted all health statistics reports on NCD management in the past six months before the date of data collection of this study and that they kept copies of reports of the health statistics reports on NCDs submitted (refer to Table 4-80). Seven respondents perceived that OPDs did not have any shortage of health statistics forms for NCDs.

Eighty-three (96.5%) respondents at healthcare centres thought that healthcare centres submitted NCDs health statistics and 96.5% (n = 83) of respondents indicated that they

submitted all health statistics reports on NCD management of which, they kept copies of reports of the health statistics reports as per the perception of 77 (89.5%) respondents (refer to Table 4-80).

Table 4-80: The perception of respondents at health facilities on submission of health statistics on non-communicable diseases by health facilities

Submission of health statistics on NCDs.	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Do you submit health statistics on NCD management?	4	8	0	4	3 (3.5)	83 (96.5)	0	0
Have you submitted all health statistics reports on NCD management in the past six months?	3	8	0	5	3 (3.5)	83 (96.5)	0	0
Have you had any shortage of health statistics forms for NCDs in the last six months?	7	2	1	6	70 (81.4)	10 (11.6)	0	6 (7.0)
Do you keep copies of reports of the health statistics reports on NCDs you submit?	3	8	0	5	6 (7.0)	77 (89.5)	2 (2.3)	1 (1.2)
<i>OPDs = Outpatient departments</i>								

Question 4.1.1 (refer to Annexure C) and question 4.1.1 (refer to Annexure D,) required managers to indicate to whom they submitted the health statistics on NCD management. Table 4-81 displays that six respondents at OPDs perceived that NCDs statistics were submitted to DHMTs and eight respondents believed they were submitted to the MOH.

Eighty-one (94.2%) respondents at healthcare centres perceived that healthcare centres submitted. The submission of reports by OPDs and healthcare centres was in line with the levels of reporting health information in the public health system of Lesotho (refer to Figure 4-19).

Table 4-81: The perception of respondents at health facilities on places where non-communicable diseases statistics are submitted by health facilities

Places where NCDs statistics are submitted.	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
DHMTs	0	6	10	1 (1.2)	81 (94.2)	4 (4.7)
District hospital	0	3	13	10 (11.6)	8 (9.3)	68 (79.1)
Ministry of Health	0	8	8	5 (5.8)	18 (20.9)	63 (73.3)

OPDs = Outpatient departments; DHMTs = District Health Management Teams

Eleven respondents at OPDs perceived that they did not receive any feedback from the national level whereas, ten respondents indicated that they did not receive feedback from the district level in response to reports that were submitted on NCD management in the past six months before the date of data collection of this study. However, one respondent was of the opinion that OPDs received feedback from the national level. This perception of respondents at OPDs was in response to question 4.12 in the OPDs questionnaire (refer to Annexure C).

Sixty-two (72.1%) respondents at healthcare centres perceived that feedback was not provided by the district level in response to reports that were submitted on NCD management in the past six months before the date of data collection of this study but, 15.1% (n = 13) of respondents thought that the district level provided feedback to healthcare centres. The perception of respondents at healthcare centres was a result of their response to question 4.13 (refer to Annexure D).

- **Discussion of results on levels of recording and reporting of information on non-communicable diseases**

Section 4.8.1 presents results on levels recording and reporting of information of patients with NCDs at health facilities. These results are discussed in this subsection.

Reporting of health information about NCDs to the national level is important as this information will assist with planning and decision-making on NCD management at the different levels of the health system, thus, improving the effectiveness of health services (Kassa & Grace, 2019:9-10). Panda *et al.* (2018:568-569) assessed health system preparedness in NCDs in Odisha and Kerala states (India) and revealed that there was a lack of monitoring and supervision in the collection of NCD-related morbidity and mortality data. Thus, Panda *et al.* (2018:568-569) suggested that surveillance for chronic diseases does not seem to be integrated into the state

and national health information systems. Therefore, the lack of reliable systematic data in NCDs makes the tracking of trends and evidence-based policy- and decision-making more difficult (Panda *et al.*, 2018:568-569). On the contrary, the study findings revealed that the district and PHC levels of the health system of Lesotho submitted NCDs statistics reports and they submitted all statistics reports on NCD management in the last six months (refer to Section 4.8.1.1, Table 4-77; Section 4.8.1.2, Table 4-80). The DHMTs submitted statistics for NCDs to the MOH, the statistics for NCDs were submitted by OPDs to both MOH and DHMTs, while healthcare centres submitted NCDs statistics reports to DHMTs (refer to Section 4.8.1.1; Section 4.8.1.2, Table 4-81). The submission of reports by the DHMTs, OPDs and the healthcare centres was in line with the levels of reporting health information in the public health system of Lesotho (refer to Figure 4-19). As a result, health information on NCDs reached the national level to assist with planning and decision-making in NCDs management. Additionally, the study findings indicated that health facilities did not run out of statistics reports for NCDs in the last six months, and the district and PHC levels kept copies of submitted statistics reports on NCD management (refer to Section 4.8.1.1, Table 4-77; Section 4.8.1.2, Table 4-80).

In contrast, the DHMTs, OPDs, and healthcare centres did not receive feedback from either the national or the district level in response to NCDs statistics reports that were submitted as viewed by respondents at the DHMTs and health facilities (refer to Section 4.8.1.1; Section 4.8.1.2). This is not in line with the levels of reporting (refer to Figure 4-19) because according to the organogram, the district and the PHC levels have to get feedback pertaining to submitted reports. Compared to Liberia which also is burdened with escalating NCDs, the performance of HMIS of Liberia improved in both production of quality data and use of information for decision-making although, weakness persisted in sending feedback to lower levels and processing and analysing data at the health facilities (Republic of Liberia, 2015:7). Thus, the Lesotho and Liberia HMIS are similar in that the health facilities were not given feedback pertaining to statistics on NCDs that were submitted by health facilities thus, health facilities were not able to monitor healthcare services and to use the statistics on NCDs.

According to Kassa and Grace (2019:10), surveillance data on NCDs are collected by establishing and implementing data collection standardized protocols in the healthcare system which are data collection forms used to obtain morbidity, mortality, and risk factor-related data. Thus, the study findings showed that NCD data collection tools were available at OPDs and healthcare centres, and these tools were in the form of paper-based registries, paper-based outpatient medical files and electronic (refer to Section 4.8.1.2, Table 4-79). Similarly, key stakeholders in the states of Odisha and Kerala in India mentioned that the data collection in both states was done electronically in standardised monitoring format (Panda *et al.*, 2018:568).

However, there was no monitoring mechanism to ensure the quality of data, and the data were not used for evidence-based policy and decision-making (Panda *et al.*, 2018:568). Likewise, Liberia as a country also battling with an increasing prevalence of NCDs indicated that the HMIS in Liberia had standardised ledgers and integrated reporting forms used for NCDs data collection (Republic of Liberia, 2014:7). Furthermore, the HMIS in Liberia had established reporting channels and timelines as well as the installation of District Health Information System (DHIS) software which was in use at the county health offices (Republic of Liberia, 2014:7). As a result, information on NCDs was used for decision-making at the national level as well as at the health facility level (Republic of Liberia, 2014:7). Also, this study indicated that the data collectors in the public health facilities in Lesotho included nurses, nursing assistants and data collection clerks (refer to Section 4.8.1.2, Table 4-78). Comparatively, the HMIS officers in Malawi stated that HMIS data collectors from the district hospital, health facilities, and the community included medical assistants, nurse–midwives, statistical clerks, and health surveillance assistants (Kasambara *et al.*, 2017:243).

The following section focus on all factors that influenced the recording and reporting of information of the patient with NCDs.

4.8.2 Factors influencing recording and reporting of information on outpatients with non-communicable diseases

This section entails the perceptions of managers at the DHMTs, OPDs and the healthcare centres about factors that influenced the recording and reporting of information of patients with NCDs at the PHC level. This section is subdivided into the district and the PHC levels.

4.8.2.1 The district level

Figure 4-20 present the perception of managers at DHMTs about challenges experienced by DHMTs during the preparation and submission of NCDs' statistics reports. The DHMTs responded to question 4.4 (refer to Annexure B) where, two respondents perceived that there were no constraints during the preparation and submission of health statistics reports on NCDs.

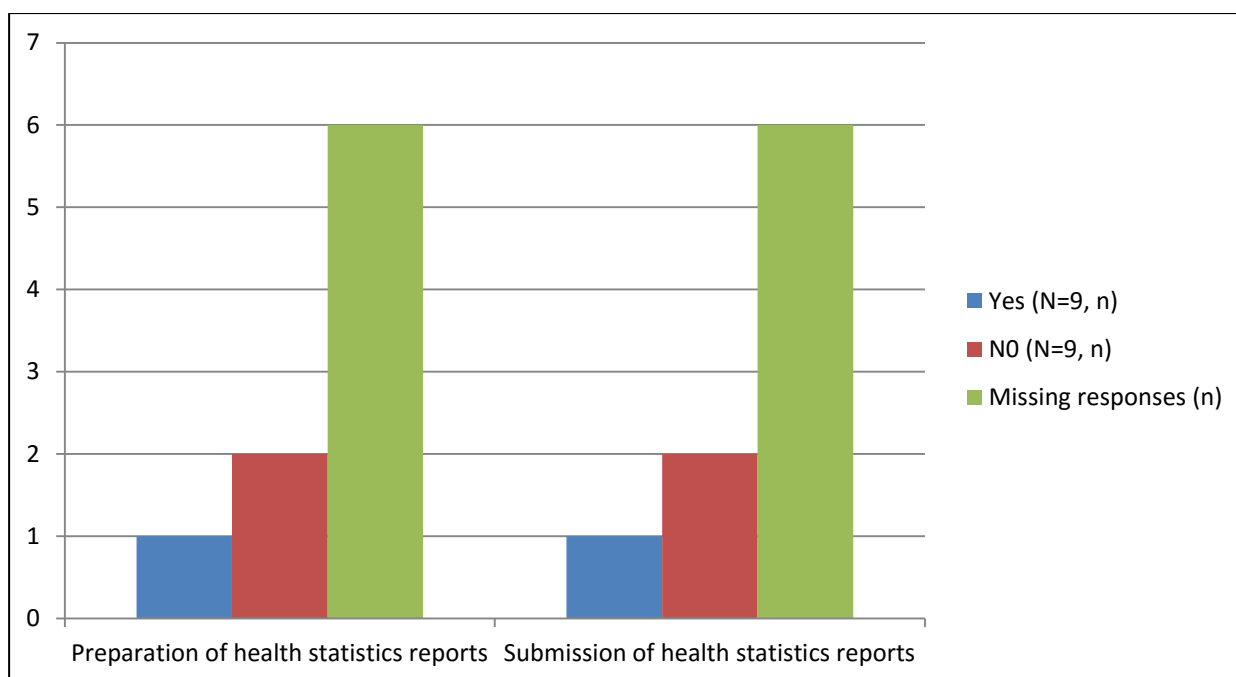


Figure 4-20: The perception of respondents at the District Health Management Teams on constraints of preparation and submission of statistical reports on non-communicable diseases experienced by district health management teams

Furthermore, the managers answered questions 4.5 and 4.6 where they had to state the constraints to preparation and submission of health statistics reports for NCDs (refer to Annexure C). One respondent was of the opinion that difficulties in preparation and submission of NCDs health statistics reports could be due to “*lack of reporting tools*”.

4.8.2.2 The primary healthcare level

The perception of managers at OPDs and healthcare centres about constraints experienced during the preparation and submission of statistical reports for NCDs at health facilities is presented in Table 4-82. The managers at OPD and healthcare centres responded to question 4.3 (refer to Annexure C and Annexure D, respectively). Six respondents at OPDs perceived that there were no constraints during preparation and submission of statistical reports on NCDs at OPDs. Seventy-one (82.6%) respondents at healthcare centres thought that healthcare centres did not experience any constraints during preparation of statistical reports while 80.2% (n = 69) of respondents indicated that they did not have any difficulty during submission of NCDs statistical reports (refer to Table 4-82).

The respondents at OPDs addressed questions 4.4 and 4.5 (refer to Annexure C) and missing responses were more than 80%. Two respondents perceived that the main constraint to the

preparation of health statistics reports on NCDs was that “*medical doctors are not using tally sheet thus difficult to compile statistics.*” One respondent thought that challenges to submission of NCDs health statistics reports could be “*transport to Maseru is not always available*” and “*no data collection clerks.*”

Questions 4.4 and 4.5 required managers at healthcare centres to describe the constraints to preparation and submission of NCDs statistical reports (refer to Annexure D). More than three-quarters of managers did not answer questions 4.4 and 4.5. One respondent at a healthcare centre perceived that constraints to the preparation of health statistics reports for NCDs at healthcare centres were a “*lack of network*”, stating that “*our facility is far away from DHMTs offices and transport to DHMTs is a constraint to submission of health statistics reports when internet is dysfunctional due to network*”, “*lack of NCDs data collection tools*”, and “*when data collection clerk is on leave.*”

Three respondents (3.5%) at healthcare centres also perceived that healthcare centres experienced constraints with the submission of health statistics reports because of “*lack of network*” and “*transport constraints.*”

Table 4-82: The perception of respondents at health facilities on constraints of preparation and submission of statistical reports on non-communicable diseases experienced by health facilities

Constraints experienced during the preparation and submission of statistical reports on NCDs	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Preparation of health statistics reports	6	4	0	6	71 (82.6)	3 (3.5)	4 (4.7)	8 (9.3)
Submission of health statistics reports	6	4	0	6	69 (80.2)	3 (3.5)	7 (8.1)	7 (8.1)
<i>OPDs = Outpatient departments</i>								

- **Discussion of results on factors influencing recording and reporting of information on non-communicable diseases**

This subsection entails a discussion of results on factors that influenced the recording and reporting of information of patients with NCDs at the PHC level (refer to Section 4.8.2).

These study findings showed that the majority of respondents perceived that DHMTs, OPDs and healthcare centres had not experienced constraints during the preparation and submission of NCDs statistical reports (refer to Section 4.8.2.1, Figure 4-20; Section 4.8.2.2, Table 4-82). Issues that might affect preparation and submission of NCDs statistics reports at district and PHC levels in the public health system of Lesotho included lack of network, NCDs data collection tools, transport and lack of data collection clerks (refer to Section 4.8.2.2). Likewise, healthcare workers in Ethiopia perceived that there was a lack of standardised formats for NCD data collection and computerised data storage hubs in public hospitals (Kassa & Grace, 2018:139). The healthcare workers in the Ethiopian health system further stated that health information of patients was recorded on paper and stored together with other cases, resulting in the unavailability of accurate NCD data when needed for decision-making (Kassa & Grace, 2018:139).

4.8.3 The type of data collected and kept at the health facilities on non-communicable diseases

In this section, the viewpoints of managers at the DHMTs, OPDs and the healthcare centres on the type of data collected and kept at health facilities at PHC level on NCDs are the main focus. This section is divided into the district and the PHC level.

4.8.3.1 The district level

Table 4-83 portrays the type of information submitted to DHMTs by health facilities. The managers gave their opinion on information health facilities submitted to DHMTs, as they responded to question 4.15 (refer to Annexure B). More than half of the respondents did not respond to question 4.15 (refer to Table 4-83). The majority of respondents at the DHMTs noted that the OPDs and healthcare centres submitted all NCDs' information to DHMTs except for the number of patients with adverse drug reactions (ADRs), type of ADRs patients experienced, management of ADRs, peak flow meter readings, and therapeutic blood level monitoring for epileptic patients (refer to Table 4-83).

Table 4-83: The perception of respondents at the District Health Management Teams on the type of information submitted by health facilities to district health management teams

Type of information submitted by health facilities	Perception of respondents at DHMTs (N = 9), n					
	OPDs			Healthcare centres		
	No	Yes	Missing responses	No	Yes	Missing responses
Total number of patients diagnosed with hypertension	0	2	7	1	3	5
Total number of patients diagnosed with diabetes mellitus	0	2	7	1	3	5
Total number of patients diagnosed with asthma	0	2	7	1	3	5
Total number of patients diagnosed with epilepsy	0	2	7	0	3	6
Number of patients with hypertension in different age groups	0	2	7	0	3	6
Number of patients with diabetes mellitus in different age groups	0	2	7	0	3	6
Number of patients with asthma in different age groups	0	2	7	0	3	6
Number of patients with epilepsy in different age groups	0	2	7	0	3	6
Gender of patients with hypertension	0	2	7	0	3	6
Gender of patients with diabetes mellitus	0	2	7	0	3	6
Gender of patients with asthma	0	2	7	0	3	6
Gender of patients with epilepsy	0	2	7	0	3	6
Blood pressure values	1	1	7	1	2	6
Blood glucose levels	1	1	7	1	2	6
Peak flow meter readings	2	0	7	3	0	6
Therapeutic blood level monitoring for epileptic patients	2	0	7	3	0	6
Number of patients referred to the district hospital by healthcare centres	0	2	7	0	3	6

Type of information submitted by health facilities	Perception of respondents at DHMTs (N = 9), n					
	OPDs			Healthcare centres		
	No	Yes	Missing responses	No	Yes	Missing responses
Drug consumption rate	1	1	7	1	3	5
Number of health promotion activities conducted in the community	0	2	7	0	4	5
Number of health talks conducted	0	2	7	0	3	6
Number of patients with ADRs	2	0	7	4	0	5
Type of ADRs patients experienced	2	0	7	4	0	5
Management of ADRs	2	0	7	4	0	5
<i>DHMTs = District Health Management Teams; OPDs = Outpatient departments</i>						

The respondents at the DHMTs responded to question 4.16 (refer to Annexure B), and two respondents perceived that information on NCD management was mainly kept electronically at DHMTs.

4.8.3.2 The primary healthcare level

The perception of managers at OPDs and healthcare centres about the type of information on NCDs collected by health facilities is presented in Table 4-84. This perception was a response of managers to question 4.8 in the OPDs and healthcare centres questionnaires (refer to Annexure C and Annexure D, respectively).

The majority of respondents at OPDs perceived that OPDs collected all information on NCDs except for the number of health promotion activities conducted, the number of patients with ADRs, type of ADRs patients experienced, management of ADRs, peak flow meter readings, and therapeutic blood level monitoring for epileptic patients (refer to Table 4-84). The respondents at healthcare centres felt that healthcare centres collected all information on NCDs apart from information on peak flow meter readings and therapeutic blood level monitoring for epileptic patients (refer to Table 4-84).

Table 4-84: The perception of respondents at health facilities on the type of information on non-communicable diseases management collected at outpatient departments and healthcare centres

Type of information collected at health facilities	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Total number of patients diagnosed with hypertension	0	9	1	6	0	79 (91.9)	1 (1.2)	6 (7.0)
Total number of patients diagnosed with diabetes mellitus	0	9	1	6	0	79 (91.9)	1 (1.2)	6 (7.0)
Total number of patients diagnosed with asthma	0	9	1	6	0	77 (89.5)	2 (2.3)	7 (8.1)
Total number of patients diagnosed with epilepsy	0	9	1	6	0	76 (88.4)	2 (2.3)	8 (9.3)
Number of patients with hypertension in different age groups	1	7	1	7	2 (2.3)	78 (90.7)	0	6 (7.0)
Number of patients with diabetes mellitus in different age groups	1	6	1	8	2 (2.3)	78 (90.7)	0	6 (7.0)
Number of patients with asthma in different age groups	1	6	1	8	4 (4.7)	72 (83.7)	3 (3.5)	7 (8.1)
Number of patients with epilepsy in different age groups	1	5	1	9	3 (3.5)	74 (86.0)	2 (2.3)	7 (8.1)
Gender of patients with hypertension	0	7	1	8	3 (3.5)	76 (88.4)	1 (1.2)	6 (7.0)
Gender of patients with diabetes mellitus	1	6	1	8	1 (1.2)	77 (89.5)	1 (1.2)	7 (8.1)
Gender of patients with asthma	1	6	1	8	1 (1.2)	77 (89.5)	1 (1.2)	7 (8.1)

Type of information collected at health facilities	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Gender of patients with epilepsy	1	6	1	8	1 (1.2)	76 (88.4)	1 (1.2)	8 (9.3)
Blood pressure values	3	6	0	7	22 (25.6)	51 (59.3)	4 (4.7)	9 (10.5)
Blood glucose levels	3	6	0	7	28 (32.6)	46 (53.5)	2 (2.3)	10 (11.2)
Peak flow meter readings	3	2	0	11	58 (67.4)	10 (11.6)	2 (2.3)	16 (18.6)
Therapeutic blood level monitoring for epileptic patients	7	0	0	9	63 (73.3)	6 (7.0)	1 (1.2)	16 (18.6)
Number of patients referred to district hospital by healthcare centres	3	4	1	8	4 (4.7)	72 (83.7)	3 (3.5)	7 (8.1)
Drug consumption rate	4	5	0	7	18 (20.9)	54 (62.8)	3 (3.5)	11 (12.8)
Number of health promotion activities conducted in the community	5	1	0	10	22 (25.6)	47 (54.7)	8 (9.3)	9 (10.5)
Number of health talks conducted	3	5	0	8	11 (12.8)	62 (72.1)	4 (4.7)	9 (10.5)
Number of patients with ADRs	6	3	0	7	29 (33.7)	39 (45.3)	9 (10.5)	9 (10.5)
Type of ADRs patients experienced	6	3	0	7	29 (33.7)	40 (46.5)	9 (10.5)	8 (9.3)
Management of ADRs	5	3	1	7	25 (29.1)	47 (54.7)	6 (7.0)	8 (9.3)

Type of information collected at health facilities	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
<i>OPDs = Outpatient departments</i>								

In their response to question 4.9 (refer to Annexure C), two respondents at OPDs perceived that information on NCD management was kept in “registers” and in “pharmacy and consulting rooms” at OPDs.

Twenty respondents (23.3%) at healthcare centres perceived that information on NCD management was mainly kept in “registers” at healthcare centres (refer to Table 4-85) (Annexure D, question 4.9).

Table 4-85: The perception of respondents at healthcare centres on the place where collected non-communicable disease information is kept at healthcare centres

Places where collected data on NCDs is kept	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
“Registers”	20 (23.3)	66 (76.7)
“Cupboards or cabinets”	7 (8.1)	79 (91.9)
“Reception or consulting rooms”	10 (11.6)	76 (88.4)
“Electronically”	3 (3.5)	83 (96.5)
“Data collection clerk’s office”	3 (3.5)	83 (96.5)

- Discussion of results on the type of collected information on non-communicable diseases**

Results presented in Section 4.8.3 on the type of data collected and kept at health facilities at PHC level is discussed.

The WHO Package of Essential Non-Communicable Disease Interventions (WHO PEN) (WHO, 2018:31) indicated that NCD management indicators include individual patient monitoring and programme monitoring, and these two types of NCD management indicators have to be in place in the health system. Individual patient monitoring is when an individual patient record is used to monitor the health status and the management of a single patient over time, for instance: treatment initiation rate, control rate and complications rate (WHO, 2018:31).

The Republic of Moldova and Lesotho have similarities in their health systems, and their fight against the escalating burden of NCDs (GOL, 2016; WHO, 2017i). The health system of the Republic of Moldova is burdened by the increasing NCDs, so Laatikainen *et al.* (2020:1) determined the feasibility of implementing and evaluating the WHO PEN approach in primary healthcare in the Republic of Moldova. According to Laatikainen *et al.* (2020:3), interventions for the prevention of CVD can be implemented and evaluated using routine clinical data (such as the proportion of patients diagnosed with diabetes or hypertension, blood pressure

measurements, smoking status, the gender of patients with NCDs) from paper-based records following a standard protocol. Thus, improvements to the PHC services in the Republic of Moldova were made through the use of existing, publicly available guidelines in a relatively short period (Laatikainen *et al.*, 2020:5). Similarly, health workers in public health facilities in Lesotho collected and submitted the following information on NCDs to DHMTs (refer to Section 4.8.3.1, Table 4-83; Section 4.8.3.2, Table 4-84):

- Total number of patients diagnosed with hypertension, diabetes mellitus, asthma and epilepsy;
- Number of patients with hypertension, diabetes mellitus, asthma and epilepsy;
- Gender of patients with hypertension, diabetes mellitus, asthma and epilepsy;
- Number of patients referred to district hospital by healthcare centres, and
- Number of health talks and health promotion activities conducted.

This information could be used in policy- and decision-making at the national level (refer to Figure 4-19). On the downside, individual patient monitoring was a challenge at PHC level in Lesotho, as the OPDs and healthcare centres did not collect and submit information such as the number of patients with ADRs, type of ADRs patients experienced, management of ADRs, peak flow meter readings, and therapeutic blood level monitoring for epileptic patients to the DHMTs (refer to Section 4.8.3.1, Table 4-83; Section 4.8.3.2, Table 4-84). Thus, the lack of submission of this information to the DHMTs could affect decisions made concerning ADRs, asthma and epilepsy management at the national level which have to be implemented at the PHC level by health workers. Likewise, in the Dedza district (Malawi), NCDs information was reported on medical records that were retained by patients (patient information booklet) and clinical registers which contained information such as date, patient name, age, gender, suspected diagnosis and medications provided (Wood *et al.*, 2015:2-3). There is a lack of quality data on NCDs in primary care of NCDs in Malawi, thus, attention should be given to continuous quality improvement cycles to monitor progress and better information continuity in the medical record for patients requiring chronic care (Wood *et al.*, 2015:5).

The findings of this study also revealed that NCD management information was kept electronically at DHMTs, and in public health facilities, NCD information was kept in registers, pharmacy and consultation rooms (refer to Section 4.8.3.1; Section 4.8.3.2, Table 4-85). Similarly, Blake *et al.* (2019:8) assessed the quality of care for NCDs in PHC facilities in the Republic of Moldova and found that health centres used a 'mixed system' both a paper and electronic system, a 'paper only system' and some health centres used an electronic system for

keeping patient records solely. Thus, health facilities in the Republic of Moldova are able to record information on NCD prevention and management (Blake *et al.*, 2019:8).

4.8.4 The use of data on non-communicable diseases by health workers for decision-making at the district and primary healthcare levels

The perception of managers at the DHMTs, OPDs and the healthcare centres on the use of data on NCDs in decision-making at the district and the PHC levels are presented in this section. This section is subdivided into the district and the PHC levels.

4.8.4.1 The district level

Question 4.7 asked managers at DHMTs about whether the analysis of the health statistics on NCDs was carried out by the staff of the DHMT or not (refer to Annexure B). Three out of nine respondents responded to this question. One respondent at DHMTs perceived that data on NCDs were analysed by employees at the DHMTs, one respondent was of the opinion that data was sometimes analysed by employees at DHMTs but, one respondent thought that employees at DHMTs did not analyse data on NCDs. Also, respondents at DHMTs answered question 4.8 in which respondents had to state how the analysed data were presented (refer to Annexure B). One respondent at DHMTs was of the opinion that the analysed NCDs data were presented using “*graphs*” and “*tables*”.

Two respondents perceived that staff at DHMTs did not use the health statistics on NCDs whereas one respondent thought that staff at DHMTs sometimes used the health statistics on NCDs (Annexure B, question 4.9).

Question 4.12 required respondents at DHMTs to indicate if health activity monitoring mechanisms for NCD management such as charts or diagrams showing recent health achievements in the district were being made (refer to Annexure B). Three out of nine respondents responded to question 4.12, and two respondents perceived that health activity monitoring mechanisms for NCD management showing recent health achievements in the district were not being made but, one respondent thought that they were sometimes made.

4.8.4.2 The primary healthcare level

The respondents at OPDs responded to question 4.10 (refer to Annexure C) and respondents at healthcare centres responded to question 4.10 (refer to Annexure D). Nine respondents at OPDs perceived that NCDs statistics were not being analysed by staff at OPDs but, one respondent was of the opinion that staff at OPDs analysed NCDs statistics. The majority of

respondents at healthcare centres (44.2%, n = 38) thought that NCDs statistics were not analysed by staff at healthcare centres, whereas 33.7% (n = 29) of respondents were of the opinion that NCDs statistics were analysed by staff at healthcare centres, and 16.3% (n = 14) of respondents thought that staff at healthcare centres sometimes analysed NCDs statistics.

The respondents at OPDs had to indicate, in question 4.10.1, how the analysed data were presented (refer to Annexure C). Also, respondents at healthcare centres responded to question 4.10.1 which required them to provide examples of how the analysed data were presented (refer to Annexure D). One respondent at OPDs perceived that “*graphs*” were used to present data on NCDs, and 15.1% (n = 13) of respondents at healthcare centres perceived that “*graphs*” were used to present the data on NCDs.

Six respondents at OPDs perceived that employees at OPDs did not use the analysed statistics on NCDs management in decision-making, and one respondent thought that employees at OPDs used the analysed data on NCDs. Also, one respondent indicated that they sometimes used these data. This perception was a response of respondents at OPDs to question 4.11 (refer to Annexure C).

The respondents at healthcare centres responded to question 4.11 on the use of analysed data on NCDs by employees at healthcare centres (refer to Annexure D). Thirty-one (36.0%) respondents at healthcare centres perceived that employees at healthcare centres mainly used analysed data on NCDs in decision-making, and 17.4% (n = 15) of respondents thought that employees at healthcare centres sometimes used the NCD data but, 26.7% (n = 23) of respondents were of the opinion that healthcare centres’ employees did not use the analysed NCD data in decision-making.

In response to question 4.12 (refer to Annexure D), managers at healthcare centres indicated examples of how the analysed data on NCDs was used by employees at healthcare centres in decision-making. The respondents at healthcare centres (15.1%, n = 13) perceived that analysed data on NCDs were used “*to decide on interventions to be done for patients such as health education*” and “*ordering of NCD drugs*”.

- **Discussion of results on the use of data on non-communicable diseases at health facilities**

Results on how data on NCDs is used by health workers in decision-making at the district and the PHC levels are deliberated on in this subsection (refer to Section 4.8.4).

The patient information on NCDs collected by health workers from public health facilities in Lesotho has to be analysed to be able to inform the national level on the functioning and performance of the health system of Lesotho. The health system of Liberia in comparison to that of Lesotho is also challenged by NCDs (WHO, 2014a:11-13; WHO, 2018d:1). The results from the Liberia PRISM assessment indicated that there were improvements in HMIS performance in both production of quality data and use of information for decision-making at national and health facility levels (Republic of Liberia, 2015:7). The findings of this study showed that NCDs statistics analysed by employees at DHMTs (refer to Section 4.8.4.1), and the analysed NCDs statistics were presented using graphs and tables at DHMTs and health facilities (refer to Section 4.8.4.1; Section 4.8.4.2). Similarly, the Liberia PRISM assessment stated that significant improvement was observed at the county health team in performing data analysis with increased skill level on using district health information system (DHIS2) (Republic of Liberia, 2015:7).

The findings of the study also indicated that employees at DHMTs and OPDs did not use analysed NCDs statistics in decision-making, but that healthcare centres did (refer to Section 4.8.4.1; Section 4.8.4.2). The Liberia PRISM assessment similarly indicated that information on NCDs was used at the health facility level to inform decision-making about NCDs (Republic of Liberia, 2015:7). Employees at healthcare centres in Lesotho used analysed NCDs statistics to decide on interventions to be done for patients such as health education, and when ordering medicines for NCDs (refer to Section 4.8.4.2).

Lesotho and Malawi are among the least developed countries in Africa and are also battling NCDs (WHO, 2014a:11-13; WHO, 2018d:1). The Monitoring, Evaluation and Health Information Systems Strategy (MEHIS) in Malawi, in agreement with DHMTs and OPDs in Lesotho not using analysed NCDs statistics in decision-making, stated that a key weakness in the HMIS of Malawi was that data collected were often not used as part of decision-making and planning (Government of the Republic of Malawi, 2018:11). The collected data were not used in decision-making and planning due to a lack of regular information products or other documents that made data readily available, limited systems to make incorporating data into decision-making easy, and a lack of trust in the data available (Government of the Republic of Malawi, 2018:11).

4.8.5 The profile of personnel responsible for non-communicable disease management data

The perception of managers at the MOH about personnel responsible for the implementation of HSIS is assessed in this section.

4.8.5.1 The Ministry of Health

The managers at the MOH responded to question 4.1 about the availability of sufficient personnel to implement an effective HSIS (refer to Annexure A). Two respondents at the MOH perceived that there was sufficient personnel engaged in implementing an effective HSIS in Lesotho's health system but, two respondents also perceived that the personnel employed was insufficient.

The respondents answered question 4.2 (refer to Annexure A) and their perception is presented in Table 4-86. Four respondents at the MOH perceived that the HIS had a network of qualified health information staff in place at the district level. Two respondents thought that health workers in health facilities received regular training in health information through work-related training in the public sector. Three respondents indicated that at the district level, there were designated full-time health information officer positions.

Table 4-86: The perception of respondents at the Ministry of Health on health system information system implementation at different levels of the public health system

Implementation of HIS	Perception of respondents at MOH (N = 6), n			
	No	Yes	Don't know	Missing responses
The HIS has a network of qualified HIS at the district level	0	4	0	2
Regular training in health information which is incorporated into continuing education in the public sector is provided regularly to health workers in health	1	1	2	2
Regular training in health information through work-related training in the public sector is provided to health workers in health facilities	1	2	1	2
There is sufficient capacity in core health information sciences (epidemiology, demography, statistics, information, and information and ICT) at the MOH	2	1	1	2
There is sufficient capacity in statistics (demography, statistics, ICT) at the national statistics office	0	1	2	2
There are designated full-time health information officer positions at the district level	1	3	0	2
<i>MOH = Ministry of Health; ICT = Information and communications technology</i>				

- **Discussion of results on the profile of personnel responsible for data on non-communicable disease management**

In this subsection results on personnel responsible for the implementation of HSIS are discussed.

An effective HMIS is important because it generates information to be used in the planning and when making decisions at the different levels of the health system also, monitors the performance of NCDs programmes. The MEHIS in Malawi indicated that there was understaffing of HIS personnel at national and subnational levels of the health system of Malawi (Government of the Republic of Malawi, 2018:8) to implement an effective HIS. The findings of this study were not conclusive as to whether there was sufficient personnel to implement an effective HSIS at different levels of the public health system of Lesotho (refer to Section 4.8.5.1).

The following had been implemented regarding HSIS in the public health system of Lesotho. Firstly, HIS in Lesotho had a network of qualified health information staff at the district level (refer to Section 4.8.5.1, Table 4-86). Secondly, health workers in health facilities received regular training in health information through work-related training in the public sector (refer to Section 4.8.5.1, Table 4-86). Lastly, at the district level, there were designated full-time health information officer positions (refer to Section 4.8.5.1, Table 4-86). In support of the findings of this study where health workers in health facilities in Lesotho received training in health information, Kumar *et al.* (2012:11) investigated the role of HMIS in disease reporting in district Jamshoro, Sindh (Pakistan) and found that most health facilities had trained personnel in HMIS reporting, resulting in the submission of correct, complete and accurate information. In contrast, the MEHIS in Malawi stated that the newly appointed HMIS staff at the district level (including clerks) lacked basic training, supervision, and mentorship on data management, despite various training efforts (Government of the Republic of Malawi, 2018:8).

4.8.6 The use of data on non-communicable diseases from health facilities countrywide to inform decision-making at the national level

The perception of managers at the MOH about data on NCDs and its use in decision-making at the national level is presented.

4.8.6.1 The Ministry of Health

The managers at the MOH answered question 4.6 on whether core set indicators and data requirements for NCDs were defined (refer to Annexure A). Two respondents perceived that

core indicators and data requirements for NCDs were not defined but, one respondent was of the opinion that they were defined.

The perception of respondents on NCDs statistics in place, presented in Table 4-87, was a response of respondents at the MOH to question 4.7 (refer to Annexure A). Two out of three respondents at the MOH perceived that the NCDs statistics in place included the existence of national indicators with targets and annual reporting to advise yearly health sector reviews and other planning cycles and the national, district and PHC levels national minimum core indicators for covering all categories of health indicators (refer to Table 4-87).

Table 4-87: The perception of respondents at the Ministry of Health on statistics of non-communicable diseases in place

Statistics of NCDs in place	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Existence of national indicators with targets and annual reporting to advise yearly health sector reviews and other planning cycles	1	2	3
The national level minimum core indicators covering all categories of health indicators	1	2	3
The district level minimum core indicators covering all categories of health indicators	1	2	3
The PHC level minimum core indicators covering all categories of health indicators	1	2	3
<i>MOH = Ministry of Health</i>			

Question 4.8 required managers at the MOH to indicate whether core indicators for NCD management were selected using explicit criteria or not (refer to Annexure A). Two-thirds of the respondents did not answer question 4.8 (refer to Table 4-88). One respondent perceived that the explicit criteria used when selecting core indicators for NCD management were usefulness, scientific soundness, reliability, feasibility and accessibility.

Table 4-88: The perception of respondents at the Ministry of Health on criteria for core indicators selection

Explicit criteria for the selection of core indicators	Perception of respondents at MOH (N = 6), n			
	No	Yes	Don't know	Missing responses
Usefulness	0	1	1	4
Scientific soundness	0	1	1	4

Explicit criteria for the selection of core indicators	Perception of respondents at MOH (N = 6), n			
	No	Yes	Don't know	Missing responses
Reliability	0	1	1	4
Representativeness	0	0	1	4
Feasibility	0	1	1	4
Accessibility	0	1	1	4
<i>MOH = Ministry of Health</i>				

The managers at the MOH responded to question 4.9 where they had to indicate whether core indicators for NCD management were defined in collaboration with key stakeholders or not (refer to Annexure A). Two-thirds of respondents did not respond to question 4.9. One respondent perceived that core indicators for NCD management were defined in collaboration with the MOH and major disease-focused programmes but, another one respondent thought that the national statistics office and professional organisations were not involved.

Responses of managers at the MOH to questions 4.17 and 4.18 about analysis and synthesis of data on NCDs (refer to Annexure A) are presented in Table 4-89. Two out of three respondents at the MOH perceived that the data on NCDs were analysed and synthesised to generate valuable information about the health status and needs of the population, and health system performance (refer to Table 4-89). Two respondents thought that population projections by age and sex for the current year at DHMTs, OPDs and healthcare centres were not available (refer to Table 4-89).

Table 4-89: The perception of respondents at the Ministry of Health on analysis and synthesis of non-communicable diseases data

Analysis and synthesis of data on NCDs to generate valuable information about population health status and needs, and health system performance	Perception of respondents at MOH (N = 6), n			
	Not at all	Sometimes	Almost always	Missing responses
Population health status	1	0	2	3
Population needs	1	0	2	3
Health system performance	1	0	2	3
Availability of population projections by age and sex for the current year at district and PHC levels	No	Yes	Sometimes	Missing responses
DHMTs	2	1	0	3
OPDs	2	1	0	3
Healthcare centres	2	1	0	3

Analysis and synthesis of data on NCDs	Perception of respondents at MOH (N = 6), n
<i>MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments</i>	

Two out of three respondents perceived that the data on population-based surveys were not used to analyse individual needs and experiences of women, men, girls and boys with NCDs (refer to Table 4-90) (refer to Annexure A, question 4.19). One respondent thought that the data from recurrent HIS and facility surveys were used to analyse individual needs and experiences of women, men, girls and boys with NCDs (refer to Table 4-90).

Table 4-90: The perception of respondents at the Ministry of Health on the use of non-communicable diseases data from population-focused surveys, recurrent health information system and facility surveys

Gender	Perception of respondents at MOH (N = 6), n								
	Population-based survey			Routine HIS			Facility surveys		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Women	2	1	3	1	1	4	1	1	4
Men	2	1	3	1	1	4	1	1	4
Girls	2	1	3	1	1	4	1	1	4
Boys	2	1	3	1	1	4	1	1	4

MOH = Ministry of Health; HIS = Health information system

In response to question 4.20 (refer to Annexure A), two out of six respondents at the MOH perceived that there was an appointed and active institutional mechanism responsible for the analysis of health statistics in relation to NCD management (refer to Table 4-91).

Table 4-91: The perception of respondents at the Ministry of Health on institutional mechanism charged with analysis of non-communicable diseases data

Institutional mechanisms	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Health statistics	1	2	3
Synthesis of data from different sources	1	1	2
Validation of data from population-based sources	1	1	2
Validation of data from facility-based sources	1	1	2

MOH = Ministry of Health

Four respondents at the MOH perceived that information from the HIS on NCDs was not used in decision-making on human resources allocation at a national level (refer to Table 4-92). A further three respondents perceived that information from the HIS on NCDs was not used in decision-making on human resources allocation at the district and PHC levels.

Table 4-92: The perception of respondents at the Ministry of Health on the allocation of resources based on information from the health information system on non-communicable diseases

Levels of the health system	Perception of respondents at MOH (N = 6), n					
	Human resources			Financial resource		
	No	Yes	Missing responses	No	Yes	Missing responses
National level	4	0	2	1	1	4
District level	3	0	3	1	1	4
PHC level	3	0	3	1	1	4

MOH = Ministry of Health

- **Discussion of results on the use of non-communicable information in decision-making**

Results on the use of information of NCDs from health facilities country-wide to inform decision-making at the national level presented in Section 4.8.6 are discussed.

Malawi and Lesotho are African countries with similarities within their health system, also these countries are faced with an increasing prevalence of NCDs (GOL, 2016; Ministry of Health and Population, 2016:1; WHO, 2014a:11-13; WHO, 2018d:1). The findings of the study indicated that respondents at the MOH perceived that there was an appointed and active institutional mechanism responsible for the analysis of health statistics in relation to NCD management (refer to Section 4.8.6.1, Table 4-91). In support of this study finding, there is a designated and functioning institutional mechanism, known as the Health Planning and Statistics Unit (HPSU), charged with analysis of health statistics at the MOH of Lesotho (MOHSW, 2010:95). Also, Malawi has the health information management secretariat or national data bank overseeing data management and provision of information to be used in decision-making (Kasambara *et al.*, 2017:241).

The WHO developed the global action plan (WHO, 2013:61), which included nine targets and 25 indicators to assist in monitoring global and national progress in the prevention and control of NCDs. Likewise, the MOH in the Republic of Kenya utilised these indicators to monitor NCDs in an attempt to decrease the prevalence of NCDs in Kenya (Ministry of Health Republic of Kenya, 2014:23). The study findings indicated that the majority of respondents at the MOH perceived that core set indicators and data requirements for NCDs in the public health system of Lesotho had not been defined (refer to Section 4.8.6.1). Although, the following NCDs statistics were in place: national indicators with targets and annual reporting to advise yearly health sector

reviews and other planning cycles, and the national, district and PHC levels minimum core indicators for covering all categories of health indicators (refer to Section 4.8.6.1, Table 4-87). Similarly, Kasambara *et al.* (2017:244) while assessing the implementation of the HMIS at the district level in southern Malawi found that the HMIS analysed the data to check health indicators and produced reports to enable decision-makers or respondents to plan accordingly. Also, HMIS enabled monitoring and evaluation of the progress of the health systems. Thus, there were health indicators set for the district level (Kasambara *et al.*, 2017:244) though; the data were neither comprehensive nor adequate for effective planning and decision-making due to a limited number of indicators for specific programmes.

The WHO discussion paper (WHO, 2012) indicated that indicator selection should be based on explicit criteria, such as relevance, scientific soundness, technical feasibility, and usability for decision-makers. Similarly, the HMIS in Lesotho used explicit criteria when selecting core indicators for NCD management which included usefulness, scientific soundness, reliability, feasibility and accessibility (refer to Section 4.8.6.1, Table 4-88). Core indicators for NCD management were defined in collaboration with MOH and major disease-focused programmes (refer to Section 4.8.6.1). Also, the MOH of the Revolutionary Government of Zanzibar selected the HIS core indicators using clear criteria that involved usefulness, scientific soundness, reliability, representativeness, feasibility and accessibility (Revolutionary Government of Zanzibar, 2012:27).

The findings of the study furthermore indicated that the public health system in Lesotho analysed and synthesised NCD data to generate valuable information about population health status and needs, and health system performance (refer to Section 4.8.6.1, Table 4-89). The escalation of NCDs is a global problem affecting all countries, including African and European countries. In comparison to Lesotho, the data from the national health monitoring system in Finland, including data collected through population-based health surveys and national health registers, were used to study past trends and the current situation of NCDs prevention and control (WHO/Europe, 2015:20).

The findings of the study indicated that the data from population-based surveys were not used to analyse individual needs and experiences of women, men, girls and boys (refer to Section 4.8.6.1, Table 4-90). Also, information from HIS on NCDs was not used in decision-making on the allocation of human resources at the national, district and PHC level (refer to Section 4.8.6.1, Table 4-92). Comparatively, information from the HMIS in Malawi was not used in decision-making for programme planning, human resource allocation, and drug distribution (Kasambara *et al.*, 2017:244).

The following section entails results on the existence and implementation of a National HMIS policy in governing data for NCDs.

4.8.7 The availability and application of a National Health Management and Information System policy in governing data for non-communicable diseases

This section present and discuss the viewpoint of managers at the MOH on availability of a national HMIS policy.

4.8.7.1 The Ministry of Health

The managers at the MOH responded to questions 4.24 and 4.24.1 (refer to Annexure A), and three out of six respondents responded to question 4.24. Two out of three respondents perceived that a national HMIS policy existed. One respondent perceived that NCD management was included in the policy, whereas another respondent thought that NCD management was not included.

- **Discussion of results on availability of a national Health Management and Information System policy**

The National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of Non-Communicable Diseases (2014-2020) of Lesotho stated that key performance indicators for NCDs will be included in HIS as well as community-based reporting on primary prevention interventions (MOH, 2014:42). Thus, the findings of the study indicated that the national HMIS policy existed (refer to Section 4.8.7.1). In support of the study results, Kenya as an African country also battling with an escalating prevalence of NCDs has the Health Information System Policy (2014-2030) which gives guidance on the collection and dissemination of accurate and timely information on the incidence and prevalence of diseases, assessment of healthcare and public health needs and evaluation of programs, services, institutions and providers (Republic of Kenya, 2014b:2). The Department of Health in the Republic of South Africa has the District Health Management Information System (DHMIS) policy (2011) (Republic of South Africa, 2011:7). However, the policy does not specifically mention NCDs. The policy concentrates on generating good quality data to monitor the progress of increasing life expectancy, decreasing maternal and child mortality rates, combating HIV and AIDS, and tuberculosis, and strengthening health systems effectiveness (Republic of South Africa, 2011:7).

The subsequent section present and discuss results on structures that lead and manage the HSIS in the management of NCDs.

4.8.8 Structures in place to lead and manage the health system information system in the management of non-communicable diseases

This section entails the thoughts of managers at the MOH about the availability of structures that lead and manage HSIS in the management of NCDs.

4.8.8.1 The Ministry of Health

This section focus on the perception of managers at the MOH on HIS capacity-building, structures that lead and manage HSIS, equipment used for NCDs data, and information and communication technology (ICT) at national, district and PHC levels.

Table 4-93 displays the perception of respondents at the MOH, in response to question 4.3 (refer to Annexure A), on capacity-building activities on HIS that occurred over the past year before the date of data collection of this study for HIS staff at the national and district levels. Two respondents at the MOH perceived that epidemiology training for HIS staff at the national and district levels did not take place (refer to Table 4-93). The results on capacity-building activities such as statistical training, software maintenance and database maintenance showed that one respondent perceived that these activities took place.

Table 4-93: The perception of respondents at the Ministry of Health on health information system capacity-building activities at national and district levels

HIS capacity-building activities at national and district levels	Perception of respondents at MOH (N = 6), n					
	National level			District level		
	No	Yes	Missing responses	No	Yes	Missing responses
Statistics training	1	1	4	1	1	4
Software maintenance	1	1	4	1	1	4
Database maintenance	1	1	4	1	1	4
Epidemiology training	2	0	4	2	0	4
<i>MOH = Ministry of Health</i>						

Question 4.4 required managers at the MOH to indicate which capacity-building activities on HIS occurred over the past year for staff at health facilities (refer to Annexure A). More than two-thirds of managers did not respond to question 4.4. One respondent perceived that data collection, analysis and presentations took place at OPDs, and one respondent was of the view that they sometimes took place. Also, one respondent at the MOH thought that data collection, analysis and presentations took place at healthcare centres.

The managers at the MOH had to indicate which structures were in place to lead and manage HSIS in NCD management when responding to questions 4.5 and 4.5.1 (refer to Annexure A). Two out of three respondents at the MOH perceived that structures that lead and managed HSIS in NCD management were in place (refer to Table 4-94). Also, the respondents perceived that these structures were as follows (refer to Table 4-94). Three respondents perceived that there were functional national HIS managerial units for designing, developing and supporting health information collection, management, analysis, dissemination, and use for planning and management. Three respondents also thought that there were meetings and a multi-year plan to harmonise the timing, measured key variables, and funding of nationally representative population-focused surveys that measured health indicators.

Table 4-94: The perception of respondents at the Ministry of Health on structures to lead and manage health system information system

Structures that lead and manage HSIS	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Are there structures that lead and manage HSIS in NCD management in place?	1	2	3
Examples of structures to lead and manage HSIS			
There is a representative and active national committee responsible for HIS coordination.	0	1	5
Coordination mechanisms (e.g. a task force on health statistics) have been established by the national statistics office and the MOH.	0	2	4
There are operational national HIS administrative units that design the collection, management, analysis, dissemination, and use of health information for planning.	0	3	3
There are operational national HIS administrative units that develop collection, management, analysis, dissemination, and use of health information for management.	0	3	3
There are operational national HIS administrative units that support collection, management, analysis, dissemination, and use of health information for planning.	0	3	3
There are operational national HIS administrative units that support collection, management, analysis, dissemination, and use of health information for management.	0	3	3
There are meetings to harmonise the timing, measured key variables, and funding of nationally representative population-focused surveys that measure health indicators.	0	3	3
There is a multiyear plan to harmonise the timing, measured key variables, and funding of nationally representative population-focused surveys that measure health indicators.	0	3	3
The health and statistical constituencies in Lesotho work together on design and implementation of survey including data analysis and use.	0	2	4
<i>MOH = Ministry of Health</i>			

The perception of managers at the MOH on whether data on NCDs from different information sub-systems was managed in a coordinated and integrated manner at the national level (refer to Annexure A, questions 4.10 and 4.11) is presented in Table 4-95. Two respondents at the MOH perceived that there were strategies in place for the management of information on NCDs in a coordinated and integrated manner at the national level (refer to Table 4-95).

Two respondents at the MOH perceived that strategies in place included the availability of unique identifier codes for administrative geographical units (e.g. DHMTs, OPDs, healthcare centres) to assist with merging of multiple databases from different sources used to manage information in a coordinated and integrated fashion.

Table 4-95: The perception of respondents at the Ministry of Health on the management of non-communicable diseases data at the national level

How data on NCDs is managed at the national level	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Existence of coordinated and integrated management of data on NCDs at the national level from across different information sub-systems	0	2	4
Strategies in place for the management of information in a coordinated and integrated fashion at the national level			
Are there typical formats and codes used in information sub-systems (to assist with data exchange and aggregation)?	0	1	5
Is there a documented set of procedures for data management?	0	1	5
Are unique identifier codes available for administrative geographical units (e.g. DHMT, outpatient departments in district hospitals, healthcare centres) to assist with merging of multiple databases from different sources?	0	2	4
There is a data warehouse equivalent to the national one at the district level.	0	1	5
A data warehouse at the district level has a reporting function that is accessible to various users.	0	1	5
<i>MOH = Ministry of Health</i>			

Two out of three respondents at the MOH also perceived that working equipment for collection, management and transmission of NCDs data was available (refer to Annexure A, question 4.12)

Responses of respondents to question 4.14 on the availability of computers to permit rapid compilation of district data on NCDs at different levels of the health system of Lesotho are portrayed in Figure 4-21. Four respondents perceived that the Pharmaceutical Directorate and

DHMTs had computers to compile NCD data (refer to Figure 4-21). Two respondents thought that the NCD unit and healthcare centres had computers.

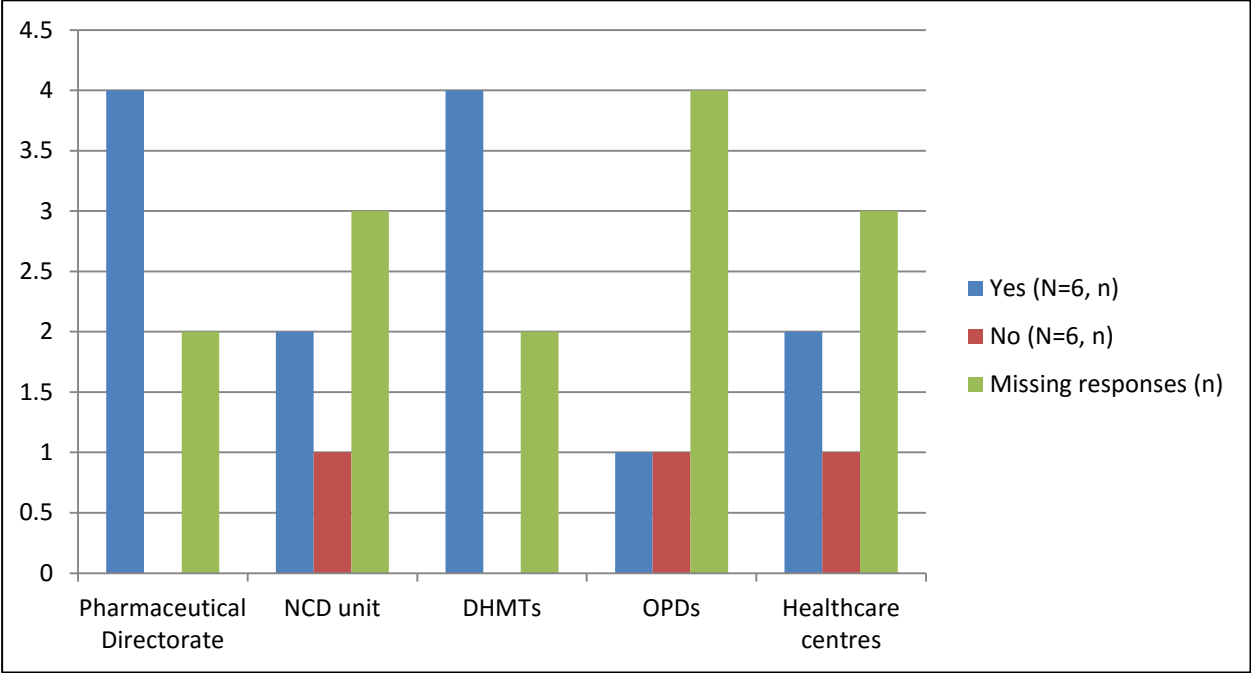


Figure 4-21: The perception of respondents at the Ministry of Health on the availability of computers to compile non-communicable diseases data

The managers at the MOH also answered question 4.15 about basic information and communications technology (ICT) infrastructure in place at different levels of the health system (refer to Annexure A). Three respondents at the MOH noted that the basic ICT infrastructure in place at the MOH included telephones whereas four respondents thought that it included internet access and electronic mail (refer to Table 4-96). Four respondents perceived that DHMTs had telephones, internet access, and electronic mail (refer to Table 4-96). Three respondents were of the opinion that OPDs had telephones and electronic mail, and four respondents thought that OPDs had internet access (refer to Table 4-96). Two respondents perceived that healthcare centres had telephones and internet access (refer to Table 4-96).

Table 4-96: The perception of respondents at the Ministry of Health on information and communication technology infrastructure in place at different levels of the public health system

ICT infrastructure at national, district and PHC levels	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
MOH			
Telephones	1	3	2
Internet access	0	4	2
Electronic mail	0	4	2
DHMTs			
Telephones	0	4	2
Internet access	0	4	2
Electronic mail	0	4	2
OPDs			
Telephones	1	3	2
Internet access	0	4	2
Electronic mail	0	3	3
Healthcare centres			
Telephones	1	2	3
Internet access	0	2	4
Electronic mail	0	1	5
<i>MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments</i>			

When responding to question 4.16 (refer to Annexure A), three respondents at the MOH thought that ICT equipment support was available at national level, and four respondents also perceived that this support was available district level. Although one respondent perceived that support for ICT equipment was available at PHC level, one respondent perceived that there was none.

In their response to question 4.22 (refer to Annexure A), the respondents at the MOH perceived that there were no HSIS information dissemination systems in place (refer to Table 4-97).

Table 4-97: The perception of respondents at the Ministry of Health on the availability of a system for health information system dissemination

System for HIS dissemination	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
A website for country health statistics assisting with providing the latest reports and data on NCDs to the general public	1	0	5
Graphs are commonly used to present information on NCDs at health administrative offices	2	0	4
Graphs are commonly used to present information on NCDs at health facilities	2	0	4
<i>MOH = Ministry of Health</i>			

- **Discussion of results on structures that lead and manage health system information system**

This section discusses results generated from the specific objective that assessed structures in place that lead and manage HSIS in NCD management presented in Section 4.8.8.

Countries battling an increasing burden of NCDs also include Liberia and Malawi and Lesotho (WHO, 2014a:11-13; WHO, 2018d:1). The Ministry of Health and Social Welfare (MOHSW) in Liberia provided training for community health team (CHT) staff on data analysis, using indicators, developing monitoring and evaluation plans, problem identification and problem-solving (Republic of Liberia, 2014:38). These training sessions improved staff ability for problem identification, problem-solving and use of information at the CHTs (Republic of Liberia, 2014:38). Similarly, at PHC level in Lesotho, capacity-building activities on HIS that took place in the past year included data collection, analysis and presentation of NCDs data (refer to Section 4.8.8.1).

The findings of the study also indicated that there were structures in place that lead and managed HSIS in NCD management (refer to Section 4.8.8.1, Table 4-94). These structures were as follows. Firstly, there were operational national HIS administrative units that design, develop and support the collection, management, analysis, dissemination, and use of health information for planning and management (refer to Section 4.8.8.1, Table 4-94). In support of this study findings, the Central Monitoring and Evaluation Division (CMED) within the Ministry of Health and Population in Malawi is the unit responsible for monitoring and evaluation and is responsible for setting guidelines and indicators, collating and analysing data, monitoring implementation and progress, and disseminating findings (Government of the Republic of

Malawi, 2018). Secondly, there were meetings and a multi-year plan to harmonise the timing, measured key variables, and funding of nationally representative population-focused surveys that measure health indicators (Section 4.8.8.1, Table 4-94). Thirdly, the national statistics office and the MOH had established coordination mechanisms. Lastly, the health and statistical constituencies in Lesotho worked together on the design and implementation of the survey including data analysis and use (Section 4.8.8.1, Table 4-94).

The public health system of Lesotho had strategies in place for the management of information in a coordinated and integrated fashion at the national level (Section 4.8.8.1, Table 4-95). There was coordinated and integrated management of data on NCDs at the national level from across different information sub-systems (Section 4.8.8.1, Table 4-95). Also, there were different codes available for administrative geographical units (such as DHMTs, OPDs, healthcare centres) to assist with merging multiple databases from different sources used to manage information in a coordinated and integrated fashion (Section 4.8.8.1, Table 4-95). In contrast, the HIS in Malawi lacked interoperability and/or data exchange between the multiple electronic sub-systems and the national central repository for aggregate data including a lack of core components of an interoperability layer necessary for data to be accurately linked and analysed across systems (Government of the Republic of Malawi, 2018:10). Thus, the data collected were often not used as part of decision-making and planning, because of a lack of regular information products or other documents that made data readily available, and limited systems to make incorporating data into decision-making easy (Government of the Republic of Malawi, 2018:11). The MOHSW in Liberia also adapted the district health information system (DHIS2) application for integrated data capture (Republic of Liberia, 2014:26). However, there was a lack of integrated data repository that interlinked the various data sources, such as HMIS, logistics management system (LMIS), and integrated human resource information system (iHRIS), and finance (Republic of Liberia, 2014:26). However, the health workers and managers felt that the HMIS gave them a good understanding of the health system's performance and that DHIS2 was a good platform for integration of information (Republic of Liberia, 2014:40).

According to the Lesotho Ministry of Communications, Science and Technology (2005:26), the physical infrastructure in Lesotho is underdeveloped and limited in coverage thus; there is a need for modern and efficient infrastructure, such as communications networks, roads and utilities for the country to benefit from ICT. The lack of physical infrastructure makes it impossible to deliver telecommunications, broadcasting, computing and information services such as the internet, mobile cellular communications, digital television and radio, interactive multi-media, telemedicine and distance learning (Ministry of Communications, Science and Technology, 2005:26). Thus, the managers at the MOH noted that ICT infrastructure in place at

MOH, DHMTs, OPDs and healthcare centres included telephone, internet access and electronic mail even though, healthcare centres partially had internet access and electronic mail (Section 4.8.8.1, Table 4-96). Also, ICT equipment support was available at national and district levels compared to PHC level where support for ICT equipment was a challenge (Section 4.8.8.1). Healthcare centres in the public health system of Lesotho are found in very remote areas where infrastructure to support ICT is very limited thus, explaining why healthcare centres partially had internet and electronic mail as well as a lack of support for ICT equipment. The respondents also perceived that there was working equipment for collecting, managing and transmitting NCDs data and, computers were available at the national, district and PHC levels to compile NCDs data (Section 4.8.8.1, Figure 4-21).

There were no HSIS information dissemination systems, such as a website for country statistics, in place at the national level in Lesotho (Section 4.8.8.1, Table 4-97) thus, the latest reports and data on NCDs are unavailable to the public. The Revolutionary Government of Zanzibar (2012:8), in contrast, had enhanced the MOH website for increased information sharing and dissemination thus, information on health statistics was readily available to the population. This implies that Lesotho has to design and implement HSIS information dissemination systems, such as a website for country statistics, to enhance knowledge about the status of NCDs in Lesotho.

The next section presents and discusses the results for healthcare financing specific objectives.

4.9 Healthcare financing

The results and discussions about healthcare financing are sectioned based on the specific objective, i.e. to describe healthcare financing at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs;
- Payment for some of the services provided at the health facilities by outpatients with NCDs, and
- Resources allocation procedures at the national level for NCD management.

4.9.1 The process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of non-communicable diseases

This section focuses on the perception of managers at the DHMTs, OPDs and the healthcare centres about planning and budgeting processes for NCD management. This section is further subdivided into the district and the PHC levels.

Figure 4-22 shows an organogram of the process of budget allocation at different levels of the public health system of Lesotho (MOHSW, 2010:31). This organogram presents how finances for healthcare flow from the source (Ministry of Finance and Development Planning (MOFDP)) to health providers in the public health system of Lesotho.

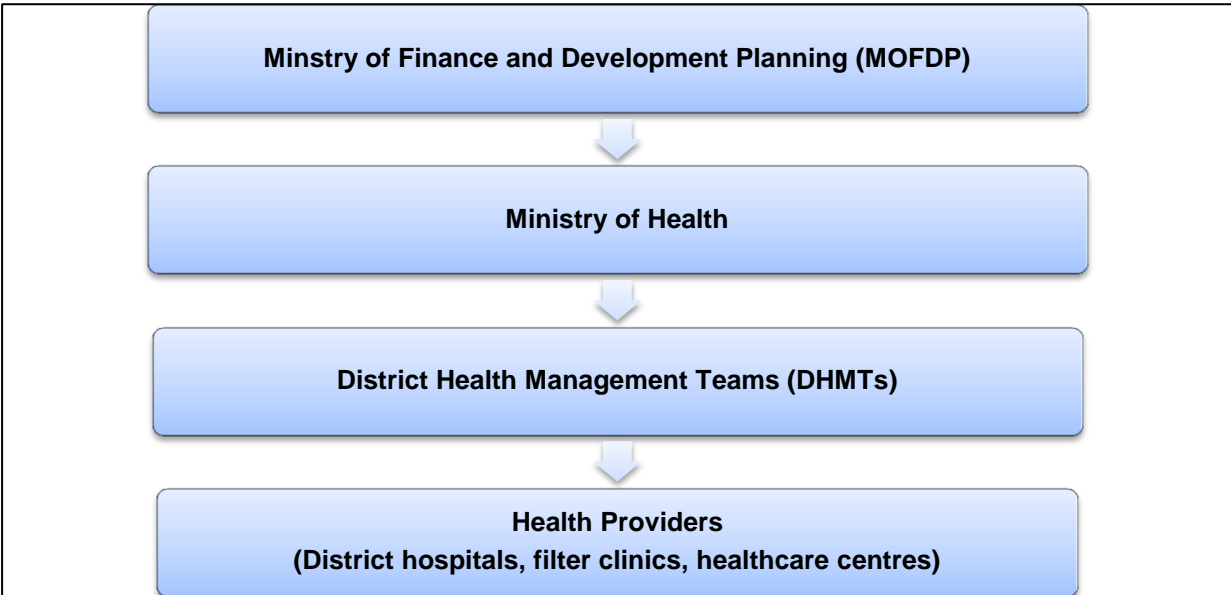


Figure 4-22: Process of budget allocation at different levels of the public health system of Lesotho

4.9.1.1 The district level

Five respondents out of six respondents at DHMTs perceived that the DHMTs had a budget, however, one respondent was of the opinion that DHMTs did not have one (refer to Annexure B, question 5.1).

With regard to the level of authority the DHMTs had in the use of its budget (refer to Annexure B, question 5.2), three respondents at DHMTs thought that DHMTs had full authority to purchase drugs and equipment for healthcare centres and two respondents perceived that DHMTs had the authority to purchase drugs for OPDs (refer to Table 4-98).

Concerning the authority to purchase equipment for OPDs and to repair and maintain equipment at OPDs and healthcare centres, two respondents thought that DHMTs had full authority (refer to Table 4-98). Also, four respondents thought that DHMTs did not have authority to pay staff salaries and to maintain vehicles and motorcycles (refer to Table 4-98).

Table 4-98: The perception of respondents at the District Health Management Teams on the authority of the District Health Management Teams over its budget

Authority of DHMTs over its budget	Perception of respondents at DHMTs (N = 9), n			
	No authority	Partial authority	Full authority	Missing responses
Paying staff salaries	4	1	0	4
Purchasing drugs for healthcare centres	0	2	3	4
Purchasing drugs for OPDs	0	1	2	6
Purchasing equipment used for NCDs diagnosis and management in healthcare centres	0	2	3	4
Purchasing equipment used for NCDs diagnosis and management in OPDs	0	3	2	4
Repairing and maintaining equipment used for NCDs diagnosis and management in healthcare centres	0	3	2	4
Repairing and maintaining equipment used for NCDs diagnosis and management in OPDs	0	3	2	4
Maintaining buildings	1	2	1	5
Maintaining vehicles and motorcycles	4	1	0	4

DHMTs = District Health Management Teams; OPDs = Outpatient departments

Question 5.4 asked DHMTs managers about their involvement in the development of a budget for NCD management at the national level (refer to Annexure B). Five out of nine respondents answered question 5.4. Three respondents at DHMTs perceived that DHMTs were not involved in the development of a budget at the national level but, two respondents thought that DHMTs were sometimes involved.

The respondents at DHMTs, furthermore, responded to question 5.7 where they had to indicate if financing for NCD management flew effortlessly from source to intended end user (refer to Annexure B). Four out of nine respondents responded to this question where, two respondents perceived that finances for NCD management always moved without difficulty from the source (MOFPD) to the intended end-users (health providers), and two respondents thought that finances sometimes were distributed without difficulty from MOFPD to health providers.

Figure 4-23 displays financial monitoring systems used at DHMTs. The respondents at DHMTs responded to question 5.3 and indicate which financial monitoring systems were used by the DHMTs (refer to Annexure B). Three respondents at DHMTs perceived that financial records and accounting procedures were used at DHMTs.

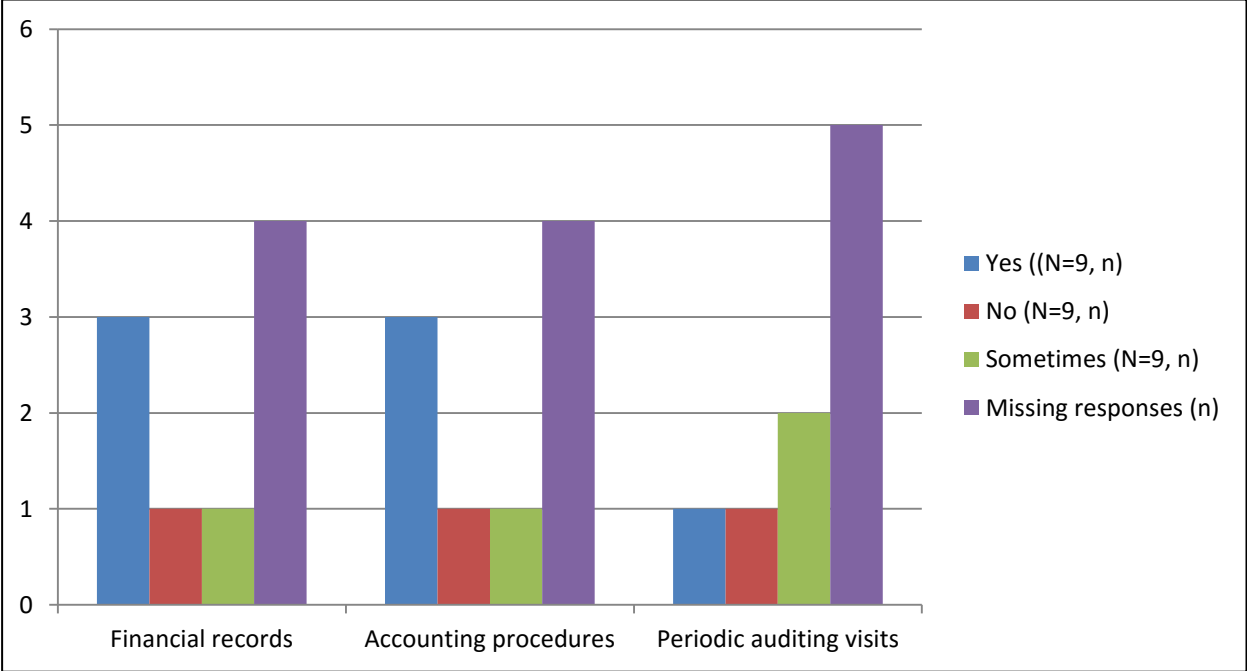


Figure 4-23: The perception of respondents at the District Health Management Teams on financial monitoring systems in use at district health management teams

In response to question 5.5 about planning and budgeting procedures (refer to Annexure B), three respondents at the DHMTs perceived that planning and budgeting procedures were available to strengthen service delivery performance in NCD management but, one respondent was of the opinion that these procedures were not available.

Respondents at DHMTs answered question 5.5.3 on whether planning and budgeting procedures were used by health facilities to strengthen service delivery performance in NCD management. More than two-thirds of respondents did not respond to question 5.5.3. Two respondents at DHMTs perceived that OPDs used planning and budgeting procedures. Two respondents thought that healthcare centres sometimes used planning and budgeting procedures, and one respondent was of the opinion that healthcare centres used these procedures to strengthen service delivery performance in NCD management.

4.9.1.2 The primary healthcare level

This section presents the perception of managers at the OPDs and the healthcare centres about planning and budgeting processes at health facilities.

Respondents at OPDs and healthcare centres answered question 5.1 (refer to Annexure C and Annexure D, respectively). Four respondents at OPDs perceived that OPDs had a budget but, four respondents also thought that OPDs did not have a budget. The majority of respondents (67.4%, n = 58) at healthcare centres perceived that healthcare centres had a budget but, 26.7% (n = 23) of respondents were of the opinion that healthcare centres did not have a budget.

Responses of managers at OPDs to question 5.2 (refer to Annexure C), and of managers at healthcare centres to question 5.2 (refer to Annexure D) about the authority OPDs and healthcare centres had on their budgets are presented in Table 4-99.

Seven respondents at OPDs mainly perceived that OPDs had full authority to purchase drugs (refer to Table 4-99). Three respondents further perceived that OPDs had full authority to purchase and maintain equipment.

Thirty-three (38.4%) respondents at healthcare centres perceived that healthcare centres had full authority to purchase drugs and repair equipment, 39.5% (n = 34) of respondents indicated that they were fully authorised to purchase equipment, while 33.7% (n = 29) thought that they had full authority to maintain equipment (refer to Table 4-99).

Table 4-99: The perception of respondents at health facilities on authority of outpatient departments and healthcare centres over their budget

Authority of health facilities over their budget	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	Full authority	Partial authority	No authority	Missing responses	Full authority	Partial authority	No authority	Missing responses
Paying staff salaries	3	1	6	6	23 (26.7)	9 (10.5)	24 (27.9)	30 (34.9)
Purchasing drugs for NCDs	7	3	1	5	33 (38.4)	11 (12.8)	15 (17.4)	27 (31.4)
Purchasing equipment used for NCDs diagnosis and management	3	5	3	5	34 (39.5)	11 (12.8)	14 (16.3)	27 (31.4)
Repairing equipment used for NCDs diagnosis and management	2	4	5	5	33 (38.4)	9 (10.5)	17 (19.8)	27 (31.4)
Maintaining equipment used for NCDs diagnosis and management	3	5	3	5	29 (33.7)	14 (16.3)	15 (17.4)	28 (32.6)
Maintaining buildings	4	3	4	5	16 (18.6)	17 (19.8)	25 (29.1)	28 (32.6)
Maintaining vehicles and motorcycles	1	2	7	6	16 (18.6)	3 (3.5)	36 (41.9)	31 (36.0)
<i>OPDs = Outpatient departments</i>								

The managers at OPDs responded to question 5.4 (refer to Annexure C) and managers at healthcare centres responded to question 5.4 (refer to Annexure D) about their involvement in the development of the budget. Six respondents at OPDs perceived that OPDs were involved in the development of the budget at the national level, two respondents thought that OPDs were sometimes involved but, two respondents were of the opinion that OPDs were not involved during budget development at the national level. Twenty-eight (32.6%) respondents at healthcare centres perceived that they were involved during budget development of their healthcare centres, 26.7% (n = 23) of respondents thought that they were sometimes involved but, 30.2% (n = 26) of respondents were of the view that they were not involved during budget development of their healthcare centres.

Three respondents at OPDs perceived that they were involved in the development of the budget for OPDs at the national level by "*the district hospital draw a budget then sent it to central level*" (refer to question 5.4.1, Annexure C)

The respondents at healthcare centres responded to question 5.5 (refer to Annexure D). Twelve (14.0%) respondents at healthcare centres perceived that they were involved when the budget for healthcare centres was developed by "*listing the needs of the health facility for a period of a year.*"

Question 5.3 (refer to Annexure C) and question 5.3 (refer to Annexure D) required managers at OPDs and healthcare centres to indicate financial monitoring systems used at OPDs and healthcare centres, respectively. Six respondents thought that accounting procedures were used and four respondents perceived that periodic auditing visits were used to monitor finances at OPDs (refer to Table 4-100).

Fifty-four (62.8%) respondents at healthcare centres were of the opinion that financial records were used to monitor finances at healthcare centres, 50.0% (n = 43) of respondents perceived that accounting procedures were used, and 50.0% (n = 43) thought that periodic auditing visits were used (refer to Table 4-100).

Table 4-100: The perception of respondents at health facilities on financial monitoring systems in use at outpatient departments and healthcare centres

Financial monitoring systems	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Financial records	5	5	0	6	21 (24.4)	54 (62.8)	0	11 (12.8)
Accounting procedures	5	6	0	4	27 (31.4)	43 (50.0)	2 (2.3)	14 (16.3)
Periodic auditing visits	5	4	0	7	22 (25.6)	43 (50.0)	7 (8.1)	14 (16.3)
<i>OPDs = Outpatient departments</i>								

- **Discussion of results on the process of budget allocation**

The results about the process of budget allocation at different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs presented in Section 4.9.1 are discussed.

The MOHSW (2010:30) in Lesotho uses the medium-term expenditure framework (MTEF) activity-based budgeting and costing systems, broken down by programmes and sub-programmes. The budgeting and costing of salaries, training, drugs, and fuel fall under the sub-programme level (MOHSW, 2010:30). Thus, DHMTs and health facilities have budgets that cater for provision of healthcare services. As a result, the study findings indicated that DHMTs at the district level as well as OPDs and healthcare centres at the PHC level in Lesotho had budgets (refer to Section 4.9.1.1; Section 4.9.1.2). In their budgets, the DHMTs had full authority to purchase drugs for OPDs and healthcare centres and to purchase equipment used for NCDs diagnosis and management in healthcare centres (refer to Section 4.9.1.1, Table 4-98). The majority of respondents at OPDs perceived that OPDs had full authority to purchase drugs for NCDs (refer to Section 4.9.1.2, Table 4-99). In support of the study findings, the Lesotho MOHSW (2010:36) indicated that the district hospitals had been granted various degrees of independence on making decisions on expenditures or inputs such as in the procurement of supplies, gasoline and medicines. Also, healthcare centres received their requested goods and services from district hospitals or DHMTs (MOHSW, 2010:36).

The findings of this study also indicated that the majority of respondents at healthcare centres perceived that healthcare centres had full authority to purchase drugs and equipment, and to repair and maintain equipment (refer to Section 4.9.1.2, Table 4-99). In contrast, the MOHSW of Lesotho stated that healthcare centres did not have any independence in expenditure or inputs including planning and budgeting, thus, healthcare centres received requested goods and services from district hospitals or DHMTs (MOHSW, 2010:36). Also, the findings of the study indicated that the DHMTs, OPDs and healthcare centres did not have authority to pay staff salaries, and to maintain buildings, vehicles and motorcycles (refer to Section 4.9.1.1, Table 4-98; Section 4.9.1.2, Table 4-99).

The study findings showed that respondents at DHMTs mainly thought that DHMTs was not involved in the development of a budget for NCD management (refer to Section 4.9.1.1). However, the majority of respondents at OPDs perceived that district hospitals were involved in the development of a budget for NCD management at the national level in that, district hospitals drew a budget and sent it to the national level (refer to Section 4.9.1.2).

Similarly, in Kenya, the budgeting and planning process included quarterly budgeting and the annual work planning (AWP) process where, the development of the hospital budget and the AWP were designed to be linked and aligned (Barasa *et al.*, 2017:331). The public hospitals in Kenya developed and submitted AWP's at the beginning of each government fiscal year (July 1) to the MOH for approval, following which, the hospitals developed quarterly budgets that outlined the allocation of available resources to the priorities indicated in the AWP's (Barasa *et al.*, 2017:331). Thus, the public hospitals in Kenya were involved in the development of a health budget at the national level. Similarly, the findings of this study indicated that healthcare centres were involved in the development of their budget for NCD management at the district level through listing the needs of the health facility for a year or meeting at DHMTs for forecasting and budgeting (refer to Section 4.9.1.2).

The findings of the study showed that there were planning and budgeting procedures used to support service delivery performance in NCD management, and OPDs and healthcare centres used both planning and budgeting procedures to improve service delivery performance in NCD management (refer to Section 4.9.1.2). In contrast, Barasa *et al.* (2017:332) and Waithaka *et al.* (2018:e746), while assessing budgeting and planning processes in public hospitals in Kenya, found that there was a lack of alignment of the budgeting process and the annual work planning process. These misalignments between budgets and sector priorities resulted in a downstream manifestation of a lack of coordination and harmonisation of the budgeting and planning processes for the health sector with the MOH (Barasa *et al.*, 2017:335; Waithaka *et al.*, 2018:e746), thus, affecting services delivery in hospitals.

The Global Fund financial management handbook (Global Fund, 2017:62) supports implementers in designing, improving, or strengthening a robust approach to financial management systems. The handbook highlighted that financial transactions should be entered or recorded regularly and that financial records should be complete, accurate, appropriately authorised and in a complete audit trail, including the adherence to effective records management practices to assist with financial monitoring (Global Fund, 2017:62). Similarly, the finding of the study also indicated that financial monitoring systems used by DHMTs, OPDs and healthcare centres included financial records and accounting procedures, healthcare centres also used periodic auditing visits (refer to Section 4.9.1.1, Figure 4-23; Section 4.9.1.2, Table 4-100).

Section 4.9.2 presents and discusses results involving payment for some of the services provided at health facilities by patients with NCDs.

4.9.2 Payment for some of the services provided at health facilities by outpatients with non-communicable diseases

The perception of managers at OPDs and healthcare centres about payment for some NCDs services at the PHC level is presented in this section.

4.9.2.1 The primary healthcare level

The managers at OPDs responded to questions 5.5 and 5.6 about fees charged to patients for some NCD services and medicines for NCDs (refer to Annexure C). Thirteen respondents at OPDs perceived that there were fees charged for some of the NCD services provided at OPDs. Also, ten respondents were of the opinion that patients with NCDs were not charged for medicines for NCDs provided at OPDs but, two respondents thought that patients with NCDs were charged for medicines for NCDs.

In response to question 5.5.1 (refer to Annexure C), eight respondents at OPDs perceived that patients with NCDs were charged a “*consultation fee*” at OPDs. Furthermore, 13 respondents at OPDs perceived that patients with NCDs used direct payment to pay for NCD services, and six respondents were of the opinion that patients used health insurance.

The majority of respondents (89.5%, n = 77) at healthcare centres mainly indicated that fees were not charged for some of the NCD services at healthcare centres, but 4.7% (n = 4) of respondents thought that fees were being charged for some NCD services (refer to Annexure D, question 5.6). Most respondents at healthcare centres (89.5%, n = 77) also were of the opinion that patients with NCDs were not charged for their medicines for NCDs (refer to Annexure D, question 5.7).

- **Discussion of results on payment of services provided at health facilities**

As presented in Section 4.9.2, results on payment for some of the services provided at health facilities by outpatients with NCDs are discussed.

Universal health coverage is important when trying to decrease the burden of NCDs in middle-income and low-income countries (LMICs) which are already experiencing challenges in their health systems (WHO, 2014a:11-13). Lesotho, India and Sri Lanka are LMICs while, Cambodia is a low-income country whose health systems are challenged by the increasing prevalence of NCDs (WHO, 2014a:12-13; WHO, 2018d:1). All hospitals in the health district level in Cambodia charged consultation fees from patients for NCD-related services (Jacobs *et al.*, 2017:9). Similarly, the findings of the study indicated that respondents were of the opinion that

consultation fees were charged to patients with NCDs at OPDs (refer to Section 4.9.2.1). These patients used direct payment methods to pay for these services at OPDs (refer to Section 4.9.2.1). Public healthcare centres in Lesotho did not charge fees for some of the NCD services provided to patients at healthcare centres (refer to Section 4.9.2.1). Similarly, Fernandopulle *et al.* (2019:7) while assessing the availability and out-of-pocket expenditure for drugs for NCDs in Sri Lanka, found that the majority of participants used public hospitals for treatment and follow-up of NCDs within the past five years. Thus, suggesting that patients with NCDs were satisfied with the healthcare services for NCDs provided by the government free of charge (Fernandopulle *et al.*, 2019:7). Therefore, some public health facilities in Lesotho charged fees for services provided to patients with NCDs as opposed to public health facilities in Sri Lanka that provided free services for NCDs to patients.

The findings of this study indicated that healthcare centres and the majority of OPDs in Lesotho did not charge patients with NCDs for their medicines for NCDs but, OPDs charged patients a consultation fee (refer to Section 4.9.2.1). In contrast to the findings of the study, in Tumkur district (India), Elias *et al.* (2018:4) assessed preparedness of delivering NCDs service at PHC and found that the majority of patients obtained their medicines from private facilities as compared to public facilities. The patients would rather pay for their medication at private facilities because of the poor or irregular availability of medicines in public facilities (Elias *et al.*, 2018:5).

4.9.3 Resources allocation procedures at the national level for non-communicable disease management

This section mainly presents the perception of managers at the MOH on the allocation of resources for NCD management at the national level.

4.9.3.1 The Ministry of Health

Figure 4-24 displays the opinion of managers at the MOH on the responsibility for financing NCD management among stakeholders (refer to Annexure A, question 5.1). Three respondents at the MOH perceived that responsibilities for the financing of NCD management were defined and agreed to by the different government levels and different levels of healthcare (refer to Figure 4-24). Four respondents thought that responsibilities for the financing of NCD management were also defined and agreed upon among development partners.

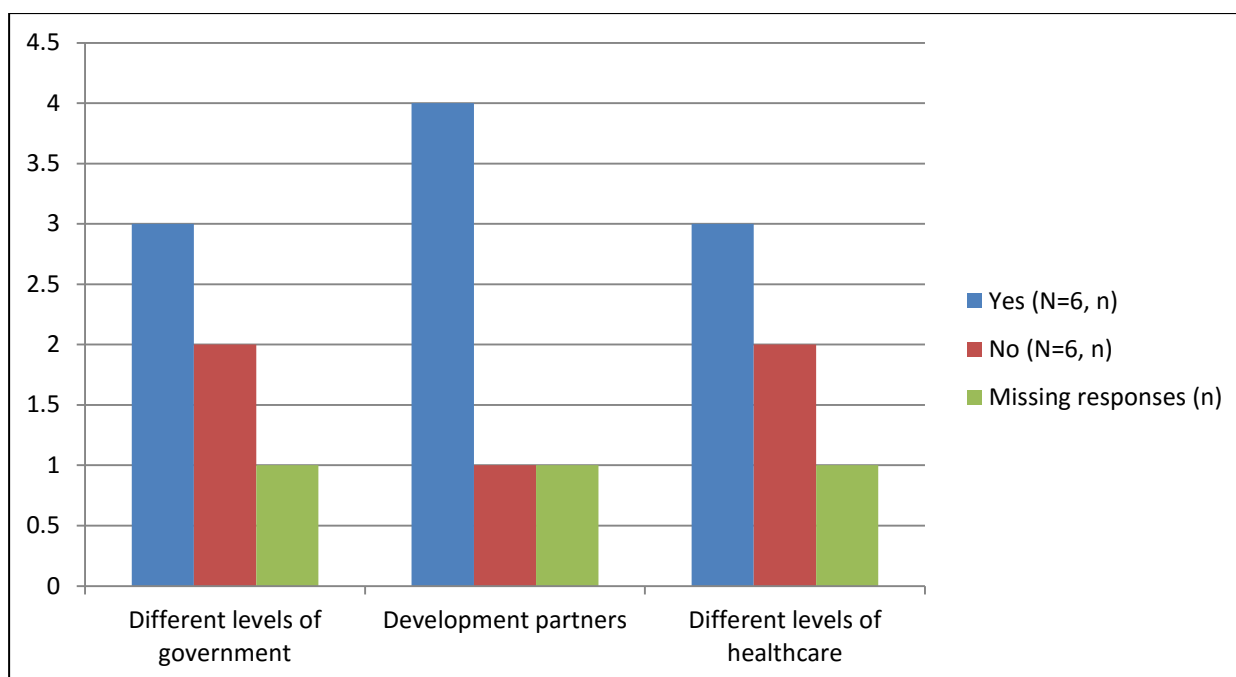


Figure 4-24: The perception of respondents at the Ministry of Health on financing responsibilities for non-communicable disease management

In question 5.2, respondents at the MOH indicated the availability of a joint annual review and planning process, where financial commitments were made, involving all major development partners (refer to Annexure A). Four out of six respondents responded to this question, with all four respondents perceiving that a joint annual review and planning process was in place where financial commitments were made, involving all major development partners.

One respondent at the MOH perceived that funds for NCD management were collected or disbursed in a timely and predictable fashion, whereas one respondent thought that the funds were only sometimes collected or disbursed in a timely and predictable fashion. However, one respondent was of the view that committed funds for NCD management were not collected or disbursed in a timely and predictable fashion (refer to Annexure A, question 5.4).

The respondents at the MOH responded to questions 5.5 and 5.5.1 about the existence of risk-pooling mechanisms in the management of NCDs (refer to Annexure A). Table 4-101 shows the perception of respondents on risk-pooling mechanisms where three of the six respondents at the MOH thought that risk-pooling mechanisms in the management of NCDs were not in place. Five respondents did not respond to question 5.5.1 but, one respondent perceived that there were no risk-pooling mechanisms used in the management of NCDs (refer to Table 4-101).

Table 4-101: The perception of respondents at the Ministry of Health on risk-pooling mechanisms in place in the management of non-communicable diseases

Risk pooling mechanisms	Perception of respondents at MOH (N = 6), n			
	No	Yes	Don't know	Missing responses
Existence of risk-pooling mechanisms, specifically those targeting the vulnerable (i.e. poor and marginalised populations) in the management of NCDs	3	1	0	2
Risk-pooling approaches used in the management of NCDs	Not at all	Sometimes	Almost always	Missing responses
No risk-pooling	0	0	1	5
Unitary risk-pooling	0	0	0	0
Fragmented risk-pooling	0	0	0	0
Integrated risk-pooling	0	0	0	0
<i>MOH = Ministry of Health</i>				

Table 4-102 presents that three respondents perceived that performance indicators mainly used in budgets for planning and implementation of NCD management included linkage of budget to the annual operational plan for the current year (refer to Annexure A, question 5.7).

Table 4-102: The perception of respondents at the Ministry of Health on performance indicators used in budgets for planning and implementation

Performance indicators	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
The budget is connected to the annual operational plan for the current year	0	3	3
The health facilities use planning procedures to strengthen service delivery performance	0	1	5
The health facilities use budgeting procedures to strengthen service delivery performance	0	1	5
The national level prepares budgets using Activity-Based Costing (ABC)	0	1	5
<i>MOH = Ministry of Health</i>			

In response to whether respondents at the MOH thought that planning and budgeting procedures to strengthen service delivery performance in NCD management were available (refer to Annexure A, question 5.8), three respondents agreed compared to one respondent who perceived that these procedures were not in place. Two respondents furthermore perceived that planning and budgeting procedures were used by DHMTs, OPDs and healthcare

centres to strengthen service delivery performance in NCD management (refer to Annexure A, question 5.9) (Table 4-103).

Table 4-103: The perception of the respondents at the Ministry of Health on the use of planning and budgeting procedures by health facilities

Use of planning and budgeting procedures	Perception of respondents at MOH (N = 6), n											
	DHMTs				OPDs				Healthcare centres			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Planning procedures	0	2	1	3	0	2	1	3	0	2	1	3
Budgeting procedures	0	2	1	3	0	2	1	3	0	2	1	3

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments

The information on population health needs on NCD management was used to inform resources allocation decisions as per the viewpoint of two out of the six respondents at the MOH. Also, two out of the six respondents were of the opinion that information on population health needs on NCD management was not used to inform resource allocation decisions (refer to Annexure A, question 5.10).

Question 5.11 required respondents at the MOH to indicate which analysis was used to inform resource allocation decisions for NCDs (refer to Annexure A). Figure 4-25 shows that two respondents perceived that cost-effectiveness analysis was always used to advise resource allocation decisions for NCDs.

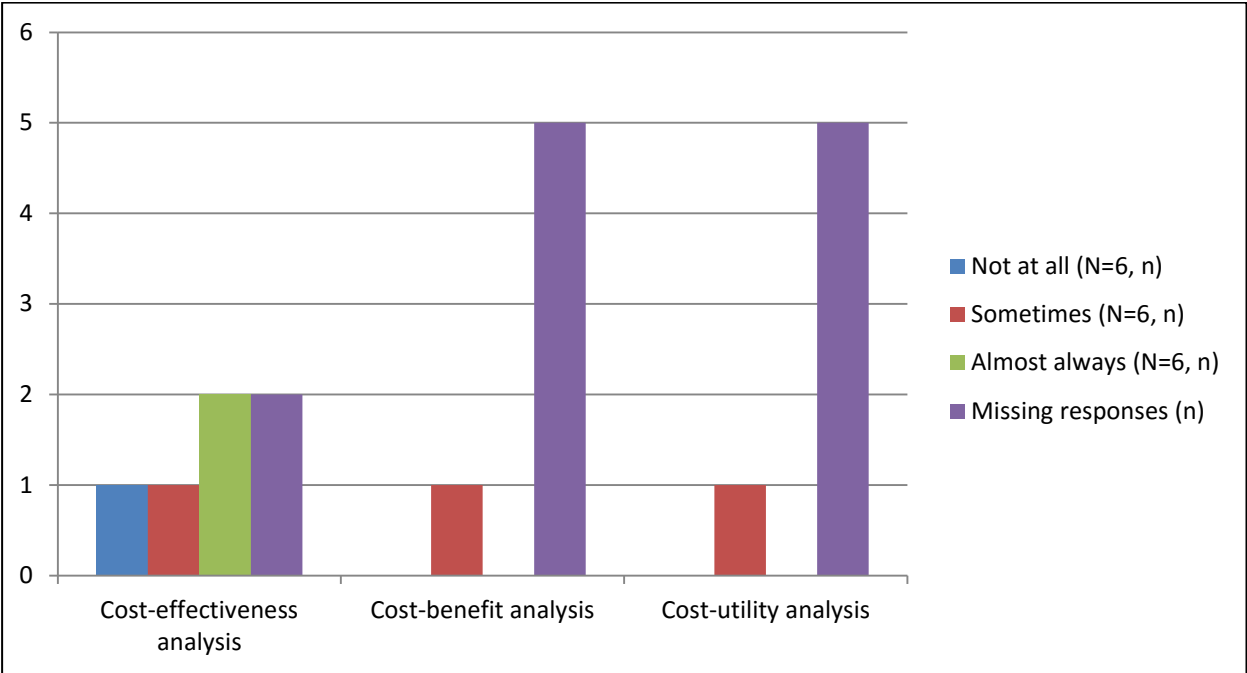


Figure 4-25: The perception of respondents at the Ministry of Health on type of analysis used to inform resource allocation decisions

Table 4.104 present the perception of managers at the MOH on whether the MOH is attaining cost-savings through reformation or innovation in procurements and contracting practices for drugs used in the management of NCDs (refer to Annexure A, question 5.12). Four respondents at the MOH perceived that the MOH achieved cost savings through reformation or innovation in procurement and contracting practices (refer to Table 4-104). Also, the procurement and contracting practices in place were as follows (refer to Table 4-104): three respondents agreed that the MOH followed active purchasing principles, four respondents thought that there were strategies to reduce the price of medicines (such as procuring generics, pooled procurement,

and negotiated price reductions) in place and four respondents believed that there were legislative provisions to permit generic drug substitution in the public sector.

Table 4-104: The perception of respondents at the Ministry of Health on cost-saving through reform or innovation in procurement and contracting practices

Procurement and contracting practices	Perception of respondents at MOH (N = 6), n		
	No	Yes	Missing responses
Achievement of cost-savings through reformation or innovation in procurement and contracting practices			
Procurement practices	1	4	1
Contracting practices	1	4	1
Existence of procurement and contracting practices			
Functioning purchasing principles are followed by the MOH	0	3	3
Existence of plans to reduce the price of medicines (e.g. procuring generics, pooled procurement, negotiated price reductions)	0	4	2
Existence of legislative provisions to permit generic drug substitution in the public sector	0	4	2
<i>MOH = Ministry of Health</i>			

In response to question 5.15 (refer to Annexure A), three respondents pointed out that functional systems for revenue and expenditure tracking in NCD management did not exist, however, one respondent was of the opinion that they did. One respondent furthermore perceived that verification of the accuracy of financial records on NCD management was carried out, whereas one other thought it was only carried out sometimes, or not at all (one respondent) (refer to Annexure A, questions 5.18 and 5.18.1). In response to open question 5.18.1, one respondent was of the opinion that processes used to verify financial records for NCD management for accuracy were “*internal and external audits*”, and “*invoices, waybills, delivery forms and requisition.*”

Concerning the flow of NCD management financing from source to the intended end-user (Annexure A, question 5.14), two respondents perceived the process as easy, compared to two respondents who thought that finances for NCDs only sometimes moved without difficulty from source to end-user. However, one respondent thought that finances were not distributed without difficulty from source to end-user. This distribution of finances for NCDs is aligned to the process of budget allocation at different levels of the public health system of Lesotho (refer to Figure 4-22).

In terms of the availability of sufficient financing to pay for the needed healthcare personnel in the management of NCDs (refer to Annexure A, question 5.19), two respondents perceived that available financing was not sufficient compared to one respondent who perceived otherwise.

- **Discussion of results on resources allocation procedures for non-communicable diseases**

This subsection discusses results on procedures used for resources allocation for NCDs at the national level presented in Section 4.9.3.

The National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of Non-communicable Diseases (2014-2020) for Lesotho was developed by the MOH to ensure that the opportunity for good health and quality of life are available to all Basotho (MOH, 2014). Thus, this strategic plan outlines the roles and responsibilities of the MOH, WHO guidelines for countries, other government sectors, civil society, WHO and the roles of other partners as per their mandate (MOH, 2014) because planning and decision-making on NCD prevention and control involve the MOH and other stakeholders. The findings of this study, in agreement with the strategic plan, indicated that the respondents are of the opinion that responsibilities for financing for NCD management were defined and agreed to by different government levels, development partners, and different levels of healthcare (refer to Section 4.9.3.1, Figure 4-24).

The findings of this study indicated that according to the perceptions of respondents, a joint annual review and planning process was in place, where financial commitments were made, and involving major development partners (refer to Section 4.9.3.1). Thus, funds for NCD management were collected or disbursed in a timely and predictable manner (refer to Section 4.9.3.1). In support of these findings, the annual joint review was introduced as a common monitoring mechanism for the health sector review to ensure that all stakeholders developed a shared understanding of progress in the sector and identified the highest priority issues that needed to be addressed to improve performance (WHO AFRO, 2014:10-11). Thus, the annual joint review indicated that the NCDs among adults in Lesotho to be addressed urgently were cardiovascular diseases and diabetes mellitus (MOH, 2014:18-19; WHO AFRO, 2014:10-11). As a result, the WHO and other partners supported the MOH in undertaking quarterly review sessions with districts, as well as the annual joint review for the health sector which looked into the performance of the health sector including financing in Lesotho from the management, programme and district levels (WHO AFRO, 2014:27). Similarly, Zambia introduced joint annual reviews in the health sector between the MoH and the Cooperating Partners to assess the performance of Zambia's health sector (Ministry of Health Republic of Zambia, 2012:10). The

joint annual reviews of Zambia complement existing routine monitoring and evaluation systems by providing a harmonised and jointly-planned annual assessment process thus, facilitating collaborative sector policy dialogue and review, to optimise information-sharing, transparency and mutual accountability (Ministry of Health Republic of Zambia, 2012:12).

Ahangar *et al.* (2018:60), while assessing risk-sharing mechanisms in healthcare finance in LMICs, stated that aggressive health financing systems (based on greater risk pooling/sharing, such as public resources and prepayments) resulted in decreased financial risk associated with healthcare for households, and the pattern of risk-sharing was equitable and efficient. Thus, health financing reforms with better risk-pooling such as prepayment schemes, community-based financing, and social health insurance, were important for achieving universal health coverage (Ahangar *et al.*, 2018:60). These reforms furthermore reduced the financial barriers to healthcare in LMICs such as those in Africa, resulting in higher utilisation but lower out-of-pocket expenditures (Ahangar *et al.*, 2018:60). The findings of this study indicated that risk-pooling mechanisms, specifically those targeted at the most vulnerable (poor and marginalised populations) in NCD management were not in place in the public health system of Lesotho (refer to Section 4.9.3.1, Table 4-101) thus, affecting the affordability of health services to marginalised populations.

Performance indicators used in budgets for planning and implementation for NCD management in the health system of Lesotho were the linkage of budgets to the annual operational plan for the current year (refer to Section 4.9.3.1, Table 4-102). Similarly, the budgeting and planning process in the health system of Kenya included quarterly budgeting and the annual work planning (AWP) process where the development of the public health facilities budgets and the AWP were designed to be linked and aligned (Barasa *et al.*, 2017:331). The study findings indicated that budgets were used effectively in the planning and implementation of NCD management (refer to Section 4.9.3.1). On the contrary, the budgeting and planning processes in public hospitals in Kenya were not effective because the annual work planning (AWP) and the budgets were not developed at the same time, that is, the budgeting and planning processes were not linked and aligned (Barasa *et al.*, 2017:333). The budget was developed without referring to the AWP (Barasa *et al.*, 2017:333). Thus, activities budgeted for in the quarterly budgets were not similar to activities planned and budgeted for in the AWP (Barasa *et al.*, 2017:333).

This study's findings also indicated that there were planning and budgeting procedures to strengthen service delivery performance in NCD management at the national level in Lesotho (refer to Section 4.9.3.1). The DHMTs, OPDs and healthcare centres used planning and

budgeting procedures to strengthen service delivery performance in NCD management (refer to Section 4.9.3.1, Table 4-103). In contrast, Barasa *et al.* (2017:332) and Waithaka *et al.* (2018:e746), indicated a lack of alignment of the budgeting process and the annual work planning process which had to be aligned, in their assessments of budgeting and planning processes in public hospitals in Kenya. The misalignment caused incoordination and a lack of harmonisation of the budgeting and planning processes for the health sector with the MOH (Barasa *et al.*, 2017:335; Waithaka *et al.*, 2018:e746) thus, affecting services delivery in hospitals.

The findings of this study indicated that some respondents at the MOH perceived that the information on population health needs on NCD management was used to inform resources allocation decisions (refer to Section 4.9.3.1). Overall service planning in healthcare in Syria, a country similarly battling with NCDs, was described as a predominantly top-down approach, rather than based on population need (Garry *et al.*, 2018:2-3). Planning in Syria was not based on population need because there was a lack of population-level data, making it difficult to allocate resources among different healthcare services, especially between care for war trauma and other urgent cases, against treatment for chronic disease (Garry *et al.*, 2018:2-3).

The analysis mostly used to inform resources allocation decisions for NCDs at the national level in the health system of Lesotho was cost-effectiveness analysis (refer to Section 4.9.3.1, Figure 4-25). Similarly, national decision-makers working together with the MOH in Uganda highlighted that cost-effectiveness was indicated as an important consideration in a priority setting, particularly as it relates to decisions around health interventions (Kapiriri & Foster, 2019:4-7). Thus cost-effectiveness was used to distribute resources aligned with health system priorities such as NCDs (Kapiriri & Foster, 2019:4-7). There were procurement and contracting practices in place by which the MOH achieves cost-savings through reformation or innovation in procurement and contracting practices (refer to Section 4.9.3.1, Table 4-104). Similarly, the National Pharmaceutical Services responsible for procuring commodities for public health facilities in the Gambia uses a pooled procurement system for the purchase and supply management of medicines and medical supplies for public health facilities, including government hospitals (Sine *et al.*, 2019:29).

The Lesotho health system assessment of 2010 indicated a strengthening of public finance management systems and technical capacity at all levels to improve the flow of funds between various levels of the system, as one of health financing recommendations (MOHSW, 2010:107). It has been 10 years since the assessment of the health system of Lesotho was conducted. The findings of this study showed that some respondents thought there was an easy flow of NCD

management financing from source to the intended end-user while others thought otherwise (refer to Section 4.9.3.1), suggesting that the health financing recommendation as per the Lesotho health systems assessment of 2010 (MOHSW, 2010:107) has not been implemented to improve the flow of funds to different levels of the public health system of Lesotho. Furthermore, three respondents perceived that available financing to pay for the needed healthcare personnel in the management of NCDs was insufficient (refer to Section 4.9.3.1). Also, one respondent indicated that the financial systems for revenue and expenditure tracking in NCD management did not exist in the health system of Lesotho although, another respondent thought otherwise (refer to Section 4.9.3.1). However, only one respondent thought that verification of the accuracy of financial records on NCD management was done using processes such as internal and external audits as well as the use of invoices, waybills, delivery notes and requisition, and another one respondent thought that it was sometimes done (refer to Section 4.9.3.1).

4.10 Health infrastructure and equipment

The results and discussions are sectioned based on the specific objective, to describe health infrastructure and equipment in the public health facilities in Lesotho in terms of:

- Restoration of health infrastructure and equipment at different levels of healthcare, and
- Availability of necessary non-medical and medical equipment for prevention, diagnosis, treatment and monitoring of NCDs at health facilities.

4.10.1 Restoration of health infrastructure and equipment at different levels of healthcare

In this section, the perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about maintaining and restoring health infrastructure and equipment at different levels of healthcare are presented. This section is subdivided into the MOH, district level and the PHC level.

4.10.1.1 The Ministry of Health

Three respondents at the MOH perceived that a maintenance plan for equipment used in the diagnosis and monitoring of NCDs was not available at DHMTs, OPDs and healthcare centres (refer to Annexure A, question 6.6).

With regard to the availability of transportation at the national, district and the PHC levels (refer to Annexure A, question 6.3); three respondents perceived that there was no transportation at the national level for the evacuation of emergency cases and for providing outreach services

(refer to Table 4-105). Two respondents thought that transportation for providing outreach services at district and PHC levels were available (refer to Table 4-105).

Table 4-105: The perception of respondents at the Ministry of Health on the availability of transportation used in non-communicable disease management at different levels of the public health system

Availability of transportation at the different levels	Perception of respondents at MOH (N = 6), n								
	National level			District level			PHC level		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Evacuation of emergency cases	3	0	3	1	0	5	1	1	4
Providing outreach services	3	0	3	1	2	3	1	2	3

MOH = Ministry of Health

Three respondents at the MOH perceived that resources to maintain transportation at DHMTs were sometimes available. Two respondents thought that there were no resources to maintain transportation at OPDs and healthcare centres but, one respondent was of the opinion that these maintenance resources were sometimes available (refer to Annexure A, question 6.4).

The respondents at the MOH gave their perception about the provision for replacement of equipment used for diagnosis and monitoring of NCDs in the budget at the district and PHC levels, in their response to question 6.5 (refer to Annexure A). Two respondents at the MOH perceived that the budget at DHMTs, OPDs and healthcare centres did not cater for the replacement of equipment used in the diagnosis and management of NCDs but, one respondent was of the opinion that this budget sometimes provided for the replacement of equipment at DHMTs, OPDs and healthcare centres.

4.10.1.2 The district level

When responding to question 6.4 about the existence of a maintenance plan for equipment used in the diagnosis and monitoring of NCDs at the district and PHC levels (refer to Annexure B), five respondents at DHMTs, three at the OPDs and four at the healthcare centres perceived that there was no maintenance plan for equipment at the respective settings. However, one respondent was of the opinion that there was a maintenance plan for equipment used in the diagnosis and monitoring of NCDs at OPDs.

Three respondents at DHMTs further responded to question 6.4.4 (refer to Annexure B), and perceived that in the absence of a maintenance plan, equipment used for diagnosis and monitoring of NCDs at district and PHC levels was “*maintained by Lesotho Millennium Development Agency (LMDA)*”.

Table 4-106 presents the respondents’ perception at DHMTs about the availability of transportation used in NCD management at OPDs and healthcare centres (refer to Annexure B, question 6.1). More than one-third of the respondents did not respond to question 6.1 (refer to Table 4-106). Two respondents perceived that there was no transportation at OPDs for the evacuation of emergency cases (refer to Table 4-106). Table 4-106 also indicates that one respondent perceived that there was transportation for providing outreach services at OPDs.

Three respondents perceived a lack of transport for the evacuation of emergency cases at healthcare centres, but two respondents thought that transportation for evacuating emergency cases at healthcare centres was sometimes available (refer to Table 4-106). Three respondents were of the opinion that there was transport for outreach services at healthcare centres.

Table 4-106: The perception of respondents at the District Health Management Teams on availability of transportation used for non-communicable disease management at primary healthcare level

Availability of transportation used in NCD management	Perception of respondents at DHMTs (N = 9), n							
	OPDs				Healthcare centres			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Evacuation of emergency cases	2	0	1	6	3	0	2	4
Providing outreach services	1	1	1	6	1	3	1	4

DHMTs = District Health Management Teams; OPDs = Outpatient departments

The managers at the DHMTs answered question 6.2 about the availability of adequate resources to maintain their transportation at OPDs and healthcare centres (refer to Annexure B). One respondent perceived that there were resources to maintain transportation at OPDs; one respondent thought that maintenance resources were sometimes available but, one respondent was of the view that there was a lack of resources to maintain transportation at OPDs. Two respondents at DHMTs perceived that maintenance resources for transport at

healthcare centres were sometimes available but, two respondents thought that these resources were not available at healthcare centres.

Question 6.7 asked managers at DHMTs to indicate activities carried out to maintain equipment used in NCD diagnosis and management (refer to Annexure B). More than 50% of the respondents did not respond to this question (refer to Table 4-107). Two respondents at DHMTs perceived that activities such as checking if the equipment is within its service dates and inspection of equipment every month were not carried out at the PHC level (refer to Table 4-107).

Table 4-107: The perception of respondents at the District Health Management Teams on activities carried out to maintain equipment at the primary healthcare level

Activities carried out to maintain equipment	Perception of respondents at DHMTs (N = 9), n			
	Not at all	Sometimes	Almost always	Missing responses
Equipment is within its service dates	2	1	1	5
Inspection of equipment every month	2	1	0	6
Regular calibration of equipment	1	1	1	6
Replacement of equipment every year	2	2	0	5
<i>DHMTs = District Health Management Teams</i>				

4.10.1.3 The primary healthcare level

Managers at OPDs and healthcare centres responded to question 6.1 (refer to Annexure C) and 6.1 (refer to Annexure D) about the availability of adequate transportation at OPDs and healthcare centres, respectively. The perception of respondents at OPDs and healthcare centres are presented in Table 4-108. Six respondents at OPDs perceived that there was transportation for the evacuation of emergencies and eight respondents also indicated availability of transportation for providing outreach services (refer to Table 4-108).

Forty-eight (55.8%) respondents at healthcare centres perceived that transport for evacuating emergency cases was available at healthcare centre while 53 (61.6%) respondents thought that transport for providing outreach services was available (refer to Table 4-108).

Table 4-108: The perception of respondents at health facilities on the availability of transportation used for non-communicable diseases at outpatient departments and healthcare centres

Availability of transportation used for NCD management	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	No	Yes	Sometimes	Missing responses	No	Yes	Sometimes	Missing responses
Evacuation of emergency cases	5	6	1	4	21 (24.4)	48 (55.8)	12 (14.0)	5 (5.8)
Providing outreach services	2	8	2	4	10 (11.6)	53 (61.6)	19 (22.1)	4 (4.7)

OPDs = Outpatient departments

The respondents at OPDs responded to question 6.2 (refer to Annexure C), and five respondents perceived that sometimes resources for maintaining transport at OPDs were adequate. Three respondents were of the view that resources to maintain transport at OPDs were always available but, three respondents perceived that these resources were not available at OPDs.

At healthcare centres, 38 (44.2%) respondents mainly thought that there were no resources to maintain transportation at healthcare centres (refer to Annexure D, question 6.2). However, 24.4% (n = 21) of respondents perceived that resources for maintaining transport at healthcare centres were always available and, 22.1% (n = 19) of respondents pointed out that sometimes these resources were available at healthcare centres.

In response to question 6.6 (refer to Annexes C and D), six respondents at OPDs perceived that checking if the equipment is within its service dates was not performed, another six respondents thought equipment was not inspected monthly, eight respondents indicated that equipment was not regularly calibrated, and seven respondents felt that equipment was not replaced yearly (refer to Table 4-109).

Forty-four (51.2%) respondents at healthcare centres perceived that inspection of equipment was not carried out every month, 47.7% (n = 41) of respondents thought that equipment was not regularly calibrated, and 41.9% (n = 36) indicated that yearly replacement of equipment was not done (refer to Table 4-109). Thirty-one (36.0%) respondents at healthcare centres perceived that equipment was checked whether it was within its service dates at healthcare centres (refer to Table 4-109).

Table 4-109: The perception of respondents at health facilities on activities carried out to maintain equipment at outpatient departments and healthcare centres

Activities carried out to maintain equipment	Perception of respondents at OPDs (N = 16), n				Perception of respondents at healthcare centres (N = 86), n (%)			
	Not at all	Sometimes	Almost always	Missing responses	Not at all	Sometimes	Almost always	Missing responses
Equipment is within its service dates	6	2	1	7	21 (24.4)	24 (27.9)	31 (36.0)	10 (11.6)
Inspection of equipment every month	6	4	0	6	44 (51.2)	23 (26.7)	12 (14.0)	7 (8.1)
Regular calibration of equipment	8	0	2	6	41 (47.7)	22 (25.6)	12 (14.0)	11 (12.8)
Replacement of equipment every year	7	3	0	6	36 (41.9)	35 (40.7)	8 (9.3)	7 (8.1)

OPDs = Outpatient departments

In response to question 6.7 (refer to Annexure C), eight respondents at OPDs perceived that there was a lack of maintenance personnel at OPDs compared to five respondents who were convinced otherwise. The majority of respondents at healthcare centres (66.3%, n = 57), in response to question 6.7 (refer to Annexure D), perceived that there was no maintenance personnel at healthcare centres but, 26.7% (n = 23) of respondents thought that healthcare centres had maintenance personnel.

During the unavailability of maintenance personnel at OPDs, three respondents at OPDs perceived that the OPDs “report immediately via administration office” (refer to Table 4-110). This was in response to question 6.7.1 (refer to Annexure C) where more than three-quarters of respondents did not respond (refer to Table 4-110).

Table 4-110: The perception of respondents at outpatient departments on the maintenance of equipment at outpatient departments during unavailability of maintenance personnel

The maintenance procedure for equipment used in the diagnosis and monitoring of NCDs at OPDs during the absence of a maintenance plan	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
“Discard them”	1	15
“Outsource maintenance personnel or services”	2	14
“Call LMDA”	2	14

The maintenance procedure for equipment used in the diagnosis and monitoring of NCDs at OPDs during the absence of a maintenance plan	Perception of respondents at OPDs (N = 16), n	Missing responses (n)
“Report immediately via administration office”	3	13
“Buy new equipment”	2	14
<i>OPDs = Outpatient departments</i>		

The respondents at healthcare centres responded to question 6.7.1 (refer to Annexure D), and 27.9% (n = 24) of respondents perceived that healthcare centres “*call Lesotho Millennium Development Agency (LMDA)*” and 24.4% (n = 21) of respondents thought that healthcare centres “*report to DHMTs*” in the absence of maintenance personnel at healthcare centres (refer to Table 4-111).

Table 4-111: The perception of respondents at healthcare centres about the maintenance of equipment at healthcare centres during unavailability of maintenance personnel

The maintenance procedure for equipment used in the diagnosis and monitoring of NCDs at healthcare centres during the absence of a maintenance plan	Perception of respondents at healthcare centres (N = 86), n (%)	Missing responses, n (%)
“Call LMDA”	24 (27.9)	62 (72.1)
“Outsource maintenance personnel or services”	2 (2.3)	84 (97.7)
“Report to the district hospital for maintenance personnel to assist”	5 (5.8)	81 (94.2)
“Report to DHMTs”	21 (24.4)	59 (68.6)
“Buy new equipment”	11 (12.8)	75 (87.2)

- **Discussion of results on the restoration of health infrastructure and equipment**

The results presented in Section 4.10.1 about the restoration of health infrastructure and equipment at different levels of healthcare are discussed.

The Lesotho Health Sector Strategic Plan 2012/13-2016/17 indicated that the healthcare centres were maintained by the MOH technicians based in the district hospitals (GOL, 2013:19). The technicians in the Estate Management Unit (EMU) at the MOH were mostly appointed on contracts and this unit was highly understaffed (GOL, 2013:19). Consequently, there was a lack of institutional capacity to manage infrastructure planning, programming, design, procurement and maintenance by the EMU (GOL, 2013:20). The findings of the study showed that respondents of the MOH and DHMTs perceived there was a lack of a maintenance plan for equipment used for diagnosis and monitoring of NCDs at district and PHC levels (refer to Section 4.10.1.1; Section 4.10.1.2). The results of this study indicated that some respondents at

OPDs and healthcare centres thought that maintenance personnel responsible for maintaining and restoring medical devices used in NCD management were not available at OPDs and healthcare centres whereas other respondents were convinced otherwise (refer to Section 4.10.1.3). Therefore, suggesting that some OPDs and healthcare centres had maintenance personnel.

The findings of this study indicated that some respondents at DHMTs, OPDs and healthcare centres perceived that activities carried out on equipment for diagnosis and management of NCDs at district and PHC levels included checking service dates, a monthly inspection of equipment, regular calibration, and yearly replacement of equipment whereas other respondents thought on the contrary (refer to Section 4.10.1.2, Table 4-107; Section 4.10.1.3, Table 4-109). Thus, the study findings suggested that there were irregularities in the restoration and maintenance of equipment at district and PHC levels because other OPDs and healthcare centres carry out equipment maintenance while others experience challenges. In support of the findings of this study, Perry and Malkin (2011:719), when assessing the effectiveness of medical equipment donations to improve health systems, indicated that 38.3% of equipment in developing countries was out of service mainly due to a lack of healthcare workers' training, health technology management and infrastructure. According to the Lesotho Health Sector Strategic Plan 2012/13-2016/17, there was a budget for maintaining and purchasing new equipment, but it could not cover costs and the MOH did not have specialised personnel to maintain specialised equipment (GOL, 2013:20). As a result, if a machine broke, it took a long time to be repaired, affecting healthcare service delivery. Furthermore, Lesotho is a low-income country that depends on donations, including those of equipment. According to Compton *et al.* (2018:2), the sustainability of donated equipment becomes a challenge in low-income countries because of the lack of local biomedical technician training, leading to a shortage of individuals in the health system skilled at using, maintaining, or repairing equipment. Thus, health systems that offer biomedical technician training to build a workforce skilled in medical device maintenance and repair suggest a greater likelihood that equipment will be in service more often and last longer (Compton *et al.*, 2018:2).

The findings of the study showed that respondents had conflicting views where some thought that transport for evacuating emergency cases and for providing outreach services was available at the district and PHC levels while others thought otherwise (refer to Section 4.10.1.2, Table 4-106; Section 4.10.1.3, Table 4-108). This study's findings further indicated that resources for maintaining transport at the PHC level were not always available (refer to Section 4.10.1.2; Section 4.10.1.3). Thus, the findings of this study suggested that the health system of Lesotho, although strengthening is needed, has transportation at district and PHC levels for

conducting NCD prevention activities within the community such as health promotion and public education. Additionally, emergency cases can easily be referred to high levels of care with adequate skills and capacity to treat NCDs emergencies; thus, decreasing mortality due to NCDs.

The subsequent section focuses on results for the availability and management of infrastructure and equipment used for NCDs at the PHC level.

4.10.2 Availability and management of infrastructure and equipment used for non-communicable diseases at health facilities

This section presents and discusses the perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about the availability and management of infrastructure and basic equipment used for diagnosing and managing NCDs at health facilities. This section is divided into the MOH, district and PHC levels. The availability of basic equipment used for diagnosis and management of NCDs at health facilities was assessed using the WHO Package of Essential Non-communicable (PEN) disease interventions for primary healthcare in low-resource settings (WHO, 2010b:35-36). A list of basic equipment is depicted in Table 4-112.

Table 4-112: List of essential technologies and tools for non-communicable diseases

Technologies	Tools
Thermometer	WHO/ISH risk prediction charts
Stethoscope	Evidence-based clinical protocols
Sphygmomanometer*	Flow charts with referral criteria
Measurement tape	Patient clinical record
Weighing scale	Medical information register
Peak flow meter**	Audit tools
Spacers for inhalers	
Glucometer	
Blood glucose test strips	
Urine protein test strips	
Urine ketones test strips	
*For facilities with non-physician health workers a validated sphygmomanometer with digital reading is preferable for accurate measurement of blood pressure	
**Disposable mouthpieces required. Peak flow meters with one-way flow are preferable.	

4.10.2.1 The Ministry of Health

The MOH managers responded to question 6.1 about service delivery sites at district and PHC levels (refer to Annexure A). The majority of respondents at the MOH perceived that service delivery sites at district and PHC levels were well-distributed and well-equipped to provide essential services for NCD management (refer to Table 4-181).

Table 4-113: The perception of respondents at the Ministry of Health on the distribution of service delivery sites at district and primary healthcare levels

District and PHC levels	Perception of respondents at MOH (N = 6), n					
	Well distributed service delivery sites			Well-equipped service delivery sites		
	No	Yes	Missing responses	No	Yes	Missing responses
DHMTs	0	3	3	0	2	4
OPDs	0	3	3	0	2	4
Healthcare centres	1	2	3	0	2	4

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.10.2.2 The district level

Table 4-114 portrays the perception of managers at DHMTs on the availability of a standard list of equipment at OPDs and healthcare centres. This perception was a response to question 6.3 (refer to Annexure B). Less than 50% of respondents responded to question 6.3 (refer to Table 4-114). Three respondents thought that OPDs did not have a standard list for equipment for diagnosis of NCDs (refer to Table 4-114). Three respondents at the DHMTs perceived that OPDs had standard lists for equipment for monitoring blood pressure, glucose level, and for monitoring asthmatic patients.

Three respondents at DHMTs perceived that healthcare centres had a list of equipment for diagnosis of NCDs (refer to Table 4-114). Four respondents indicated that a list of equipment used to monitor blood pressure was available (refer to Table 4-114). Three respondents further perceived that healthcare centres had a list of equipment used for glucose level monitoring. Table 4-114 further indicates that four respondents at DHMTs perceived that healthcare centres did not have equipment for monitoring asthmatic patients, and five respondents thought there was no list of equipment for therapeutic drug level monitoring for epileptic patients.

Table 4-114: The perception of respondents at the District Health Management Teams the on availability of a standard list of equipment at health facilities

Availability of a standard list of equipment at OPDs and health care centres	Perception of respondents at DHMTs (N = 9), n					
	OPDs			Healthcare centres		
	No	Yes	Missing responses	No	Yes	Missing responses
Equipment that should be available for diagnosis of NCDs	3	0	6	1	3	5
Equipment that should be available for monitoring of blood pressure level in hypertensive patients	0	3	6	1	4	4
Equipment that should be available for monitoring of glucose level in diabetic patients	0	3	6	2	3	4
Equipment that should be available for monitoring asthmatic patients	0	3	6	4	1	4
Equipment that should be available for therapeutic drug level monitoring for epileptic patients	1	2	6	5	0	4

DHMTs = District Health Management Teams; OPDs = Outpatient departments

The opinion of managers at DHMTs about available and functional equipment at OPDs and healthcare centres for diagnosis and monitoring of NCDs is presented in Table 4-115. The respondents answered question 6.5 (refer to Annexure B). The majority of respondents at DHMTs perceived that OPDs had equipment for diagnosis and monitoring of NCDs except for peak flow meters and therapeutic drug level monitoring for epileptic patients and that this equipment is functional (refer to Table 4-115).

The respondents at DHMTs mainly were of the opinion that equipment for the diagnosis and monitoring of NCDs was available and functional at healthcare centres, apart from peak flow meters, spacers for inhalers, urine ketones test strips and therapeutic drug level monitoring for epileptic patients (refer to Table 4-115).

The available equipment was in line with the list of basic equipment stated by the WHO PEN (WHO, 2010b:35-36) (refer to Table 4-112) with an exception of spacers for inhalers which were perceived by respondents to be unavailable at healthcare centres.

Table 4-115: The perception of respondents at the District Health Management Teams on available equipment for diagnosis and monitoring of non-communicable diseases at the primary healthcare level

Equipment used for diagnosis and management of NCDs	Perception of respondents at DHMTs (N = 9), n											
	Number of DHMTs that selected the option						Number of DHMTs that selected the option					
	Available			Functional			Available			Functional		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Thermometer	0	3	6	0	3	6	0	5	4	0	5	4
Stethoscope	0	3	6	0	3	6	0	5	4	0	5	4
Sphygmomanometer	0	3	6	0	3	6	0	5	4	0	5	4
Measurement tape	0	3	6	0	3	6	0	5	4	0	5	4
Weighing scale	0	3	6	0	3	6	0	5	4	0	5	4
Peak flow meter	2	1	6	1	1	7	5	0	4	2	0	7
Spacers for inhalers	1	2	6	1	2	6	4	1	4	2	1	6
Glucometer	0	3	6	0	3	6	1	4	4	0	5	4
Blood glucose test strips	0	3	6	0	3	6	3	3	3	0	4	5
Urine protein test strips	0	3	6	0	3	6	2	3	4	1	3	5
Urine ketones test strips	1	2	6	1	2	6	3	2	4	2	1	6
Therapeutic drug level monitoring for epileptic patients	2	1	6	1	1	7	4	0	5	2	0	7

DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.10.2.3 The primary healthcare level

In response to the availability of a standard list of equipment used for the diagnosis and monitoring of NCDs (refer to question 6.3 in Annexure C and D, respectively).

Nine respondents at OPDs perceived that OPDs had a list of equipment for NCDs diagnosis whereas ten respondents thought a list of equipment used to monitor blood pressure and glucose level was available (refer to Table 4-116). Six respondents perceived that there was a list of equipment used to monitor asthmatic patients (refer to Table 4-116). Six respondents at

OPDs thought that a list of equipment for therapeutic drug level monitoring for epileptic patients was not available (refer to Table 4-116).

Fifty-eight (67.2%) respondents at healthcare centres perceived that a standard list of equipment for NCDs diagnosis was available at healthcare centres, 76.7% (n = 66) of respondents thought that a list for equipment used to monitor blood pressure was available, and 75.6% (n = 65) of respondents indicated that a list for equipment used to monitor glucose level was also available (refer to Table 4-116). However, 55.8% (n = 48) of respondents thought that healthcare centres lacked the equipment to monitor asthmatic patients and 66.3% (n = 57) of respondents perceived that healthcare centres did not have a list of equipment for therapeutic drug level monitoring for epileptic patients (refer to Table 4-116).

Table 4-116: The perception of respondents at health facilities on the availability of a standard list of equipment at outpatient departments and healthcare centres

Availability of a standard list of equipment	Perception of respondents at OPDs (N = 16), n			Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses	No	Yes	Missing responses
Equipment that should be available for diagnosis of NCDs	1	9	6	16 (18.6)	58 (67.4)	12 (14.0)
Equipment that should be available for monitoring of blood pressure level in hypertensive patients	1	10	5	11 (12.8)	66 (76.7)	9 (10.5)
Equipment that should be available for monitoring of glucose level in diabetic patients	1	10	5	11 (12.8)	65 (75.6)	10 (11.6)
Equipment that should be available for monitoring asthmatic patients	3	6	7	48 (55.8)	24 (27.9)	14 (16.3)
Equipment that should be available for therapeutic drug level monitoring for epileptic patients	6	4	6	57 (66.3)	16 (18.6)	13 (15.1)

OPDs = Outpatient departments

Question 6.4 requested managers at OPDs to indicate available and functional equipment in the hospital for diagnosis and monitoring of NCDs (refer to Annexure C). Twelve out of 16 respondents perceived that OPDs had thermometers, stethoscopes, sphygmomanometers, weighing scales, glucometers, blood glucose strips, urine protein test strips and urine ketones

test strips (refer to Table 4-117). Eleven respondents thought that measuring tapes were available at OPDs.

Ten respondents perceived that thermometers and weighing scales were functional as opposed to one respondent who thought they were not (refer to Table 4-117). Nine respondents also indicated that stethoscopes, measuring tapes, urine protein test strips and urine ketones test strips were functional (refer to Table 4-117). Eight respondents indicated that sphygmomanometers, glucometers and blood glucose test strips were functional. The available equipment was in line with the WHO PEN list of basic equipment (WHO, 2010b:35-36) (refer to Table 4-112).

Table 4-117: The perception of respondents at outpatient departments on the available equipment for diagnosis and monitoring of non-communicable diseases at outpatient departments

Equipment used for diagnosis and monitoring of NCDs	Perception of respondents at OPDs (N = 16), n					
	Number of OPDs that selected the option			Number of OPDs that selected the option		
	Available			Functional		
	No	Yes	Missing responses	No	Yes	Missing responses
Thermometer	0	12	4	1	10	5
Stethoscope	0	12	4	1	9	6
Sphygmomanometer	0	12	4	1	8	7
Measurement tape	0	11	5	1	9	6
Weighing scale	0	12	4	1	10	5
Peak flow meter	4	4	8	2	4	10
Spacers for inhalers	6	4	6	2	4	10
Glucometer	0	12	4	1	8	7
Blood glucose test strips	0	12	4	1	8	7
Urine protein test strips	0	12	4	1	9	6
Urine ketones test strips	0	12	4	1	9	6
Therapeutic drug level monitoring for epileptic patients	9	2	5	7	1	8
<i>OPDs = Outpatient departments</i>						

Table 4-118 portrays the opinion of managers at healthcare centres about available and functional equipment at healthcare centres used for diagnosis and monitoring of NCDs (refer to Annexure D, question 6.4).

Eighty-one (94.2%) respondents at healthcare centres perceived that thermometers, stethoscopes and sphygmomanometers were available at healthcare centres, and 93.0% (n = 80) of respondents thought that measuring tapes and weighing scales were available (refer to Table 4-118). Seventy-nine (91.9%) respondents indicated that healthcare centres had glucometers. Seventy-four (86.0%) respondents felt that there were blood glucose test strips at healthcare centres. Seventy-one (82.6%) respondents also perceived that healthcare centres had urine protein test strips. Sixty-eight (79.1%) respondents further indicated that urine ketones test strips were available (refer to Table 4-118). Sixty (69.8%) respondents were of the view that healthcare centres did not have peak flow meters. Fifty-nine (68.6%) respondents perceived that there were no spacers for inhalers at healthcare centres. Sixty-seven (77.9%) respondents also believed that therapeutic drug level monitoring for an epileptic patient was not available (refer to Table 4-118).

The available equipment was in line with the WHO PEN list of basic equipment (WHO, 2010b:35-36) (refer to Table 4-112).

Table 4-118: The perception of respondents at healthcare centres on the available equipment for diagnosis and monitoring of non-communicable diseases at healthcare centres

Equipment used for diagnosis and monitoring of NCDs	Perception of respondents at healthcare centres (N = 86), n (%)					
	Number of healthcare centres that selected the option (n)			Number of healthcare centres that selected the option, (n) (%)		
	Available			Functional		
	No	Yes	Missing responses	No	Yes	Missing responses
Thermometer	0	81 (94.2)	5 (5.8)	0	74 (86.0)	12 (14.0)
Stethoscope	0	81 (94.2)	5 (5.8)	0	76 (88.4)	10 (11.6)
Sphygmomanometer	0	81 (94.2)	5 (5.8)	0	70 (81.4)	16 (18.6)
Measurement tape	0	80 (93.0)	6 (7.0)	0	74 (86.0)	12 (14.0)
Weighing scale	0	80 (93.0)	6 (7.0)	0	70 (81.4)	16 (18.6)
Peak flow meter	60 (69.8)	7 (8.1)	19 (22.1)	14 (19.3)	3 (3.5)	69 (80.2)
Spacers for inhalers	59 (68.6)	11 (12.8)	16 (18.6)	12 (14.0)	8 (9.3)	66 (76.7)
Glucometer	2 (2.3)	79 (91.9)	5 (5.8)	3 (3.5)	65 (75.6)	18 (20.9)

Equipment used for diagnosis and monitoring of NCDs	Perception of respondents at healthcare centres (N = 86), n (%)					
	Number of healthcare centres that selected the option (n)			Number of healthcare centres that selected the option, (n) (%)		
	Available			Functional		
	No	Yes	Missing responses	No	Yes	Missing responses
Blood glucose test strips	7 (8.1)	74 (86.0)	5 (5.8)	1 (1.2)	62 (72.1)	23 (26.7)
Urine protein test strips	10 (11.6)	71 (82.6)	5 (5.8)	3 (3.5)	63 (73.3)	20 (23.3)
Urine ketones test strips	12 (14.0)	68 (79.1)	6 (7.0)	2 (2.3)	61 (70.9)	23 (26.7)
Therapeutic drug level monitoring for epileptic patients	67 (77.9)	8 (9.3)	11 (12.8)	10 (11.6)	6 (7.0)	70 (81.4)

- **Discussion of results on infrastructure and equipment for non-communicable disease management**

This subsection discusses results presented in Section 4.10.2 on the availability and management of infrastructure and equipment used in NCD management.

The WHO (2010b:35) recommended cost-effective basic equipment to be used in low-resource settings to diagnose and monitor NCDs based on population needs. This equipment includes a few core medical devices such as weighing scales, sphygmomanometers, peak flow meters and equipment for urine albumin and blood glucose analysis (refer to Table 4-180). Availability of this equipment will enable most patients with major NCDs to be treated close to their health facilities and enhance the utilisation of primary care services (WHO, 2010b:35). Lesotho is a low-resource-setting country that has used the WHO PEN to acquire equipment for its health facilities. Thus, the availability of equipment was reflected by the study findings where OPDs and healthcare centres in Lesotho had a standard list of equipment for NCDs diagnosis and monitoring (refer to Section 4.10.2.2, Table 4-114; Section 4.10.2.3, Table 4-116). However, some health facilities did not have a standard list of equipment for monitoring asthmatic patients, and for therapeutic drug level monitoring for epileptic patients while others did (refer to Section 4.10.2.2, Table 4-114; Section 4.10.2.3, Table 4-116).

The findings of this study showed that available and functional equipment for diagnosis and monitoring of NCDs at health facilities included thermometers, stethoscopes, sphygmomanometers, measurement tape, weighing scales, glucometers, blood glucose strips, urine protein test strips and urine ketone test strips (refer to Section 4.10.2.2, Table 4-115;

Section 4.10.2.3, Table 4-117, Table 4-118). However, some respondents perceived that equipment such as peak flow meters, spacers for inhalers, and therapeutic drug level monitoring for epileptic patients was not available at OPDs and healthcare centres whereas other respondents thought this equipment was available (refer to Section 4.10.2.2, Table 4-115; Section 4.10.2.3, Table 4-117, Table 4-118). The perceived unavailability of this equipment in some of Lesotho's health facilities created challenges when diagnosing and monitoring patients with asthma and epilepsy such as misdiagnosis and mismanagement of these NCDs. Similarly, public health facilities in South Karnataka (India) had equipment such as an adult weighing scale, sphygmomanometer, stethoscope and stature meter, as well as basic diagnostics for diabetes such as blood glucose (fasting blood sugar and postprandial blood sugar) used in NCD diagnosis and control (Jayanna *et al.*, 2019:7). Thus, public health facilities in Karnataka were able to manage patients with hypertension and diabetes (Jayanna *et al.*, 2019:8-9). The public sector health facilities in Bangladesh had basic equipment required to provide basic NCDs services such as sphygmomanometers, weighing scales and height measurement boards except for glucometers and glucometer strips (Rawal *et al.*, 2019:4). The public sector health facilities in Uganda had thermometers, stethoscopes, sphygmomanometers, measuring tapes, weighing scales, glucometers and urine testing strips used to diagnose and monitor NCDs (Rogers *et al.*, 2018:5). However, these health facilities did not meet the WHO-PEN standards for essential tools and medicines to implement effective NCD interventions (Rogers *et al.*, 2018:7-8; WHO, 2010b:35-36).

Section 4.11 presents and discusses results for the role of the pharmacist in the different levels of healthcare.

4.11 Role of the pharmacist in the different levels of healthcare

The results and discussions about pharmacist's role in different levels of healthcare are sectioned based on the specific objective, to assess the role of the pharmacist at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The profile of pharmacists in the management of NCDs, and
- The role of pharmacists in the management of NCDs.

The next section focuses on the presentation of the profile of pharmacists in the management of NCDs.

4.11.1 The profile of pharmacists in the management of non-communicable diseases

The perception of managers at the MOH, DHMTs, OPDs and the healthcare centres about pharmacists' involvement in managing NCDs is presented in this section. This section is subdivided into the MOH, district level and the PHC level.

4.11.1.1 The Ministry of Health

Question 7.1 requested managers at the MOH to indicate if there were pharmacists in the different sectors of the health system of Lesotho involved in managing NCDs (refer to Annexure A). All respondents at the MOH perceived that DHMTs, OPDs and the Pharmaceutical Directorate had pharmacists involved with NCD management (refer to Figure 4-26). Five respondents were of the opinion that there were no pharmacists involved with NCD management at healthcare centres (refer to Figure 4-26). Four respondents thought that the NCD unit had pharmacists involved with NCD management.

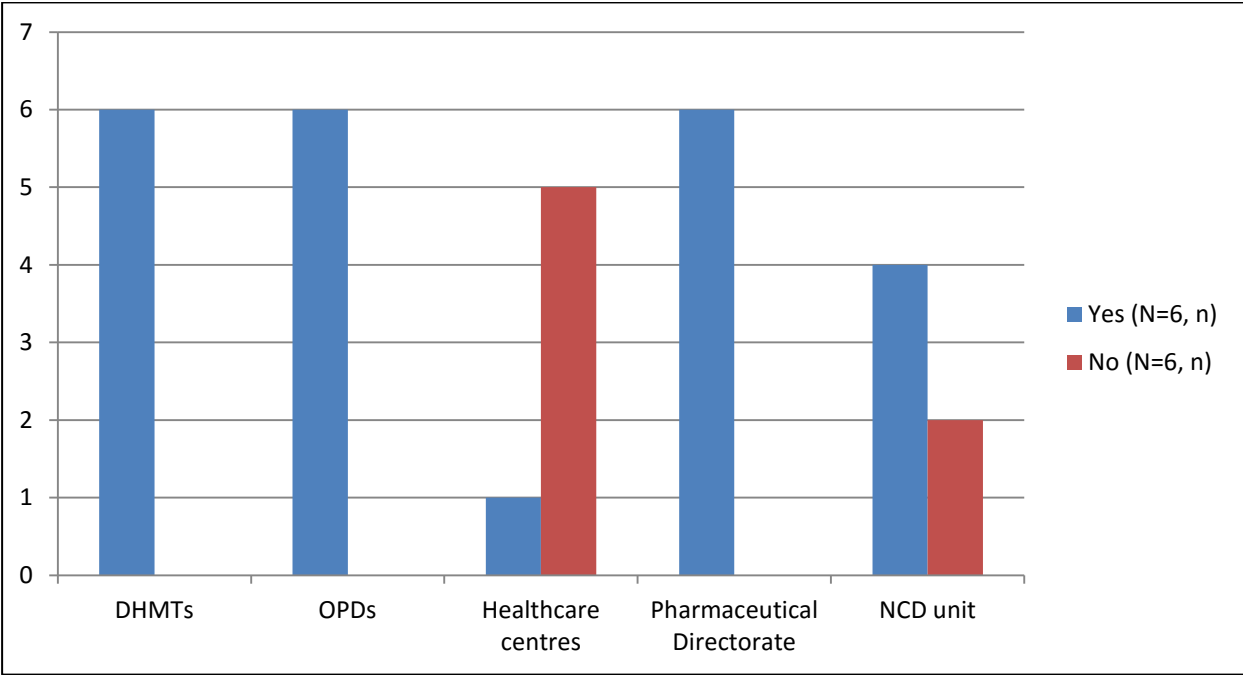


Figure 4-26: The perception of the respondent at the Ministry of Health on the availability of pharmacists involved with non-communicable disease management at different levels of the public health system of Lesotho

In response to question 7.1 (refer to Annexure A), two respondents perceived that there was a lack of pharmacists involved with NCD management at the NCD unit and healthcare centres because “positions for pharmacists are not established in healthcare centres and NCD unit structures.”

4.11.1.2 The district level

The managers at DHMTs responded to question 7.1 about the availability of pharmacists involved with NCD management in the health system of Lesotho (refer to Annexure B). Figure 4-27 displays that the majority of respondents at DHMTs perceived that DHMTs, OPDs, the Pharmaceutical Directorate, and the NCD unit had pharmacists involved with NCD management. Three respondents were of the opinion that pharmacists involved with NCD management at healthcare centres were not available (refer to Figure 4-27).

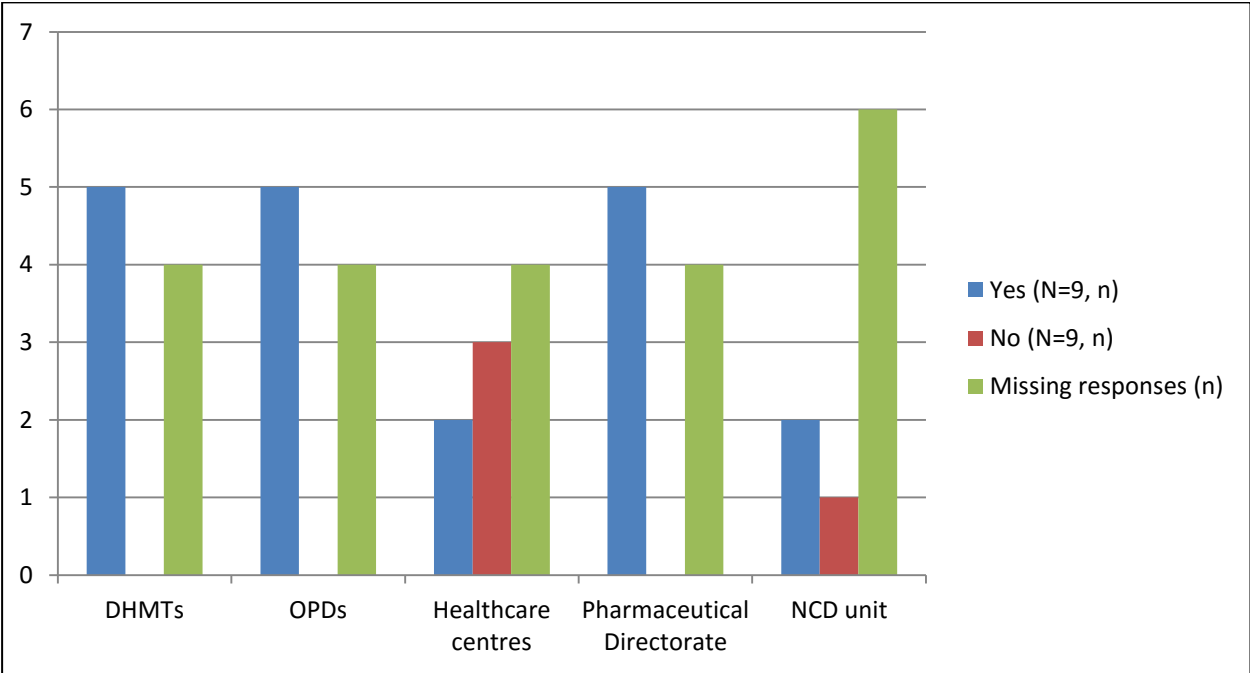


Figure 4-27: Availability of pharmacists involved with non-communicable disease management according to respondents at the District Health Management Teams

Three out of the nine respondents at DHMTs responded to open question 7.2 where they had to explain why there was a lack of pharmacists involved with NCD management in some sectors within the health system of Lesotho (refer to Annexure B). Three respondents at DHMTs thought that the main reason for the lack of pharmacists in healthcare centres was that “currently the government of Lesotho does not have positions of pharmacists at healthcare centres”.

4.11.1.3 The primary healthcare level

The managers at OPDs and healthcare centres responded to question 7.1 (refer to Annexure C and Annexure D) on the availability of pharmacists involved with NCD management at OPDs

and healthcare centres, respectively. Eleven out of 13 respondents at OPDs perceived that pharmacists involved with NCD management were available at OPDs and two respondents were of the opinion that there were no pharmacists. More than half (54.7%, n = 47) of respondents at healthcare centres mostly perceived that there were no pharmacists involved with NCD management at healthcare centres whereas 31.4% (n = 27) were of the opinion that healthcare centres had these pharmacists.

The respondents at healthcare centres further responded to questions 2.22, 2.23 and 2.24 about the availability of pharmacists at healthcare centres (refer to Annexure D). Fifty-three (61.6%) respondents at healthcare centres mainly perceived that there were no pharmacists available in the pharmacies of healthcare centres but, 36.0% (n = 31) thought that there were pharmacists in those pharmacies. Fifty-four (62.8%) respondents pointed out that staff at healthcare centres needed pharmacists in healthcare centres pharmacies whereas three (3.5%) respondents thought on the contrary.

In response to question 2.24 (refer to Annexure D), 48.8% (n = 42) of respondents at healthcare centres perceived that pharmacists were needed by staff at healthcare centres “*for proper management of commodities, proper dispensing and ordering of medicines*”.

- **Discussion of results on the profile of pharmacists in non-communicable diseases**

Results on the availability of pharmacists involved with the management of NCDs at different levels of the health system of Lesotho (refer to Section 4.11.1) are discussed in detail.

According to the Lesotho Health Sector Strategic plan 2012/13-2016/17 (GOL, 2013:17), there was a general shortage of staff in Lesotho, where 73.3% of the personnel in the MOH were nurses, 6% physicians, and pharmacists and other health cadres had the lowest percentage. Despite the shortage of pharmacists in the health system of Lesotho, the findings of this study indicated that respondents perceived that there were pharmacists involved with NCD management at DHMTs, OPDs, pharmaceutical directorate and NCD unit (refer to Section 4.11.1.1, Figure 4-26; Section 4.11.1.2, Figure 4-27; Section 4.11.1.3). Additionally, five respondents at the MOH thought that there were no pharmacists involved with NCD management at healthcare centres compared to one respondent who thought there were pharmacists at healthcare centres (refer to Section 4.11.1.1, Figure 4-26; Section 4.11.1.2). In support of this study's findings, the Human Resource Strategic Plan 2005-2025 of Lesotho stated that pharmacists and pharmacy technicians managed drugs for hospitals (MOHSW, 2005:2-10). In contrast, at healthcare centres, management of medicines may be the responsibility of a nurse clinician, nurse-in-charge or sometimes a pharmacy technician

(MOHSW, 2005:2-10). This study's findings also showed that staff at healthcare centres needed pharmacists in healthcare centres pharmacies to help with proper management of commodities and proper dispensing and ordering of medicines (refer to Section 4.11.1.3). Similarly, there was a shortage of pharmacists in public facilities in the Tumkur district in India, which posed challenges in providing required pharmaceutical care at PHCs (Elias *et al.*, 2018:7). Pharmacists were also part of human resources providing health services at PHC in Uganda, although pharmacists were mainly found in urban areas compared to rural areas that were mainly staffed by allied health workers (WHO, 2017:12-13).

The following section presents and discusses the results of the specific objective that describe the role of pharmacists in the management of NCDs in Lesotho's public health system.

4.11.2 The role of pharmacists in the management of non-communicable diseases

This section presents the perception of managers at the MOH, DHMTs, OPDs and the healthcare centres on the role of the pharmacist in the management of NCDs at the national, district, and PHC levels. This section is divided into the MOH, district level, and the PHC level.

A checklist including 11 activities performed by pharmacists at MOH and 15 activities performed by pharmacists at PHC level was created using the following documents:

- Lesotho Health Policy 2011 (MOHSW, 2011a).
- National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of NCDs 2014-2020 (MOH, 2014b).
- National Health Strategic Plan 2017-22 (MOH, 2016b).
- Role of the pharmacist in the healthcare system (WHO, 1994).
- Developing pharmacy practice: a focus on patient care (WHO, 2006b).
- Joint International Pharmaceutical Federation (FIP)/WHO guidelines on good pharmacy practice: standards for quality of pharmacy practice (WHO, 2011d).
- American College of Clinical Pharmacy (ACCP) template for evaluating a clinical pharmacist (Lee *et al.*, 2017).
- National competency standards framework for pharmacists in Australia (Pharmaceutical Society of Australia, 2016).
- Pharmacist clinical services performance evaluation (American Pharmacists Association (APhA), 2009).
- Exploring pharmacists' role in a changing healthcare environment (Avalere Health, 2014).

This checklist was used to evaluate activities performed by pharmacists at the national and PHC levels (refer to Table 4-119).

Table 4-119: Checklist for evaluating activities of pharmacists at the national and the primary healthcare levels

Functions of pharmacists	Lesotho policies/strategic plans	Other sources	Core function	
			MOH	PHC
Formulation of health policy	LHP2011; NHSP2017-22	WHO, 1994	X	
Formulation of drug policy	LHP2011; NHSP2017-22	WHO, 1994	X	
Collaborate with educators in pharmacy schools		WHO, 1994	X	
Collaborate with educators in continuing education programmes	NCD-NSP2014-20; NHSP2017-22	WHO, 1994; WHO, 2011	X	
Drug procurement	LHP2011; NCD-NSP2014-20; NHSP2017-22	WHO, 1994; WHO, 2006; WHO, 2011	X	X
Drug distribution	LHP2011; NCD-NSP2014-20; NHSP2017-22	WHO, 1994; WHO, 2006; WHO, 2011	X	X
Drug supply	LHP2011	WHO, 1994; WHO, 2006; WHO, 2011	X	
Drug approval		WHO, 1994	X	
Drug registration	LHP2011	WHO, 1994	X	
Drug quality control	NHSP2017-22	WHO, 1994; WHO, 2011	X	
Post-marketing surveillance	LHP2011; NHSP2017-22	WHO, 1994; WHO, 2006	X	
Monitoring of NCDs	NCD-NSP2014-20			X
Advise patients about medication		WHO, 1994; WHO, 2006; Avalere Health		X
Advice patients on self-care		WHO, 2006		X
Advice patients on self-medication		WHO, 2006		X
Develop health plans for NCDs		WHO, 2006; PSA; APhA		X
Communicate with other health providers about patient care		WHO, 1994; WHO, 2006; WHO, 2011; ACCP template; PSA; APhA		X
Refer patients for assessment by a physician		WHO, 1994		X
Prevent medication problems		WHO, 2006		X
Manage drug therapy		WHO, 1994; WHO, 2006; WHO, 2011, Avalere Health		X
Drug storage	NHSP2017-22	WHO, 2006; WHO, 2011		X
Adverse drug reactions monitoring		WHO, 1994; WHO, 2006; ACCP template		X
Adverse drug reactions reporting		WHO, 1994; WHO, 2011; ACCP template		X
Health promotion	LHP2011; NCD-NSP2014-20; NHSP2017-22	WHO, 1994; WHO, 2006; WHO, 2011; PSA; Avalere Health, 2014		X

4.11.2.1 The Ministry of Health

This section entails the perceptions of managers at the MOH pertaining to the role of pharmacists in the management of NCDs at the national, district, and PHC levels.

The managers at the MOH responded to question 7.4 (refer to Annexure A) and their perceptions are presented in Table 4-120.

Two respondents at the MOH perceived that pharmacists in the pharmaceutical directorate were involved in the formulation of health policy (refer to Table 4-120). Five respondents perceived that pharmacists at the pharmaceutical directorate were involved in the formulation of drug policy, drug control, and they cooperated with educators in establishing and modifying the curricula of schools of pharmacy. Six respondents indicated that these pharmacists also carried out pharmaceutical supply management and drug approval. Three respondents perceived that other activities carried out by pharmacists included drug registration and cooperation with educators in establishing and modifying the curricula of continuing education programmes (refer to Table 4-120).

Two respondents thought that pharmacists at the NCD unit participated in the formulation of drug policy, pharmaceuticals supply management, and cooperated with educators in establishing and modifying the curricula of schools of pharmacy (refer to Table 4-120). Three respondents also perceived that pharmacists at the NCD unit carried out drug approval (refer to Table 4-120).

Table 4-120: The perception of respondents at the Ministry of Health on activities carried out by pharmacists at the national level

Activities currently carried out by pharmacists at the pharmaceutical directorate and the NCD unit	Perception of respondents at MOH (N = 6), n					
	Pharmaceutical directorate			NCD unit		
	No	Yes	Missing responses	No	Yes	Missing responses
Formulation of health policy	1	2	3	2	1	3
Formulation of drug policy	0	5	1	1	2	3
Cooperate with educators in establishing and modifying the curricula of schools of pharmacy	1	5	0	3	2	1
Cooperate with educators in establishing and modifying the curricula of continuing education programmes	3	3	0	4	1	1
Pharmaceuticals supply management	0	6	0	3	2	1
Drug approval	0	6	0	2	3	1

Activities currently carried out by pharmacists at the pharmaceutical directorate and the NCD unit	Perception of respondents at MOH (N = 6), n					
	Pharmaceutical directorate			NCD unit		
	No	Yes	Missing responses	No	Yes	Missing responses
Drug registration	3	3	0	4	0	2
Drug control	1	5	0	3	1	2
Post-marketing surveillance	4	2	0	3	1	2
<i>MOH = Ministry of Health</i>						

Question 7.3 asked managers at the MOH to indicate which activities were currently being carried out by pharmacists in the management of NCDs in the district and PHC levels (refer to Annexure A).

Four respondents at the MOH perceived that pharmacists at the DHMTs carried out ADRs recording, pharmaceuticals supply management, health promotion activities, communicated with other healthcare providers to provide patient care to patients, and monitored NCDs (refer to Table 4-121). Three respondents indicated that these pharmacists provided advice to patients about their medication and health conditions, and ADRs monitoring. Two respondents further thought that they prevented and managed medication problems, advised patients on self-care, managed drug therapy, and lifestyle counselling.

Four respondents perceived that pharmacists at OPDs monitored NCDs, provided lifestyle counselling, and carried out ADRs monitoring (refer to Table 4-121). All respondents indicated that these pharmacists provided advice to patients about their medication and health conditions. Five respondents also thought that they prevented and managed medication problems, advised patients on self-care, managed drug therapy, pharmaceuticals supply management, ADRs recording and reporting, and communicated with other healthcare providers to provide patient care (refer to Table 4-121). Three respondents perceived that pharmacists at OPDs referred patients for assessment by a physician, and participate in health promotion activities.

Four respondents perceived that pharmacists at healthcare centres did not monitor NCDs, manage medication problems, advise patients on self-care, participate in health promotion activities, lifestyle counselling, ADRs monitoring, ADRs recording and reporting, communicate with other healthcare providers to provide patient care to patients (refer to Table 4-121). Three respondents indicated that they provided advice to patients about their medication. Five respondents perceived that pharmacists at healthcare centres developed care plans (refer to Table 4-121).

Table 4-121: The perception of respondents at the Ministry of Health on activities carried out by pharmacists at the district and primary healthcare levels

Activities currently carried out by pharmacists at the DHMTs, OPDs and the healthcare centres	Perception of respondents at MOH (N = 6), n								
	DHMTs			OPDs			Healthcare centres		
	No	Yes	Missing responses	No	Yes	Missing responses	No	Yes	Missing responses
Monitoring of NCDs	2	4	0	2	4	0	4	1	1
Provide advice to patients about their medication	0	3	3	0	6	0	2	3	1
Provide advice to patients about their health conditions	2	3	1	0	6	0	3	2	1
Prevent medication problems	3	2	1	0	5	1	3	2	1
Manage medication problems	2	2	2	1	5	0	4	1	1
Advise patients on self-care	3	2	1	1	5	0	4	1	1
Develop care plans	3	1	2	4	1	1	5	0	1
Refer patients for assessment by a physician	2	1	3	2	3	1	2	2	2
Manage drug therapy for patients	2	2	2	1	5	0	3	2	1
Communicate with other healthcare providers to provide patient care to patients	1	4	1	0	5	1	4	1	1
Participate in health promotion activities	1	4	1	1	3	2	4	1	1
Lifestyle counseling for patients	2	2	2	1	4	1	4	1	1
Pharmaceuticals supply management	1	4	1	1	5	0	3	2	1
ADRs monitoring	0	3	3	0	4	2	4	1	1
ADRs recording and reporting	0	4	2	0	5	1	4	1	1

MOH = Ministry of Health; DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.11.2.2 The district level

This section presents results on the perception of managers at DHMTs on activities currently carried out by pharmacists at OPDs and healthcare centres. This perception was a response of managers to question 7.3 in the DHMTs questionnaire (refer to Annexure B).

Three respondents at the DHMTs perceived that pharmacists at OPDs carried out activities such as managing drug therapy, health promotion activities, pharmaceuticals supply management, ADRs recording and reporting, and collaborate with other healthcare providers as

part of a team whereas one respondent felt they did not perform these activities (refer to Table 4-122). Three respondents further perceived that these pharmacists provided advice to patients about their medication and monitored ADRs. Two respondents thought that they prevented and managed medication problems, and referred patients for assessment by a physician (refer to Table 4-122). Four respondents felt that pharmacists at OPDs advised patients on self-care and supervised pharmacy technicians (refer to Table 4-122).

Two respondents perceived that pharmacists at healthcare centres prevented medication problems and advised patients on self-care (refer to Table 4-122).

Table 4-122: The perception of respondents at the District Health Management Teams on activities carried out by pharmacists in the management of non-communicable diseases at the primary healthcare level

Activities carried out by pharmacists at OPDs and healthcare centres at the time of the study	Perception of respondents at DHMTs (N = 9), n					
	OPDs			Healthcare centres		
	No	Yes	Missing responses	No	Yes	Missing responses
Monitoring of NCDs	1	1	7	1	1	7
Provide advice to patients about their medication	0	3	6	1	1	7
Prevent medication problems	1	2	6	1	2	6
Manage medication problems	1	2	6	1	1	7
Advise patients on self-care	1	4	4	1	2	6
Develop care plans	2	2	5	1	0	8
Refer patients for assessment by a physician	1	2	6	1	0	8
Manage drug therapy for patients	1	3	5	1	1	7
Supervise pharmacy technicians	0	4	5	1	0	8
Collaborate with other healthcare providers as part of a team	1	3	5	1	1	7
Participate in health promotion activities	1	3	5	1	1	7
Pharmaceuticals supply management	1	3	5	1	1	7
ADRs monitoring	0	3	6	1	0	8
ADRs recording and reporting	1	3	5	1	0	8

DHMTs = District Health Management Teams; OPDs = Outpatient departments

4.11.2.3 The primary healthcare level

The managers at OPDs responded to question 7.2 about activities performed by pharmacists at OPDs at the time of the study (refer to Annexure C).

Six respondents at OPDs perceived that pharmacists at OPDs monitored NCDs (refer to Table 4-123). Ten respondents indicated that they referred patients for assessment by a physician, recorded and reported ADRs, monitored ADRs, and participated in health promotion activities (refer to Table 4-123). Five respondents perceived that pharmacists at OPDs developed care plans (refer to Table 4-123). Fourteen respondents perceived that these pharmacists provided advice to patients about their medication and self-care and carried out pharmaceuticals supply management whereas 11 respondents indicated that they managed drug therapy (refer to Table 4-123). Twelve respondents further perceived that they prevented and managed medication problems. Thirteen respondents also perceived that pharmacists at OPDs supervised pharmacy technicians and collaborated with other healthcare providers as part of a team (refer to Table 4-123).

Table 4-123: The perception of respondents at outpatient departments on activities carried out by pharmacists in non-communicable disease management at outpatient departments

Activities currently carried out by pharmacists at OPDs	Perception of respondents at OPDs (N = 16), n		
	No	Yes	Missing responses
Monitoring of NCDs	4	6	6
Provide advice to patients about their medication	0	14	2
Prevent medication problems	0	12	4
Manage medication problems	0	12	4
Advise patients on self-care	0	14	2
Develop care plans	4	5	7
Refer patients for assessment by a physician	2	10	4
Manage drug therapy for patients	0	11	5
Supervise pharmacy technicians	0	13	3
Collaborate with other healthcare providers as part of a team	0	13	3
Participate in health promotion activities	1	10	5
Pharmaceuticals supply management	0	14	2
ADRs monitoring	1	10	5
ADRs recording and reporting	2	10	4
<i>OPDs = Outpatient departments</i>			

Question 7.2 asked managers at healthcare centres to indicate which activities should be carried out by pharmacists involved with the management of NCDs at healthcare centres (refer to Annexure D).

Twenty-five (29.1%) respondents at healthcare centres perceived that pharmacists at healthcare centres should monitor NCDs (refer to Table 4-124). Fifty-nine (68.6%) respondents thought that pharmacists should provide advice to patients about their medication, 64.0% (n = 55) of respondents felt they should advise patients on self-care, and 31.7% (n = 27) indicated that they should develop care plans (refer to Table 4-124).

Fifty-seven (66.3%) respondents perceived that pharmacists at healthcare centres should prevent medication problems, 47 (54.7%) thought they should manage medication problems whereas 49 (57.0%) believed they should manage drug therapy (refer to Table 4-124). Furthermore, 45.3% (n = 39) of respondents perceived that pharmacists at healthcare centres should monitor ADRs, and 46.5% (n = 40) thought they should record and report ADRs (refer to Table 4-124).

Fifty-two (60.5%) respondents thought that pharmacists at healthcare centres should supervise pharmacy technicians, 27 (31.4%) felt that they should refer patients for assessment by a physician, and 56 (65.1%) perceived that they should collaborate with other healthcare providers as part of a team (refer to Table 4-124). Fifty-one (59.3%) respondents further indicated that these pharmacists should participate in health promotion activities whereas 60 (69.8%) respondents thought they should carry out pharmaceuticals supply management.

Table 4-124: The perception of respondents at healthcare centres on activities that pharmacists should carry out in non-communicable disease management at healthcare centres

Activities that pharmacists should carry out at healthcare centres	Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses
Monitoring of NCDs	25 (29.1)	25 (29.1)	36 (41.7)
Provide advice to patients about their medication	6 (7.0)	59 (68.6)	21 (24.4)
Prevent medication problems	6 (7.0)	57 (66.3)	23 (26.7)
Manage medication problems	13 (15.1)	47 (54.7)	26 (30.2)
Advise patients on self-care	9 (10.5)	55 (64.0)	22 (25.6)
Develop care plans	26 (30.2)	27 (31.7)	33 (38.4)
Refer patients for assessment by a physician	27 (31.4)	25 (29.1)	34 (39.5)
Manage drug therapy for patients	15 (17.4)	49 (57.0)	22 (25.6)
Supervise pharmacy technicians	10 (11.6)	52 (60.5)	24 (27.9)
Collaborate with other healthcare providers as part of a team	7 (8.1)	56 (65.1)	23 (26.7)
Participate in health promotion activities	8 (9.3)	51 (59.3)	27 (31.4)
Pharmaceuticals supply management	6 (7.0)	60 (69.8)	20 (23.3)

Activities that pharmacists should carry out at healthcare centres	Perception of respondents at healthcare centres (N = 86), n (%)		
	No	Yes	Missing responses
ADRs monitoring	21 (24.4)	39 (45.3)	26 (30.2)
ADRs recording and reporting	20 (23.3)	40 (46.5)	26 (30.2)

- **Discussion of results on the role of pharmacists in non-communicable disease management**

This subsection discusses results generated from the specific objective that assessed the role of pharmacists in NCD management at the different levels of the health system of Lesotho.

The findings of this study showed activities carried out by pharmacists involved with NCD management at the national level (pharmaceutical directorate and NCD unit) in the health system of Lesotho at the time of this study. Pharmacists at the NCD unit at the MOH in Lesotho were carrying out activities such as drug policy formulation, pharmaceuticals supply management, and drug approvals (refer to Section 4.11.2.1, Table 4-120). Pharmacists in the pharmaceutical directorate at the MOH in Lesotho were carrying out activities such as formulation of health and drug policies, cooperate with educators in establishing and modifying curricula for schools of pharmacy and continuing education programmes, pharmaceuticals supply management, drug approval, drug registration, and drug control (refer to Section 4.11.2.1, Table 4-120). The study results suggested that the pharmaceutical directorate was a sector in the MOH that exclusively dealt with pharmaceuticals. The WHO, in support of the study findings, stated that each MOH had a section that handled pharmaceutical matters such as health and drug policy formulation; selection, procurement and distribution of drugs; work with educators in formulation and modification of pharmacy-related education; and approval, registration and quality control of medicines (WHO, 1994:8-10). However, most respondents at the MOH perceived that pharmacists at the pharmaceutical directorate did not carry out post-marketing surveillance (refer to Section 4.11.2.1, Table 4-120). In support of the study findings, the Lesotho Health Policy 2011 stated that pharmacovigilance was not yet functional (MOHSW, 2011:55) while, the National Health Strategic Plan 2017-2022 stated that pharmacovigilance centre needs to be strengthened (MOH, 2016:44). Thus, it is evident from the study's findings that, a decade later, the pharmaceutical directorate still has to strengthen post-marketing surveillance, although, it was in place.

The study findings also showed activities pharmacists involved with NCD management at the district level carried out. Pharmacists at DHMTs monitored NCDs, provided advice to patients about their medication and health conditions, communicated with other healthcare providers to

provide patient care to patients, participated in health promotion activities, pharmaceuticals supply management, ADRs monitoring, and ADRs recording and reporting (refer to Section 4.11.2.1, Table 4-121). Pharmacists at DHMTs in the public health system of Lesotho seem to carry out activities similar to pharmacists in health facilities (refer to Section 4.11.2.1, Table 4-121). According to the Lesotho Health Sector Strategic Plan 2012/13-2016/17, the DHMT was responsible for managing healthcare service delivery at healthcare centres and community-level health interventions (MOHSW, 2011:41; GOL, 2013:40). Also, Bradley *et al.* (2015:4-5), when assessing roles and competencies of district and sub-district pharmacists in Cape Town (South Africa), indicated that district pharmacists were not expected to work at health facilities but to contribute to the district management team (DMT) through planning, coordination and monitoring of pharmaceuticals.

The study findings indicated activities carried out by pharmacists at PHC level. Pharmacists at OPDs provided advice to patients about their medication, prevented and managed medication problems, advised patients on self-care, referred patients for assessment by a physician, managed drug therapy for patients, supervised pharmacy technicians, collaborated with other healthcare providers as part of a team, participated in health promotion activities, pharmaceuticals supply management, ADRs monitoring, and ADRs recording and reporting (refer to Section 4.11.2.1, Table 4-121; Section 4.11.2.2, Table 4-122; Section 4.11.2.3, Table 4-123).

Healthcare centres in the health system of Lesotho did not have pharmacists manning the pharmacy (refer to Section 4.11.1.1, Figure 4-26; Section 4.11.1.3). Although there were no pharmacists in the healthcare centres, respondents at healthcare centres thought that pharmacists, if available, should carry out the following activities (refer to Section 4.11.2.3, Table 4-124):

- Provide advice to patients about their medication.
- Prevent and manage medication problems.
- Advise patients on self-care.
- Manage drug therapy for patients.
- Supervise pharmacy technicians.
- Collaborate with other healthcare providers as part of a team.
- Participate in health promotion activities.
- Pharmaceuticals supply management; and
- ADRs monitoring, recording and reporting.

Similar to the study findings, the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) (SIAPS, 2014:5-8) indicated that pharmacists as part of healthcare teams delivered patient-centred services which included pharmaceutical care activities such as the provision of medication-related care to patients and health promotion and lifestyle modification activities. Also, in Western Nepal, community pharmacy-based intervention where pharmacists empowered patients with NCDs with knowledge and lifestyle practices concerning their NCDs resulted in improved hypertensive patients' knowledge and lifestyle practices and reduced patients' blood pressure (Sharma *et al.*, 2014:307). As in Lesotho, pharmacists in Nepal also screened and monitored NCDs, provided lifestyle counselling, offered medication therapy management, and were involved with public health and health promotion in addition to traditional dispensing services (Khanal *et al.*, 2016:657-658).

The Lesotho legal documentation in support of the study findings was as follows. The Lesotho Health Policy 2011 and the National Multi-Sectoral Integrated Strategic Plan for the Prevention and Control of NCDs 2014-2020 stated that pharmacists procure, supply, distribute and register drugs (MOH, 2014:41-46; MOHSW, 2011:31,55). Pharmacists were involved in health promotion, healthy lifestyles and policy formulation (MOHSW, 2011:30 & 41), pharmacovigilance (MOHSW, 2011:55) as well as monitoring of NCDs, collaboration with educators in continuing education (MOH, 2014:41-46). Additionally, the National Health Strategic Plan 2017-2022 stated that pharmacists procure, store, distribute and control drugs (MOH, 2016:29). Pharmacists also conducted health promotion and healthy lifestyle activities (MOH, 2016:27), were involved in policy formulation (MOH, 2016:14) as well as pharmacovigilance and collaborated with educators in continuing education (MOH, 2016:50, 56).

4.12 Chapter summary

This chapter displayed and discussed results for the empirical study (refer to Chapter one, paragraph 1.3.2.2). Chapter five will entail a detailed explanation of a proposed NCD management structure emphasising the role of the pharmacist in NCD management in the public health system of Lesotho.

CHAPTER 5 NON-COMMUNICABLE DISEASE MANAGEMENT STRUCTURE

5.1 Chapter introduction

This chapter entails a detailed description of the proposed non-communicable disease (NCD) management structure which answers the aim: to develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

5.1.1 Elements of the proposed non-communicable disease management structure for the public health system of Lesotho

The proposed NCD management structure for Lesotho's public health system was developed based on a literature review about chronic disease management models (Chapter two), Lesotho's health system (Chapter three), and the results and discussion of the specific objectives of the empirical investigation of this study in Chapter four.

The structure comprises six elements (refer to Chapter three, Section 3.2.3, Figure 3-3). These elements have been chosen because there are three essential dimensions of the healthcare system (namely: regulation, financing, and service provision) which have a hierarchical relationship (Böhm *et al.*, 2013:260; WHO, 2010a:1-2; Witter *et al.*, 2019:1981-1985). The hierarchical relationship is led by regulation, followed by financing, and service provision, where the superior dimension restricts the nature of the subordinate dimensions (Böhm *et al.*, 2013:260; Mutale *et al.*, 2013:7-8; WHO, 2010a:1-2; Witter *et al.*, 2019:1981-1985). The service provision dimension encompasses human resources, medicines, HMIS, health infrastructure, and equipment (Böhm *et al.*, 2013:260; WHO, 2010a:31-2). Therefore, all the elements need to be coherent for the health system to function effectively as these elements are interdependent (Manyazewal, 2017:5-6; Mutale *et al.*, 2013:7-8). These different elements are further divided into the national, district, and primary healthcare (PHC) levels.

The following sections will elaborate on the different elements of the NCD management structure.

5.1.1.1 Healthcare financing

Healthcare financing is the second most important component because all other components rely on sustainable healthcare financing to achieve universal health coverage (UHC). Elements

such as human resources for health, medicines and medical devices, useful health information systems (HIS) and maintenance of health infrastructure and equipment all need financing to deliver good health services to patients. Mismanagement of these elements could lead to an increase in health spending. Global health spending has increased rapidly from US\$ 7.6 trillion in 2016 to US\$ 7.8 trillion in 2017, where 60% of this spending was public and 40% private (WHO, 2019b:6). Health spending also increased faster in low-income countries than in middle- and high-income countries (WHO, 2019b:6). Thus, it is vital for countries to effectively manage their different sources of financing options, such as domestic government resources, out-of-pocket (OOP) spending and donor funding, to maintain a functional health system to attain UHC (McIntyre *et al.*, 2017:127-128; Shaw *et al.*, 2015:82-84; WHO, 2019b:7-12; World Bank, 2018:1).

In healthcare financing (refer to Section 2.2.5, Chapter 2), there has to be consistent financing with cost-savings measures during the allocation of resources and realistic resources allocation procedures to the national, district, and PHC levels for Lesotho's health system to decrease the prevalence of NCDs. Figure 5-1 presents the proposed structure of healthcare financing in the public health system of Lesotho. This structure was developed based on this study's results (refer to Chapter four, Section 4.9).

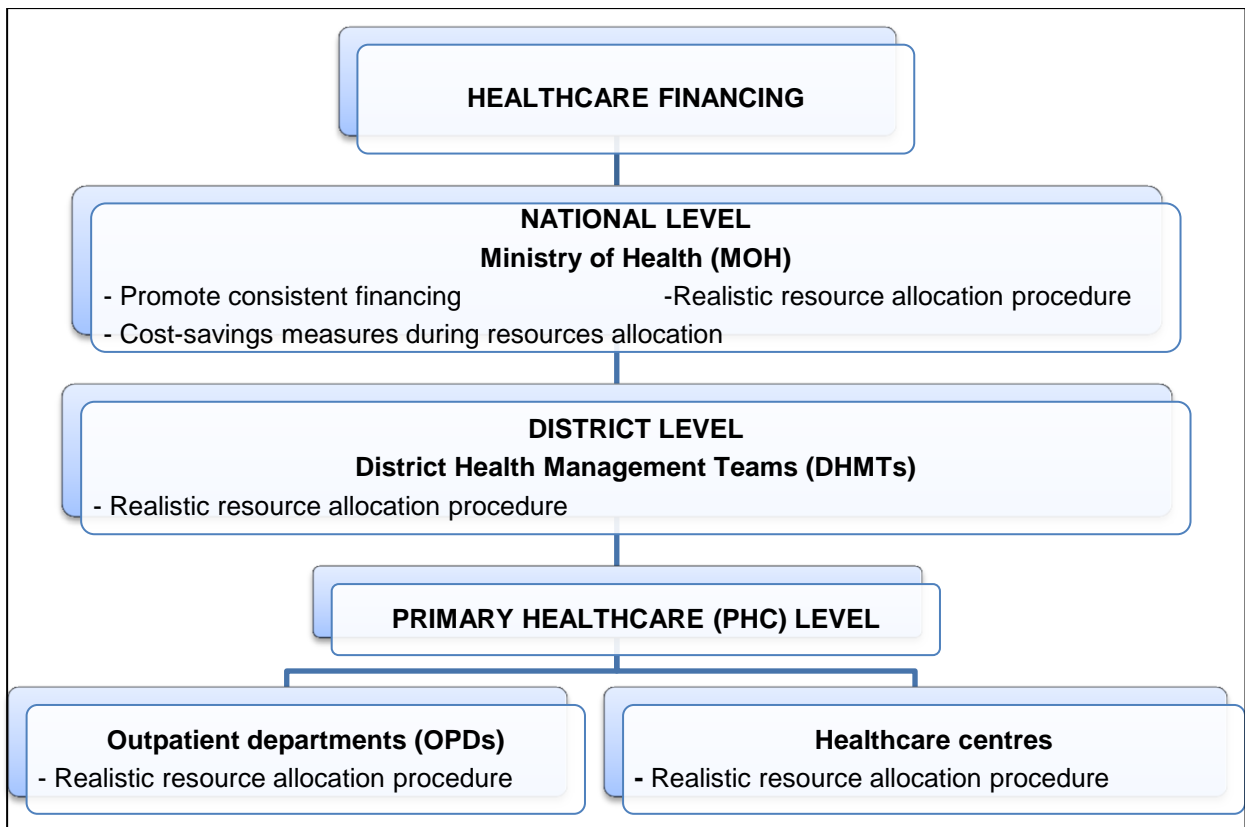


Figure 5-1: Proposed structure of healthcare financing in the public health system of Lesotho

In the current structure of healthcare financing, there is a lack of consistency in financing especially for NCDs which could be solved by applying cost-savings measures during resources allocation at the MOH. The proposed structure improves the current one in that during the allocation of funds for the different levels of the health system of Lesotho, the MOH could use different cost-savings measures. These measures will assist with consistent financing towards healthcare services including services for NCD prevention and management. Additionally, budgeting together with the application of cost-saving measures will strengthen resources allocation procedures.

The following sections discuss healthcare financing components as per the results of this study (refer to Chapter four, Section 4.9).

5.1.1.1.1 Promote consistent financing

The burden of NCDs is a global challenge that needs sustainable financing (Dutta & Ly, 2018:1; UNDP, 2019:1; WHO, 2015b:1). When exploring the different NCD financing options and achieving UHC in low- and middle-income countries (LMICs), the main sources of available finance include taxation, loans, engagement with the private sector, impact investment and

innovative financing mechanisms (Allen, 2017:2-4; Dutta & Ly, 2018:1; Makinen *et al.*, 2018:1-8; Kutzin *et al.*, 2017:17-19; Yang *et al.*, 2016:4-5). These different financing options will assist with consistent financing of the health system provided they are well managed. Therefore, LMICs will have to manage and use these different financing sources to reduce the burden of NCDs (Allen, 2017:5; International Monetary Fund, 2011:19).

Similarly, Lesotho utilises different financing sources such as taxation, donor funding and innovative financing to fund its health system (refer to Chapter three, Section 3.2.3.4). The public sector revenue in Lesotho is centralised within the Ministry of Finance and Development Planning (MoFDP), and the health system of Lesotho is mainly financed by government sources followed by development partners (such as the United Nations Systems, the World Bank, the Millennium Challenge Corporation, the Christian Health Association of Lesotho (CHAL)), and national and international non-governmental organisations (NGOs) (MOHSW, 2010:15; UNICEF, 2017:3). Lesotho's government expenditure on health mainly comes from the South African Customs Unions (SACU), tax revenue and non-tax revenue (Lesotho, 2019:1-11). The health sector of Lesotho received the second-highest allocation of the national budget after agriculture (Lesotho, 2019:1-11). Between the 2013/14 and 2017/18 fiscal years, the average proportion of allocation to the health sector was 11.94% of total expenditure (UNICEF, 2017:5). However, the investment into the health sector of Lesotho falls far below the Government's commitment to the Abuja Declaration of 15% of the national budget for health (UNICEF, 2017:5; WHO, 2011f:1).

Consistent financing for NCDs is possible through budgeting and planning procedures for NCDs at the national, district, and PHC levels of the health system. As per Section 3.2.3.4 (refer to Chapter three), the MOH draws a budget that has to be approved by the Parliament, upon which the MoFDP issues a warrant to spend (MOHSW, 2010:31). The warrant allows the MOH to gain access and spend its funds. The MoFDP transfers the funds for all cost centre programmes including the districts and the CHAL to the MOH headquarters quarterly based on the approved budget from the MOH (MOHSW, 2010:31). The MOH transfers the funds to the various cost centres and keeps the funds allocated for the MOH headquarters cost centres (MOHSW, 2010:31). Thus, the MOH attains budgets from district and PHC levels, incorporated into the central MOH budget. These budgets should include NCD prevention and management to cater to the prevention and management of NCDs at the district and PHC levels in Lesotho.

As per this study's findings, there were differences in the perceptions of respondents at DHMTs, OPDs and healthcare centres about budget availability and the level of authority regarding the use of the budget. Some respondents at DHMTs perceived that the DHMTs had a budget (refer

to Chapter four, Section 4.9.1.1). In their budget, respondents at DHMTs indicated that they were fully authorised to purchase drugs and equipment for healthcare centres, purchase drugs for OPDs, maintain buildings, and repair and maintain equipment at OPDs and healthcare centres while, other respondents felt that they had partial authority (refer to Chapter four, Section 4.9.1.1, Table 4-98). On the contrary, however, some DHMTs managers thought they did not have the authority to maintain buildings, pay staff salaries, and maintain vehicles and motorcycles (refer to Chapter four, Section 4.9.1.1, Table 4-98).

Furthermore, some respondents at OPDs perceived that OPDs had a budget, while others disagreed (refer to Chapter four: Section 4.9.1.2). Respondents at OPDs perceived that they had full authority to purchase drugs and equipment and repair and maintain equipment, whereas some respondents thought that they only had partially authorised to do so (refer to Chapter four: Section 4.9.1.2, Table 4-99), with some respondents indicating that they had no authority to pay staff salaries, repair equipment, and maintain vehicles and motorcycles (refer to Chapter four: Section 4.9.1.2, Table 4-99). The respondents at healthcare centres also indicated that healthcare centres had a budget, but, some respondents believed healthcare centres did not (refer to Chapter four: Section 4.9.1.2). Respondents at healthcare centres believed that they were fully authorised to pay staff salaries, purchase drugs and equipment, and repair and maintain equipment although other respondents believed they had partial authority (refer to Chapter four: Section 4.9.1.2, Table 4-99). On the other hand, some respondents at healthcare centres also perceived that they did not have the authority to pay staff salaries (refer to Chapter four: Section 4.9.1.2, Table 4-99).

Despite differences in the perceptions of respondents at DHMTs, OPDs and healthcare centres about budget availability and the level of authority they have over their budget, budgets are available at some health facilities in the district and PHC levels of Lesotho's public health system. The health budget is distributed to the district and PHC levels according to their needs. The budgets at district and PHC levels cater to NCD prevention and management. Even though, three managers at DHMTs perceived that they were not involved in developing a budget at the national level whereas two managers thought they were sometimes involved (refer to Chapter four, Section 4.9.1.1). In different circumstances, some respondents at OPDs believed they were involved in the development of the budget at the national level (refer to Chapter four, Section 4.9.1.2). At healthcare centres, respondents perceived that they were involved during the budget development of their healthcare centres, whereas some respondents indicated that they were only sometimes involved, compared to some respondents who believed that they were not involved during budget development of their healthcare centres at all (refer to Chapter four, Section 4.9.1.2). Therefore, DHMTs and OPDs in some districts were involved

with budget development at the national level, and only some managers in other healthcare centres were included during budget development.

Additionally, some respondents perceived that DHMTs, OPDs and healthcare centres in Lesotho's health system used financial monitoring systems such as financial records, accounting procedures, and periodic auditing visits (refer to Chapter four, Section 4.9.1.1; Section 4.9.1.2, Table 4-100). Other respondents, on the contrary, perceived that financial records, accounting procedures, and periodic auditing visits were not used to monitor finances at DHMTs, OPDs and healthcare centres. Furthermore, some respondents at DHMTs perceived that finances for NCD management always moved without difficulty from the source (MoFPD) to the intended end-users (health providers) (refer to Chapter four, Section 4.9.1.1; Section 4.9.3.1). Budgeting and planning procedures are important during the allocation of resources, and managers in some health facilities perceived that they used planning and budgeting procedures while others indicated they sometimes used these procedures (refer to Chapter four, Section 4.9.1.1; Section 4.9.3.1, Table 4-103).

In conclusion, it appears that consistent financing is a challenge in the public health system of Lesotho. Some respondents have a perception that there are DHMTs, OPDs and healthcare centres without budgets, and there is inconsistency in the authority they have on the use of their budgets. Also, not all OPDs and DHMTs are involved in budgeting at the national level. Some health facilities do not use financial monitoring systems and planning and budgeting procedures thus, making it difficult for the MOH to decide what priorities to fund in the prevention and management of NCDs at the different levels of the public health system of Lesotho.

5.1.1.1.2 Realistic resources allocation procedures

Lesotho's budgeting process consists of five stages, namely: planning, preparation, approval, execution, as well as auditing and reporting (Jitsing *et al.*, 2017:43). Budget planning is the vital stage in the budgeting process of Lesotho where the Minister of Health will lobby for the inclusion of NCDs as one of the priority areas, as per the National Strategic Development Plan 2018/19-2022/23 (Government of Lesotho, 2018:119), in the National Budget Strategy Paper (Jitsing *et al.*, 2017:44). The inclusion of NCDs in the National Budget Strategy Paper ensures that resources are allocated to NCDs during the budget process as the budget planning stage links resource allocation to government priorities.

In addition to the budgeting process, an annual joint review is an essential component of the health sector monitoring mechanism, and its goal is to review progress against health sector plans and to develop consensus on how well the sector is progressing and actions that will

improve performance (WHO, 2014h:5). Countries such as Kenya (Republic of Kenya, 2010:6-7), Zambia (Ministry of Health Republic of Zambia, 2012:10-12) and Lesotho (WHO AFRO, 2014:27) implemented annual joint reviews in their health sectors which includes a collaboration between the MOH and other stakeholders to assess the performance of the health sectors including financing.

Chapter four (refer to Section 4.9.3.1, Figure 4-24) shows that some respondents at the MOH perceived that financing for NCD management was defined and agreed to by different government levels, development partners, and different levels of healthcare in the public health system of Lesotho. However, some respondents thought that these responsibilities were not defined and agreed to by different government levels and different levels of healthcare. Furthermore, four managers at the MOH perceived that a joint annual review and planning process was in place where financial commitments were made, involving all major development partners (refer to Chapter four, Section 4.9.3.1). Some respondents at the MOH however thought that risk-pooling mechanisms in the management of NCDs were not in place (refer to Chapter four, Section 4.9.3.1, Table 4-101).

Section 4.9.3.1, Table 4-102 (Chapter four) revealed that some respondents at the MOH thought that the performance indicators used in budgets for planning and implementation for NCD management are linked to the current year's annual operational plan (refer to Chapter four: Section 4.9.3.1, Table 4-102). Other respondents perceived that planning and budgeting procedures to strengthen service delivery performance in NCD management were available (refer to Chapter four: Section 4.9.1.1). Additionally, some respondents perceived that planning and budgeting procedures were used by DHMTs, OPDs and healthcare centres to strengthen service delivery performance in NCD management (refer to Chapter four: Section 4.9.3.1, Table 4-103). Similarly, Kenya's health sector has planning and budgeting processes in which the budget is aligned to the annual work plans to enable allocation of resources to priority areas of which NCD management and prevention is a priority (Republic of Kenya, 2013:97-98).

In conclusion, it appears that resource allocation at the MOH needs strengthening. The prevention and management of NCDs is a task for different stakeholders, including the Government of Lesotho but, respondents have limited knowledge about it. Lesotho is a developing country; thus, cost-savings during resource allocation are important for providing equitable quality health services to the population to achieve UHC.

5.1.1.1.3 Cost-savings measures during resources allocation

The decision-making tool used to inform resource allocation for NCDs in Lesotho was cost-effectiveness analysis (refer to Chapter four, Section 4.9.3.1, Table 4-164). Similarly, the MOH in Uganda used cost-effectiveness analysis to distribute resources aligned with health system priorities such as NCDs (Kapiriri & Foster, 2019:4-7). It was also indicated by four out of five respondents in Chapter four (refer to Section 4.9.3.1, Table 4-104), that the MOH of Lesotho achieved cost-savings through reformation or innovation in procurement and contracting practices. Some respondents agreed that the MOH followed active purchasing principles while other respondents thought that there were strategies to reduce the price of medicines (such as procuring generics, pooled procurement, and negotiated price reductions) (refer to Chapter four: Section 4.9.3.1, Table 4-104). Some respondents further believed that there were legislative provisions to permit generic drug substitution in the public sector. Thus, the national level in Lesotho's public health system has procedures to assist with efficient spending of the health budget on NCD management and prevention.

The following element, which is also very important, is human resources, discussed in detail in the subsequent section.

5.1.1.2 Human resources

Human resources consist of workers responsive to people's needs and expectations to achieve the best outcomes with available resources and circumstances (WHO, 2010a). According to the WHO (Scheffler *et al.*, 2016:12), a health worker density of 2.3 skilled health workers (physicians and nurses/midwives) per 1000 population is generally necessary to attain high health coverage. The ratio of doctors to population (0.9 per 10 000) and nurse-midwives to population (10.2 per 10 000) in Lesotho are below the World Health Organization Africa (WHO AFRO) average for doctors (2.6 per 10 000) and distribution of health workers (12.0 per 10 000) (UNICEF, 2017a:3; World Bank, 2017:21). Also, estimating health worker needs was based on the density necessary to achieve the emphasised 80% coverage of essential health services, including births with a skilled health worker and immunisation (Scheffler *et al.*, 2016:12). The shortage of health workers in LMICs (refer to Chapter two, Section 2.2.2), could be overcome by training health workers, motivation and retention, and task-shifting in managing NCDs. The proposed human resource structure (refer to Figure 5-2) was constructed based on results and discussion on human resources (refer to Section 4.4, Chapter four).

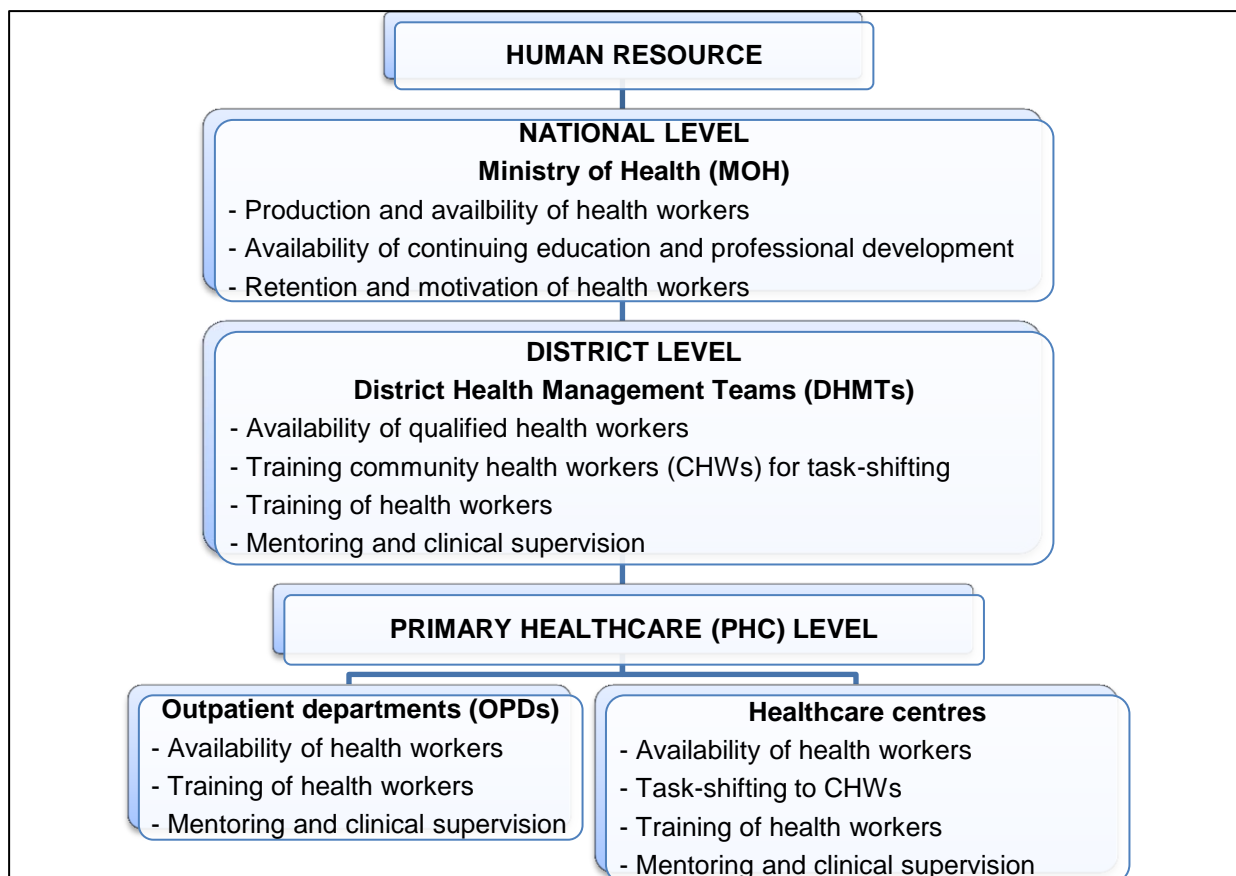


Figure 5-2: Proposed structure of human resources in the public health system of Lesotho

The different activities at the MOH, DHMTs and the PHC levels (refer to Figure 5-2) are elaborated on in the subsequent sections.

5.1.1.2.1 Availability of health workers in non-communicable disease management

Scheffler *et al.* (2016:6) predicted the largest needs-based shortages of health workers in South-East Asia at 6.9 million and Africa at 4.2 million. Health workers are essential for the improvement of health outcomes such as disability-adjusted life years (DALYs) where Castillo-Laborde (2011:7) indicated that an increase of one unit in the density of health workers per 1000 would decrease, on average, the total burden of communicable and non-communicable diseases between one and three per cent. Health worker density of 2.3 skilled health workers (physicians and nurses/midwives) per 1000 population are required to attain high health coverage (Scheffler *et al.*, 2016:12), however, the density of nurses and midwives in the WHO Member States, was not statistically associated to DALYs (Castillo-Laborde, 2011:8). Thus, an increase in health workers' density will reduce the burden of the diseases so; health workers are

an essential element of the health systems (Castillo-Laborde, 2011:11). Different countries have implemented various interventions to address this shortage of health workers.

For instance, India, as one of the countries located in southern Asia, has introduced Accredited Social Health Activists (ASHA) as part of PHC teams to fight against NCDs' increasing burden (Abdel-All *et al.*, 2019:3). The ASHAs in India are recognised as part of the National Programme for Cardiovascular Disease, Diabetes, Cancer and Stroke (NPCDCS) at the policy level (Abdel-All *et al.*, 2019:3). The ASHAs are faced with constraints such as a lack of formal recognition as part of NPCDCS' service delivery team and as employees of the health system, work overload, and a lack of training or remuneration for NCD activities they provide in the community (Abdel-All *et al.*, 2019:3). The health system of India needs to address these constraints faced by ASHAs because ASHAs, similar to community health workers (CHWs), are enthusiastic about their work including the NPCDCS' responsibility and are an essential link between the health system and the community thus, can assist with combating the increasing burden of NCDs (Abdel-All *et al.*, 2019:5-7). Bangladesh, also located in Southern Asia, is experiencing a critical shortage of health workers at the PHC level where most of the health workforce was composed of traditional medicine practitioners, traditional birth attendants, village doctors, drug sellers, and CHWs (Islam *et al.*, 2017:98-99). Also, health workers in Bangladesh's public health sector are not trained in NCD care at the PHC and district hospitals, making the private sectors the first-line clinical care for NCDs (Islam *et al.*, 2017:99). Therefore, most population of Bangladesh, especially those in rural areas, have limited access to healthcare services for NCDs, which can be addressed by development, training as well as support for health workers and integration of CHWs, nurses and other healthcare providers for NCDs at the PHC levels (Islam *et al.*, 2017:100).

A report by UNICEF (2017:3) and the World Bank Group (2017:21) showed that the ratio of doctors to population (0.9 per 10 000) in Lesotho was below the WHO Africa (WHO AFRO) average for doctors (2.6 per 10 000) and distribution of health workers in 2017. Similarly, the results of this study showed that respondents perceived that the public health system of Lesotho consists of pharmacists, pharmacy technicians, nurse clinicians, nurses, nursing assistants, public health nurses and medical doctors (refer to Chapter four: Section 4.4.1.1, Table 4-6; Section 4.4.1.2; Section 4.4.1.3, Figure 4-3). However, some respondents perceived that there was a shortage of health professionals involved in the management of NCDs in health facilities (refer to Chapter four: Section 4.4.1.1, Table 4-6; Section 4.4.1.2; Section 4.4.1.3, Figure 4-3). Additionally, Chapter 4 (refer to Section 4.4.1.1, Table 4-6) indicated that some respondents at the MOH perceived that all vacancies of pharmacists, pharmacy technicians, nurses, public health nurses, and medical doctors were occupied at DHMTs whereas other

respondents thought that posts of nursing assistants and pharmacy technicians were not occupied at DHMTs. Some respondents at OPDs further indicated that vacancies for pharmacists, pharmacy technicians at OPDs were occupied but, other respondents thought that posts for nurses, nursing assistants, and medical doctors were not (refer to Chapter four: Section 4.4.1.1, Table 4-6). Some respondents at the MOH also perceived that posts for pharmacists and nurse clinicians were vacant at healthcare centres (refer to Chapter four: Section 4.4.1.1, Table 4-6).

Additionally, there were certain respondents at DHMTs who perceived that OPDs were adequately staffed with healthcare personnel, while other respondents indicated that OPDs were not adequately staffed (refer to Chapter four: Section 4.4.1.2). Also, some respondents at DHMTs perceived that healthcare centres were not adequately staffed with healthcare personnel compared to other respondents who perceived that healthcare centres staffing were somewhat adequate (refer to Chapter four: Section 4.4.1.2). At OPDs, some respondents perceived that OPDs were adequately staffed with pharmacists, pharmacy technicians and medical doctors and other respondents thought otherwise (refer to Chapter four: Section 4.4.1.3, Figure 4-3). Although other respondents perceived that OPDs were adequately staffed with nurses and nurse clinicians, some thought OPDs were not adequately staffed with nurses and nurse clinicians (refer to Chapter four: Section 4.4.1.3, Figure 4-3).

Thus, from this analysis, it appears that some health facilities are experiencing a shortage of health workers to deliver quality health services in Lesotho's health facilities, including delivering NCDs services as perceived by respondents at the MOH, DHMTs and OPDs. In support of this finding, the Government of Lesotho (GOL, 2013:17) stated that there was a general shortage of staff in Lesotho, where 73.3% of the MOH personnel are nurses, 6% physicians, and 20.7% included pharmacists and other health cadres. The nursing cadre is thus the largest in the health sector. The state of the health workforce in Lesotho's public health system is elaborated on in Section 3.2.3.1, Chapter three.

Lesotho needs to identify strategies to increase the number of certain types of health professionals at health facilities where they are inadequate. To improve the retention of health professionals at health facilities, the incentive system could be explored.

5.1.1.2.2 Retention of health workers in non-communicable disease management

The increasing burden of NCDs is a cause for concern in Sub-Saharan Africa. Health workforce planning formulated through a collaborative process between the Ministries of Health and other

key stakeholder helps governments and health managers develop and implement strategies to achieve an effective and sustainable health workforce (WHO, 2010e:4). Similarly, Table 4-11 (Chapter four, Section 4.4.2.1), indicated that some respondents at the MOH perceived that a regular and coordinated health workforce planning for NCD management existed at the national, district, and the PHC levels including development partners and the private sector. Other respondents further indicated that health workforce planning excluded the Department of Education, Department of Finance and Academic Institutions at the MOH (refer to Chapter four: Section 4.4.2.1, Table 4-11). The prevention and management of NCDs involve numerous stakeholders bringing varying contributions in the form of finances, skills, competencies, and health workers' production. Thus, the public sector of Lesotho has to strengthen its health workforce planning for NCD management to include all stakeholders involved with NCD prevention and management.

According to the WHO (2014d:22), health workers' incentive systems, patients with NCDs, and the community are essential to ensure the delivery of services related to NCDs' prevention and management. The incentive systems should be aligned across the different levels of care in the health system to influence health workers, patients with NCDs and the community, and the impact this may have on the provision or consumption of services for NCDs (WHO, 2014d:22). Incentive systems such as financial incentives, salary revisions, access to training, and career development opportunities improved the motivation and retention of health workers in Pakistan (Shah *et al.*, 2016:472) and Ghana (Kwansah *et al.*, 2012:674).

The incentive system for health workers in Mauritius' health system included salaries and allowances linked to position levels, years of service, and assigned responsibilities (Musango *et al.*, 2020:13). However, there were no monetary incentives linked to the outstanding provision of quality NCD care at individual and institutional levels, healthy behaviour change in the population, and better self-management of patients with NCDs (Musango *et al.*, 2020:13). The lack of these incentives could demotivate both health workers and patients with NCDs. Thus, the MOH of Mauritius has to formulate a comprehensive policy and plan for human resources for health to improve recruitment, efficient allocation of health workers, competitive remunerations, performance contracts and assessment, and reduction in attrition of human resources (Musango *et al.*, 2020:18). Section 2.2.2, Chapter two, also highlights issues of motivation and retention of health workers in health facilities in Lesotho.

Likewise, some respondents at DHMTs perceived that rotation systems, incentives, and medical aids were not available to employees at DHMTs (refer to Chapter four: Section 4.4.2.2, Table 4-13). On the contrary, some respondents perceived that training plans, incentives, and rotation

systems were available to personnel (refer to Chapter four: Section 4.4.2.2, Table 4-13). Furthermore, some respondents perceived that employees at OPDs had rotation systems and housing (refer to Chapter four: Section 4.4.2.2, Table 4-13). However, other respondents believed that employees at OPDs did not have medical aids and incentives (refer to Chapter four: Section 4.4.2.2, Table 4-13). Also, certain respondents at DHMTs perceived that employees at healthcare centres had rotation systems and a training plan (refer to Chapter four: Section 4.4.2.2, Table 4-13). However, there were other respondents, who also believed that employees at healthcare centres did not have medical aids (refer to Chapter four: Section 4.4.2.2, Table 4-13). There was a limited response to the availability of incentives, promotion opportunities, and housing to employees at healthcare centres. Based on this low response, these benefits may or may not have been available to personnel at healthcare centres thus, further investigations should be conducted (refer to Chapter four: Section 4.4.2.2, Table 4-13). At OPDs, some respondents thought rotation systems, incentives, housing, and a training plan were available to employees (refer to Chapter four: Section 4.4.2.3, Table 4-14). Some respondents also indicated that employees were not given incentives and medical aids, and there were no rotation systems, a training plan, and housing for personnel at OPDs (refer to Chapter four: Section 4.4.2.3, Table 4-14). Additionally, some respondents at healthcare centres perceived that employees at healthcare centres had rotation systems, they were provided with housing, and employees were given incentives (refer to Chapter four: Section 4.4.2.3, Table 4-14). However, other respondents felt that employees did not have rotation systems, there was no housing for personnel, and employees did not receive incentives (refer to Chapter four: Section 4.4.2.3, Table 4-14). Some respondents further perceived that employees at healthcare centres did not have a training plan, promotion opportunities, and medical aids compared to other respondents who thought otherwise (refer to Chapter four: Section 4.4.2.3, Table 4-14).

Despite the availability of these incentives to employees, some respondents at the MOH perceived that DHMTs and OPDs did not have high attrition rates compared to other respondents who thought that they do (refer to Chapter four: Section 4.4.2.1, Figure 4-4). Other respondents, however, were of the view that healthcare centres had high attrition rates although one respondent thought otherwise (refer to Chapter four: Section 4.4.2.1, Figure 4-4). Only one out of six managers stated that: “*Most health workers seek greener pastures at partner organisations such as Elizabeth Glaser Paediatric AIDS Foundation (EGPATH), Partners in Health (PIH) and some oversees through recruitment agencies*” (refer to Chapter four: Section 4.4.2.1).

Some MOH managers further perceived that pharmacists and district health managers did not have high attrition rates at the DHMTs (refer to Chapter four: Section 4.4.2.1). However, responses to the high attrition rate of public health nurses at DHMTs were limited, thus, there may or may not be a high attrition rate of this personnel. As a result, further investigations should be carried out (refer to Chapter four: Section 4.4.2.1). Certain respondents also indicated that attrition rates were low for pharmacists, the hospital manager for nursing services, matrons, and pharmacy technicians at OPDs (refer to Chapter four: Section 4.4.2.1). Based on the results indicating a limited response to the high attrition rate of nurses at OPDs, there may or may not have been a high attrition rate of nurses thus, this requires further investigation (refer to Chapter four: Section 4.4.2.1). Some respondents perceived that nurses and nurses in charge had high attrition rates at healthcare centres (refer to Chapter four: Section 4.4.2.1).

Chapter four, Section 4.4.2, entailed a detailed discussion on hiring and retaining health workers in Lesotho's health facilities. Nevertheless, the availability and improvement of these benefits (such as medical aids, incentives, promotion opportunities, housing for personnel, training plan, and rotation systems) could remedy the high attrition rates of nurses and nurses in charge in healthcare centres as the benefits will motivate health workers not to resign.

In addition to benefits for employees, other strategies that will assist with the retention and motivation of health workers in health facilities include training, continuing education support, and professional development—these interventions open doors for promotion opportunities for NCD prevention and management employees.

- **Training of health workers in non-communicable disease management**

Training and experience in the prevention and management of NCDs among public health workers are essential, especially in LMICs (Davila *et al.*, 2015; Heller *et al.*, 2019; Schmidt, 2018). Public health workers' training in NCDs prevention and management improves knowledge, competencies and skills of health workers in the prevention and management of NCDs (Davila *et al.*, 2015:343-347; Heller *et al.*, 2019:8), thus training and refresher training is a necessity to health workers at health facilities.

Health workers in public health facilities at the PHC level in Lesotho were trained on the use of basic equipment for the diagnosis and management of NCDs such as thermometers, stethoscopes, sphygmomanometers, measurement tape, weighing scales, glucometers, blood glucose test strips, urine protein test strips and urine ketone test strips (refer to Chapter four: Section 4.6.2.1, Table 4-46; Section 4.6.2.2, Table 4-53).

The pharmaceutical staff was trained on drug supply and medical supplies management where some respondents perceived that pharmaceutical staff at healthcare centres received training on drug supply and medical supplies management (refer to Chapter four: Section 4.6.2.1, Table 4-49). Some respondents at DHMTs indicated that the training on drug supply and medical supplies management covered “*Good inventory management, good storage practice and supply chain management*” (refer to Chapter four: Section 4.6.2.1). Certain respondents further thought that changes recommended due to drug supply and medical supplies management training for pharmaceutical staff were implemented at health facilities (refer to Chapter four: Section 4.6.2.1). Some respondents also perceived these changes made in health facilities include “*improved data and availability of medicines, bin cards for medical supplies were created, and good storage practices were in place*” (refer to Chapter four: Section 4.6.2.1). At OPDs, some respondents perceived that training sessions on drug supply and medical supplies management were held for pharmaceutical staff at OPDs (refer to Chapter four: Section 4.6.2.1, Table 4-54). Other respondents at OPDs further perceived that topics covered during drug supply and medical supplies management training sessions were “*Supply chain management, medical supply management and standard operating procedures for health professionals*” (refer to Chapter four: Section 4.6.2.1). Also, some respondents thought that changes resulting from drug supply and medical supplies management training were not implemented at OPDs (refer to Chapter four: Section 4.6.2.1).

The non-pharmaceutical staff at the PHC level was also trained in drug supply and medical supplies management as perceived by certain respondents at DHMTs and healthcare centres. Certain respondents at DHMTs perceived that non-pharmaceutical staff at OPDs was not trained on drug supply and medical supplies management (refer to Chapter four: Section 4.6.2.1, Table 4-47). Some respondents, on the contrary, perceived that non-pharmaceutical staff at healthcare centres was trained in drug supply and medical supplies management (refer to Chapter four: Section 4.6.2.1, Table 4-47). Some respondents at DHMTs were of the opinion that “*good inventory management, good storage practice and supply chain management*” was covered during drug supply and medical supplies management (refer to Chapter four: Section 4.6.2.1). Other respondents further indicated that changes due to training were implemented at health facilities that include “*Maximum stock levels are never exceeded, and minimum stock levels are never passed*” (refer to Chapter four: Section 4.6.2.1). Additionally, some respondents at healthcare centres perceived that training sessions for non-pharmaceutical staff at healthcare centres on drug supply and medical supplies management were conducted, whereas certain respondents felt that these training sessions were not held (refer to Chapter four: Section 4.6.2.2, Figure 4-11). Other respondents further perceived that the most common topics during

drug supply and medical supplies management training were “*Stores management, requisition of medicines and calculation of average monthly consumption*” (refer to Chapter four: Section 4.6.2.2, Table 4-56). Some respondents also felt that changes made during training sessions on drug supply and medical supplies management were implemented at healthcare centres (refer to Chapter four: Section 4.6.2.2, Figure 4-12).

Furthermore, some respondents at OPDs believed that refresher training sessions for pharmaceutical staff at OPDs on drug supply and medical supplies management were held once a year, whereas other respondents perceived that they were never held (refer to Chapter four: Section 4.6.2.2, Figure 4-10). Certain respondents at healthcare centres also indicated that refresher training sessions on drug supply and medical supplies management were never held for non-pharmaceutical staff at healthcare centres (refer to Chapter four: Section 4.6.2.2, Figure 4-13). However, other respondents perceived that refresher training sessions on drug supply and medical supplies management were held once a year for non-pharmaceutical staff (refer to Chapter four: Section 4.6.2.2, Figure 4-13).

Thus, there is a perception that some health workers in Lesotho's health system were being trained on some aspects of NCD management, such as the use of equipment for diagnosis and monitoring of NCDs compared to drug supply and medical supplies management. Training on NCD prevention and management needs to be improved to have well-rounded health workers with adequate knowledge, competencies, and skills in NCD prevention and management at Lesotho's public health facilities.

- **Continuing education support and professional development for health workers in non-communicable disease management**

Health workers in health facilities at the PHC level have to possess adequate knowledge and competencies to prevent and manage NCDs, which could be achieved by providing professional development and continuing education support to health workers. Countries such as Mauritius created the Mauritius Institute of Health (MIH) which provided opportunities for continuing education for health workers to develop new competencies and skills in NCD prevention and management (Musango *et al.*, 2020:13). Ethiopia has also introduced in-service training for health workers and implemented education and training through curriculum review of undergraduate pharmacy programme (Sporrong *et al.*, 2016:5-6). The professional development and continuing education provided to health workers will improve the competencies and skills of health workers in NCD management and increase the chances of

promotion, which will lead to job satisfaction, including motivation and retention of health workers.

Similarly, Lesotho's public health system provided professional development and continuing education support for health workers at some health facilities at the PHC level (refer to Chapter four: Section 4.6.1.1, Table 4-41; Section 4.6.1.2, Table 4-43). There were respondents at the MOH and DHMTs who thought that professional development and continuing education support was provided to health workers at the different levels of the health system of Lesotho although other respondents felt otherwise (refer to Chapter four: Section 4.6.1.1, Table 4-41; Section 4.6.1.2, Table 4-43). Also, respondents at the MOH had a conflicting view about supporting tools in place that enabled the provision of professional development and continuing education support for health professionals at the PHC level in Lesotho (refer to Chapter four: Section 4.6.1.1, Table 4-42; Section 4.6.1.2, Table 4-44). Some respondents at the MOH thought that study leave, funding for tuition fees, and a harmonised system of work-related training or continuing education across the MOH were supporting tools that assisted with professional development and continuing education support (refer to Chapter four: Section 4.6.1.1, Table 4-42). Some respondents at DHMTs further perceived that supporting tools for professional development and continuing education support included formal work-related training components for all staff levels, and a coordinated in-service training/continuing education system across OPDs and healthcare centre (refer to Chapter four: Section 4.6.1.2, Table 4-44).

Thus, mechanisms to retain health workers are somewhat in place and implemented in the public health system of Lesotho. It appears as if there is a need for the MOH to strengthen the existing benefits of retaining health workers.

5.1.1.2.3 Community health workers in the management of non-communicable diseases

Task-shifting is one of the interventions used to address the shortage of health workers in NCD management and Chapter two, Section 2.2.2 elaborated on task-shifting where CHWs are part of the health team involved with the prevention and management of NCDs. Other countries can use the CHWs programme to address the shortage of health workers and deliver specific services closer to patients' homes, thus improving the healthcare services related to NCDs (Devex, 2019:1). In countries such as China (Long *et al.*, 2018), Liberia (Devex, 2019; IntraHealth International, 2016:5-6) and Eswatini (previously Swaziland) (Swaziland, 2016:10), CHWs (also known as village health workers (VHWs)) were used to provide NCD-related services to patients with NCDs and the community.

The increasing burden of NCDs in countries in the Asian Pacific Region (Bangladesh, China, Nepal and Vietnam) has lead policy-makers to identify innovative approaches to control NCDs by strengthening PHC services and health workforce (Abdulla *et al.*, 2019:1). Thus, CHWs have been recognised as a frontline healthcare workforce to support government actions to combat NCDs in the Asian Pacific Region (Abdulla *et al.*, 2019:1). The NCD-related services provided to patients with NCDs including the community, were follow-up home visits, behavioural change, counselling on a healthy diet, physical activities, measuring blood pressure, and screening NCDs (Long *et al.*, 2018:14; Tsolekile *et al.*, 2018:3-4). These assisted in the early detection of high-risk populations (Long *et al.*, 2018:14; Tsolekile *et al.*, 2018:3-4). These roles performed by CHWs assisted patients with NCDs with diabetes and hypertension, which is an important element of NCD management (Tsolekile *et al.*, 2018:5).

Comparatively, the results from this study (refer to Section 4.4.4.1, Figure 4-5; Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25), indicated that some of the respondents at the MOH, DHMTs and healthcare centres perceived that CHWs were working with some healthcare centres on NCD management and prevention at PHC level in Lesotho. However, some respondents at the MOH perceived that no CHWs worked together with healthcare centres at the PHC level (refer to Chapter four: Section 4.4.4.1, Figure 4-5). Other respondents at DHMTs and healthcare centres also perceived that CHWs were not working together with healthcare centres on NCD management (refer to Chapter four: Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25).

In healthcare centres that collaborated with CHWs in NCD management, CHWs carried out activities related to NCD prevention and management while others did not (refer to Chapter four: Section 4.4.4.2, Table 4-24; Section 4.4.4.3, Table 4-25). Some respondents at DHMTs thought that CHWs held health talks on prevention of NCDs, lifestyle modification, and medication use (refer to Chapter four: Section 4.4.4.2, Table 4-24). Certain respondents believed that CHWs did not use peak flow meters to monitor asthma control and that they did not carry out therapeutic drug level monitoring for epileptic patients (refer to Chapter four: Section 4.4.4.2, Table 4-24). Also, some respondents thought that CHWs in certain healthcare centres monitor blood pressure and blood glucose levels (refer to Chapter four: Section 4.4.4.2, Table 4-24). On the other hand, some respondents at healthcare centres also perceived that CHWs carried out health talks on prevention of NCDs, medication use and lifestyle modification (refer to Chapter four: Section 4.4.4.3, Table 4-25). Certain respondents further believed that CHWs monitor blood pressure and glucose levels (refer to Chapter four: Section 4.4.4.3, Table 4-25). However, most respondents at healthcare centres perceived that CHWs did not monitor asthma control

using peak flow meters and they did not carry out therapeutic drug level monitoring for epileptic patients (refer to Chapter four: Section 4.4.4.3, Table 4-25).

Additionally, guidelines for CHWs are essential because they stated activities to be carried out by CHWs (refer to Chapter four: Section 4.4.6.1, Table 4-32; Section 4.4.6.2, Table 4-33; Section 4.4.6.3, Table 4-34). Some respondents at the MOH, DHMTs and healthcare centres perceived that guidelines that stated the relationship between CHWs and healthcare centres at the PHC level were available (refer to Chapter four: Section 4.4.6.1, Table 4-32; Section 4.4.6.2, Table 4-33; Section 4.4.6.3, Table 4-34). With regard to the major issues covered by these guidelines, certain respondents perceived that home visits, lifestyle counselling on NCDs, nutrition education, and health promotion activities on NCDs were addressed (refer to Chapter four: Section 4.4.6.1, Table 4-32; Section 4.4.6.2, Table 4-33; Section 4.4.6.3, Table 4-34). Furthermore, other respondents thought recording and reporting of NCDs to a healthcare centre, palliative care for patients, monitoring of NCDs, collection of medicines for patients with NCDs, and screening of NCDs were also addressed in the guidelines.

Despite CHWs being able to carry out some of these activities, there seems to be a need for training of CHWs in Lesotho to deliver health services to the community, patients with NCDs in particular. By training health workers, Lesotho can improve the state of health workers' availability within the public health system of Lesotho.

5.1.1.2.4 Training of qualified healthcare personnel

A shortage of health workers can be overcome by strengthening government frameworks to guide the training of health workers by national and international institutions including employment of these health professionals (Kamineni, 2019:1; WHO, 2016d:2-3). With an effort at increasing the number of health professionals in NCD management, some respondents perceived that institutions for higher education in Lesotho, such as the National University of Lesotho (NUL), National Health Training College (NHTC) and the CHAL Nursing College, can train pharmacists, pharmacy technicians, nurses, nurse clinicians and nursing assistants (refer to Chapter four: Section 4.4.5.1, Table 4-31). The increased numbers of health professionals involved in NCD management at the PHC level will solve the shortage and maldistribution of health personnel. Additionally, there was a perceived collaboration between the MOH of Lesotho with SADAC countries about healthcare personnel's training (refer to Chapter four: Section 4.4.5.1) which the respondents believe they relieve the shortage of medical doctors in Lesotho because the NUL, NHTC and the CHAL Nursing College do not train doctors.

Monitoring and clinical supervision are important elements of healthcare services. These assist with ensuring that health workers provide quality healthcare services to patients with NCDs at health facilities.

5.1.1.2.5 Monitoring and clinical supervision of health workers

Clinical supervision is defined as providing clinical practice guidance for qualified health professionals by a more experienced health professional (Kilminster *et al.*, 2007; Lyth, 2000; Milne, 2007). Effective prevention, management and control of NCDs requires frontline health workers to have appropriate training, supervision, and support to be able to carry out a range of activities related to NCDs, thus, ensuring that they are integrated into health teams and the health system (IntraHealth International, 2016:5-8). The Eswatini (previously Swaziland MOH has developed supportive supervision and clinical mentoring frameworks encompassing NCD management in collaboration with stakeholders to complement in-service training (Swaziland, 2016:10,24). Thus, supportive supervision and clinical mentoring helped to combat the increasing burden of NCDs in the country by engaging health workers with relevant competencies and skills to prevent and manage NCDs. Also, the MOH of Tanzania has developed a strategic and action plan to prevent and control NCDs. Supervision and mentoring of trained health workers are priorities for strategic intervention (Government of the United Republic of Tanzania, 2016:27-28). During supportive supervision and mentoring of health workers in NCD prevention and management, the national level supervises regions annually. Regions then supervise districts, and the districts, in turn, supervise health facilities quarterly (Government of the United Republic of Tanzania, 2016:39).

Burundi (Nsengiyumva & Musango, 2013:3) and Lesotho (MOHSW, 2011a:41; GOL, 2013:40) have introduced a district health system responsible for monitoring and supervising health workers at PHC. The study findings indicated that some respondents thought that district health management structures in place in Lesotho included the DHMTs who had the authority to make decisions on the district health plan and budget, human resources, and purchase of drugs and medical supplies (refer to Chapter four: Section 4.4.3.1, Table 4-17; Section 4.4.3.2, Table 4-19).

Chapter four, Section 4.4.3, provided a detailed discussion on monitoring and clinical supervision of health workers. In addition to the DHMTs having authority over human resources, certain respondents felt that they also conducted clinical supervisory visits at OPDs and healthcare centres at the PHC level in Lesotho (refer to Chapter four: Section 4.4.3.2; Section 4.4.3.3). Although DHMTs in Lesotho's health sector conducted clinical supervisory visits at the

PHC level, the number of clinical supervisory visits was below the norm for clinical supervision which indicates that visits at health facilities at the PHC level of Lesotho should be carried out at least once per month at a health facility (UNICEF, 2017b:43) (refer to Chapter four: Section 4.4.3.2, Table 4-20; Section 4.4.3.3, Table 4-22). During the conduction of clinical supervisory visits at OPDs and healthcare centres at the PHC level in Lesotho, some respondents at DHMTs, OPDs and healthcare centres perceived that DHMTs used supervision checklists, supervision plan or schedule, and reports of past supervision visits during clinical supervisory visits at OPDs and healthcare centres (refer to Chapter four: Section 4.4.3.2; Section 4.4.3.3).

Section 5.1.1.3 explains medicines for NCD management which is also an essential component of the health system in managing and controlling NCDs.

5.1.1.3 Medicines for non-communicable disease management

Medicines and medical products are among the most significant healthcare budget components and the private health expenditure in LMICs (WHO, 2019b:1-2). Figure 5-3 presents the proposed structure for medicines for NCD management in the public health system of Lesotho. This structure was developed based on results and discussion on NCDs' medicines in section 4.7 (Chapter four).

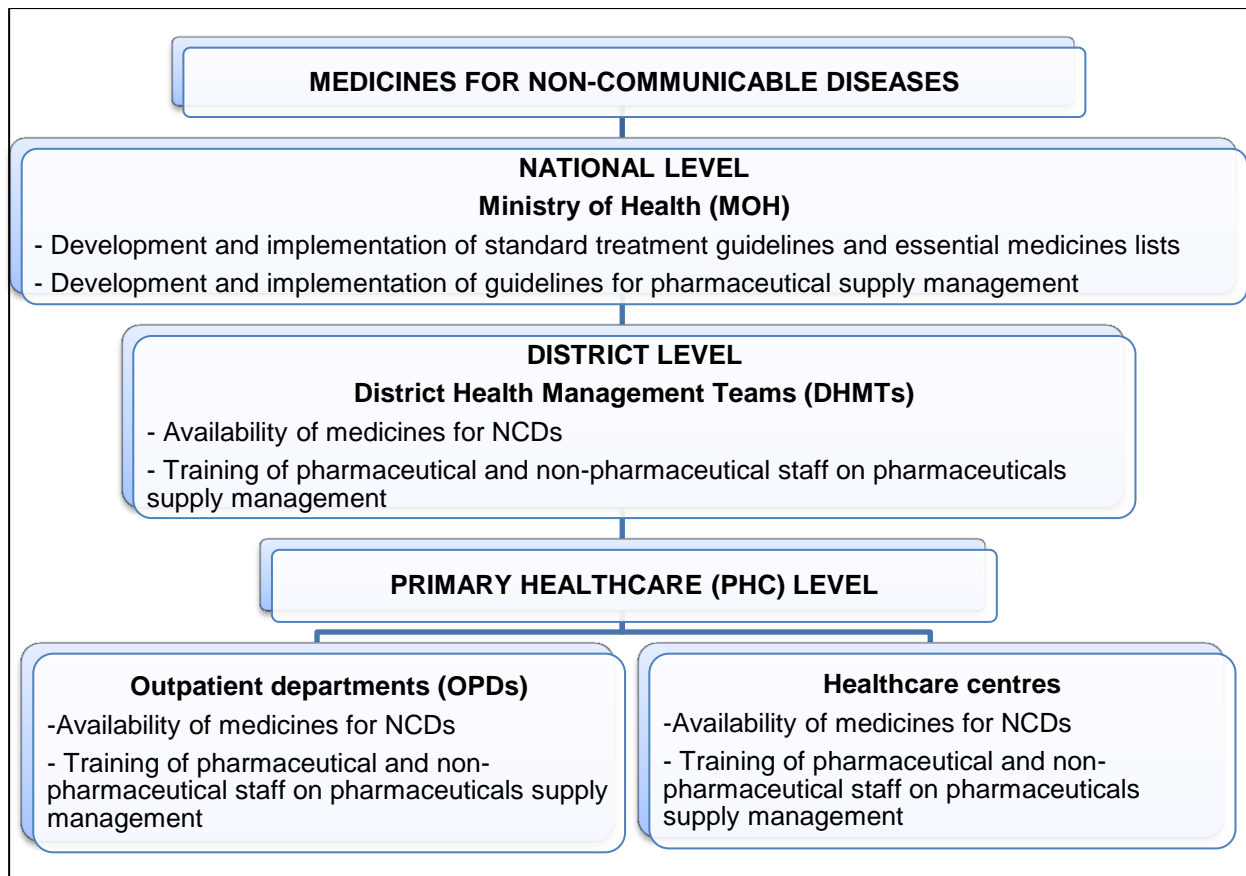


Figure 5-3: Proposed structure of medicines for non-communicable diseases in the public health system of Lesotho

The subsequent sections discuss activities involve when dealing with medicines for NCDs.

5.1.1.3.1 Availability of medicines for the management of non-communicable disease

Consistent availability of essential medicines for NCDs is critical in public health facilities because NCDs are chronic conditions requiring uninterrupted medicines consumption by patients with NCDs. Governments provide minimal funding for medicines in LMICs (WHO, 2019b:43). The limited funding for essential medicines thus affects the availability and affordability of essential medicines resulting in increased out-of-pocket spending for patients (WHO, 2019b:1-2). Therefore, accessing treatment for NCDs in public health facilities in LMICs is a barrier for patients with NCDs as an interruption in the supply of medicines for NCDs leads to uncontrolled NCD management (Armstrong-Hough *et al.*, 2018:8; Cameron *et al.*, 2012:964; Elias *et al.*, 2018:10; Ewen *et al.*, 2017:7; Kankeu *et al.*, 2013:8; Maher *et al.*, 2012:5; Robertson *et al.*, 2015:5; Rockers *et al.*, 2018:5) (refer to Chapter two, Section 2.2.3). To address the availability and affordability of medicines for NCDs in LMICs, the WHO had developed the Model List of Essential Medicines 21st list 2019 (WHO, 2019c). The WHO Model List of Essential Medicines 21st list 2019 helps develop national and institutional essential

medicine lists that list good quality, readily available, and affordable drugs necessary for managing NCDs and other diseases (WHO, 2019c). Similarly, some respondents at DHMTs, OPDs and healthcare centres perceived that most essential medicines used in the management of diabetes mellitus, hypertension, asthma and epilepsy were available in public health facilities at the PHC level in the health system of Lesotho due to limited out-of-stock cases (refer to Chapter four: Section 4.7.1.1, Figure 4-14; Section 4.7.1.2, Table 4-62, Table 4-63 and Table 4-64).

In Chapter four (refer to Section 4.7.1.2, Table 4-63 and Table 4-64), perceptions of respondents at OPDs and healthcare centres on the type of medicines for NCDs that were available and those that were not in public health facilities in Lesotho were presented. Some respondents at OPDs perceived that gliclazide, glibenclamide, metformin, and actraphane were available to manage diabetes mellitus at OPDs (refer to Chapter four: Section 4.7.1.2, Table 4-63). Other respondents perceived that antihypertensive medicines available at OPDs included hydralazine, hydrochlorothiazide, atenolol, methyldopa, nifedipine, and captopril (refer to Chapter four: Section 4.7.1.2, Table 4-63). Some respondents also thought that available antiasthmatic medicines included salbutamol tablets, beclomethasone and salbutamol inhalers, and prednisolone tablets (refer to Chapter four: Section 4.7.1.2, Table 4-63). Some respondents at OPDs further indicated that anti-epileptic medicines available were phenytoin, carbamazepine, phenobarbitone, sodium valproate, and diazepam (refer to Chapter four: Section 4.7.1.2, Table 4-63). Additionally, some respondents at healthcare centres perceived that glibenclamide, metformin and actraphane were available for the management of diabetes mellitus at healthcare centres (refer to Chapter four: Section 4.7.1.2, Table 4-64). All respondents at healthcare centres thought that hydrochlorothiazide and methyldopa were available to manage hypertension at healthcare centres (refer to Chapter four: Section 4.7.1.2, Table 4-64). Certain respondents were of the view that salbutamol tablets, salbutamol inhalers and prednisolone tablets were available to manage patients with asthma at healthcare centres (refer to Chapter four: Section 4.7.1.2, Table 4-64). Some respondents also perceived that the anti-epileptics available to manage epilepsy at healthcare centres were phenytoin, phenobarbitone, sodium valproate, carbamazepine, and diazepam tablets (refer to Chapter four: Section 4.7.1.2, Table 4-64). The essential medicines for NCDs in Lesotho's public health facilities were as per the WHO Model List of Essential Medicines 21st list 2019 (refer to Chapter four: Section 4.7.1, Table 4-58; Section 4.7.1.2, Table 4-86 & Table 4-64). Also, medicines used to manage NCDs at health facilities were mostly available.

Not all pharmaceutical and non-pharmaceutical staff in Lesotho's public health facilities received in-service training on drug supply and medical supplies management (refer to Chapter four,

Section 4.6.2 and Chapter five, Section 5.1.1.2.2). It, therefore, seems that competencies and skills of health workers in pharmaceuticals supply management could be improved by in-service training on drug supply management to prevent shortages of medicines for NCDs that could occur in health facilities (refer to Chapter four: Section 4.6.2.1, Table 4-47, Table 4-48, Table 4-49 & Table 4-50; Section 4.6.2.2, Table 4-54 & Figure 4-11).

To further improve the availability and affordability of essential medicines for NCDs, standard treatment guidelines (STGs) and essential medicines list (EML) should be available and implemented in all health system levels.

5.1.1.3.2 Availability of standard treatment guidelines and essential medicines list

The WHO Model List of Essential Medicines 21st list 2019 contains the available and affordable list of medicines used in NCD management that could be used by LMICs when developing their essential medicines lists (WHO, 2019c). The Republic of South Africa has the PHC STGs and EML list 6th edition 2018 that guide health professionals in the management of NCDs as well as guiding referral of patients with NCDs who have developed complications to health facilities with resources to manage those complications (Republic of South Africa, 2018). The availability of STGs and EML in PHC facilities will promote the management of NCDs as per protocol, improving health outcomes.

The type of medicines for NCDs available in Lesotho's public health facilities was in line with the Lesotho EML 2017 except for prednisolone tablets and diazepam (refer to Chapter four: Section 4.7.1, Table 4-58; Section 4.7.1.2, Table 4-63 & Table 4-64).

Most respondents at the MOH, DHMTs, OPDs and healthcare centres perceived that an EML and STGs used in the management of hypertension, diabetes mellitus, asthma and epilepsy were available and in use at health facilities at PHC level in Lesotho (refer to Chapter four: Section 4.7.2.1; Section 4.7.2.2, Table 4-67; Section 4.7.2.3, Table 4-69 and Table 4-70). Furthermore, some respondents at OPDs and healthcare centres thought that the EML included medicines for the management of diabetes mellitus, hypertension, asthma and epilepsy (refer to Chapter four: Section 4.7.2.3).

In conclusion, STGs and EMLs guide health workers on NCD management thus, their availability is essential at all public health facilities in Lesotho.

5.1.1.3.3 Guidelines for pharmaceuticals supply management

The MOH at the national level has a pharmaceutical section which deals with the drug supply chain to all public health facilities in a country and works in collaboration with the central medical store to ensure that medicines used to manage chronic diseases are readily available in health facilities and at affordable prices (WHO, 1994:5-6). The Ministry of Health and Child Welfare in Zimbabwe works with the National Pharmaceutical Company of Zimbabwe, a national drug supplier, and supplies pharmaceutical products to government health facilities (Mdege *et al.*, 2016:879; Zimbabwe. Ministry of Health and Child Care, 2017:1). The MOH in Lesotho in collaboration with the National Drug Supply Organisation (NDSO), is responsible for procurement, storage and distribution of medicines and medical supplies for healthcare facilities (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10) (refer to Section 3.2.3.2, Chapter three). Most respondents perceived that the main supplier of medicines for NCDs at public health facilities in Lesotho was the NDSO (refer to Chapter four, Section 4.7.1.1 and Section 4.7.1.2).

The procurement system affects the availability of essential medicines in health facilities. For example, the Ministry of Public Health (MoPH) in Afghanistan uses quantification methods such as consumption, morbidity, proxy consumption, and service-level budget projection methods, with the consumption method being the most utilised method of quantification. These quantification methods ensure access to safe, effective, and quality essential medicines for patients (Islamic Republic of Afghanistan Ministry of Public Health, 2014:11). The National Pharmaceutical Services of Gambia also uses procurement methods such as open and restricted tendering and direct or single procurement for the purchase and supply management of medicines and medical supplies for public health facilities, including government hospitals (Sine *et al.*, 2019:30).

As per Section 4.7.5 (Chapter four), some respondents at the MOH thought that the methods of quantification used for drug needs or consumption at the national level of the public health system of Lesotho included consumption method, morbidity method, informed push system and service-level projection of budget requirements (refer to Chapter four: Section 4.7.5.1, Table 4-74). However, the national level mostly used the consumption method (refer to Chapter four: Section 4.7.5.1, Table 4-74). Some respondents at the MOH also perceived that Lesotho's procurement system management had policies and standard operating procedures (SOPs) on medicine procurement that specified the most cost-effective medicines in place (refer to Chapter four: Section 4.7.5.1, Table 4-75). Other respondents at the MOH further indicated that the procurement methods mainly used in medicines and medical devices purchase for health

facilities in Lesotho included restricted tender and direct procurement (refer to Chapter four: Section 4.7.5.1, Table 4-76).

Although tools to support the procurement system were in place, some respondents at the MOH perceived that the procurement process was inefficient (refer to Chapter four, Section 4.7.5.1). Some respondents further thought that this inefficiency was because the Government health facilities were only allowed to procure from one supplier, NDSO, whose pricing for drugs is not controlled by the Government, whereas the NDSO also had frequent stock-outs (refer to Chapter four, Section 4.7.5.1). Thus, the public health sector's procurement system in Lesotho needs strengthening to ensure the availability of medicines for NCD management in all public health facilities.

There is also a health management and information systems (HMIS) component of the proposed NCD management structure which will be discussed subsequently.

5.1.1.4 Health management and information systems

Policy-making and decision-making in improving healthcare services' effectiveness and efficiency in public healthcare facilities by decision-makers at all levels of health systems are made based on data produced by health information systems (HIS) (UNICEF, 2016:5; WHO, 2008c:3; WHO, 2010f:44). Data collection, processing, reporting, analysis, dissemination, and use of information by decision-makers and in policy-making all form part of HIS (WHO, 2008c:3; WHO, 2010f:44). The data includes clinical data, diagnostic and laboratory information and recorded information on patients for certain diseases (Hong *et al.*, 2018:176; Tan *et al.*, 2015:546-547).

Refer to Section 2.2.4 (Chapter two) for an elaborate discussion on HMIS and Section 3.2.3.3 (Chapter three) for a detailed description of health information and research in Lesotho's public health system. Figure 5-4 portrays a proposed structure for HMIS in Lesotho's public health system, developed based on results and discussion of HMIS in Section 4.8 (Chapter four).

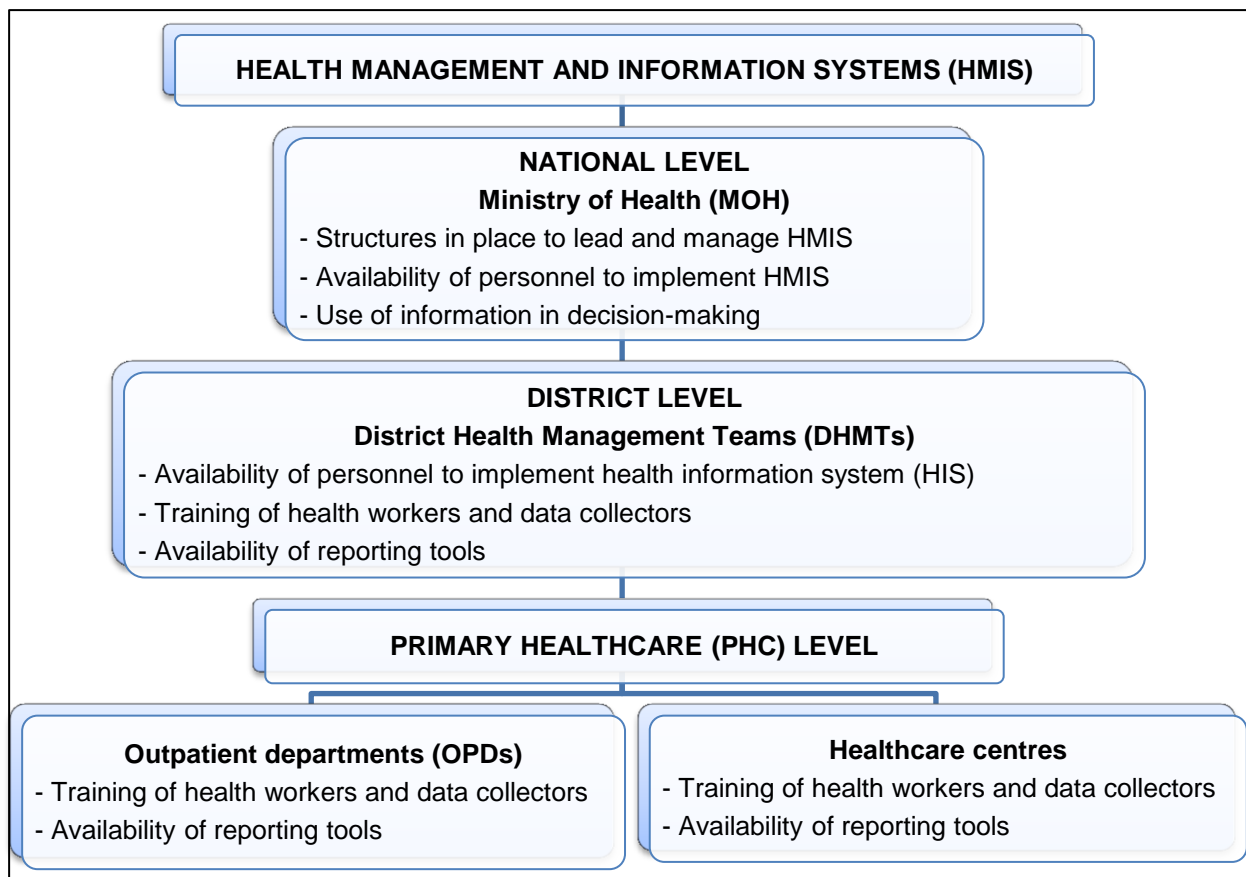


Figure 5-4: Proposed structure for health management and information systems in the public health system of Lesotho

In the following section, the components of the proposed structure for HMIS in Lesotho's public health system are discussed.

5.1.1.4.1 Structures to lead and manage health information systems

For structures that lead and manage HIS to be in place, they have to be supported by policy. The Lesotho Bureau of Statistics Act (2001) is a legal document, ensuring that all statistics are produced in an objective, scientific and unbiased way. African countries battling with the burden of NCDs such as Kenya (Republic of Kenya, 2014:2), South Africa (Republic of South Africa, 2011:7) and Lesotho (refer to Section 4.8.7, Chapter four) have health information policies that guide the health systems on structures needed to generate good quality data to be used in assessing healthcare and in monitoring the performance of the health systems. The HIS structure in place in Malawi is the Central Monitoring and Evaluation Division (CMED) within the Ministry of Health and Population, which is responsible for monitoring and evaluation as well as for setting guidelines and indicators, collating and analysing data, monitoring implementation and progress, and disseminating findings (Government of the Republic of Malawi, 2018).

Some respondents at the Lesotho MOH perceived that the MOH has an appointed and active institutional mechanism, responsible for analysis of health statistics concerning NCD management in the public health system of Lesotho (refer to Chapter four: Section 4.8.6.1, Table 4-91). Similarly, according to the MOH of Lesotho (MOHSW, 2010:95), a designated and functioning institutional mechanism, known as the Health Planning and Statistics Unit (HPSU), was charged with analysis of health statistics. Certain respondents also indicated that structures were in place that led and managed the Lesotho health system information system (HSIS) in NCD management (refer to Chapter four: Section 4.8.8.1, Table 4-94). These structures included operational national HIS administrative units that design, develop and support collection, management, analysis, dissemination, and use of health information for planning and management (refer to Chapter four: Section 4.8.8.1, Table 4-94). There were also meetings and a multi-year plan to harmonise the timing, measured key variables, and funding of nationally representative population-focused surveys that measure health indicators (refer to Chapter four: Section 4.8.8.1, Table 4-94). The National Statistics Office and the MOH had established coordination mechanisms (refer to Chapter four: Section 4.8.8.1, Table 4-94). Furthermore, the country's health and statistical constituencies worked together on the design and implementation of the survey, and data analysis and use (refer to Chapter four: Section 4.8.8.1, Table 4-94).

Additionally, some respondents at the MOH perceived that certain facilities had working equipment for collecting, managing and transmitting 'NCDs' data and, computers at the national, district and the PHC levels to compile 'NCDs' data (refer to Chapter four: Section 4.8.8.1, Figure 4-21). There were respondents who thought some DHMTs at the district level had computers (refer to Chapter four: Section 4.8.8.1, Figure 4-21). Also, some respondents perceived that some OPDs and healthcare centres at PHC level had computers (refer to Chapter four: Section 4.8.8.1, Figure 4-21).

Therefore, there are structures in place to lead and manage HIS in the health system of Lesotho although, there were no HSIS information dissemination systems in place at the national level in Lesotho, such as a website for country statistics, (refer to Chapter four: Section 4.8.8.1, Table 4-97), thus, making the latest reports and data on NCDs unavailable to the public. Also, a lack of computers in some health facilities could be a contributing factor to the latest reports and data on NCDs being unavailable.

The structures leading and managing HIS in the health sector of Lesotho need trained personnel.

- **Training of health workers in health information system**

Chapter four, Section 4.8.8.1, Table 4-93 showed that some respondents at the MOH perceived that epidemiology training for HIS staff at the national and district levels did not occur. The results on capacity-building activities such as statistical training, software maintenance and database maintenance showed that certain respondents perceived that these activities took place, compared to other respondents who thought otherwise (refer to Chapter four: Section 4.8.8.1, Table 4-93). Some respondents further indicated that the capacity-building activities at the PHC level included data collection, analysis and presentation of NCDs data (refer to Chapter four: Section 4.8.8.1). A detailed discussion on the training of health workers on HIS was presented in Section 4.8.8 (Chapter four).

Thus, there are structures to lead and manage HMIS and information and communication technology (ICT) infrastructure. However, ICT infrastructure has to be strengthened significantly at PHC levels (refer to Chapter four: Section 4.8.8.1, Table 4-94); furthermore, HIS staff training at the national, district and PHC levels has to be improved. Also, HSIS information dissemination systems have to be implemented to enable sharing of NCDs information with national, district and PHC levels and the community.

5.1.1.4.2 Availability of personnel to implement health management and information system

The HMIS strategic plan 2013-2017 focuses on the availability of relevant, accurate and complete health information through trained and highly motivated staff with necessary resources and appropriate technology (MOH, 2013:14). Most health facilities in Sindh (Pakistan) had also trained personnel in HMIS reporting, resulting in the submission of correct, complete and accurate information (Kumar *et al.*, 2012:11). In contrast, the newly appointed HMIS staff at the district level in Malawi (including clerks) lacked basic training, supervision, and mentorship on data management, despite various government training efforts (Government of the Republic of Malawi, 2018:8).

Chapter four, Section 4.8.5, provides an elaborate discussion of HIS personnel in Lesotho. Some respondents at the MOH perceived that there was sufficient personnel hired to implement an effective HSIS in Lesotho's health system, but other respondents also perceived that the personnel employed was insufficient (refer to Chapter four, Section 4.8.5.1). Some respondents further perceived that the HIS had a network of qualified health information staff in place at the district level (refer to Chapter four, Section 4.8.5.1, Table 4-86). Additionally, some respondents indicated that health workers in health facilities received regular training in health information through work-related training in the public sector, and there were designated full-time health

information officer positions at the district level (refer to Chapter four: Section 4.8.5.1, Table 4-86).

The generated information from the HMIS is used in planning and making decisions at different levels of the health system including monitoring the performance of NCDs programmes.

5.1.1.4.3 Use of non-communicable diseases data in a decision-making

The HIS data at health facilities are used to make decisions on health services and health outcomes related to NCDs by decision-makers at the national level. Countries such as Liberia (Republic of Liberia, 2015:7), Malawi (Government of the Republic of Malawi, 2018:11) and Finland (WHO/Europe, 2015:20) have HIS that collects and analyses data to be used in decision-making at national and health facility levels. The main challenge of HIS in Malawi is that the collected data is often not used in decision-making and planning (Government of the Republic of Malawi, 2018:11). This is because of a lack of regular information and documents that make data readily available, limited systems to enable easy incorporation of data into decision-making, and mistrust in the available data (Government of the Republic of Malawi, 2018:11).

The analysis and presentation of information generated by HIS in Lesotho were discussed in Chapter four, Section 4.8.4. Some respondents at the DHMTs perceived that data on NCDs were analysed by employees at the DHMTs (refer to Chapter four, Section 4.8.4.1). However, other respondents at OPDs perceived that NCDs statistics were not being analysed by staff at OPDs (refer to Chapter four, Section 4.8.4.2). Similarly, some respondents at healthcare centres thought that NCDs statistics were not analysed by staff at healthcare centres (refer to Chapter four, Section 4.8.4.2). Furthermore, certain respondents at DHMTs, OPDs and healthcare centres were of the opinion that the analysed NCDs data were presented using “*graphs*” and “*tables*” (refer to Chapter four, Section 4.8.5.1; Section 4.8.4.2).

The information generated by HIS in Lesotho was used by some health facilities in decision-making while other health facilities did not use this information. Some respondents at OPDs perceived that employees at OPDs did not use the analysed statistics on NCDs management in decision-making (refer to Chapter four, Section 4.8.4.2). At healthcare centres, some respondents perceived that employees mainly used analysed data on NCDs in decision-making (refer to Chapter four, Section 4.8.4.2). Furthermore, certain respondents at the MOH perceived that the data on population-based surveys were not used to analyse individual needs and experiences of women, men, girls and boys with NCDs (refer to Chapter four: Section 4.8.6.1, Table 4-90). Other respondents at the MOH, on the contrary, thought that the data on recurrent

HIS and facility surveys were used to analyse individual needs and experiences of women, men, girls, and boys with NCDs (refer to Chapter four: Section 4.8.6.1, Table 4-90). Information from HIS on NCDs was not used in decision-making on allocating human resources at the national, district and PHC levels (refer to Chapter four: Section 4.8.6.1, Table 4-92). Some respondents at the MOH (refer to Chapter four, Section 4.8.6, Table 4-89) stated that Lesotho's public health system analysed and synthesised NCDs data to generate valuable information about population health status and needs, and health system performance. Also, some respondents at the MOH thought that population projections by age and sex for the current year at DHMTs, OPDs and healthcare centres were not available (refer to Chapter four: Section 4.8.6.1, Table 4-89).

Thus, based on the analysis of data for this study, it seems as if the use of information from HIS in making decisions at all levels of Lesotho's public health system has to be strengthened to cater to all aspects of NCD management such as human and financial resources allocation. Improvements in the use of 'NCDs' data in decision-making at national, district and PHC levels of Lesotho's health system are important because the data can help with resource allocation and in monitoring the performance of the health system at different levels.

The last element of the proposed NCD management structure was health infrastructure and equipment, which will be discussed in the following section.

5.1.1.5 Health infrastructure and equipment

The state of health infrastructure and equipment of Lesotho's public health system was discussed in Section 3.2.3.5 (Chapter three). Availability of functional and well-maintained essential equipment in health facilities enables easy and appropriate screening for, diagnosis and monitoring of NCDs in patients and the community. The proposed structure of health infrastructure and equipment in Lesotho's public health system is presented in Figure 5-5. This structure was developed based on the results and discussion of specific objectives for health infrastructure and equipment in Lesotho's public health system (refer to Chapter four, Section 4.10).

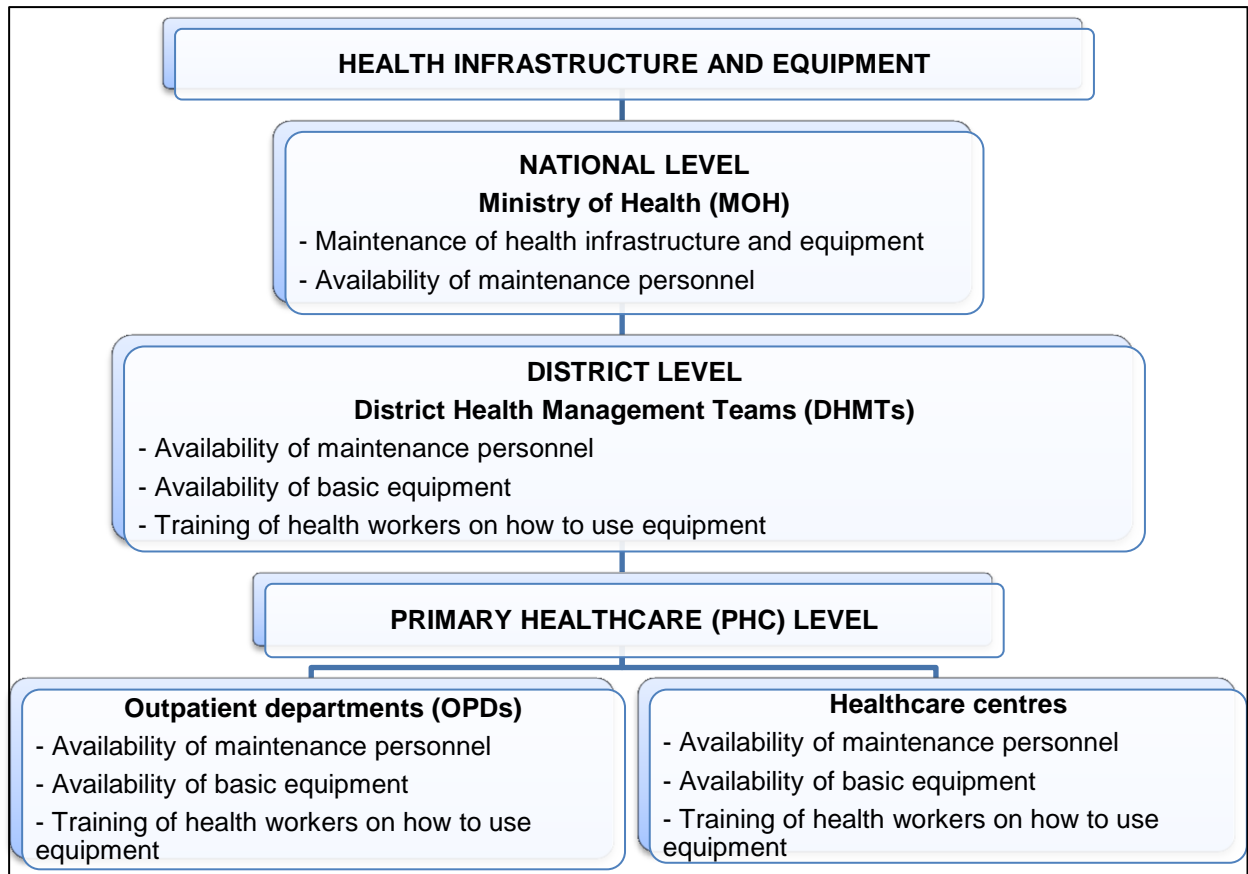


Figure 5-5: Proposed structure for health infrastructure and equipment in the public health system of Lesotho

The subsequent sections discuss the activities that have to be carried out at the different levels of Lesotho’s health system (Figure 5-5).

5.1.1.5.1 Availability of medical equipment for non-communicable diseases diagnosis and management

In strengthening the health system, the Global Action Plan for the Prevention and Control of NCDs emphasised the importance of medical equipment by stating that 80% of the affordable basic technology required to treat major NCDs should be available in both public and private health facilities (WHO, 2013:41). The WHO has developed a list of essential equipment that should be available in public healthcare facilities in low-resource settings known as the WHO Package of Essential Non-communicable (PEN) disease interventions for PHC in low-resource settings (WHO, 2010b:35-36). The selected cost-effective basic equipment includes a few core medical devices such as weighing scales, sphygmomanometers, peak flow meters and equipment for urine protein and ketones, and blood glucose analysis (WHO, 2010b:35). This equipment will assist health facilities to diagnose and monitor NCDs with ease because they are

affordable and readily available. Essential equipment in public health facilities in countries such as Ethiopia (Bekele *et al.*, 2017:112), India (Jayanna *et al.*, 2019:7; Pakhare *et al.*, 2015:3-6), Bangladesh (Rawal *et al.*, 2019:4) and Uganda (Rogers *et al.*, 2018:5) include sphygmomanometers, measuring tape, scale, peak flow meters, spacers for inhalers, glucometers, urine protein and ketone testing strips, and blood glucose test strips. This equipment enables these countries to diagnose and manage NCDs at the PHC level.

As one of the low-resource-setting countries, Lesotho has used the WHO PEN (WHO, 2010b:35-36) when acquiring equipment for its health facilities. A detailed discussion on the availability of essential equipment used to diagnose and monitor NCDs in Lesotho's public health system is presented in Chapter four, Section 4.10.2.

Some respondents at the DHMTs thought that OPDs did not have a standard list for equipment for diagnosis of NCDs (refer to Chapter four: Section 4.10.2.2, Table 4-114). However, other respondents perceived that OPDs had standard lists for equipment for monitoring blood pressure, glucose level, asthmatic patients, and for therapeutic drug level monitoring for epileptic patients (refer to Chapter four: Section 4.10.2.2, Table 4-114). Some respondents at DHMTs further perceived that healthcare centres had a list of equipment for diagnosis of NCDs and monitoring of blood pressure and glucose level (refer to Chapter four: Section 4.10.2.2, Table 4-114). Other respondents at DHMTs, however, perceived that healthcare centres did not have equipment for monitoring asthmatic patients and for therapeutic drug level monitoring for epileptic patients (refer to Chapter four: Section 4.10.2.2, Table 4-114).

At OPDs, some respondents perceived that OPDs had a list of equipment for NCDs diagnosis, therapeutic drug level monitoring for epileptic patients, and for monitoring blood pressure, glucose level and asthmatic patients (refer to Chapter four: Section 4.10.2.3, Table 4-116). However, certain respondents thought that a list for equipment for monitoring asthmatic patients and for therapeutic drug level monitoring for epileptic patients was not available (refer to Chapter four: Section 4.10.2.3, Table 4-116). Additionally, some respondents at healthcare centres mainly perceived that a standard list of equipment for NCDs diagnosis and monitoring of blood pressure and glucose level were available at healthcare centres (refer to Chapter four: Section 4.10.2.3, Table 4-116). However, some respondents mainly thought that healthcare centres lacked the equipment to monitor asthmatic patients and for therapeutic drug level monitoring for epileptic patients (refer to Chapter four: Section 4.10.2.3, Table 4-116).

Most respondents at DHMTs, OPDs and healthcare centres perceived that available and functional equipment for diagnosis and monitoring of NCDs in public health facilities in Lesotho

include a sphygmomanometer, measuring tape, scale, peak flow meter, spacers for inhalers, glucometer, urine protein and ketone testing strips, and blood glucose test strips (refer to Chapter four: Section 4.10.2.2, Table 4-115; Section 4.10.2.3, Table 4-117 & Table 4-118). However, equipment such as peak flow meters, spacers for inhalers, and therapeutic drug level monitoring for epileptic patients was not available in some health facilities.

- **Training of health workers on how to use the equipment for diagnosis and monitoring of non-communicable diseases**

Although some health workers at the PHC level were not trained on the use of the equipment for diagnosis and monitoring of NCDs, Section 4.6.2 (Chapter four) indicated that most health workers at the PHC level in Lesotho were trained on the use of basic equipment for diagnosis and management of NCDs. These health workers were trained on how to use thermometers, stethoscopes, sphygmomanometers, measurement tape, weighing scales, glucometers, blood glucose test strips, urine protein and ketone test strips (refer to Chapter four: Section 4.6.2.1, Table 4-46; Section 4.6.2.2, Table 4-53). Training of health workers on how to use peak flow meters, spacers for inhalers and therapeutic drug level monitoring for epileptic patients was the most concerning (refer to Chapter four: Section 4.6.2.1, Table 4-46; Section 4.6.2.2, Table 4-53). The lack of training on how to use this equipment could lead to misdiagnosis and mismanagement of asthma and epilepsy at PHC level in Lesotho. It, therefore, seems that training of health workers on the use of equipment for diagnosis and monitoring of NCDs has to be strengthened.

Although most of the equipment used for diagnosis and monitoring of NCDs in public health facilities in Lesotho were functional and available, the unavailability of some of this equipment created challenges when diagnosing and monitoring patients with asthma and epilepsy (refer to Chapter four: Section 4.10.2.2, Table 4-115; Section 4.10.2.3, Table 4-117 & Table 4-118). Thus, improvement in the availability of equipment in public health facilities still has to be addressed by the MOH.

The basic equipment used for diagnosis and monitoring of NCDs in health facilities should be within service dates meaning, the equipment has to be restored and maintained to enable health workers to screen for, diagnose and monitor NCDs and receive reliable readings from the equipment.

5.1.1.5.2 Maintenance of health infrastructure and equipment

Health systems improvement as per the Global Action Plan for the Prevention and Control of NCDs includes improving diagnostic services for NCDs by collaboration with the private sector to improve affordability, accessibility and maintenance of diagnostic equipment and technologies for NCDs (WHO, 2013:101). The National Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2020-2025 of the Republic of South Africa (Republic of South Africa, 2019:99) also reiterated that collaboration with the private sector to improve affordability, accessibility, and maintenance of diagnostic equipment and technologies, to improve diagnostic services for NCDs would improve the health system. Likewise, the MOH of Lesotho has a unit known as the Estate Management Unit (EMU) responsible for the maintenance and restoration of health infrastructure and basic equipment used to diagnose and monitor NCDs (GOL, 2013:19). The Lesotho Health Sector Strategic Plan 2012/13-2016/17 indicated that healthcare centres were maintained by the MOH technicians based in the district hospitals (GOL, 2013:19). The EMU at the MOH was understaffed because technicians were mostly on contracts (GOL, 2013:19). Therefore, there was a lack of institutional capacity to manage infrastructure planning, programming, design, procurement and maintenance by the EMU (GOL, 2013:20).

A detailed discussion about health infrastructure and equipment in public health facilities in Lesotho was provided in Section 4.10.1 (Chapter four). Some respondents at the MOH indicated that a maintenance plan for equipment used in the diagnosis and monitoring of NCDs was not available at certain DHMTs, OPDs and healthcare centres (refer to Chapter four: Section 4.10.1.1). Likewise, certain respondents at DHMTs, OPDs and healthcare centres perceived that there was no maintenance plan for equipment at some health facilities (refer to Chapter four: Section 4.10.1.2). Additionally, some respondents at OPDs perceived that there was a lack of maintenance personnel at OPDs compared to other respondents who were convinced otherwise (refer to Chapter four: Section 4.10.1.3). The majority of respondents at healthcare centres also perceived that there was no maintenance personnel at some healthcare centres (refer to Chapter four: Section 4.10.1.3).

The findings of this study indicated that some respondents at DHMTs, OPDs and healthcare centres perceived that activities to maintain equipment for NCD diagnosis and management at district and PHC levels were carried out (refer to Chapter four: Section 4.10.1.2, Table 4-107; Section 4.10.1.3, Table 4-109). These activities included checking service dates, a monthly inspection of equipment, regular calibration, and yearly replacement of equipment (refer to Chapter four: Section 4.10.1.2, Table 4-107; Section 4.10.1.3, Table 4-109). Thus, the study

findings suggested that there were irregularities in the restoration and maintenance of equipment at district and PHC levels. In terms of health infrastructure, some health facilities at the district and the PHC levels in Lesotho had transportation for providing outreach services and for the evacuation of emergency cases (refer to Chapter four: Section 4.10.1.1, Table 4-105; Section 4.10.1.2, Table 4-106; Section 4.10.1.3, Table 4-108). However, resources to maintain transportation were thought not to be adequate by some respondents while others thought otherwise (refer to Chapter four: Section 4.10.1.1, Table 4-105; Section 4.10.1.2, Table 4-106; Section 4.10.1.3, Table 4-108).

Thus, there were challenges in the restoration and maintenance of equipment at district and PHC levels of Lesotho, due to a shortage of maintenance personnel and a lack of funds, resulting in misdiagnosis and mismanagement of NCDs. The health system of Lesotho needs to strengthen the maintenance of equipment as well as the availability of transportation at district and PHC levels for conducting NCD prevention activities within the community such as health promotion and public education. Additionally, emergency cases could easily be referred to high levels of care with adequate skills and capacity to treat NCD emergencies; thus, decreasing mortality due to NCDs.

5.1.1.6 The proposed structure for non-communicable disease management in the public health system of Lesotho

The proposed structure for NCD management was developed based on results and discussion of specific objectives of this study (refer to Chapter one, Section 1.3.2.2; Chapter four). Figure 5-6 shows the proposed NCD management structure at Lesotho's public health system's different levels. The interlinkage and relationship between the different elements of the proposed structure discussed in this chapter (refer to Chapter five, Section 5.1.1.1 to Section 5.1.1.5) is presented in Figure 5-6.

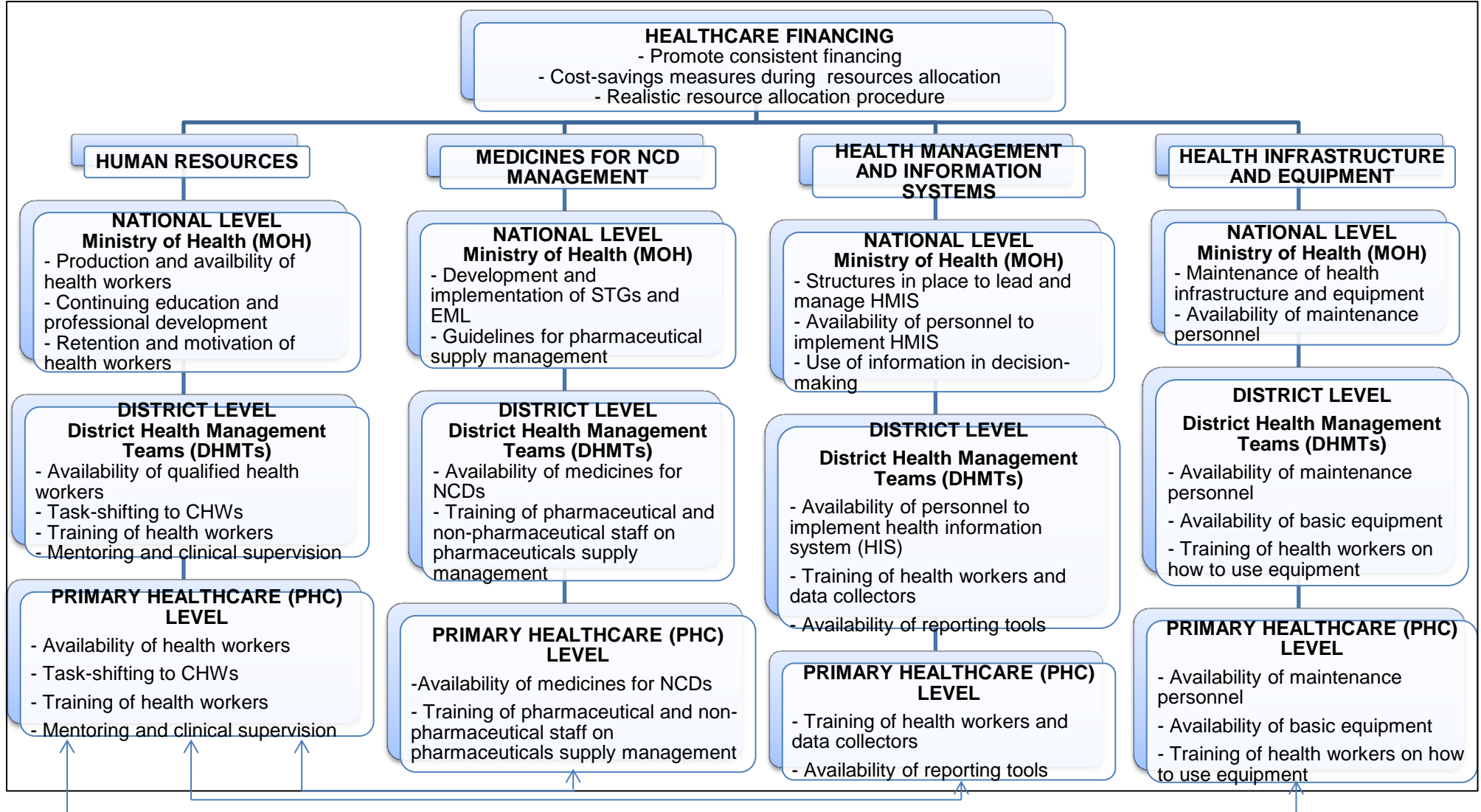


Figure 5-6: Proposed non-communicable disease management structure for the different levels of the public health system of Lesotho

Healthcare financing, human resources, medicines for NCDs, HMIS and health infrastructure and equipment are similar in the proposed and current NCD management structures for the different levels of the public health system of Lesotho. The proposed structure highlights areas that could be strengthened in the current structure.

Healthcare financing in the current structure could be strengthened by promoting consistent financing for NCDs through improving cost-saving measures used during resources allocation; thus, resulting in realistic allocation of resources. Human resources could be improved by the production and availability of health workers through absorbing graduates from institutions of higher education in Lesotho and continuing education and professional development of health workers. Additionally, training of CHWs on the prevention and management of NCDs could be improved to include all NCDs so that CHWs could carry out activities related to NCDs in the community. Mentoring and clinical supervision of health workers in health facilities also could be strengthened to improve the quality of healthcare services for NCDs at health facilities.

Strengthening of the availability of medicines for NCDs could be done through improving the training of pharmaceutical and non-pharmaceutical staff at health facilities on drug supply and medical supplies management including the development, implementation and review of EML, STGs and guidelines for pharmaceutical supply management. Also, structures that lead and manage HMIS could be improved by the availability of personnel to implement HMIS, training health workers and data collectors, and the availability of reporting tools. The proposed structure also highlights the importance of using information for NCDs in decision-making.

Health infrastructure and equipment could be strengthened by having maintenance personnel at different levels of the health system, regular maintenance of infrastructure and equipment, and training of health workers on how to use equipment used for diagnosis and management of NCDs. Therefore, services for NCDs at different levels of the health system including in the community will be improved resulting in decreasing in the prevalence of NCDs.

5.2 Chapter summary

This chapter outlined the proposed NCD management structure of the public health system of Lesotho. The different elements of the proposed NCD management structure were also discussed in detail. Chapter six will entail the conclusions, the benefits of this study, recommendations and limitations of this study.

CHAPTER 6 CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

6.1 Chapter introduction

This chapter focuses on the conclusions generated from the general aims in Chapter one, Section 1.3.1. It also includes the benefits of the study as well as recommendations and limitations of the study.

Section 6.2 entails the conclusions for specific objectives of the literature review. The conclusions and recommendations on the perceptions of managers at the Ministry of Health (MOH), District Health Management Teams (DHMTs), outpatient departments (OPDs) and the healthcare centres will address the general aims (refer to Chapter one, section 1.3.1):

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities, and
- To assess the role of the pharmacist in the national, district and primary healthcare (PHC) levels in the health system of Lesotho concerning the management of hypertension, diabetes mellitus, asthma and epilepsy.

6.2 Conclusions for specific objectives of the literature review

Section 6.2 entails the conclusions of specific research objectives for the literature review stated in Chapter one, Section 1.3.2.1 as follows:

- To determine different health system structures for non-communicable disease (NCD) management;
- To determine how the different health system structures for NCD management progressed from older structures to cater to the increasing prevalence of NCDs;
- To describe NCD management structures in the health system of both developing and developed countries;
- To investigate the expanding role of pharmacists in the management of NCDs, and
- To describe the health system of Lesotho about health service delivery in public health facilities in the management of NCDs.

The following sections 6.2.1 to 6.2.5 will focus on conclusions of these specific objectives individually.

6.2.1 Conclusions for different health system structures for non-communicable disease management

Health systems are composed of six building blocks from the WHO framework to achieve functions such as effective procurement and distribution systems, sufficient healthcare workers, and sustainable financial and health information systems (HIS) to provide improved healthcare (WHO, 2007a:3). The six building blocks are healthcare service delivery, healthcare workers, health information, medicines and medical devices, healthcare financing, and leadership and governance (refer to Chapter two, Section 2.2). These building blocks are interdependent with a common goal of providing improved, affordable and quality healthcare services.

There are different chronic disease management models incorporated into health systems to monitor performance in the provision of services for NCDs, development of health workers, and mobilisation and allocation of finances for NCD management (WHO, 2007a:3). The different chronic disease management models are the chronic care model (CCM) (Wagner *et al.*, 1999; Wagner *et al.*, 2001), the preventive system (Solberg, Kottke, Brekke *et al.*, 1998), the expanded chronic care model (expanded CCM) (Barr *et al.*, 2003), and the innovative care for chronic conditions (ICCC) framework (WHO, 2002) (refer to Chapter two, section 2.3.1). Thus, there are different chronic disease management models that the health system can use either individually or collectively to decrease the burden of NCDs. The different chronic disease models consist of elements designed to assist with managing NCDs in the different levels of the health system. For instance, the CCM consists of healthcare organisation, self-management support, decision support, delivery systems design, clinical information systems and community resources and policies (Wagner *et al.*, 1999:57-59; Wagner *et al.*, 2001:69-70) (refer to Chapter two: Sections 2.3.1.1, Figure 2-3; Sections 2.3.1.1.1 – 2.3.1.1.6). The preventive system consists of ten component processes in the prevention system presented in Table 2-2 (Chapter two) that support the delivery of clinical preventive services (Glasgow *et al.*, 2001:602; Solberg, Kottke, Brekke *et al.*, 1998:33-34) (refer to Chapter two, Sections 2.3.1.2). Barr *et al.* (2003:73) further indicate that the expanded CCM contains similar elements to those in the CCM with the integration of population health promotion to strengthen the community-resources and policy-linkage components of the CCM (refer to Chapter two: Sections 2.3.1.3, Figure 2-4; Sections 2.3.1.3.1–2.3.1.3.7). There is also the ICCC framework developed to meet the shortfalls of the CCM in developing countries (WHO, 2002). The ICCC framework includes components at the micro- (patient and family), meso- (healthcare organisation and community), and macro-levels (policy) (Epping-Jordan *et al.*, 2004:301; WHO, 2002:41) (refer to Chapter two: Sections 2.3.1.4, Figure 2-5; Sections 2.3.1.4.1–2.3.1.4.3).

6.2.2 Conclusions on how the different health system structures for NCD management progressed from older structures to cater to the increasing prevalence of NCDs

Wagner *et al.* (1996:518) developed the first model for improving outcomes in chronic diseases, which consisted of five elements (refer to Chapter two, Section 2.3.1.1, Figure 2-2). This model focused on the implementation of evidence-based, planned care within a health system with guidelines and a plan to assist healthcare workers to comply with guidelines, training of healthcare workers and availability of HIS (Wagner *et al.*, 1996:519). This first model did not take into consideration financial constraints, performance expectations and increasingly informed patients when providing services to patients with NCDs thus, leading to the development of the CCM (Wagner *et al.*, 1999:56) (refer to Chapter two, Section 2.3.1.1). The first model was revised to include the community and self-management support which were lacking (Wagner *et al.*, 1999:57). As a result, the elements of the CCM were healthcare organisation, self-management support, decision support, delivery systems design, clinical information systems, and community resources and policies (Wagner *et al.*, 1999:57-59; Wagner *et al.*, 2001:69-70) (refer to Chapter two, Section 2.3.1.1).

Furtherance in research prompted for the re-evaluation of the six elements of the CCM (Wagner *et al.*, 2001:72). This led to the development of a preventive system by Solberg and others (cited by Glasgow *et al.*, 2001:601-602) that focused mainly on clinical preventive services (refer to Chapter two, Section 2.3.1.2). The preventive system improved the CCM in that it indicated specific elements of preventive care while, the CCM described practice systems characteristics associated with improved preventive care (Glasgow *et al.*, 2001:602). The preventive system highlighted the importance of prevention when trying to decrease the burden of NCDs thus, the expanded CCM was developed to incorporate population health promotion (refer to Chapter two, Section 2.3.1.3). The inclusion of health promotion improved the CCM by strengthening the community-resources and policy-linkage components of the CCM (Barr *et al.*, 2003:73-74; Glasgow *et al.*, 2001:589-590). Therefore, the goal of the expanded CCM is to provide healthcare services to individuals, communities and populations to prevent, manage and control NCDs (Barr *et al.*, 2003:76). This bridges a gap between the health system and the community (Barr *et al.*, 2003:76).

To accommodate developing countries, the innovative care for chronic conditions (ICCC) framework was developed (WHO, 2002) (refer to Chapter two, Section 2.3.1.4). This model was developed to meet the challenges of implementing the CCM in developing countries. Therefore, the ICCC framework includes a more extensive policy environment that encloses patients and their families, healthcare organisation, and communities (WHO, 2002:43).

In conclusion, the CCM (Wagner *et al.*, 1999; Wagner *et al.*, 2001), preventive system (Solberg, Kottke, Brekke *et al.*, 1998), expanded CCM (Barr *et al.*, 2003), and the ICC framework (WHO, 2002) were developed, in light of advancement in research, to cater to the increasing prevalence of NCDs.

6.2.3 Conclusions for non-communicable disease management structures in the health system of both developing and developed countries

The developed and developing countries incorporated the different chronic disease management models in their health systems due to the prevailing increase in NCDs. The developed countries such as the United States of America (USA) (Goodwin, 2006:17), the United Kingdom (UK) (Ham, 2009:191; United Kingdom. Department of Health, 2005:8), Australia (Browning & Thomas, 2015:1; Dennis *et al.*, 2008:S53) and Canada (Martin, 2007:2087; Nolte *et al.*, 2008:164) have adapted different chronic disease management models within their health systems to manage NCDs (refer to Chapter two, Section 2.4.1). The USA uses the CCM (Goodwin, 2006:17), whereas the UK has incorporated the CCM (Ham, 2009:191) and the National Health Service (NHS) and Social Care model (United Kingdom. Department of Health, 2005:8). Additionally, Canada has adopted the CCM (Martin, 2007:2087); furthermore, the Government of British Columbia has implemented the expanded CCM (Nolte *et al.*, 2008:164).

Chapter two, section 2.4.2, shows that South Africa uses an Integrated Chronic Disease Management (ICDM) model (Mahomed & Asmall, 2015:9; Mahomed *et al.*, 2016:2) to improve the provision of healthcare services for NCDs. The ICDM model was developed based on the CCM (Wagner *et al.*, 1999:57-59) and the WHO ICC framework (WHO, 2002:41). In contrast, Cameroon uses the biomedical and the traditional medicine systems (Aikins *et al.*, 2010:9) and Ghana uses the biomedical, ethnomedical, and faith-healing systems (Aikins *et al.*, 2010:5) when managing NCDs.

Thus, some developed and developing countries have integrated chronic disease models in their health systems to strengthen the prevention and management of NCDs.

6.2.4 Conclusion for the expanding role of pharmacists in the management of non-communicable diseases

Pharmacists work with other health workers, patients and the community to effectively prevent and manage NCDs (Systems for Improved Access to Pharmaceuticals and Services (SIPAS), 2014:10; WHO, 2018c:8). Pharmacists have different roles at the national, district and PHC levels during the management of NCDs (refer to Chapter two, Section 2.5). Pharmacists at the

national level are involved with the drug supply chain and work together with central medical stores to ensure that medicines for NCDs are available at health facilities (Government of Lesotho (GOL), 2016:29; Mdege *et al.*, 2016:879) (refer to Chapter two, Section 2.5.1). Furthermore, pharmacists carry out forecasting and budgeting for drugs to be consumed during every financial year (ASHP, 2008:527; Bernard *et al.*, 2010:330; OECD, 2019:10-15). They also use HIS to manage medicines for NCDs (ASHP, 2008:536-537; Bigdeli *et al.*, 2014:97-98).

Pharmacists at the district level supervise and monitor healthcare workers on drug-related issues in healthcare facilities (South African Pharmacy Council (SAPC), 2004:29) (refer to Chapter two, Section 2.5.2). As part of the district management team (DMT) pharmacists also plan, coordinate, and monitor pharmaceuticals at the district level (Bradley *et al.* 2015:4-5). Furthermore, pharmacists at the PHC level support primary prevention and NCD management by providing affordable, good quality medicines to manage NCDs (SIAPS, 2014:2). Pharmacists at the PHC level also dispense medicines for NCDs, screen and monitor NCDs, provide lifestyle counselling, offer medication therapy management, and are involved with public health and health promotion (FIP, 2019:6; George & Zairina, 2016:3; Morrison *et al.*, 2012:2; SIAPS, 2014:5-8).

6.2.5 Conclusions on the health system of Lesotho about health service delivery in public health facilities in the management of NCDs.

Health service delivery is carried out at public health facilities such as referral hospitals, speciality hospitals, district hospitals, filter clinics, and healthcare centres (GOL, 2016:9). The Government of Lesotho has a memorandum of understanding with the Christian Health Association of Lesotho (CHAL) to provide free services at healthcare centres and apply uniform costs in CHAL hospitals (Wade, 2015:6). Thus, some of the district hospitals and healthcare centres in the public health system of Lesotho belong to CHAL (GOL, 2016:10) (refer to Chapter three, Section 3.2.1, Figure 3-1).

The Lesotho health service delivery is offered at three levels of care which are primary, secondary and tertiary (MOHSW, 2010:80; MOH, 2016a:24) (refer to Chapter three, section 3.2.1). The primary level of care consists of healthcare centres, health posts and all community-level initiatives and provides basic health services such as diagnosis, treatment and management of patients with NCDs (GOL, 2016:10) (refer to Chapter three, Section 3.2.1.1).

The district level of care consists of filter clinics and district hospitals (GOL, 2016:10; MOH, 2016a:24) (refer to Chapter three, Section 3.2.1.2). Filter clinics offer curative and preventive services and limited inpatient care (MOH, 2016a:24). There is a district hospital in each district

in Lesotho except for the Maseru district that serves as a referral facility for filter clinics and healthcare centres (GOL, 2013:10; GOL, 2016:10). The district hospitals have both inpatient and outpatient departments (OPDs) and OPDs offer PHC services because people residing in towns do not have access to free services offered in the healthcare centres (GOL, 2013:10; GOL, 2016:10; MOH, 2014a:9). The district hospitals offer complex treatment and diagnostic services as compared to filter clinics and healthcare centres such as operative services, ophthalmic care, mental health services, dental services, and specialised care for tuberculosis (TB), human immunodeficiency virus (HIV) and NCDs (MOH, 2014a:9).

The tertiary level of care is composed of one national referral hospital namely the Queen Mmamohato Memorial hospital (QMMH) and two specialised hospitals namely Mohlomi Mental hospital and Bots'abelo Leprosy hospital (GOL, 2016:10; GOL, 2013:10). The district hospitals refer complex cases to the QMMH, and if they are too difficult for the QMMH, the QMMH refers these cases to South Africa for quaternary care (GOL, 2016:11; GOL, 2013:10).

6.3 Conclusion and recommendations for specific objectives of the empirical investigation

The conclusions and recommendations in this section are based on managers' perceptions at the MOH, DHMTs, OPDs and the healthcare centres about the specific objectives as stated in Section 1.3.2.2 (Chapter one) also, refer to Chapter four for a detailed presentation of results.

The conclusions and recommendations will be divided into specific objectives of the empirical study, as stated in Chapter one, Section 1.3.2.2. They will further be subdivided into the MOH, district and PHC levels.

6.3.1 Conclusions and recommendations for the specific objectives for human resources

The conclusions and recommendations about human resources were sectioned based on the specific objective, to assess the human resources at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The profile of health personnel managing NCDs;
- Strategies used for hiring and retention of health personnel in health facilities;
- Available human resource management system that includes support and clinical supervision and performance monitoring;
- Collaborative activities among public and private health facilities, including the community concerning NCD management;

- The capacity of the public and private sector in addressing the number of health personnel in NCD management;
- Guidelines on roles of community health workers (CHWs) in NCD management, and
- Integration of traditional leaders, community and traditional healers with healthcare services to enhance health promotion in NCD management.

6.3.1.1 Conclusions and recommendations for the profile of health personnel managing non-communicable diseases

This section entails conclusions and recommendations for the profile of health personnel managing NCDs at district and PHC levels.

6.3.1.1.1 Conclusions

Human resources are important when trying to achieve universal health coverage. Thus, human resources should consist of workers responsive to people's needs and expectations to achieve the best outcomes with available resources and circumstances (WHO, 2010a). However, the shortage of healthcare workers is a concern worldwide where Liu *et al.* (2017:7) and Scheffler *et al.* (2016:6) indicated a global need-based shortage of health workers. Liu *et al.* (2017:7) further indicated that there would be a net global demand-based shortage of 15 million healthcare workers by 2030. Scheffler *et al.* (2016:6) estimated the largest needs-based shortages of health workers in South-East Asia at 6.9 million and Africa at 4.2 million. The lack of health workers will significantly affect the quality of health service delivery.

Similarly, Lesotho also experiences a shortage of health professionals. The ratio of doctors (0.9 per 10 000) to population and nurse-midwives (10.2 per 10 000) to the population in Lesotho was below the average for doctors (2.6 per 10 000) and distribution of health workers (12.0 per 10 000) as per the World Health Organization Africa (WHO AFRO) (UNICEF, 2017:3; World Bank, 2017:21). There is a general shortage of staff in Lesotho, where 73.3% of the MOH personnel are nurses, 6% physicians, and 20.7% pharmacists and technicians, dentists and technicians, laboratory technicians and environmental and public health workers (GOL, 2013:17). The shortage of health workers in Lesotho may potentially affect the delivery of quality health services in public health facilities, including delivering NCDs services.

The conclusions and recommendations are drawn from the results indicated in Section 4.4.1, Chapter four are subdivided into the MOH, district and PHC levels and are as follows:

- The Ministry of Health

At the time of the study, some respondents perceived that Lesotho's public health system is composed of health workers such as medical doctors, pharmacists, pharmacy technicians, nurses, public health nurses, nurse clinicians, and nursing assistants involved in the management of NCDs (refer to Chapter four, Section 4.4.1.1). Among these health workers, some respondents thought that DHMTs were staffed with pharmacists, nurses, public health nurses, and medical doctors (refer to Chapter four, Section 4.4.1.1, Table 4.5 & 4.6). Also, certain respondents indicated that filled posts of health workers at OPDs included pharmacists and pharmacy technicians, and filled posts at healthcare centres were those of pharmacy technicians, nurses and nursing assistants (refer to Chapter four, Section 4.4.1.1, Table 4-6).

- The district level

Some respondents at DHMTs perceived that health workers found at OPDs included one pharmacist, two nurse clinicians and at least five pharmacy technicians, three nurses and two medical doctors. Other respondents also indicated that healthcare centres were staffed with a pharmacy technician and a nurse clinician, and at least two nurses (refer to Chapter four: Section 4.4.1.2, Table 4-7). Some respondents further perceived that OPDs and healthcare centres were not adequately staffed with healthcare personnel (refer to Chapter four: Section 4.4.1.2).

- The primary healthcare level

Certain respondents at OPDs perceived that health professionals available at OPDs include pharmacists, pharmacy technicians, nurse clinicians, nurses and medical doctors, among which there was adequate staffing of pharmacists, pharmacy technicians and medical doctors and inadequate staffing of nurse clinicians and nurses (refer to Chapter four: Section 4.4.1.3, Tables 4-9). Some respondents also indicated that the main reasons for OPDs being seemingly inadequately staffed with healthcare personnel included loss of interest, lack of motivation, and use of the establishment list of 1966 (staffing norm of health workers in Lesotho) (refer to chapter four: section 4.4.1.3, Table 4-10).

Health workers available in the public health system of Lesotho include medical doctors, pharmacists, pharmacy technicians, nurses, public health nurses, nurse clinicians, and nursing assistants involved in the management of NCDs. This suggests that the health sector has qualified health professionals although; there is a shortage of these health professionals in the public sector. The shortage of qualified health professionals in the management of NCDs poses a risk of poor services for NCDs at health facilities. Services such as screening for NCDs, health

promotion, diagnosis and monitoring of NCDs at health facilities are affected negatively. To overcome the shortage of health professionals, a lack of interest and motivation of health workers could be improved through provision of incentives especially for health workers working in rural areas, salary increments, medical aids, staff rotation to keep health workers challenged by new environments, training or continuing education and professional development. Additionally, staffing norms (the establishment list of 1966) could be reviewed to hire health workers based on the increasing number of patients with NCDs per health worker.

6.3.1.1.2 Recommendations

There seem to be challenges with staffing at different levels of the health system as perceived by some respondents therefore, the MOH is encouraged to develop staffing norms for health workers. These staffing norms will be defined for each level of the public health system, to outline the minimum number of health workers, by cadre, needed to assure the provision of health services. The WHO workload indicators for staffing needs (WHO, 2010e) that derives staffing needs based on staff's work, can be used to assist in the development of such norms.

6.3.1.2 Conclusions and recommendations for strategies used for hiring and retention of health personnel in health facilities

This section presents conclusions and recommendations for hiring and retaining health personnel in health facilities.

6.3.1.2.1 Conclusions

In the event of the increasing burden of NCDs globally, strategies that health systems could implement to decrease the burden of NCDs include the integration of NCDs prevention and management into existing services and programmes such as HIV/AIDS programmes (Marquez & Farrington, 2013:3-5), and collaborative formulation of health workforce planning between the MOH and stakeholders (WHO, 2010e:4) (refer to Chapter two, Section 2.2.1). Health workforce planning will assist low- and middle-income countries (LMICs) governments and health managers develop and implement strategies to achieve an effective and sustainable health workforce (WHO, 2010e:4). The integration of NCDs prevention and management with existing services and programmes with shared determinants, characteristics, and interventions in sub-Saharan Africa will strengthen health systems through universal coverage, strong PHC, integrated chronic care delivery, and community-based interventions (Marquez & Farrington, 2013:3-5).

The incentive systems for health workers in NCD management are essential because it will impact health workers and the community and influence the provision or consumption of

services for NCDs (WHO, 2014d:22). Thus, health systems should have effective incentive systems to prevent attrition rates or migration of health workers in health facilities. Health systems could have incentive systems such as financial incentives, salary revisions, access to training, and provision of career development opportunities to motivate and retain health workers in health facilities (Bowser *et al.*, 2014:995; Kwansah *et al.*, 2012:674; Musango *et al.*, 2020:13; Reich *et al.*, 2016:815; Shah *et al.*, 2016:472).

The conclusions and recommendations are drawn from the results indicated in Section 4.4.2, Chapter four. This section is subdivided into the MOH, district and PHC levels:

- The Ministry of Health

Results of the study indicated that some respondents perceived that the public health system of Lesotho seemed to have regular and coordinated health workforce planning for NCD management in different health system levels or departments with the exclusion of stakeholders such as finance, education, and academic institutions (refer to Chapter four: section 4.4.2.1, Table 4-11). Also, certain respondents perceived that DHMTs, OPDs and healthcare centres had a high attrition rate of health professionals (refer to Chapter four: section 4.4.2.1, Figure 4-4 & 4-12).

- The district level

Some respondents thought that DHMTs were responsible for ensuring the availability of medicines and guidelines in public health facilities and mentoring health workers (refer to Chapter four: Section 4.4.2.2). Some respondents perceived that generally, employee benefits available for employees in Lesotho's public health system included incentives, rotation systems, training plans, housing for personnel, and promotion opportunities. However, other respondents indicated that the benefits were not the same for DHMTs, OPDs and healthcare centres (refer to Chapter four: Section 4.4.2.2, Table 4-13). The results of the study further indicated that it appears as if the healthcare personnel at OPDs were satisfied with their working conditions compared to healthcare personnel at healthcare centres who were not satisfied with their working conditions.

- The primary healthcare level

Employees at health facilities had benefits, though the benefits were different for OPDs and healthcare centres (refer to Chapter four: Section 4.4.2.3, Table 4-14). Some respondents perceived that these benefits included rotation systems, training plans, housing for personnel, incentives, and free medical services for staff.

In conclusion, Lesotho's public health system had health workforce planning for NCD management. However, stakeholders such as finance, education and academic institutions were excluded in health workforce planning for the management of NCDs. The implication is that the challenge of shortage of health workers (refer to Section 6.3.1.1) will not be resolved because of a lack of finances to implement salary increments, incentives, medical aids, training or continuing education and professional development of health workers. Therefore, a lack of motivation and interest of health workers will escalate leading to high attrition rates in health facilities. Exclusion of stakeholders such as education and academic institutions propels the shortage of health workers in that health professionals graduating from institutions of higher education with skills necessary for NCD management (refer to Section 6.3.1.5) will not be employed by the MOH. Additionally, the MOH will not give its input on the type of modules and courses to be taught to students during curriculum reviews so that services for NCDs could be improved.

Although employees at the district and PHC levels had benefits, these benefits differ amongst health facilities. This inconsistency is one of the reasons there is high attrition rates in some health facilities. Thus, strategies used for hiring and retaining health personnel in health facilities which is health workforce planning and employees' benefits could be improved to enhance health workers job satisfaction.

6.3.1.2.2 Recommendations

- The Ministry of Health

During planning sessions, all health system levels need to be represented. Health system and stakeholders' levels could give input and contribute to the availability and retention of health workers in NCD management to improve NCDs' healthcare services. Additionally, strengthening of the incentive system will assist with personnel motivation and job satisfaction thus decreasing attrition rates of healthcare personnel at the PHC level.

- The district level

There is a need for the revision of the benefits of employees in consultation with the MOH and stakeholders. Improvement of employees' job satisfaction will result in decreased attrition rates of healthcare personnel at the PHC level.

6.3.1.3 Conclusions and recommendations for an available human resource management system that includes support, clinical supervision and performance monitoring

This section entails conclusions and recommendations for the specific objective that assessed the available human resource management system, including support, clinical supervision and performance monitoring.

6.3.1.3.1 Conclusions

The district health system is defined as a network of health facilities or organisations providing primary care services such as a comprehensive range of promotive, preventive and curative healthcare services to a defined population including the community and under the supervision of a district hospital and district health management team (DHMT) (WHO, 2011c:6). Also, Kilminster *et al.* (2007), Lyth (2000) and Milne (2007) have defined clinical supervision as the provision of guidance of clinical practice for qualified health professionals by a more experienced health professional. Therefore, Lesotho (MOHSW, 2011a:41; GOL, 2013:40) and Burundi (Nsengiyumva & Musango, 2013:3) have the DHMT that provides clinical supervision and oversee the performance of health facilities at PHC level. Additionally, The Ministries of Health in Eswatini (previously Swaziland) (Swaziland, 2016:10,24), Tanzania (Government of the United Republic of Tanzania, 2016:27-28) and South Africa (National Department of Health: Assurance Directorate, 2009) have developed and implemented clinical supervision and mentoring for trained health workers at PHC level to help guide and improve competencies and skills of health workers in NCD prevention and management.

The conclusions and recommendations are drawn from the results indicated in Section 4.4.3, Chapter four. This section is subdivided into the MOH, district and PHC levels:

- The Ministry of Health

Some respondents perceived that health workers at DHMTs, OPDs and healthcare centres had job descriptions that included NCD management (refer to Chapter four, Section 4.4.3.1, Table 4-15 & 4-16). Also, other respondents indicated that DHMTs are the district health management structures in place in Lesotho with the authority to make decisions on the district health plan, district health budget, human resources, and purchase of drugs and medical supplies (refer to chapter four, section 4.4.3.1, Table 4-17). Also, to strengthen clinical supervision at health facilities, some respondents perceived that visits to healthcare centres were planned for the next year (refer to Chapter four, section 4.4.3.1, Table 4-18). Some respondents further

indicated that studies on NCDs carried out in Lesotho in the past five years were health system research, household surveys, and capacity study to support NCDs.

- The district level

Certain respondents perceived that DHMT structures present in Lesotho had guidelines on its functions and responsibilities and had the authority to make decisions on district health plan and budget, human resources, and purchase of drugs and medical supplies (refer to Chapter four, Section 4.4.3.2, Table 4-19). Other respondents thought that clinical supervision was conducted by DHMTs in healthcare centres using supervision checklists (refer to Chapter four, Section 4.4.3.2). The norm for clinical supervision visits was that DHMTs should carry out at least one clinical supervisory visit per healthcare centre per month (UNICEF, 2017b:43) but, respondents perceived that DHMTs carried out a minimum of four visits in the past six months before the date of data collection of this study which was below the norm (refer to Chapter four, Section 4.4.3.2, Table 4-20). This implies that there were months when clinical supervision was not conducted in healthcare centres. The only NCD studies conducted in the districts in the past five years were a household survey (refer to Chapter four, Section 4.4.3.2).

- The primary healthcare level

Some respondents perceived that DHMTs used supervision checklists and a supervision plan or schedule during clinical supervision in public health facilities (refer to Chapter four: Section 4.4.3.3). In agreement with respondents at DHMTs, respondents at healthcare centres perceived that DHMTs did not conduct monthly clinical supervisory visits at healthcare centres as per the norm (refer to Chapter four, section 4.4.3.3, Table 4-22).

It is commendable that employees at the district and the PHC levels of Lesotho's health system had job descriptions that catered for NCD management suggesting that health workers knew their roles in the prevention and management of NCDs. Additionally, the district level has DHMTs with guidelines on their function. This is important because they know when and how frequently they have to conduct clinical visits at health facilities. Clinical supervisory visits are important as they enable DHMTs to also support and monitor the performance of health workers at healthcare centres. However; the DHMTs were not able to visit health facilities on monthly basis to conduct clinical supervisions. The study did not ask respondents to give reasons why DHMTs were not able to visit health facilities on monthly basis to conduct clinical supervisions thus; it is not known why they did not carry out monthly visits. This implied that some of the challenges faced by health workers at healthcare centres could not be addressed on time or at all thus affecting service provision for NCDs.

6.3.1.3.2 Recommendations

Monitoring and clinical supervision of health facilities by DHMTs are essential as it informs the national, district and PHC levels of Lesotho about the quality of services related to NCDs provided in health facilities and areas that need strengthening. Therefore, strengthening clinical supervision visits at some health facilities is important.

6.3.1.4 Conclusions and recommendations for collaborative activities among public and private health facilities including the community concerning non-communicable disease management

This section outlines conclusions and recommendations for the specific objective that assessed collaborative activities among public and private health facilities, including the community concerning NCD management.

6.3.1.4.1 Conclusions

In resource-limited settings, community-level prevention and control of NCDs are very important in curbing the burden of NCDs (WHO, 2016b:5). Thus, community health workers (CHWs) can provide NCD care within communities while also connecting individuals to the formal healthcare system (Puoane *et al.*, 2017:176). Therefore, CHWs are recognised as frontline health workers supporting the government to combat NCDs because strengthening services and health workforce at the PHC level is one of the interventions that can help reduce the burden of NCDs (Abdullah *et al.*, 2019:1). The CHWs can provide health promotion and community health education workshops, advice on dietary and physical activity, distribution of medication, blood pressure and glucose measurement, and lifestyle modification on NCD prevention and management readily within the community (Long *et al.*, 2018:14; Low *et al.*, 2014:6; Pakhare *et al.*, 2015:5; Tsolekile *et al.*, 2018:5).

The conclusions and recommendations are drawn from the results indicated in Section 4.4.4, Chapter four. This section is subdivided into the MOH, district and PHC levels:

- The Ministry of Health

Most respondents perceived that Lesotho's public health system did not have an institutional structure for a community-focused service delivery system in NCD management (refer to Chapter four, Section 4.4.4.1). Some respondents further indicated that CHWs at the PHC level did not work together with healthcare centres (refer to Chapter four, section 4.4.4.1, Figure 4-5). However, some respondents perceived that CHWs were funded by the government of Lesotho (refer to Chapter four, Section 4.4.4.1, Figure 4-5).

- The district level

Some respondents perceived that there were collaborative activities related to NCD management between the DHMTs and private health services at the district level although further investigations should be carried out (refer to Chapter four, Section 4.4.4.2). Also, four out of six respondents perceived that arrangements such as referral of patients with NCDs and submission of reports for health information systems (HIS) were not in place (refer to Chapter four, Section 4.4.4.2, Figure 4-6). Some respondents indicated that CHWs, mainly funded by the Government of Lesotho, worked in collaboration with certain healthcare centres at the PHC level on NCD management (refer to Chapter four, Section 4.4.4.2, Table 4-24). Activities carried out by some CHWs on the prevention and management of NCDs at certain PHC levels were health talks on preventing NCDs, lifestyle modifications, medication use, and monitoring blood pressure and blood glucose levels (refer to Chapter four, Section 4.4.4.2, Table 4-24). Some health workers in certain health facilities at the PHC level also conducted health promotion activities within the communities (refer to Chapter four, Section 4.4.4.2).

- The primary healthcare level

Collaboration between health facilities and traditional healers on NCD management lacked at the PHC level (refer to Chapter four, Section 4.4.4.3). Most respondents at healthcare centres perceived that CHWs worked together with the majority of healthcare centres to manage NCDs (refer to Chapter four, Section 4.4.4.3, Table 4-25 & Figure 4-7). Also, other respondents further indicated that CHWs were mainly funded by Lesotho's government (refer to Chapter four, Section 4.4.4.3, Table 4-25 & Figure 4-7). Some respondents indicated that CHWs carried out activities such as health talks on preventing NCDs, lifestyle modifications and medication use. Additionally, certain respondents thought that health workers in some health facilities conducted health promotion activities on preventing and managing NCDs within the community (refer to Chapter four, Section 4.4.4.3, Table 4-25). Also, some respondents perceived that there was a collaboration between private health facilities and non-governmental organisations (NGOs) with the OPDs on NCD management; whereas, certain respondents perceived that such collaboration did not exist for healthcare centres (refer to Chapter four, Section 4.4.4.3, Table 4-28).

Lesotho's public health system does not have an institutional structure for a community-focused service delivery system in NCD management. This poses a challenge in the prevention and management of NCDs as NCDs do not only affect the individual but, families and the community as well. Availability of this institutional structure will enable community groups and

NGOs at the community level involved with NCD prevention and management to work together with the MOH and also to carry out some of the activities that health facilities cannot conduct.

It is commendable that there is some sort of collaboration between DHMTs and private health services at the district level because all stakeholders involved with NCD management have to develop a good working relationship. This relationship could include roles and responsibilities of different stakeholders to avoid duplication of services which leads to wastage of funds. Additionally, referral of patients with NCDs and submission of reports for HIS should be clearly defined for stakeholders because reports are needed by the MOH to monitor the performance of NCD prevention and management in the country including in decision-making. Guidelines for referring patients with NCDs should be in place to avoid interruptions in the workflow during provision of services to patients with NCDs. In Lesotho, traditional healers are respected and this is probably the first place where patients go for consultation. Thus, a collaboration between health facilities and traditional healers on NCD management needs to be established with guidelines on defining roles of each individual.

Task-shifting can be used as an intervention to overcome the shortage of health professionals as indicated in Section 6.3.1.1. Health workers such as CHWs could be trained on how to conduct health promotion activities on the prevention and management of NCDs.

6.3.1.4.2 Recommendations

Collaboration among public health facilities, private health facilities, NGOs, and traditional healers on the prevention and management of NCDs at district and PHC levels has to be strengthened by developing policies that support this collaboration. These policies will guide the district and PHC levels, private health facilities, NGOs, and traditional healers to collectively prevent and manage NCDs at the PHC level, including within the community.

6.3.1.5 Conclusions and recommendations for the capacity of the public service and private sector in addressing the number of health personnel in non-communicable disease management

This section presents conclusions and recommendations for assessing public service and the private sector's capacity in addressing the number of health personnel in NCD management.

6.3.1.5.1 Conclusions

The shortage of health workers can be overcome by increasing the quantity and training of health workers, which will also address the imbalanced distribution of health workers in health

facilities (WHO, 2014:23). The conclusions and recommendations are drawn from the results indicated in Section 4.4.5, Chapter four.

- The Ministry of Health

Lesotho can train health professionals nationally to manage NCDs through higher education institutions such as the National University of Lesotho (NUL), National Health Training College (NHTC) and the Christian Health Association of Lesotho (CHAL) Nursing College (refer to Chapter four, Section 4.4.5.1, Table 4-31). These higher education institutions graduate pharmacists, pharmacy technicians, nurses, nurse clinicians, and nursing assistants except for medical doctors (refer to Chapter four, Section 4.4.5.1, Table 4-31). However, the MOH of Lesotho collaborated with the South African Development Community (SADC) countries regarding healthcare personnel training, thus enabling Lesotho to have internationally trained Basotho medical doctors.

The shortage of health professionals for NCD management in Lesotho's public health system (refer to Section 6.3.1.1) could be alleviated by training health professionals nationally using national higher education institutions. At present, Lesotho through its higher education institutions, graduates pharmacists, pharmacy technicians, nurses, nurse clinicians, and nursing assistants except medical doctors who could be employed by the MOH to work in the prevention and management of NCDs at the different levels of the health system. Furthermore, Basotho students could be advised to study bachelor of medicine with universities in other SADC countries. This, together with revised staffing norms will address the issue of the shortage of health workers at different levels of the health system.

6.3.1.5.2 Recommendations

Lesotho can train most of the health professionals needed in NCD management nationally. Thus, there is a need for the MOH to review the health sector staffing norms to absorb these health professionals.

6.3.1.6 Conclusions and recommendations for guidelines on roles of community health workers in non-communicable disease management

This section outlined conclusions and recommendations for the specific objective that assessed guidelines on roles of CHWs in NCD management.

6.3.1.6.1 Conclusions

The policies and strategies developed at the national level on prevention and management of NCDs should include CHWs because CHWs link health facilities and the community when managing NCDs (Abdullah *et al.*, 2019:9; Scott *et al.*, 2018:13). In collaboration with stakeholders, the governments need to establish national guidelines and regulations stating how CHWs will operate, training and supervision of CHWs, and roles to be performed by CHWs (Mishra *et al.*, 2015:3; Scott *et al.*, 2018:12-13).

The conclusions and recommendations are drawn from the results indicated in Section 4.4.6, Chapter four. This section is subdivided into the MOH, district and PHC levels:

- The Ministry of Health

Some respondents perceived that Lesotho's public health system has guidelines about the relationship between healthcare centres and CHWs, which addressed home visits, lifestyle counselling on NCDs, and nutrition education (refer to Chapter four, Section 4.4.6.1, Table 4-32).

- The district level

Certain respondents perceived that guidelines concerning the roles of CHWs in the management of NCDs at the PHC level were in place and covered issues on home visits, lifestyle counselling, nutrition education, health promotion activities, recording and reporting of NCDs, and screening of NCDs (refer to Chapter four, Section 4.4.6.2, Table 4-33).

- The primary healthcare level

There were certain respondents who were of the view that guidelines that stated the relationship between CHWs and healthcare centres, which addressed home visits, lifestyle counselling, nutrition education, and health promotion activities were in place (refer to Chapter four, Section 4.4.6.3, Table 4-34).

It is worthy to note that Lesotho's public health system had guidelines for CHWs that mapped out the relationship between healthcare centres and CHWs and the roles of CHWs in NCD prevention and management. This is important because appropriate training covering topics as stated in the guidelines could be provided to CHWs to increase their competency and knowledge in NCD prevention and management. Also, health workers at the health facilities will be able to know which areas to concentrate on during supervision and mentoring of CHWs. Health facilities working together with CHWs in the prevention and management of NCDs will

have a decreased workload as CHWs will be conducting health promotion activities in the community. Thus, health workers can concentrate on other services where their expertise are most needed.

6.3.1.7 Conclusions and recommendations for the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in non-communicable disease management

This section entails conclusions and recommendations for assessing the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.

6.3.1.7.1 Conclusions

Civil society refers to a wide-ranging collection of organisations such as community groups, NGOs, labour unions, indigenous groups, charitable organisations, faith-based organisations, professional associations, trade unions, social movements, coalitions, and advocacy groups (Jezard, 2018:1; United Nations, 2019:1; WHO, 2020c:1). In collaboration with government entities, other stakeholders involved with leadership and governance activities include health service providers, service users, the general public and organised civil society (Brinkerhoff & Bossert, 2014:686-687). Thus, an effective health system governance engages the civil society (WHO/Europe, 2017:12), and the participation of healthcare users in decision-making and policy development (Conklin *et al.*, 2015:163).

The conclusions and recommendations are drawn from the results indicated in Section 4.4.7, Chapter four. This section is subdivided into the MOH and the district levels.

- The Ministry of Health

Some respondents perceived that a certain category of the community participates in decision-making and service delivery on NCD management at the national, district and PHC levels (refer to Chapter four, Section 4.4.7.1, Table 4-35). This community includes chiefs, priests, traditional healers, committees or forums where community members can participate in and influence decisions affecting the health system, and community-focused organisations or networks relevantly involved in making policies at the national, district and the PHC levels (refer to Chapter four, Section 4.4.7.1, Table 4-36).

- The district level

Certain respondents perceived that a certain group of the community partakes in making decisions and strengthening service quality on NCD management at the district and the PHC levels (refer to Chapter four, Section 4.4.7.2, Table 4-37). Some of these groups include community involved are chiefs, priests, traditional healers, community-focused organisations or networks relevantly involved in making policies at national, district and PHC levels, and committees or forums where community members can participate in and influence decisions affecting the district and PHC levels (refer to chapter four, Section 4.4.7.2, Table 4-38).

Lesotho as a country that has a nation that strongly upholds its tradition, traditional leaders and traditional healers have a strong influence in the community. Therefore, inclusion of traditional leaders and healers in decision-making and service delivery on NCD management at different levels of the health system is commendable. When the community sees that their traditional healers and leaders participate in issues related to NCDs, they will also follow suit and make use of health facilities and practice self-management using the knowledge gained during health promotion activities.

6.3.2 Conclusions and recommendations for specific objectives for health promotion

The conclusions and recommendations for health promotion were based on the specific objective to describe health promotion at the district and PHC levels in Lesotho's public health facilities in terms of conduction of health promotion activities by health workers in health facilities.

6.3.2.1 Conclusions and recommendations for conduction of health promotion activities by health workers in health facilities

The conclusions and recommendations are drawn from the results indicated in Section 4.5.1, Chapter four.

6.3.2.1.1 Conclusions

Non-communicable diseases are a concern in the Americas (PAHO, 2017:1), the European region (WHO, 2016c:4-5) and sub-Saharan Africa (Bigna & Noubiap, 2019:1295-1296), causing ill health, death and disability. Prevention is the most important approach to respond to these chronic conditions. Thus, policy centred on public health interests, regulatory, and health promotion interventions are recommended to reduce NCD risk factors such as tobacco use, harmful alcohol use, physical inactivity, and unhealthy diet (PAHO, 2017:1; WHO, 2016c:4-5). Health sectors for the Republic of Moldova (Sécula *et al.*, 2020:2), Kenya (Asiki *et al.*, 2018:5)

and Lesotho (MOH, 2014b:39) recognise the importance of health promotion as the best tool for prevention and control of NCDs. Thus, health professionals have to conduct health promotion activities at the PHC level and within the community to combat the increasing burden of NCDs (Asiki *et al.*, 2018:5; MOH, 2014b:39; Sécula *et al.*, 2020:2).

This discussion in this section is subdivided into the district and PHC levels.

- The district level

Certain respondents perceived that health workers at some OPDs and healthcare centres conduct health promotion activities on NCD prevention and management within the communities they were found in (refer to Chapter four, Section 4.5.1, Figure 4-8).

- The primary healthcare level

As perceived by some respondents, health workers at certain OPDs and healthcare centres carry out health promotion activities on prevention of NCDs within the community, which focus on hypertension and diabetes mellitus health talks and the management and prevention of diabetes, including lifestyle modifications (refer to Chapter four, Section 4.5.2, Table 4-52, 4-39 & 4-40).

Lesotho acknowledges that prevention of NCDs is the most important approach in combating the increasing burden of NCDs. Therefore, health promotion can be best used to prevent and control NCDs. Hence health workers at health facilities conduct health promotion activities on prevention of NCDs within the community. However, the scope of activities has to be broadened to cover all other NCDs including hypertension and diabetes mellitus.

6.3.2.1.2 Recommendations

To improve mentorship, supervision and training of health workers on health promotion, strengthening is needed to cover various NCDs (hypertension, diabetes mellitus, asthma and epilepsy) and equip health workers with skills and competencies to deal with these NCDs.

6.3.3 Conclusions and recommendations for specific objectives for continuing education and training of health workers in non-communicable diseases

The conclusions and recommendations for continuing education and training of health workers in NCDs were sectioned based on the specific objective, to assess continuing education and training of health workers in NCDs at the district and the PHC level in the public health system of Lesotho in terms of:

- The availability of professional development and continuing education support on NCD management for health workers at health facilities, and
- The availability of training on NCD management for health workers at health facilities.

The subsequent section outlines conclusions and recommendations for the availability of professional development and continuing education support for health workers on NCD management at health facilities.

6.3.3.1 Conclusions and recommendations for the availability of professional development and continuing education support for health workers on non-communicable disease management at health facilities

The conclusions and recommendations are drawn from the results indicated in Section 4.6.1, Chapter four.

6.3.3.1.1 Conclusions

Continuing professional development is a systematic and continuing process of education, in-service training, learning, and support activities that build on the initial education and training to ensure continuing competence, extend knowledge and skills to new responsibilities or changing roles, and increase personal and professional effectiveness (Giri *et al.*, 2012:1). Continuing professional development includes formal and informal activities that health workers undertake to maintain, update, develop, and enhance their professional skills, knowledge, and attitudes (Giri *et al.*, 2012:1). Thus, continuing professional development programmes must be planned, financed, delivered, and evaluated effectively to improve health workers' competencies and skills (Giri *et al.*, 2012:5).

According to Evans *et al.* (2016:21), health workers with significant working experience are better positioned to contribute to the cost of their education and/or be sponsored by their employer, thus changing the affordability and profitability prospects significantly in comparison with pre-service training. Continuing professional development has been implemented in Ethiopia (Sporrong *et al.*, 2016:5-6), Mauritius (Musango *et al.*, 2020:13) and India (Macaden *et al.*, 2017:941) to improve and strengthen skills and competencies of health workers in public health facilities on NCD management. This section is subdivided into the MOH, district and PHC levels.

- The Ministry of Health

Some respondents thought that the delivery of professional development and continuing education support was not adequate at DHMTs, OPDs and healthcare centres (refer to Chapter

four, Section 4.6.1.1, Table 4-41). However, it seems as if the supporting tools for professional development and continuing education support such as study leave, funding for tuition fees, and a synchronised system of work-related training or continuing education across the MOH, were somewhat in place (refer to Chapter four, section 4.6.1.1, Table 4-42).

- The district level

Professional development and continuing education support for health workers were provided at OPDs and healthcare centres as per the perception of some respondents (refer to Chapter four, Section 4.6.1.2, Table 4-43). Certain supporting tools for professional development and continuing education support included a formal work-related training component for all staff levels and a synchronised system of work-related training or continuing education across OPDs and healthcare centres (refer to Chapter four, Section 4.6.1.2, Table 4-44).

Supporting tools for professional development and continuing education are in place at DHMTs, OPDs and healthcare centres which enable health workers to improve academically and also to enhance their skills in the prevention and management of NCDs. However, there is a limited utilisation of these tools by health workers. Health workers could be encouraged to take part in professional development and continuing education as this will make them eligible for promotions and salary increments. Therefore, health workers will be motivated to stay at their jobs, decreasing the high attrition rates at health facilities. Additionally, services for NCDs will be improved because health workers will be implementing the knowledge gained during continuing education and professional development. Seeing an improvement in healthcare services together with patient satisfaction will motivate health workers to stay at their jobs thus improving job satisfaction and retention of health workers.

6.3.3.1.2 Recommendations

Professional development and continuing education support are important as it is one of the interventions used to motivate, retain, and improve health workers' competencies and skills. The MOH and the DHMTs need to develop strategies to strengthen continuing education support and professional development for health workers at the national, district and PHC levels using available supporting tools.

6.3.3.2 Conclusions and recommendations for the availability of training on non-communicable disease management for health workers at health facilities

This section presents conclusions and recommendations about the training of health workers in health facilities on NCD management. The conclusions and recommendations are drawn from the results indicated in Section 4.6.2, Chapter four.

6.3.3.2.1 Conclusions

Non-communicable diseases are a concern worldwide and training and experience in prevention and management of NCDs among public health workers are important, especially in LMICs (Davila *et al.*, 2015; Heller *et al.*, 2019; Schmidt, 2018). Also, training health professionals on how to use basic equipment for diagnosis and monitoring of NCDs will enable patients with NCDs to be treated in health facilities close to them and enhance the utilisation of primary care services (WHO, 2010b:35).

Pharmaceutical staff encompasses pharmacists and pharmacy technicians who are qualified health professionals in pharmaceuticals supply management and have to be provided with continuing professional education and in-service training on pharmaceuticals supply management to improve their skills and competencies (Rouse *et al.*, 2016:5-6). Due to shortages of health workers (Liu *et al.*, 2017:7; Scheffler *et al.*, 2016:6), task-shifting where unqualified health workers are trained to carry out some of the roles of qualified health workers, has to be implemented (European Commission, 2019:19; WHO, 2016b:7; WHO, 2018b:1). For instance, due to a shortage of pharmaceutical staff in Tanzania, pharmaceutical services are provided by non-pharmaceutical staff (Wiedenmayer *et al.*, 2015:5-6). Thus, the non-pharmaceutical staff has also to be trained in pharmaceuticals supply management.

The conclusions in this section are subdivided into the district and the PHC levels.

- The district level

Most health workers at PHC level were trained on how to use the equipment for the diagnosis and management of NCDs except for peak flow meters, spacers for inhalers, and therapeutic drug level monitoring for epileptic patients (refer to Chapter four, Section 4.6.2.1, Table 4-46). Some respondents perceived that the pharmaceutical staff in public health facilities at the PHC level was trained on drug supply and medical supplies management (refer to Chapter four, Section 4.6.2.1, Table 4-49). It further seems as if training on drug supply and medical supplies management was carried out for non-pharmaceutical staff at healthcare centres, whereas; this

training was not conducted for non-pharmaceutical staff at OPDs (refer to Chapter four, Section 4.6.2.1, Table 4-47).

- The primary healthcare level

Although there was no training plan on NCD management at both OPDs and healthcare centres, some health workers were trained on NCD management (refer to Chapter four, Section 4.6.2.2, Table 4-51). Most respondents perceived that health workers were trained on topics on NCD management presented in Table 4-51 (Chapter four, Section 4.6.2.2) however, medication storage and lifestyle modifications were the least taught topics. Health workers at OPDs and healthcare centres were mostly taught how to use the equipment for the diagnosis and management of NCDs except for peak flow meters, spacers for inhalers and therapeutic drug level monitoring for epileptic patients (refer to Chapter four, Section 4.6.2.2, Table 4-53). Some respondents perceived that the pharmaceutical staff at OPDs was also trained on drug supply and medical supplies management with refresher training held once a year (refer to Chapter four, Section 4.6.2.2, Table 4-54 & Figure 4-10). Non-pharmaceutical staff in healthcare centres were trained on drug supply and medical supplies management, however, refresher training has never been held (refer to Chapter four, Section 4.6.2.2, Figures 4-11 & 4-13).

A training plan has to be developed and implemented to keep track of training sessions conducted and those yet to be carried out. It will assist with making sure that all health workers received training needed to enhance their competencies and skills in NCD prevention and management. On a positive note, health workers were trained on NCD management and on drug supply and medical supplies although, the scope of these training sessions has to be improved to cater for all NCDs. Furthermore, the frequency of holding refresher training should be increased from once a year to quarterly because the field of NCDs is continually changing and new information is provided.

Additionally, some health workers at health facilities have been trained on how to use most of the equipment used in the diagnosis and monitoring of NCDs. All health workers involved with diagnosis and monitoring of NCDs should be taught how to utilise all the equipment so that services for NCDs are not compromised. A training plan will thus assist with making sure that all health workers have been trained on the use of all equipment needed in NCD management and control.

6.3.3.2.2 Recommendations

The DHMTs need to create training plans for the PHC level, which should be distributed to the health facilities. Training of health workers should be improved to include all aspects

surrounding the prevention and management of NCDs, including asthma and epilepsy. Also, health workers in health facilities need refresher training on NCD management, pharmaceuticals supply management, and the use of equipment for diagnosis and monitoring of NCDs frequently. The training will improve service delivery for NCDs and utilisation of healthcare facilities by patients with NCDs.

The following section entails conclusions and recommendations generated from specific objectives of medicines for NCD management.

6.3.4 Conclusions and recommendations for specific objectives for medicines for non-communicable disease management

The conclusions and recommendations for medicines for NCD management were sectioned based on the specific objective, to assess medicines for NCD management at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- Types and availability of medicines used in NCD management at the health facilities;
- Availability of NCDs standard treatment guidelines (STGs) and essential medicines list (EML) at the health facilities;
- The availability of drug supply management tool(s);
- The updating the national EML so that it is in line with the overall burden of NCDs, and
- Guidelines on quality control, selection, procurement, storage and distribution of drugs.

6.3.4.1 Conclusions and recommendations for types and availability of medicines used in non-communicable disease management at health facilities

This section focuses on conclusions and recommendations for the types and availability of medicines used in NCD management at the PHC level. The conclusions and recommendations are drawn from the results indicated in Section 4.7.1, Chapter four.

6.3.4.1.1 Conclusions

The World Health Organization (WHO) Model of Essential Medicines 21st list 2019 provides guidance for developing national and institutional essential medicine lists that includes good quality, readily available, and affordable drugs necessary to manage NCDs (WHO, 2019a). The medicines for NCDs in the public health system of Lesotho were as per the WHO Model of Essential Medicines 21st list 2019 (WHO, 2019a) and the Lesotho EML 2017 (MOH, 2017a). Non-communicable diseases are chronic diseases that need continual administration of

medicines to be kept under control. Thus, the availability of essential medicines for NCDs in health facilities is important.

There is currently one leading statutory body established as a trading account of the MOH in Lesotho, namely the National Drug Supply Organisation (NDSO) that has been delegated to manage the national drug supply (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10). The NDSO is responsible for the procurement, storage and distribution of medicines and medical supplies for CHAL and government healthcare facilities (GOL, 2013:16; GOL, 2016:29).

The conclusions for this section is subdivided into the district and the PHC levels:

- The district level

The NDSO was the main supplier of medicines used for NCD management at public health facilities in Lesotho's health sector (refer to Chapter four, Section 4.7.1.1). Medicines used for the management of NCDs at health facilities had not been out-of-stock in the past three months before the date of data collection of this study (refer to Chapter four, Section 4.7.1.1, Figure 4-14). Occasionally, medicines for NCD management would be out-of-stock at health facilities during which medicines would be redistributed from other government-owned healthcare centres and borrowed from district hospitals (refer to Chapter four, Section 4.7.1.1, Figure 4-14). Reasons for medicines being out-of-stock included delayed requisition of medicines and stock-outs at a supplier, and irrational medicines use which increased the monthly drug consumption rate, and poor reporting from the health facilities (refer to Chapter four, Section 4.7.1.1).

- The primary healthcare level

The main supplier of medicines for NCD management to OPDs and healthcare centres was the NDSO (refer to Chapter four, Section 4.7.1.2). Medicines used in the management of diabetes mellitus, hypertension, asthma and epilepsy had not been out-of-stock in the past three months at health facilities (refer to Chapter four, Section 4.7.1.2, Table 4-62). Infrequently, some medicines used for NCD management in health facilities would be out-of-stock due to stock-outs at suppliers (refer to Chapter four, Section 4.7.1.2, Table 4-65). During medicines stock-outs at health facilities, to maintain a constant supply of medicines for NCDs to the patient, health facilities borrowed medicines from other health facilities (refer to Chapter four, Section 4.7.1.2, Table 4-65).

Currently, the central medical store supplying all public health facilities with medicines for NCDs in Lesotho is the NDSO. It is worth pointing out that health facilities hardly ran out of medicines for hypertension, diabetes mellitus, asthma and epilepsy. Thus suggesting that procurement

systems employed at health facilities work efficiently. Additionally, training of both pharmaceutical and non-pharmaceutical staff on drug supply and medical supplies management at health facilities (refer to Section 6.3.3.2) made a positive change since health facilities rarely experience stock-outs.

Another reason for medicine stock-outs is irrational drug use and poor reporting. Training of health workers on the use of STGs would assist with decreasing irrational drug use together with training on the recording of information on medicines consumption. One could point out that recording of information is a component that needs to be included or improved during training of both pharmaceutical and non-pharmaceutical staff on drug supply management. In the event of stock-outs of medicines at health facilities, there are mechanisms put in place such as borrowing from health facilities that have these medicines in stock. This is worth applauding as health workers are trying to keep NCDs under control by not letting patients miss their doses.

6.3.4.1.2 Recommendations

- The Ministry of Health

The MOH could consider having more than one supplier of medicines for NCD management as alternatives during medicines' stock-outs at the main supplier (NDSO).

- The district and the primary healthcare centres

The DHMTs and health facilities should present to the MOH the importance of having more than one supplier of medicines for NCDs to have alternatives during stock-outs of medicines at the main supplier (NDSO).

6.3.4.2 Conclusions and recommendations for the availability of non-communicable diseases standard treatment guidelines and essential medicines list at the health facilities

The subsequent section focuses on conclusions and recommendations for the specific objective that described the availability of STGs for NCD management and EML at PHC level. The conclusions and recommendations are drawn from the results indicated in Section 4.7.2, Chapter four.

6.3.4.2.1 Conclusions

Improvement of access to essential medicines is possible through effective use of updated STGs and EML, effective procurement, timely distribution, and appropriate storage of essential

medicines (Joshua *et al.*, 2016:543). The Republic of South Africa (Republic of South Africa, 2018:xviii-xxii), Lesotho (MOH, 2017a; MOH, 2017b) and the Republic of Moldova (Blake *et al.*, 2019:9) have an EML and STGs that guide health professionals in the management of NCDs at public health facilities. The conclusions in this section are subdivided into the MOH, district and PHC levels.

- The Ministry of Health

The STGs for managing hypertension, diabetes mellitus, asthma and epilepsy, including the EML, were available at most DHMTs, OPDs and healthcare centres (refer to Chapter four, Section 4.7.2.1). Also, there is a published National Medicines Policy, national STGs, national EML, and a functional national committee responsible for managing the process of updating a national medicines list (refer to Chapter four, Section 4.7.2.1, Table 4-66).

- The district level

Healthcare centres in Lesotho's public health system had both STGs and EML used to manage diabetes mellitus, hypertension, asthma, and epilepsy (refer to Chapter four, Section 4.7.2.2, Table 4-67). Health workers at OPDs and healthcare centres used the South African Medicines Formulary and the Lesotho Medicines Formulary as references when managing NCDs (refer to Chapter four, Section 4.7.2.2, Table 4-68).

- The primary healthcare level

The STGs used in the management of diabetes mellitus, hypertension, asthma and epilepsy, and an EML were available and in use at OPDs and healthcare centres (refer to Chapter four, Section 4.7.2.3, Table 4-69 & 4-70). Health workers at OPDs and healthcare centres used the Lesotho Medicines Formulary and the South African Medicines Formulary (refer to Chapter four, Section 4.7.2.2, Table 4-71).

It is evident that STGs and EMLs are available and used by health workers at health facilities in Lesotho. However, one of the reasons health facilities ran out of medicines for NCDs was due to irrational medicines use that increased the monthly consumption (refer to Section 6.3.4.1). Therefore, health workers should be encouraged to use the STGs and also be provided with training sessions on how to use them. The availability and use of STGs and EMLs at health facilities improve the availability of safe and affordable medicines for NCDs because the MOH procures generics as a cost-saving measure (refer to Chapter four, Section 4.9.3, Table 4-104). Additionally, there is legislation permitting generic drug substitution in the public sector making medicines for NCDs more affordable. The use of STGs also ensures that patients with NCDs

are managed appropriately thus reducing the risks of misdiagnosis and mismanagement of patient with NCDs which could lead to further complications and even death.

6.3.4.3 Conclusions and recommendations for the availability of drug supply management tool(s)

The following section focuses on conclusions and recommendations for assessing the availability of drug supply management tool(s) in health facilities. The conclusions and recommendations are drawn from the results indicated in Section 4.7.3, Chapter four.

6.3.4.3.1 Conclusions

Stock records are used to record all medicine transactions, including receipts, issues, stock balances and stock losses include bin cards, stock cards, stock ledgers, requisition forms and computer files. For instance, the MOH of Ethiopia developed standardised inventory management tools to use by public health facilities manually or using the logistics management information system (LMIS) (Federal Democratic Republic of Ethiopia Ministry of Health, 2010:34; Kefale & Shebo, 2019:2). These inventory management tools included bin cards, stock cards, internal facility requests, issue and receipt vouchers, facility combined reports and requisition forms, and records for returning unusable commodities (Federal Democratic Republic of Ethiopia Ministry of Health, 2010:35; Kefale & Shebo, 2019:2).

The conclusions in this section are subdivided into the district and the PHC levels.

- The district level

Some respondents perceived that health workers in healthcare centres in Lesotho used drug supply management tools such as bin cards, dispensing tally sheets, stock count sheets and requisition forms distributed by the DHMTs (refer to Chapter four, Section 4.7.3.1, Figure 4-15). Also, certain healthcare centres hardly ran out of these drugs supply management tools (refer to Chapter four, Section 4.7.3.1, Figure 4-16).

- The primary healthcare level

Health workers at some OPDs and healthcare centres used bin cards, dispensing tally sheets, stock count sheets and requisition forms when managing medicines for NCDs (refer to Chapter four, Section 4.7.3.2, Table 4-72). The OPDs obtained the drug supply management tools through procurement by the district hospital for OPDs whereas, DHMTs mainly distributed the drug supply management tools to healthcare centres (refer to Chapter four, Section 4.7.3.2).

Also, OPDs and healthcare centres hardly ran out of drug supply management tools (refer to Chapter four, Section 4.7.3.2, Table 4-73).

Health workers at health facilities in Lesotho used drug supply management tools such as bin cards, dispensing tally sheets, stock count sheets and requisition forms. These forms were almost always available at health facilities. Availability of these forms and proper use by health workers implies that health facilities will hardly run out of medicines for NCDs. Additionally, one could suggest that training sessions on drug supply management for pharmaceutical and non-pharmaceutical staff (refer to Section 6.3.3.2) included the use of drug supply management tools when managing medicines in the pharmacy.

6.3.4.4 Conclusions and recommendations for updating the national essential medicines list so that it is in line with the prevailing burden of non-communicable diseases

The following section presents conclusions and recommendations for the specific objective that described updating the national EML to align with NCDs' prevailing overall burden. The conclusions and recommendations are drawn from the results indicated in Section 4.7.4, Chapter four.

6.3.4.4.1 Conclusions

Jarvis *et al.* (2019:2) indicated that the national EMLs are important policy tools in NCD management that indicated which medicines were essential within a country's health system. Thus, Jarvis *et al.* (2019:5) revealed that most of the priority medicines for NCDs described within the key WHO NCD technical package (WHO, 2019a) were listed on almost all national EMLs at the LMICs.

The selection of medicines used in the management of NCDs at OPDs and healthcare centres in Lesotho's public health system was aligned with the national EML (refer to Chapter four, Section 4.7.4.1, Table 4-73). Thus, the selection of medicines used in managing NCDs in public health facilities at the PHC level in Lesotho was aligned with the national EML (refer to Chapter four, Section 4.7.4). The EML and STGs are important guides that health facilities use during prescribing, dispensing and procurement of medicines. They contain generic drugs which are less expensive because this is one of the cost-saving measures used by the MOH. Also, because they list generic medicines, it is easier for generic substitution which is permitted by legislation (refer to Chapter four, Section 4.9.3, Table 4-104).

6.3.4.5 Conclusions and recommendations for guidelines on quality control, selection, procurement, storage and distribution of drugs

This section outlines conclusions and recommendations for guidelines on quality control, selection, procurement, storage, and distribution of medicines for NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.7.5, Chapter four.

6.3.4.5.1 Conclusions

The MOH at the national level of a country has a pharmaceutical section which deals with the drug supply chain to all public health facilities in the country and works in collaboration with the central medical store to ensure that medicines used to manage chronic diseases are readily available in health facilities and at affordable prices (WHO, 1994:5-6). The Ministries of Health in Zimbabwe (Mdege *et al.*, 2016:879) and Lesotho (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10) have national drug suppliers responsible for procurement, storage and distribution of medicines and medical supplies. There is currently one leading statutory body established as a trading account of the MOH in Lesotho, the NDSO responsible for procurement, storage and distribution of medicines and medical consumables for public health facilities (GOL, 2013:16; GOL, 2016:29; MOHSW, 2005:2-10; Wade, 2015:7). The conclusion in this section pertains to the MOH.

The consumption method is one of the methods of quantification used for drug needs or consumption forecasting at the national level in Lesotho (refer to Chapter four, Section 4.7.5.1, Table 4-74). The tools for supporting the procurement system management included policies on medicines procurement and standard operating procedures (SOPs) on procurement of medicines specifying very cost-effective medicines (refer to Chapter four, Section 4.7.5.1, Table 4-75). Also, procurement methods mainly used in medicines and medical devices purchase included restricted to tender and direct procurement (refer to Chapter four, Section 4.7.5.1, Table 4-76).

It is evident that the procurement system used in Lesotho is efficient hence medicines for NCDs are almost always available and affordable at health facilities and in the event of stock-outs, health workers borrowed medicines from other health facilities (refer to Section 6.3.4.1). Additionally, health workers used drug supply management tools to manage medicines for NCDs which assisted with availability of these medicines (refer to Section 6.3.4.3). Furthermore, the use of STGs and EML at health facilities ensured the availability of safe, quality and affordable medicines for NCDs because the MOH used procured generic medicines (refer to Section 6.3.4.2).

In addition to using drug supply management tools and STGs and EML, the use of consumption methods, medicines procurement policies, SOPs for procuring cost-effective medicines and use of restricted and direct procurement methods results in an efficient procurement system. Thus, control and management of NCDs by medication are commendable at health facilities in Lesotho due to the uninterrupted availability of medicines to patients.

6.3.4.5.2 Recommendations

Although the MOH of Lesotho has guidelines on quality control, selection, procurement, storage and distribution of drugs, however, strengthening is needed. The MOH needs to utilise more than one supplier to procure and distribute medicines for NCDs to public health facilities to buy from cheaper suppliers and have options during stock-outs from the main supplier (NDSO).

The following section focuses on conclusions and recommendations for the specific objectives of health management and information system (HMIS).

6.3.5 Conclusions and discussions for specific objectives for health management and information systems

The conclusions and recommendations for HMIS were sectioned based on the specific objective, to describe the HMIS at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The level of recording and reporting of information on outpatients with NCDs;
- All factors are influencing the recording and reporting of information on outpatients with NCDs either positively or negatively;
- The type of data collected and kept at the health facilities on NCDs;
- The use of data on NCDs by health workers for decision-making at the district and PHC levels;
- The profile of personnel responsible for NCD management data;
- The use of data on NCDs from health facilities countrywide to inform decision-making at the national level;
- The availability and application of a National Health Management and Information System (NHMIS) policy in governing NCDs data, and
- Structures in place to lead and manage the health system information system (HSIS) in managing NCDs.

6.3.5.1 Conclusions and recommendations for the level of recording and reporting of information on outpatients with non-communicable diseases

This section focuses on conclusions and recommendations for the specific objective that described recording and reporting information on outpatients with NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.8.1, Chapter four.

6.3.5.1.1 Conclusions

A health information system produces, analyses, and disseminates valuable quality data to improve healthcare services' effectiveness and efficiency at all healthcare levels (WHO, 2007a:19). The health information system includes data collection, processing, reporting, and information obtained for decision-making in all health system levels (Kassa & Grace, 2019:9-10; WHO, 2007a:18; WHO, 2008a:12).

Section 6.3.5.1.1 is subdivided into the district and the PHC levels.

- The district level

Indicators for NCDs used by the public health system of Lesotho to monitor NCDs were available and reports on NCDs statistics were submitted to the national level by the DHMTs (refer to Chapter four, Section 4.8.1.1, Table 4-77). Though the DHMTs submitted NCDs statistics to the national level, they did not provide feedback to OPDs and healthcare centres in response to submitted reports (refer to Chapter four, Section 4.8.1.1). Similarly, the national level did not provide feedback to the DHMTs in response to reports submitted regarding NCDs.

- The primary healthcare level

Respondents perceived that persons who collected data on NCDs at OPDs and healthcare centres included nurses, nursing assistants, pharmacists, medical doctors, CHWs and data collection clerks (refer to Chapter four, Section 4.8.1.2, Table 4-78). The NCDs data collection tools at OPDs and healthcare centres were paper-based registries, electronic and paper-based outpatient medical files, which were always available (refer to Chapter four, Section 4.8.1.2, Table 4-79). The OPDs submitted reports on NCDs to the MOH and the DHMTs while the healthcare centres submitted to the DHMTs (refer to Chapter four, Section 4.8.1.2, Table 4-80 & 4-81). The health facilities did not receive any feedback from either the national or district levels in response to reports submitted regarding NCD (refer to Chapter four, Section 4.8.1.2).

The levels of reporting health information on NCDs where health facilities report to DHMTs and DHMTs to the MOH are practically in line with the levels of data reporting (refer to Chapter

three, Section 3.2.3.3). However, it is important to acknowledge receiving submitted reports and to also provide feedback to those who submitted these reports to improve communication between colleagues and stakeholders. To monitor the performance of the health system on NCD prevention and management, indicators for NCDs are available. The availability of these indicators enables health workers at different levels of the health system of Lesotho to collect data on NCDs and submit these reports to relevant structures. Collection of good quality data relies on the availability of people who record this data using data collection tools designed for NCDs which could either be paper-based or electronic in nature. The use of both paper-based and electronic data collection tools is recommended in Lesotho because some health facilities are found in rural areas where internet connectivity is a challenge thus; the use of paper-based data collection tools becomes practical.

6.3.5.1.2 Recommendation

- The Ministry of Health

The communication should be improved and SOPs should be developed to establish what statistics should be given feedback on, when and to whom.

- The district level

The DHMTs have to improve their communication with the MOH and request feedback.

6.3.5.2 Conclusions and recommendations for all factors influencing recording and reporting of information on outpatients with non-communicable diseases either positively or negatively

This section focuses on conclusions and recommendations for all factors that influenced recording and reporting patient information with NCDs either positively or negatively. The conclusions and recommendations are drawn from the results indicated in Section 4.8.2, Chapter four.

6.3.5.2.1 Conclusions

Reporting health information about NCDs to the national level is essential as this information will help with planning and decision-making affecting NCD management at the different levels of the health system, thus improving the effectiveness of health services (Kassa & Grace, 2019:9-10). Therefore, public health facilities need to be able to prepare and submit NCDs data without any constraints.

- The district level

Respondents perceived that DHMTs did not experience any challenges during the preparation and submission of NCDs statistics reports though; difficulties could occur due to a lack of reporting tools (refer to Chapter four, Section 4.8.2.1, Figure 4-20).

- The primary healthcare level

There were respondents who thought that OPDs and healthcare centres did not experience constraints during preparation and submission of NCDs statistics reports (refer to Chapter four, Section 4.8.2.2, Tables 4-82). However, challenges such as a lack of transport, network, and a lack of data collection clerks could cause difficulties in the preparation and submission of reports (refer to Chapter four, Section 4.8.2.2).

The availability of good quality data is important at different levels of the health system because this information will be used for planning and decision-making at the national level which will affect other levels of the health system. Therefore, challenges during the preparation and submission of statistical reports on NCDs at different levels of reporting should be alleviated or avoided. This is possible through the availability of data collection tools and persons responsible for collecting data (refer to Section 6.3.5.1). Therefore, there is little or no constraints during preparation and submission of statistic reports on NCDs at health facilities.

6.3.5.3 Conclusions and recommendations for the type of data collected and kept at the health facilities on non-communicable diseases

The section outlines conclusions and recommendations for the specific objective that assessed the type of NCDs data collected and kept at health facilities.

The conclusions and recommendations are drawn from the results indicated in Section 4.8.3, Chapter four.

6.3.5.3.1 Conclusions

The World Health Organization had developed ten progress monitoring indicators to observe progress achieved by countries in controlling NCDs and their risk factors (WHO, 2017f:212-230). The WHO Package of Essential Non-communicable Disease Interventions (WHO PEN) indicated that NCD management indicators include individual patient monitoring and programme monitoring. These two types of NCD management indicators have to be in place in the health system (WHO, 2018f:31). The NCD management indicators include treatment initiation rate, control rate and complications rate, number of patients screened and treated,

treatment guidelines, and screening coverage in a population (WHO, 2018f:31). These NCD indicators will help countries establish and integrate surveillance and monitoring systems for NCDs into the HIS to monitor NCDs' progress.

- The district level

The OPDs and healthcare centres at the PHC level submitted information for NCDs to DHMTs except for the number of patients with adverse drug reactions (ADRs), type of ADRs patients experienced, management of ADRs, peak flow meter readings, and therapeutic blood level monitoring for epileptic patients (refer to Chapter four, Section 4.8.3.1, Table 4-83). Also, NCD management information was kept electronically at DHMTs (refer to Chapter four, Section 4.8.3.1).

- The primary healthcare level

Some of the OPDs collected information on NCDs except for the number of health promotion activities conducted, the number of patients with ADRs, type of ADRs patients experienced, management of ADRs, peak flow meter readings, and therapeutic blood level monitoring for epileptic patients (refer to Chapter four, Section 4.8.3.2, Table 4-84). Also, some healthcare centres collected information on NCDs apart from peak flow meter readings and therapeutic blood level monitoring for epileptic patients (refer to Chapter four, Section 4.8.3.2, Table 4-84). The information on NCD management was kept in registers at OPDs and healthcare centres (refer to Chapter four, Section 4.8.3.2).

Information on NCDs is submitted by health workers at health facilities to DHTMs who in turn submit to the MOH as done practically in the health system of Lesotho (refer to Chapter three, Section 3.2.3.3), and this is also supported by the results of this study (refer to Section 6.3.5.1). Although health facilities collect and submit data on NCDs to relevant parties, some information on NCDs is not submitted for analysis and interpretation. This implies that there is some information on NCDs lacking without which it becomes difficult for the MOH to make decisions and planning for healthcare services for NCDs at health facilities.

6.3.5.3.2 Recommendations

- The district level

The health workers at public health facilities at the PHC level in Lesotho need to be encouraged to collect all information regarding NCDs because leaving out some information will lead to uninformed decision-making related to NCD prevention and management.

- The primary healthcare level

Information on NCDs submitted by health facilities to the national level is used to determine which areas need improvement. Thus, health facilities need strengthening on the collection and submission of all information on NCDs to the national level.

6.3.5.4 Conclusions and recommendations for the use of data on non-communicable diseases by health workers for decision-making at the district and primary healthcare levels

The following section entails conclusions and recommendations for the specific objective that described the use of data on NCDs by health workers for decision-making at the district and the PHC levels. The conclusions and recommendations are drawn from the results indicated in Section 4.8.4, Chapter four.

6.3.5.4.1 Conclusions

The HIS data at health facilities are used in decision-making about health services and health outcomes related to NCDs at the national level. For instance, the county health team in Liberia's health system performed data analysis using the district health information system (DHIS2) to be used in decision-making at the national level (Republic of Liberia, 2014:7). Also, Malawi's health system (Government of the Republic of Malawi, 2018:11) and Finland (WHO/Europe, 2015:20) have HIS that collects and analyses data to be used in decision-making at national and health facility levels. Thus, Liberia, Malawi and Finland collected, analysed and used the analysed data on NCDs for decision-making at different levels of their health systems (Government of the Republic of Malawi, 2018:11; the Republic of Liberia, 2015:7; WHO/Europe, 2015:20).

Conclusions in this section are subdivided into the district and the PHC levels.

- The district level

The respondents indicated that the DHMT did not use the analysed data. Thus, they did not give examples of how the analysed data was used (refer to Chapter four, Section 4.8.4.1). However, other respondents indicated that the analysed data for NCDs were not used by employees at DHMTs in decision-making on NCD management (refer to Chapter four, Section 4.8.4.1).

- The primary healthcare level

Some respondents perceived that the employees at OPDs and healthcare centres did not analyse the data on NCDs whereas other respondents thought they did (refer to Chapter four, section 4.8.4.2). Some respondents further indicated that the analysed NCDs data were presented using graphs at OPDs and healthcare centres (refer to Chapter four, section 4.8.4.2). Healthcare centres used the analysed data to decide on interventions to be done for patients such as health education and also during ordering of medicines (refer to Chapter four, Section 4.8.4.2).

The Health planning and statistics unit (HPSU) is responsible for analysis of health statistics at the MOH in Lesotho (MOHSW, 2010:95). Thus, analysed data are not analysed by health workers at health facilities. This unit has qualified personnel to carry out the analysis of data on NCDs from health facilities and DHMTs. Additionally, there are qualified health information officers at the district level. However, the analysed data are mostly not used in decision-making at DHMTs and health facilities implying that the prevention and management of NCDs at these levels is not informed by quality data. One of the reasons could be that DHMTs did not receive any feedback on information submitted to the MOH and health facilities did not receive any feedback concerning NCD information submitted to DHMTs (refer to Section 6.3.5.1).

6.3.5.4.2 Recommendations

Information on NCDs collected submitted and analysed could help monitor the health system's performance concerning NCD prevention and management to curb the increasing burden of NCDs. Thus, the use of the analysed data on NCDs needs strengthening at the district and PHC levels to improve health services related to NCD management and increase utilisation of public health facilities by the patient with NCDs.

6.3.5.5 Conclusions and recommendations for the profile of personnel responsible for non-communicable disease management data

The subsequent section presents conclusions and recommendations for the profile of personnel responsible for data on NCD management. The conclusions and recommendations are drawn from the results indicated in Section 4.8.5, Chapter four.

6.3.5.5.1 Conclusions

Health information systems need qualified or trained personnel to function effectively in generating quality data. Lesotho has a Health Management Information System (HMIS) strategic plan 2013-2017, which focuses on the availability of relevant, accurate, and complete

health information through trained and highly motivated staff with necessary resources and appropriate technology (MOH, 2013:14). Also, most health facilities in Sindh (Pakistan) had trained personnel in HMIS reporting, resulting in the submission of correct, complete, and accurate information (Kumar *et al.*, 2012:11).

Lesotho's public health system has designated full-time health information officer positions, including trained health information staff at the district level (refer to Chapter four, Section 4.8.5.1, Table 4-86). Respondents also perceived that health workers in health facilities received regular training in health information through work-related training in the public sector (refer to Chapter four, Section 4.8.5.1, Table 4-86).

The health system of Lesotho through its HPSU has a decentralised HIS by creating positions for health information officers at the district levels. Also, health workers are being trained on health information. This will enable the district and PHC levels to analyse some of its data and use it in decision-making, thus, solving the challenge of not using data on NCDs in decision-making because of lack of communication between the MOH, DHMTs and health facilities (refer to Section 6.3.5.1).

6.3.5.6 Conclusions and recommendations for the use of data on non-communicable diseases from health facilities countrywide to inform decision-making at the national level

The following section presents conclusions and recommendations for the specific objective that assessed the use of data on NCDs from health facilities countrywide to inform decision-making at the national level. The conclusions and recommendations are drawn from the results indicated in Section 4.8.6, Chapter four.

6.3.5.6.1 Conclusions

Policy-making and decision-making need quality data generated from HIS to make informed decisions about healthcare services' effectiveness and efficiency in public healthcare facilities (UNICEF, 2016:5; WHO, 2008c:3; WHO, 2010f:44). The WHO developed the global action plan, which included nine targets and 25 indicators to monitor global and national progress in preventing and controlling NCDs (WHO, 2013:61). For instance, the MOH in the Republic of Kenya utilised these indicators to monitor NCDs to decrease the prevalence of NCDs in Kenya (Ministry of Health Republic of Kenya, 2014:23). Also, the district level in southern Malawi used the analysed data to check health indicators. They produced reports to enable decision-makers to plan accordingly and monitor and evaluate the health system's progress (Kasambara *et al.*, 2017:244). Lesotho's public health system has defined core set indicators and data

requirements for NCDs to inform annual health sector reviews (refer to Chapter four, Section 4.8.6.1). Some respondents perceived that data on NCDs from health facilities were analysed and synthesised to generate valuable information about population health status and needs, and health system performance (refer to Chapter four, Section 4.8.6.1, Table 4-89). However, other respondents indicated that data on population-based surveys were not used to analyse individual needs and experiences of women, men, girls and boys with NCDs (refer to Chapter four, Section 4.8.6.1, Table 4-90). Also, HIS information on NCDs was not used in decision-making on human resources allocation at national, district and PHC levels (refer to Chapter four, Section 4.8.6.1, Table 4-92).

It is worth noting that there were core set indicators and data requirements for NCDs in Lesotho's public health system to generate information about population health status and needs, and health system performance. However, information about individual needs and experiences of women, men, girls and boys with NCDs was lacking. This suggests that decision-making on NCD prevention and management concerning these groups of people was not informed by practical data, creating a challenge for the MOH when assessing NCD prevention and management to these groups at district and PHC levels. Without this information, health facilities are not informed of areas that need strengthening to curb the increasing burden of NCDs. Furthermore, information on NCDs is not used in decision-making on human resources allocation at the national, district and PHC levels which could be one of the contributing factors to the health system of Lesotho experiencing a shortage of health workers (refer to Section 6.3.1.1).

6.3.5.6.2 Recommendations

- The Ministry of Health, district level and the primary healthcare level

The different levels of the public health system of Lesotho need to be encouraged to utilise information on NCDs generated from HIS when making policies and decisions related to NCD prevention and management.

6.3.5.7 Conclusions and recommendations for the availability and application of a National Health Management and Information System policy in governing data for non-communicable diseases

The following section entails conclusions and recommendations for the existence and implementation of a National HMIS policy in governing data for NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.8.7, Chapter four.

6.3.5.7.1 Conclusions

The policy serves as a guide to informed decision-making and operations that support the health system. Thus, an HMIS policy is essential in health systems to collect and disseminate health information, assess and disseminate health information, assess healthcare and public health needs, and evaluate programmes (WHO, 2010f). The health system of Kenya (Republic of Kenya, 2014:2) and South Africa (Republic of South Africa, 2011:7) have health information policies that guide structures needed to generate useful quality data to assess healthcare and monitor the performance of health systems.

Lesotho's health sector has a national HMIS policy that included the management of NCDs (refer to Chapter four, Section 4.8.7.1). Availability and implementation of this policy are important as it will guide the HPSU and HIS at district and PHC levels on the collection, analysis and dissemination of health information on NCDs including assessment of public health needs and healthcare. Thus, the availability and implementation of this policy solves the issue of health information on NCDs not being used in decision-making on human resources allocation and in assessing individual needs and experiences of women, men, boys and girls with NCDs (refer to Section 6.3.5.6).

6.3.5.8 Conclusions and recommendations for structures in place to lead and manage the health system information system in the management of non-communicable diseases

The subsequent section presents conclusions and recommendations for structures to lead and manage HSIS in managing NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.8.8, Chapter four.

6.3.5.8.1 Conclusions

The Lesotho Health Management and Information System (HMIS) provide information on the performance of healthcare services which is guided by policies and legislation such as the Lesotho Bureau of Statistics Act (2001), Information Communication Technology (ICT) Policy Guidelines 2003 (MOHSW, 2003a), HMIS Guidelines Policy 2003 (MOHSW, 2003b), and the HMIS Strategic Plan 2013-2017 (MOH, 2013). The HMIS in Lesotho is a hybrid with a mixture of integrated and stand-alone data systems whereby the integrated HMIS software is a web-based system hosted by the Ministry of Communications Science and Technology (MCST) (MOH, 2013:7).

Lesotho's public health system has structures that lead and managed HSIS in NCD management in place (refer to Chapter four, Section 4.8.8.1, Table 4-94). The structures include operational national HIS administrative units that design, develop, and support collection, management, analysis, dissemination, planning, and management of health information (refer to Chapter four, Section 4.8.8.1, Table 4-94). Also, certain respondents perceived that working equipment for collecting, managing and transmitting NCDs data was available at most health system levels (refer to Chapter four, Section 4.8.8.1, Table 4-96 & Figure 4-21). Other respondents further indicated that ICT equipment support is available at national and district levels (refer to Chapter four, section 4.8.8.1).

From the limited responses received on the topic, it seems that there is no health information dissemination system in place within Lesotho's health system (refer to Chapter four, Section 4.8.8.1, Table 4-97). However, staff capacity-building activities at OPDs and healthcare centres included data collection, analysis, and presentations (refer to Chapter four, Section 4.8.8.1, Table 4-93).

As presented in Sections 6.3.5.1, 6.3.5.2, 6.3.5.3, 6.3.5.5 and 6.3.5.7, it is evident that there is a HIS in place responsible for data collection, analysis and dissemination at different levels of the health system of Lesotho. However, use of information generated from the HIS in planning and decision-making on NCD prevention and management could be improved. In support of the HIS, there are structures that lead and manage HSIS in NCD management including ICT equipment. Therefore, it is practically possible for the health system of Lesotho to have a well-functioning HIS that produces quality information to be used to inform planning, assessment and monitoring of healthcare and population needs.

6.3.5.8.2 Recommendations

The health information dissemination system has to be created; thus, the development and implementation of this system or improvement of the already existing system are needed so that information can be disseminated to the different levels of the health system and the public. Information dissemination will assist with decision-making related to improving health services related to NCD prevention and management.

The following section presents conclusions and recommendations for specific objectives for healthcare financing.

6.3.6 Conclusions and recommendations for specific objectives for healthcare financing

The conclusions and recommendations for healthcare financing were sectioned based on the specific objective, to describe healthcare financing at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The process of budget allocation in different healthcare levels towards medication and medical devices is used to diagnose and manage NCDs;
- Payment for some of the services provided at the health facilities by outpatients with NCDs, and
- Resources allocation procedures at the national level for NCD management.

6.3.6.1 Conclusions and recommendations for the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of non-communicable diseases

The subsequent section focuses on conclusions and recommendations for budget allocation in different healthcare levels towards medication and medical devices used in the diagnosis and management of NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.9.1, Chapter four.

6.3.6.1.1 Conclusions

Health financing aims to improve healthcare by reducing healthcare access inequalities and removing financial barriers for poor populations (WHO, 2010a). In LMICs, healthcare financing comes from the government's domestic resources and donor funds (Mcintyre *et al.*, 2017:127-128; Norwegian Government *et al.*, 2018:1; Shaw *et al.*, 2015:82-84). Sufficient budgets should be allocated for NCD management at all health system levels at national level, to improve NCD healthcare services (WHO-Europe, 2014:28). The MOH in Lesotho uses a medium-term expenditure framework (MTEF), activity-based budgeting and costing systems, broken down by programmes and sub-programmes (MOHSW, 2010:30). The flow of finances within Lesotho's health system has been decentralised, although the local authorities are not responsible for health system management (MOHSW, 2010:31). Refer to Chapter three, Section 3.2.3.2 for a detailed description of the flow of funds in Lesotho's health sector.

This section is subdivided into the district and the PHC levels.

- The district level

Some DHMTs have a budget; although other DHMTs are not involved in developing a budget at the national level (refer to Chapter four, Section 4.9.1.1). Planning and budgeting procedures to strengthen service delivery performance in NCD management were available and used by the OPDs and healthcare centres (refer to Chapter four, Section 4.9.1.1). There were certain respondents who perceived that NCD management financing moved freely from source to the intended end-user (refer to Chapter four, Section 4.9.1.1). Additionally, other respondents perceived that DHMTs used financial records and accounting procedures as financial monitoring systems (refer to Chapter four, Section 4.9.1.1, Figure 4-23). Also, some respondents perceived that DHMTs had full authority to purchase drugs for OPDs and healthcare centres and purchase equipment used for NCDs diagnosis and management in healthcare centres (refer to Chapter four, Section 4.9.1.1, Table 4-98).

- The primary healthcare level

Certain OPDs and healthcare centres had budgets and, some district hospitals were involved in the development of a budget at the national level whereas, some healthcare centres were involved in the development of a budget for NCD management at the district level (refer to Chapter four, Section 4.9.1.2). Some respondents perceived that certain managers at OPDs and healthcare centres used a financial monitoring system such as financial records, accounting procedures and periodic auditing visits (refer to Chapter four, Section 4.9.1.2, Table 4-100). Also, most respondents perceived that OPDs had full authority to purchase NCDs' drugs (refer to Chapter four, Section 4.9.1.2, Table 4-99). Some healthcare centres had full authority to purchase NCDs drugs and equipment used for NCDs diagnosis and management and repair and maintain equipment used for NCDs diagnosis and management (refer to Chapter four, Section 4.9.1.2, Table 4-99).

The process of budget allocation is as per the Ministry of Health and Social Welfare (MOHSW) (MOHSW, 2010:31) (refer to Chapter four, Section 4.9.1, Figure 4-22). The DHMTs, OPDs and healthcare centres have budgets that assist with the allocation of finances. However, some DHMTs and health facilities were not involved in developing their budgets suggesting that needs concerning NCDs might be omitted in the budget thus, creating a challenge when providing services for NCDs. Also, DHMTs, OPDs and healthcare centres have some level of authority on their budget. Practically, district hospitals have been granted various degrees of independence on making decisions on expenditures or inputs such as procurement of supplies, gasoline and medicines (MOHSW, 2010:36). In contrast with the finding of this study on the level of authority that healthcare centres have in their budget, in practice, healthcare centres

and filter clinics do not have any independence in expenditure or inputs including planning and budgeting (MOHSW, 2010:36). Instead, they receive their requested goods and services from district hospitals or DHMTs.

6.3.6.1.2 Recommendations

To strengthen the financing for NCD management, DHMTs need to be directly involved at the national level during budget development because they oversee public health facilities running at the PHC level. Also, the DHMTs need to directly involve healthcare centres during budget development because they will have better input about health facilities' needs.

6.3.6.2 Conclusions and recommendations for payment for some of the services provided at health facilities by outpatients with non-communicable diseases

The next section entails conclusions and recommendations for payment for some of the services provided at health facilities by patients with NCDs. The conclusions and recommendations are drawn from the results indicated in Section 4.9.2, Chapter four.

6.3.6.2.1 Conclusions

The increasing burden of NCDs is a worldwide public health challenge for health systems and universal health coverage is essential when trying to decrease the burden of NCDs, although patients with NCDs still pay for some of the services related to NCDs. For instance, all hospitals in Cambodia's health district level charged consultation fees from patients for NCD-related services (Jacobs *et al.*, 2017:9). Some OPDs charge patients with NCDs a consultation fee and some of these patients used direct payment methods to pay for the consultation fee (refer to Chapter four, Section 4.9.2.1). On the other hand, certain healthcare centres do not charge fees for some of the services provided to patients with NCDs (refer to Chapter four, Section 4.9.2.1). Both OPDs and healthcare centres do not charge fees for medicines provided to NCDs patients (refer to Chapter four, Section 4.9.2.1).

The services for NCDs including medicines are free at health facilities thus, making these services available and affordable for patients with NCDs. In Lesotho, healthcare centres are found in rural areas where underprivileged people are mostly located. Therefore, free services for NCDs and free medicines for NCDs provided to patients at healthcare centres assist the health system of Lesotho in trying to decrease the burden of NCDs. The OPDs are located in district hospitals in towns where most people are employed so, patients with NCDs using OPDs for NCD services can afford to pay for consultation fees and get medicines for free. Thus, services at OPDs are somewhat affordable to patients.

6.3.6.2.2 Recommendations

To achieve universal health coverage, the development of interventions within the budget to cater to consultation fees charged to patients with NCDs at OPDs are necessary to make all services for NCDs free in all public health facilities at the PHC level.

6.3.6.3 Conclusions and recommendations for resources allocation procedures at the national level for non-communicable disease management

The following section focuses on conclusions and recommendations for the specific objective that assessed resources allocation procedures for NCD management at the national level. The conclusions and recommendations are drawn from the results indicated in Section 4.9.3, Chapter four.

6.3.6.3.1 Conclusions

According to the WHO (2014b:5), an annual joint review is an important component of the health sector monitoring mechanism. An annual joint review aims to review progress against health sector plans and develop consensus on how well the sector progresses and actions that will improve performance (WHO, 2014h:5). An annual joint review was introduced in health sectors between the MOH and other stakeholders to assess the performance of the health sectors including financing in countries such as Kenya (Republic of Kenya, 2010:6-7), Zambia (Ministry of Health Republic of Zambia, 2012:10-12) and Lesotho (WHO AFRO, 2014:27).

Furthermore, the budgeting process of Lesotho includes budget planning (Jitsing *et al.*, 2017:43) where the Minister of Health campaigns for the inclusion of NCDs as one of the priority areas, as per the National Strategic Development Plan 2018/19-2022/23 (Government of Lesotho, 2018:119), in the National Budget Strategy Paper (Jitsing *et al.*, 2017:44). The National Budget Strategy Paper ensures that resources are allocated to NCDs during the budget process as the budget planning stage links resource allocation to government priorities.

A joint annual review and planning processes are in place, where financial commitments are made, involving all major development partners (refer to Chapter four, Section 4.9.3.1). Some respondents indicated that there was an easy flow of NCD management financing from source to the intended user (refer to Chapter four, Section 4.9.3.1). Other respondents perceived that budgets were used effectively for planning and implementation in NCD management and, that some health facilities at the district and PHC levels used planning and budgeting procedures to strengthen service delivery performance in NCD management (refer to Chapter four, Section 4.9.3.1, Table 4-103). The Lesotho MOH used cost-effectiveness analysis to advise resource

allocation decisions (refer to Chapter four, Section 4.9.3.1, Figure 4-25). Also, some respondents perceived that the MOH achieved cost savings through reformation or innovation in procurement and contracting practices (refer to Chapter four, Section 4.9.3.1, Table 4-104).

Lesotho's public health system lacked risk-pooling mechanisms; particularly those targeted at the most vulnerable (i.e. poor and marginalised populations) in managing NCDs (refer to Chapter four, Section 4.9.3.1, Table 4-101). Also, available financing to pay for the needed healthcare personnel in managing NCDs was not sufficient (refer to Chapter four, Section 4.9.3.1).

Practically, DHMTs, OPDs and healthcare centres have budgets where DHMTs and OPDs have a level of authority over their budgets while healthcare centres rely on DHMTs to service them (MOHSW, 2010:36). These budgets are used during planning and budgeting procedures to strengthen service delivery performance in NCD management. Budgeting links resources allocation to government priorities. Therefore, finances for NCD management and prevention will flow easily from the Ministry of Finance to healthcare services providers especially when plans for the prevention and management of NCDs are included in the budgets. However, financing needed for paying health workers is not sufficient (refer to Section 6.3.5.6). Hence there is a shortage of health workers in the health system of Lesotho which impacts the quality of healthcare services provided at health facilities.

6.3.6.3.2 Recommendations

The MOH of Lesotho has and uses resource allocation procedures at the national level for NCD management; however, strengthening is needed to cater to vulnerable people in the management of NCDs. The MOH needs to develop and implement risk-pooling mechanisms, specifically those targeted at the most vulnerable (i.e. poor and marginalised populations) in the management of NCDs to provide universal healthcare coverage. Also, the establishment of additional funding is essential to cater to health workers involved in NCD management, especially in health facilities found in rural areas. The additional funds could improve the incentive system, motivate health workers, and decrease attrition rates of health workers in public health facilities.

The following section focuses on conclusions and recommendations for specific objectives for health infrastructure and equipment.

6.3.7 Conclusions and recommendations for specific objectives for health infrastructure and equipment

The conclusions and recommendations for health infrastructure and equipment were sectioned based on the specific objective, to describe health infrastructure and equipment in the public health facilities in Lesotho in terms of:

- Restoration of health infrastructure and equipment at different levels of healthcare, and
- Availability of necessary non-medical and medical equipment for prevention, diagnosis, treatment and monitoring of NCDs at health facilities.

6.3.7.1 Conclusions and recommendations for restoration of health infrastructure and equipment at different levels of healthcare

The subsequent section presented conclusions and recommendations for the restoration of health infrastructure and equipment at different healthcare levels. The conclusions and recommendations are drawn from the results indicated in Section 4.10.1, Chapter four.

6.3.7.1.1 Conclusions

According to the Global Action Plan for the Prevention and Control of NCDs (WHO, 2013:101), health systems improvement entails improving diagnostic services for NCDs by collaboration with the private sector to improve affordability, accessibility, and maintenance of diagnostic equipment and technologies for NCDs. Similarly, the Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-17 of the Republic of South Africa (Republic of South Africa, 2013:72) stated that collaboration with the private sector to improve affordability, accessibility, and maintenance of diagnostic equipment and technologies to improve diagnostic services for NCDs is important.

The MOH of Lesotho has a unit known as the Estate Management Unit (EMU), responsible for maintenance and restoration of health infrastructure and necessary equipment used for diagnosis and monitoring of NCDs; however, the EMU at the MOH was understaffed because technicians were mostly on contracts (GOL, 2013:19).

This section is subdivided into the MOH, district and the PHC levels.

- The Ministry of Health

Three out of three respondents perceived that a maintenance plan was not available at DHMTs, OPDs and healthcare centres (refer to Chapter four, section 4.10.1.1). Some respondents perceived that the district and PHC levels had transportation for providing outreach services

(refer to Chapter four, Section 4.10.1.1, Table 4-105). However, resources to maintain transportation were not available (refer to Chapter four, Section 4.10.1.1). Some respondents also perceived that the budget did not provide for the replacement of equipment used to diagnose and monitor NCDs at DHMTs, OPDs and healthcare centres (refer to Chapter four, Section 4.10.1.1).

- The district level

A maintenance plan for equipment used to diagnose and manage NCDs was seldom available at DHMTs, OPDs and healthcare centres (refer to Chapter four, Section 4.10.1.2). Respondents perceived that there was transportation for providing outreach services at OPDs and healthcare centres (refer to Chapter four, section 4.10.1.2, Table 4-106). However, OPDs and healthcare centres only sometimes had adequate resources to maintain their transportation (refer to Chapter four, section 4.10.1.2). Some respondents further pointed out that activities carried out to maintain equipment at PHC included checking if the equipment is within its service dates and inspection of equipment every month (refer to Chapter four, section 4.10.1.2, Table 4-107).

- The primary healthcare level

The OPDs and healthcare centres had transportation for the evacuation of emergency cases and for providing outreach services (refer to Chapter four, Section 4.10.1.3). However, respondents perceived that resources to maintain transportation at OPDs and healthcare centres were not adequate (refer to Chapter four, Section 4.10.1.3). Most respondents perceived that the following activities were not carried out at OPDs: checking if the equipment was within its service dates, regular calibration, replaced of equipment yearly, and monthly inspection (refer to Chapter four, Section 4.10.1.3, Table 4-109). However, at healthcare centres, some respondents indicated that activities mostly carried out on equipment include checking if the equipment was within its service dates (refer to Chapter four, Section 4.10.1.3, Table 4-109). Also, some respondents perceived that there was a lack of maintenance personnel responsible for maintaining and restoring medical devices used to manage NCDs at OPDs and healthcare centres (refer to Chapter four, Section 4.10.1.3).

Presently, the MOH of Lesotho has a unit called the Estate Management Unit (EMU) responsible for maintenance and restoration of health infrastructure and equipment used for diagnosis and monitoring of NCDs (GOL, 2013:19). However, technicians in the EMU are mostly on contracts and this unit is highly understaffed, resulting in a lack of institutional capacity to manage infrastructure planning, programming, design, procurement and maintenance. There is also a lack of resources to maintain equipment for diagnosis and monitoring of NCDs and to maintain transportation used for providing outreach services and

evacuating emergency cases in health facilities. The MOH also maintains and repairs healthcare facilities when needed using technicians based in the district hospitals (GOL, 2013:19) however, due to a shortage of personnel at the EMU, maintenance of health infrastructure and equipment is not carried out efficiently. Another reason for a lack of resources to maintain infrastructure and equipment is that maintenance is not provided for in the budget because health workers at health facilities are not involved during the development of budgets for their facilities (refer to Section 6.3.6.1). Health workers have reliable information concerning their needs for providing NCD services at health facilities which could be very informative during budget development, therefore; they should be part of the budget development process.

Additionally, having a maintenance plan at health facilities is important because it assists with information on when maintenance should be carried out and for which equipment. Thus, a lack of a maintenance plan at health facilities contributes to inadequate maintenance and repair of equipment used for diagnosis and monitoring of NCDs. This could affect the quality of results during NCD screening and monitoring.

6.3.7.1.2 Recommendations

Revision of the maintenance plan to include maintenance of equipment used to diagnose and monitor NCDs is necessary. Also, the availability of maintenance personnel at health facilities needs to be considered during the planning and development of human resources for NCD management.

6.3.7.2 Conclusions and recommendations for availability and management of infrastructure and equipment used for non-communicable diseases at health facilities

The subsequent section presents conclusions and recommendations for the specific objective that assessed the availability and management of infrastructure and equipment used for NCDs at the PHC level. The conclusions and recommendations are drawn from the results indicated in Section 4.10.2, Chapter four.

6.3.7.2.1 Conclusions

The WHO (2010c:35) has selected cost-effective basic equipment to be used in low-resource settings to diagnose and monitor NCDs based on population needs. This equipment includes core medical devices such as weighing scales, sphygmomanometers, peak flow meters, and urine albumin and blood glucose analysis (WHO, 2010b:35). This equipment will enable patients with NCDs to be treated close to their health facilities and enhance the utilisation of primary care services (WHO, 2010b:35). The public health facilities in south Karnataka (India)

(Jayanna *et al.*, 2019:7), Bangladesh (Rawal *et al.*, 2019:4) and in Uganda (Rogers *et al.*, 2018:5) had equipment such as weighing scales, sphygmomanometers, stethoscope and stature meter, as well as basic diagnostics for diabetes such as blood glucose used in NCD diagnosis and control.

This section is subdivided into the MOH, district and PHC levels.

- The Ministry of Health

The service delivery sites at the district and the PHC levels were well-distributed and well-equipped to deliver essential services for NCD management (refer to Chapter four, Section 4.10.2.1, Table 4-113).

- The district level

The equipment for diagnosing and monitoring NCDs was available and functional at most OPDs and healthcare centres apart from peak flow meters, spacers for inhalers, urine ketones test strips, and therapeutic drug level monitoring for epileptic patients (refer to Chapter four, Section 4.10.2.2, Table 4-115). The equipment includes thermometers, stethoscopes, sphygmomanometers, measurement tapes, weighing scales, glucometers, blood glucose strips, urine protein test strips, urine ketone test strips, and spacers for inhalers (refer to Chapter four, Section 4.10.2.2, Table 4-115).

- The primary healthcare level

The majority of OPDs and healthcare centres had functional equipment for diagnosis and monitoring of NCD. They include thermometers, stethoscopes, sphygmomanometers, measurement tapes, weighing scales, glucometers, blood glucose strips, urine protein test strips and urine ketone test strips (refer to Chapter four, Section 4.10.2.3, Table 4-117 & 4-118). However, the availability of spacers for inhalers, peak flow meters and therapeutic blood level monitoring for epileptic patients in most health facilities was a challenge (refer to Chapter four, Section 4.10.2.3, Table 4-185 & 4-118).

Although there are challenges with the maintenance of equipment used for the diagnosis and monitoring of NCDs at health facilities, it is commendable that most health facilities have functional equipment used to diagnose and monitor NCDs. Thus, diagnosis and monitoring of hypertension and diabetes mellitus are performed efficiently by health workers at health facilities. However, diagnosis and monitoring of patients with asthma and epilepsy may be suboptimal because of limited availability of spacers for inhalers and peak flow meters used during monitoring of asthma as well as limited availability of therapeutic drug level monitoring for

patients with epilepsy in epilepsy management. Therefore, asthma and epilepsy diagnosis and monitoring is a concern as there is a possibility of misdiagnosis and mismanagement of patients with these NCDs.

6.3.7.2.2 Recommendations

- The Ministry of Health and the district level

To improve the availability and functionality of all equipment used for diagnosis and monitoring of NCD, distribution and maintenance of this equipment at different levels of the health system need to be strengthened.

The conclusions and recommendations for specific objectives for the pharmacist's role in the different healthcare levels are displayed and discussed in the next section.

6.3.8 Conclusions and recommendations for specific objectives for the role of the pharmacist in the different levels of healthcare

The conclusions and recommendations for the role of the pharmacist in the different levels of healthcare were sectioned based on the specific objective, to assess the role of the pharmacist at the national, district and PHC levels in the public health facilities in Lesotho in terms of:

- The profile of pharmacists in the management of NCDs, and
- The role of pharmacists in the management of NCDs.

6.3.8.1 Conclusions and recommendations for the profile of pharmacists in the management of non-communicable diseases

The subsequent section focused on conclusions and recommendations for the specific objective that assessed pharmacists' profile in the management of NCDs. The conclusions and recommendations are drawn from the results indicated in section 4.11.1, Chapter four.

6.3.8.1.1 Conclusions

Chronic diseases can be prevented or controlled through health promotion which results in the reduction of risk factors such as sedentary lifestyle, poor nutrition, tobacco use and excessive alcohol consumption (Barrett *et al.*, 2016:137-138; Dietz *et al.*, 2016:1). Effective management of chronic diseases needs good communication and teamwork among pharmacists, other healthcare workers, patients and the community (Rosen *et al.*, 2018:438-440; SIPAS, 2014:10; WHO, 2018c:8). Thus, the health sector should recognise that pharmacists play an essential

role as part of the healthcare team because they are readily accessible healthcare professionals in a community (SIPAS, 2014:10; WHO, 2018c:8).

This section is subdivided into the MOH, district and the PHC levels.

- The Ministry of Health

All respondents perceived that the Pharmaceutical Directorate, DHMTs and OPDs had pharmacists involved in NCD management whereas some respondents thought that these pharmacists were not available at the NCD unit and healthcare centres (refer to Chapter four, Section 4.11.1.1, Figure 4-26).

- The district level

Pharmacists were involved with NCD management at DHMTs, OPDs, Pharmaceutical Directorate and NCD unit (refer to Chapter four, Section 4.11.1.2, Figure 4-27).

- The primary healthcare level

Most OPDs were perceived to have pharmacists involved with NCD management, whereas most healthcare centres were thought not to have pharmacists involved with NCD management (refer to Chapter four, Section 4.11.1.3). Also, some employees in healthcare centres indicated that they needed pharmacists in the pharmacies of healthcare centres to assist with proper management of commodities and proper dispensing and ordering of medicines (refer to Chapter four, Section 4.11.1.3).

Although there is a shortage of health professionals including pharmacists for the management of NCDs (refer to Section 6.3.1.1), pharmacists were available at the Pharmaceutical Directorate, NCD unit, DHMTs and OPDs with an exception of healthcare centres. This implies that issues pertaining to the management of pharmaceuticals are conducted by qualified health professionals. This could be one of the reasons health facilities almost always had medicines for NCDs (refer to Section 6.3.4.1).

6.3.8.1.2 Recommendations

The Ministry of Health could consider including pharmacists at healthcare centres when looking at the health sector staffing norms. Pharmacists are part of a healthcare team who is readily available and accessible to provide pharmaceutical care to patients with NCDs (SIPAS, 2014:10; WHO, 2018c:8).

6.3.8.2 Conclusions and recommendations for the role of pharmacists in the management of non-communicable diseases

The following section presents conclusions and recommendations for the specific objective that described the role of pharmacists in the management of NCDs in the public health system of Lesotho. The conclusions and recommendations are drawn from the results indicated in Section 4.11.2, Chapter four.

6.3.8.2.1 Conclusions

The functions of pharmacists in NCD management include pharmacy-based screening and monitoring of NCDs, counselling on healthy lifestyle, self-management and prevention, patients and caregivers support in understanding the management of NCDs and use of monitoring devices, dispensing of medicines, and therapy and disease management (FIP, 2019:6-7; Steep & Ramaswamy, 2019:2-3; WHO, 2011d:318-323). The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) (SIAPS, 2014:5-8) indicated that pharmacists, as part of healthcare teams, delivered patient-centred services that included pharmaceutical care activities such as the provision of medication-related care to patients, health promotion, and lifestyle modification activities.

This section is subdivided into the MOH, district and the PHC levels.

- The Ministry of Health

At the time of the study, some of the pharmacists in the pharmaceutical directorate were carrying out the following activities (refer to Chapter four, Section 4.11.2.1, Table 4-120):

- Formulation of health and drug policies,
- Cooperate with educators in establishing and modifying curricula for schools of pharmacy and of continuing education programmes,
- Pharmaceuticals supply management,
- Drug approval,
- Drug registration and
- Drug control.

Pharmacists in the NCD unit performed activities such as drug policy formulation, and drug approval (refer to Chapter four, Section 4.11.2.1, Table 4-120).

Pharmacists at DHMTs conducted activities such as (refer to Chapter four, Section 4.11.2.1, Table 4-121):

- Monitored NCDs,
- Provided advice to patients about their medication and health conditions,
- Communicated with other healthcare providers to provide patient care to patients,
- Participated in health promotion activities,
- Pharmaceuticals supply management and
- ADRs monitoring, recording and reporting.

Pharmacists carried out the following activities at OPDs (refer to Chapter four, Section 4.11.2.1, Table 4-121):

- Monitoring of NCDs,
- Providing advice to patients about their medication and health conditions,
- Preventing and managing medication problems,
- Advising patients on self-care,
- Referring patients for assessment by a physician,
- Managing drug therapy for patients,
- Communicating with other healthcare providers to provide patient care to patients,
- Participating in health promotion activities,
- Lifestyle counselling for patients,
- Pharmaceuticals supply management and
- ADRs monitoring, recording and reporting.

- The district level

Pharmacists at OPDs carried out the following activities in NCD management (refer to Chapter four, Section 4.11.2.2, Table 4-122):

- Provide advice to patients about their medication,
- Prevent medication problems,
- Manage medication problems and drug therapy for patients,
- Advise patients on self-care,
- Refer patients for assessment by a physician,
- Supervise pharmacy technicians,
- Collaborate with other healthcare providers as part of a team,
- Participate in health promotion activities,
- Pharmaceuticals supply management and
- ADRs monitoring, recording and reporting.

- The primary healthcare level

The activities currently carried out by pharmacists at OPDs in NCD management included (refer to Chapter four, Section 4.11.2.3, Table 4-123):

- Monitoring NCDs,
- Providing advice to patients about their medication,
- Preventing medication problems,
- Managing medication problems and drug therapy for patients,
- Advising patients on self-care,
- Referring patients for assessment by a physician,
- Supervising pharmacy technicians,
- Collaborating with other healthcare providers as part of a team,
- Participating in health promotion activities,
- Pharmaceuticals supply management and
- ADRs monitoring, recording and reporting.

The pharmacists at healthcare centres should carry out all activities similar to those being done by pharmacists in OPDs (refer to Chapter four, Section 4.11.2.3, Table 4-124).

In conclusion, pharmacists at the MOH, DHMTs and OPDs (except in healthcare centres) carried out activities related to NCD prevention and management hence why medicines for NCDs hardly ran out at OPDs. Thus, pharmacists work as part of a healthcare team at the national and district levels of the health system of Lesotho. The roles of pharmacists at the national and district levels have been outlined in the management of NCDs except in healthcare centres.

6.3.8.2.2 Recommendations

The MOH could consider staffing healthcare centres with at least one pharmacist per healthcare centre to assist with activities similar to those carried out by pharmacists in OPDs. Also, task-shifting to pharmacy technicians or non-pharmaceutical staff could be other options to assist with activities that are to be carried out by a pharmacist.

6.4 General conclusion

The most important elements of the public health system of Lesotho that need improvement are healthcare finance and human resources to provide quality NCD services to patients with NCDs and the community. Healthcare finance together with human resources is the main driving force behind the other elements namely: medicines for NCDs, HIS and health infrastructure and

equipment. Healthcare finance is at the top of the hierarchy. As funds generated from taxes and other government revenues are being allocated, the MOH of Lesotho has to use cost-saving measures during resources allocation at the national, district and the PHC levels. The MOH should not only rely on cost-effectiveness analysis (CEA) but use other cost-saving measures such as cost-benefit analysis (CBA). Reduction of the risk of inefficient allocation of resources in the public sector needs a harmonised procedure for economic evaluations. For instance, Svensson and Hultkrantz (2017:50) in their comparison between the practical use of CEA and CBA in Sweden revealed that it is beneficial to use these two methods of economic evaluation as tools to allocate public funds in the health sector. They indicated that CBA is carried out within a given budget frame, while CEA is conducted without considering budgetary consequences in Sweden (Svensson & Hultkrantz, 2017:50). However, these methods of economic evaluation are used to decide on how much to do (budget allocation), not just what to do within a sector. Thus, budgetary constraints will not be the only determining factor on how much should be allocated to NCDs but quality-adjusted life years will also be considered.

The shortage of human resources is a concern in the health system of Lesotho, thus, funds have to be allocated to generate, train, motivate and retain health workers at different levels of the health system especially in health facilities. There are national training institutions that graduate health professionals such as pharmacists, pharmacy technicians, nurses and nursing assistants. The MOH could revise the establishment list of 1980, which guides the MOH on hiring of health professionals. The MOH could develop new staffing norms based on the number of patients per health professionals to cater for the increasing number of patients with NCDs. Training of CHWs could also be improved so that they can efficiently carry out health promotion and screening for NCDs to assist with early diagnosis and data collection. The CHWs will be able to relieve some of the work that health professionals have to do. There could also be funding allocated towards salaries for CHWs so that they are motivated to carry out their roles in NCD prevention and management. This funding could be shared amongst different stakeholders such as the government and NGOs. Training of health workers through professional development and continuing education should be financed to enable health workers to improve their competencies and skills in the prevention and management of NCDs. Training will also motivate health workers to stay in their jobs. Motivation of health workers could also be through provision of incentives especially for those working in rural areas, medical aid, salary increments and staff rotation to keep health workers challenged by new environments.

Health workers are also the main drivers behind the availability of medicines for NCDs. Some of the cost-saving measures that could be put in place are regulation for use of generic medicines

and substitution of brands with generic medicines because generics are affordable. Additionally, health workers should be trained on drug supply and medical supplies management to alleviate medicine stock-out or over-stocking. Refresher training sessions could also be held for health workers so that new improvements on drug supply and medical supplies management can be taught. The MOH could consider not only relying on the NDSO as the main source of supplying health facilities with medicines for NCDs. The MOH may consider another supplier as backup during instances when the NDSO fails to supply medicines to health facilities timely.

Funding also needs to be available to purchase and maintain equipment used for diagnosis and monitoring of NCDs including training of health workers on how to use this equipment. Equipment for screening and monitoring of NCDs has to be maintained through regular servicing which could be provided by maintenance personnel. Therefore, maintenance personnel should be available at health facilities or arrangements made for them to visit health facilities regularly for maintenance of equipment. Availability of functional equipment will assist health workers with quality results during screening for NCDs and during monitoring of patients with NCDs. This quality data will help during decision-making at different levels of the health system on NCD prevention and management. For quality data on NCDs to be available, the MOH could employ data collectors or train people to perform the role of data collection using both paper-based and electronic means of data collection. Paper-based forms will be useful in rural areas where there is a lack of internet. Furthermore, trained personnel on data analysis could be available at the national and district areas to assist with the generation of quality reports on NCDs that will be used in policy-making and decision-making at the different levels of the health system.

In conclusion, there is a lack of recent research about the health system of Lesotho. This study will be beneficial to the MOH because it will provide the most recent data on the different elements of the public health system of Lesotho. Not only will the MOH benefit, but the district level and health facilities will have baseline information on how the management and prevention of NCDs are being carried out, where improvements need to be done and necessary steps to be taken to provide quality services for NCDs at health facilities. The different levels of the public health system of Lesotho could also learn a lot from the proposed structure of NCD management which could be used to improve on the already existing structure.

6.5 Recommendations for future research

There was limited response to some of the questions by respondents in this study. Therefore, further investigations are needed for specific objectives stated in Section 6.3. Further research is recommended in the following areas:

- Research on staffing norms and availability of health workers in NCD management in Lesotho's public health sector;
- Studies about strategies to improve communication in relation to NCDs among the different levels of the health system, and
- Investigating financing of activities related to the prevention and management of NCDs.

The proposed framework of NCD management in the public health system of Lesotho shown in Figure 5-6 (refer to Chapter five, Section 5.1.1.6) cannot be implemented and tested because the results of this study were perceptions of managers at the different levels of the health system of Lesotho. However, this proposed structure can be used to improve on the existing structure provided the different elements (refer to Chapter five, Section 5.1.1.6, Figure 5-6) are further investigated.

6.6 Benefits

The study does not directly benefit participants, but the participants might feel good about an altruistic action and receive an opportunity to share their views on NCD management in settings in Lesotho. Indirect benefits include:

- The information generated from this study will be used by the national, district, and PHC levels to inform decision-making in the management of NCDs in Lesotho's health sector.
- This was an observational cross-sectional study that assessed the management of NCDs in Lesotho's public health system. Some of the issues identified included a lack of human resources and a need to strengthen continuing professional development, training of health workers, maintenance of equipment, and financing of NCD management. These issues call for further exploration through research.
- The participating institutions could benefit from this study by understanding the nature of services or problems of NCD management in various healthcare levels in Lesotho.
- The study strived to indirectly benefit the community by supporting healthcare providers' insight into the management of NCDs in different healthcare levels in Lesotho.
- The study identified factors that influenced the effective management of NCDs. These factors included:
 - Availability of trained health workers on NCD management.
 - Availability of benefits for health workers at health facilities and DHMTs.
 - Use of CHWs to reach the community.
 - Availability of sufficient funds for prevention and management of NCDs.
 - Availability of medicines for NCDs in health facilities.
 - In-service training and continuing professional development for health workers.

- Importance of having a well-functioning HIS in the public health system of Lesotho.
- Importance of use of data on NCDs in decision-making and policy-making.
- Maintenance of equipment used in NCD prevention and management.
- Importance of having pharmacists at different levels of the health systems in the prevention and management of NCDs.

6.7 Limitations of the study

Limitations of the study were as follows:

- The total number of potential participants was nine at the MOH and only six participants partook in the study (66.7% response rate). A limitation could be that questions about issues beyond their scope of work were asked to participants. Therefore, participants were not able to respond to these questions.
- The questionnaire could have been too long and complicated thus not user friendly. Most participants ended submitting unanswered questionnaires, which affected the response rate at the district and PHC levels. Nine out of 30 participants at the district level (DHMTs) responded to the questionnaires, which lead to a low response rate of 30%. At OPDs 16 out of 90 participants responded to the questionnaires (response rate was 17.8%) and at healthcare centres, 86 out of 276 participants responded to the questionnaires (response rate was 31.2%).
- Also, a lack of personnel at DHMTs, OPDs and healthcare centres in the district and PHC levels led to a reduced participation rate.
- Staff transfers from one health facility to the other led to participants not complying with the inclusion criteria because they had less than six months working in the new health facility.

6.8 Chapter summary

This chapter focussed on the interpretation and practical implications of the findings of this study.

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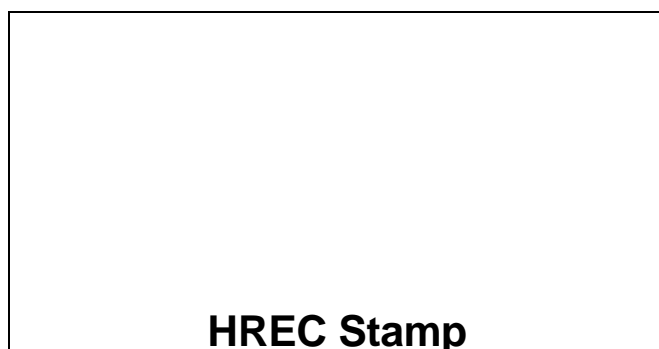
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ANNEXURE A: MINISTRY OF HEALTH SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE



NON-COMMUNICABLE DISEASE MANAGEMENT IN THE PUBLIC HEALTH SYSTEM OF LESOTHO

MINISTRY OF HEALTH OF LESOTHO SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE

Thank you for taking this self-administered structured questionnaire.

The general aims of this study are as follows:

- To assess the health system in public health facilities in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy.
- To assess the role of the pharmacist in the national, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

Please indicate your answer marking with an **X symbol** for closed-ended questions or by giving your **opinion** for open-ended questions. Your opinion is very valuable so please be as honest as possible. The self-administered structured questionnaire is lengthy so you will be given three days to complete the self-administered structured questionnaire.

Your replies are strictly confidential. Your participation is completely voluntary. If a specific question makes you too uncomfortable, you may skip it and proceed to the next question. Alternatively you may also withdraw from the study without any penalties. The findings of the research will be shared with the Ministry of Health of Lesotho, district health management teams, district hospitals and the healthcare centres.

The self-administered structured questionnaire should only be completed by participants who have given their informed consent. Participants will be identified using codes to guarantee anonymity. Confidentiality will be maintained through confidentiality agreements between mediators and participant, and between participant and other participants.

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Thank you for your time. Your participation is greatly appreciated and will greatly benefit to the success of the research project.

For office use only

Self-administered structured questionnaire number:	
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MINISTRY OF HEALTH SURVEY

Date:	__dd__mm__yyyy__
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SECTION 1: DEMOGRAPHIC INFORMATION

1.1 Which division or programme do you work for at the Ministry of Health?

Division/program	Please mark with an X
1.1.1 Pharmaceutical directorate	1
1.1.2 Non-communicable disease unit	2

1.2 What is your current position in **question 1.1**?

1.3 What are your year(s) of employment at your current position in question 1.2?

1.4 What is your gender?

Gender	Please mark with an X
Male	1
Female	2

1.5 What is your age (in years)? _____

1.6 What is your highest level of education?

Highest level of education	Please mark with an X
1.6.1 Diploma	1
1.6.2 Bachelor's degree	2
1.6.3 Master's degree	3
1.6.4 PhD	4
1.6.5 Other, please specify	5-10

1.7 What is your profession? _____

1.8 Fill in table below with respect to District Health Management (DHM) Structures. **Please mark with an X**

Characteristics	District development committee		District health committee		District health management team	
	No	Yes	No	Yes	No	Yes
1.8.1 Is the District Health Management structure in place in Lesotho	0	1	0	1	0	1
1.8.2 Do the District Health Management structures have guidelines on its functions	0	1	0	1	0	1
1.8.3 Does the District Health Management structure have authority to make decisions on:						
	No	Yes	No	Yes	No	Yes
1.8.3.1 District health plan	0	1	0	1	0	1
1.8.3.2 District health budget	0	1	0	1	0	1
1.8.3.3 Human resources	0	1	0	1	0	1
1.8.3.4 Purchase of drugs	0	1	0	1	0	1
1.8.3.5 Purchase of medical supplies	0	1	0	1	0	1
1.8.3.6 Other, please specify	0	1	0	1	0	1

1.9 According to the policy of the Ministry of Health, do professionals in the DHMTs, outpatient departments in district hospitals and the healthcare centres have job descriptions? **Please mark with an X**

Professionals	No	Yes
DHMTs		
1.9.1 District health managers	0	1
1.9.2 Pharmacists	0	1
1.9.3 Public health nurses	0	1
Outpatient departments in district hospitals		
1.9.4 Pharmacists	0	1
1.9.5 Hospital manager of nursing services	0	1
1.9.6 Matrons	0	1
1.9.7 Medical superintendents	0	1
1.9.8 Doctors	0	1
1.9.9 Nurses	0	1
Healthcare centres		
1.9.10 Nurse clinicians ¹	0	1
1.9.11 Nurses	0	1

¹ A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration and supervision duties (MOHSW, 1980:75-77).

1.10 For the following professionals with job descriptions, is management of non-communicable diseases included in their job descriptions? **Please mark with an X**

Professionals	No	Yes
DHMTs		
1.10.1 District health managers	0	1
1.10.2 Pharmacists	0	1
1.10.3 Public health nurses	0	1
Outpatient departments in district hospitals		
1.10.4 Pharmacists	0	1
1.10.5 Hospital manager of nursing services	0	1
1.10.6 Matrons	0	1
1.10.7 Medical superintendents	0	1
1.10.8 Doctors	0	1
1.10.9 Nurses	0	1
Healthcare centres		
1.10.10 Nurse clinicians	0	1
1.10.11 Nurses	0	1

1.11 How many facilities in the districts have district health plans?

1.12 Have any of the following studies on non-communicable diseases been carried out in the districts in the past 5 years? **Please mark with an X**

Research on non-communicable diseases	No	Yes
1.12.1 Health system research	0	1
1.12.2 Household surveys	0	1
1.12.3 Other operational studies, please specify	0	1

If any of your answers to question 1.12 are yes, continue with question 1.13. If all the answers to question 1.12 are no, please proceed to question section 2.

1.13 Please give examples of studies carried out in the past 5 years on non-communicable diseases.

SECTION 2: HUMAN RESOURCES

2.1 Is there regular and coordinated health workforce planning for non-communicable disease management on the following levels or departments? **Please mark with an X**

	No	Yes
2.1.1 National level	0	1
2.1.2 District level	0	1
2.1.3 Primary healthcare level	0	1
2.1.4 Education including academic institutions	0	1
2.1.5 Finance	0	1
2.1.6 Private sector actors (role-players)	0	1
2.1.7 Development partners	0	1
2.1.8 Other key stakeholders, please specify	0	1

2.2 If one of your answers to question 2.1 are **yes**, indicate which of the following exist. **Please mark with an X**

	No	Yes
2.2.1 Existence of joint annual human resource planning process that involves key stakeholders	0	1
2.2.2 Existence of policies regarding hiring, firing, disciplining, paying, rewarding, promotion, and deploying workers	0	1
2.2.3 Existence of institutional models for projecting, monitoring, and evaluating staffing requirements	0	1
2.2.4 Other, please specify	0	1

2.3 Which cadre of healthcare professionals is produced by the following institutions? **Please mark with an X**

Cadre of healthcare professionals	No	Yes
National University of Lesotho		
2.3.1 Pharmacists	0	1
2.3.2 Pharmacy technicians	0	1
2.3.3 Nurses	0	1
2.3.4 Nurse clinicians	0	1
2.3.5 Nursing assistants	0	1
2.3.6 Medical doctors	0	1
National Health Training College		
2.3.7 Pharmacists	0	1
2.3.8 Pharmacy technicians	0	1
2.3.9 Nurses	0	1
2.3.10 Nurse clinicians	0	1
2.3.11 Nursing assistants	0	1
2.3.12 Medical doctors	0	1
Christian Health Association of Lesotho (CHAL) Nursing College		

2.3.13 Pharmacists	0	1
2.3.14 Pharmacy technicians	0	1
2.3.15 Nurses	0	1
2.3.16 Nurse clinicians	0	1
2.3.17 Nursing assistants	0	1
2.3.18 Medical doctors	0	1

2.4 Do health sciences students (students who will be healthcare professionals after graduation) in the Lesotho higher education institutions graduate with skills indicated below to be used in non-communicable disease management? **Please mark with an X**

Skills	No	Yes
National University of Lesotho		
2.4.1 Clinical skills ²	0	1
2.4.2 Technical skills ³	0	1
2.4.3 Management skills ⁴	0	1
National Health Training College		
2.4.4 Clinical skills	0	1
2.4.5 Technical skills	0	1
2.4.6 Management skills	0	1
Christian Health Association of Lesotho (CHAL) Nursing College		
2.4.7 Clinical skills	0	1
2.4.8 Technical skills	0	1
2.4.9 Management skills	0	1

² Clinical skills consist of components such as procedural knowledge (how to perform the skill), declarative knowledge that justifies this procedural knowledge (such as underlying anatomy and physiology), and clinical reasoning (including diagnostic reasoning and clinical decision-making) (Michels *et al.*, 2012:e580).

³ Technical skills are practical in nature and often pertain to mechanical or scientific subjects that is, allows a person to complete a designated task in real life situations and not theoretically (Mack, 2017). Technical skills refer to the ability to perform a certain task (blood glucose level monitoring, blood pressure monitoring) that require the use of certain tools (glucometer, blood pressure machine).

⁴ Management skills are skills that enable a person to manage others effectively and they include motivation (ability to motivate employees or patients); problem-solving (being able to identify, face and overcome various problems that may arise in the workplace); professionalism (ability to hold the highest standards such as work ethic and demeanour so that employees and clients will have a clear example of what to strive for); communication (being able to communicate effectively in both verbal and written form with employees, managers and clients); technical skills (knowledge of practical practice using certain tools); and innovation (being able to bring different perspectives and new ideas) (CareerBuilder, 2017).

2.5 Which of the following institutions produce sufficient number of graduates? **Please mark with an X**

Institutions	Yes	Somewhat	No
2.5.1 National University of Lesotho	0	1	2
2.5.2 National Health Training College	0	1	2
2.5.3 CHAL Nursing College	0	1	2

2.5.4 Does the Ministry of Health of Lesotho collaborate with South African Development Community (SADAC) countries regarding training of healthcare personnel?

No	Yes	Sometimes
0	1	2

2.6 Indicate which of the following are in place or carried out to strengthen clinical supervision⁵. **Please mark with an X**

	No	Yes
2.6.1 In the past year, did health service providers at primary healthcare facilities receive clinical supervision on non-communicable disease management?	0	1
2.6.2 In the past year, did senior staff at primary healthcare facilities receive in-service management training on non-communicable disease management?	0	1
2.6.3 In the past year, did senior staff at primary healthcare facilities receive in-service management training with nationally approved curricula on non-communicable disease management?	0	1
2.6.4 In the past six months, did community health workers receive clinical supervision on non-communicable disease management?	0	1
2.6.5 In the last year, were clinical supervision visits to healthcare centres conducted for which data are available?	0	1
2.6.6 In the next year, are there planned clinical supervision visits to healthcare centres?	0	1

⁵ Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive.” This definition will be used to define clinical supervision in this study.

2.7 Do healthcare workers in different levels of the health system receive adequate professional development or continuing education support on non-communicable disease management?

Please mark with an X

Levels of the health system	Professional development			Continuing education support		
	Yes	Somewhat	No	Yes	Somewhat	No
District level						
2.7.1 District Health Management Teams (DHMTs)	0	1	2	0	1	2
Primary healthcare level						
2.7.2 Outpatient departments in district hospitals	0	1	2	0	1	2
2.7.3 Healthcare centres	0	1	2	0	1	2

2.8 If any of your answers to question 2.7 are **yes**, which of the following exist? **Please mark with an X**

	No	Yes
2.8.1 Existence of a formal in-service training component for all levels of staff	0	1
2.8.2 Existence of a coordinated system of in-service training/continuing education across the Ministry of Health	0	1
2.8.3 Existence of study leave	0	1
2.8.4 Existence of funding for tuition fees	0	1

2.9 Are there high attrition rates⁶ of health professionals in the following areas? **Please mark with an X**

Areas	No	Yes
2.9.1 DHMT	0	1
2.9.2 Outpatient departments in district hospitals	0	1
2.9.3 Healthcare centres	0	1

2.10 If any of your answers to question 2.9 are **yes**, please provide possible reasons for high attrition rates in those areas.

⁶ Attrition rate refers to employees voluntarily resigning from the health facilities (NGDATA, 2017).

2.11 Indicate cadres with high attrition rates in the following areas. **Please mark with an X**

Professionals	No	Yes
DHMTs		
2.11.1 District health managers	0	1
2.11.2 Pharmacists	0	1
2.11.3 Public health nurses	0	1
Outpatient departments in district hospitals		
2.11.4 Pharmacists	0	1
2.11.5 Hospital manager of nursing services	0	1
2.11.6 Matrons	0	1
2.11.7 Medical superintendents	0	1
2.11.8 Nurses	0	1
2.11.9 Pharmacy technicians	0	1
Healthcare centres		
2.11.10 Nurses in charge	0	1
2.11.11 Nurse clinicians	0	1
2.11.12 Nurses	0	1

2.12 Is there community participation in decision-making and improving service quality in non-communicable disease management at the following levels of the health system? **Please mark with an X**

Levels of the health system	Decision-making			Improving service quality		
	No	Yes	Sometimes	No	Yes	Sometimes
2.12.1 National level	0	1	2	0	1	2
2.12.2 District level	0	1	2	0	1	2
2.12.3 Primary healthcare level	0	1	2	0	1	2

2.13 If any of your answers to question 2.12 are **yes or sometimes**, indicate which of the following are involved in decision-making and improving service quality in the management of non-communicable diseases? **Please mark with an X**

	Decision making			Improving service quality		
	No	Yes	Sometimes	No	Yes	Sometimes
National level						
2.13.1 Chiefs	0	1	2	0	1	2
2.13.2 Priests	0	1	2	0	1	2
2.13.3 Traditional healers	0	1	2	0	1	2
2.13.4 Existence of committees/forums where community members can engage with and influence decisions affecting the health system	0	1	2	0	1	2
2.13.5 Community-based organisations/networks meaningfully involved in policy-	0	1	2	0	1	2

making processes at the national level?						
District level						
2.13.7 Chiefs	0	1	2	0	1	2
2.13.8 Priests	0	1	2	0	1	2
2.13.9 Traditional healers	0	1	2	0	1	2
2.13.10 Community-based organisations/networks meaningfully involved in policy-making processes at the district level	0	1	2	0	1	2
Primary healthcare level						
2.13.11 Chiefs	0	1	2	0	1	2
2.13.12 Priests	0	1	2	0	1	2
2.13.13 Traditional healers	0	1	2	0	1	2
2.13.14 Community-based organisations/networks meaningfully involved in policy-making processes at the primary healthcare level	0	1	2	0	1	2

2.14 Is there an institutional structure for a community-based service delivery system in non-communicable disease management? **Please mark with an X**

No	Yes
0	1

2.15 Are there community health workers⁷ working with healthcare centres in the primary healthcare level throughout Lesotho involved in non-communicable disease management? **Please mark with an X**

No	Yes
0	1

2.15.1 If your answer to question 2.15 is **yes**, are there guidelines stating the relationship of the community health workers and the healthcare centres in the primary healthcare level? **Please mark with an X**

No	Yes
0	1

⁷ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter informal training provided by nurses at the healthcare centres (WHO, 2007b:2).

2.15.2 If your answer to question 2.15.1 is **yes**, what major issues do these guidelines cover in terms of the relationship between the healthcare centre and the community health workers in managing non-communicable diseases? **Please mark with an X**

Issues	No	Yes
2.15.2.1 Home visits	0	1
2.15.2.2 Lifestyle counselling on NCDs	0	1
2.15.2.3 Nutrition education	0	1
2.15.2.4 Health promotion activities ⁸ on NCDs	0	1
2.15.2.5 Palliative care for NCDs patients	0	1
2.15.2.6 Recording of NCDs to the healthcare centre	0	1
2.15.2.7 Reporting of NCDs to the healthcare centre	0	1
2.15.2.8 Collection of medication for NCDs patients from the healthcare centre	0	1
2.15.2.9 Screening of NCDs	0	1
2.15.2.10 Monitoring of non-communicable diseases	0	1
2.15.2.11 Other, please specify _____		

2.16 Indicate whether the community health workers receive funding from the following sources. **Please mark with an X**

Sources of funding	No	Yes	Sometimes
2.16.1 Government	0	1	2
2.16.2 NGOs	0	1	2
2.16.3 Community members	0	1	2
2.16.4 Other, please specify _____	0	1	2

2.17 According to the district health plan, how many health professionals should be allocated to the following sectors? **Please write your answers in provided spaces.**

Professionals	Sectors		
	DHMT	Outpatient department in a district hospital	Healthcare centre
2.17.1 Pharmacists			
2.17.2 Pharmacy technicians			
2.17.3 Nurses			
2.17.4 Nurse clinicians			
2.17.5 Nursing assistants			
2.17.6 Public health nurses			
2.17.7 Medical doctors			

⁸ Health promotion is a process that enables individuals and communities to engage in healthy lifestyles and make changes that reduce the risk of developing diseases and other comorbidities (WHO, 1998:43).

2.18 Indicate whether all posts of professionals stated in question 2.17 are currently filled in the following sectors. ***Please mark with an X***

Professionals	Sectors					
	DHMTs		Outpatient departments in district hospitals		Healthcare centres	
	No	Yes	No	Yes	No	Yes
2.18.1 Pharmacists	0	1	0	1	0	1
2.18.2 Pharmacy technicians	0	1	0	1	0	1
2.18.3 Nurses	0	1	0	1	0	1
2.18.4 Nurse clinicians	0	1	0	1	0	1
2.18.5 Nursing assistants	0	1	0	1	0	1
2.18.6 Public health nurses	0	1	0	1	0	1
2.18.7 Medical doctors	0	1	0	1	0	1

SECTION 3: MEDICATION AND MEDICAL DEVICES

3.1 Are there standard treatment guidelines for the following non-communicable diseases?

Standard treatment guidelines	No	Yes
3.1.1 Hypertension	0	1
3.1.2 Diabetes mellitus	0	1
3.1.3 Asthma	0	1
3.1.4 Epilepsy	0	1

3.2 Is there a formal list of essential medicines consistent with population health priorities in the management of non-communicable diseases in the following levels of the health system?

Please mark with an X

Levels of the health system	No	Yes
District level		
3.2.1 District Health Management Team (DHMT)	0	1
Primary healthcare level		
3.2.2 Outpatient departments in district hospitals	0	1
3.2.3 Healthcare centres	0	1

3.3 If any of your answers to question 3.2 are **yes**, indicate the state of the following. **Please mark with an X**

	No	Yes	Year
3.3.1 Existence and year of last update of a published national medicines policy	0	1	
3.3.2 Existence and year of last update of a published national standard treatment guidelines	0	1	
3.3.3 Existence and year of last update of a published national list of essential medicines	0	1	
3.3.4 Existence of an active national committee responsible for managing the process of maintaining a national medicines list	0	1	

3.4 Is medicine selection for the management of non-communicable diseases at the primary healthcare level in line with the national essential medicine list? **Please mark with an X**

Primary healthcare	No	Yes
3.4.1 Outpatient departments in district hospitals	0	1
3.4.2 Healthcare centres	0	1

3.5 If any of your answers to question 3.4 are **no**, why is medicine selection for the management of non-communicable diseases at the primary healthcare level not in line with the national essential medicines list?

3.6 Which method of quantification do you use to make forecasts of drug needs/consumption at the national level? **Please mark with an X**

Method of quantification	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.6.1 Consumption method	0	1	2	3	4
3.6.2 Morbidity method	0	1	2	3	4
3.6.3 Proxy consumption method	0	1	2	3	4
3.6.4 Service-level projection of budget requirements	0	1	2	3	4
3.6.5 Other, please specify	0	1	2	3	4

3.7 How accurate are the forecasts of drug needs/consumption? **Please mark with an X**

	Level of accuracy
3.7.1 Very inaccurate	1
3.7.2 Inaccurate	2
3.7.3 Accurate	3
3.7.4 Very accurate	4
3.7.5 Undecided	5

3.8 Is the procurement process in the Ministry of Health of Lesotho efficient i.e. getting the best drugs for the best price at the right time? **Please mark with an X**

Inefficient	Uncertain	Efficient
0	1	2

3.8.1 If your answer to question 3.8 is **inefficient**, please provide reasons why the procurement process is inefficient.

3.8.2 Do the following exist in the national level to manage the procurement system? **Please mark with an X**

	No	Yes
3.8.2.1 Existence of policies on medicines procurement that specify the most cost-effective medicines	0	1
3.8.2.2 Existence of standard operating procedures (SOPs) on medicines procurement that specify the most cost-effective medicines	0	1
3.8.2.3 Existence of legal provisions to allow generic substitution in the public sector	0	1
3.8.2.4 Existence of legal provisions to encourage generic substitution in the public sector	0	1

3.9 Indicate whether guidelines for monitoring medical products for the following exist? **Please mark with an X**

Guidelines	Exist	
	No	Yes
3.9.1 Potency	0	1
3.9.2 Proper labelling	0	1
3.9.3 Expiration	0	1
3.9.4 Damage	0	1
3.9.5 Tampering	0	1

3.10 Which of the following quality and safety monitoring systems are in existence? **Please mark with an X**

	No	Yes
3.10.1 Existence of standard procedures for the quality control of health products at initial receipt at the national level	0	1
3.10.2 Existence of a system for the collection of data regarding post-marketing surveillance	0	1
3.10.3 Other, please specify	0	1

3.11 Which procurement method is used at the national level to purchase medicines and medical devices for the country? **Please mark with an X**

Procurement method	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.11.1 Open tender (public and unrestricted bid)	0	1	2	3	4
3.11.2 Restricted tender (suppliers must be registered and approved in advance)	0	1	2	3	4
3.11.3 Negotiated procurement (suppliers are well known and can be approached directly)	0	1	2	3	4
3.11.4 Direct procurement (suppliers' wholesale or retail prices are used directly)	0	1	2	3	4
3.11.5 Other, please specify _____	0	1	2	3	4

SECTION 4: HEALTH MANAGEMENT AND INFORMATION SYSTEM

4.1 Are there sufficient personnel employed to implement an effective Health System Information System (HSIS)? *Please mark with an X*

Sufficient	Uncertain	Insufficient
0	1	2

4.2 Indicate which of the following have been implemented. *Please mark with an X*

	No	Yes	Don't know
4.2.1 The health information system has a cadre of trained health information staff in place at the district level	0	1	2
4.2.2 Health workers in health facilities (healthcare centres, district hospitals) receive regular training in health information that is integrated into continuing education in the public sector	0	1	2
4.2.3 Health workers in health facilities (healthcare centres, district hospitals) receive regular training in health information through in-service training in the public sector	0	1	2
4.2.4 The Ministry of Health has adequate capacity in core health information sciences (epidemiology, demography, statistics, information, and information and communications technology (ICT))	0	1	2
4.2.5 The national statistics office has adequate capacity in statistics (demography, statistics, ICT)	0	1	2
4.2.6 At the district level there are designated full-time health information officer positions	0	1	2

4.3 Have the following Health Information System (HIS) capacity-building activities taken place over the past year for HIS staff at the national and district levels? *Please mark with an X*

Activities	National level			District level		
	No	Yes	Sometimes	No	Yes	Sometimes
4.3.1 Statistics training	0	1	2	0	1	2
4.3.2 Software maintenance	0	1	2	0	1	2
4.3.3 Database maintenance	0	1	2	0	1	2
4.3.4 Epidemiology training	0	1	2	0	1	2

4.4 Have the following Health Information System capacity-building activities taken place over the past year for health facility staff? *Please mark with an X*

Activities	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
4.4.1 Data collection	0	1	2	0	1	2
4.4.2 Analysis	0	1	2	0	1	2
4.4.3 Presentations	0	1	2	0	1	2

4.5 Are structures in place to lead and manage Health System Information Systems in non-communicable disease management? **Please mark with an X**

No	Yes
0	1

4.5.1 If your answer to question 4.5 is **yes**, indicate which of the following are in place. **Please mark with an X**

	No	Yes	Don't know
4.5.1.1 There is a representative and functioning national committee in charge of HIS coordination	0	1	2
4.5.1.2 The national statistics office and the Ministry of Health have established coordination mechanisms (e.g. a task force on health statistics)	0	1	2
4.5.1.3 There are functional national HIS administrative units to design health information collection, management, analysis, dissemination, and use for planning	0	1	2
4.5.1.4 There are functional national HIS administrative units to develop health information collection, management, analysis, dissemination, and use for management	0	1	2
4.5.1.5 There are functional national HIS administrative units to support health information collection, management, analysis, dissemination, and use for planning	0	1	2
4.5.1.6 There are functional national HIS administrative units to support health information collection, management, analysis, dissemination, and use for management	0	1	2
4.5.1.7 There are meetings to coordinate the timing, key variables measured, and funding of nationally representative population-based surveys that measure health indicators	0	1	2
4.5.1.8 There is a multiyear plan to coordinate the timing, key variables measured, and funding of nationally representative population-based surveys that measure health indicators	0	1	2
4.5.1.9 The health and statistical constituencies in the country work together closely on survey design and implementation and data analysis and use	0	1	2

4.6 Has the following been defined for non-communicable diseases? **Please mark with an X**

	No	Yes
4.6.1 Core set of indicators	0	1
4.6.2 Data requirements	0	1

If any of your answers to question 4.6 are yes, continue with question 4.7, 4.8 and 4.9. If all the answers to question 4.6 are no, please proceed to question 4.10.

4.7 Indicate which of the following is in place for the management of non-communicable diseases. **Please mark with an X**

	No	Yes	Don't know
4.7.1 Existence of a national set of indicators with targets and annual reporting to inform annual health sector reviews and other planning cycles	0	1	2
4.7.2 National minimum core indicators have been identified for the national level covering all categories of health indicators	0	1	2
4.7.3 National minimum core indicators have been identified for the district level covering all categories of health indicators	0	1	2
4.7.4 National minimum core indicators have been identified for the primary healthcare level covering all categories of health indicators	0	1	2

4.8 Have core indicators for non-communicable disease management been selected according to the following explicit criteria. **Please mark with an X**

Criteria	No	Yes	Don't know
4.8.1 Usefulness	0	1	2
4.8.2 Scientific soundness	0	1	2
4.8.3 Reliability	0	1	2
4.8.4 Representativeness	0	1	2
4.8.5 Feasibility	0	1	2
4.8.6 Accessibility	0	1	2

4.9 Core indicators for non-communicable disease management are defined in collaboration with which of the following key stakeholders? **Please mark with an X**

Key stakeholders	No	Yes	Don't know
4.9.1 Ministry of Health	0	1	2
4.9.2 National Statistics Office	0	1	2
4.9.3 Professional organisations	0	1	2
4.9.4 Major disease-focused programmes	0	1	2
4.9.5 Other relevant ministries; please specify	0	1	2

4.10 Are data on non-communicable diseases from across different information sub-systems managed in a coordinated and integrated fashion on national level? **Please mark with an X**

Yes	Somewhat	No
0	1	2

4.11 If your answer to question 4.10 is **yes**, indicate which of the following is used to manage information in a coordinated and integrated fashion. **Please mark with an X**

	No	Yes
4.11.1 Are there standard formats and codes used across information sub-systems (to facilitate data exchange and aggregation)?	0	1
4.11.2 Is there a written set of procedures for data management?	0	1
4.11.3 Are unique identifier codes available for administrative geographical units (e.g. DHMT, outpatient departments in district hospitals, healthcare centres) to facilitate the merging of multiple databases from different sources?	0	1
4.11.4 At the district level, a data warehouse equivalent to the national one exists	0	1
4.11.5 A data warehouse at the district level has a reporting utility that is accessible to various users	0	1

4.12 Is there functioning equipment for the following in relation to non-communicable disease management? **Please mark with an X**

	No	Yes
4.12.1 Collecting data	0	1
4.12.2 Managing data	0	1
4.12.3 Transmitting data ⁹	0	1

If any of your answers to question 4.12 are yes, continue with question 4.13, 4.14, 4.15 and 4.16. If all the answers to question 4.12 are no, please proceed to question 4.17.

⁹ Transmitting data is a process of sending data over a communication medium (such as a computer) to one or multiple recipient devices such as a computer or server (Technopedia, 2017).

4.13 Indicate which of the following supplies are available for data collection on non-communicable diseases at different levels of the health system. **Please mark with an X**

Supplies	National level			District level			Primary healthcare level		
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
4.13.1 Recording forms	0	1	2	0	1	2	0	1	2
4.13.2 Paper	0	1	2	0	1	2	0	1	2
4.13.3 Pencils	0	1	2	0	1	2	0	1	2
4.13.4 Other, specify _____	0	1	2	0	1	2	0	1	2

4.14 Indicate whether computers are available to permit rapid compilation of district data on non-communicable diseases at the following levels of the health system. **Please mark with an X**

	No	Yes	Sometimes
National level			
4.14.1 Pharmaceutical directorate	0	1	2
4.14.2 Non-communicable disease unit	0	1	2
District level			
4.14.3 DHMT	0	1	2
Primary healthcare level			
4.14.4 Outpatient departments in district hospitals	0	1	2
4.14.5 Healthcare centres	0	1	2

4.15 Indicate which basic information and communications technology (ICT) infrastructure is in place at the following sectors. **Please mark with an X**

	No	Yes
Ministry of Health		
4.15.1 Telephones	0	1
4.15.2 Internet access	0	1
4.15.3 e-mail	0	1
District Health Management Teams		
4.15.4 Telephones	0	1
4.15.5 Internet access	0	1
4.15.6 e-mail	0	1
Outpatient departments in district hospitals		
4.15.7 Telephones	0	1
4.15.8 Internet access	0	1
4.15.9 e-mail	0	1
Healthcare centres		
4.15.10 Telephones	0	1
4.15.11 Internet access	0	1

4.15.12 e-mail	0	1
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4.16 Indicate whether support for information and communications technology (ICT) equipment is available at the following levels of the health system. **Please mark with an X**

Health system levels	No	Yes	Sometimes
4.16.1 National level	0	1	2
4.16.2 District level	0	1	2
4.16.3 Primary healthcare level	0	1	2

4.17 Are data on non-communicable diseases being analysed and synthesised to produce useful information about the following? **Please mark with an X**

	Not at all	Sometimes	Almost always
4.17.1 Population health status	0	1	2
4.17.2 Population needs	0	1	2
4.17.3 Health system performance	0	1	2

If any of your answers to question 4.17 are sometimes or almost always, continue with question 4.18, 4.19 and 4.20. If all the answers to question 4.17 are no, please proceed to question 4.21.

4.18 Are population projections by age and sex on non-communicable diseases available for the following areas for the current year? **Please mark with an X**

Areas	No	Yes	Sometimes
4.18.1 DHMT	0	1	2
4.18.2 Outpatient departments in district hospitals	0	1	2
4.18.3 Healthcare centres	0	1	2

4.19 Indicated whether data from the following are used to analyse the different needs and experiences of the following population with non-communicable diseases. **Please mark with an X**

Areas	Population-based surveys			Routine HIS			Facility surveys		
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
4.19.1 Women	0	1	2	0	1	2	0	1	2
4.19.2 Men	0	1	2	0	1	2	0	1	2
4.19.3 Girls	0	1	2	0	1	2	0	1	2
4.19.4 Boys	0	1	2	0	1	2	0	1	2

4.20 Is there a designated and functioning institutional mechanism charged with analysis of the following in relation to management of non-communicable diseases? **Please mark with an X**

	No	Yes
4.20.1 Health statistics	0	1
4.20.2 Synthesis of data from different sources	0	1
4.20.3 Validation of data from population-based sources	0	1
4.20.4 Validation of data from facility-based sources	0	1

4.21 Is there an effective system for disseminating Health System Information System (HSIS) information on non-communicable diseases to the following at the following levels of healthcare? **Please mark with an X**

	National level			District level			Primary healthcare level		
	Ineffective	Uncertain	Effective	Ineffective	Uncertain	Effective	Ineffective	Uncertain	Effective
4.21.1 Policy makers	0	1	2	0	1	2	0	1	2
4.21.2 Managers	0	1	2	0	1	2	0	1	2
4.21.3 Providers	0	1	2	0	1	2	0	1	2
4.21.4 Other, specify _____	0	1	2	0	1	2	0	1	2

4.22 If any of your answers to question 4.21 are **effective**, indicate which of the following are in place and functional. **Please mark with an X**

	In place		Functional		
	No	Yes	No	Yes	Sometimes
4.22.1 Existence of a website for country health statistics, making the latest reports and data on NCDs available to the general public	0	1	0	1	2
4.22.2 Graphs are widely used to display information on NCDs at health administrative offices	0	1	0	1	2
4.22.3 Graphs are widely used to display information on NCDs at health facilities	0	1	0	1	2

4.23 Is information from the health information system on non-communicable diseases used as a foundation for deciding how resources will be allocated across the levels of the health system? **Please mark with an X**

Levels of the health system	Human resource			Financial resource		
	No	Yes	Sometimes	No	Yes	Sometimes
4.23.1 National level	0	1	2	0	1	2
4.23.2 District level	0	1	2	0	1	2
4.23.3 Primary healthcare level	0	1	2	0	1	2

4.24 Does a National Health Management and Information System policy exist? **Please mark with an X**

No	Yes
0	1

4.24.1 If your answer to question 4.24 is **yes**, does it cater for management of information for non-communicable diseases? **Please mark with an X**

No	Yes
0	1

4.24.2 If your answer to question 4.24.1 is **yes**, outline what the national health management and information system policy says about management of information for non-communicable diseases.

SECTION 5: HEALTHCARE FINANCING

5.1 Are responsibilities for financing of non-communicable disease management clearly defined and agreed upon among the following actors? **Please mark with an X**

	Yes	Sometimes	No	Don't know
5.1.1 Different levels of government	0	1	2	3
5.1.2 Development partners	0	1	2	3
5.1.3 Different levels of healthcare	0	1	2	3

If any of your answers to question 5.1 are yes or sometimes, continue with question 5.2 and 5.3. If all the answers to question 5.1 are no or don't know, please proceed to question 5.4.

5.2 Is there a joint annual review and planning process in place, where financial commitments are made, involving all major development partners? **Please mark with an X**

	No	Yes
5.2.1 Joint annual review	0	1
5.2.2 Joint planning process	0	1

5.3 If any of your answers to question 5.2 are **no**, what do you use as an indicator for financial commitments made involving all major development partners?

5.4 Are committed funds for non-communicable disease management collected/disbursed in a timely and predictable fashion? **Please mark with an X**

No	Yes	Sometimes
0	1	2

5.4.1 If your answer to question 5.4 is **no**, please give reasons why committed funds for non-communicable disease management are not collected/disbursed in a timely and predictable fashion.

5.5 Are risk-pooling¹⁰ mechanisms in place, especially those targeting the most vulnerable (i.e. poor and marginalised populations) in the management of non-communicable diseases?

Please mark with an X

Yes	No	Don't know
0	1	2

5.5.1 If your answer to question 5.5 is **yes**, indicate the risk-pooling approach used? **Please mark with an X**

Risk pooling approach	Not at all	Sometimes	Almost always
5.5.1.1 No risk-pooling ¹¹	0	1	2
5.5.1.2 Unitary risk-pooling ¹²	0	1	2
5.5.1.3 Fragmented risk-pooling ¹³	0	1	2
5.5.1.4 Integrated risk-pooling ¹⁴	0	1	2
5.5.1.5 Other, specify	0	1	2

5.6 Are budgets being used effectively for planning and implementation in non-communicable disease management? **Please mark with an X**

	Ineffectively	Uncertain	Effectively
5.6.1 Planning	0	1	2
5.6.2 Implementation	0	1	2

¹⁰ Pooling is the health system function whereby collected health revenues are transferred to purchasing organisations and ensures that the risk related to financing health interventions is borne by all the members of the pool, not by each contributor individually (Smith & Witter, 2004).

¹¹ In no risk-pool, all expenditure liability lies with the individual to cover certain healthcare services (Smith & Witter, 2004).

¹² In unitary risk pool, revenue generated by taxation, social insurance, healthcare insurance, or user charges is placed in a single central pool that covers certain healthcare services (Smith & Witter, 2004).

¹³ In fragmented risk pools, a series of independent risk pools (such as local governments or employer-based pools) are to that covers certain healthcare services (Smith & Witter, 2004).

¹⁴ In integrated risk pools, fragmented risk pools are compensated for the variations in risk to which they are exposed (Smith & Witter, 2004).

5.7 If any of your answers to question 5.6 are **effectively**, indicate which of these performance indicators are used? **Please mark with an X**

Performance indicators	No	Yes
5.7.1 The budget is linked to the annual operational plan for the current year	0	1
5.7.2 The health facilities use planning procedures to strengthen service delivery performance	0	1
5.7.3 The health facilities use budgeting procedures to strengthen service delivery performance	0	1
5.7.4 The national level prepares budgets using Activity-Based Costing (ABC)	0	1

5.7.5 Other, specify

5.8 Are planning and budgeting procedures in existence to strengthen service delivery performance in non-communicable disease management? **Please mark with an X**

	No	Yes	Don't know
5.8.1 Planning procedures	0	1	2
5.8.2 Budgeting procedures	0	1	2

5.9 If any of your answers to question 5.8 are **yes**, do health facilities use the planning and budgeting procedures to strengthen service delivery performance in non-communicable disease management? **Please mark with an X**

	DHMT			OPDs in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
5.9.1 Planning procedures	0	1	2	0	1	2	0	1	2
5.9.2 Budgeting procedures	0	1	2	0	1	2	0	1	2

5.10 Is information on population health needs¹⁵ on non-communicable disease management used to inform resource allocation decisions? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

¹⁵ “The need for health services as recognised by health professionals from the point of view of the benefit obtainable from advice, preventive measures, management or specific therapy” (WHO, 2011c).

5.10.1 If your answer to question 5.10 is **not at all**, what do you use in order to make informed decisions on resource allocation for non-communicable disease management?

5.11 Which analysis is used to inform resource allocation decisions for non-communicable diseases? **Please mark with an X**

Analysis	Not at all	Sometimes	Almost always
5.11.1 Cost-effectiveness analysis ¹⁶	0	1	2
5.11.2 Cost-benefit analysis ¹⁷	0	1	2
5.11.3 Cost-utility analysis ¹⁸	0	1	2

5.12 Is the Ministry of Health achieving cost-savings through reform/innovation in procurements and contracting practices for drugs used in the management of non-communicable diseases?

Please mark with an X

	No	Yes	Sometimes
5.12.1 Procurement practices	0	1	2
5.12.2 Contracting practices	0	1	2

5.13 If any of your answers to question 5.12 are **yes or sometimes**, indicate which of the following are in existence. **Please mark with an X**

	No	Yes
5.13.1 Active purchasing principles are followed by the Ministry of Health	0	1
5.13.2 Existence of strategies to reduce the price of medicines (e.g. procuring generics, pooled procurement, negotiated price reductions)	0	1

¹⁶ Cost-effectiveness analysis is a cost analysis technique which considers the level of provision of goods or services achieved from a given level of inputs (WHO, 1998:21; WHO, 2003b:26). Cost-effectiveness analysis is used to assess undertakings where it is not possible to use CBA which normally requires that the value of both the inputs and the outputs is put in money terms (WHO, 1998:21).

¹⁷ Cost-benefit analysis is a cost analysis technique for enumerating and evaluating the total costs and total benefits associated with an undertaking (WHO, 1998:20; WHO, 2003b:27). Cost-benefit analysis involves costs and benefits to be included; (b) evaluation of costs; interest rate to be used for assessing the relative weight to give to the parts of the stream of present and future costs and benefits arising in the undertaking; and constraints to be recognised within the analysis which may affect the overall feasibility or impact of the undertaking or the actual distribution of costs and benefits (WHO, 1998:20-21).

¹⁸ Cost-utility analysis is a cost analysis technique used to determine cost in terms of utilities, especially quantity and quality of life (WHO, 2003b:27). CUA is used to compare two different drugs or procedures whose benefits may be different (WHO, 2003b:27).

5.13.3 Existence of legal provisions to allow generic drug substitution in public sector	0	1
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5.14 Does financing for non-communicable disease management flow easily from source to intended end user? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.14.1 If your answer to question 5.14 is **not at all**, please give reasons why financing for non-communicable disease management does not flow easily from source to intended end user.

5.15 Is there a functional system for revenue and expenditure tracking in non-communicable disease management? **Please mark with an X**

	No	Yes	Don't know
5.15.1 Revenue tracking	0	1	2
5.15.2 Expenditure tracking	0	1	2

If any of your answers to question 5.15 are yes, continue with question 5.16 and 5.17. If all the answers to question 5.15 are no, please proceed to question 5.18.

5.16 How do you track revenue in non-communicable disease management?

5.17 How do you track expenditure in non-communicable disease management?

5.18 Is accuracy of financial records on non-communicable disease management verified?

Please mark with an X

No	Yes	Sometimes
0	1	2

5.18.1 If your answer to question 5.18 is **yes or sometimes**, specify how financial records on non-communicable disease management are verified for accuracy?

5.19 Is sufficient financing available to pay for the needed healthcare personnel in the management of non-communicable diseases? **Please mark with an X**

Not at all	Occasionally	Sometimes	Frequently	Almost always
0	1	2	3	4

SECTION 6: HEALTH INFRASTRUCTURE AND EQUIPMENT

6.1 Are service delivery sites (healthcare centres, OPDs in district hospitals etc.) at the district and primary healthcare level well distributed and equipped to deliver essential services for non-communicable disease management? *Please mark with an X*

Level of health system	Well distributed service delivery sites			Well-equipped service delivery sites		
	No	Yes	Sometimes	No	Yes	Sometimes
District level						
6.1.1 DHMT	0	1	2	0	1	2
Primary healthcare level						
6.1.2 Outpatient departments in district hospitals	0	1	2	0	1	2
6.1.3 Healthcare centres	0	1	2	0	1	2

6.2 Are there guidelines for procedures on maintenance of infrastructure and equipment used for non-communicable disease management at the district and primary healthcare level? *Please mark with an X*

	District level		Primary healthcare level	
	No	Yes	No	Yes
6.2.1 Maintenance of infrastructure	0	1	0	1
6.2.2 Maintenance of equipment	0	1	0	1

6.3 Does the national, district and the primary healthcare levels have adequate transportation for the following in the management of non-communicable diseases? *Please mark with an X*

	National level		District level			Primary healthcare level			
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
6.3.1 Evacuation of emergency cases	0	1	2	0	1	2	0	1	2
6.3.2 Providing outreach services	0	1	2	0	1	2	0	1	2
6.3.3 Other, specify _____	0	1	2	0	1	2	0	1	2

6.4 Do district and primary healthcare levels have adequate resources to maintain their transportation? **Please mark with an X**

Transportation maintenance	Not at all	Sometimes	Almost always
District level			
6.4.1 DHMT	0	1	2
Primary healthcare level			
6.4.2 Outpatient departments in district hospitals	0	1	2
6.4.3 Healthcare centres	0	1	2

6.5 Does the budget make provision for replacement of equipment used for diagnosis and monitoring of non-communicable diseases at the district and primary healthcare level? **Please mark with an X**

Level of health system	No	Yes	Sometimes
6.5.1 DHMT	0	1	2
6.5.2 Outpatient departments in district hospitals	0	1	2
6.5.3 Healthcare centres	0	1	2

6.6 Does a maintenance plan for equipment used in the diagnosis and monitoring of non-communicable diseases at the district and primary healthcare levels exist? **Please mark with an X**

Maintenance plan	No	Yes
6.6.1 DHMT	0	1
6.6.2 Outpatient departments in district hospitals	0	1
6.6.3 Healthcare centres	0	1

SECTION 7: ROLE OF THE PHARMACIST IN THE DIFFERENT LEVELS OF HEALTHCARE

7.1 Are there pharmacists in the following sectors of the health system of Lesotho involved in the management of non-communicable diseases? *Please mark with an X*

Sectors	No	Yes
7.1.1 DHMTs	0	1
7.1.2 Outpatient departments in district hospitals	0	1
7.1.3 Healthcare centres	0	1
7.1.4 The pharmaceutical directorate	0	1
7.1.5 The non-communicable disease unit	0	1

7.2 For sectors **without** pharmacists in question 7.1, please give reasons why there are no pharmacists.

7.3 Which activities are currently being carried out by pharmacists in management of non-communicable diseases in **the district and primary healthcare levels** of Lesotho? *Please mark with an X*

Activities	District Health Management Teams			OPDs in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
7.3.1 Monitoring of non-communicable diseases ¹⁹	0	1	2	0	1	2	0	1	2
7.3.2 Provide advice to patients about their medication	0	1	2	0	1	2	0	1	2
7.3.3 Provide advice to patients about their health conditions	0	1	2	0	1	2	0	1	2
7.3.4 Prevent medication problems	0	1	2	0	1	2	0	1	2
7.3.5 Manage medication problems	0	1	2	0	1	2	0	1	2
7.3.6 Advise patients on self-care	0	1	2	0	1	2	0	1	2
7.3.7 Advise patients on self-medication	0	1	2	0	1	2	0	1	2
7.3.8 Develop care plans for diseases	0	1	2	0	1	2	0	1	2
7.3.9 Refer patients for assessment by a physician	0	1	2	0	1	2	0	1	2
7.3.10 Manage drug therapy for patients	0	1	2	0	1	2	0	1	2
7.3.11 Communicate with other healthcare providers to provide patient care to patients	0	1	2	0	1	2	0	1	2
7.3.12 Participate in health promotion activities	0	1	2	0	1	2	0	1	2
7.3.13 Lifestyle counseling for patients	0	1	2	0	1	2	0	1	2
7.3.14 Procure medication for diseases	0	1	2	0	1	2	0	1	2
7.3.15 Store medication for diseases	0	1	2	0	1	2	0	1	2
7.3.16 Distribute medication for diseases	0	1	2	0	1	2	0	1	2
7.2.17 Adverse drug reactions monitoring ²⁰	0	1	2	0	1	2	0	1	2

¹⁹ Monitoring of NCDs is periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).

Activities	District Health Management Teams			OPDs in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes	No	Yes	Sometimes
7.2.18 Adverse drug reactions recording ²¹	0	1	2	0	1	2	0	1	2
7.2.19 Adverse drug reactions reporting ²²	0	1	2	0	1	2	0	1	2
7.2.20 Other, specify _____	0	1	2	0	1	2	0	1	2

²⁰ Adverse drug reactions monitoring is a process of continuously monitoring of undesirable effects suspected to be associated with medicine use (Tanzania Food & Drugs Authority, 2006).

²¹ Adverse drug reactions recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (Tanzania Food & Drugs Authority, 2006) thus generating suspected case reports of adverse drug reactions.

²² Adverse drug reactions reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (Tanzania Food & Drugs Authority, 2006).

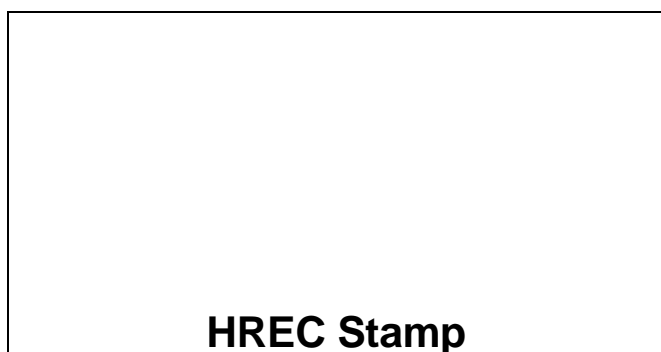
7.4 Which activities are currently being carried out by pharmacists in management of non-communicable diseases at **national level** in Lesotho? *Please mark with an X*

Activities	Pharmaceutical directorate			Non-communicable disease unit		
	No	Yes	Sometimes	No	Yes	Sometimes
7.4.1 Formulation of health policy	0	1	2	0	1	2
7.4.2 Formulation of drug policy	0	1	2	0	1	2
7.4.3 Cooperate with educators in establishing the curricula of schools of pharmacy.	0	1	2	0	1	2
7.4.4 Cooperate with educators in modifying the curricula of schools of pharmacy.	0	1	2	0	1	2
7.4.5 Cooperate with educators in establishing the curricula of continuing education programmes	0	1	2	0	1	2
7.4.6 Cooperate with educators in modifying the curricula of continuing education programmes	0	1	2	0	1	2
7.4.7 Management of drug procurement	0	1	2	0	1	2
7.4.8 Management of drug distribution	0	1	2	0	1	2
7.4.9 Management of drug supply	0	1	2	0	1	2
7.4.10 Drug approval	0	1	2	0	1	2
7.4.11 Drug registration	0	1	2	0	1	2
7.4.12 Drug control	0	1	2	0	1	2
7.4.13 Post-marketing surveillance	0	1	2	0	1	2
7.4.14 Other, please specify	0	1	2	0	1	2

The self-administered structured questionnaire is now complete! Remember that you cannot withdraw your answers after you have placed your questionnaire in the submission box, since we cannot trace your answers back to you.

Thank you for your time and participation!

ANNEXURE B: DISTRICT HEALTH MANAGEMENT TEAMS SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE



NON-COMMUNICABLE DISEASE MANAGEMENT IN THE PUBLIC HEALTH SYSTEM OF LESOTHO

DISTRICT HEALTH MANAGEMENT TEAM SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE

Thank you for taking this self-administered structured questionnaire.

The general aims of this study are as follows:

- To assess the health system in public health facilities in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy.
- To assess the role of the pharmacist in the national, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

Please indicate your answer by marking with an **X symbol** for closed-ended questions or by giving your **opinion** for open-ended questions. Your opinion is very valuable so please be as honest as possible. The self-administered structured questionnaire is lengthy so you will be given three days to complete the self-administered structured questionnaire.

Your replies are strictly confidential. Your participation is completely voluntary. If a specific question makes you too uncomfortable, you may skip it and proceed to the next question. Alternatively you may also withdraw from the study without any penalties. The findings of the research will be shared with the Ministry of Health of Lesotho, district health management teams, district hospitals and the healthcare centres.

The self-administered structured questionnaire should only be completed by participants who have given their informed consent. Participants will be identified using codes to guarantee anonymity. Confidentiality will be maintained through confidentiality agreements between mediators and participant, and between participant and other participants.

You are welcome to contact:

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Ethics committee:

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Thank you for your time. Your participation is greatly appreciated and will greatly benefit to the success of the research project.

For office use only

Self-administered structured questionnaire number:	
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DISTRICT HEALTH MANAGEMENT TEAM (DHMT) SURVEY

Date:	__dd__mm__yyyy__
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SECTION 1: DEMOGRAPHIC INFORMATION

1.1 In which district is your DHMT found? Please mark with an X

District	Please mark with an X
1.1.1 Maseru	1
1.1.2 Berea	2
1.1.3 Leribe	3
1.1.4 Butha-Buthe	4
1.1.5 Mokhotlong	5
1.1.6 Thaba-Tseka	6
1.1.7 Qacha's Nek	7
1.1.8 Quthing	8
1.1.9 Mohale's Hoek	9
1.1.10 Mafeteng	10

1.2 Which managerial position do you hold at the DHMT?

Managerial position	Please mark with an X
1.3.1 District medical officer	1
1.3.2 District pharmacist	2
1.3.3 Public health nurse	3
1.3.4 Other, please specify _____	4-10

1.3 What are your year(s) of employment at the managerial position you hold in question 1.2?

1.4 What is your gender?

Gender	Please mark with an X
1.4.1 Male	1
1.4.2 Female	2

1.5 What is your age (in years)? _____

1.6 What is your highest level of education?

Highest level of education	Please mark with an X
1.6.1 Diploma	1
1.6.2 Bachelor's degree	2
1.6.3 Master's degree	3
1.6.4 PhD	4
1.6.5 Other, please specify _____	5-10

1.7 What is your profession? _____

1.8 Fill in the table below with respect to the DHMT structures. **Please mark with an X**

Characteristics	DHMT	
	No	Yes
1.8.1 Is the DHMT structure in place?	0	1
1.8.2 Does the DHMT have guidelines on its functions and responsibilities?	0	1
1.8.3 Does the DHMT structure have authority to make decisions on:		
	No	Yes
1.8.3.1 District health plan?	0	1
1.8.3.2 District health budget?	0	1
1.8.3.3 Human resources e.g. posting or transfers?	0	1
1.8.3.4 Purchase of drugs?	0	1
1.8.3.5 Purchase of other medical supplies?	0	1
1.8.3.6 Other, please specify _____	0	1

1.9 Have any of the following studies on non-communicable diseases been carried out in the districts in the past 5 years? **Please mark with an X**

Research on non-communicable diseases	No	Yes
1.9.1 Health system research	0	1
1.9.2 Household surveys	0	1
1.9.3 Other operational studies, please specify _____	0	1

1.10. How were the results of the different studies on non-communicable diseases used in the district?

1.11 What is your role at the DHMT in relation to non-communicable disease management?

1.12 Do you have a job description? *Please mark with an X*

No	Yes
0	1

SECTION 2: HUMAN RESOURCES

2.1 Do you carry out clinical supervisions²³ in healthcare centres? **Please mark with an X**

No	Yes	Sometimes
0	1	2

If your answer to question 2.1 is yes or sometimes, continue with question 2.2, 2.3, 2.3.1 and 2.3.2. If the answer to question 2.1 is no, please proceed to question 2.4.

2.2 Which documents do you use during clinical supervision of healthcare centres? **Please mark with an X**

Documents	No	Yes
2.2.1 Supervision checklist	0	1
2.2.2 Supervision plan or schedule	0	1
2.2.3 Reports of past supervision visits	0	1

2.3 How many clinical supervisory visits concerning non-communicable disease management did you carry out at the healthcare centres in the past 6 months?

2.3.1 Have changes you recommended during clinical supervisory visits on non-communicable disease management been implemented? **Please mark with an X**

No	Yes
0	1

2.3.2 List examples of changes that were made as a result of clinical supervisory visits on non-communicable disease management in the past 6 months.

²³ “Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive” (Powell & Brodsky, 2004).

2.4 Are there community health workers²⁴ in healthcare centres under your supervision working with the community? **Please mark with an X**

No	Yes
0	1

If your answer to question 2.4 is yes, continue with question 2.5 and 2.6. If the answer to question 2.4 is no, please proceed to question 2.7.

2.5 Are there guidelines stating the relationship of the community health workers and the healthcare centres in the primary healthcare level? **Please mark with an X**

No	Yes
0	1

2.6 What major issues do these guidelines cover concerning management of non-communicable diseases? **Please mark with an X**

Issues	No	Yes
2.6.1 Home visits	0	1
2.6.2 Lifestyle counselling on NCDs	0	1
2.6.3 Nutrition education	0	1
2.6.4 Health promotion activities ²⁵ on NCDs	0	1
2.6.5 Palliative care for NCDs patients	0	1
2.6.6 Recording of NCDs to the healthcare centre	0	1
2.6.7 Reporting of NCDs to the healthcare centre	0	1
2.6.8 Collection of medication for NCDs patients from the healthcare centre	0	1
2.6.9 Screening of NCDs	0	1
2.6.10 Monitoring of non-communicable diseases	0	1
2.6.11 Other, please specify _____	0	1

²⁴ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter informal training provided by nurses at the healthcare centres (WHO, 2007b:2).

²⁵ Health promotion is a process that enables individuals and communities to engage in healthy lifestyles and make changes that reduce the risk of developing diseases and other comorbidities (WHO, 1998:43).

2.7 Indicate whether the community health workers²⁶ carry out the following community activities related to non-communicable disease prevention²⁷ and management. **Please mark with an X**

Community activities	No	Yes	Sometimes
2.7.1 Health talks on prevention of non-communicable diseases	0	1	2
2.7.2 Health talks on lifestyle modifications for patients with non-communicable diseases	0	1	2
2.7.3 Health talks on medication use	0	1	2
2.7.4 Blood pressure monitoring	0	1	2
2.7.5 Blood glucose level monitoring	0	1	2
2.7.6 Use of peak flow meter to monitor asthma control	0	1	2
2.7.7 Therapeutic drug level monitoring for epileptic patients	0	1	2
2.7.8 Other, please specify	0	1	2

2.8 Indicate whether the community health workers receive funding from the following sources. **Please mark with an X**

Sources of funding	No	Yes	Sometimes
2.8.1 Government	0	1	2
2.8.2 Non-governmental organisations (NGOs)	0	1	2
2.8.3 Community members	0	1	2
2.8.4 Other, please specify	0	1	2

2.9 Are there high attrition rates²⁸ of health professionals in primary healthcare? **Please mark with an X**

No	Yes
0	1

²⁶ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter training than professional workers (WHO, 2007b:2).

²⁷ Activities intended to protect patients and the general public from actual or potential health risks and their consequences through provision of information on nutrition, and behavioural and medical health risks; consultations; and measures to decrease health risks at the personal and community level (WHO, 2017c).

²⁸ Attrition rate refers to employees voluntarily resigning from the health facilities (NGDATA, 2017).

2.9.1 If your answer to question 2.9 is **yes**, please provide possible reasons for high attrition rates of health professionals in primary healthcare.

2.10 Is there community participation at district and primary healthcare levels in the following?

Please mark with an X

Community participation	District level			Primary healthcare level		
	No	Yes	Sometimes	No	Yes	Sometimes
2.10.1 Decision-making	0	1	2	0	1	2
2.10.2 Improving service quality	0	1	2	0	1	2

2.11 If any of your answers to question 2.10 is **yes or sometimes**, indicate which of the following are involved in decision-making and improving service quality at the district level??

Please mark with an X

	Decision-making			Improving service quality		
	District level			District level		
	No	Yes	Sometimes	No	Yes	Sometimes
2.11.1 Chief	0	1	2	0	1	2
2.11.2 Priests	0	1	2	0	1	2
2.11.3 Traditional healers	0	1	2	0	1	2
2.11.4 Existence of committees/forums where community members can engage with and influence decisions affecting the district and primary healthcare levels	0	1	2	0	1	2
2.11.5 Community-based organisations/networks meaningfully involved in policy making processes at national, district and primary levels?	0	1	2	0	1	2
2.11.6 Other, please specify	0	1	2	0	1	2

2.11.1 If any of your answers to question 2.10 is **yes or sometimes**, indicate which of the following are involved in decision-making and improving service quality at the primary healthcare level? **Please mark with an X**

	Decision-making			Improving service quality		
	Primary healthcare level			Primary healthcare level		
	No	Yes	Sometimes	No	Yes	Sometimes
2.11.1.1 Chief	0	1	2	0	1	2
2.11.1.2 Priests	0	1	2	0	1	2
2.11.1.3 Traditional healers	0	1	2	0	1	2
2.11.1.4 Existence of committees/forums where community members can engage with and influence decisions affecting the district and primary healthcare levels	0	1	2	0	1	2
2.11.1.5 Community-based organisations/networks meaningfully involved in policy making processes at national, district and primary levels?	0	1	2	0	1	2
2.11.1.6 Other, please specify _____	0	1	2	0	1	2

2.12 Do the DHMTs undertake collaborative activities related to non-communicable disease management with the non-public health services in the district level? **Please mark with an X**

No	Yes	Sometime
0	1	2

2.12.1 If your answer to question 2.12 is **yes**, list the collaborative activities related to non-communicable disease management undertaken by DHMTs with the non-public health services in the district level.

2.13 Indicate which of the following arrangements are in place for the non-public health facilities in the district in relation to non-communicable disease management? **Please mark with an X**

	All	Some	None
2.13.1 Agreement on referral of patients with non-communicable diseases	0	1	2
2.13.2 Submission of reports for the health information system	0	1	2
2.13.3 Other, please specify _____	0	1	2

2.14 Does the following exist for the DHMT, outpatient departments in district hospital and the healthcare centres? Indicate **yes or no**; and describe your degree of satisfaction with each factor on a scale of 1 to 4, where 1=Very dissatisfied, 2=Dissatisfied, 3=Satisfied, 4=Very satisfied, and 5=undecided.

DHMT	No	Yes	Degree of satisfaction*				
			Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.14.1 Job description	0	1	0	1	2	3	4
2.14.2 Rotation systems ²⁹	0	1	0	1	2	3	4
2.14.3 Training plan	0	1	0	1	2	3	4
2.14.4 Housing for personnel	0	1	0	1	2	3	4
2.14.5 Incentives	0	1	0	1	2	3	4
2.14.6 Promotion opportunities	0	1	0	1	2	3	4
2.14.7 Medical aids	0	1	0	1	2	3	4
2.14.8 Other, please specify	0	1	0	1	2	3	4
Outpatient departments in district hospitals	No	Yes	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.14.9 Job description	0	1	0	1	2	3	4
2.14.10 Rotation systems	0	1	0	1	2	3	4
2.14.11 Training plan	0	1	0	1	2	3	4
2.14.12 Housing for personnel	0	1	0	1	2	3	4
2.14.13 Incentives	0	1	0	1	2	3	4
2.14.14 Promotion opportunities	0	1	0	1	2	3	4

²⁹ A rotation system is a system used to move health professionals from one healthcare setting to another after spending a certain period of time in a particular setting. Health professionals rotate to different settings of healthcare; such as outpatient departments, medical wards and healthcare centres; within a stipulated time (BusinessDictionary, 2017).

2.14.15 Medical aids	0	1	0	1	2	3	4
2.14.16 Other, please specify	0	1	0	1	2	3	4
Healthcare centres	No	Yes	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.14.17 Job description	0	1	0	1	2	3	4
2.14.18 Rotation systems	0	1	0	1	2	3	4
2.14.19 Training plan	0	1	0	1	2	3	4
2.14.20 Housing for personnel	0	1	0	1	2	3	4
2.14.21 Incentives	0	1	0	1	2	3	4
2.14.22 Promotion opportunities	0	1	0	1	2	3	4
2.14.23 Medical aids	0	1	0	1	2	3	4
2.14.24 Other, please specify	0	1	0	1	2	3	4

2.15 Do health workers in the health facilities receive professional development/continuing education support on non-communicable disease management? **Please mark with an X**

Facilities	Professional development			Continuing education		
	No	Yes	Sometimes	No	Yes	Sometimes
2.15.1 Outpatient departments in district hospitals	0	1	2	0	1	2
2.15.2 Healthcare centres	0	1	2	0	1	2

If any of your answers to question 2.15 are yes, continue with question 2.16 and 2.17. If all the answers to question 2.15 are no, please proceed to question 2.18.

2.16 Which of the following exist? **Please mark with an X**

	No	Yes
2.16.1 A formal in-service training component for all levels of staff	0	1
2.16.2 A coordinated system of in-service training/continuing education across the outpatient departments in district hospitals	0	1
2.16.3 A coordinated system of in-service training/continuing education across the healthcare centre	0	1
2.16.4 Other, please specify	0	1

2.17 State the topics covered in professional training/continuing education support on non-communicable disease management?

2.18 Do staff in the health facilities conduct health promotion activities within “their communities” on non-communicable disease management? **Please mark with an X**

Facilities	No	Yes	Sometimes
2.18.1 Outpatient departments in district hospitals	0	1	2
2.18.2 Healthcare centres	0	1	2

2.18.3 If any of your answers to question 2.18 are **yes or sometimes**, which activities are conducted by staff within their communities?

2.19 Is the healthcare personnel in the health facilities satisfied with working conditions? **Please mark with an X**

Facilities	No	Yes
2.19.1 Outpatient departments in district hospitals	0	1
2.19.2 Healthcare centres	0	1

2.19.3 If any of your answers to question 2.19 are **no**, please provide reasons why the healthcare personnel is not satisfied with working conditions?

2.20 In the outpatient departments in the district hospital, how many qualified healthcare personnel are currently available for the management of non-communicable diseases?

Type of professionals	Current number available per outpatient department
2.20.1 Pharmacists	
2.20.2 Pharmacy technicians	
2.20.3 Nurse clinicians ³⁰	
2.20.4 Nurses	
2.20.5 Doctors	

2.21 In healthcare centres, how many qualified healthcare personnel are currently available for management of non-communicable diseases?

Type of professionals	Current number available per healthcare centre
2.21.1 Pharmacists	
2.21.2 Pharmacy technicians	
2.21.3 Nurse clinicians	
2.21.4 Nurses	
2.21.5 Doctors	

³⁰ A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration and supervision duties (MOHSW, 1980:75-77).

2.22 Are the health facilities adequately staffed with healthcare personnel for the management of non-communicable diseases? **Please mark with an X**

Healthcare facilities	Yes	Somewhat	No
2.22.1 Outpatient departments in district hospitals	0	1	2
2.22.2 Healthcare centres	0	1	2

2.22.3 If any of your answers to question 2.22 are **no or somewhat**, state the cadre of healthcare professional and reasons why their number is inadequate.

SECTION 3: MEDICATION AND MEDICAL DEVICES (DHMT PHARMACIST)

3.1 Indicate whether standard treatment guidelines on the following issues are available in the healthcare centres: **Please mark with an X**

Standard treatment guidelines	Available		In use		
	No	Yes	No	Yes	Sometimes
3.1.1 Management of diabetes mellitus	0	1	0	1	2
3.1.2 Management of hypertension	0	1	0	1	2
3.1.3 Management of asthma	0	1	0	1	2
3.1.4 Management of epilepsy	0	1	0	1	2

3.2 Does the DHMT have essential drugs lists for healthcare centres? **Please mark with an X**

No	Yes
0	1

3.2.1 If your answer to question 3.2 is **yes**, are drugs used in the following non-communicable disease management included in the essential drug lists?

Diseases	Please mark with an X	
	No	Yes
3.2.1.1 Diabetes mellitus	0	1
3.2.1.2 Hypertension	0	1
3.2.1.3 Asthma	0	1
3.2.1.4 Epilepsy	0	1

3.2.2 Which handbooks/reference books do health facilities use to diagnose and manage non-communicable diseases? **Please mark with an X**

Handbooks	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
3.2.2.1 Lesotho formulary	0	1	2	0	1	2
3.2.2.2 South African medicines formulary	0	1	2	0	1	2
3.2.2.3 British national formulary	0	1	2	0	1	2
3.2.2.4 Other, please specify			2			2

3.3 Indicate whether the drugs for the healthcare centres in part or in full, are purchased from the following sources: **Please mark with an X**

Sources	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.3.1 National Drug Supply Organisation (NDSO)	0	1	2	3	4
3.3.2 Tripharm®	0	1	2	3	4
3.3.3 Private drug wholesaler elsewhere	0	1	2	3	4
3.3.4 Other, please specify _____	0	1	2	3	4

3.4 Describe the process the DHMT uses for requisition of drugs used in the management of non-communicable diseases at the healthcare centres.

3.5 Describe the process the DHMT uses for delivery of drugs used in the management of non-communicable diseases to the healthcare centres.

3.6 How often do the OPDs in district hospitals and the healthcare centres order drugs used in the management of non-communicable diseases from the supplier? **Please mark with an X**

Frequency of ordering drugs	Outpatient departments in district hospitals	Healthcare centres
3.6.1 Once every month	1	1
3.6.2 Twice every month	2	2
3.6.3 Once every two months	3	3
3.6.4 Other, please specify _____	4	4

3.7 How long does it take to have drugs delivered and/or received by the OPDs in district hospitals and the healthcare centres from the supplier? **Please mark with an X**

	Outpatient departments in district hospitals	Healthcare centres
3.7.1 One week	1	1
3.7.2 One to two weeks	2	2
3.7.3 Two to three weeks	3	3
3.7.4 Three to four weeks	4	4
3.7.5 Other, please specify	5	5

3.8 What happens when transport for delivering drugs to the OPDs in district hospitals in remote areas is not available due to bad weather conditions in the mountains?

3.8.1 What happens when transport for delivering drugs to the healthcare centres in remote areas is not available due to bad weather conditions in the mountains?

3.9 Does the DHMT pharmacist determine the maximum and minimum drug stock levels for healthcare centres under its supervision? **Please mark with an X**

	No	Yes	Sometimes
3.9.1 Maximum drug stock levels	0	1	2
3.9.2 Minimum drug stock levels	0	1	2

If any of your answers to question 3.9 are yes or sometimes, continue with question 3.10 and 3.11. If all the answers to question 3.9 are no, please proceed to question 3.12.

3.10 How does the DHMT pharmacist determine the maximum drug stock levels for healthcare centres under its supervision?

3.11 How does the DHMT determine the minimum drug stock levels for healthcare centres under its supervision?

3.12 Have drugs used in the management of the following non-communicable diseases ever been out-of-stock in the past 3 months in the healthcare centres you supervise? **Please mark with an X**

Diseases	Not at all	Rarely	Sometimes	Frequently	Almost always
3.12.1 Diabetes mellitus	0	1	2	3	4
3.12.2 Hypertension	0	1	2	3	4
3.12.3 Asthma	0	1	2	3	4
3.12.4 Epilepsy	0	1	2	3	4

If any of your answers to questions 3.12 are sometimes, frequently or almost always, continue with question 3.13 and 3.14. If all the answers to question 3.12 are no, please proceed to question 3.15.

3.13 If some of the drugs in question 3.12 **were not available** in the past 3 months, what were the reasons?

3.14 If some of the drugs in question 3.12 **were not available** in the past 3 months, which actions did you take?

3.15 Do healthcare centres under your supervision use the following drug supply management tools? **Please mark with an X**

Drug supply management tools	No	Yes	Sometimes
3.15.1 Stock (bin) cards	0	1	2
3.15.2 Dispensing tally sheets	0	1	2
3.15.3 Stock count sheet	0	1	2
3.15.4 Requisition forms	0	1	2
3.15.5 Other, please specify _____	0	1	2

3.16 How do drug supply management tools reach your healthcare centres?

3.16.1 Have your healthcare centres ever run out of the following drug supply management tools? **Please mark with an X**

Drug supply management tools	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.16.1.1 Stock (bin) cards	0	1	2	3	4
3.16.1.2 Dispensing tally sheets	0	1	2	3	4
3.16.1.3 Stock count sheet	0	1	2	3	4
3.16.1.4 Requisition forms	0	1	2	3	4
3.16.1.5 Other, please specify _____	0	1	2	3	4

3.16.2 If any of your answers to question 3.16.1 are **sometimes, frequently or almost always**, which measures did you take to make sure that these tools were available at your healthcare centres?

3.17 Have training on drug supply and medical supplies management for pharmaceutical staff been conducted in the past 6 months in your health facilities? **Please mark with an X**

Health facilities	Drug supply management			Medical supplies management		
	No	Yes	Sometimes	No	Yes	Sometimes
3.17.1 Outpatient departments in district hospitals	0	1	2	0	1	2
3.17.2 Healthcare centres	0	1	2	0	1	2

If any of your answers to questions 3.17 are yes, continue with question 3.17.3, 3.17.4 and 3.17.5, 3.17.6, 3.17.7. If all the answers to question 3.17 are no, please proceed to question 3.18.

3.17.3 How many times have you conducted training on drug supply management or medical supplies management at health facilities in the past 6 months?

	Number of training sessions in outpatient departments in district hospitals	Number of training sessions in healthcare centres
3.17.3.1 Drug supply management		
3.17.3.2 Medical supplies management		

3.17.4 If any of your answers to question 3.17.3 are **1 or 2**, list the topics covered in the drug supply management training.

3.17.5 If any of your answers to question 3.17.3 are **1 or 2**, list the topics covered in medical supplies management training.

3.17.6 Have changes been made with regard to either drug supply management or medical supplies management as a result of these training sessions? **Please mark with an X**

	Not at all	Sometimes	Almost always
3.17.6.1 Drug supply management	0	1	2
3.17.6.2 Medical supplies management	0	1	2

3.17.7 Give examples of changes made as a result of either drug supply management or medical supplies management in the past 6 months.

3.18 Have you conducted any training on drug supply and medical supplies management for non-pharmaceutical staff in your health facilities in the past 6 months? **Please mark with an X**

Health facilities	Drug supply management			Medical supplies management		
	No	Yes	Sometimes	No	Yes	Sometimes
3.18.1 Outpatient departments in district hospitals	0	1	2	0	1	2
3.18.2 Healthcare centres	0	1	2	0	1	2

If any of your answers to questions 3.18 are yes, continue with question 3.18.3, 3.18.4 and 3.18.5. If all the answers to question 3.18 are no, please proceed to question 3.19.

3.18.1 How many times have you conducted training on drug supply and medical supplies management for non-pharmaceutical staff at health facilities in the past 6 months?

	Number of trainings in outpatient departments in district hospitals	Number of trainings in healthcare centres
3.18.1.1 Drug supply management		
3.18.1.2 Medical supplies management		

3.18.2 If any of your answers to question 3.18.1 are **1 or 2**, list the topics covered in the drug supply management training.

3.18.3 If any of your answers to question 3.18.1 are **1 or 2**, list the topics covered in medical supplies management training.

3.18.4 Have changes been made with regard to either drug supply management or medical supplies management as a result of these training sessions? **Please mark with an X**

	Not at all	Sometimes	Almost always
3.18.4.1 Drug supply management	0	1	2
3.18.4.2 Medical supplies management	0	1	2

3.18.5 Give examples of changes made as a result of drug supply management training in the past 6 months in health facilities.

3.18.6 Give examples of changes made as a result of medical supplies management training in the past 6 months in health facilities.

3.19 Is an order preparation schedule prepared by the DHMT pharmacist available at the health facilities? **Please mark with an X**

Health facilities	Not at all	Sometimes	Almost always
3.19.1 Outpatient departments in district hospitals	0	1	2
3.19.2 Healthcare centres	0	1	2

3.19.3 If any of your answers to question 3.19 are **not at all or sometimes**, how do you know when it is time for health facilities to order drugs?

3.20 Is the National Drug Supply Organisation (NDSO) order delivery schedule available in health facilities? **Please mark with an X**

Health facilities	Not at all	Sometimes	Almost always
3.20.1 Outpatient departments in district hospitals	0	1	2
3.20.2 Healthcare centres	0	1	2

3.20.3 If any of your answers to question 3.20 are **not at all or sometimes**, how do health facilities calculate the quantity of drugs to order?

SECTION 4: HEALTH MANAGEMENT AND INFORMATION SYSTEM

4.1 Do you submit health statistics on non-communicable disease management to the national level? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.2 Please answer the following questions: **Please mark with an X**

Questions	No	Yes	Sometimes
4.2.1 Have you submitted all health statistics reports on non-communicable disease management in the past 6 months to the national level?	0	1	2
4.2.2 Have you had any shortage of health statistics forms for non-communicable diseases in the last 6 months?	0	1	2
4.2.3 Do you keep copies of reports of the health statistics reports on non-communicable diseases you submit?	0	1	2

4.3 List the indicators available in the health information statistics regarding NCDs?

4.4 Were there any constraints to the preparation and submission of the health statistics reports on non-communicable diseases to the national level? **Please mark with an X**

Constraints	No	Yes	Sometimes
4.4.1 Preparation of health statistics reports	0	1	2
4.4.2 Submission of health statistics reports	0	1	2

If any of your answers to question 4.4 are yes or sometimes, continue with question 4.5 and 4.6. If all the answers to question 4.4 are no, please proceed to question 4.7.

4.5 Describe the main constraints in preparation of the health statistics reports on non-communicable disease management?

4.6 Describe the main constraints in submission of the health statistics reports on non-communicable disease management?

4.7 Are the health statistics on non-communicable diseases being analysed by the staff of the DHMT? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.8 If your answer to question 4.7 is **yes or sometime**, how is the analysed data presented (graphs, frequency tables etc.)?

4.9 Are the health statistics on non-communicable diseases used by the DHMT staff? **Please mark with an X**

Yes	Sometimes	No	Don't know
0	1	2	3

4.10 If your answer to question 4.9 is **yes or sometimes**, please give examples of how the DHMT staff uses the health statistics on non-communicable diseases?

4.11 Does the DHMT provide feedback to health facilities in response to reports for non-communicable disease management submitted by them? **Please mark with an X**

Health facilities	No	Yes	Sometimes	Don't know
4.11.1 Outpatient departments in district hospitals	0	1	2	3
4.11.2 Healthcare centres	0	1	2	3

4.12 Are health activity monitoring mechanisms for non-communicable disease management such as charts or diagrams showing recent health achievements in the district being made?

Please mark with an X

No	Yes	Sometimes
0	1	2

4.12.1 If the answer to question 4.12 is **yes or sometimes**, are such charts and diagrams made available to health facilities in the district? **Please mark with an X**

Health facilities	No	Yes	Sometimes
4.12.1.1 Outpatient departments in district hospitals	0	1	2
4.12.1.2 Healthcare centres	0	1	2

4.13 In the past 6 months, have you received any feedback from the national level in response to reports that were submitted regarding non-communicable diseases? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.14 If your answer to question 4.13 is **yes or sometimes**, what kind of feedback did you receive from the national level in response to reports that were submitted regarding non-communicable diseases?

4.15 What information is submitted to the DHMT by the health facilities? **Please mark with an X**

Type of information	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
4.15.1 Total number of patients diagnosed with hypertension	0	1	2	0	1	2
4.15.2 Total number of patients diagnosed with diabetes mellitus	0	1	2	0	1	2
4.15.3 Total number of patients diagnosed with asthma	0	1	2	0	1	2
4.15.4 Total number of patients diagnosed with epilepsy	0	1	2	0	1	2
4.15.5 Number of patients with hypertension in different age groups	0	1	2	0	1	2
4.15.6 Number of patients with diabetes mellitus in different	0	1	2	0	1	2

Type of information	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
age groups						
4.15.7 Number of patients with asthma in different age groups	0	1	2	0	1	2
4.15.8 Number of patients with epilepsy in different age groups	0	1	2	0	1	2
4.15.9 Gender of patients with hypertension	0	1	2	0	1	2
4.15.10 Gender of patients with diabetes mellitus	0	1	2	0	1	2
4.15.11 Gender of patients with asthma	0	1	2	0	1	2
4.15.12 Gender of patients with epilepsy	0	1	2	0	1	2
4.15.13 Blood pressure values	0	1	2	0	1	2
4.15.14 Blood glucose levels	0	1	2	0	1	2
4.15.15 Peak flow meter readings	0	1	2	0	1	2
4.15.16 Therapeutic blood level monitoring for epileptic patients	0	1	2	0	1	2
4.15.17 Number of patients referred to district hospital by healthcare centres	0	1	2	0	1	2
4.15.18 Drug consumption rate	0	1	2	0	1	2
4.15.19 Number of health promotion activities conducted in the community	0	1	2	0	1	2
4.15.20 Number of health talks conducted	0	1	2	0	1	2
4.15.21 Number of patients with adverse drug reactions	0	1	2	0	1	2
4.15.22 Type of adverse drug reactions patients experienced	0	1	2	0	1	2
4.15.23 Management of adverse drug reactions	0	1	2	0	1	2
4.15.24 Other, please specify _____	0	1	2	0	1	2

4.16 How is the collected information on non-communicable disease management kept at the DHMT? **Please mark with an X**

	No	Yes
4.16.1 Electronically	0	1
4.16.2 Paper-based	0	1
4.16.3 Both electronically and paper-based	0	1
4.16.4 Other, please specify _____	0	1

SECTION 5: HEALTHCARE FINANCING

5.1 Does the DHMT have a budget? **Please mark with an X**

No	Yes
0	1

5.2 Indicate the level of authority the DHMT has in the use of its budget for each of the following specified areas. **Please mark with an X**

Area	Non	Partial	Full
5.2.1 Paying staff salaries	0	1	2
5.2.2 Purchasing drugs for healthcare centres	0	1	2
5.2.3 Purchasing drugs for outpatient departments in district hospitals	0	1	2
5.2.4 Purchasing equipment used for non-communicable diseases diagnosis and management in healthcare centres	0	1	2
5.2.5 Purchasing equipment used for non-communicable diseases diagnosis and management in outpatient departments in district hospitals	0	1	2
5.2.6 Repairing and maintaining equipment used for non-communicable diseases diagnosis and management in healthcare centres	0	1	2
5.2.7 Repairing and maintaining equipment used for non-communicable diseases diagnosis and management in outpatient departments in district hospitals	0	1	2
5.2.8 Maintaining buildings	0	1	2
5.2.9 Maintaining vehicles and motorcycles	0	1	2
5.2.10 Other, please specify	0	1	2

5.3 Indicate whether the following financial monitoring systems are in use by the DHMT. **Please mark with an X**

Financial monitoring systems	No	Yes	Sometimes
5.3.1 Financial records	0	1	2
5.3.2 Accounting procedures	0	1	2
5.3.3 Periodic auditing visits	0	1	2
5.3.4 Other, please specify	0	1	2

5.4 Is the DHMT involved in the development of a budget for non-communicable disease management at the national level? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.4.1 If your answer to question 5.4 is **sometimes or almost always**, explain how the DHMT is involved in the development of a budget for NCD management at the national level.

5.5 Do planning and budgeting procedures to strengthen service delivery performance in non-communicable disease management exist? **Please mark with an X**

	No	Yes
5.5.1 Planning procedures	0	1
5.5.2 Budgeting procedures	0	1

5.5.3 If any your answers to question 5.5 are **yes**, do the health facilities use the planning and budgeting procedures to strengthen service delivery performance in non-communicable disease management? **Please mark with an X**

	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
5.5.3.1 Planning procedures	0	1	2	0	1	2
5.5.3.2 Budgeting procedures	0	1	2	0	1	2

5.6 Is information on health needs³¹ on non-communicable disease management used to inform resource allocation decisions? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.6.1 If your answer to question 5.6 is **not at all**, what do you use in order to make informed decisions on resource allocation for non-communicable disease management?

³¹ Health needs is “the need for health services as recognised by health professionals from the point of view of the benefit obtainable from advice, preventive measures, management or specific therapy” (WHO, 2011c).

5.7 Does financing for non-communicable disease management flow easily from source to intended end user? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.7.1 If your answer to question 5.7 is **not at all**, please give reasons why financing for non-communicable disease management does not flow easily from source to intended end user.

SECTION 6: HEALTH INFRASTRUCTURE AND EQUIPMENT

6.1 Do health facilities have adequate transportation for the following services? **Please mark with an X**

	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
6.1.1 Evacuation of emergency cases	0	1	2	0	1	2
6.1.2 Providing outreach services	0	1	2	0	1	2
6.1.3 Other, please specify	0	1	2	0	1	2

6.2 Do health facilities have adequate resources to maintain their transportation? **Please mark with an X**

Health facilities	Not at all	Sometimes	Almost always
6.2.1 Outpatient departments in district hospitals	0	1	2
6.2.2 Healthcare centres	0	1	2

6.3 Do the health facilities have a standard list of equipment that should be available for the diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Standard list of equipment	Outpatient departments in district hospitals			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
6.3.1 Equipment that should be available for diagnosis of non-communicable diseases	0	1	2	0	1	2
6.3.2 Equipment that should be available for monitoring of blood pressure level in hypertensive patients	0	1	2	0	1	2
6.3.3 Equipment that should be available for monitoring of glucose level in diabetic patients	0	1	2	0	1	2
6.3.4 Equipment that should be available for monitoring asthmatic patients	0	1	2	0	1	2
6.3.5 Equipment that should be available for therapeutic drug level monitoring for epileptic patients	0	1	2	0	1	2

6.4 Does a maintenance plan for equipment used in the diagnosis and monitoring of non-communicable diseases at the district and primary healthcare levels exist? **Please mark with an X**

Maintenance plan	No	Yes
6.4.1 DHMT	0	1
6.4.2 Outpatient departments in district hospitals	0	1
6.4.3 Healthcare centres	0	1

6.4.4 If any of your answers to question 6.4 are **no**, how is maintenance for equipment used in diagnosis and monitoring of non-communicable diseases carried out at the district and primary healthcare levels?

6.5 Which of the following equipment is available and functional at the primary healthcare level for diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Equipment	Outpatient departments in district hospitals					Healthcare centres				
	Available		Functional			Available		Functional		
	No	Yes	No	Yes	Sometimes	No	Yes	No	Yes	Sometimes
6.5.1 Thermometer	0	1	0	1	2	0	1	0	1	2
6.5.2 Stethoscope	0	1	0	1	2	0	1	0	1	2
6.5.3 Blood pressure measurement device	0	1	0	1	2	0	1	0	1	2
6.5.4 Measurement tape	0	1	0	1	2	0	1	0	1	2
6.5.5 Weighing scale	0	1	0	1	2	0	1	0	1	2
6.5.6 Peak flow meter	0	1	0	1	2	0	1	0	1	2
6.5.7 Spacers for inhalers	0	1	0	1	2	0	1	0	1	2
6.5.8 Glucometer	0	1	0	1	2	0	1	0	1	2
6.5.9 Blood glucose test strips	0	1	0	1	2	0	1	0	1	2
6.5.10 Urine protein test strips	0	1	0	1	2	0	1	0	1	2
6.5.11 Urine ketones test strips	0	1	0	1	2	0	1	0	1	2
6.5.12 Therapeutic drug level	0	1	0	1	2	0	1	0	1	2

monitoring for epileptic patients										
6.5.13 Other, specify	0	1	0	1	2	0	1	0	1	2

6.6 Indicate if healthcare personnel have been trained on how to use the following equipment in the outpatient departments in district hospitals and the healthcare centres. **Please mark with an X**

Equipment	Outpatient departments in district hospitals		Healthcare centres	
	No	Yes	No	Yes
6.6.1 Thermometer	0	1	0	1
6.6.2 Stethoscope	0	1	0	1
6.6.3 Blood pressure measurement device	0	1	0	1
6.6.4 Measurement tape	0	1	0	1
6.6.5 Weighing scale	0	1	0	1
6.6.6 Peak flow meter	0	1	0	1
6.6.7 Spacers for inhalers	0	1	0	1
6.6.8 Glucometer	0	1	0	1
6.6.9 Blood glucose test strips	0	1	0	1
6.6.10 Urine protein test strips	0	1	0	1
6.6.11 Urine ketones test strips	0	1	0	1
6.6.12 Therapeutic drug level monitoring for epileptic patients	0	1	0	1
6.6.13 Other, please specify	0	1	0	1

6.7. Indicate if any of the following activities are carried out to maintain equipment used in NCD diagnosis and management.

	Not at all	Sometimes	Almost always
6.7.1 Is equipment within its service dates?	0	1	2
6.7.2 Inspection of equipment every month	0	1	2
6.7.3 Regular calibration of equipment	0	1	2
6.7.4 Replacement of equipment every year	0	1	2

SECTION 7: ROLE OF THE PHARMACIST IN THE DIFFERENT LEVELS OF HEALTHCARE

7.1 Are there pharmacists in the following sectors of the health system of Lesotho involved in the management of non-communicable diseases? *Please mark with an X*

Sectors	No	Yes
7.1.1 DHMTs	0	1
7.1.2 Outpatients departments in district hospitals	0	1
7.1.3 Healthcare centres	0	1
7.1.4 The pharmaceutical directorate	0	1
7.1.5 Non-communicable disease unit	0	1

7.2 For sectors **without** pharmacists indicated in question 7.1, list these sectors and give reasons why there are no pharmacists.

7.3 Which activities are currently being carried out by pharmacists in management of non-communicable diseases at the primary healthcare level in Lesotho? *Please mark with an X*

Activities	Outpatients departments in district hospital			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
7.3.1 Monitoring of non-communicable diseases ³²	0	1	2	0	1	2
7.3.2 Provide advice to patients about their medication	0	1	2	0	1	2
7.3.3 Prevent medication problems	0	1	2	0	1	2
7.3.4 Manage medication problems	0	1	2	0	1	2
7.3.5 Advise patients on self-care	0	1	2	0	1	2
7.3.6 Advise patients on self-medication	0	1	2	0	1	2
7.3.7 Develop care plans	0	1	2	0	1	2
7.3.8 Refer patients for assessment by a physician	0	1	2	0	1	2
7.3.9 Manage drug therapy for patients	0	1	2	0	1	2
7.3.10 Supervise pharmacy technicians	0	1	2	0	1	2
7.3.11 Communicate with other healthcare providers to provide patient care	0	1	2	0	1	2

³² Monitoring of NCDs is periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).

Activities	Outpatients departments in district hospital			Healthcare centres		
	No	Yes	Sometimes	No	Yes	Sometimes
7.3.12 Collaborate with other healthcare providers as part of a team	0	1	2	0	1	2
7.3.13 Participate in health promotion activities	0	1	2	0	1	2
7.3.14 Procure medication for non-communicable diseases	0	1	2	0	1	2
7.3.15 Store medication for non-communicable diseases	0	1	2	0	1	2
7.3.16 Distribute medication for non-communicable diseases	0	1	2	0	1	2
7.3.17 Adverse drug reactions monitoring ³³	0	1	2	0	1	2
7.3.18 Adverse drug reactions recording ³⁴	0	1	2	0	1	2
7.3.19 Adverse drug reactions reporting ³⁵	0	1	2	0	1	2
7.3.20 Other, please specify	0	1	2	0	1	2

The self-administered structured questionnaire is now complete! Remember that you cannot withdraw your answers after you have placed your questionnaire in the submission box, since we cannot trace your answers back to you.

Thank you for your time and participation!

³³ Adverse drug reactions monitoring is a process of continuously monitoring of undesirable effects suspected to be associated with medicine use (Tanzania Food & Drugs Authority, 2006).

³⁴ Adverse drug reactions recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (Tanzania Food & Drugs Authority, 2006) thus generating suspected case reports of adverse drug reactions.

³⁵ Adverse drug reactions reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (Tanzania Food & Drugs Authority, 2006).

ANNEXURE C: OUTPATIENT DEPARTMENTS IN DISTRICT HOSPITALS SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE



NON-COMMUNICABLE DISEASE MANAGEMENT IN THE PUBLIC HEALTH SYSTEM OF LESOTHO

OUTPATIENT DEPARTMENTS IN DISTRICT HOSPITAL SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE

Thank you for taking this self-administered structured questionnaire.

The general aims of this study are as follows:

- To assess the health system in public health facilities in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy.
- To assess the role of the pharmacist in the national, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

Please indicate your answer by marking with an **X symbol** for closed-ended questions or by giving your **opinion** for open-ended questions. Your opinion is very valuable so please be as

honest as possible. The self-administered structured questionnaire is lengthy so you will be given three days to complete the self-administered structured questionnaire.

Your replies are strictly confidential. Your participation is completely voluntary. If a specific question makes you too uncomfortable, you may skip it and proceed to the next question. Alternatively you may also withdraw from the study without any penalties. The findings of the research will be shared with the Ministry of Health of Lesotho, district health management teams, district hospitals and the healthcare centres.

The self-administered structured questionnaire should only be completed by participants who have given their informed consent. Participants will be identified using codes to guarantee anonymity. Confidentiality will be maintained through confidentiality agreements between mediator and participant, and between participant and other participants.

You are welcome to contact:

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Ethics committee:

Mrs Carolien van Zyl email: carolien.vanzyl@nwu.ac.za tel: +27182991206

Thank you for your time. Your participation is greatly appreciated and will greatly benefit to the success of the research project.

For office use only

Self-administered structured questionnaire number:	
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OUTPATIENT DEPARTMENTS IN DISTRICT HOSPITALS SURVEY

Date:	__dd__mm__yyyy__
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SECTION 1: DEMOGRAPHIC INFORMATION

1.1 In which district is your hospital?

District	Please mark with an X
1.1.1 Maseru	1
1.1.2 Berea	2
1.1.3 Leribe	3
1.1.4 Butha-Buthe	4
1.1.5 Mokhotlong	5
1.1.6 Thaba-Tseka	6
1.1.7 Qacha's Nek	7
1.1.8 Quthing	8
1.1.9 Mohale's Hoek	9
1.1.10 Mafeteng	10

1.2 Which organisation owns your hospital? *Please mark with an X*

Organisation	Yes
1.2.1 Government of Lesotho	1
1.2.2 Christian Health Association of Lesotho (CHAL)	2
1.2.3 Don't know	3

1.3 Which managerial position do you hold?

Managerial position	Please mark with an X
1.3.1 District medical officer	1
1.3.2 Head pharmacist	2
1.3.3 Pharmacist	3
1.3.4 Matron	4
1.3.5 Hospital manager of nursing services	5
1.3.6 Medical superintendent	6
1.3.7 Other, please specify	7-10

1.4 What are your year(s) of employment at the managerial position you hold in question 1.3?

1.5 Indicate the outpatient department you work for in the district hospital. **Please mark with an X**

Departments in OPDs in district hospitals	No	Yes
1.5.1 Pharmacy	0	1
1.5.2 Nurses	0	1
1.5.3 Other, please specify _____	0	1

1.6 What is your gender?

Gender	Please mark with an X
1.6.1 Male	1
1.6.2 Female	2

1.7 What is your age (in years)? _____

1.8 What is your highest level of education?

Highest level of education	Please mark with an X
1.8.1 Diploma	1
1.8.2 Bachelor's degree	2
1.8.3 Master's degree	3
1.8.4 PhD	4
1.8.5 Other, please specify _____	5-10

1.9 What is your profession? _____

SECTION 2: HUMAN RESOURCES

2.1 Does the DHMT carry out clinical supervisory³⁶ visits in your hospital? **Please mark with an X**

No	Yes	Sometimes
0	1	2

If your answer to question 2.1 is yes, continue with question 2.2 2.3, 2.3.1, 2.3.2 and 2.3.3. If the answer to question 2.1 is no, please proceed to question 2.4.

2.2 Does the DHMT use the following documents during clinical supervision? **Please mark with an X**

Documents	No	Yes
2.2.1 Supervision checklist	0	1
2.2.2 Supervision plan or schedule	0	1
2.2.3 Reports of past supervision visits	0	1

2.3 In the past 6 months, how many clinical supervisory visits concerning non-communicable disease management were carried out at your hospital by the DHMT? **Please state number of visits in spaces provided.**

Member of DHMT	Number of clinical supervisory visits
2.3.1 DHMT pharmacist	
2.3.2 Public health nurse	
2.3.1 Other, please specify _____	

2.3.1 If any of your answers to question 2.3 are 1 or 2, did the DHMT provide/recommend any changes? **Please state number of visits in spaces provided.**

No	Yes
0	1

³⁶ "Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive" (Powell & Brodsky, 2004).

2.3.2 If your answer to question 2.3.1 is **yes**, have changes provided/recommended by the DHMT during clinical supervisory visits concerning non-communicable disease management been implemented? **Please mark with an X**

No	Yes
0	1

2.3.3 If your answer to question 2.3.2 is **yes**, list examples of changes implemented as a result of clinical supervisory visits in the past 6 months.

2.4 Does the hospital undertake collaborative activities related to non-communicable disease management with traditional healers in the catchment area? **Please mark with an X**

No	Yes	Sometimes
0	1	2

2.5 If your answer to question 2.4 is **yes or sometimes**, indicate which collaborative activities are undertaken by the hospital and traditional healers in the management of non-communicable diseases. **Please mark with an X**

Collaborative activities	No	Yes	Sometimes
2.5.1 Do traditional healers refer patients with non-communicable diseases to the hospital?	0	1	2
2.5.2 Does the hospital refer patients with non-communicable diseases to traditional healers?	0	1	2
2.5.3 Other, please specify _____	0	1	2

2.6 Have you conducted health promotion activities on prevention and management of non-communicable diseases for patients and the community in the past 6 months? **Please mark with an X**

Health promotion activities	Patients			Community		
	No	Yes	Sometimes	No	Yes	Sometimes
2.6.1 Prevention of NCDs	0	1	2	0	1	2
2.6.2 Management of NCDs	0	1	2	0	1	2

If any of your answers to question 2.6 are yes, continue with question 2.7 and 2.8. If all the answers to question 2.6 are no, please proceed to question 2.9.

2.7 Which topics were covered in health promotion activities on prevention of non-communicable diseases for the patients and the community?

2.8 Which topics were covered in health promotion activities on management of non-communicable diseases for the patients and the community?

2.9 Are there any non-public healthcare providers in your catchment area that provide healthcare services to patients with non-communicable diseases? **Please mark with an X**

Non-public healthcare providers	No	Yes
2.9.1 Private clinics	0	1
2.9.2 Non-governmental organisations (NGO)	0	1
2.9.3 Community pharmacies	0	1
2.9.4 Other, please specify _____	0	1

If any of your answers to question 2.9 are yes, continue with question 2.10 and 2.11. If all the answer to question 2.9 are no, please proceed to question 2.12.

2.10 Does the hospital undertake collaborative activities related to non-communicable disease management with the non-public healthcare services in the area? **Please mark with an X**

Non-public healthcare providers	No	Yes	Sometimes
2.10.1 Private clinics	0	1	2
2.10.2 Non-governmental organisations (NGO)	0	1	2
2.10.3 Community pharmacies	0	1	2
2.10.4 Other, please specify _____	0	1	2

2.11 List the collaborative activities related to non-communicable disease management undertaken by the hospital and the non-public healthcare services.

2.12 Does the following exist for the outpatient departments in district hospital? Indicate **yes** or **no**; and describe your degree of satisfaction with each factor. **Please mark with an X**

	No	Yes	Degree of satisfaction*				
			Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.12.1 Job description	0	1	0	1	2	3	4
2.12.2 Rotation systems ³⁷	0	1	0	1	2	3	4
2.12.3 Training plan	0	1	0	1	2	3	4
2.12.4 Housing for personnel	0	1	0	1	2	3	4
2.12.5 Incentives	0	1	0	1	2	3	4
2.12.6 Promotion opportunities	0	1	0	1	2	3	4
2.12.7 Medical aids	0	1	0	1	2	3	4
2.12.8 Other, please specify _____	0	1	0	1	2	3	4

2.13 Does a training plan on non-communicable disease management exist? **Please mark with an X**

No	Yes
0	1

If your answer to question 2.13 is yes, continue with question 2.14 and 2.15. If the answer to question 2.13 is no, please proceed to question 2.16.

³⁷ A rotation system is a system used to move health professionals from one healthcare setting to another after spending a certain period of time in a particular setting. Health professionals rotate to different settings of healthcare; such as outpatient departments, medical wards and healthcare centres; within a stipulated time (BusinessDictionary, 2017).

2.14 Indicate topics covered in trainings on non-communicable disease management? **Please mark with an X**

Topics	No	Yes
2.14.1 Topics on hypertension	0	1
2.14.2 Topics on diabetes mellitus	0	1
2.14.3 Topics on asthma	0	1
2.14.4 Topics on epilepsy	0	1
2.14.5 Topics on medication use for patients with NCDs	0	1
2.14.6 Topics on medication storage for patients with NCDs	0	1
2.14.7 Topics on lifestyle modifications for patients with NCDs	0	1
2.14.8 Topics on prevention of NCDs	0	1
2.14.9 Topics on management of NCDs	0	1
2.14.10 Other, please specify _____	0	1

2.15 How often are training sessions on NCD management held? **Please mark with an X**

2.15.1 Every 6 months	1
2.15.2 Once a year	2
2.15.3 Never	3
2.15.4 Other, please specify _____	4

2.16 Indicate which type of healthcare professionals are available in the outpatient department. **Please mark with an X**

Type of healthcare professionals	No	Yes
2.16.1 Pharmacists	0	1
2.16.2 Pharmacy technicians	0	1
2.16.3 Nurse clinicians ³⁸	0	1
2.16.4 Nurses	0	1
2.16.5 Medical doctors	0	1

2.17 In your outpatient department, how many healthcare professionals are available for the management of non-communicable diseases? **Please write in spaces provided**

Healthcare professionals	Number available
2.17.1 Pharmacists	
2.17.2 Pharmacy technicians	
2.17.3 Nurse clinicians	
2.17.4 Nurses	
2.17.5 Medical doctors	

³⁸ A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration and supervision duties (MOHSW, 1980:75-77).

2.18 Is your outpatient department adequately staffed with healthcare personnel for the management of non-communicable diseases? **Please mark with an X**

Healthcare personnel	Yes	Somewhat	No
2.18.1 Pharmacists	0	1	2
2.18.2 Pharmacy technicians	0	1	2
2.18.3 Nurse clinicians	0	1	2
2.18.4 Nurses	0	1	2
2.18.5 Medical doctors	0	1	2

2.19 If any of your answers to question 2.18 are **no or somewhat**, list healthcare personnel and reasons why their number is inadequate.

SECTION 3: MEDICATION AND MEDICAL DEVICES

3.1 Indicate whether standard treatment guidelines on the following issues are available in the outpatient department. **Please mark with an X**

Standard treatment guidelines	Available		In Use		
	No	Yes	No	Yes	Sometimes
3.1.1 Management of diabetes mellitus	0	1	0	1	2
3.1.2 Management of hypertension	0	1	0	1	2
3.1.3 Management of asthma	0	1	0	1	2
3.1.4 Management of epilepsy	0	1	0	1	2

3.2 Which handbooks/reference books does the outpatient department use to diagnose and manage non-communicable diseases? **Please mark with an X**

Handbooks	No	Yes	Sometimes
3.2.1 Lesotho formulary	0	1	2
3.2.2 South African medicines formulary	0	1	2
3.2.3 British national formulary	0	1	2
3.2.4 Other, please specify	0	1	2

3.3 Do you have a list of essential drugs for NCD management in the outpatient department?
Please mark with an X

No	Yes
0	1

3.3.1 If your answer to question 3.3 is **yes**, are drugs used in the following non-communicable disease management included?

Diseases	Please mark with an X	
	No	Yes
3.3.1.1 Diabetes mellitus	0	1
3.3.1.2 Hypertension	0	1
3.3.1.3 Asthma	0	1
3.3.1.4 Epilepsy	0	1

3.4 Indicate which of the following drugs are generally available and which drugs were out-of-stock in the past 3 months in the outpatient department. **Please mark with an X**

Disease	Drugs	Available		Out-of-stock in the past 3 months	
		No	Yes	No	Yes
3.4.1 Diabetes mellitus	3.4.1.1 Gliclazide	0	1	0	1
	3.4.1.2 Glibenclamide	0	1	0	1
	3.4.1.3 Glimepiride	0	1	0	1
	3.4.1.4 Metformin	0	1	0	1
	3.4.1.5 Protaphane	0	1	0	1
	3.4.1.6 Actraphane	0	1	0	1
	3.4.1.7 Actrapid	0	1	0	1
	3.4.1.8 Other, please specify _____	0	1	0	1
3.4.2 Hypertension	3.4.2.1 Hydrochlorothiazide	0	1	0	1
	3.4.2.2 Atenolol	0	1	0	1
	3.4.2.3 Indapamide	0	1	0	1
	3.4.2.4 Hydralazine	0	1	0	1
	3.4.2.5 Methyldopa	0	1	0	1
	3.4.2.6 Nifedipine	0	1	0	1
	3.4.2.7 Perindopril	0	1	0	1
	3.4.2.8 Captopril	0	1	0	1
	3.4.2.9 Other, please specify _____	0	1	0	1
3.4.3 Asthma	3.4.3.1 Salbutamol tablets	0	1	0	1
	3.4.3.2 Salbutamol inhaler	0	1	0	1
	3.4.3.3 Beclomethasone inhaler	0	1	0	1
	3.4.3.4 Prednisolone tablets	0	1	0	1
	3.4.3.5 Other, please specify _____	0	1	0	1
3.4.4 Epilepsy	3.4.4.1 Phenytoin	0	1	0	1
	3.4.4.2 Phenobarbitone	0	1	0	1
	3.4.4.3 Sodium valproate	0	1	0	1
	3.4.4.4 Carbamazepine	0	1	0	1
	3.4.4.5 Diazepam	0	1	0	1
	3.4.4.6 Other, please specify _____	0	1	0	1

3.5 Indicate whether the drugs for the outpatient department are purchased from the following sources. **Please mark with an X**

Sources	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.5.1 National Drug Supply Organisation (NDSO)	0	1	2	3	4
3.5.2 Tripharm®	0	1	2	3	4
3.5.3 Private drug wholesaler elsewhere	0	1	2	3	4

3.5.4 Other, specify _____	0	1	2	3	4
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3.6 How often does the OPD in district hospital order drugs used in the management of non-communicable diseases from the supplier? **Please mark with an X**

Frequency of ordering drugs	
3.6.1 Once every month	1
3.6.2 Twice every month	2
3.6.3 Once every two months	3
3.6.4 Other, please specify _____	4

3.7 How long does it take to have drugs delivered and/or received by the OPD in district hospital from the supplier? **Please mark with an X**

3.7.1 One week	1
3.7.2 One to two weeks	2
3.7.3 Two to three weeks	3
3.7.4 Three to four weeks	4
3.7.5 Other, please specify _____	5

3.8 Does the pharmacist determine the maximum and minimum drug stock levels at the OPD in district hospital? **Please mark with an X**

	No	Yes	Sometimes
3.8.1 Maximum drug stock levels	0	1	2
3.8.2 Minimum drug stock levels	0	1	2

If any of your answers to question 3.8 are yes or sometimes, continue with question 3.9 and 3.10. If all the answers to question 3.8 are no, please proceed to question 3.11.

3.9 How does the pharmacist determine the maximum drug stock levels at the OPD in district hospital?

3.10 How does the pharmacist determine the minimum drug stock levels at the OPD in district hospital?

3.11 In the past 3 months, have drugs used in the management of the following non-communicable diseases ever been out-of-stock in the outpatient department? **Please mark with an X**

Diseases	Not at all	Rarely	Sometimes	Frequently	Almost always
3.11.1 Diabetes mellitus	0	1	2	3	4
3.11.2 Hypertension	0	1	2	3	4
3.11.3 Asthma	0	1	2	3	4
3.11.4 Epilepsy	0	1	2	3	4

If any of your answers to questions 3.11 are sometimes, frequently or almost always, continue with question 3.12, 3.13 and 3.14. If all the answers to question 3.11 are no, please proceed to question 3.15.

3.12 If some of the drugs in question 3.11 **were not available** in the past 3 months, what were the reasons?

3.13 If some of the drugs in question 3.11 **were not available** in the past 3 months, which actions did you take?

3.14 Indicate whether the population served by the hospital can buy (or obtain) drugs used in the management of non-communicable diseases from the following: **Please mark with an X**

	No	Yes	Sometimes
3.14.1 Public health facility	0	1	2
3.14.2 Community or retail pharmacy	0	1	2
3.14.3 Not for profit hospital (e.g. mission, NGO)	0	1	2

	No	Yes	Sometimes
3.14.4 Not for profit clinic (e.g. mission, NGO)	0	1	2
3.14.5 Other, please specify	0	1	2

3.15 Does the outpatient department use the following drug supply management tool(s)?

Please mark with an X

Drug supply management tools	No	Yes	Sometimes
3.15.1 Stock (bin) cards	0	1	2
3.15.2 Dispensing tally sheets	0	1	2
3.15.3 Stock count sheet	0	1	2
3.15.4 Requisition forms	0	1	2
3.15.5 Other, please specify	0	1	2

3.16 How do drug supply management tool(s) listed in question 3.15, reach the outpatient department?

3.17 Have you run out of the management tools listed in question 3.15 in the past 3 months?

Please mark with an X

Hardly ever	Occasionally	Sometimes	Frequently	Almost always
0	1	2	3	4

3.18 If your answer to question 3.17 is **sometimes, frequently or almost always**, which measures did you take to make sure that these tools were available at the outpatient department?

3.19 Have training sessions on drug supply and medical supplies management for pharmaceutical staff been conducted in the past 6 months? **Please mark with an X**

	No	Yes	Sometimes
3.19.1 Drug supply management	0	1	2
3.19.2 Medical supplies management	0	1	2

If any of your answers to questions 3.19 are yes, continue with question 3.20, 3.21, 3.22, 3.23, 3.24 and 3.25. If all the answers to question 3.19 are no, please proceed to question 3.26.

3.20 How many times have training for pharmaceutical staff on drug supply and medical supplies management been done at the outpatient department in the past 6 months?

	Number of trainings in outpatient department
3.20.1 Drug supply management	
3.20.2 Medical supplies management	

3.21 If any of your answers to question 3.20 are **1 or 2**, list the topics covered in the drug supply management training for pharmaceutical staff.

3.22 If any of your answers to question 3.20 are **1 or 2**, list the topics covered in medical supplies management training for pharmaceutical staff.

3.23 Have changes been made with regard to either drug supply management or medical supplies management as a result of these training sessions? **Please mark with an X**

	Not at all	Sometimes	Almost always
3.23.1 Drug supply management	0	1	2
3.23.2 Medical supplies management	0	1	2

3.24 Which changes have been made as a result of drug supply management training in the past 6 months?

3.24.1 Which changes have been made as a result of medical supplies management training in the past 6 months?

3.25 How often are refresher training sessions on drug supply management and medical supplies management held for pharmaceutical staff? **Please mark with an X**

	Drug supply management	Medical supplies management
3.25.1 Every 6 months	1	1
3.25.2 Once a year	2	2
3.25.3 Never	3	3
3.25.4 Other, please specify	4	4

3.26 Is a National Drug Supply Organisation (NDSO) order delivery schedule available in the pharmacy in the outpatient department? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

3.26.1 If your answer to question 3.26 is **not at all or sometimes**, how do you calculate the quantity of drugs to order?

3.27 Is an order preparation schedule prepared by the DHMT pharmacist available at the pharmacy in the outpatient department? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

3.27.1 If your answer to question 3.27 is **not at all or sometimes**, how do you know when it is time for you to order drugs?

SECTION 4: HEALTH MANAGEMENT AND INFORMATION SYSTEM

4.1 Do you submit health statistics on non-communicable disease management? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.1.1 If your answer to question 4.1 is **yes or sometimes**, to whom do you submit the health statistics on non-communicable disease management? **Please mark with an X**

	No	Yes
4.1.1.1 District Health Management Team (DHMT)	0	1
4.1.1.2 District Hospital	0	1
4.1.1.3 Ministry of Health	0	1
4.1.1.4 Other, please specify _____	0	1

4.2 Please answer the following questions: **Please mark with an X**

Questions	No	Yes	Sometimes
4.2.1 Have you submitted all health statistics reports on non-communicable disease management in the past 6 months?	0	1	2
4.2.2 Have you had any shortage of health statistics forms for non-communicable diseases in the last 6 months?	0	1	2
4.2.3 Do you keep copies of the health statistics reports on non-communicable diseases you submit?	0	1	2

4.3 Were there any constraints to the preparation and submission of the health statistics reports on non-communicable diseases? **Please mark with an X**

	No	Yes	Sometimes
4.3.1 Constraints to preparation of the health statistics reports	0	1	2
4.3.2 Constraints to submission of health statistics reports	0	1	2

If any of your answers to question 4.3 are yes or sometimes, continue with question 4.4 and 4.5. If all the answers to question 4.3 are no, please proceed to question 4.6.

4.4 Describe the main constraints for preparation of health statistics reports on non-communicable diseases?

4.5 Describe the main constraints for submitting health statistics reports on non-communicable diseases?

4.6 Who collects data on non-communicable disease management from outpatients in the outpatient department? **Please mark with an X**

	Not at all	Sometimes	Almost always
4.6.1 Nurse	0	1	2
4.6.2 Nurse assistant	0	1	2
4.6.3 Data collection clerk	0	1	2
4.6.4 Pharmacist	0	1	2
4.6.5 Pharmacy technician	0	1	2
4.6.6 Doctor	0	1	2
4.6.7 Receptionist	0	1	2
4.6.8 Community health workers ³⁹	0	1	2
4.6.9 Other, please specify	0	1	2

4.7 Is there a data collection tool for capturing information on non-communicable disease management in the outpatient department? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

4.7.1 If your answer to question 4.7 is **sometimes or almost always**, in what format is the data collection tool available? **Please mark with an X**

	No	Yes
4.7.1.1 Paper-based (registries)	0	1
4.7.1.2 Electronic	0	1
4.7.1.3 Paper-based outpatient medical files	0	1
4.7.1.4 Other, please specify	0	1

³⁹ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter informal training provided by nurses at the healthcare centres (WHO, 2007b:2).

4.8 What type of information is collected in the outpatient department on non-communicable diseases? **Please mark with an X**

Type of information	No	Yes	Sometimes
4.8.1 Total number of patients diagnosed with hypertension	0	1	2
4.8.2 Total number of patients diagnosed with diabetes mellitus	0	1	2
4.8.3 Total number of patients diagnosed with asthma	0	1	2
4.8.4 Total number of patients diagnosed with epilepsy	0	1	2
4.8.5 Number of patients with hypertension in different age groups	0	1	2
4.8.6 Number of patients with diabetes mellitus in different age groups	0	1	2
4.8.7 Number of patients with asthma in different age groups	0	1	2
4.8.8 Number of patients with epilepsy in different age groups	0	1	2
4.8.9 Gender of patients with hypertension	0	1	2
4.8.10 Gender of patients with diabetes mellitus	0	1	2
4.8.11 Gender of patients with asthma	0	1	2
4.8.12 Gender of patients with epilepsy	0	1	2
4.8.13 Blood pressure values	0	1	2
4.8.14 Blood glucose levels	0	1	2
4.8.15 Peak flow meter readings	0	1	2
4.8.16 Therapeutic blood level monitoring for epileptic patients	0	1	2
4.8.17 Number of patients referred to district hospital by healthcare centres	0	1	2
4.8.18 Drug consumption rate	0	1	2
4.8.19 Number of health promotion activities conducted in the community	0	1	2
4.8.20 Number of health talks conducted	0	1	2
4.8.21 Number of patients with adverse drug reactions	0	1	2
4.8.22 Type of adverse drug reactions patients experienced	0	1	2
4.8.23 Management of adverse drug reactions	0	1	2
4.8.24 Other, please specify	0	1	2

4.9 Where is the collected information on non-communicable disease management kept in the outpatient department?

4.10 Are the health statistics on non-communicable diseases being analysed by staff in the outpatient department? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.10.1 If your answer to question 4.10 is **yes or sometimes**, please give examples of how the analysed data are presented?

4.11 Are health statistics on non-communicable disease management used by the staff in the outpatient department in decision-making? **Please mark with an X**

Yes	Sometimes	No	Don't know
0	1	2	3

4.11.1 If your answer to question 4.11 is **yes or sometimes**, please give examples of how the staff in the outpatient department use the health statistics on non-communicable disease management in decision-making?

4.12 In the past 6 months, have you received any feedback from the national or district level in response to reports that were submitted on non-communicable disease management? **Please mark with an X**

	No	Yes	Sometimes
4.12.1 National level	0	1	2
4.12.2 District level	0	1	2

4.13 If your answer to question 4.12 is **yes or sometimes**, please give examples of feedback you received from the national or district level?

SECTION 5: HEALTHCARE FINANCING

5.1 Does the outpatient department in the district hospital have a budget? **Please mark with an X**

No	Yes
0	1

5.2 Indicate the level of authority the outpatient department in the district hospital has in the use of its budget for each specified area. **Please mark with an X**

Area	Full	Partial	Non
5.2.1 Paying staff salaries	0	1	2
5.2.2 Purchasing drugs for non-communicable diseases	0	1	2
5.2.3 Purchasing equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.4 Repairing equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.5 Maintaining equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.6 Maintaining buildings	0	1	2
5.2.7 Maintaining vehicles and motorcycles	0	1	2
5.2.8 Other, please specify	0	1	2

5.3 Indicate whether the following financial monitoring systems are used by the outpatient department in district hospital. **Please mark with an X**

Financial monitoring systems	No	Yes	Sometimes
5.3.1 Financial records	0	1	2
5.3.2 Accounting procedures	0	1	2
5.3.3 Periodic auditing visits	0	1	2
5.3.4 Other, please specify	0	1	2

5.4 Is the district hospital involved in the development of a budget at the national level? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.4.1 If your answer to question 5.4 is **sometimes or almost always**, please explain the involvement of the district hospital in the development of the budget at the national level.

5.5 Does your hospital charge fees for some of its services to patients with non-communicable diseases? **Please mark with an X**

No	Yes	Sometimes
0	1	2

If your answer to question 5.5 is yes or sometimes, continue with question 5.5.1 and 5.5.2. If the answer to question 5.5 is no, please proceed to question 5.6.

5.5.1 Indicate for which services, fees are charged to patients with non-communicable diseases?

5.5.2 Which of the following payment methods are in use for services provided for outpatients in the hospital. **Please mark with an X**

Payment methods	No	Yes	Sometimes
5.5.2.1 Direct payment	0	1	2
5.5.2.2 Health insurance	0	1	2
5.5.2.3 Other, please specify	0	1	2

5.6 Does your hospital charge fees for drugs used for management of non-communicable diseases by outpatients? **Please mark with an X**

No	Yes	Sometimes
0	1	2

5.6.1 If the answer to question 5.6 is **yes or sometimes**, which of the following payment methods are in use for drugs used in the management of non-communicable diseases in the outpatient department. **Please mark with an X**

Payment methods	No	Yes	Sometimes
5.6.1.1 Direct payment	0	1	2
5.6.1.2 Health insurance	0	1	2
5.6.1.3 Other, please specify	0	1	2

SECTION 6: HEALTH INFRASTRUCTURE AND EQUIPMENT

6.1 Does the outpatient department have adequate transportation for the following? **Please mark with an X**

	No	Yes	Sometimes
6.1.1 Evacuation of emergency cases	0	1	2
6.1.2 Providing outreach services	0	1	2
6.1.3 Other, please specify _____	0	1	2

6.2 Does the hospital have adequate resources to maintain transportation services? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

6.3 Does the outpatient department have a standard list of equipment that should be available for the diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Standard list of equipment	No	Yes	Sometimes
6.3.1 Equipment that should be available for diagnosis of non-communicable diseases	0	1	2
6.3.2 Equipment that should be available for monitoring of blood pressure level in hypertensive patients	0	1	2
6.3.3 Equipment that should be available for monitoring glucose level in diabetic patients	0	1	2
6.3.4 Equipment that should be available for monitoring asthmatic patients	0	1	2
6.3.5 Equipment that should be available for therapeutic drug level monitoring for epileptic patients	0	1	2

6.4 Which of the following equipment is available and functional in the hospital for diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.1 Thermometer	0	1	0	1	2
6.4.2 Stethoscope	0	1	0	1	2
6.4.3 Blood pressure measurement device	0	1	0	1	2
6.4.4 Measurement tape	0	1	0	1	2
6.4.5 Weighing scale	0	1	0	1	2
6.4.6 Peak flow meter	0	1	0	1	2
6.4.7 Spacers for inhalers	0	1	0	1	2
6.4.8 Glucometer	0	1	0	1	2
6.4.9 Blood glucose test strips	0	1	0	1	2
6.4.10 Urine protein test strips	0	1	0	1	2

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.11 Urine ketones test strips	0	1	0	1	2
6.4.12 Therapeutic drug level monitoring for epileptic patients	0	1	0	1	2
6.4.13 Other, please specify	0	1	0	1	2

6.5 Indicate if healthcare professionals have been trained on how to use the following equipment in the outpatient department. **Please mark with an X**

Equipment	No	Yes
6.5.1 Thermometer	0	1
6.5.2 Stethoscope	0	1
6.5.3 Blood pressure measurement device	0	1
6.5.4 Measurement tape	0	1
6.5.5 Weighing scale	0	1
6.5.6 Peak flow meter	0	1
6.5.7 Spacers for inhalers	0	1
6.5.8 Glucometer	0	1
6.5.9 Blood glucose test strips	0	1
6.5.10 Urine protein test strips	0	1
6.5.11 Urine ketones test strips	0	1
6.5.12 Therapeutic drug level monitoring for epileptic patients	0	1
6.5.13 Other, please specify	0	1

6.6. Indicate if any of the following are carried out to maintain equipment used in NCD diagnosis and management. **Please mark with an X**

	Not at all	Sometimes	Almost always
6.6.1 Is equipment within its service dates?	0	1	2
6.6.2 Inspection of equipment every month	0	1	2
6.6.3 Regular calibration of equipment	0	1	2
6.6.4 Replacement of equipment every year	0	1	2

6.7 Do you have maintenance personnel for maintaining and restoring medical devices used in non-communicable disease management? **Please mark with an X**

No	Yes
0	1

6.7.1 If your answer to question 6.7 is **no**, what do you do when medical devices have to be repaired or maintained?

SECTION 7: ROLE OF THE PHARMACIST IN THE DIFFERENT LEVELS OF HEALTHCARE

7.1 Are there pharmacists involved with the management of non-communicable diseases in the outpatient department in the district hospital? *Please mark with an X*

No	Yes
0	1

7.2 Which activities are currently being carried out by pharmacists involved with management of non-communicable diseases in the outpatient department? *Please mark with an X*

Activities	No	Yes	Sometimes
7.2.1 Monitoring of non-communicable diseases ⁴⁰	0	1	2
7.2.2 Provide advice to patients about their medication	0	1	2
7.2.3 Prevent medication problems	0	1	2
7.2.4 Manage medication problems	0	1	2
7.2.5 Advise patients on self-care	0	1	2
7.2.6 Advise patients on self-medication	0	1	2
7.2.7 Develop care plans	0	1	2
7.2.8 Refer patients for assessment by a physician	0	1	2
7.2.9 Manage drug therapy for patients	0	1	2
7.2.10 Supervise pharmacy technicians	0	1	2
7.2.11 Communicate with other healthcare providers to provide patient care	0	1	2
7.2.12 Collaborate with other healthcare providers as part of a team	0	1	2
7.2.13 Participate in health promotion activities	0	1	2
7.2.14 Procure medication for non-communicable diseases	0	1	2
7.2.15 Store medication for non-communicable diseases	0	1	2
7.2.16 Distribute medication for non-communicable diseases	0	1	2
7.2.17 Adverse drug reactions monitoring ⁴¹	0	1	2
7.2.18 Adverse drug reactions recording ⁴²	0	1	2
7.2.19 Adverse drug reactions reporting ⁴³	0	1	2
7.2.20 Adverse drug reactions management	0	1	2
7.2.21 Other, please specify	0	1	2

⁴⁰ Monitoring of NCDs is periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).

⁴¹ Adverse drug reactions monitoring is a process of continuously monitoring of undesirable effects suspected to be associated with medicine use (WHO, 2006a:22).

⁴² Adverse drug reactions recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (WHO, 2006a:41) thus generating suspected case reports of adverse drug reactions.

⁴³ Adverse drug reactions reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (WHO, 2006a:24).

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The self-administered structured questionnaire is now complete! Remember that you cannot withdraw your answers after you have placed your questionnaire in the submission box, since we cannot trace your answers back to you.

Thank you for your time and participation!

ANNEXURE D: HEALTHCARE CENTRES SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE



NON-COMMUNICABLE DISEASE MANAGEMENT IN THE PUBLIC HEALTH SYSTEM OF LESOTHO

HEALTHCARE CENTRE SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE

Thank you for taking this self-administered structured questionnaire.

The general aims of this study are as follows:

- To assess the health system in public health facilities in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy.
- To assess the role of the pharmacist in the national, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

Please indicate your answer with an **X symbol** for closed-ended questions or by giving your **opinion** for open-ended questions. Your opinion is very valuable so please be as honest as possible. The self-administered structured questionnaire is lengthy so you will be given three days to complete the self-administered structured questionnaire.

Your replies are strictly confidential. Your participation is completely voluntary. If a specific question makes you too uncomfortable, you may skip it and proceed to the next question. Alternatively you may also withdraw from the study without any penalties. The findings of the research will be shared with the Ministry of Health of Lesotho, district health management teams, district hospitals and the healthcare centres.

The self-administered structured questionnaire should only be completed by participants who have given their informed consent. Participants will be identified using codes to guarantee anonymity. Confidentiality will be maintained through confidentiality agreements between mediator and participant, and between participant and other participants.

You are welcome to contact:

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Ethics committee:

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Thank you for your time. Your participation is greatly appreciated and will greatly benefit to the success of the research project.

For office use only

Self-administered structured questionnaire number:	
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HEALTHCARE CENTRES SURVEY

Date:	__dd__mm__yyyy__
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SECTION 1: DEMOGRAPHIC INFORMATION

1.1 In which district is your healthcare centre found?

District	Please mark with an X
1.1.1 Maseru	1
1.1.2 Berea	2
1.1.3 Leribe	3
1.1.4 Butha-Buthe	4
1.1.5 Mokhotlong	5
1.1.6 Thaba-Tseka	6
1.1.7 Qacha's Nek	7
1.1.8 Quthing	8
1.1.9 Mohale's Hoek	9
1.1.10 Mafeteng	10

1.2 Which organisation owns your healthcare centre?

Organisation	Yes
1.2.1 Government of Lesotho	1
1.2.2 Christian Health Association of Lesotho (CHAL)	2
1.2.3 Don't know	3

1.3 Which managerial position do you hold in the healthcare centre?

Managerial position	Please mark with an X
1.3.1 Nurse in charge	1
1.3.2 Nurse clinician ⁴⁴	2

⁴⁴ A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration and supervision duties (MOHSW, 1980:75-77).

1.3.3 Nurse	3
1.3.4 Other, please specify _____	4-10

1.4 What are your year(s) of employment at the managerial position you hold in question 1.3?

1.5 What is your gender?

Gender	Please mark with an X
1.5.1 Male	1
1.5.2 Female	2

1.6 What is your age (in years)? _____

1.7 What is your highest level of education?

Highest level of education	Please mark with an X
1.7.1 Diploma	1
1.7.2 Bachelor's degree	2
1.7.3 Master's degree	3
1.7.4 PhD	4
1.7.5 Other, please specify _____	5-10

1.8 What is your profession? _____

SECTION 2: HUMAN RESOURCES

2.1 Does the DHMT use the following documents during clinical supervision⁴⁵? **Please mark with an X**

Documents	No	Yes
2.1.1 Supervision checklist	0	1
2.1.2 Supervision plan or schedule	0	1
2.1.3 Reports of past supervision visits	0	1

2.2 In the past 6 months, how many clinical supervisory visits concerning non-communicable disease management were carried out at your healthcare centre by the DHMT? **Please state number of visits in spaces provided.**

Member of DHMT	Number of clinical supervisory visits
2.2.1 DHMT pharmacist	
2.2.2 Public health nurse	
2.2.1 Other, please specify _____	

2.2.1 If any of your answers to question 2.2 are **1 or 2**, did the DHMT provide/recommend any changes? **Please state number of visits in spaces provided.**

No	Yes
0	1

2.3 If your answer to question 2.2.1 is **yes**, have changes recommended by the DHMT during clinical supervisory visits concerning non-communicable disease management been implemented in your healthcare centre? **Please mark with an X**

No	Yes
0	1

⁴⁵ "Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive" (Powell & Brodsky, 2004).

2.4 If your answer to question 2.3 is **yes**, list examples of changes implemented as a result of clinical supervisory visits concerning non-communicable disease management in your healthcare centre in the past 6 months.

2.5 Are there community health workers⁴⁶ operating in communities that use your healthcare centre? **Please mark with an X**

No	Yes
0	1

If your answer to question 2.5 is **yes**, continue with question 2.6 and 2.7. If the answer to question 2.5 is **no**, please proceed to question 2.8.

2.6 Are there guidelines stating the relationship between the community health workers and the healthcare centre? **Please mark with an X**

No	Yes
0	1

2.7 What major issues do these guidelines cover concerning management of non-communicable diseases? **Please mark with an X**

Issues	No	Yes
2.7.1 Home visits	0	1
2.7.2 Lifestyle counselling on NCDs.	0	1
2.7.3 Nutrition education	0	1
2.7.4 Health promotion activities ⁴⁷ on NCDs	0	1
2.7.5 Palliative care for NCDs patients	0	1
2.7.6 Reporting of NCDs to the healthcare centre	0	1
2.7.7 Collection of medication for NCDs patients from the healthcare centre	0	1
2.7.8 Monitoring of non-communicable diseases	0	1

⁴⁶ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter informal training provided by nurses at the healthcare centres (WHO, 2007b:2).

⁴⁷ Health promotion activities are activities that enable individuals and communities to engage in healthy behaviours and make changes that reduce the risk of developing diseases and other comorbidities.

2.7.9 Other, please specify _____	0	1
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2.8 Indicate whether the community health workers in your healthcare centre carry out the following community activities related to non-communicable disease prevention and management. **Please mark with an X**

Community activities	No	Yes	Sometimes
2.8.1 Health talks on prevention of non-communicable diseases	0	1	2
2.8.2 Health talks on lifestyle modifications for patients with non-communicable diseases	0	1	2
2.8.3 Health talks on medication use	0	1	2
2.8.4 Blood pressure monitoring	0	1	2
2.8.5 Blood glucose monitoring	0	1	2
2.8.6 Use of peak flow meter to monitor asthma control	0	1	2
2.8.7 Therapeutic drug level monitoring for epileptic patients	0	1	2
2.8.8 Other, please specify _____	0	1	2

2.9 Indicate whether community health workers in your healthcare centre receive funding from the following sources. **Please mark with an X**

Sources of funding	No	Yes	Sometimes
2.9.1 Government	0	1	2
2.9.2 Non-governmental organisations (NGOs)	0	1	2
2.9.3 Community members	0	1	2
2.9.4 Other, please specify _____	0	1	2

2.10 Does the healthcare centre undertake collaborative activities related to non-communicable disease management with traditional healers in the catchment area? **Please mark with an X**

No	Yes	Sometimes
0	1	2

2.11 If your answer to question 2.10 is **yes** or **sometimes**, indicate which collaborative activities are undertaken by the healthcare centre and traditional healers in the management of non-communicable diseases. **Please mark with an X**

Questions (Please mark with an X)	No	Yes	Sometimes
2.11.1 Do traditional healers refer patients with non-communicable diseases to the healthcare centre?	0	1	2
2.11.2 Does the healthcare centre refer patients with non-communicable diseases to traditional healers?	0	1	2
2.11.3 Other, please specify _____	0	1	2

2.12 Have you conducted health promotion activities in a form of village gatherings on prevention and management of non-communicable diseases in your healthcare centre area in the past 6 months? **Please mark with an X**

Health promotion activities	No	Yes	Sometimes
2.12.1 Prevention ⁴⁸ of NCDs	0	1	2
2.12.2 Management ⁴⁹ of NCDs	0	1	2

If any of your answers to question 2.12 are yes, continue with question 2.13 and 2.14. If all the answers to question 2.12 are no, please proceed to question 2.15.

2.13 Which topics were covered in health promotion activities on prevention of non-communicable diseases during village gathering?

2.14 Which topics were covered in health promotion activities on management of non-communicable diseases during village gathering?

2.15 Are there any non-public healthcare providers that provide healthcare services to patients with non-communicable diseases in the area of your healthcare centre? **Please mark with an X**

Non-public healthcare providers	No	Yes
2.15.1 Private clinics	0	1
2.15.2 Non-governmental organisations (NGO)	0	1
2.15.3 Community pharmacies	0	1
2.15.4 Other, please specify _____	0	1

⁴⁸ Prevention is activities intended to protect patients and the general public from actual or potential health threats and their consequences or activities undertaken to minimise the incidence or effects of disease.

⁴⁹ Management is a system of coordinated healthcare interventions and communications for people with non-communicable diseases in which patient self-care efforts are important.

If any of your answers to question 2.15 are yes, continue with question 2.16 and 2.17. If all the answers to question 2.15 are no, please proceed to question 2.18.

2.16 Does the healthcare centre undertake collaborative activities related to non-communicable disease management with the non-public healthcare services in the area? **Please mark with an X**

Non-public healthcare providers	No	Yes	Sometimes
2.16.1 Private clinics	0	1	2
2.16.2 Non-governmental organisations (NGO)	0	1	2
2.16.3 Community pharmacies	0	1	2
2.16.4 Other, please specify _____	0	1	2

2.17 List the collaborative activities related to non-communicable disease management undertaken by the healthcare centre and the non-public healthcare services.

2.18 Does the following exist for the healthcare centre? Indicate **yes or no**; and describe your degree of satisfaction with each factor. **Please mark with an X**

	No	Yes	Degree of satisfaction*				
			Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.18.1 Job description	0	1	0	1	2	3	4
2.18.2 Rotation systems ⁵⁰	0	1	0	1	2	3	4
2.18.3 Training plan	0	1	0	1	2	3	4
2.18.4 Housing for personnel	0	1	0	1	2	3	4
2.18.5 Incentives	0	1	0	1	2	3	4
2.18.6 Promotion opportunities	0	1	0	1	2	3	4
2.18.7 Medical aids	0	1	0	1	2	3	4
2.18.8 Other, please specify _____	0	1	0	1	2	3	4

⁵⁰ A rotation system is a system used to move health professionals from one healthcare setting to another after spending a certain period of time in a particular setting. Health professionals rotate to different settings of healthcare; such as outpatient departments, medical wards and healthcare centres; within a stipulated time (BusinessDictionary, 2017).

2.19 Does a training plan on non-communicable disease management exist? **Please mark with an X**

No	Yes
0	1

If your answer to question 2.19 is yes, continue with question 2.20 and 2.21. If the answer to question 2.19 is no, please proceed to question 2.22.

2.20 Indicate topics covered in trainings on non-communicable disease management? **Please mark with an X**

Topics	No	Yes
2.20.1 Topics on hypertension	0	1
2.20.2 Topics on diabetes mellitus	0	1
2.20.3 Topics on asthma	0	1
2.20.4 Topics on epilepsy	0	1
2.20.5 Topics on medication use for patients with NCDs	0	1
2.20.6 Topics on medication storage for patients with NCDs	0	1
2.20.7 Topics on lifestyle modifications for patients with NCDs	0	1
2.20.8 Topics on prevention of NCDs	0	1
2.20.9 Topics on management of NCDs	0	1
2.20.10 Other, please specify _____	0	1

2.21 How often are training sessions on NCD management held? **Please mark with an X**

2.21.1 Every 6 months	1
2.21.2 Once a year	2
2.21.3 Never	3
2.21.4 Other, please specify _____	4

2.22 Do you have a pharmacist in the healthcare centre pharmacy? **Please mark with an X**

No	Yes
0	1

If your answer to question 2.22 is no, continue with question 2.23 and 2.24. If the answer to question 2.22 is yes, please proceed to section 3.

2.23 Do you need a pharmacist in the healthcare centre pharmacy? **Please mark with an X**

No	Yes
0	1

2.24 If your answer to question 2.23 is **yes**, motivate why you need a pharmacist in the healthcare centre pharmacy.

SECTION 3: MEDICATION AND MEDICAL DEVICES

3.1 Indicate whether standard treatment guidelines on the following issues are available in the healthcare centre. **Please mark with an X**

Standard treatment guidelines	Available		In Use		
	No	Yes	No	Yes	Sometimes
3.1.1 Management of diabetes mellitus	0	1	0	1	2
3.1.2 Management of hypertension	0	1	0	1	2
3.1.3 Management of asthma	0	1	0	1	2
3.1.4 Management of epilepsy	0	1	0	1	2

3.2 Which handbooks/reference books does the healthcare centre use to diagnose and manage non-communicable diseases? **Please mark with an X**

Handbooks	No	Yes	Sometimes
3.2.1 Lesotho formulary	0	1	2
3.2.2 South African medicines formulary	0	1	2
3.2.3 British national formulary	0	1	2
3.2.4 Other, please specify _____	0	1	2

3.3 Do you have a list of essential drugs for NCD management in your healthcare centre? **Please mark with an X**

No	Yes
0	1

3.3.1 If your answer to question 3.3 is **yes**, are drugs used in the following non-communicable disease management included in the list of essential drugs for NCDs in your healthcare centre? **Please mark with an X**

Diseases	No	Yes
3.3.1.1 Diabetes mellitus	0	1
3.3.1.2 Hypertension	0	1
3.3.1.3 Asthma	0	1
3.3.1.4 Epilepsy	0	1

3.4 Indicate which drugs are generally available and which drugs were out-of-stock in the past 3 months in your healthcare centre. **Please mark with an X**

Disease	Drugs	Available		Out-of-stock in the past 3 months	
		No	Yes	No	Yes
3.4.1 Diabetes mellitus	3.4.1.1 Gliclazide	0	1	0	1
	3.4.1.2 Glibenclamide	0	1	0	1
	3.4.1.3 Glimepiride	0	1	0	1
	3.4.1.4 Metformin	0	1	0	1
	3.4.1.5 Protaphane	0	1	0	1
	3.4.1.6 Actraphane	0	1	0	1
	3.4.1.7 Actrapid	0	1	0	1
	3.4.1.8 Other, please specify _____	0	1	0	1
3.4.2 Hypertension	3.4.2.1 Hydrochlorothiazide	0	1	0	1
	3.4.2.2 Atenolol	0	1	0	1
	3.4.2.3 Indapamide	0	1	0	1
	3.4.2.4 Hydralazine	0	1	0	1
	3.4.2.5 Methyldopa	0	1	0	1
	3.4.2.6 Nifedipine	0	1	0	1
	3.4.2.7 Perindopril	0	1	0	1
	3.4.2.8 Captopril	0	1	0	1
	3.4.2.9 Other, please specify _____	0	1	0	1
3.4.3 Asthma	3.4.3.1 Salbutamol tablets	0	1	0	1
	3.4.3.2 Salbutamol inhaler	0	1	0	1
	3.4.3.3 Beclomethasone inhaler	0	1	0	1
	3.4.3.4 Prednisolone tablets	0	1	0	1
	3.4.3.5 Other, please specify _____	0	1	0	1
3.4.4 Epilepsy	3.4.4.1 Phenytoin	0	1	0	1
	3.4.4.2 Phenobarbitone	0	1	0	1
	3.4.4.3 Sodium valproate	0	1	0	1
	3.4.4.4 Carbamazepine	0	1	0	1
	3.4.4.5 Diazepam	0	1	0	1
	3.4.4.6 Other, please specify _____	0	1	0	1

3.5 Indicate whether the drugs for the healthcare centre are purchased from the following sources. **Please mark with an X**

Sources	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.5.1 National Drug Supply Organisation (NDSO)	0	1	2	3	4
3.5.2 Tripharm®	0	1	2	3	4
3.5.3 Private drug wholesaler elsewhere	0	1	2	3	4

3.5.4 Other, specify _____	0	1	2	3	4
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3.6 Have drugs used in the management of the following non-communicable diseases ever been out-of-stock in the past 3 months?

Diseases	Not at all	Rarely	Sometimes	Frequently	Almost always
3.6.1 Diabetes mellitus	0	1	2	3	4
3.6.2 Hypertension	0	1	2	3	4
3.6.3 Asthma	0	1	2	3	4
3.6.4 Epilepsy	0	1	2	3	4

If any of your answers to questions 3.6 are sometimes, frequently or almost always, continue with question 3.7, 3.8 and 3.9. If all the answers to question 3.6 are no, please proceed to question 3.10.

3.7 If some of the drugs in question 3.6 **were not available** in the past 3 months, what were the reasons?

3.8 If some of the drugs in question 3.6 **were not available** for the past 3 months, which actions did you take?

3.9 Indicate whether the population in the area of the healthcare centre can buy (or obtain) drugs from the following. **Please mark with an X**

	No	Yes	Sometimes
3.9.1 Public health facility	0	1	2
3.9.2 Community or retail pharmacy	0	1	2
3.9.3 Not for profit hospital (e.g. mission, NGO)	0	1	2
3.9.4 Not for profit clinic (e.g. mission, NGO)	0	1	2
3.9.5 Other, please specify _____	0	1	2

3.10 Does the healthcare centre use the following drug supply management tool(s)? **Please mark with an X**

Drug supply management tools	No	Yes	Sometimes
3.10.1 Stock (bin) cards	0	1	2
3.10.2 Dispensing tally sheets	0	1	2
3.10.3 Stock count sheet	0	1	2
3.10.4 Requisition forms	0	1	2
3.10.5 Other, please specify	0	1	2

3.11 How do drug supply management tool(s) listed in question 3.10 reach the healthcare centre?

3.12 Have you run out of drug supply management tools listed in question 3.10 in the past 3 months? **Please mark with an X**

Hardly ever	Occasionally	Sometimes	Frequently	Almost always
0	1	2	3	4

3.13 If your answer to question 3.12 is **sometimes, frequently or almost always**, which measures did you take to make sure that these tools were available at the healthcare centre?

3.14 Have training sessions on drug supply and medical supplies management for non-pharmaceutical staff been conducted in the past 6 months? **Please mark with an X**

	No	Yes	Sometimes
3.14.1 Drug supply management	0	1	2
3.14.2 Medical supplies management	0	1	2

If any of your answers to questions 3.14 are yes, continue with question 3.15, 3.16, 3.17, 3.18, 3.19 and 3.20. If all the answers to question 3.14 are no, please proceed to question 3.21.

3.15 How many times have training for non-pharmaceutical staff on drug supply and medical supplies management been done at the healthcare centre in the past 6 months?

	Number of trainings in healthcare centres
3.15.1 Drug supply management	
3.15.2 Medical supplies management	

3.16 If any of your answers to question 3.15 are **1 or 2**, list topics covered in the drug supply management training for non-pharmaceutical staff.

3.17 If any of your answers to question 3.15 are **1 or 2**, list topics covered in medical supplies management training for non-pharmaceutical staff.

3.18 Have changes been made with regard to either drug supply management or medical supplies management as a result of these training sessions? **Please mark with an X**

	Not at all	Sometimes	Almost always
3.18.1 Drug supply management	0	1	2
3.18.2 Medical supplies management	0	1	2

3.19 Which changes have been made as a result of drug supply management training in the past 6 months?

3.19.1 Which changes have been made as a result of medical supplies management training in the past 6 months?

3.20 How often are refresher training sessions on drug supply and medical supplies management held for non-pharmaceutical staff? **Please mark with an X**

	Drug supply management	Medical supplies management
3.20.1 Every 6 months	1	1
3.20.2 Once a year	2	2
3.20.3 Never	3	3
3.20.4 Other, please specify _____	4	4

3.21 Is an order preparation schedule prepared by your DHMT pharmacist available in your healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

3.21.1 If your answer to question 3.21 is **not at all or sometimes**, how do you know when it is time to order drugs?

3.22 Is a National Drug Supply Organisation (NDSO) order delivery schedule available in your healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

3.22.1 If your answer to question 3.22 is **not at all or sometimes**, how do you calculate the quantity of drugs to order?

SECTION 4: HEALTH MANAGEMENT AND INFORMATION SYSTEM

4.1 Do you submit health statistics on non-communicable disease management? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.1.1 If your answer to question 4.1 is **yes or sometimes**, to whom do you submit the health statistics on non-communicable disease management? **Please mark with an X**

	No	Yes
4.1.1.1 District Health Management Team (DHMT)	0	1
4.1.1.2 District Hospital	0	1
4.1.1.3 Ministry of Health	0	1
4.1.1.4 Other, please specify _____	0	1

4.2 Please answer the following questions. **Please mark with an X**

Questions	No	Yes	Sometimes
4.2.1 Have you submitted all health statistics reports on non-communicable disease management in the past 6 months?	0	1	2
4.2.2 Have you had any shortage of health statistics forms for non-communicable diseases in the last 6 months?	0	1	2
4.2.3 Do you keep copies of the health statistics reports on non-communicable diseases you submit?	0	1	2

4.3 Were there any constraints to the preparation and submission of the health statistics reports on non-communicable diseases? **Please mark with an X**

	No	Yes	Sometimes
4.3.1 Constraints to preparation of the health statistics reports	0	1	2
4.3.2 Constraints to submission of health statistics reports	0	1	2

If any of your answers to questions 4.3 are yes or sometimes, continue with question 4.4 and 4.5. If all the answers to question 4.3 are no, please proceed to question 4.6.

4.4 Describe the main constraints for preparation of health statistics reports on non-communicable diseases?

4.5 Describe the main constraints for submitting health statistics reports on non-communicable diseases?

4.6 Who collects data on non-communicable disease management from patients in the healthcare centre? **Please mark with an X**

	Not at all	Sometimes	Almost always
4.6.1 Nurse	0	1	2
4.6.2 Nurse assistant	0	1	2
4.6.3 Data collection clerk	0	1	2
4.6.4 Pharmacist	0	1	2
4.6.5 Pharmacy technician	0	1	2
4.6.6 Doctor	0	1	2
4.6.7 Receptionist	0	1	2
4.6.8 Community health workers	0	1	2
4.6.9 Other, please specify	0	1	2

4.7 Is there a data collection tool for capturing information on non-communicable disease management in the healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

4.7.1 If your answer to question 4.7 is **sometimes or almost always**, in what format is the data collection tool. **Please mark with an X**

	No	Yes
4.7.1.1 Paper-based (registries)	0	1
4.7.1.2 Electronic	0	1
4.7.1.3 Paper-based outpatient medical files	0	1
4.7.1.4 Other, please specify	0	1

4.8 What type of information is collected in the healthcare centre on non-communicable diseases? **Please mark with an X**

Type of information	No	Yes	Sometimes
4.8.1 Total number of patients diagnosed with hypertension	0	1	2
4.8.2 Total number of patients diagnosed with diabetes mellitus	0	1	2
4.8.3 Total number of patients diagnosed with asthma	0	1	2
4.8.4 Total number of patients diagnosed with epilepsy	0	1	2
4.8.5 Number of patients with hypertension in different age groups	0	1	2
4.8.6 Number of patients with diabetes mellitus in different age groups	0	1	2
4.8.7 Number of patients with asthma in different age groups	0	1	2
4.8.8 Number of patients with epilepsy in different age groups	0	1	2
4.8.9 Gender of patients with hypertension	0	1	2
4.8.10 Gender of patients with diabetes mellitus	0	1	2
4.8.11 Gender of patients with asthma	0	1	2
4.8.12 Gender of patients with epilepsy	0	1	2
4.8.13 Blood pressure values	0	1	2
4.8.14 Blood glucose levels	0	1	2
4.8.15 Peak flow meter readings	0	1	2
4.8.16 Therapeutic blood level monitoring for epileptic patients	0	1	2
4.8.17 Number of patients referred to district hospital by healthcare centres	0	1	2
4.8.18 Drug consumption rate	0	1	2
4.8.19 Number of health promotion activities conducted in the community	0	1	2
4.8.20 Number of health talks conducted	0	1	2
4.8.21 Number of patients with adverse drug reactions	0	1	2
4.8.22 Type of adverse drug reactions patients experienced	0	1	2
4.8.23 Management of adverse drug reactions	0	1	2
4.8.24 Other, please specify	0	1	2

4.9 Where is the collected information on non-communicable disease management kept in the healthcare centre?

4.10 Are health statistics on non-communicable diseases being analysed by staff of the healthcare centre? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.10.1 If your answer to question 4.10 is **yes or sometimes**, please give examples of how the analysed data are presented?

4.11 Are health statistics on non-communicable disease management used by the staff of the healthcare centre in decision-making? **Please mark with an X**

Yes	Sometimes	No	Don't know
0	1	2	3

4.12 If your answer to question 4.11 above is **yes or sometimes**, please give examples of how the staff at the healthcare centre uses the health statistics on non-communicable disease management in decision-making?

4.13 In the past 6 months, have you received any feedback from the district level in response to reports that were submitted on non-communicable diseases? **Please mark with an X**

No	Yes	Sometimes
0	1	2

4.14 If your answer to question 4.13 is **yes or sometimes**, please give examples of feedback you received from the district level?

SECTION 5: HEALTHCARE FINANCING

5.1 Does your healthcare centre have a budget? *Please mark with an X*

No	Yes
0	1

If any of your answer to question 5.1 is yes, continue with question 5.2. If the answer to question 5.1 is no, please proceed to question 5.3.

5.2 Indicate the level of authority the healthcare centre has in the use of its budget for each specified area. *Please mark with an X*

Area	Full	Partial	Non
5.2.1 Paying staff salaries	0	1	2
5.2.2 Purchasing drugs for non-communicable diseases	0	1	2
5.2.3 Purchasing equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.4 Repairing equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.5 Maintaining equipment used for non-communicable diseases diagnosis and management	0	1	2
5.2.6 Maintaining buildings	0	1	2
5.2.7 Maintaining vehicles and motorcycles	0	1	2
5.2.8 Other, please specify	0	1	2

5.3 Indicate whether the following financial monitoring systems are used by the healthcare centre. *Please mark with an X*

Financial monitoring systems	No	Yes	Sometimes
5.3.1 Financial records	0	1	2
5.3.2 Accounting procedures	0	1	2
5.3.3 Periodic auditing visits	0	1	2
5.3.4 Other, please specify	0	1	2

5.4 Are you involved in the development of a budget for your healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

5.5 If your answer to question 5.4 is **sometimes or almost always**, please explain how you are involved in the development the healthcare centre budget.

5.6 Does your healthcare centre charge fees for some of its services to patients with non-communicable diseases? **Please mark with an X**

No	Yes	Sometimes
0	1	2

If your answer to questions 5.6 is yes or sometimes, continue with question 5.6.1 and 5.6.2. If the answer to question 5.6 is no, please proceed to question 5.7.

5.6.1 Indicate for which services, fees are charged to patients with non-communicable diseases?

5.6.2 Indicate which of the following payment methods are in use for services provided for patients in the healthcare centre. **Please mark with an X**

Payment methods	No	Yes	Sometimes
5.6.2.1 Direct payment	0	1	2
5.6.2.2 Health insurance	0	1	2
5.6.2.3 Other, please specify	0	1	2

5.7 Does your healthcare centre charge fees for drugs used in the treatment of non-communicable diseases? **Please mark with an X**

No	Yes	Sometimes
0	1	2

5.7.1 If your answer to question 5.7 is **yes or sometimes**, indicate which of the following payment methods are in use for drugs in the healthcare centre. **Please mark with an X**

Payment methods	No	Yes	Sometimes
5.7.2.1 Direct payment	0	1	2
5.7.2.2 Health insurance	0	1	2
5.7.2.3 Other, please specify _____	0	1	2

SECTION 6: HEALTH INFRASTRUCTURE AND EQUIPMENT

6.1 Does the healthcare centre have adequate transportation for the following? **Please mark with an X**

	No	Yes	Sometimes
6.1.1 Evacuation of emergency cases	0	1	2
6.1.2 Providing outreach services	0	1	2
6.1.3 Other, please specify _____	0	1	2

6.2 Does the healthcare centre have adequate resources to maintain transportation? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	2

6.3 Does the healthcare centre have a standard list of equipment that should be available for the diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Standard list of equipment	No	Yes	Sometimes
6.3.1 Equipment that should be available for diagnosis of non-communicable diseases	0	1	2
6.3.2 Equipment that should be available for monitoring of blood pressure level in hypertensive patients	0	1	2
6.3.3 Equipment that should be available for monitoring glucose level in diabetic patients	0	1	2
6.3.4 Equipment that should be available for monitoring asthmatic patients	0	1	2
6.3.5 Equipment that should be available for therapeutic drug level monitoring for epileptic patients	0	1	2

6.4 Which of the following equipment is available and functional in your healthcare centre for diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.1 Thermometer	0	1	0	1	2
6.4.2 Stethoscope	0	1	0	1	2
6.4.3 Blood pressure measurement device	0	1	0	1	2
6.4.4 Measurement tape	0	1	0	1	2
6.4.5 Weighing scale	0	1	0	1	2
6.4.6 Peak flow meter	0	1	0	1	2
6.4.7 Spacers for inhalers	0	1	0	1	2
6.4.8 Glucometer	0	1	0	1	2
6.4.9 Blood glucose test strips	0	1	0	1	2
6.4.10 Urine protein test strips	0	1	0	1	2

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.11 Urine ketones test strips	0	1	0	1	2
6.4.12 Therapeutic drug level monitoring for epileptic patients	0	1	0	1	2
6.4.13 Other, please specify	0	1	0	1	2

6.5 Indicate if healthcare personnel have been trained on how to use the following equipment in the healthcare centres. **Please mark with an X**

Equipment	No	Yes
6.5.1 Thermometer	0	1
6.5.2 Stethoscope	0	1
6.5.3 Blood pressure measurement device	0	1
6.5.4 Measurement tape	0	1
6.5.5 Weighing scale	0	1
6.5.6 Peak flow meter	0	1
6.5.7 Spacers for inhalers	0	1
6.5.8 Glucometer	0	1
6.5.9 Blood glucose test strips	0	1
6.5.10 Urine protein test strips	0	1
6.5.11 Urine ketones test strips	0	1
6.5.12 Therapeutic drug level monitoring for epileptic patients	0	1
6.5.13 Other, please specify	0	1

6.6. Indicate if any of the following are carried out to maintain equipment used in NCD diagnosis and management. **Please mark with an X**

	Not at all	Sometimes	Almost always
6.6.1 Is equipment within its service dates?	0	1	2
6.6.2 Inspection of equipment every month	0	1	2
6.6.3 Regular calibration of equipment	0	1	2
6.6.4 Replacement of equipment every year	0	1	2

6.7 Do you have maintenance personnel for maintaining and restoring medical devices used in non-communicable disease management? **Please mark with an X**

No	Yes
0	1

6.7.1 If your answer to question 6.7 is **no**, what do you do when medical devices have to be repaired or maintained?

SECTION 7: ROLE OF THE PHARMACIST IN THE DIFFERENT LEVELS OF HEALTHCARE

7.1 Are there pharmacists involved with the management of non-communicable diseases in your healthcare centre? **Please mark with an X**

No	Yes
0	1

7.2 Which activities should be carried out by pharmacists in your facility involved with management of non-communicable diseases? **Please mark with an X.**

Activities	No	Yes	Sometimes
7.2.1 Monitoring of non-communicable diseases ⁵¹	0	1	2
7.2.2 Provide advice to patients about their medication	0	1	2
7.2.3 Prevent medication problems	0	1	2
7.2.4 Manage medication problems	0	1	2
7.2.5 Advise patients on self-care	0	1	2
7.2.6 Advise patients on self-medication	0	1	2
7.2.7 Develop care plans	0	1	2
7.2.8 Refer patients for assessment by a physician	0	1	2
7.2.9 Manage drug therapy for patients	0	1	2
7.2.10 Supervise pharmacy technicians	0	1	2
7.2.11 Communicate with other healthcare providers to provide patient care	0	1	2
7.2.12 Collaborate with other healthcare providers as part of a team	0	1	2
7.2.13 Participate in health promotion activities	0	1	2
7.2.14 Procure medication for non-communicable diseases	0	1	2
7.2.15 Store medication for non-communicable diseases	0	1	2
7.2.16 Distribute medication for non-communicable diseases	0	1	2
7.2.17 Adverse drug reactions monitoring ⁵²	0	1	2
7.2.18 Adverse drug reactions recording ⁵³	0	1	2
7.2.19 Adverse drug reactions reporting ⁵⁴	0	1	2
7.2.20 Adverse drug reactions management	0	1	2
7.2.21 Other, please specify	0	1	2

⁵¹ Monitoring of NCDs is periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).

⁵² Adverse drug reactions monitoring is a process of continuously monitoring of undesirable effects suspected to be associated with medicine use (WHO, 2006a:22).

⁵³ Adverse drug reactions recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (WHO, 2006a:41) thus generating suspected case reports of adverse drug reactions.

⁵⁴ Adverse drug reactions reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (WHO, 2006a:24).

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The self-administered structured questionnaire is now complete! Remember that you cannot withdraw your answers after you have placed your questionnaire in the submission box, since we cannot trace your answers back to you.

Thank you for your time and participation!

ANNEXURE E: VARIABLES AND RESEARCH OBJECTIVES FOR SELF-ADMINISTERED STRUCTURED QUESTIONNAIRES IN ALL LEVELS OF THE STUDY

Table E-1: Variables and research objectives for self-administered structured questionnaires in all levels of the study

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> • MOH division • Question number 1.1 	<ul style="list-style-type: none"> • Division or programme at the MOH where the participant is working, categorised by groups; the pharmaceutical directorates or the NCD unit. 	<ul style="list-style-type: none"> • Demographic information
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • District • Question 1.1 (DHMT) • Question 1.1 (OPDs) • Question 1.1 (Healthcare centres) 	<ul style="list-style-type: none"> • The district in which the DHMT, OPDs or healthcare centres are located. Districts include Maseru, Berea, Leribe, Butha-Buthe, Mokhotlong, Thaba-Tseka, Qacha's Nek, Quthing, Mohale's Hoek and Mafeteng. 	<ul style="list-style-type: none"> • Demographic information
OPDs in district hospital (AnnexureC) Healthcare centre (AnnexureD)	<ul style="list-style-type: none"> • Organisation • Question 1.2 (OPDs) • Question 1.2 (Healthcare centres) 	<ul style="list-style-type: none"> • Organisation that owns the hospital and healthcare centres. Public facilities in Lesotho are owned either by the government of Lesotho or the Christian Health Association of Lesotho CHAL. 	<ul style="list-style-type: none"> • Demographic information
MOH (AnnexureA)	<ul style="list-style-type: none"> • Position • Question 1.2 	<ul style="list-style-type: none"> • Current position held in MOH divisions. The participants stated their current positions. 	<ul style="list-style-type: none"> • Demographic information
DHMT (AnnexureB) OPDs in district hospitals	<ul style="list-style-type: none"> • Managerial position • Question 1.2 (DHMT) • Question 1.3 (OPDs) 	<p>Current managerial position held at the DHMT. Managerial positions are categorised into district medical officers, district pharmacist and public health nurses.</p> <p>Current managerial position held at the OPDs in district hospitals. Managerial positions are categorised into district medical officer, head pharmacist, pharmacist, matron,</p>	<ul style="list-style-type: none"> • Demographic information

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 1.3 (Healthcare centres) 	<p>hospital manager of nursing services and medical superintendent.</p> <p>Current managerial position held at the healthcare centre in district hospitals. Managerial positions are categorised into a nurse in charge, nurse clinician, nurse and other.</p>	
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Years of employment <ul style="list-style-type: none"> • Question 1.3 (MOH) • Question 1.3 (DHMT) • Question 1.4 (OPDs) • Question 1.4 (Healthcare centres) 	<ul style="list-style-type: none"> • Duration of employment in current position, measured in years. 	<ul style="list-style-type: none"> • Demographic information
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • OPD <ul style="list-style-type: none"> • Question 1.5 	<ul style="list-style-type: none"> • OPD in which the participants work in the district hospital. The OPDs include pharmacy (categorised as yes/no), nurses (categorised as yes/no) and other (categorised as yes/no) 	<ul style="list-style-type: none"> • Demographic information
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Gender <ul style="list-style-type: none"> • Question 1.4 (MOH) • Question 1.4 (DHMT) • Question 1.6 (OPDs) • Question 1.5 (Healthcare centres) 	<ul style="list-style-type: none"> • The gender of the participant categorised as the following gender groups: 'male' or 'female' or 'unknown'. 	<ul style="list-style-type: none"> • Demographic information
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals	<ul style="list-style-type: none"> • Age <ul style="list-style-type: none"> • Question 1.5 (MOH) • Question 1.5 (DHMT) • Question 1.7 (OPDs) • Question 1.6 	<ul style="list-style-type: none"> • The age of the participant in years. Participants were divided into age quartiles based on descriptive statistics where necessary for analysis. 	<ul style="list-style-type: none"> • Demographic information

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC) Healthcare centres (AnnexureD)	(Healthcare centres)		
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Educational level <ul style="list-style-type: none"> Question 1.6 (MOH) Question 1.6 (DHMT) Question 1.8 (OPDs) Question 1.7 (Healthcare centres) 	<ul style="list-style-type: none"> Highest level of education held by the participant. Educational levels were categorised as diploma, bachelor's degree, master's degree and PhD. 	<ul style="list-style-type: none"> Demographic information
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Profession <ul style="list-style-type: none"> Question 1.7 (MOH) Question 1.7 (DHMT) Question 1.9 (OPDs) Question 1.8 (Healthcare centres) 	<ul style="list-style-type: none"> Participant's profession. Profession were categorised as a medical doctor, pharmacist, nurse clinician, nurse and other. 	<ul style="list-style-type: none"> Demographic information
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> District Health Management structures <ul style="list-style-type: none"> Question 1.8 (MOH) Question 1.8 (DHMT) 	<ul style="list-style-type: none"> Description of the District Health Management Structures in the following areas: district development committee, district health committee and DHMT. The categories include the existence of the district health management structures (categorised as yes/no), availability of guidelines on the functions of the district health management structures (categorised as yes/no), the authority to make decisions on district health plan (categorised as yes/no), authority to make decisions on district health budget (categorised as yes/no), authority to make decisions on personnel (categorised as yes/no), authority to make decisions on purchase of drugs (categorised as yes/no) and authority to make decisions on the purchase of medical supplies (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> Job description <ul style="list-style-type: none"> Question 1.9 (MOH) Question 1.10 (MOH) 	<p>Availability of job descriptions for professionals at the DHMT, OPDs in district hospitals and the healthcare centres. Professionals include district health manager (categorised as yes/no), pharmacists (categorised as yes/no), public health nurse (categorised as yes/no), hospital manager of nursing services (categorised as yes/no), matrons (categorised as yes/no), medical superintendents (categorised as yes/no), doctors (categorised as yes/no), nurses (categorised as yes/no), nurse clinicians (categorised as yes/no).</p> <p>Inclusion of management of NCDs in job descriptions for professionals at the DHMT, OPDs in district hospitals and the healthcare centres. Professionals include district health manager (categorised as yes/no), pharmacists (categorised as yes/no), public health nurse (categorised as yes/no), hospital manager of nursing services (categorised as yes/no), matrons (categorised as yes/no), medical superintendents (categorised as yes/no), doctors (categorised as yes/no), nurses (categorised as yes/no), nurse clinicians (categorised as yes/no).</p>	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Question 1.12 (DHMT) 	<p>Availability of a job description for participants at the DHMT (categorised as yes/no).</p>	
MOH (AnnexureA)	<ul style="list-style-type: none"> Number of facilities with the district health plan <ul style="list-style-type: none"> Question 1.11 (MOH) 	<ul style="list-style-type: none"> The number of facilities in the districts which have district health plans. The number of facilities were stated by participants. 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> NCDs studies conducted <ul style="list-style-type: none"> Question 1.12 (MOH) Question 1.9 (DHMT) 	<ul style="list-style-type: none"> Conducted studies on NCDs in the districts in the past 5 years. Studies include health system research (categorised as yes/no), household survey (categorised as yes/no) and other operational studies (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance

Questionnaire/Annexes Variable/Question number		Description	Objectives
			monitoring.
MOH (AnnexureA)	<ul style="list-style-type: none"> Examples of NCDs studies conducted Question 1.13 (MOH) 	<ul style="list-style-type: none"> Examples of studies carried out on NCDs in the past 5 years. The participants will state the studies. 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Use of NCDs studies Question 1.10 (DHMT) 	<ul style="list-style-type: none"> How the results of the studies on NCDs are used in the district health plan. The participants will state how the results are used. 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Participant role Question 1.11 (DHMT) 	<ul style="list-style-type: none"> Role of the participant at the DHMT in relation to NCD management. Participants' role were stated by the participant. 	<ul style="list-style-type: none"> To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> Health workforce planning Question 2.1 (MOH) 	<ul style="list-style-type: none"> Existence of regular and coordinated health workforce planning for NCD management in the health system levels or departments. The health system levels or departments include: the national level (categorised as yes/no), district level (categorised as yes/no), PHC level (categorised as yes/no), education including academic institutions (categorised as yes/no), finance (categorised as yes/no), private sector actors (categorised as yes/no), development partners (categorised as yes/no), and other key stakeholders (categorised as yes/no). 	<ul style="list-style-type: none"> To describe strategies used for hiring and retention of health personnel in health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> Human resources planning Question 2.2 (MOH) 	<ul style="list-style-type: none"> Existence of the following for regular and coordinated health workforce planning for NCD management. They include: existence of joint annual human resources planning process that involves key stakeholders (categorised as yes/no), existence of policies regarding hiring, firing, disciplining, paying, rewarding, promotion, and deploying workers (categorised as yes/no), existence of institutional model for 	<ul style="list-style-type: none"> To describe strategies used for hiring and retention of health personnel in health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		projecting, monitoring, and evaluating staffing requirements (categorised as yes/no) and other (categorised as yes/no).	
MOH (AnnexureA)	<ul style="list-style-type: none"> Skills used in NCD management Question 2.4 (MOH) 	<ul style="list-style-type: none"> Higher education institutions in Lesotho such as the National University of Lesotho (NUL), National Health Training College (NHTC) and CHAL nursing college graduate students with skills to be used in NCD management. Skills used in NCD management include clinical skills (categorised as yes/no), technical skills (categorised as yes/no) and management skills (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Health professionals' cadre Question 2.3 (MOH) 	<ul style="list-style-type: none"> Cadre of health professionals produced by the NUL, NHTC, and the CHAL Nursing College. The cadres include pharmacists (categorised as yes/no), pharmacy technicians (categorised as yes/no), nurses (categorised as yes/no), nurse clinicians (categorised as yes/no), nursing assistants (categorised as yes/no), and medical doctors (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Healthcare personnel training by the Southern African Development Community (SADAC) countries Question 2.5.4 (MOH) 	<ul style="list-style-type: none"> SADAC countries train healthcare personnel on behalf of the MOH. These countries collaborate with the MOH concerning training healthcare personnel for Lesotho. It is categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Strengthening of clinical supervision Question 2.6 (MOH) 	<ul style="list-style-type: none"> Processes that are carried out or are in place to strengthen clinical supervision. They include health service providers at PHC facilities receiving clinical supervision on NCD management in the past year (categorised as yes/no), senior staff at PHC facilities receiving in-service management training on NCD management in the past year (categorised as yes/no), senior staff at PHC facilities receiving in-service management training with nationally approved curricula on NCD management in the past year (categorised as yes/no), community health workers receiving clinical supervision on NCD management in the 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		past six months (categorised as yes/no), conduction of clinical supervision visits to healthcare centres in the last year (categorised as yes/no) and availability of planned clinical supervision visits to healthcare centres (categorised as yes/no).	
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Conduction of clinical supervisions <ul style="list-style-type: none"> Question 2.1 (DHMT) Question 2.1 (OPDs) 	<ul style="list-style-type: none"> Conduction of clinical supervisions in OPDs in district hospitals and healthcare centres by the DHMT categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Clinical supervision document <ul style="list-style-type: none"> Question 2.2 (DHMT) Question 2.2 (OPDs) Question 2.1 (Healthcare centres) 	<ul style="list-style-type: none"> Documents used by the DHMT during clinical supervision of OPDs in district hospitals and healthcare centres. The documents include a supervision checklist (categorised as yes/no), supervision plan or schedule (categorised as yes/no) and reports of past supervision visits (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Number of clinical supervisory visits <ul style="list-style-type: none"> Question 2.3 (DHMT) Question 2.3 (OPDs) Question 2.2 (Healthcare centres) 	<ul style="list-style-type: none"> The number of clinical supervisory visits on NCD management carried out by the DHMT in OPDs in district hospitals and healthcare centres in the past 6 months. The members of the DHMT who carry out clinical supervisory visits are DHMT pharmacist (categorised as yes/no), public health nurse (categorised as yes/no) and other (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Recommendations provided during clinical supervisory visits <ul style="list-style-type: none"> Question 2.3.1 (OPDs) Question 2.2.1 (Healthcare centres) 	<ul style="list-style-type: none"> Provision of recommendations of changes in NCD management at OPDs in district hospitals and healthcare centres during clinical supervisory visits by the DHMT categorised as yes/no. 	<ul style="list-style-type: none"> To assess available human resource management system that includes support, clinical supervision and performance monitoring.
DHMT (AnnexureB) OPDs in district	<ul style="list-style-type: none"> Implementation of recommendations provided during clinical 	<ul style="list-style-type: none"> Implementation of changes recommended by the DHMT during clinical supervisory visits on NCD management at the OPDs in district hospitals and healthcare centre 	<ul style="list-style-type: none"> To assess the available human resource management system that includes support, clinical

Questionnaire/Annexes Variable/Question number		Description	Objectives
hospitals (AnnexureC) Healthcare centres (AnnexureD)	supervisory visits <ul style="list-style-type: none"> • Question 2.3.1 (DHMT) • Question 2.3.2 (OPDs) • Question 2.3 (Healthcare centres) 	categorised as yes/no.	supervision and performance monitoring.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Examples of changes made in NCD management • Question 2.3.2 (DHMT) 	<ul style="list-style-type: none"> • Examples of changes that were made in healthcare centres as a result of clinical supervisory visits on NCD management in the past 6 months categorised as yes/no. 	<ul style="list-style-type: none"> • To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Examples of changes implemented in NCD management • Question 2.3.3 (OPDs) • Question 2.4 (Healthcare centres) 	<ul style="list-style-type: none"> • Examples of changes implemented in OPDs in district hospitals and healthcare centres as a result of clinical supervisory visits on NCD management in the past 6 months categorised as yes/no. 	<ul style="list-style-type: none"> • To assess the available human resource management system that includes support, clinical supervision and performance monitoring.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Professional development for healthcare workers • Question 2.7 (MOH) 	<ul style="list-style-type: none"> • Delivery of adequate professional development on NCD management for health workers in different levels of the health system. The different levels of the health system are the district level: DHMT (categorised as yes, somewhat or no) and the PHC level: OPDs in district hospitals (categorised as yes, somewhat or no) and healthcare centres (categorised as yes, somewhat or no). 	<ul style="list-style-type: none"> • To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Continuing education support for healthcare workers • Question 2.7 (MOH) 	<ul style="list-style-type: none"> • Delivery of adequate continuing education support on NCD management for health workers in different levels of the health system. The different levels of the health system are the district level: DHMT (categorised as yes, somewhat or no) and the PHC level: OPDs in district hospitals (categorised as yes, somewhat or no) and healthcare centres (categorised as yes, somewhat or no). 	<ul style="list-style-type: none"> • To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> Type of training for health workers Question 2.8 (MOH) 	<ul style="list-style-type: none"> Existing types of training for health workers. This include the following: existence of a formal in-service training component for all levels of staff (categorised as yes/no), existence of a coordinated system of in-service training/continuing education across the MOH (categorised as yes/no), existence of study leave (categorised as yes/no), and existence of funding for tuition fees (categorised as yes/no). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Provision of professional development for health workers Question 2.15.1 (DHMT) 	<ul style="list-style-type: none"> Provision of adequate professional development on NCD management for health workers in the OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.
DHMT(AnnexureB)	<ul style="list-style-type: none"> Provision of continuing education support for health workers Question 2.15.2 (DHMT) 	<ul style="list-style-type: none"> Provision of adequate continuing education support on NCD management for health workers in the OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Type of training for health workers in OPDs in district hospitals and health care centres Question 2.16 (DHMT) 	<ul style="list-style-type: none"> Existence of the following training for health workers in OPDs in district hospitals and healthcare centres. Formal in-service training component for all levels of staff (categorised as yes/no), coordinated system of in-service training or continuing education across the OPDs in district hospitals (categorised as yes/no), coordinated system of in-service training or continuing education across the healthcare centres (categorised as yes/no) and other (categorised as yes/no). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT AnnexureB)	<ul style="list-style-type: none"> In-service training/continuing education support topics Question 2.17 (DHMT) 	<ul style="list-style-type: none"> Topics covered during in-service training or continuing education support on NCD management. The participants will provide the topics. 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Healthcare personnel training on usage of 	<ul style="list-style-type: none"> Training of healthcare personnel in OPDs in district hospitals and healthcare centres on how to use equipment 	<ul style="list-style-type: none"> To describe the availability of training of health workers in

Questionnaire/Annexes Variable/Question number		Description	Objectives
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	equipment <ul style="list-style-type: none"> • Question 6.6 (DHMT) • Question 6.5 (OPDs) • Question 6.5 (Healthcare centres) 	used in the diagnosis and management of NCDs. The equipment includes thermometer (categorised as yes/no), stethoscope (categorised as yes/no), sphygmomanometer (categorised as yes/no), measurement tape (categorised as yes/no), weighing scale (categorised as yes/no), peak flow meter (categorised as yes/no), spacers for inhalers (categorised as yes/no), glucometer (categorised as yes/no), blood glucose strips (categorised as yes/no), urine protein strips (categorised as yes/no), urine ketone test strips (categorised as yes/no), and therapeutic drug level monitoring for epileptic patients (categorised as yes/no).	health facilities on NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Training plan on NCD management • Question 2.13 (OPDs) • Question 2.19 (Healthcare centres) 	<ul style="list-style-type: none"> • Existence of a training plan on NCD management at the OPDs in district hospitals and the healthcare centres categorised as yes/no. 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • NCD management training topics • Question 2.14 (OPDs) • Question 2.20 (Healthcare centres) 	<ul style="list-style-type: none"> • Topics covered in training on NCD management at the OPDs in district hospitals and the healthcare centres. Topics include hypertension (categorised as yes/no), diabetes mellitus (categorised as yes/no), asthma (categorised as yes/no), epilepsy (categorised as yes/no), medication use for patients with NCDs (categorised as yes/no), medication storage for patients with NCDs (categorised as yes/no), lifestyle modifications for patients with NCDs (categorised as yes/no), prevention of NCDs (categorised as yes/no), and management of NCDs (categorised as yes/no). 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Training sessions frequency • Question 2.15 (OPDs) • Question 2.21 (healthcare centres) 	<ul style="list-style-type: none"> • Frequency of holding training sessions on NCD management at the OPDs in district hospitals and the healthcare centre. It includes every 6 months (categorised as 1), once a year (categorised as 2), and never (categorised as 3). 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Attrition rates of 	<ul style="list-style-type: none"> • Presence of high attrition rates of health professionals at the 	<ul style="list-style-type: none"> • To assess strategies used for

Questionnaire/Annexes Variable/Question number		Description	Objectives
	healthcare personnel • Question 2.9 (MOH)	DHMT (categorised as yes/no), OPDs in district hospitals (categorised as yes/no), and the healthcare centres (categorised as yes/no).	hiring and retention of health personnel in health facilities.
MOH (AnnexureA)	• Reasons for high attrition rates of healthcare personnel • Question 2.10 (MOH)	• Reasons for high attrition rates at the DHMT, OPDs in district hospitals, and healthcare centres. The answers were stated by the participants.	• To assess strategies used for hiring and retention of health personnel in health facilities.
MOH (AnnexureA)	• Cadres of healthcare personnel with high attrition rates • Question 2.11 (MOH)	• Cadres of healthcare personnel with high attrition rates at the DHMT, OPDs in district hospitals, and the healthcare centres. The cadres include district health managers (categorised as yes/no), pharmacists (categorised as yes/no), public health nurses (categorised as yes/no), hospital manager of nursing services (categorised as yes/no), matrons (categorised as yes/no), medical superintendent (categorised as yes/no), nurses (categorised as yes/no), pharmacy technicians (categorised as yes/no), nurse in charge (categorised as yes/no) and nurse clinicians (categorised as yes/no).	• To assess strategies used for hiring and retention of health personnel in health facilities.
DHMT (AnnexureB)	• Attrition rates of healthcare personnel in primary healthcare • Question 2.9 (DHMT)	• Existence of high attrition rates of health professionals in PHC categorised as yes/no.	• To assess strategies used for hiring and retention of health personnel in health facilities.
DHMT (AnnexureB)	• High attrition rates reasons in primary healthcare • Question 2.9.1 (DHMT)	• Reasons for high attrition rates of health professionals in PHC. The answers were stated by the participants.	• To assess strategies used for hiring and retention of health personnel in health facilities.
MOH (AnnexureA) DHMT (AnnexureB)	• Community participation in decision-making • Question 2.12 (MOH) • Question 2.10.1 (DHMT)	• Participation of the community in decision-making in NCD management at the national level (categorised as yes, no or sometimes), district level (categorised as yes, no or sometimes) and the PHC level (categorised as yes, no or sometimes).	• To assess the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.
MOH (AnnexureA)	• Community participation in improving service	• Participation of the community in improving service quality in NCD management at the national level (categorised as	• To assess the integration of traditional leaders, community

Questionnaire/Annexes Variable/Question number		Description	Objectives
DHMT (AnnexureB)	<p>quality</p> <ul style="list-style-type: none"> • Question 2.12 (MOH) • Question 2.10.2 (DHMT) 	yes, no or sometimes), district level (categorised as yes, no or sometimes) and the PHC level (categorised as yes, no or sometimes).	and traditional healers with healthcare to enhance health promotion in NCD management.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> • Community involved in the decision-making • Question 2.13 (MOH) • Question 2.11 (DHMT) • Question 2.11.1 	<ul style="list-style-type: none"> • Kind of community involved in decision-making in NCD management at the national, district and PHC levels. The community includes chiefs (categorised as yes, no or sometimes), priests (categorised as yes, no or sometimes), traditional healers (categorised as yes, no or sometimes), committees/forums where community members can engage with and influence decisions affecting the health system (categorised as yes, no or sometimes) and community-based organisations/networks meaningfully involved in policy-making processes at the national level (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> • Community involved in improving service quality • Question 2.13 (MOH) • Question 2.11 (DHMT) • Question 2.11.1 	<ul style="list-style-type: none"> • The community that participates in improving service quality in NCD management at the national, district and PHC levels. The community includes chiefs (categorised as yes, no or sometimes), priests (categorised as yes, no or sometimes), traditional healers (categorised as yes, no or sometimes), committees/forums where community members can engage with and influence decisions affecting the health system (categorised as yes, no or sometimes) and community-based organisations/networks meaningfully involved in policy-making processes at the national level (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Collaborative activities with non-public health services • Question 2.12 (DHMT) 	<ul style="list-style-type: none"> • Existence of collaborative activities related to NCD management between the DHMT and the non-public health services at the district level categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> • To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • List of NCD collaborative activities with non-public health services 	<ul style="list-style-type: none"> • A list of collaborative activities related to NCD management between the DHMT and the non-public health services at the district level. The participants will state the activities 	<ul style="list-style-type: none"> • To describe collaborative activities among public and private health facilities including

Questionnaire/Annexes Variable/Question number		Description	Objectives
	<ul style="list-style-type: none"> Question 2.12.1 (DHMT) 	carried out at the DHMT in collaboration with non-public health services.	the community in relation to NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Arrangements in place for non-public health facilities in relation to NCD management Question 2.13 (DHMT) 	<ul style="list-style-type: none"> Arrangements in place for the non-public health facilities in the district in relation to NCD management include arrangements on the referral of patients with NCDs (categorised as yes/no), and submission of reports for the health information system (categorised as yes/no). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Collaborative activities with traditional healers Question 2.4 (OPDs) Question 2.10 (Healthcare centres) 	<ul style="list-style-type: none"> Existence of collaborative activities related to NCD management at the OPDs in district hospital (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes) with traditional healers in their catchment areas. 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Collaborative activities are undertaken with traditional healers at the OPDs in district hospitals Question 2.5 (OPDs) 	<ul style="list-style-type: none"> Collaborative activities related to NCD management undertaken by the OPDs in district hospital together with traditional healers. They include referral of patients with NCDs by traditional healers to the OPDs in district hospital (categorised as yes, no or sometimes), and referral of patients with NCDs by the OPDs in district hospitals to traditional healers (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Collaborative activities undertaken with traditional healers at the healthcare centres Question 2.11 (Healthcare centres) 	<ul style="list-style-type: none"> Collaborative activities related to NCD management undertaken by the healthcare centres together with traditional healers. They include referral of patients with NCDs by traditional healers to the healthcare centres (categorised as yes, no or sometimes), and referral of patients with NCDs by the healthcare centres to traditional healers (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Community-based service delivery system Question 2.14 (MOH) 	<ul style="list-style-type: none"> Existence of an institutional structure for a community-based service delivery system in NCD management categorised as yes/no. 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
MOH (AnnexureA) DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Community health workers' availability <ul style="list-style-type: none"> • Question 2.15 (MOH) • Question 2.4 (DHMT) • Question 2.5 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of community health workers working together with healthcare centres in the PHC level throughout Lesotho involved in NCD management categorised as yes/no. 	<ul style="list-style-type: none"> • To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
MOH (AnnexureA) DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Community health workers' guidelines availability <ul style="list-style-type: none"> • Question 2.15.1 (MOH) • Question 2.5 (DHMT) • Question 2.6 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of guidelines stating the relationship between the community health workers and the healthcare centres in the PHC level categorised as yes/no. 	<ul style="list-style-type: none"> • To assess guidelines on roles of community health workers in NCD management.
MOH (AnnexureA) DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Issues covered in community health workers' guidelines <ul style="list-style-type: none"> • Question 2.15.2 (MOH) • Question 2.6 (DHMT) • Question 2.7 (Healthcare centres) 	<ul style="list-style-type: none"> • Issues covered by the guidelines in terms of the relationship between the healthcare centre and the community health workers in managing NCDs. The issues include home visits (categorised as yes/no), lifestyle counselling on NCDs (categorised as yes/no), nutrition education (categorised as yes/no), health promotion activities on NCDs (categorised as yes/no), palliative care for NCDs patients (categorised as yes/no), recording of NCDs to the healthcare centre (categorised as yes/no), reporting of NCDs to the healthcare centre (categorised as yes/no), collection of medication for NCDs patients from the healthcare centre (categorised as yes/no), screening of NCDs (categorised as yes/no), and monitoring of NCDs (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess guidelines on the roles of community health workers in NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Community activities done by community health workers <ul style="list-style-type: none"> • Question 2.7 (DHMT) • Question 2.8 (Healthcare centres) 	<ul style="list-style-type: none"> • Community activities related to NCD prevention and management carried out by community health workers. These activities include health talks on prevention of NCDs (categorised as yes, no or sometimes), health talks on lifestyle modification (categorised as yes, no or sometimes), health talks on medication use (categorised as yes, no or sometimes), blood pressure monitoring (categorised as yes, 	<ul style="list-style-type: none"> • To describe collaborative activities among public and private health facilities including the community in relation to NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		no or sometimes), blood glucose level monitoring (categorised as yes, no or sometimes), use of peak flow meter to monitor asthma control (categorised as yes, no or sometimes), and therapeutic drug level monitoring for epileptic patients (categorised as yes, no or sometimes).	
MOH (AnnexureA) DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Community health workers funding <ul style="list-style-type: none"> Question 2.16 (MOH) Question 2.8 (DHMT) Question 2.9 (Healthcare facilities) 	<ul style="list-style-type: none"> Sources of funding for community health workers. Funding could come from the government of Lesotho (categorised as yes, no or sometimes), NGOs (categorised as yes, no or sometimes), community members (categorised as yes, no or sometimes) and other funders (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Number of health professionals at the district and primary healthcare levels <ul style="list-style-type: none"> Question 2.17 (MOH) 	<ul style="list-style-type: none"> The number of health professionals to be allocated to the DHMT, OPDs in district hospitals and healthcare centres as stated in the district health plan. Health professionals include pharmacist (categorised as participant stating a number), pharmacy technicians (categorised as participant stating a number), nurses (categorised as participant stating a number), nurse clinicians (categorised as participant stating a number), nursing assistants (categorised as participant stating a number), public health nurses (categorised as participant stating a number) and medical doctors (categorised as participant stating a number). 	<ul style="list-style-type: none"> To describe the profile of health personnel managing NCDs in each health facility.
MOH (AnnexureA)	<ul style="list-style-type: none"> Posts of health professionals at district and PHC levels <ul style="list-style-type: none"> Question 2.18 (MOH) 	<ul style="list-style-type: none"> Indication of whether all posts of professionals are currently filled by health professionals in the DHMT, OPDs in district hospitals and the healthcare centres. Health professionals include pharmacist (categorised as yes/no), pharmacy technicians (categorised as yes/no), nurses (categorised as yes or no), nurse clinicians (categorised as yes/no), nursing assistants (categorised as yes/no), public health nurses (categorised as yes/no) and medical doctors (categorised as yes/no). 	<ul style="list-style-type: none"> To describe the profile of health personnel managing NCDs in each health facility.
DHMT (AnnexureB) OPDs in district hospitals	<ul style="list-style-type: none"> Number of healthcare personnel <ul style="list-style-type: none"> Question 2.20 	<ul style="list-style-type: none"> Number of currently employed qualified healthcare personnel for the management of NCDs at the OPDs and healthcare centres. Healthcare personnel include 	<ul style="list-style-type: none"> To describe the profile of health personnel managing NCDs in each health facility.

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC)	(DHMT) <ul style="list-style-type: none"> • Question 2.21 (DHMT) • Question 2.17 (OPDs) 	pharmacists (categorised as participant stating a number), pharmacy technicians (categorised as participant stating a number), nurse clinicians (categorised as participant stating a number), nurses (categorised as participant stating a number) and doctors (categorised as participant stating a number).	
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Type of healthcare professionals • Question 2.16 (OPDs) 	<ul style="list-style-type: none"> • Type of healthcare professionals available in the OPDs in district hospital. They include pharmacists (categorised as yes/no), pharmacy technicians (categorised as yes/no), nurse clinicians (categorised as yes/no), nurses (categorised as yes/no) and doctors (categorised as yes/no). 	<ul style="list-style-type: none"> • To describe the profile of health personnel managing NCDs in each health facility.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Department staffing at OPDs in district hospitals • Question 2.18 (OPDs) 	<ul style="list-style-type: none"> • Indication of whether the participant's department in the OPDs in district hospitals is adequately staffed with healthcare personnel for the management of NCDs. They include pharmacists (categorised as yes, somewhat or no), pharmacy technicians (categorised as yes, somewhat or no), nurse clinicians (categorised as yes, somewhat or no), nurses (categorised as yes, somewhat or no) and doctors (categorised as yes, somewhat or no). 	<ul style="list-style-type: none"> • To describe the profile of health personnel managing NCDs in each health facility.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Reasons for the inadequate number of healthcare personnel • Question 2.19 (OPDs) 	<ul style="list-style-type: none"> • List of healthcare personnel and reasons why their number is inadequately categorised as participants stating the healthcare personnel and corresponding reasons for inadequate numbers of that healthcare personnel. 	<ul style="list-style-type: none"> • To describe the profile of health personnel managing NCDs in each health facility.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Health facility staffing • Question 2.22 (DHMT) 	<ul style="list-style-type: none"> • Adequate staffing of health facilities with healthcare personnel for the management of NCDs. Health facilities include the OPDs in district hospitals (categorised as yes, somewhat or no) and healthcare centres (categorised as yes, somewhat or no). 	<ul style="list-style-type: none"> • To describe the profile of health personnel managing NCDs in each health facility.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Reasons for inadequate number of healthcare professionals • Question 2.22.3 (DHMT) 	<ul style="list-style-type: none"> • List of the cadre of healthcare professionals and reasons why their number is inadequately categorised as participants stating the cadre of healthcare professionals and corresponding reasons for inadequate numbers of those cadres of healthcare professionals. 	<ul style="list-style-type: none"> • To describe the profile of health personnel managing NCDs in each health facility.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centre (AnnexureD)	<ul style="list-style-type: none"> • Employees benefits <ul style="list-style-type: none"> • Question 2.14 (DHMT) • Question 2.12 (OPDs) • Question 2.18 (Healthcare centres) 	<ul style="list-style-type: none"> • Existence of employees benefits at the DHMT, OPDs in district hospitals and the healthcare centres. Employee benefits included, rotation systems (categorised as yes/no), training plan (categorised as yes/no), housing for personnel (categorised as yes/no), incentives (categorised as yes/no), promotion opportunities (categorised as yes/no), medical aids (categorised as yes/no) and other (categorised as yes/no). Description of the degree of satisfaction with employee benefits included, rotation systems (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided), training plan (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided), housing for personnel (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided), incentives (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided), promotion opportunities (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided), and medical aids (categorised as very dissatisfied, dissatisfied, satisfied, very satisfied or undecided). 	<ul style="list-style-type: none"> • To describe strategies used for hiring, retention and continuing education for health personnel in health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Health promotion activities <ul style="list-style-type: none"> • Question 2.18 (DHMT) 	<ul style="list-style-type: none"> • Conduction of health promotion activities within the community on NCD management by staff at the OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe health promotion activities conducted by health workers in health facilities. • To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • List of health promotion activities <ul style="list-style-type: none"> • Question 2.18.3 (DHMT) 	<ul style="list-style-type: none"> • List of health promotion activities conducted by staff in OPDs in district hospitals (categorised as participant naming the health promotion activities) and healthcare centres (categorised as participant naming the health promotion activities) on NCD management within the 	<ul style="list-style-type: none"> • To describe health promotion activities conducted by health workers in health facilities. • To describe collaborative activities among public and

Questionnaire/Annexes Variable/Question number		Description	Objectives
		community.	private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Conduction of health promotion activities on the prevention of NCDs <ul style="list-style-type: none"> Question 2.6.1 (OPDs) 	<ul style="list-style-type: none"> Conduction of health promotion activities on prevention of NCDs for patients (categorised as yes, no or sometimes) and the community (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Conduction of health promotion activities on management of NCDs <ul style="list-style-type: none"> Question 2.6.2 (OPDs) 	<ul style="list-style-type: none"> Conduction of health promotion activities on management of NCDs for patients (categorised as yes, no or sometimes) and the community (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Topics on health promotion activities on the prevention of NCDs <ul style="list-style-type: none"> Question 2.7 (OPDs) 	<ul style="list-style-type: none"> Topics covered in health promotion activities on prevention of NCDs for patients (categorised as participant naming topics) and the community (categorised as participant naming topics). 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Topics on health promotion activities on management of NCDs <ul style="list-style-type: none"> Question 2.8 (OPDs) 	<ul style="list-style-type: none"> Topics covered in health promotion activities on management of NCDs for patients (categorised as participant naming topics) and the community (categorised as participant naming topics). 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including

Questionnaire/Annexes Variable/Question number		Description	Objectives
			the community in relation to NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Conduction of health promotion activities on prevention of NCDs in the form of village gatherings <ul style="list-style-type: none"> Question 2.12.1 (Healthcare centres) 	<ul style="list-style-type: none"> Conduction of health promotion activities on prevention of NCDs in a form of village gatherings categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Conduction of health promotion activities on management of NCDs in the form of village gatherings <ul style="list-style-type: none"> Question 2.12.2 (Healthcare centres) 	<ul style="list-style-type: none"> Conduction of health promotion activities on management of NCDs in a form of village gatherings categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Topics on health promotion activities on prevention of NCDs in village gatherings <ul style="list-style-type: none"> Question 2.13 (Healthcare centres) 	<ul style="list-style-type: none"> Topic covered in health promotion activities on prevention of NCDs during village gatherings categorised as participant naming topics 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Topics on health promotion activities on management of NCDs in village gatherings <ul style="list-style-type: none"> Question 2.14 (Healthcare centres) 	<ul style="list-style-type: none"> Topic covered in health promotion activities on management of NCDs during village gatherings categorised as participant naming topics. 	<ul style="list-style-type: none"> To describe health promotion activities conducted by health workers in health facilities. To describe collaborative activities among public and private health facilities including

Questionnaire/Annexes Variable/Question number		Description	Objectives
			the community in relation to NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Non-public health providers' availability <ul style="list-style-type: none"> Question 2.9 (OPDs) Question 2.15 (Healthcare centres) 	<ul style="list-style-type: none"> Existence of non-public health providers at the OPDs in district hospitals and the healthcare centres areas that provide healthcare services to patients with NCDs. Non-public health providers include private clinics (categorised as yes/no), NGOs (categorised as yes/no), and community pharmacies (categorised as yes/no). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Collaborative activities with non-public health providers <ul style="list-style-type: none"> Question 2.10 (OPDs) Question 2.16 (Healthcare centres) 	<ul style="list-style-type: none"> Collaborative activities related to NCD management undertaken by the OPDs in district hospitals and the healthcare centres together with the non-public health services. Non-public health providers include private clinics (categorised as yes, no or sometimes), NGOs (categorised as yes, no or sometimes), and community pharmacies (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> List of collaborative activities with non-public health providers <ul style="list-style-type: none"> Question 2.11 (OPDs) Question 2.17 (Healthcare centres) 	<ul style="list-style-type: none"> List of collaborative activities related to NCD management undertaken by the OPDs in the district hospital and the healthcare centres with the non-public health services categorised as participant naming collaborative activities. 	<ul style="list-style-type: none"> To describe collaborative activities among public and private health facilities including the community in relation to NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Working conditions satisfaction <ul style="list-style-type: none"> Question 2.19 (DHMT) 	<ul style="list-style-type: none"> Satisfaction of healthcare personnel with their working conditions in OPDs in district hospitals (categorised as yes/no) and healthcare centres (categorised as yes/no). 	<ul style="list-style-type: none"> To describe strategies used for hiring and retention of health personnel in health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Reasons for non-satisfaction with working conditions <ul style="list-style-type: none"> Question 2.19.3 (DHMT) 	<ul style="list-style-type: none"> Reasons why healthcare personnel is not satisfied with their working conditions at OPDs in district hospitals (categorised as participants providing reasons) and healthcare centres (categorised by participants providing reasons). 	<ul style="list-style-type: none"> To describe strategies used for hiring and retention of health personnel in health facilities.
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district	<ul style="list-style-type: none"> STGs availability <ul style="list-style-type: none"> Question 3.1 (MOH) Question 3.1 (DHMT) Question 3.1 (OPDs) 	<ul style="list-style-type: none"> Availability of STGs for management of hypertension (categorised as yes, no or sometimes), diabetes mellitus (categorised as yes, no or sometimes), asthma (categorised as yes, no or sometimes) and epilepsy (categorised as yes, 	<ul style="list-style-type: none"> To assess the availability of NCDs STGs and EML at health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 3.1 (Healthcare centres) 	no or sometimes).	
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • STGs in use • Question (OPDs) • Question (Healthcare centres) 	<ul style="list-style-type: none"> • STGs in use in OPDs in district hospitals and healthcare centres in the management of hypertension (categorised as yes/no), diabetes mellitus (categorised as yes/no), asthma (categorised as yes/no) and epilepsy (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess the availability of NCDs STGs and EML at health facilities.
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • EML availability for the district and primary healthcare levels • Question 3.2 (MOH) • Question 3.2 (DHMT) • Question 3.3 (OPDs) • Question 3.3 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of a formal EML consistent with population health priorities in the management of NCDs at the district and PHC levels. The district-level includes the DHMT (categorised as yes/no). The PHC level includes the OPDs in district hospitals (categorised as yes/no) and the healthcare centres (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess the availability of NCDs STGs and EML at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> • EML • Question 3.3 (MOH) 	<ul style="list-style-type: none"> • Existence of the following in terms of the EML at the MOH. Existence and year of the last update of a published national medicines policy (categorised as yes/no), existence and year of the last update of a published national STGs (categorised as yes/no), existence and year of the last update of a published national list of essential medicines (categorised as yes/no) and the existence of an active national committee responsible for managing the process of maintaining a national medicines list (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess the availability of NCDs STGs and EML at health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres	<ul style="list-style-type: none"> • Drugs in the EML • Question 3.2.1 (DHMT) • Question 3.3.1 (OPDs) • Question 3.3.1 	<ul style="list-style-type: none"> • Inclusion of drugs used in the management of hypertension (categorised as yes/no), diabetes mellitus (categorised as yes/no), asthma (categorised as yes/no) and epilepsy (categorised as yes/no) at the OPDs in district hospitals and the healthcare centres in the EDL. 	<ul style="list-style-type: none"> • To assess the availability of NCDs STGs and EML at health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureD)	(Healthcare centres)		
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Handbooks/reference books Question 3.2.2 (DHMT) Question 3.2 (OPDs) Question 3.2 (Healthcare centres) 	<ul style="list-style-type: none"> Textbooks or reference books used at OPDs in district hospitals and healthcare centres to diagnose and manage NCDs. They include Lesotho medicines formulary (categorised as yes, no or sometimes), South African medicines formulary (categorised as yes, no or sometimes), and British national formulary (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the availability of NCDs STGs and EML at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> Medicine selection in line with the EML Question 3.4 (MOH) 	<ul style="list-style-type: none"> Alignment of medicine selection for the management of NCDs at the PHC level with the national EML. The PHC level includes the OPDs in district hospitals (categorised as yes/no) and the healthcare centres (categorised as yes/no). 	<ul style="list-style-type: none"> To assess updating of the national EML so that it is in line with the prevailing burden of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Reasons for non-alignment of medicine selection with the EML Question 3.5 (MOH) 	<ul style="list-style-type: none"> Reasons why medicine selection for the management of NCDs at the PHC level is not in line with the national EML. The PHC level includes the OPDs in district hospitals (categorised as participants giving reasons) and the healthcare centres (categorised as participants giving reasons). 	<ul style="list-style-type: none"> To assess updating of the national EML so that it is in line with the prevailing burden of NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Drugs order frequency Question 3.6 (DHMT) Question 3.6 (OPDs) 	<ul style="list-style-type: none"> Frequency of ordering drugs used in the management of NCDs by the OPDs in district hospitals and the healthcare centre from the supplier. Frequency is as follows: once every month (categorised as 1), twice every month (categorised as 2), and once every two months (categorised as 3). 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Time of delivery of drugs Question 3.7 (DHMT) Question 3.7 (OPDs) 	<ul style="list-style-type: none"> Time it takes for the OPDs in district hospitals and the healthcare centres to receive their drug orders from the supplier. Time is as follows: one week (categorised as 1), one to two weeks (categorised as 2), two to three weeks (categorised as 3), and three to four weeks (categorised as 4). 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Unavailability of transport to deliver drugs Question 3.8 (DHMT) 	<ul style="list-style-type: none"> Measures taken when transport for delivering drugs to the OPDs in district hospitals (categorised as participants stating measures taken) and the healthcare centres (categorised as participants stating measures taken) in 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health

Questionnaire/Annexes Variable/Question number		Description	Objectives
	<ul style="list-style-type: none"> • Question 3.8.1 (DHMT) 	remote areas is not available due to bad weather conditions in the mountains.	facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Determination of minimum drug stock levels for healthcare centres • Question 3.9.2 (DHMT) 	<ul style="list-style-type: none"> • Determination of the minimum drug stock levels (categorised as yes, no or sometimes) by the DHMT pharmacist for healthcare centres. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Determination of maximum drug stock levels for healthcare centres • Question 3.9.1 (DHMT) 	<ul style="list-style-type: none"> • Determination of the maximum drug stock levels (categorised as yes, no or sometimes) by the DHMT pharmacist for healthcare centres. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Calculation of minimum drug stock levels for healthcare centres • Question 3.11 (DHMT) 	<ul style="list-style-type: none"> • Calculation of the minimum drug stock levels (categorised as participants providing information on calculations) by the DHMT pharmacist for healthcare centres. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Calculation of maximum drug stock levels for healthcare centres • Question 3.10 (DHMT) 	<ul style="list-style-type: none"> • Calculation of the maximum drug stock levels (categorised as participants providing information on calculations) by the DHMT pharmacist for healthcare centres. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Determination of minimum drug stock levels for OPDs • Question 3.8.2 (OPDs) 	<ul style="list-style-type: none"> • Determination of the minimum drug stock levels (categorised as yes, no or sometimes) by the pharmacist for OPDs in district hospitals. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Determination of maximum drug stock levels for OPDs • Question 3.8.1 (OPDs) 	<ul style="list-style-type: none"> • Determination of the maximum drug stock levels (categorised as yes, no or sometimes) by the pharmacist for OPDs in district hospitals. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Calculation of minimum drug stock levels for OPDs • Question 3.10 (OPDs) 	<ul style="list-style-type: none"> • Calculation of the minimum drug stock levels (categorised as participants providing information on calculations) by the pharmacist for OPDs in district hospitals. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Calculation of maximum drug stock levels for OPDs • Question 3.9 (OPDs) 	<ul style="list-style-type: none"> • Calculation of the maximum drug stock levels (categorised as participants providing information on calculations) by the pharmacist for OPDs in district hospitals. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • NCD drugs available in past 3 months • Question 3.4 (OPDs) • Question 3.4 (Healthcare centres) 	<ul style="list-style-type: none"> • NCD drugs available at the OPDs in district hospitals and the healthcare centres in the past 3 months. NCD drugs include gliclazide (categorised as yes/no), glibenclamide (categorised as yes/no), glimepiride (categorised as yes/no), metformin (categorised as yes/no), protaphane (categorised as yes/no), actraphane (categorised as yes/no), actrapid (categorised as yes/no), hydrochlorothiazide (categorised as yes/no), atenolol (categorised as yes/no), indapamide (categorised as yes/no), hydralazine (categorised as yes/no), methyl dopa (categorised as yes/no), nifedipine (categorised as yes/no), perindopril (categorised as yes/no), captopril (categorised as yes/no), salbutamol tablets (categorised as yes/no), salbutamol inhaler (categorised as yes/no), beclomethasone inhaler (categorised as yes/no), prednisolone tablets (categorised as yes/no), phenytoin (categorised as yes/no), phenobarbitone (categorised as yes/no), sodium valproate (categorised as yes/no), carbamazepine (categorised as yes/no), and diazepam (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • NCD drugs out-of-stock in past 3 months • Question 3.4 (OPDs) • Question 3.4 (Healthcare centres) 	<ul style="list-style-type: none"> • NCD drugs out-of-stock at the OPDs in district hospitals and the healthcare centres in the past 3 months. NCD drugs include gliclazide (categorised as yes/no), glibenclamide (categorised as yes/no), glimepiride (categorised as yes/no), metformin (categorised as yes/no), protaphane (categorised as yes/no), actraphane (categorised as 	<ul style="list-style-type: none"> • To assess type and availability of medicines used in NCD management at the health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		yes/no), actrapid (categorised as yes/no), hydrochlorothiazide (categorised as yes/no), atenolol (categorised as yes/no), indapamide (categorised as yes/no), hydralazine (categorised as yes/no), methyldopa (categorised as yes/no), nifedipine (categorised as yes/no), perindopril (categorised as yes/no), captopril (categorised as yes/no), salbutamol tablets (categorised as yes/no), salbutamol inhaler (categorised as yes/no), beclomethasone inhaler (categorised as yes/no), prednisolone tablets (categorised as yes/no), phenytoin (categorised as yes/no), phenobarbitone (categorised as yes/no), sodium valproate (categorised as yes/no), carbamazepine (categorised as yes/no), and diazepam (categorised as yes/no).	
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> NCD drugs out-of-stock in healthcare centres <ul style="list-style-type: none"> Question 3.12 (DHMT) Question 3.11 (OPDs) Question 3.6 (Healthcare centres) 	<ul style="list-style-type: none"> NCD drugs out-of-stock in OPDs in district hospitals and healthcare centres in the past 3 months. NCD drugs used in the management of diabetes mellitus (categorised as not at all, rarely, sometimes, frequently, almost always), hypertension (categorised as not at all, rarely, sometimes, frequently, almost always), asthma (categorised as not at all, rarely, sometimes, frequently, almost always) and epilepsy (categorised as not at all, rarely, sometimes, frequently, almost always). 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Reasons for unavailability of NCD drugs in healthcare centres <ul style="list-style-type: none"> Question 3.13 (DHMT) Question 3.12 (OPDs) Question 3.7 (Healthcare centres) 	<ul style="list-style-type: none"> Reasons for the unavailability of drugs used in the management of diabetes mellitus, hypertension, asthma and epilepsy in the past 3 months in healthcare centres categorised as participants providing reasons for stock-outs. 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals	<ul style="list-style-type: none"> Actions taken during NCD drugs unavailability <ul style="list-style-type: none"> Question 3.14 	<ul style="list-style-type: none"> Actions taken when drugs used in the management of diabetes mellitus, hypertension, asthma and epilepsy were out-of-stock in the past 3 months in healthcare centres 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC) Healthcare centres (AnnexureD)	(DHMT) <ul style="list-style-type: none"> • Question 3.13 (OPDs) • Question 3.8 (Healthcare centres) 	categorised as participants providing actions taken during drug stock-outs.	facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Suppliers of NCD drugs • Question 3.3 (DHMT) • Question 3.5 (OPDs) • Question 3.5 (Healthcare centres) 	<ul style="list-style-type: none"> • Suppliers of drugs used in the management of NCDs at the OPDs in district hospitals and healthcare centres. They include NDSO (categorised as hardly ever, occasionally, sometimes, frequently or almost always), Tripharm® (categorised as hardly ever, occasionally, sometimes, frequently or almost always), private drug wholesalers elsewhere (categorised as hardly ever, occasionally, sometimes, frequently or almost always) and other (categorised as hardly ever, occasionally, sometimes, frequently or almost always). 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Methods of quantification for drug needs/consumption forecasting • Question 3.6 (MOH) 	<ul style="list-style-type: none"> • Method of quantification used for drug needs/consumption forecasting at the national level. Methods of quantification include consumption method (categorised as hardly ever, occasionally, sometimes, frequently or almost always), morbidity method (categorised as hardly ever, occasionally, sometimes, frequently or almost always), proxy consumption method (categorised as hardly ever, occasionally, sometimes, frequently or almost always), service-level projection of budget requirements (categorised as hardly ever, occasionally, sometimes, frequently or almost always) and other (categorised as hardly ever, occasionally, sometimes, frequently or almost always). 	<ul style="list-style-type: none"> • To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Forecasts of drug needs/consumption accuracy • Question 3.7 (MOH) 	<ul style="list-style-type: none"> • Accuracy of the forecasts of drug needs/consumption categorised as 'very inaccurate', 'inaccurate', 'accurate', 'very accurate' and 'undecided'. 	<ul style="list-style-type: none"> • To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Procurement process • Question 3.8 (MOH) 	<ul style="list-style-type: none"> • The efficiency of the procurement process at the MOH, i.e. getting the best drugs for the best price at the right time categorised as inefficient, uncertain or efficient. 	<ul style="list-style-type: none"> • To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
MOH (AnnexureA)	<ul style="list-style-type: none"> Reasons for the inefficient procurement process Question 3.8.1 (MOH) 	<ul style="list-style-type: none"> Reasons why the procurement process at the MOH is inefficiently categorised by participants stating reasons of inefficiency of the procurement process. 	<ul style="list-style-type: none"> To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Procurement system management Question 3.8.2 (MOH) 	<ul style="list-style-type: none"> Existence of the following to manage the procurement process at the national level. Existence of policies on medicine procurement that specify the most cost-effective medicines (categorised as yes/no), existence of standard operating procedures on medicines procurement that specify most cost-effective medicines (categorised as yes/no), existence of legal provisions to allow generic substitution in the public sector (categorised as yes/no) and existence of legal provisions to encourage generic substitution in the public sector (categorised as yes/no). 	<ul style="list-style-type: none"> To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Medical products monitoring guideline availability Question 3.9 (MOH) 	<ul style="list-style-type: none"> Existence of guidelines on monitoring of medical products. Medical products are monitored through assessment of their potency (categorised as yes/no), proper labelling (categorised as yes/no), expiration (categorised as yes/no), damage (categorised as yes/no) and tampering (categorised as yes/no). 	<ul style="list-style-type: none"> To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Quality and safety monitoring systems availability Question 3.10 (MOH) 	<ul style="list-style-type: none"> Quality and safety monitoring systems available at the national level. They include existence of a system for the collection of data regarding post-marketing surveillance (categorised as yes/no), existence of standard procedures for the quality control of health products at initial receipt at the national level (categorised as yes/no) and other (categorised as yes/no). 	<ul style="list-style-type: none"> To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Type of procurement method Question 3.11 (MOH) 	<ul style="list-style-type: none"> Type of procurement method used at the national level to purchase medicines and medical devices for the country. Possible procurement methods include open tender (categorised as hardly ever, occasionally, sometimes, frequently or almost always), restricted tender (categorised as hardly ever, occasionally, sometimes, frequently or almost always), negotiated procurement (categorised as 	<ul style="list-style-type: none"> To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		hardly ever, occasionally, sometimes, frequently or almost always), direct procurement (categorised as hardly ever, occasionally, sometimes, frequently or almost always) and other (categorised as hardly ever, occasionally, sometimes, frequently or almost always).	
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Purchase of drugs Question 3.14 (OPDs) Question 3.9 (Healthcare centres) 	<ul style="list-style-type: none"> Purchase of drugs used in the management of NCDs by the population in the area of the district hospital or healthcare centres. Drugs can be bought from public health facilities (categorised as yes, no or sometimes), community or retail pharmacy (categorised as yes, no or sometimes), not for profit hospital (categorised as yes, no or sometimes), not for profit clinic (categorised as yes, no or sometimes) and other (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Drugs requisition process Question 3.4 (DHMT) 	<ul style="list-style-type: none"> Description of the process used by the DHMT to request for drugs used in the management of NCDs at the healthcare centres categorised as participants providing information on the process of drug requisition. 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Drugs delivery process Question 3.5 (DHMT) 	<ul style="list-style-type: none"> Description of the process used by the DHMT to deliver drugs used in the management of NCDs to the healthcare centres categorised as participants providing information on drug delivery process. 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Use of drug supply management tools Question 3.15 (DHMT) Question 3.15 (OPDs) Question 3.10 (Healthcare centres) 	<ul style="list-style-type: none"> Drug supply management tools used at the OPDs in district hospitals and the healthcare centres. They include stock (bin) cards (categorised as yes, no or sometimes), dispensing tally sheets (categorised as yes, no or sometimes), stock count sheet (categorised as yes, no or sometimes), and requisition forms (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the availability of drug supply management tool(s).
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres	<ul style="list-style-type: none"> Dissemination of drug supply management tools Question 3.16 (DHMT) Question 3.16 (OPDs) 	<ul style="list-style-type: none"> Dissemination of drug supply management tools to the OPDs in district hospitals and the healthcare centres categorised as the participant's view/opinion. 	<ul style="list-style-type: none"> To assess the availability of drug supply management tool(s).

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureD)	<ul style="list-style-type: none"> • Question 3.11 (Healthcare centres) 		
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Drug supply management tools unavailability • Question 3.16.1 (DHMT) 	<ul style="list-style-type: none"> • Unavailability of drug supply management tools in healthcare centres such as stock (bin) cards (categorised as hardly ever, occasionally, sometimes, frequently or almost always), dispensing tally sheets (categorised as hardly ever, occasionally, sometimes, frequently or almost always), stock count sheet (categorised as hardly ever, occasionally, sometimes, frequently or almost always), and requisition forms (categorised as hardly ever, occasionally, sometimes, frequently or almost always). 	<ul style="list-style-type: none"> • To assess the availability of drug supply management tool(s).
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Unavailability of drug supply management tools in the past 3 months • Question 3.17 (OPDs) • Question 3.12 (Healthcare centres) 	<ul style="list-style-type: none"> • Unavailability of drug supply management tools in the past 3 months at the OPDs in district hospitals and the healthcare centres categorised as hardly ever, occasionally, sometimes, frequently or almost always. 	<ul style="list-style-type: none"> • To assess the availability of drug supply management tool(s).
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Measures taken during unavailability of drug supply management tools • Question 3.16.2 (DHMT) • Question 3.18 (OPDs) • Question 3.13 (Healthcare centres) 	<ul style="list-style-type: none"> • Measures taken to make sure that unavailable drug supply management tools were available at the OPDs in district hospitals and the healthcare centres categorised as participant's view/opinion. 	<ul style="list-style-type: none"> • To assess availability of drug supply management tool(s).
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Drug supply management training for pharmaceutical staff • Question 3.17 (DHMT) • Question 3.19.1 (OPDs) 	<ul style="list-style-type: none"> • Conduction of training on drug supply management for pharmaceutical staff in OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in the past 6 months. 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Medical supplies management training for 	<ul style="list-style-type: none"> • Conduction of training on medical supplies management for pharmaceutical staff in OPDs in district hospitals 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in

Questionnaire/Annexes Variable/Question number		Description	Objectives
OPDs in district hospitals (AnnexureC)	pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17 (DHMT) • Question 3.19.2 (OPDs) 	(categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in the past 6 months.	health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Number of drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.3.1 (DHMT) • Question 3.20.1 (OPDs) 	<ul style="list-style-type: none"> • Number of training on drug supply management conducted for pharmaceutical staff in OPDs in district hospitals (categorised by participants stating the number of training sessions) and healthcare centres (categorised by participants stating the number of training sessions) in the past 6 months. 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Number of medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.3.2 (DHMT) • Question 3.20.2 (OPDs) 	<ul style="list-style-type: none"> • Number of training on medical supplies management conducted for pharmaceutical staff in OPDs in district hospitals (categorised by participants stating the number of training sessions) and healthcare centres (categorised by participants stating the number of training sessions) in the past 6 months. 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Topics for drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.4 (DHMT) • Question 3.21 (OPDs) 	<ul style="list-style-type: none"> • Topics covered in drug supply management training for pharmaceutical staff at the OPDs in district hospitals (categorised by participants providing topics) and the healthcare centres (categorised by participants providing topics). 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> • Topics for medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.5 (DHMT) • Question 3.22 (OPDs) 	<ul style="list-style-type: none"> • Topics covered in medical supplies management training for pharmaceutical staff at the OPDs in district hospitals (categorised by participants providing topics) and the healthcare centres (categorised by participants providing topics). 	<ul style="list-style-type: none"> • To describe the availability of training of health workers in health facilities on NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Changes made due to drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> Question 3.17.6.1 (DHMT) Question 3.23.1 (OPDs) 	<ul style="list-style-type: none"> Changes made concerning drug supply management as a result of the training sessions by pharmaceutical staff at the OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Changes made due to medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> Question 3.17.6.2 (DHMT) Question 3.23.2 (OPDs) 	<ul style="list-style-type: none"> Changes made about medical supplies management as a result of the training sessions by pharmaceutical staff at the OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Examples of changes made due to drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> Question 3.17 (DHMT) Question 3.24 (OPDs) 	<ul style="list-style-type: none"> Examples of recent changes made with regard to drug supply management training by pharmaceutical staff in the past 6 months at the OPDs in district hospitals (categorised by participants giving examples of changes made) and the healthcare centres (categorised by participants giving examples of changes made). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Examples of changes made due to medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> Question 3.17 (DHMT) Question 3.24.1 (OPDs) 	<ul style="list-style-type: none"> Examples of recent changes made with regard to medical supplies management training by pharmaceutical staff in the past 6 months at the OPDs in district hospitals (categorised by participants giving examples of changes made) and the healthcare centres (categorised by participants giving examples of changes made). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
OPDs in district hospitals	<ul style="list-style-type: none"> Frequency of drug supply management refresher 	<ul style="list-style-type: none"> Frequency of holding refresher training sessions on drug supply management for pharmaceutical staff in OPDs in 	<ul style="list-style-type: none"> To describe the availability of training of health workers in

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC)	trainings for pharmaceutical staff • Question 3.25 (OPDs)	district hospitals. It includes every 6 months (categorised as 1), once a year (categorised as 2), and never (categorised as 3).	health facilities on NCD management.
OPDs in district hospitals (AnnexureC)	• Frequency of medical supplies management refresher trainings for pharmaceutical staff • Question 3.25 (OPDs)	• Frequency of holding refresher training sessions on medical supplies management for pharmaceutical staff in OPDs in district hospitals. It includes every 6 months (categorised as 1), once a year (categorised as 2), and never (categorised as 3).	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Drug supply management training for non-pharmaceutical staff • Question 3.18 (DHMT) • Question 3.14.1 (Healthcare centres)	• Conduction of training on drug supply management for non-pharmaceutical staff in OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in the past 6 months.	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Medical supplies management training for non-pharmaceutical staff • Question 3.18 (DHMT) • Question 3.14.2 (Healthcare centres)	• Conduction of training on medical supplies management for non-pharmaceutical staff in OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in the past 6 months.	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Number of drug supply management training for non-pharmaceutical staff • Question 3.18.1.1 (DHMT) • Question 3.15.1 (OPDs)	• Number of trainings on drug supply management conducted for non-pharmaceutical staff in OPDs in district hospitals (categorised by participants stating the number of training sessions) and healthcare centres (categorised by participants stating the number of training sessions) in the past 6 months.	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Number of medical supplies management training for non-pharmaceutical staff • Question 3.18.1.2	• Number of training on medical supplies management conducted for non-pharmaceutical staff in OPDs in district hospitals (categorised by participants stating the number of training sessions) and healthcare centres (categorised by participants stating the number of training sessions) in the	• To describe the availability of training of health workers in health facilities on NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
	(DHMT) • Question 3.15.2 (Healthcare centres)	past 6 months.	
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Topics for drug supply management training for non-pharmaceutical staff • Question 3.18.2 (DHMT) • Question 3.16 (Healthcare centres)	• Topics covered in drug supply management training for non-pharmaceutical staff at the OPDs in district hospitals (categorised by participants providing topics) and the healthcare centres (categorised by participants providing topics).	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Topics for medical supplies management training for non-pharmaceutical staff • Question 3.18.3 (DHMT) • Question 3.17 (Healthcare centres)	• Topics covered in medical supplies management training for non-pharmaceutical staff at the OPDs in district hospitals (categorised by participants providing topics) and the healthcare centres (categorised by participants providing topics).	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Changes made due to drug supply management training for non-pharmaceutical staff • Question 3.18.4.1 (DHMT) • Question 3.18.1 (Healthcare centres)	• Changes made with regard to drug supply management as a result of the training sessions by non-pharmaceutical staff at the OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centres (categorised as not at all, sometimes or almost always).	• To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	• Changes made due to medical supplies management training for non-pharmaceutical staff • Question 3.18.4.2 (DHMT) • Question 3.18.2 (Healthcare centres)	• Changes made with regard to medical supplies management as a result of the training sessions by non-pharmaceutical staff at the OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centres (categorised as not at all, sometimes or almost always).	• To describe the availability of training of health workers in health facilities on NCD management.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Examples of changes made due to drug supply management training for non-pharmaceutical staff <ul style="list-style-type: none"> Question 3.18.5 (DHMT) Question 3.19 (Healthcare centres) 	<ul style="list-style-type: none"> Examples of recent changes made with regard to drug supply management training by non-pharmaceutical staff in the past 6 months at the OPDs in district hospitals (categorised by participants giving examples of changes made) and the healthcare centres (categorised by participants giving examples of changes made). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Examples of changes made due to medical supplies management training for non-pharmaceutical staff <ul style="list-style-type: none"> Question 3.18.5 (DHMT) Question 3.19.1 (Healthcare centres) 	<ul style="list-style-type: none"> Examples of recent changes made with regard to medical supplies management training by non-pharmaceutical staff in the past 6 months at the OPDs in district hospitals (categorised by participants giving examples of changes made) and the healthcare centres (categorised by participants giving examples of changes made). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Frequency of drug supply management refresher training for non-pharmaceutical staff <ul style="list-style-type: none"> Question 3.20 (Healthcare centres) 	<ul style="list-style-type: none"> Frequency of holding refresher training sessions on drug supply management for non-pharmaceutical staff in healthcare centres. It includes every 6 months (categorised as 1), once a year (categorised as 2), and never (categorised as 3). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Frequency of medical supplies management refresher training for non-pharmaceutical staff <ul style="list-style-type: none"> Question 3.20 (Healthcare centres) 	<ul style="list-style-type: none"> Frequency of holding refresher training sessions on medical supplies management for non-pharmaceutical staff in healthcare centre. It includes every 6 months (categorised as 1), once a year (categorised as 2), and never (categorised as 3). 	<ul style="list-style-type: none"> To describe the availability of training of health workers in health facilities on NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Order preparation schedule availability <ul style="list-style-type: none"> Question 3.19 (DHMT) Question 3.27 (OPDs) 	<ul style="list-style-type: none"> Availability of an order preparation schedule prepared by the DHMT pharmacist at the OPDs in district hospitals (categorised as not at all, sometimes or almost always) and healthcare centres (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To assess the type and availability of medicines used in NCD management at the health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 3.21 (Healthcare centres) 		
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Ordering drugs during unavailability of an order preparation schedule • Question 3.19.3 (DHMT) • Question 3.27.1 (OPDs) • Question 3.21.1 (Healthcare centres) 	<ul style="list-style-type: none"> • How OPDs in district hospitals (categorised by participants providing answers) and healthcare centres (categorised by participants providing answers) know when it is time to order drugs in the absence of an order preparation schedule. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • NDSO order delivery schedule availability • Question 3.20 (DHMT) • Question 3.26 (OPDs) • Question 3.22 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of an NDSO order delivery schedule in the OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centres (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Calculation of quantity of drugs during unavailability of an NDSO order delivery schedule • Question 3.20.3 (DHMT) • Question 3.26.1 (OPDs) • Question 3.22.1 (Healthcare centres) 	<ul style="list-style-type: none"> • How OPDs in district hospitals (categorised by participants providing answers) and healthcare centres (categorised by participants providing answers) calculate the quantity of drugs to order in the absence of an NDSO order delivery schedule. 	<ul style="list-style-type: none"> • To assess the type and availability of medicines used in NCD management at the health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Availability of health system information system (HSIS) personnel • Question 4.1 (MOH) 	<ul style="list-style-type: none"> • Availability of management, professional and/or clinical personnel employed to implement an effective HSIS categorised as sufficient, uncertain or insufficient. 	<ul style="list-style-type: none"> • To assess the profile of personnel for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • HSIS implementation at 	<ul style="list-style-type: none"> • Indication of whether health information system has a cadre 	<ul style="list-style-type: none"> • To assess the profile of

Questionnaire/Annexes Variable/Question number		Description	Objectives
	<p>different levels of the health system</p> <ul style="list-style-type: none"> • Question 4.2 (MOH) 	<p>of trained health information staff in place at the district level (categorised as yes, no or don't know), health workers in health facilities receive regular training in health information that is integrated into continuing education in the public sector (categorised as yes, no or don't know), health workers in health facilities receive regular training in health information through in-service training in the public sector (categorised as yes, no or don't know), the MOH has adequate capacity in core health information sciences (categorised as yes, no or don't know), the national statistics office has adequate capacity in statistics (categorised as yes, no or don't know), and availability of full-time health information officer position at the district level (categorised as yes, no or don't know).</p>	<p>personnel for NCD management.</p>
MOH (AnnexureA)	<ul style="list-style-type: none"> • Health information system (HIS) capacity-building activities at national and district levels • Question 4.3 (MOH) 	<ul style="list-style-type: none"> • Type of HIS capacity-building activities that have taken place over the past year for HIS staff at the national and district level. Activities include statistics training (categorised as yes, no or do not know), software maintenance (categorised as yes, no or do not know), database maintenance (categorised as yes, no or do not know), and epidemiology training (categorised as yes, no or do not know). 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • HIS capacity-building activities for health facility staff • Question 4.4 (MOH) 	<ul style="list-style-type: none"> • HIS capacity-building activities that have taken place over the past year for health facility staff in the OPDs in district hospitals and healthcare centres. Activities include data collection (categorised as yes, no or sometimes), analysis (categorised as yes, no or sometimes), and presentations (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Structures to lead and manage HSIS • Question 4.5 (MOH) 	<ul style="list-style-type: none"> • Existence of structures to lead and manage HSIS in NCD management categorised as yes/no. 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • HSIS structures in place to lead and manage HSIS • Question 4.5.1 (MOH) 	<ul style="list-style-type: none"> • Structures in place to lead and manage HSIS in NCD management. These structures include a representative and functioning national committee in charge of HIS 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		<p>coordination (categorised as yes, no or don't know), the national statistics office and the MOH have established coordination mechanisms (categorised as yes, no or don't know), functional national HIS administrative units to design health information collection, management, analysis, dissemination and use for health (categorised as yes, no or don't know), functional national HIS administrative units to develop health information collection, management, analysis, dissemination and use for health (categorised as yes, no or don't know), functional national HIS administrative units to support health information collection, management, analysis, dissemination and use for planning (categorised as yes, no or don't know), functional national HIS administrative units to support health information collection, management, analysis, dissemination and use for management (categorised as yes, no or don't know), there are meetings to coordinate the timing, key variables measured and funding of nationally representative population-based surveys that measure health indicators (categorised as yes, no or don't know), there is a multiyear plan to coordinate the timing, key variables measured and funding of nationally representative population-based surveys that measure health indicators (categorised as yes, no or don't know), and the health and statistics constituencies in the country work together closely on survey design and implementation and data analysis and use (categorised as yes, no or don't know).</p>	
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD statistics definition Question 4.6 (MOH) 	<ul style="list-style-type: none"> Definition of the following: core set of indicators (categorised as yes/no) and data requirements (categorised as yes/no) for NCD statistics. 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD statistics in place Question 4.7 (MOH) 	<ul style="list-style-type: none"> NCD statistics in place to be used in the management of NCDs. They include existence of a national set of indicators with targets and annual reporting to inform annual health 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-

Questionnaire/Annexes Variable/Question number		Description	Objectives
		sector reviews and other planning cycles (categorised as yes, no or don't know), national minimum core indicators have been identified for the national level covering all categories of health indicators (categorised as yes, no or don't know), national minimum core indicators have been identified for the district level covering all categories of health indicators (categorised as yes, no or don't know), and national minimum core indicators have been identified for the PHC levels covering all categories of health indicators (categorised as yes, no or don't know).	making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Explicit criteria for core indicators selection Question 4.8 (MOH) 	<ul style="list-style-type: none"> Selection of core indicators for NCD management according to usefulness (categorised as yes, no or don't know), scientific soundness (categorised as yes, no or don't know), reliability (categorised as yes, no or don't know), representativeness (categorised as yes, no or don't know), feasibility (categorised as yes, no or don't know), and accessibility (categorised as yes, no or don't know). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Identification of core indicators Question 4.9 (MOH) 	<ul style="list-style-type: none"> Definition of core indicators for NCD management in collaboration with key stakeholders such as the MOH (categorised as yes, no or don't know), national statistics office (categorised as yes, no or don't know), professional organisations (categorised as yes, no or don't know), major disease-focused programmes (categorised as yes, no or don't know), and other relevant ministries (categorised as yes, no or don't know). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Management of NCD data at the national level Question 4.10 (MOH) 	<ul style="list-style-type: none"> Existence of coordinated and integrated management of data on NCDs at the national level from across different information sub-systems categorised as yes, somewhat or no. 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Management of information in a coordinated and integrated fashion Question 4.11 (MOH) 	<ul style="list-style-type: none"> Strategies in place for the management of information in a coordinated and integrated fashion at the national level. They are as follows: are there standard formats and codes used across information sub-systems (categorised as yes/no), is there a written set of procedures for data 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		management (categorised as yes/no), are unique identifiers codes for administrative geographical units to facilitate the merging of multiple databases from different sources (categorised as yes/no), at the district level, a data warehouse equivalent to the national one exists (categorised as yes/no), and a data warehouse at the district level has a reporting utility that is accessible to various users (categorised as yes/no).	
MOH (AnnexureA)	<ul style="list-style-type: none"> Analysis and synthesis of NCD data Question 4.17 (MOH) 	<ul style="list-style-type: none"> The data on NCDs is being analysed and synthesised to produce useful information about population health status (categorised as not at all, sometimes or almost always), population needs (categorised as not at all, sometimes or almost always), and health system performance (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of population projections by age and sex Question 4.18 (MOH) 	<ul style="list-style-type: none"> Availability of population projections by age and sex for the current year at the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD data from population-based surveys Question 4.19 (MOH) 	<ul style="list-style-type: none"> Indication of whether NCD data from population-based surveys is used to analyse the different needs and experiences of women (categorised as yes, no or sometimes), men (categorised as yes, no or sometimes), girls (categorised as yes, no or sometimes), and boys (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD data from routine HIS Question 4.19 (MOH) 	<ul style="list-style-type: none"> Indication of whether NCD data from routine HIS is used to analyse the different needs and experiences of women (categorised as yes, no or sometimes), men (categorised as yes, no or sometimes), girls (categorised as yes, no or sometimes), and boys (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD data from facility surveys Question 4.19 (MOH) 	<ul style="list-style-type: none"> Indication of whether NCD data from facility surveys is used to analyse the different needs and experiences of women (categorised as yes, no or sometimes), men (categorised as 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-

Questionnaire/Annexes Variable/Question number		Description	Objectives
		yes, no or sometimes), girls (categorised as yes, no or sometimes), and boys (categorised as yes, no or sometimes).	making at the national level.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Type of information on NCDs submitted to the DHMT Question 4.15 (DHMT) 	<ul style="list-style-type: none"> Type of information submitted to the DHMT by the OPDs in district hospitals and the healthcare centres regarding NCDs. Information submitted includes total number of patients diagnosed with hypertension (categorised as yes, no or sometimes), total number of patients diagnosed with diabetes mellitus (categorised as yes, no or sometimes), total number of patients diagnosed with asthma (categorised as yes, no or sometimes), total number of patients diagnosed with epilepsy (categorised as yes, no or sometimes), number of age groups with hypertension (categorised as yes, no or sometimes), number of age groups with diabetes mellitus (categorised as yes, no or sometimes), number of age groups with asthma (categorised as yes, no or sometimes), number of age groups with epilepsy (categorised as yes, no or sometimes), gender of patients with hypertension (categorised as yes, no or sometimes), gender of patients with diabetes mellitus (categorised as yes, no or sometimes), gender of patients with asthma (categorised as yes, no or sometimes), gender of patients with epilepsy (categorised as yes, no or sometimes), blood pressure values (categorised as yes, no or sometimes), blood glucose levels (categorised as yes, no or sometimes), peak flow meter readings (categorised as yes, no or sometimes), therapeutic blood level monitoring for epileptic patients (categorised as yes, no or sometimes), number of patients referred to district hospital by healthcare centres (categorised as yes, no or sometimes), drug consumption rate (categorised as yes, no or sometimes), number of health promotion activities conducted in the community (categorised as yes, no or sometimes), number of health talks conducted, number of patients with adverse drug reactions (categorised as yes, no or sometimes), type 	<ul style="list-style-type: none"> To describe the type of data collected and kept at the health facilities on NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		of adverse drug reactions patients experienced (categorised as yes, no or sometimes), and management of adverse drug reactions (categorised as yes/no).	
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Data collectors <ul style="list-style-type: none"> Question 4.6 (OPDs) Question 4.6 (Healthcare centres) 	<ul style="list-style-type: none"> Person(s) who collect data on NCD management from patients at the OPDs in district hospitals and the healthcare centre. They include nurses (categorised as not at all, sometimes or almost always), nurse assistants (categorised as not at all, sometimes or almost always), data collection clerk (categorised as not at all, sometimes or almost always), pharmacist (categorised as not at all, sometimes or almost always), pharmacy technician (categorised as not at all, sometimes or almost always), doctors (categorised as not at all, sometimes or almost always), receptionist (categorised as not at all, sometimes or almost always), and community health workers (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To describe the level of recording and reporting of information on outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Type of information collected on NCDs <ul style="list-style-type: none"> Question 4.8 (OPDs) Question 4.8 (Healthcare centres) 	<ul style="list-style-type: none"> Type of information collected at the OPDs in district hospitals and the healthcare centres on NCDs. Information collected includes total number of patients diagnosed with hypertension (categorised as yes, no or sometimes), total number of patients diagnosed with diabetes mellitus (categorised as yes, no or sometimes), total number of patients diagnosed with asthma (categorised as yes, no or sometimes), total number of patients diagnosed with epilepsy (categorised as yes, no or sometimes), number of age groups with hypertension (categorised as yes, no or sometimes), number of age groups with diabetes mellitus (categorised as yes, no or sometimes), number of age groups with asthma (categorised as yes, no or sometimes), number of age groups with epilepsy (categorised as yes, no or sometimes), gender of patients with hypertension (categorised as yes, no or sometimes), gender of patients with diabetes mellitus (categorised as yes, no or sometimes), gender of patients with asthma (categorised as yes, no or sometimes), gender of patients with epilepsy 	<ul style="list-style-type: none"> To describe type of data collected and kept at the health facilities on NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		(categorised as yes, no or sometimes), blood pressure values (categorised as yes, no or sometimes), blood glucose levels (categorised as yes, no or sometimes), peak flow meter readings (categorised as yes, no or sometimes), therapeutic blood level monitoring for epileptic patients (categorised as yes, no or sometimes), number of patients referred to district hospital by healthcare centres (categorised as yes, no or sometimes), drug consumption rate (categorised as yes, no or sometimes), number of health promotion activities conducted in the community (categorised as yes, no or sometimes), number of health talks conducted, number of patients with adverse drug reactions (categorised as yes, no or sometimes), type of adverse drug reactions patients experienced (categorised as yes, no or sometimes), and management of adverse drug reactions (categorised as yes, no or sometimes).	
DHMT (AnnexureB)	<ul style="list-style-type: none"> Method of keeping collected NCD information <ul style="list-style-type: none"> Question 4.16 (DHMT) 	<ul style="list-style-type: none"> Method of keeping collected information on NCD management at the DHMT. Information on NCDs can be kept electronically (categorised as yes/no), paper-based (categorised as yes/no), and both electronically and paper-based (categorised as yes/no). 	<ul style="list-style-type: none"> To describe type of data collected and kept at the health facilities on NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Place where collected NCD information is kept <ul style="list-style-type: none"> Question 4.9 (OPDs) Question 4.9 (Healthcare centres) 	<ul style="list-style-type: none"> Storage of collected information on NCD management at the OPDs in district hospitals and the healthcare centre categorised by participants providing places where information is kept. 	<ul style="list-style-type: none"> To describe type of data collected and kept at the health facilities on NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Availability of data collection tool <ul style="list-style-type: none"> Question 4.7 (OPDs) Question 4.7 (healthcare centres) 	<ul style="list-style-type: none"> Availability of a data collection tool for capturing information on NCD management at the OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centres (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To describe the level of recording and reporting of information on outpatients with NCDs.
OPDs in district hospitals	<ul style="list-style-type: none"> Format of data collection tool 	<ul style="list-style-type: none"> Format of the data collection tool used for capturing information on NCD management at the OPDs in district 	<ul style="list-style-type: none"> To describe the level of recording and reporting of information on

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 4.7.1 (OPDs) • Question 4.7.1 (Healthcare centres) 	hospitals and the healthcare centres. Format include paper-based (registries) (categorised as yes/no), electronic (categorised as yes/no), and paper-based outpatient medical files (categorised as yes/no).	outpatients with NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Submission of health statistics reports • Question 4.1 (DHMT) • Question 4.1 (OPDs) • Question 4.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Submission of health statistics on NCD management by the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the health care centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Health statistics reports • Question 4.2 (DHMT) • Question 4.2 (OPDs) • Question 4.2 (Healthcare centres) 	<ul style="list-style-type: none"> • Questions about health statistics reports include have you submitted all health statistics reports on NCDs in the past 6 months? (categorised as yes, no or sometimes), have you had any shortage of health statistics forms for NCDs in the last 6 months? (categorised as yes, no or sometimes), and do you keep copies of the health statistics reports on NCDs you submit? (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Places to submit health statistics • Question 4.1.1 (OPDs) • Question 4.1.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Places where health statistics on NCD management is submitted by the OPDs in district hospitals and the healthcare centres. Places include the DHMT (categorised as yes/no), district hospital (categorised as yes/no) and the MOH (categorised as yes/no). 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Analysis of health statistics • Question 4.7 (DHMT) • Question 4.10 (OPDs) • Question 4.10 (Healthcare centres) 	<ul style="list-style-type: none"> • Analysis of health statistics by the staff of the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the Healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.
DHMT (AnnexureB) OPDs in district hospitals	<ul style="list-style-type: none"> • Presentation of analysed health statistics • Question 4.8 (DHMT) 	<ul style="list-style-type: none"> • Example of how the analysed health statistics data is presented at the DHMT (categorised by participants giving examples), OPDs in district hospitals (categorised by 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 4.10.1 (OPDs) • Question 4.10.1 (Healthcare centres) 	participants giving examples) and the healthcare centres (categorised by participants giving examples).	and primary healthcare levels.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Use of health statistics • Question 4.9 (DHMT) • Question 4.11 (OPDs) • Question 4.11 (Healthcare centres) 	<ul style="list-style-type: none"> • Use of health statistics on NCD management by the staff at the DHMT (categorised as yes, sometimes, no or don't know), OPDs in district hospitals (categorised as yes, sometimes, no or don't know) and the healthcare centres (categorised as yes, sometimes, no or don't know) in decision-making. 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Examples of how health statistics are used • Question 4.10 (DHMT) • Question 4.11.1 (OPDs) • Question 4.12 (Healthcare centres) 	<ul style="list-style-type: none"> • Examples of how the staff at the DHMT (categorised by participants giving examples), OPDs in district hospitals (categorised by participants giving examples) and the healthcare centres (categorised by participants giving examples) use the health statistics on NCD management in decision-making. 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Indicators for health information statistics on NCDs • Question 4.3 (DHMT) 	<ul style="list-style-type: none"> • List of indicators available in the health information statistics regarding NCDs characterised by participants listing the indicators. 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Preparation of health statistics reports on NCDs difficulties • Question 4.4.1 (DHMT) • Question 4.3.1 (OPDs) • Question 4.3.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Difficulties encountered during preparation of health statistics reports on NCDs categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> • To describe all factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Submission of health statistics reports on 	<ul style="list-style-type: none"> • Difficulties encountered during submission of health statistics reports on NCDs categorised as yes, no or 	<ul style="list-style-type: none"> • To describe all factors influencing recording and reporting of

Questionnaire/Annexes Variable/Question number		Description	Objectives
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	NCDs difficulties <ul style="list-style-type: none"> • Question 4.4.2 (DHMT) • Question 4.3.2 (OPDs) • Question 4.3.2 (Healthcare centres) 	sometimes.	information on outpatients with NCDs either positively or negatively.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Description of constraints for preparation of health statistics reports on NCDs <ul style="list-style-type: none"> • Question 4.5 (DHMT) • Question 4.4 (OPDs) • Question 4.4 (Healthcare centres) 	<ul style="list-style-type: none"> • Description of the main constraints encountered during preparation of the health statistics reports on NCDs categorised by participants stating the constraints. 	<ul style="list-style-type: none"> • To describe all factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Description of constraint for submission of health statistics reports on NCDs <ul style="list-style-type: none"> • Question 4.6 (DHMT) • Question 4.5 (OPDs) • Question 4.5 (Healthcare centres) 	<ul style="list-style-type: none"> • Description of the main constraints encountered in submission of the health statistics reports on NCDs categorised by participants stating the constraints. 	<ul style="list-style-type: none"> • To describe all factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Provision of feedback on submitted reports on NCD management <ul style="list-style-type: none"> • Question 4.11 (DHMT) 	<ul style="list-style-type: none"> • Provision of feedback to OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in response to submission of reports on NCD management. 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres	<ul style="list-style-type: none"> • Obtaining feedback on submitted reports on NCD management <ul style="list-style-type: none"> • Question 4.13 (DHMT) • Question 4.12 (OPDs) 	<ul style="list-style-type: none"> • Obtaining feedback from the national level and the district level in response to reports that were submitted by the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes) on NCDs in the past 6 months. 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureD)	<ul style="list-style-type: none"> • Question 4.13 (Healthcare centres) 		
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Examples of feedback obtained • Question 4.14 (DHMT) • Question 4.13 (OPDs) • Question 4.14 (Healthcare centres) 	<ul style="list-style-type: none"> • Examples of feedback received from the national and the district levels in response to report that were submitted by the DHMT (categorised as yes/no), the OPDs in district hospitals (categorised as yes/no) and the healthcare centres (categorised as yes/no) in the past 6 months. 	<ul style="list-style-type: none"> • To describe the level of recording and reporting of information on outpatients with NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Recent health achievement reflected on health activity monitoring mechanisms • Question 4.12 (DHMT) 	<ul style="list-style-type: none"> • Health activity monitoring mechanisms for NCD management such as charts or diagrams showing recent health achievements in the district categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Availability of charts and diagrams to health facilities • Question 4.12.1 (DHMT) 	<ul style="list-style-type: none"> • Availability of charts and diagrams to OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes) in the district. 	<ul style="list-style-type: none"> • To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Availability of equipment used for NCD data • Question 4.12 (MOH) 	<ul style="list-style-type: none"> • Availability of functioning equipment for collecting data (categorised as yes/no), managing data (categorised as yes/no) and transmitting data (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Availability of computers • Question 4.14 (MOH) 	<ul style="list-style-type: none"> • Availability of computers to permit rapid compilation of district data at all levels of the healthcare system. They include the national level: pharmaceutical directorate (categorised as yes, no or sometimes) and NCD unit (categorised as yes, no or sometimes), the district level: DHMT (categorised as yes, no or sometimes) and the PHC level: OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Data collection supplies availability 	<ul style="list-style-type: none"> • Availability of data collection supplies such as recording forms (categorised as yes, no or sometimes), paper 	<ul style="list-style-type: none"> • To assess structures in place to lead and manage HSIS in the

Questionnaire/Annexes Variable/Question number		Description	Objectives
	<ul style="list-style-type: none"> Question 4.13 (MOH) 	(categorised as yes, no or sometimes), pencil (categorised as yes, no or sometimes) and other (categorised as yes, no or sometimes) at the national, district and the PHC levels.	management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Information and communication technology (ICT) infrastructure in place Question 4.15 (MOH) 	<ul style="list-style-type: none"> Existence of basic information and communication technology (ICT) infrastructure at the MOH, DHMTs, OPDs in district hospitals and the healthcare centres. ICT infrastructure include telephone (categorised as yes/no), internet access (categorised as yes/no) and e-mail (categorised as yes/no). 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of support for ICT equipment Question 4.16 (MOH) 	<ul style="list-style-type: none"> Availability of support for ICT equipment at the national level (categorised as yes, no or sometimes), district level (categorised as yes, no or sometimes) and the primary healthcare level (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Institutional mechanism charged with analysis of NCD data Question 4.20 (MOH) 	<ul style="list-style-type: none"> Existence of a designated and functioning institutional mechanism charged with analysis of health statistics (categorised as yes/no), synthesis of data from different sources (categorised as yes/no), validation of data from population-based sources (categorised as yes/no) and validation of data from facility-based sources (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of a system for HSIS information dissemination Question 4.21 (MOH) 	<ul style="list-style-type: none"> Existence of an effective system for disseminating HSIS information at the national, district and the PHC levels. The systems include policy makers (categorised as ineffective, uncertain or effective), managers (categorised as ineffective, uncertain or effective), providers (categorised as ineffective, uncertain or effective) and other stakeholders (categorised as ineffective, uncertain or effective). 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> HSIS information dissemination systems in place Question 4.22 (MOH) 	<ul style="list-style-type: none"> HSIS information dissemination systems in place include existence of a website for country health statistics, making the latest reports and data available to the general public (categorised as yes, no or sometimes), graphs are widely used to display information at health administrative offices (categorised as yes, no or sometimes) and graphs are widely used to display information at health facilities 	<ul style="list-style-type: none"> To assess structures in place to lead and manage HSIS in the management of NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		(categorised as yes, no or sometimes).	
MOH (AnnexureA)	<ul style="list-style-type: none"> Human resource allocation Question 4.23 (MOH) 	<ul style="list-style-type: none"> Use of NCDs information from the HIS as a foundation for deciding allocation of human resources at the national level (categorised as yes, no or sometimes), district level (categorised as yes, no or sometimes) and the PHC level (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> Financial resource allocation Question 4.23 (MOH) 	<ul style="list-style-type: none"> Use of NCDs information from the health information system as a foundation for deciding allocation of financial resources at the national level (categorised as yes, no or sometimes), district level (categorised as yes, no or sometimes) and the PHC level (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.
MOH (AnnexureA)	<ul style="list-style-type: none"> National health management and information system (NHMIS) policy availability Question 4.24 (MOH) 	<ul style="list-style-type: none"> Existence of a NHMIS policy categorised as yes/no. 	<ul style="list-style-type: none"> To assess the existence and implementation of NHMIS policy in governing data for NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Inclusion of NCD management in the NHMIS policy Question 4.24.1 (MOH) 	<ul style="list-style-type: none"> An existing NHMIS policy caters for management of information for NCDs categorised as yes/no. 	<ul style="list-style-type: none"> To assess the existence and implementation of NHMIS policy in governing data for NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> NCD information management according to NHMIS policy Question 4.24.2 (MOH) 	<ul style="list-style-type: none"> Outline of what the NHMIS policy says about management of information for NCDs categorised by participants outlining what the NHMIS policy says about NCD information management. 	<ul style="list-style-type: none"> To assess the existence and implementation of NHMIS policy in governing data for NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Financing responsibilities Question 5.1 (MOH) 	<ul style="list-style-type: none"> Clearly defined and agreed upon financing responsibilities among the different levels of government (categorised as yes, sometimes, no or don't know), development partners (categorised as yes, sometimes, no or don't know) and the different levels of healthcare (categorised as yes, sometimes, no or don't know). 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of a joint annual review process Question 5.2.1 (MOH) 	<ul style="list-style-type: none"> Existence of a joint annual review process where financial commitments are made, involving all major development partners categorised as yes/no. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of a joint planning process Question 5.2.2 (MOH) 	<ul style="list-style-type: none"> Existence of a joint planning process where financial commitments are made, involving all major development partners categorised as yes/no. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Indicator for financial commitments Question 5.3 (MOH) 	<ul style="list-style-type: none"> Indicator for financial commitments made, involving major development partners categorised by participants stating the indicators. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Committed funds for NCD management Question 5.4 (MOH) 	<ul style="list-style-type: none"> Timely and predictable collection/disbursement of committed funds for NCD management categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Reasons for untimely collection/disbursement of committed NCD management funds Question 5.4.1 (MOH) 	<ul style="list-style-type: none"> Reasons why committed funds for NCD management are not collected/dispensed in a timely and predictable fashion categorised by participants stating the reasons. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Risk-pooling mechanisms in place Question 5.5 (MOH) 	<ul style="list-style-type: none"> Existence of risk-pooling mechanisms, especially those targeting the most vulnerable (i.e. poor and marginalised populations) in the management of NCDs categorised as yes, no or don't know. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Risk-pooling approach used Question 5.5.1 (MOH) 	<ul style="list-style-type: none"> Risk-pooling approaches used include unitary risk pooling (categorised as not at all, sometimes or almost always), fragmented risk pooling (categorised as not at all, sometimes or almost always), and integrated risk pooling (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Effective use of budgets for planning Question 5.6.1 (MOH) 	<ul style="list-style-type: none"> Effective use of budgets for planning in NCD management categorised as ineffectively, uncertain or effectively. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Effective use of budgets for implementation Question 5.6.2 (MOH) 	<ul style="list-style-type: none"> Effective use of budgets for implementation in NCD management categorised as ineffectively, uncertain or effectively. 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> Performance indicators used in budgets for planning and implementation Question 5.7 (MOH) 	<ul style="list-style-type: none"> Performance indicators used in budgets for planning and implementation of NCD management. They include the budget is linked to the annual operational plan for the current year (categorised as yes/no), the health facilities use planning procedures to strengthen service delivery performance (categorised as yes/no), the health facilities use budgeting procedures to strengthen service delivery performance (categorised as yes/no), and the national level prepares budgets using activity-based costing (ABC) (categorised as yes/no). 	<ul style="list-style-type: none"> To assess resources allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Provision for replacement of equipment in the budget Question 6.5 (MOH) 	<ul style="list-style-type: none"> Provision for replacement of equipment used in the diagnosis and monitoring of NCDs in the budget at the district level: DHMT (categorised as yes, no or sometimes) and the PHC level: OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe availability of necessary non-medical and medical equipment at different levels of healthcare.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Availability of a budget Question 5.1 (DHMT) Question 5.1 (OPDs) Question 5.1 (Healthcare centres) 	<ul style="list-style-type: none"> Existence of a budget at the DHMT (categorised as yes/no), OPDs in district hospitals (categorised as yes/no) and the healthcare centres (categorised as yes/no). 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> DHMT authority over its budget Question 5.2 (DHMT) 	<ul style="list-style-type: none"> Level of authority the DHMT has on the use of its budget. Authority in terms of paying staff salaries (categorised as yes/no), purchasing drugs for healthcare centres (categorised as yes/no), purchasing drugs for OPDs in district hospitals (categorised as yes/no), purchasing equipment used for NCD diagnosis and management in healthcare centres (categorised as yes/no), purchasing equipment for NCD diagnosis and management in OPDs in district hospitals (categorised as yes/no), repairing and maintaining equipment used for NCD diagnosis and management in healthcare centres (categorised as yes/no), 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		repairing and maintaining equipment used for NCD diagnosis and management in OPDs in district hospitals (categorised as yes/no), maintaining buildings (categorised as yes/no), and maintaining vehicles and motorcycles (categorised as yes/no).	
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Authority over budget <ul style="list-style-type: none"> Question 5.2 (OPDs) Question 5.2 (Healthcare centres) 	<ul style="list-style-type: none"> Level of authority the OPDs in district hospitals and the healthcare centres have on the use of their budgets. Authority includes paying staff salaries (categorised as yes/no), purchasing drugs for NCDs (categorised as yes/no), purchasing equipment used for NCD diagnosis and management (categorised as yes/no), repairing equipment used for NCD diagnosis and management (categorised as yes/no), maintaining equipment used for NCD diagnosis and management (categorised as yes/no), maintaining buildings (categorised as yes/no), and maintaining vehicles and motorcycles (categorised as yes/no). 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Involvement in the development of a budget <ul style="list-style-type: none"> Question 5.4 (DHMT) Question 5.4 (OPDs) Question 5.4 (Healthcare centres) 	<ul style="list-style-type: none"> Involvement of the DHMT (categorised as not at all, sometimes or almost always), OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centres (categorised as not at all, sometimes or almost always) in the development of a budget for NCDs. 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Explanation of involvement in the development of a budget <ul style="list-style-type: none"> Question 5.4.1 (DHMT) Question 5.4.1 (OPDs) Question 5.4.1 (Healthcare centres) 	<ul style="list-style-type: none"> Explanation of how the DHMT (categorised by participants giving explanations of their involvement), OPDs in district hospitals (categorised by participants giving explanations of their involvement) and the healthcare centres (categorised by participants giving explanations of their involvement) are involved in the development of a budget for NCDs. 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Existence of planning procedures 	<ul style="list-style-type: none"> Existence of planning procedures to strengthen service delivery performance in NCD management categorised as 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level

Questionnaire/Annexes Variable/Question number		Description	Objectives
	<ul style="list-style-type: none"> • Question 5.8.1 (MOH) 	yes, no or don't know.	for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Existence of budgeting procedures • Question 5.8.2 (MOH) 	<ul style="list-style-type: none"> • Existence of budgeting procedures to strengthen service delivery performance in NCD management categorised as yes, no or don't know. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Use of planning procedures to strengthen service delivery • Question 5.9.1 (MOH) 	<ul style="list-style-type: none"> • Use of planning procedures by the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes) to strengthen service delivery performance in NCD management. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Use of budgeting procedures to strengthen service delivery • Question 5.9.2 (MOH) 	<ul style="list-style-type: none"> • Use of budgeting procedures by the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes) to strengthen service delivery performance in NCD management. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Use of information on population health needs • Question 5.10 (MOH) 	<ul style="list-style-type: none"> • Use of the information on population health needs on NCD management to inform resource allocation decisions categorised as not at all, sometimes or almost always. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Population health needs information not used to inform resource allocation decisions • Question 5.10.1 (MOH) 	<ul style="list-style-type: none"> • If the information on population health needs on NCD management is not used to inform resource allocation decisions, what is used? Categorised by participants stating what is used. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Type of analysis used to inform resource allocation decisions • Question 5.11 (MOH) 	<ul style="list-style-type: none"> • Type of analysis used to inform resource allocation decisions for NCDs. The different types of analysis are cost-effectiveness analysis (categorised as not at all, sometimes or almost always), cost-benefit analysis (categorised as not at all, sometimes or almost always) and cost-utility analysis (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Cost-saving through reform/innovation in procurement practices • Question 5.12.1 	<ul style="list-style-type: none"> • Achievement of cost-savings through reform/innovation in procurement practices by the MOH categorised by yes, no or sometimes. 	<ul style="list-style-type: none"> • To assess resource allocation procedures at the national level for NCD management.

Questionnaire/Annexes Variable/Question number		Description	Objectives
	(MOH)		
MOH (AnnexureA)	<ul style="list-style-type: none"> Cost-saving through reform/innovation in contracting practices <ul style="list-style-type: none"> Question 5.12.2 (MOH) 	<ul style="list-style-type: none"> Achievement of cost-savings through reform/innovation in contracting practices by the MOH categorised by yes, no or sometimes. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Procurement and contracting practices in existence <ul style="list-style-type: none"> Question 5.13 (MOH) 	<ul style="list-style-type: none"> Existence of procurement and contracting practices. They include active purchasing principles are followed by the MOH (categorised by yes/no), existence of strategies to reduce the price of medicines (categorised by yes/no) and existence of legal provisions to allow generic drug substitution in the public sector categorised by yes/no. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> Flow of financing from source to intended end user <ul style="list-style-type: none"> Question 5.14 (MOH) Question 5.7 (DHMT) 	<ul style="list-style-type: none"> Easy flow of financing for NCD management from source to intended end user categorised as not at all, sometimes or almost always. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management. To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> Reasons for financing not flowing easily from source to intended end user <ul style="list-style-type: none"> Question 5.14.1 (MOH) Question 5.7.1 (DHMT) 	<ul style="list-style-type: none"> Reasons why financing for NCD management does not flow easily from source to intended end user categorised by participants giving reasons for flow difficulties. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management. To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> Available financing for healthcare personnel <ul style="list-style-type: none"> Question 5.19 (MOH) 	<ul style="list-style-type: none"> Availability of sufficient financing to pay for the needed healthcare personnel in the management of NCDs categorised as not at all, sometimes or almost always. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of a system for revenue tracking <ul style="list-style-type: none"> Question 5.15.1 (MOH) 	<ul style="list-style-type: none"> Existence of a functional system for revenue tracking in NCD management categorised as yes, no or don't know. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of a system for expenditure tracking <ul style="list-style-type: none"> Question 5.15.2 (MOH) 	<ul style="list-style-type: none"> Existence of a functional system for expenditure tracking in NCD management categorised as yes, no or don't know. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Revenue tracking <ul style="list-style-type: none"> Question 5.16 (MOH) 	<ul style="list-style-type: none"> Process of tracking of revenue in NCD management categorised by participants stating how they track revenue. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Expenditure tracking <ul style="list-style-type: none"> Question 5.17 (MOH) 	<ul style="list-style-type: none"> Process of tracking of expenditure in NCD management categorised by participants stating how they track expenditure. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Accuracy of financial records <ul style="list-style-type: none"> Question 5.18 (MOH) 	<ul style="list-style-type: none"> Verification of accuracy of financial records on NCD management categorised as yes, no or sometimes. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the central level for NCD management.
MOH (AnnexureA)	<ul style="list-style-type: none"> Verification process of financial records <ul style="list-style-type: none"> Question 5.18.1 (MOH) 	<ul style="list-style-type: none"> Process used to verify financial records for NCD management for accuracy categorised by participants specifying the verification process. 	<ul style="list-style-type: none"> To assess resource allocation procedures at the national level for NCD management.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Financial monitoring systems <ul style="list-style-type: none"> Question 5.3 (DHMT) Question 5.3 (OPDs) Question 5.3 (Healthcare centres) 	<ul style="list-style-type: none"> Financial monitoring systems used by the DHMT, OPDs in district hospitals and the healthcare centres. They include financial records (categorised as yes, no or sometimes), accounting procedures (categorised as yes, no or sometimes), and periodic auditing visits (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Availability of planning procedures <ul style="list-style-type: none"> Question 5.5.1 (DHMT) 	<ul style="list-style-type: none"> Existence of planning procedures to strengthen service delivery performance in NCD management categorised as yes/no. 	<ul style="list-style-type: none"> To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and

Questionnaire/Annexes Variable/Question number		Description	Objectives
			management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Availability of budgeting procedures • Question 5.5.2 	<ul style="list-style-type: none"> • Existence of budgeting procedures to strengthen service delivery performance in NCD management categorised as yes/no. 	<ul style="list-style-type: none"> • To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Use of planning procedures by health facilities • Question 5.5.3.1 (DHMT) 	<ul style="list-style-type: none"> • Use of planning procedures to strengthen service delivery performance in NCD management by OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Use of budgeting procedures by health facilities • Question 5.5.3.2 (DHMT) 	<ul style="list-style-type: none"> • Use of budgeting procedures to strengthen service delivery performance in NCD management by OPDs in district hospitals (categorised as yes, no or sometimes) and healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Use of the information on health needs • Question 5.6 (DHMT) 	<ul style="list-style-type: none"> • Use of the information on the health needs on NCD management to inform resource allocation decisions categorised as yes/no. 	<ul style="list-style-type: none"> • To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
DHMT (AnnexureB)	<ul style="list-style-type: none"> • Non-use of information on health needs • Question 5.6.1 (DHMT) 	<ul style="list-style-type: none"> • What is used to make informed decisions on resource allocation for NCD management in the absence of information on health needs categorised by a participant stating what is used. 	<ul style="list-style-type: none"> • To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.
OPDs in district	<ul style="list-style-type: none"> • Fees charged for some of the NCD services 	<ul style="list-style-type: none"> • Charging of fees to patients with NCDs for some of the services offered at the OPDs in district hospitals 	<ul style="list-style-type: none"> • To describe payment for some of the services provided at the

Questionnaire/Annexes Variable/Question number		Description	Objectives
hospitals (AnnexureC) Healthcare centres (AnnexureD)	provided <ul style="list-style-type: none"> • Question 5.5 (OPDs) • Question 5.6 (Healthcare centres) 	(categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes).	health facilities by outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • NCD services that fees are charged • Question 5.5.1 (OPDs) • Question 5.6.1 (Healthcare centres) 	<ul style="list-style-type: none"> • List of NCD services fees are charged for at the OPDs in district hospitals (categorised by participants stating the NCD services) and the healthcare centres (categorised by participants stating the NCD services). 	<ul style="list-style-type: none"> • To describe payment for some of the services provided at the health facilities by outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Payment methods used for NCD services • Question 5.5.2 (OPDs) • Question 5.6.2 (Healthcare centres) 	<ul style="list-style-type: none"> • Payment methods used for paying for services provided for patients with NCDs at the OPD in district hospitals and the healthcare centres. They include direct payment (categorised as yes, no or sometimes) and health insurance (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe payment for some of the services provided at the health facilities by outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Fees charged for NCD drugs • Question 5.6 (OPDs) • Question 5.7 (Healthcare centres) 	<ul style="list-style-type: none"> • Charging of fees for drugs used in the management of NCDs in the OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe payment for some of the services provided at the health facilities by outpatients with NCDs.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Payment methods used for NCD drugs • Question 5.6.1 (OPDs) • Question 5.7.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Payment methods used for paying for drugs used in the management of NCDs at the OPDs in district hospitals and the healthcare centres. Payment methods include direct payment (categorised as yes, no or sometimes) and health insurance (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To describe payment for some of the services provided at the health facilities by outpatients with NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Well distributed service delivery sites • Question 6.1 (MOH) 	<ul style="list-style-type: none"> • Service delivery sites well distributed to deliver essential services for NCD management at the district and the PHC level. Service deliver sites include the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.

Questionnaire/Annexes Variable/Question number		Description	Objectives
MOH (AnnexureA)	<ul style="list-style-type: none"> Well-equipped service delivery sites Question 6.1 (MOH) 	<ul style="list-style-type: none"> Service delivery sites well-equipped to deliver essential services for NCD management at the district and the PHC level. Service delivery sites include the DHMT (categorised as yes, no or sometimes), OPDs in district hospitals (categorised as yes, no or sometimes) and the healthcare centres (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of guidelines for procedure on the maintenance of infrastructure Question 6.2.1 (MOH) 	<ul style="list-style-type: none"> Existence of guidelines for procedures on maintenance of infrastructure used for NCD management at the district level (categorised as yes/no) and the PHC level (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
MOH (AnnexureA)	<ul style="list-style-type: none"> Availability of guidelines for procedure on maintenance of equipment Question 6.2.2 (MOH) 	<ul style="list-style-type: none"> Existence of guidelines for procedures on the maintenance of equipment used for NCD management at the district level (categorised as yes/no) and the PHC level (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
MOH (AnnexureA) DHMT (AnnexureB)	<ul style="list-style-type: none"> Availability of a maintenance plan for equipment Question 6.6 (MOH) Question 6.4 (DHMT) 	<ul style="list-style-type: none"> Existence of a maintenance plan for equipment used in the diagnosis and monitoring of NCDs at the DHMT (categorised as yes/no), OPDs in district hospitals (categorised as yes/no) and healthcare centres (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the availability and management of infrastructure and equipment used for NCDs at health facilities. To assess the restoration of health infrastructure and equipment at different levels of healthcare.
DHMT (AnnexureB)	<ul style="list-style-type: none"> Unavailability of a maintenance plan for equipment Question 6.4.4 (DHMT) 	<ul style="list-style-type: none"> Maintenance procedure for equipment used in the diagnosis and monitoring of NCDs at the DHMT (categorised by participants stating the maintenance procedure), OPDs in district hospitals (categorised by participants stating the maintenance procedure) and the healthcare centres (categorised by participants stating the maintenance procedure) in the absence of a maintenance plan? 	<ul style="list-style-type: none"> To assess the restoration of health infrastructure and equipment at different levels of healthcare.
DHMT (AnnexureB) OPDs in district	<ul style="list-style-type: none"> Activities carried out to maintain equipment Question 6.7 (DHMT) 	<ul style="list-style-type: none"> Activities carried out to maintain equipment used in NCDs diagnosis and management. Activities include: is equipment within its service dates (categorised as not at all, sometimes 	<ul style="list-style-type: none"> To assess the restoration of health infrastructure and equipment at different levels of

Questionnaire/Annexes Variable/Question number		Description	Objectives
hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 6.6 (OPDs) • Question 6.6 (Healthcare centres) 	or almost always), inspection of equipment every month (categorised as not at all, sometimes or almost always), regular calibration of equipment (categorised as not at all, sometimes or almost always) and replacement of equipment every year (categorised as not at all, sometimes or almost always).	healthcare.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Availability of maintenance personnel • Question 6.7 (OPDs) • Question 6.7 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of maintenance personnel responsible for maintaining and restoring medical devices used in the management of NCDs categorised as yes/no. 	<ul style="list-style-type: none"> • To assess the restoration of health infrastructure and equipment at different levels of healthcare.
OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Unavailability of maintenance personnel • Question 6.7.1 (OPDs) • Question 6.7.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Procedure followed when medical devices used in the management of NCDs have to be repaired or maintained in the absence of maintenance personnel categorised by participants stating the maintenance procedure followed. 	<ul style="list-style-type: none"> • To assess the restoration of health infrastructure and equipment at different levels of healthcare.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Availability of a standard list of equipment • Question 6.3 (DHMT) • Question 6.3 (OPDs) • Question 6.3 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of a standard list of equipment for diagnosis and monitoring of NCDs in OPDs in district hospitals and healthcare centres. The standard list includes: equipment that should be available for diagnosis of NCDs (categorised as yes, no or sometimes), equipment that should be available for monitoring of blood pressure level in hypertensive patients (categorised as yes, no or sometimes), equipment that should be available for monitoring glucose level in diabetic patients (categorised as yes, no or sometimes) equipment that should be available for monitoring asthmatic patients (categorised as yes, no or sometimes) and equipment that should be available for therapeutic drug level monitoring for epileptic patients (categorised as yes, no or sometimes) 	<ul style="list-style-type: none"> • To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
DHMT (AnnexureB) OPDs in district	<ul style="list-style-type: none"> • Available equipment for diagnosis and monitoring of NCDs 	<ul style="list-style-type: none"> • Available equipment for diagnosis and monitoring of NCDs at the OPDs in district hospitals and the healthcare facilities. The equipment includes: thermometer (categorised as yes, 	<ul style="list-style-type: none"> • To assess the availability and management of infrastructure and equipment used for NCDs at

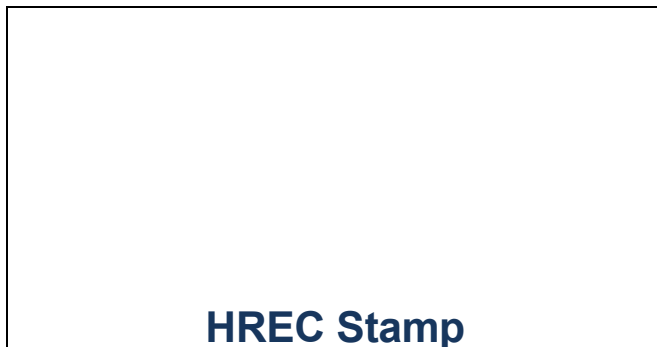
Questionnaire/Annexes Variable/Question number		Description	Objectives
hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Question 6.5 (DHMT) • Question 6.4 (OPDs) • Question 6.4 (Healthcare centres) 	no or sometimes), stethoscope (categorised as yes, no or sometimes), sphygmomanometer (categorised as yes, no or sometimes), measurement tape (categorised as yes, no or sometimes), weighing scale (categorised as yes, no or sometimes), peak flow meter (categorised as yes, no or sometimes), spacers for inhalers (categorised as yes, no or sometimes), glucometer (categorised as yes, no or sometimes), blood glucose strips (categorised as yes, no or sometimes), urine protein strips (categorised as yes, no or sometimes), urine ketone test strips (categorised as yes, no or sometimes), therapeutic drug level monitoring for epileptic patients (categorised as yes, no or sometimes), and other (categorised as yes, no or sometimes).	health facilities.
DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Functional equipment for diagnosis and monitoring of NCDs • Question 6.5 (DHMT) • Question 6,4 (OPDs) • Question 6,4 (Healthcare centres) 	<ul style="list-style-type: none"> • Functional equipment for diagnosis and monitoring of NCDs at the OPDs in district hospitals and the healthcare facilities. The equipment includes thermometer (categorised as yes/no), stethoscope (categorised as yes/no), sphygmomanometer (categorised as yes/no), measurement tape (categorised as yes/no), weighing scale (categorised as yes/no), peak flow meter (categorised as yes/no), spacers for inhalers (categorised as yes/no), glucometer (categorised as yes/no), blood glucose strips (categorised as yes/no), urine protein strips (categorised as yes/no), urine ketone test strips (categorised as yes/no), therapeutic drug level monitoring for epileptic patients (categorised as yes/no), and other (categorised as yes/no). 	<ul style="list-style-type: none"> • To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Availability of transportation • Question 6.3 (MOH) • Question 6.1 (DHMT) • Question 6.1 (OPDs) • Question 6.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of adequate transportation in the management of NCDs for activities such as the evacuation of emergency cases (categorised as yes, no or sometimes) and providing outreach services (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> • To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.

Questionnaire/Annexes Variable/Question number	Description	Objectives	
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Availability of resources to maintain transportation <ul style="list-style-type: none"> Question 6.4 (MOH) Question 6.2 (DHMT) Question 6.2 (OPDs) Question 6.2 (Healthcare centres) 	<ul style="list-style-type: none"> Availability of adequate resources to maintain transportation at the DHMT (categorised as not at all, sometimes or almost always), OPDs in district hospitals (categorised as not at all, sometimes or almost always) and the healthcare centre (categorised as not at all, sometimes or almost always). 	<ul style="list-style-type: none"> To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.
MOH (AnnexureA) DHMT (AnnexureA)	<ul style="list-style-type: none"> Availability of pharmacists in sectors of the health system of Lesotho <ul style="list-style-type: none"> Question 7.1 (MOH) Question 7.1 (DHMT) 	<ul style="list-style-type: none"> Availability of pharmacists involved in the management of NCDs in the following sectors of the health system of Lesotho. The sectors include the DHMT (categorised as yes/no), OPDs in district hospitals (categorised as yes/no), healthcare centres (categorised as yes/no), pharmaceutical directorate (categorised as yes/no) and the NCD unit (categorised as yes/no). 	<ul style="list-style-type: none"> To assess the profile of pharmacists in the management of NCDs.
MOH (AnnexureA) DHMT (AnnexureA)	<ul style="list-style-type: none"> Reasons for unavailability of pharmacists in some sectors of the health system of Lesotho <ul style="list-style-type: none"> Question 7.2 (MOH) Question 7.2 (DHMT) 	<ul style="list-style-type: none"> Reasons for unavailability of pharmacists at the DHMT (categorised by participants stating reasons of unavailability), OPDs in district hospitals (categorised by participants stating reasons of unavailability), healthcare centres (categorised by participants stating reasons of unavailability), pharmaceutical directorate (categorised by participants stating reasons of unavailability) and the NCD unit (categorised by participants stating reasons of unavailability). 	<ul style="list-style-type: none"> To assess the profile of pharmacists in the management of NCDs.
OPDs in district hospitals (AnnexureC)	<ul style="list-style-type: none"> Availability of pharmacist at the OPDs in district hospitals <ul style="list-style-type: none"> Question 7.1 (OPDs) 	<ul style="list-style-type: none"> Availability of pharmacists involved in the management of NCDs in OPDs in district hospitals categorised as yes/no. 	<ul style="list-style-type: none"> To assess the profile of pharmacists in the management of NCDs.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Availability of pharmacist at the healthcare centres pharmacy <ul style="list-style-type: none"> Question 2.22 (Healthcare centres) 	<ul style="list-style-type: none"> Availability of the pharmacist in the healthcare centre pharmacy categorised as yes/no. 	<ul style="list-style-type: none"> To assess the profile of pharmacists in the management of NCDs.
Healthcare centres	<ul style="list-style-type: none"> Need of pharmacists in 	<ul style="list-style-type: none"> Need for the pharmacist in the healthcare centre pharmacy 	<ul style="list-style-type: none"> To assess the profile of

Questionnaire/Annexes Variable/Question number		Description	Objectives
(AnnexureD)	healthcare centres <ul style="list-style-type: none"> • Question 2.23 (Healthcare centres) 	categorised as yes/no.	pharmacists in the management of NCDs.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Motivating for the need of pharmacist • Question 2.24 (Healthcare centres) 	<ul style="list-style-type: none"> • Motivation of why a pharmacist is needed in the healthcare centre pharmacy categorised by participants giving reasons why a pharmacist is needed. 	<ul style="list-style-type: none"> • To assess the profile of pharmacists in the management of NCDs.
Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> • Availability of the pharmacist involved with the management of NCDs at healthcare centres • Question 7.1 (Healthcare centres) 	<ul style="list-style-type: none"> • Availability of pharmacists involved in the management of NCDs at the healthcare centres categorised as yes/no. 	<ul style="list-style-type: none"> • To assess the profile of pharmacists in the management of NCDs.
MOH (AnnexureA)	<ul style="list-style-type: none"> • Activities carried out by pharmacists at the national level • Question 7.4 (MOH) 	<ul style="list-style-type: none"> • Activities currently being carried out by pharmacists in the management of NCDs at the pharmaceutical directorate and the NCD unit. Activities include formulation of health policy (categorised as yes, no or sometimes), formulation of drug policy (categorised as yes, no or sometimes), cooperate with educators in establishing the curricula of schools of pharmacy (categorised as yes, no or sometimes), cooperate with educators in modifying the curricula of schools of pharmacy (categorised as yes, no or sometimes), cooperate with educators in establishing the curricula of continuing education programmes (categorised as yes, no or sometimes), cooperate with educators in modifying the curricula of continuing education programmes (categorised as yes, no or sometimes), management of drug procurements (categorised as yes, no or sometimes), management of drug distribution (categorised as yes, no or sometimes), management of drug supply (categorised as yes, no or sometimes), drug approval (categorised as yes, no or sometimes), drug registration (categorised as yes, no or sometimes), drug control (categorised as yes, no or 	<ul style="list-style-type: none"> • To assess the role of pharmacists in the management of NCDs.

Questionnaire/Annexes Variable/Question number		Description	Objectives
		sometimes) and post-marketing surveillance (categorised as yes, no or sometimes).	
MOH (AnnexureA) DHMT (AnnexureB) OPDs in district hospitals (AnnexureC) Healthcare centres (AnnexureD)	<ul style="list-style-type: none"> Activities carried out by pharmacists at the district and the primary healthcare levels <ul style="list-style-type: none"> Question 7.3 (MOH) Question 7.3 (DHMT) Question 7.2 (OPDs) Question 7.2 (Healthcare centres) 	<ul style="list-style-type: none"> Activities currently being carried out by pharmacists in the management of NCDs at the DHMT, OPDs in district hospitals and the healthcare centres. Activities include monitoring NCDs (categorised as yes, no or sometimes), provide advice to patients about their medication (categorised as yes, no or sometimes), prevent medication problems (categorised as yes, no or sometimes), manage medication problems (categorised as yes, no or sometimes), advice patients on self-care (categorised as yes, no or sometimes), advice patients on self-medication (categorised as yes, no or sometimes), develop care plans (categorised as yes, no or sometimes), refer patients for assessment by physician (categorised as yes, no or sometimes), manage drug therapy for patients (categorised as yes, no or sometimes), supervise pharmacy technicians (categorised as yes, no or sometimes), communicate with other healthcare providers to provide patient care (categorised as yes, no or sometimes), collaborate with other healthcare providers as part of a team (categorised as yes, no or sometimes), participate in health promotion activities (categorised as yes, no or sometimes), procure medication for NCDs (categorised as yes, no or sometimes), store medication for NCDs (categorised as yes, no or sometimes), distribute medication for NCDs (categorised as yes, no or sometimes), adverse drug reactions monitoring (categorised as yes, no or sometimes), adverse drug reactions recording (categorised as yes, no or sometimes), adverse drug reactions reporting (categorised as yes, no or sometimes) and adverse drug reactions management (categorised as yes, no or sometimes). 	<ul style="list-style-type: none"> To assess the role of pharmacists in the management of NCDs.

**ANNEXURE F: MINISTRY OF HEALTH INFORMED CONSENT FORM
(THE PHARMACEUTICAL DIRECTORATE)**



**INFORMED CONSENT DOCUMENTATION
THE PHARMACEUTICAL DIRECTORATE**

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

**National University of Lesotho
Faculty of Health Science
Department of Pharmacy
P.O. Roma 180
Maseru, Lesotho**

CONTACT NUMBER: +266 58404323 (cell)

For office use only

Informed consent form number:	
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You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1) and the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in

three levels of the health system of Lesotho. The levels of the health system of Lesotho include the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at the pharmaceutical directorate. At the pharmaceutical directorate, you are involved in policy formulation, regulatory activities, and production and management of drug supply.

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the pharmaceutical directorate.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the pharmaceutical directorate.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better understanding of the nature of services or problems.
- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.
- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured

questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the Ministry of Health of Lesotho.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the pharmaceutical directorate after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the pharmaceutical directorate at the Ministry of Health of Lesotho.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718 299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 20....

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (*name*) declare that:

- I clearly and in detail explained the information in this document to
.....
- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of person obtaining consent

.....
Signature of witness

Declaration by researcher

I (*name*) declare that:

- I explained the information in this document to
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

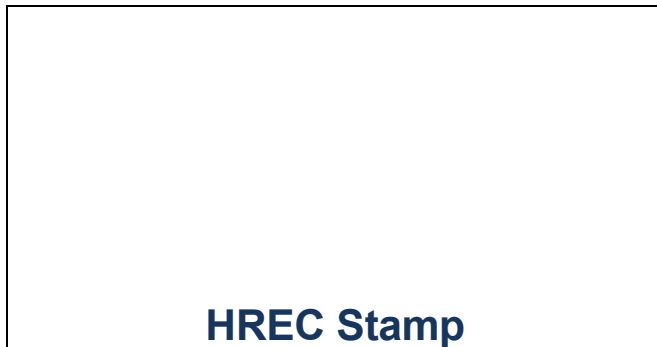
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Signature of researcher

.....

Signature of witness

**ANNEXURE G: MINISTRY OF HEALTH INFORMED CONSENT FORM
(THE NON-COMMUNICABLE DISEASE UNIT)**



**INFORMED CONSENT DOCUMENTATION
THE NON-COMMUNICABLE DISEASE UNIT**

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

National University of Lesotho

Faculty of Health Science

Department of Pharmacy

P.O. Roma 180

Maseru, Lesotho

CONTACT NUMBER: +266 58404323 (cell)

For office use only

Informed consent form number:	
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You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1) and the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in

three levels of the health system of Lesotho. The levels of the health system of Lesotho include the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at the non-communicable disease unit. At the non-communicable disease unit, you are involved in policy formulation plan that integrates several non-communicable diseases and shared risk factors and you are responsible for the development and revision of guidelines used in the management of non-communicable diseases.

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the non-communicable disease unit.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the non-communicable disease unit.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better understanding of the nature of services or problems.
- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.
- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured

questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the Ministry of Health of Lesotho.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the non-communicable disease unit after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the non-communicable disease unit at the Ministry of Health of Lesotho.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718

299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 20....

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (*name*) declare that:

- I clearly and in detail explained the information in this document to
.....
- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of person obtaining consent

.....
Signature of witness

Declaration by researcher

I (*name*) declare that:

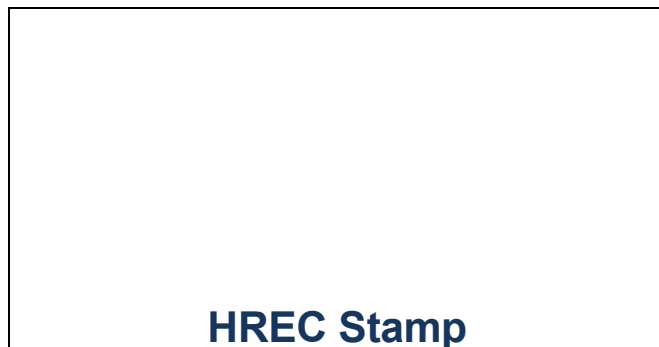
- I explained the information in this document to
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of researcher

.....
Signature of witness

ANNEXURE H: DISTRICT HEALTH MANAGEMENT TEAMS INFORMED CONSENT FORM



INFORMED CONSENT DOCUMENTATION THE DISTRICT HEALTH MANAGEMENT TEAMS

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

National University of Lesotho

Faculty of Health Science

Department of Pharmacy

P.O. Roma 180

Maseru, Lesotho

CONTACT NUMBER: +266 58404323 (cell)

For office use only

Informed consent form number:	
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You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1) and the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in

three levels of the health system of Lesotho. The levels of the health system of Lesotho include the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at the District Health Management Teams (DHMTs). At the DHMTs you are responsible for the management of health service delivery at district hospitals and healthcare centres through provision of leadership, planning and resource mobilisation, monitoring and evaluation, capacity building among staff, human resources management and development, and financial management for district health service delivery.

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the DHMT.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the DHMT.
- All public health nurses, pharmacists and district health managers in managerial positions at the DHMTs.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you

will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better understanding of the nature of services or problems.
- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.

- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the DHMTs.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the DHMTs, CHAL and the Ministry of Health after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the DHMTs.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718 299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 20....

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (*name*) declare that:

- I clearly and in detail explained the information in this document to
.....
- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....

Signature of person obtaining consent

.....

Signature of witness

Declaration by researcher

I (*name*) declare that:

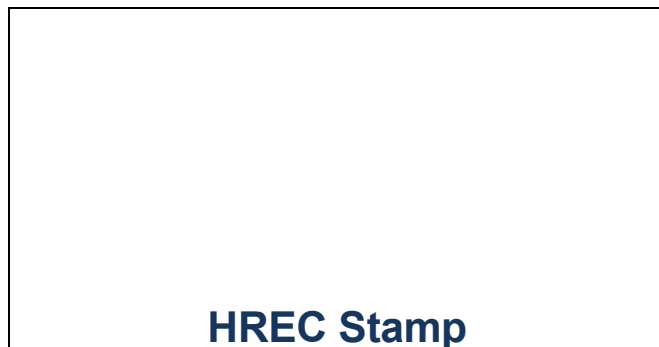
- I explained the information in this document to
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of researcher

.....
Signature of witness

ANNEXURE I: OUTPATIENT DEPARTMENTS IN DISTRICT HOSPITAL INFORMED CONSENT FORM



INFORMED CONSENT DOCUMENTATION THE OUTPATIENT DEPARTMENTS IN DISTRICT HOSPITALS

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

National University of Lesotho

Faculty of Health Science

Department of Pharmacy

P.O. Roma 180

Maseru, Lesotho

CONTACT NUMBER: +266 58404323 (cell)

For office use only

Informed consent form number:	
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You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1) and the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho. The levels of the health system of Lesotho include

the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at the outpatient department in the district hospital. At the outpatient department you are involved with provision of basic health services such as preventive measures, health promotion activities, diagnosis, treatment and management of outpatients with non-communicable diseases.

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the outpatient departments in district hospitals.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the outpatient departments at the district hospitals.
- All medical superintendents, hospital manager for nursing services, matrons, pharmacists and head pharmacists in managerial positions at the outpatient departments in district hospitals.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you

will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better understanding of the nature of services or problems.
- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.

- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the district hospital.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the DHMTs, district hospital, CHAL and at the Ministry of Health after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the district hospital.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718 299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 20....

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (*name*) declare that:

- I clearly and in detail explained the information in this document to
.....
- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....

Signature of person obtaining consent

.....

Signature of witness

Declaration by researcher

I (*name*) declare that:

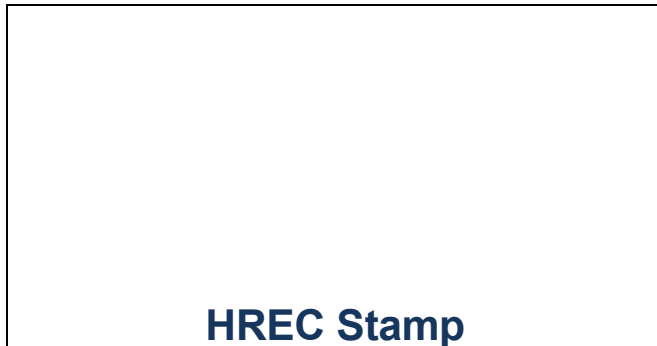
- I explained the information in this document to
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of researcher

.....
Signature of witness

ANNEXURE J: HEALTHCARE CENTRES INFORMED CONSENT FORM



INFORMED CONSENT DOCUMENTATION HEALTHCARE CENTRES

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

National University of Lesotho

Faculty of Health Science

Department of Pharmacy

P.O. Roma 180

Maseru, Lesotho

CONTACT NUMBER: +266 58404323 (cell)

Informed consent form number:	
-------------------------------	--

You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1) and the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho. The levels of the health system of Lesotho include

the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at a healthcare centre. At the healthcare centre you are involved with provision of basic health services such as preventive measures, health promotion activities, diagnosis, treatment and management of outpatients with non-communicable diseases (NCDs).

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the healthcare centres.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the healthcare centre.
- All public healthcare (PHC) managers and nurse practitioners in managerial positions at the healthcare centres.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better understanding of the nature of services or problems.
- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.
- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured

questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the healthcare centre.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the healthcare centre, DHMTs, CHAL and at the Ministry of Health after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the healthcare centre.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718

299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 20....

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (*name*) declare that:

- I clearly and in detail explained the information in this document to
.....
- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of person obtaining consent

.....
Signature of witness

Declaration by researcher

I (*name*) declare that:

- I explained the information in this document to
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (*place*) on (*date*) 20....

.....
Signature of researcher

.....
Signature of witness

ANNEXURE K: CONFIDENTIALITY AGREEMENT FORM FOR INDEPENDENT RESEARCH ASSISTANT



CONFIDENTIALITY AGREEMENT FOR INDEPENDENT RESEARCH ASSISTANT

Title: Non-communicable disease management in the public health system of Lesotho.

This study has been approved by **the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It has also been approved by **the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)**. The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho which are the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured

questionnaires by independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

What will be expected of you?

You will be expected to be an independent research assistant at the central, district and the primary healthcare level of the study. If you agree to be an independent research assistant, you will be expected to carry out the following roles:

- Explaining the study to potential participants.
- Distribution of informed consent forms and self-administered structured questionnaires to potential participants.
- Collection of sealed boxes containing informed consent forms and self-administered structured questionnaires from the study settings.
- Training of independent persons at primary healthcare level on distribution of informed consent forms and self-administered structured questionnaires.
- To maintain potential participants confidentiality.

Will you be paid to take part in this study and are there any costs for you?

- You will be reimbursed for expenses incurred such as travel and airtime expenses.

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

Declaration by the independent research assistant

I (name) _____ understand the roles of an independent research assistant and I am willingly agreeing to be an independent research assistant at the central, district and the primary health care level.

Signature: _____

Date: _____

ANNEXURE L: CONFIDENTIALITY AGREEMENT FORM FOR INDEPENDENT PERSON



CONFIDENTIALITY AGREEMENT FOR INDEPENDENT PERSON

Title: Non-communicable disease management in the public health system of Lesotho.

This study has been approved by **the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It has also been approved by **the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)**. The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho which are the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured

questionnaires by independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

What will be expected of you?

You will be expected to be an independent person at the primary healthcare level of the study. If you agree to be an independent person, you will be expected to carry out the following roles:

- Explaining the study to potential participants at healthcare centres.
- Distribution of informed consent forms and self-administered structured questionnaires to potential participants at healthcare centres.
- Collection of sealed boxes containing informed consent forms and self-administered structured questionnaires from healthcare centres.
- To maintain potential participants confidentiality.

Will you be paid to take part in this study and are there any costs for you?

- No you will not be paid to take part in the study because you will incur no expenses.

You can contact Lineo Maja at +266 5840 4323 or majalinea@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

Declaration by the independent person

I (name) _____ understand the roles of an independent person and I am willingly agreeing to be an independent person at the healthcare centres.

Signature: _____

Date: _____

ANNEXURE M: REQUEST FOR PERMISSION LETTER FOR MANAGER AT THE PHARMACEUTICAL DIRECTORATE



PERMISSION FORM

The Manager
Pharmaceutical Directorate
Ministry of Health
Maseru
Lesotho

Dear sir/madam

Permission to conduct a study at the Pharmaceutical Directorate

My name is Lineo Maja, student number 23295899. I am currently a student in the School of Pharmacy, North-West University. I will be conducting a study titled: **Non-communicable disease management in the public health system of Lesotho** to be submitted in fulfilment of the requirements for the **degree of Doctor of Philosophy in Pharmacy Practice** at the North-West University.

This study has been approved by **the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It has also been approved by **the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)**. The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.

- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho which are the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

I, Lineo Maja am asking for permission to conduct this study at the Pharmaceutical Directorate. You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

Declaration by the manager

I (name) _____ give permission to Lineo Maja to conduct a study title: **Non-communicable disease management in the public health system of Lesotho** at the Pharmaceutical Directorate.

Signature: _____

Date: _____

ANNEXURE N: REQUEST FOR PERMISSION LETTER FOR MANAGER AT THE NON-COMMUNICABLE DISEASE UNIT



PERMISSION FORM

The Manager
Non-Communicable Disease Unit
Ministry of Health
Maseru
Lesotho

Dear sir/madam

Permission to conduct a study at the Non-Communicable Disease Unit

My name is Lineo Maja, student number 23295899. I am currently a student in the School of Pharmacy, North-West University. I will be conducting a study titled: **Non-communicable disease management in the public health system of Lesotho** to be submitted in fulfilment of the requirements for the **degree of Doctor of Philosophy in Pharmacy Practice** at the North-West University.

This study has been approved by **the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It has also been approved by **the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)**. The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.

- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho which are the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

I, Lineo Maja am asking for permission to conduct this study at the Non-Communicable Disease Unit. You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

Declaration by the manager

I (name) _____ give permission to Lineo Maja to conduct a study title: **Non-communicable disease management in the public health system of Lesotho** at the Non-Communicable Disease Unit.

Signature: _____

Date: _____

ANNEXURE O: REQUEST FOR PERMISSION LETTER FOR MANAGER AT THE DISTRICT HEALTH MANAGEMENT TEAM



PERMISSION FORM

The Manager
District Health Management Team
Lesotho

Dear sir/madam

**Permission to conduct a study at the District Health Management Team, outpatient
department and healthcare centres in your district**

My name is Lineo Maja, student number 23295899. I am currently a student in the School of Pharmacy, North-West University. I will be conducting a study titled: **Non-communicable disease management in the public health system of Lesotho** to be submitted in fulfilment of the requirements for the **degree of Doctor of Philosophy in Pharmacy Practice** at the North-West University.

This study has been approved by **the Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It has also been approved by **the Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)**. The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management

in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho which are the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

I, Lineo Maja am asking for permission to conduct this study at the District Health Management Team, outpatient department and healthcare centres in your district. You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

Declaration by the manager

I (name) _____ give permission to Lineo Maja to conduct a study title: **Non-communicable disease management in the public health system of Lesotho** at the District Health Management Team, outpatient department and healthcare centres in my district.

Name of the district: _____

Signature: _____

Date: _____

ANNEXURE P: PERMISSION LETTER FROM CHAL



Christian Health Association of Lesotho

P.O. Box 1632, Maseru 100, Lesotho

Telephone: +266 2231 2500, Fax: +266 2231 0314

E-mail: ed@chal.org.ls Website: www.chal.org.ls

14th September 2018

Ms Lineo Maja
Roma 180
Maseru, Lesotho

Dear Ms Maja,

Re: Permission to conduct a study titled: Non-communicable disease management in the Public Health System of Lesotho in CHAL facilities

With this letter you are given permission to continue with the study thereto in CHAL facilities as per the subject above. However, kindly observe the following as related conditions.

- 1) Brief introductory session of the study to the Health Centres (H/C Manager and Nurse-in Charge) Hospital authorities (Hospital Administrator) upon arrival.
- 2) The findings/report of the study should be shared with CHAL upon completion.

Hoping for your understanding and cooperation in the matter.

Yours sincerely,

Lebohang Mothae (Ms)
Executive Director

**ANNEXURE Q: NORTH-WEST UNIVERSITY HEALTH RESEARCH
ETHICS COMMITTEE APPROVAL LETTER**



Private Bag X1290, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: <http://www.nwu.ac.za>

Research Ethics Regulatory Committee
Tel: 018 299-4849
Email: nkosinathi.machine@nwu.ac.za

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the North West University Health Research Ethics Committee (NWU-HREC) on 07/11/2018, the NWU Health Research Ethics Committee hereby approves your study as indicated below. This implies that the North-West University Research Ethics Regulatory Committee (NWU-RERC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Non-communicable disease management in the public health system of Lesotho.																
Study Leader/Supervisor (Principal Investigator)/Researcher: Prof JR Burger																
Student: L Maja																
Ethics number:	<table border="1"><tr><td>N</td><td>W</td><td>U</td><td>-</td><td>0</td><td>0</td><td>0</td><td>4</td><td>8</td><td>-</td><td>1</td><td>8</td><td>-</td><td>A</td><td>1</td></tr></table>	N	W	U	-	0	0	0	4	8	-	1	8	-	A	1
N	W	U	-	0	0	0	4	8	-	1	8	-	A	1		
Application Type: Single Study	Risk: Minimal															
Commencement date: 2018/11/07																
Expiry date: 2019/11/30																
Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of an annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.																

Special in process conditions of the research for approval (if applicable):

- Please provide the HREC with copies of the signed confidentiality agreements from the research assistant and the independent person when they become available.

General conditions: <i>While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:</i> <ul style="list-style-type: none">• The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the NWU-HREC:<ul style="list-style-type: none">- annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and- without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.
--

- The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the NWU-HREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.
- Annually a number of studies may be randomly selected for an external audit.
- The date of approval indicates the first date that the study may be started.
- In the interest of ethical responsibility the NWU-RERC and NWU-HREC reserves the right to:
 - request access to any information or data at any time during the course or after completion of the study;
 - to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;
 - withdraw or postpone approval if:
 - any unethical principles or practices of the study are revealed or suspected;
 - it becomes apparent that any relevant information was withheld from the NWU-HREC or that information has been false or misrepresented;
 - submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or
 - new institutional rules, national legislation or international conventions deem it necessary.
- NWU-HREC can be contacted for further information or any report templates via Ethics-HRECAppl@nwu.ac.za or 018 299 1206.

The NWU-HREC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the NWU-HREC or the NWU-RERC for any further enquiries or requests for assistance.

Yours sincerely



Digitally signed by Wayne
Towers
Date: 2018.12.04
21:02:42 +02'00'

Prof Wayne Towers
Chair NWU Health Research Ethics Committee

Current details: (22351930) M:\DSS1\8533\Monitoring and Reporting Cluster\Ethics\Certificates\Templates\Research Ethics Approval Letters\9.1.5.4.2 HREC Ethical Approval Letter.docm
3 December 2018
File reference: 9.1.5.4.2

ANNEXURE R: ETHICAL APPROVAL LETTER FROM THE MINISTRY OF HEALTH RESEARCH AND ETHICS COMMITTEE LESOTHO



LESOTHO

Ministry of Health
PO Box 514
Maseru 100

REF: ID120-2018

Date: September 03, 2018

To
Ms. Lineo Maja
PhD student
North-West University

Category of Review:

- Initial Review
 Continuing Annual Review
 Amendment/Modification
 Reactivation
 Serious Adverse Event
 Other _____

Dear Ms. Lineo,

RE: Non-communicable disease management in the public health system of Lesotho

This is to inform you that the Ministry of Health Research and Ethics Committee reviewed and **APPROVED** the above named protocol and hereby authorizes you to conduct the study according to the activities and population specified in the protocol. Departure from the approved protocol will constitute a breach of this permission.

This approval includes review of the following attachments:

- Protocol: Dated July 2018
 English consent form dated July 2018
 Data collection forms and permission forms in English dated July 2018
 Participant materials [*insert types, versions, dates*]
 Other materials: CV of the PI

This approval is **VALID** until September 02, 2019.

Please note that an annual report and request for renewal, if applicable, must be submitted at least 6 weeks before the expiry date.

All serious adverse events associated with this study must be reported promptly to the MOH Research and Ethics Committee. Any modifications to the approved protocol or consent forms must be submitted to the committee prior to implementation of any changes.

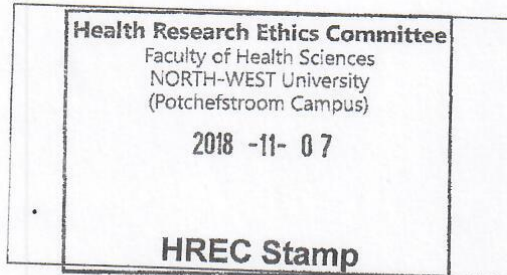
We look forward to receiving your progress reports and a final report at the end of the study. If you have any questions, please contact the Research and Ethics Committee at rcumoh@gmail.com (or) 22226317.

Sincerely,

Dr. Nyane Letsie
Director General Health Services

Dr. Jill Sanders
Co-chairperson NH-REC

**ANNEXURE S: EXAMPLE OF A COMPLETED INFORMED CONSENT
FORM**



INFORMED CONSENT DOCUMENTATION HEALTHCARE CENTRES

TITLE OF THE RESEARCH STUDY: Non-communicable disease management in the public health system of Lesotho

ETHICS REFERENCE NUMBERS: NWU-00048-18-S1 and ID120-2018

PRINCIPAL INVESTIGATOR: Ms L Maja (23295899)

ADDRESS:

National University of Lesotho
Faculty of Health Science
Department of Pharmacy
P.O. Roma 180
Maseru, Lesotho

CONTACT NUMBER: +266 58404323 (cell)

For office use only

Informed consent form number:	02
-------------------------------	----

You are being invited to take part in a **research study** that forms part of my PhD in Pharmacy Practice degree at the North-West University in South Africa.

Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is **entirely voluntary** and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the **Health Research Ethics Committee of the Faculty of Health Sciences of the North-West University (NWU-00048-18-S1)** and the **Ministry of Health Research and Ethics Committee of Lesotho (ID120-2018)** and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The aims of the study are:

- To assess the public health system in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy in different healthcare facilities
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential non-communicable disease management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

This study will be conducted in Lesotho in the year 2018 to 2019. The study will be conducted in three levels of the health system of Lesotho. The levels of the health system of Lesotho include the central level (pharmaceutical directorate and non-communicable disease unit), district level (district health management teams) and the primary healthcare level (outpatients departments in district hospitals and healthcare centres). The study will involve distribution of self-administered structured questionnaires by independent research assistant and independent persons trained in data collection in different levels of the health system to a total of 405 potential participants.

Why have you been invited to participate?

You have been invited to be part of this research project because you are employed at a healthcare centre. At the healthcare centre you are involved with provision of basic health services such as preventive measures, health promotion activities, diagnosis, treatment and management of outpatients with non-communicable diseases (NCDs).

You also fit the research because you comply with the set inclusion criteria of this study. The inclusion criteria is as follows:

- All employees in managerial positions for more than six months at the healthcare centres.
- Employees who have been holding acting managerial positions in unfilled positions for more than six months at the healthcare centre.
- All public healthcare (PHC) managers and nurse practitioners in managerial positions at the healthcare centres.

The exclusion criteria will include employees holding managerial position who will be absent during the data gathering.

What will be expected of you?

If you agree to participate, you will be expected to sign two copies of the informed consent forms and return one copy to the mediator. You can keep the other signed copy of the informed consent form.

You will receive a self-administered structured questionnaire with seven sections. You will be expected to complete this self-administered structured questionnaire on your own. The self-administered structured questionnaire will take one hour to two hours to complete therefore, you will be given three days to complete the self-administered structured questionnaire.

Will you gain anything from taking part in this research?

There will be no direct benefits or gains for you to partake, however, you will receive an opportunity to share your views on non-communicable disease (NCD) management in healthcare settings in Lesotho.

The other gains of the study are for the community, Ministry of Health and the participating institution. The gains will be as follows:

- Use of information generated from this study to inform decision-making in the management of NCDs.
- Use of information generated from this study to form a base for further research.
- The participating institution can benefit from this study by gaining a better

understanding of the nature of services or problems.

- The study strives to benefit the community indirectly by supporting healthcare providers' insight into the management of NCDs in different levels of healthcare in Lesotho.
- The study will identify factors that influence the effective management of NCDs.

Are there risks involved in you taking part in this research and what will be done to prevent them?

The risks to you in this study and how to prevent them are as follows:

- Boredom due to the length of the self-administered structured questionnaire. You will be given three days to complete the self-administered structured questionnaire. Therefore, you can limit boredom by taking breaks in-between completing the self-administered structured questionnaire.
- You may be worried about a feedback loop between other participants and your manager regarding your participation or refusal to participate in the study. You should not worry because all participants will be given both an informed consent form and a self-administered structured questionnaire. During collection, all informed consent forms and self-administered structured questionnaires either filled or not filled will be put in two labelled separate boxes by all participants. This way identity of who partook or did not partake in the study will be concealed.
- You may be uncomfortable with answering certain questions and if you are uncomfortable, you can skip that question that makes you feel uncomfortable answering.
- You may want to withdraw from the study. You can withdraw from the study at any time before you hand in the informed consent form and the self-administered structured questionnaire. Make sure that you erase your signature on the informed consent form and cancel the filled sections in the self-administered structured questionnaire.

How will we protect your confidentiality and who will see your answers?

Anonymity of your answers will be protected by using codes. Your name will not be recorded. You will be able to complete the self-administered structured questionnaire in a secluded area and place your completed self-administered structured questionnaire in a box.

Only the researcher, study promoters and the statistician at the North-West University will be able to look at the answers provided. Your answers will be kept safe and will not be shared with any other person or other members of the staff of the healthcare centre.

Once the data capturing process is completed, these documents and electronic data will be kept for the regulatory five years, where after the documents will be dealt with as per NWU policy.

What will happen with the findings or samples?

The findings of this study will be presented to the NWU (Potchefstroom Campus) as a thesis in order to complete the PhD in Pharmacy Practice programme. The researcher will present the findings at the healthcare centre, DHMTs, CHAL and at the Ministry of Health after completion of the PhD in Pharmacy Practice programme. The researcher will also present the findings at conferences and in a form of manuscripts for publication.

How will you know about the findings of this research?

We will give you the overall findings of this research when the research is completed by making copies and presentations for the healthcare centre.

Will you be paid to take part in this study and are there any costs for you?

No you will not be paid to take part in the study because you will incur no expenses.

Is there anything else that you should know or do?

You can contact Lineo Maja at +266 5840 4323 or majalineo@gmail.com if you have any further questions or have any problems. You can also contact the study promoter Prof Johanita Burger at +2718 299 2285 or Johanita.Burger@nwu.ac.za if you have any further questions or have any problems.

You can also contact the Health Research Ethics Committee via Mrs Carolien van Zyl at +2718 299 1206 or carolien.vanzyl@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

You will receive a copy of this information and consent form for your own purposes.

Declaration by participant

By signing below, I agree to take part in the research study titled: non-communicable disease management in the health system of Lesotho.

I declare that:

- I have read this information/it was explained to me by a trusted person in a language with which I am fluent and comfortable.
- The research was clearly explained to me.
- I have had a chance to ask questions to both the person getting the consent from me, as well as the researcher and all my questions have been answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be handled in a negative way if I do so.
- I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to.

Signed at (place) Morija H/c on (date) 08/01 2019

.....
Signature of participant

.....
Signature of witness

Declaration by person obtaining consent

I (name) [redacted] declare that:

- I clearly and in detail explained the information in this document to

[redacted]

- I did/did not use an interpreter.
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I gave him/her time to discuss it with others if he/she wished to do so.

Signed at (place) Morija H/c on (date) 12/11 2018

[redacted]
Signature of person obtaining consent

[redacted]
Signature of witness

Declaration by researcher

I (name) Alat [redacted] declare that:

- I explained the information in this document to [redacted]
- I did/did not use an interpreter
- I encouraged him/her to ask questions and took adequate time to answer them.
- The informed consent was obtained by an independent person.
- I am satisfied that he/she adequately understands all aspects of the research, as described above.
- I am satisfied that he/she had time to discuss it with others if he/she wished to do so.

Signed at (place) Morija HC on (date) 12/11 2012

[redacted]
Signature of researcher

[redacted]
Signature of witness

ANNEXURE T: EXAMPLE OF A COMPLETED QUESTIONNAIRE

HREC Stamp

**NON-COMMUNICABLE DISEASE MANAGEMENT IN THE PUBLIC HEALTH SYSTEM
OF LESOTHO**

HEALTHCARE CENTRE SELF-ADMINISTERED STRUCTURED QUESTIONNAIRE

Thank you for taking this self-administered structured questionnaire.

The general aims of this study are as follows:

- To assess the health system in public health facilities in Lesotho in terms of health service delivery to patients with hypertension, diabetes mellitus, asthma and epilepsy.
- To assess the role of the pharmacist in the central, district and primary healthcare levels in the health system of Lesotho with regard to the management of hypertension, diabetes mellitus, asthma and epilepsy.
- To develop a potential NCD management structure emphasising the role of the pharmacist in hypertension, diabetes mellitus, asthma and epilepsy management in Lesotho.

Please indicate your answer with an **X symbol** for closed-ended questions or by giving your **opinion** for open-ended questions. Your opinion is very valuable so please be as honest as possible. The self-administered structured questionnaire is lengthy so you will be given three days to complete the self-administered structured questionnaire.

Your replies are strictly confidential. Your participation is completely voluntary. If a specific question makes you too uncomfortable, you may skip it and proceed to the next question. Alternatively you may also withdraw from the study without any penalties. The findings of the

research will be shared with the Ministry of Health of Lesotho, district health management teams, district hospitals and the healthcare centres.

The self-administered structured questionnaire should only be completed by participants who have given their informed consent. Participants will be identified using codes to guarantee anonymity. Confidentiality will be maintained through confidentiality agreements between mediator and participant, and between participant and other participants.

You are welcome to contact:

Researcher:

Ms Lineo Maja email: majalinea@gmail.com tel: +26658404323

Promoter:

Prof Johanita Burger email: Johanita.Burger@nwu.ac.za tel: +27182992285

Co-promoter:

Prof Martie Lubbe email: Martie.Lubbe@nwu.ac.za tel: +27182992288

Ethics committee:

Mrs Carolien van Zyl email: carolien.vanzyl@nwu.ac.za tel: +27182991206

Thank you for your time. Your participation is greatly appreciated and will greatly benefit to the success of the research project.

For office use only

Self-administered structured questionnaire number:	60
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HEALTHCARE CENTRES SURVEY

Date:	14 10 2018
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SECTION 1: DEMOGRAPHIC INFORMATION

1.1 In which district is your healthcare centre found?

District	Please mark with an X
1.1.1 Maseru	1
1.1.2 Berea	2
1.1.3 Leribe	3
1.1.4 Butha-Buthe	4
1.1.5 Mokhotlong	5
1.1.6 Thaba-Tseka	6
1.1.7 Qacha's Nek	<input checked="" type="checkbox"/>
1.1.8 Quthing	7
1.1.9 Mahale's Hoek	8
1.1.10 Mafeteng	9
	10

1.2 Which organisation owns your healthcare centre?

Organisation	Yes
1.2.1 Government of Lesotho	
1.2.2 Christian Health Association of Lesotho (CHAL)	YES ¹
1.2.3 Don't know	2
	3

1.3 Which managerial position do you hold in the healthcare centre?

Managerial position	Please mark with an X
1.3.1 Nurse in charge	1
1.3.2 Nurse clinician ¹	2
1.3.3 Nurse	<input checked="" type="checkbox"/>
1.3.4 Other, please specify	4-10

¹ A nurse clinician is a person who has graduated from the Ministry of Health recognised nurse clinician training programme and their duties include curative and clinical duties, preventive, promotion, community, administration and supervision duties (MOHSW, 1980:75-77).

1.4 What are your year(s) of employment at the managerial position you hold in question 1.3?
ONE YEAR

1.5 What is your gender?

Gender	Please mark with an X
1.5.1 Male	
1.5.2 Female	X 2

1.6 What is your age (in years)? 31 YRS

1.7 What is your highest level of education?

Highest level of education	Please mark with an X
1.7.1 Diploma	
1.7.2 Bachelor's degree	X 2
1.7.3 Master's degree	3
1.7.4 PhD	4
1.7.5 Other, please specify	5-10

1.8 What is your profession? NURSE MIDWIFE

SECTION 2: HUMAN RESOURCES

2.1 Does the DHMT use the following documents during clinical supervision?² **Please mark with an X**

Documents	No	Yes
2.1.1 Supervision checklist	<input checked="" type="checkbox"/>	1
2.1.2 Supervision plan or schedule	0	<input checked="" type="checkbox"/>
2.1.3 Reports of past supervision visits	0	<input checked="" type="checkbox"/>

2.2 In the past 6 months, how many clinical supervisory visits concerning non-communicable disease management were carried out at your healthcare centre by the DHMT? **Please state number of visits in spaces provided.**

Member of DHMT	Number of clinical supervisory visits
2.2.1 DHMT pharmacist	3
2.2.2 Public health nurse	2
2.2.1 Other, please specify	

2.2.1 If any of your answers to question 2.2 are 1 or 2, did the DHMT provide/recommend any changes? **Please state number of visits in spaces provided.**

No	Yes
0	2

2.3 If your answer to question 2.2.1 is **yes**, have changes recommended by the DHMT during clinical supervisory visits concerning non-communicable disease management been implemented in your healthcare centre? **Please mark with an X**

No	Yes
<input checked="" type="checkbox"/>	1

2.4 If your answer to question 2.3 is **yes**, list examples of changes implemented as a result of clinical supervisory visits concerning non-communicable disease management in your healthcare centre in the past 6 months.

² "Clinical supervision is a disciplined, tutorial process wherein principles are transformed into practical skills, with four overlapping foci: administrative, evaluative, clinical and supportive" (Powell & Brodsky, 2004).

2.5 Are there community health workers³ operating in communities that use your healthcare centre? *Please mark with an X*

No	Yes
0	X

If your answer to question 2.5 is yes, continue with question 2.6 and 2.7. If the answer to question 2.5 is no, please proceed to question 2.8.

2.6 Are there guidelines stating the relationship between the community health workers and the healthcare centre? *Please mark with an X*

No	Yes
0	X

2.7 What major issues do these guidelines cover concerning management of non-communicable diseases? *Please mark with an X*

Issues	No	Yes
2.7.1 Home visits	0	X
2.7.2 Lifestyle counselling on NCDs.	0	X
2.7.3 Nutrition education	0	X
2.7.4 Health promotion activities ⁴ on NCDs	0	X
2.7.5 Palliative care for NCDs patients	X	X
2.7.6 Reporting of NCDs to the healthcare centre	0	X
2.7.7 Collection of medication for NCDs patients from the healthcare centre	0	X
2.7.8 Monitoring of non-communicable diseases	0	X
2.7.9 Other, please specify _____		

2.8 Indicate whether the community health workers in your healthcare centre carry out the following community activities related to non-communicable disease prevention and management. *Please mark with an X*

Community activities	No	Yes	Sometimes
2.8.1 Health talks on prevention of non-communicable diseases	0	1	X

³ Community health workers are members of the communities where they work. They are selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organisation, and have shorter informal training provided by nurses at the healthcare centres (WHO, 2007b:2).

⁴ Health promotion activities are activities that enable individuals and communities to engage in healthy behaviours and make changes that reduce the risk of developing diseases and other comorbidities.

Community activities	No	Yes	Sometimes
2.8.2 Health talks on lifestyle modifications for patients with non-communicable diseases	0 <input checked="" type="checkbox"/>	1	2
2.8.3 Health talks on medication use	0	<input checked="" type="checkbox"/>	2
2.8.4 Blood pressure monitoring	<input checked="" type="checkbox"/>	1	2
2.8.5 Blood glucose monitoring	<input checked="" type="checkbox"/>	1	2
2.8.6 Use of peak flow meter to monitor asthma control	<input checked="" type="checkbox"/>	1	2
2.8.7 Therapeutic drug level monitoring for epileptic patients	0 <input checked="" type="checkbox"/>	1	2
2.8.8 Other, please specify	0	1	2

2.9 Indicate whether community health workers in your healthcare centre receive funding from the following sources. **Please mark with an X**

Sources of funding	No	Yes	Sometimes
2.9.1 Government	0	1	<input checked="" type="checkbox"/>
2.9.2 Non-governmental organisations (NGOs)	<input checked="" type="checkbox"/>	1	2
2.9.3 Community members	<input checked="" type="checkbox"/>	1	2
2.9.4 Other, please specify	0	1	2

2.10 Does the healthcare centre undertake collaborative activities related to non-communicable disease management with traditional healers in the catchment area? **Please mark with an X**

No	Yes	Sometimes
<input checked="" type="checkbox"/>	1	2

2.11 If your answer to question 2.10 is **yes** or **sometimes**, indicate which collaborative activities are undertaken by the healthcare centre and traditional healers in the management of non-communicable diseases. **Please mark with an X**

Questions (Please mark with an X)	No	Yes	Sometimes
2.11.1 Do traditional healers refer patients with non-communicable diseases to the healthcare centre?	0	1	2
2.11.2 Does the healthcare centre refer patients with non-communicable diseases to traditional healers?	0	1	2
2.11.3 Other, please specify	0	1	2

2.12 Have you conducted health promotion activities in a form of village gatherings on prevention and management of non-communicable diseases in your healthcare centre area in the past 6 months? **Please mark with an X**

Health promotion activities			
	No	Yes	Sometimes
2.12.1 Prevention ⁵ of NCDs	<input checked="" type="checkbox"/>	1	2
2.12.2 Management ⁶ of NCDs	<input checked="" type="checkbox"/>	1	2

If any of your answers to question 2.12 are yes, continue with question 2.13 and 2.14.
 If all the answers to question 2.12 are no, please proceed to question 2.15.

2.13 Which topics were covered in health promotion activities on prevention of non-communicable diseases during village gathering?

2.14 Which topics were covered in health promotion activities on management of non-communicable diseases during village gathering?

2.15 Are there any non-public healthcare providers that provide healthcare services to patients with non-communicable diseases in the area of your healthcare centre? **Please mark with an X**

Non-public healthcare providers		
	No	Yes
2.15.1 Private clinics	<input checked="" type="checkbox"/>	1
2.15.2 Non-governmental organisations (NGO)	0	<input checked="" type="checkbox"/>

⁵ Prevention is activities intended to protect patients and the general public from actual or potential health threats and their consequences or activities undertaken to minimise the incidence or effects of disease.

⁶ Management is a system of coordinated healthcare interventions and communications for people with non-communicable diseases in which patient self-care efforts are important.

Non-public healthcare providers		
	No	Yes
2.15.3 Community pharmacies		
2.15.4 Other, please specify _____	X 0	1 1

If any of your answers to question 2.15 are yes, continue with question 2.16 and 2.17.
If all the answers to question 2.15 are no, please proceed to question 2.18.

2.16 Does the healthcare centre undertake collaborative activities related to non-communicable disease management with the non-public healthcare services in the area?
Please mark with an X

Non-public healthcare providers			
	No	Yes	Sometimes
2.16.1 Private clinics	0	1	2
2.16.2 Non-governmental organisations (NGO)	0	X	2
2.16.3 Community pharmacies	0	1	2
2.16.4 Other, please specify _____	0	1	2

2.17 List the collaborative activities related to non-communicable disease management undertaken by the healthcare centre and the non-public healthcare services.

① PROVISION OF MATERIAL

② DATA COMMUNICATION AND SHARING

2.18 Does the following exist for the healthcare centre? Indicate **yes** or **no**; and describe your degree of satisfaction with each factor. **Please mark with an X**

	No	Yes	Degree of satisfaction*				
			Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.18.1 Job description	0	X	2	X	4	5	6
2.18.2 Rotation systems ⁷	0	X	2	3	X	5	6
2.18.3 Training plan	X	1	X	3	4	5	6

⁷ A rotation system is a system used to move health professionals from one healthcare setting to another after spending a certain period of time in a particular setting. Health professionals rotate to different settings of healthcare; such as outpatient departments, medical wards and healthcare centres; within a stipulated time (BusinessDictionary, 2017).

	No	Yes	Degree of satisfaction*				
			Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Undecided
2.18.4 Housing for personnel	0	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	4	5	6
2.18.5 Incentives	0	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	4	5	6
2.18.6 Promotion opportunities	0	<input checked="" type="checkbox"/>	2	3	<input checked="" type="checkbox"/>	5	6
2.18.7 Medical aids	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	3	4	5	6
2.18.8 Other, please specify	0	1	2	3	4	5	6

2.19 Does a training plan on non-communicable disease management exist? *Please mark with an X*

No	Yes
<input checked="" type="checkbox"/>	1

If your answer to question 2.19 is yes, continue with question 2.20 and 2.21. If the answer to question 2.19 is no, please proceed to question 2.22.

2.20 Indicate topics covered in trainings on non-communicable disease management? *Please mark with an X*

Topics	No	Yes
2.20.1 Topics on hypertension	0	1
2.20.2 Topics on diabetes mellitus	0	1
2.20.3 Topics on asthma	0	1
2.20.4 Topics on epilepsy	0	1
2.20.5 Topics on medication use for patients with NCDs	0	1
2.20.6 Topics on medication storage for patients with NCDs	0	1
2.20.7 Topics on lifestyle modifications for patients with NCDs	0	1
2.20.8 Topics on prevention of NCDs	0	1
2.20.9 Topics on management of NCDs	0	1
2.20.10 Other, please specify	0	1

2.21 How often are training sessions on NCD management held? *Please mark with an X*

2.21.1 Every 6 months	
2.21.2 Once a year	1
2.21.3 Never	2
2.21.4 Other, please specify	3
	4

2.22 Do you have a pharmacist in the healthcare centre pharmacy? *Please mark with an X*

No	Yes
<input checked="" type="checkbox"/>	<input type="checkbox"/>

If your answer to question 2.22 is no, continue with question 2.23 and 2.24. If the answer to question 2.22 is yes, please proceed to section 3.

2.23 Do you need a pharmacist in the healthcare centre pharmacy? *Please mark with an X*

No	Yes
<input type="checkbox"/>	<input type="checkbox"/>

2.24 If your answer to question 2.23 is **yes**, motivate why you need a pharmacist in the healthcare centre pharmacy.

SECTION 3: MEDICATION AND MEDICAL DEVICES

3.1 Indicate whether standard treatment guidelines on the following issues are available in the healthcare centre. *Please mark with an X*

Standard treatment guidelines	Available		In Use		
	No	Yes	No	Yes	Sometimes
3.1.1 Management of diabetes mellitus	0	X	0	1	X
3.1.2 Management of hypertension	0	X	0	1	X
3.1.3 Management of asthma	0	X	0	1	X
3.1.4 Management of epilepsy	0	X	0	1	X

3.2 Which handbooks/reference books does the healthcare centre use to diagnose and manage non-communicable diseases? *Please mark with an X*

Handbooks	No	Yes	Sometimes
3.2.1 Lesotho formulary	X	1	2
3.2.2 South African medicines formulary	X	1	2
3.2.3 British national formulary	X	1	2
3.2.4 Other, please specify _____	0	1	2

3.3 Do you have a list of essential drugs for NCD management in your healthcare centre? *Please mark with an X*

No	Yes
0	X

3.3.1 If your answer to question 3.3 is **yes**, are drugs used in the following non-communicable disease management included in the list of essential drugs for NCDs in your healthcare centre? *Please mark with an X*

Diseases	No	Yes
3.3.1.1 Diabetes mellitus	0	X
3.3.1.2 Hypertension	0	X
3.3.1.3 Asthma	0	X
3.3.1.4 Epilepsy	0	X

3.4 Indicate which drugs are generally available and which drugs were out-of-stock in the past 3 months in your healthcare centre. **Please mark with an X**

Disease	Drugs	Available		Out-of-stock in the past 3 months	
		No	Yes	No	Yes
3.4.1 Diabetes mellitus	3.4.1.1 Gliclazide	X	1	X	1
	3.4.1.2 Glibenclamide	0	X	X	1
	3.4.1.3 Glimepiride	X	1	X	1
	3.4.1.4 Metformin	0	X	X	1
	3.4.1.5 Protaphane	X	1	X	1
	3.4.1.6 Actraphane	X	1	0	X
	3.4.1.7 Actrapid	X	1	0	X
	3.4.1.8 Other, please specify	0	1	0	1
3.4.2 Hypertension	3.4.2.1 Hydrochlorothiazide	0	X	X	1
	3.4.2.2 Atenolol	0	X	X	1
	3.4.2.3 Indapamide	0	X	X	1
	3.4.2.4 Hydralazine	0	X	X	1
	3.4.2.5 Methyldopa	0	X	X	1
	3.4.2.6 Nifedipine	X	1	0	X
	3.4.2.7 Perindopril	X	1	X	1
	3.4.2.8 Captopril	0	X	X	1
	3.4.2.9 Other, please specify	0	1	0	1
3.4.3 Asthma	3.4.3.1 Salbutamol tablets	0	X	X	1
	3.4.3.2 Salbutamol inhaler	0	X	X	1
	3.4.3.3 Beclomethasone inhaler	X	1	0	X
	3.4.3.4 Prednisolone tablets	0	X	X	1
	3.4.3.5 Other, please specify	0	1	0	1
3.4.4 Epilepsy	3.4.4.1 Phenytoin	0	X	X	1
	3.4.4.2 Phenobarbitone	0	X	X	1
	3.4.4.3 Sodium valproate	0	X	X	1
	3.4.4.4 Carbamazepine	0	X	X	1
	3.4.4.5 Diazepam	0	X	X	1
	3.4.4.6 Other, please specify	0	1	0	1

3.5 Indicate whether the drugs for the healthcare centre are purchased from the following sources. **Please mark with an X**

Sources	Hardly ever	Occasionally	Sometimes	Frequently	Almost always
3.5.1 National Drug Supply Organisation (NDSO)	0	1	2	3	4 X
3.5.2 Tripharm®	X	1	2	3	4

3.5.3 Private drug wholesaler elsewhere	0 X	1	2	3	4
3.5.4 Other, please specify	0	1	2	3	4

3.6 Have drugs used in the management of the following non-communicable diseases ever been out-of-stock in the past 3 months?

Diseases	Not at all	Rarely	Sometimes	Frequently	Almost always
3.6.1 Diabetes mellitus	X	1	2	3	4
3.6.2 Hypertension	0	1	X	3	4
3.6.3 Asthma	0	1	X	3	4
3.6.4 Epilepsy	X	1	2	3	4

If any of your answers to questions 3.6 are sometimes, frequently or almost always, continue with question 3.7, 3.8 and 3.9. If all the answers to question 3.6 are no, please proceed to question 3.10.

3.7 If some of the drugs in question 3.6 were not available in the past 3 months, what were the reasons?

DELAYED PROVISION OF ORDERED STOCK BY PROVIDING FACILITY

3.8 If some of the drugs in question 3.6 were not available for the past 3 months, which actions did you take?

COMMUNICATION TO OR WITH THE DHMT PHARMACIST.

3.9 Indicate whether the population in the area of the healthcare centre can buy (or obtain) drugs from the following. Please mark with an X

	No	Yes	Sometimes
--	----	-----	-----------

3.9.1 Public health facility	X	1	2
3.9.2 Community or retail pharmacy	0	X	2
3.9.3 Not for profit hospital (e.g. mission, NGO)	X	1	2
3.9.4 Not for profit clinic (e.g. mission, NGO)	X	1	2
3.9.5 Other, please specify	0	1	2

3.10 Does the healthcare centre use the following drug supply management tool(s)? **Please mark with an X**

Drug supply management tools	No	Yes	Sometimes
3.10.1 Stock (bin) cards	0	X	2
3.10.2 Dispensing tally sheets	0	1	X
3.10.3 Stock count sheet	X	1	2
3.10.4 Requisition forms	0	1	X
3.10.5 Other, please specify DHLS 2	0	X	2

3.11 How do drug supply management tool(s) listed in question 3.10 reach the healthcare centre?

THEY ARE PASSED ON TO VISITORS COMING TO THE FACILITY OR LAB RIDERS PERSONEL

3.12 Have you run out of drug supply management tools listed in question 3.10 in the past 3 months? **Please mark with an X**

Hardly ever	Occasionally	Sometimes	Frequently	Almost always
0	1	X	3	4

3.13 If your answer to question 3.12 is **sometimes, frequently or almost always**, which measures did you take to make sure that these tools were available at the healthcare centre?

COMMUNICATED AND REQUESTED SUPPLY BY DHMT PHARMACIST.

3.14 Have training sessions on drug supply and medical supplies management for non-pharmaceutical staff been conducted in the past 6 months? **Please mark with an X**

3.14.1 Drug supply management	No	Yes	Sometimes
	X	1	X

3.14.2 Medical supplies management	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>
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If any of your answers to questions 3.14 are yes, continue with question 3.15, 3.16, 3.17, 3.18, 3.19 and 3.20. If all the answers to question 3.14 are no, please proceed to question 3.21.

3.15 How many times have training for non-pharmaceutical staff on drug supply and medical supplies management been done at the healthcare centre in the past 6 months?

	Number of trainings in healthcare centres
3.15.1 Drug supply management	ONCE (1)
3.15.2 Medical supplies management	ONCE (1)

3.16 If any of your answers to question 3.15 are 1 or 2, list topics covered in the drug supply management training for non-pharmaceutical staff.

PROPER INVENTORY AND RECORDING ON SUPPLY AND
MANAGEMENT OF DRUGS IN THE HEALTH FACILITY.
USE OF DHIS 2.

3.17 If any of your answers to question 3.15 are 1 or 2, list topics covered in medical supplies management training for non-pharmaceutical staff.

USE OF DHIS 2.

3.18 Have changes been made with regard to either drug supply management or medical supplies management as a result of these training sessions? **Please mark with an X**

	Not at all	Sometimes	Almost always
3.18.1 Drug supply management	0	<input checked="" type="checkbox"/>	2
3.18.2 Medical supplies management	0	<input checked="" type="checkbox"/>	2

3.19 Which changes have been made as a result of drug supply management training in the past 6 months?

USE OF DHIS2

3.19.1 Which changes have been made as a result of medical supplies management training in the past 6 months?

USE OF DHIS2

3.20 How often are refresher training sessions on drug supply and medical supplies management held for non-pharmaceutical staff? **Please mark with an X**

	Drug supply management	Medical supplies management
3.20.1 Every 6 months	1	1
3.20.2 Once a year	2	2
3.20.3 Never	3	3
3.20.4 Other, please specify NOT SURE	4 X	4 X

3.21 Is an order preparation schedule prepared by your DHMT pharmacist available in your healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	X

3.21.1 If your answer to question 3.21 is **not at all** or **sometimes**, how do you know when it is time to order drugs?

3.22 Is a National Drug Supply Organisation (NDSO) order delivery schedule available in your healthcare centre? **Please mark with an X**

Not at all	Sometimes	Almost always
0	1	X

3.22.1 If your answer to question 3.22 is **not at all** or **sometimes**, how do you calculate the quantity of drugs to order?

SECTION 4: HEALTH MANAGEMENT AND INFORMATION SYSTEM

4.1 Do you submit health statistics on non-communicable disease management? *Please mark with an X*

No	Yes	Sometimes
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2

4.1.1 If your answer to question 4.1 is **yes** or **sometimes**, to whom do you submit the health statistics on non-communicable disease management? *Please mark with an X*

	No	Yes
4.1.1.1 District Health Management Team (DHMT)	0	<input checked="" type="checkbox"/>
4.1.1.2 District Hospital	0	1
4.1.1.3 Ministry of Health	0	1
4.1.1.4 Other, please specify	0	1

4.2 Please answer the following questions. *Please mark with an X*

Questions	No	Yes	Sometimes
4.2.1 Have you submitted all health statistics reports on non-communicable disease management in the past 6 months?	0 <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/>	2
4.2.2 Have you had any shortage of health statistics forms for non-communicable diseases in the last 6 months?	0 <input checked="" type="checkbox"/>	1	2
4.2.3 Do you keep copies of the health statistics reports on non-communicable diseases you submit?	0	1 <input checked="" type="checkbox"/>	2

4.3 Were there any constraints to the preparation and submission of the health statistics reports on non-communicable diseases? *Please mark with an X*

	No	Yes	Sometimes
4.3.1 Constraints to preparation of the health statistics reports	<input checked="" type="checkbox"/>	1	2
4.3.2 Constraints to submission of health statistics reports	<input checked="" type="checkbox"/>	1	2

If any of your answers to questions 4.3 are yes or sometimes, continue with question 4.4 and 4.5. If all the answers to question 4.3 are no, please proceed to question 4.6.

4.4 Describe the main constraints for preparation of health statistics reports on non-communicable diseases?

4.5 Describe the main constraints for submitting health statistics reports on non-communicable diseases?

4.6 Who collects data on non-communicable disease management from patients in the healthcare centre? *Please mark with an X*

	Not at all	Sometimes	Almost always
4.6.1 Nurse	0	1	X
4.6.2 Nurse assistant	0	1	X
4.6.3 Data collection clerk	0	1	X
4.6.4 Pharmacist	0	1	2
4.6.5 Pharmacy technician	0	1	2
4.6.6 Doctor	0	1	2
4.6.7 Receptionist	0	1	2
4.6.8 Community health workers	0	1	2
4.6.9 Other, please specify	0	1	2

4.7 Is there a data collection tool for capturing information on non-communicable disease management in the healthcare centre? *Please mark with an X*

Not at all	Sometimes	Almost always
0	1	X

4.7.1 If your answer to question 4.7 is **sometimes or almost always**, in what format is the data collection tool. **Please mark with an X**

	No	Yes
4.7.1.1 Paper-based (registries)	0	X
4.7.1.2 Electronic	0	1
4.7.1.3 Paper-based outpatient medical files	0	1
4.7.1.4 Other, please specify TALLY SHEET	0	X

4.8 What type of information is collected in the healthcare centre on non-communicable diseases? **Please mark with an X**

Type of information	No	Yes	Sometimes
4.8.1 Total number of patients diagnosed with hypertension	0	X	2
4.8.2 Total number of patients diagnosed with diabetes mellitus	0	X	2
4.8.3 Total number of patients diagnosed with asthma	0	X	2
4.8.4 Total number of patients diagnosed with epilepsy	0	X	2
4.8.5 Number of patients with hypertension in different age groups	0	X	2
4.8.6 Number of patients with diabetes mellitus in different age groups	0	X	2
4.8.7 Number of patients with asthma in different age groups	0	X	2
4.8.8 Number of patients with epilepsy in different age groups	0	X	2
4.8.9 Gender of patients with hypertension	0	X	2
4.8.10 Gender of patients with diabetes mellitus	0	X	2
4.8.11 Gender of patients with asthma	0	X	2
4.8.12 Gender of patients with epilepsy	0	X	2
4.8.13 Blood pressure values	0	X	2
4.8.14 Blood glucose levels	0	X	2
4.8.15 Peak flow meter readings	0	X	2
4.8.16 Therapeutic blood level monitoring for epileptic patients	X	1	2
4.8.17 Number of patients referred to district hospital by healthcare centres	0	X	2
4.8.18 Drug consumption rate	X	1	2
4.8.19 Number of health promotion activities conducted in the community	0	X	2
4.8.20 Number of health talks conducted	X	1	2
4.8.21 Number of patients with adverse drug reactions	X	1	2
4.8.22 Type of adverse drug reactions patients experienced	X	1	2
4.8.23 Management of adverse drug reactions	X	1	2
4.8.24 Other, please specify	0	1	2

4.9 Where is the collected information on non-communicable disease management kept in the healthcare centre?

CONSULTATION ROOMS

4.10 Are health statistics on non-communicable diseases being analysed by staff of the healthcare centre? *Please mark with an X*

No	Yes	Sometimes
<input checked="" type="checkbox"/>	1	2

4.10.1 If your answer to question 4.10 is **yes** or **sometimes**, please give examples of how the analysed data are presented?

4.11 Are health statistics on non-communicable disease management used by the staff of the healthcare centre in decision-making? *Please mark with an X*

Yes	Sometimes	No	Don't know
<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	3

4.12 If your answer to question 4.11 above is **yes** or **sometimes**, please give examples of how the staff at the healthcare centre uses the health statistics on non-communicable disease management in decision-making?

4.13 In the past 6 months, have you received any feedback from the district level in response to reports that were submitted on non-communicable diseases? *Please mark with an X*

No	Yes	Sometimes
<input checked="" type="checkbox"/>	1	2

4.14 If your answer to question 4.13 is **yes** or **sometimes**, please give examples of feedback you received from the district level?

SECTION 5: HEALTHCARE FINANCING

5.1 Does your healthcare centre have a budget? *Please mark with an X*

No	Yes
<input checked="" type="checkbox"/>	1

If any of your answer to question 5.1 is yes, continue with question 5.2. If the answer to question 5.1 is no, please proceed to question 5.3.

5.2 Indicate the level of authority the healthcare centre has in the use of its budget for each specified area. *Please mark with an X*

Area	Full	Partial	Non
5.2.1 Paying staff salaries	1	2	3
5.2.2 Purchasing drugs for non-communicable diseases	1	2	3
5.2.3 Purchasing equipment used for non-communicable diseases diagnosis and management	1	2	3
5.2.4 Repairing equipment used for non-communicable diseases diagnosis and management	1	2	3
5.2.5 Maintaining equipment used for non-communicable diseases diagnosis and management	1	2	3
5.2.6 Maintaining buildings	1	2	3
5.2.7 Maintaining vehicles and motorcycles	1	2	3
5.2.8 Other, please specify	1	2	3

5.3 Indicate whether the following financial monitoring systems are used by the healthcare centre. *Please mark with an X*

Financial monitoring systems	No	Yes	Sometimes
5.3.1 Financial records	<input checked="" type="checkbox"/>	1	2
5.3.2 Accounting procedures	<input checked="" type="checkbox"/>	1	2
5.3.3 Periodic auditing visits	<input checked="" type="checkbox"/>	1	2
5.3.4 Other, please specify	0	1	2

5.4 Are you involved in the development of a budget for your healthcare centre? *Please mark with an X*

Not at all	Sometimes	Almost always
X	1	2

5.5 If your answer to question 5.4 is **sometimes** or **almost always**, please explain how you are involved in the development the healthcare centre budget.

5.6 Does your healthcare centre charge fees for some of its services to patients with non-communicable diseases? *Please mark with an X*

No	Yes	Sometimes
0	X	2

If your answer to questions 5.6 is **yes** or **sometimes**, continue with question 5.6.1 and 5.6.2. If the answer to question 5.6 is **no**, please proceed to question 5.7.

5.6.1 Indicate for which services, fees are charged to patients with non-communicable diseases?

BUYING OF HEALTHCARE BOOKLETS OR PROVISION OF HEALTHCARE BOOKLETS.

5.6.2 Indicate which of the following payment methods are in use for services provided for patients in the healthcare centre. *Please mark with an X*

Payment methods	No	Yes	Sometimes
5.6.2.1 Direct payment	0	X	2
5.6.2.2 Health insurance	0	1	2
5.6.2.3 Other, please specify	0	1	2

5.7 Does your healthcare centre charge fees for drugs used in the treatment of non-communicable diseases? *Please mark with an X*

No	Yes	Sometimes
0 <input checked="" type="checkbox"/>	1	2

5.7.1 If your answer to question 5.7 is **yes** or **sometimes**, indicate which of the following payment methods are in use for drugs in the healthcare centre. *Please mark with an X*

Payment methods	No	Yes	Sometimes
5.7.2.1 Direct payment	0	1	2
5.7.2.2 Health insurance	0	1	2
5.7.2.3 Other, please specify	0	1	2

SECTION 6: HEALTH INFRASTRUCTURE AND EQUIPMENT

6.1 Does the healthcare centre have adequate transportation for the following? **Please mark with an X**

	No	Yes	Sometimes
6.1.1 Evacuation of emergency cases	<input checked="" type="checkbox"/>	1	2
6.1.2 Providing outreach services	<input checked="" type="checkbox"/>	1	2
6.1.3 Other, please specify	0	1	2

6.2 Does the healthcare centre have adequate resources to maintain transportation? **Please mark with an X**

Not at all	Sometimes	Almost always
<input checked="" type="checkbox"/>	1	2

6.3 Does the healthcare centre have a standard list of equipment that should be available for the diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Standard list of equipment	No	Yes	Sometimes
6.3.1 Equipment that should be available for diagnosis of non-communicable diseases	0	1	<input checked="" type="checkbox"/>
6.3.2 Equipment that should be available for monitoring of blood pressure level in hypertensive patients	0	<input checked="" type="checkbox"/>	2
6.3.3 Equipment that should be available for monitoring glucose level in diabetic patients	0	1	<input checked="" type="checkbox"/>
6.3.4 Equipment that should be available for monitoring asthmatic patients	<input checked="" type="checkbox"/>	1	2
6.3.5 Equipment that should be available for therapeutic drug level monitoring for epileptic patients	<input checked="" type="checkbox"/>	1	2

6.4 Which of the following equipment is available and functional in your healthcare centre for diagnosis and monitoring of non-communicable diseases? **Please mark with an X**

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.1 Thermometer	0	<input checked="" type="checkbox"/>	0	<input checked="" type="checkbox"/>	2
6.4.2 Stethoscope	0	<input checked="" type="checkbox"/>	0	<input checked="" type="checkbox"/>	2
6.4.3 Blood pressure measurement device	0	<input checked="" type="checkbox"/>	0	<input checked="" type="checkbox"/>	2
6.4.4 Measurement tape	0	<input checked="" type="checkbox"/>	0	<input checked="" type="checkbox"/>	2
6.4.5 Weighing scale	0	<input checked="" type="checkbox"/>	0	1	<input checked="" type="checkbox"/>
6.4.6 Peak flow meter	<input checked="" type="checkbox"/>	1	0	1	2
6.4.7 Spacers for inhalers	<input checked="" type="checkbox"/>	1	0	1	2
6.4.8 Glucometer	0	<input checked="" type="checkbox"/>	0	1	<input checked="" type="checkbox"/>
6.4.9 Blood glucose test strips	<input checked="" type="checkbox"/>	1	0	1	2
6.4.10 Urine protein test strips	<input checked="" type="checkbox"/>	1	0	1	2
6.4.11 Urine ketones test strips	<input checked="" type="checkbox"/>	1	0	1	2

Equipment	Available		Functional		
	No	Yes	No	Yes	Sometimes
6.4.12 Therapeutic drug level monitoring for epileptic patients	0 X	1	0	1	2
6.4.13 Other, please specify	0	1	0	1	2

6.5 Indicate if healthcare personnel have been trained on how to use the following equipment in the healthcare centres. **Please mark with an X**

Equipment	No	Yes
6.5.1 Thermometer	0	X
6.5.2 Stethoscope	0	X
6.5.3 Blood pressure measurement device	0	X
6.5.4 Measurement tape	0	X
6.5.5 Weighing scale	0	X
6.5.6 Peak flow meter	X	1
6.5.7 Spacers for inhalers	X	1
6.5.8 Glucometer	0	X
6.5.9 Blood glucose test strips	0	X
6.5.10 Urine protein test strips	0	X
6.5.11 Urine ketones test strips	0	X
6.5.12 Therapeutic drug level monitoring for epileptic patients	X	1
6.5.13 Other, please specify	0	1

6.6. Indicate if any of the following are carried out to maintain equipment used in NCD diagnosis and management. **Please mark with an X**

	Not at all	Sometimes	Almost always
6.6.1 Is equipment within its service dates?	0	X	2
6.6.2 Inspection of equipment every month	0	X	2
6.6.3 Regular calibration of equipment	0	X	2
6.6.4 Replacement of equipment every year	0	X	2

6.7 Do you have maintenance personnel for maintaining and restoring medical devices used in non-communicable disease management? **Please mark with an X**

No	Yes
X	1

6.7.1 If your answer to question 6.7 is **no**, what do you do when medical devices have to be repaired or maintained?

WE INFORM DHMT AND OR CONTRACTOR FROM LMDA
WHEN AVAILABLE.

SECTION 7: ROLE OF THE PHARMACIST IN THE DIFFERENT LEVELS OF HEALTHCARE

7.1 Are there pharmacists involved with the management of non-communicable diseases in your healthcare centre? *Please mark with an X*

No	Yes
<input checked="" type="checkbox"/>	1

7.2 Which activities should be carried out by pharmacists in your facility involved with management of non-communicable diseases? *Please mark with an X.*

Activities	No	Yes	Sometimes
7.2.1 Monitoring of non-communicable diseases ⁸	0	<input checked="" type="checkbox"/>	2
7.2.2 Provide advice to patients about their medication	0	<input checked="" type="checkbox"/>	2
7.2.3 Prevent medication problems	0	<input checked="" type="checkbox"/>	2
7.2.4 Manage medication problems	0	<input checked="" type="checkbox"/>	2
7.2.5 Advise patients on self-care	0	<input checked="" type="checkbox"/>	2
7.2.6 Advise patients on self-medication	0	<input checked="" type="checkbox"/>	2
7.2.7 Develop care plans	0	<input checked="" type="checkbox"/>	2
7.2.8 Refer patients for assessment by a physician	0	1	<input checked="" type="checkbox"/>
7.2.9 Manage drug therapy for patients	0	1	<input checked="" type="checkbox"/>
7.2.10 Supervise pharmacy technicians	<input checked="" type="checkbox"/>	1	2
7.2.11 Communicate with other healthcare providers to provide patient care	0	<input checked="" type="checkbox"/>	2
7.2.12 Collaborate with other healthcare providers as part of a team	0	<input checked="" type="checkbox"/>	2
7.2.13 Participate in health promotion activities	0	<input checked="" type="checkbox"/>	2
7.2.14 Procure medication for non-communicable diseases	0	<input checked="" type="checkbox"/>	2
7.2.15 Store medication for non-communicable diseases	0	<input checked="" type="checkbox"/>	2
7.2.16 Distribute medication for non-communicable diseases	0	<input checked="" type="checkbox"/>	2
7.2.17 Adverse drug reactions monitoring ⁹	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7.2.18 Adverse drug reactions recording ¹⁰	0	1	<input checked="" type="checkbox"/>
7.2.19 Adverse drug reactions reporting ¹¹	0	1	<input checked="" type="checkbox"/>
7.2.20 Adverse drug reactions management	0	1	<input checked="" type="checkbox"/>
7.2.21 Other, please specify	0	1	2

⁸ Monitoring of NCDs is periodic measurement that guides the management of NCDs and includes pre-treatment monitoring to determine if a disease is present; after the initiation of treatment; after the disease is treated and stable; after a significant change in the disease process or treatment has occurred; or to determine if it is possible to stop treatment (Doust & Glasziou, 2013:85).

⁹ Adverse drug reactions monitoring is a process of continuously monitoring of undesirable effects suspected to be associated with medicine use (WHO, 2006:22).

¹⁰ Adverse drug reactions recording is a process of data abstraction from a patient medical record onto an adverse drug reaction report form (WHO, 2006:41) thus generating suspected case reports of adverse drug reactions.

¹¹ Adverse drug reactions reporting is a process whereby suspected case reports of adverse drug reactions are reported by healthcare professionals and pharmaceutical manufacturers to regulatory groups (WHO, 2006:24).

The self-administered structured questionnaire is now complete! Remember that you cannot withdraw your answers after you have placed your questionnaire in the submission box, since we cannot trace your answers back to you.

Thank you for your time and participation!

ANNEXURE U: STATISTICAL ANALYSIS TABLE

Table U-1: Statistical analysis

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
Demographic information	Frequency of division or programme at the MOH where the participant is working.	MOH division <ul style="list-style-type: none"> Question number 1.1 (MOH) 		<ul style="list-style-type: none"> Frequency
Demographic information	Frequency of the district in which the DHMTs, OPDs or healthcare centres are located.	District <ul style="list-style-type: none"> Question 1.1 (DHMT) Question 1.1 (OPDs) Question 1.1 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Frequency of an organisation that owns the hospitals and healthcare centres.	Organisation <ul style="list-style-type: none"> Question 1.2 (OPDs) Question 1.2 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Frequency of current position held in MOH divisions.	Position <ul style="list-style-type: none"> Question 1.2 (MOH) 		<ul style="list-style-type: none"> Frequency
Demographic information	Frequency of current managerial positions held by respondents at the DHMTs, OPDs and healthcare centres.	Managerial position <ul style="list-style-type: none"> Question 1.2 (DHMT) Question 1.3 (OPDs) Question 1.3 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Frequency of duration of employment in current position, measured in years.		Years of employment <ul style="list-style-type: none"> Question 1.3 (MOH) Question 1.3 (DHMT) Question 1.4 (OPDs) Question 1.4 (Healthcare centres) 	<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Frequency of OPD in which the	OPD		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
	respondents work in the district hospital.	<ul style="list-style-type: none"> Question 1.5 		
Demographic information	Frequency of the gender of the respondents.	Gender <ul style="list-style-type: none"> Question 1.4 (MOH) Question 1.4 (DHMT) Question 1.6 (OPDs) Question 1.5 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Average age of the respondents in years.		Age <ul style="list-style-type: none"> Question 1.5 (MOH) Question 1.5 (DHMT) Question 1.7 (OPDs) Question 1.6 (Healthcare centres) 	<ul style="list-style-type: none"> Mean Standard deviation Confidence intervals
Demographic information	Frequency of highest levels of education held by the respondents.	Educational level <ul style="list-style-type: none"> Question 1.6 (MOH) Question 1.6 (DHMT) Question 1.8 (OPDs) Question 1.7 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
Demographic information	Frequency of participant's profession.	Profession <ul style="list-style-type: none"> Question 1.7 (MOH) Question 1.7 (DHMT) Question 1.9 (OPDs) Question 1.8 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of description of the District Health Management Structures in the following areas: district development committee, district health committee and DHMT.	District Health Management structures <ul style="list-style-type: none"> Question 1.8 (MOH) Question 1.8 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess the available human	Frequency of availability of job	Job description		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
resource management system that includes support, clinical supervision and performance monitoring.	descriptions for health professionals at the DHMT, OPDs and the healthcare centres.	<ul style="list-style-type: none"> Question 1.9 (MOH) Question 1.12 (DHMT) 		
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of inclusion of management of NCDs in job descriptions for professionals at the DHMT, OPDs and the healthcare centres.	Job description <ul style="list-style-type: none"> Question 1.10 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of the number of facilities in the districts which have district health plans.	Number of facilities with the district health plan <ul style="list-style-type: none"> Question 1.11 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of conducted studies on NCDs in the districts in the past 5 years.	NCDs studies conducted <ul style="list-style-type: none"> Question 1.12 (MOH) Question 1.9 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of examples of studies carried out on NCDs in the past 5 years.	Examples of NCDs studies conducted <ul style="list-style-type: none"> Question 1.13 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of how the results of the studies on NCDs are used in the district health plan.	Use of NCDs studies <ul style="list-style-type: none"> Question 1.10 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of the role of the participant at the DHMT in relation to NCD management.	Participant role <ul style="list-style-type: none"> Question 1.11 (DHMT) 		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of existence of regular and coordinated health workforce planning for NCD management in the health system levels or departments.	Health workforce planning <ul style="list-style-type: none"> • Question 2.1 (MOH) • Question 2.2 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.	Frequency at which higher education institutions in Lesotho graduate students with skills to be used in NCD management.	Skills used in NCD management <ul style="list-style-type: none"> • Question 2.4 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.	Frequency of cadre of health professionals produced by higher education institutions in Lesotho.	Health professionals' cadre <ul style="list-style-type: none"> • Question 2.3 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the capacity of the public service and private sector in addressing the number of health personnel in NCD management.	Frequency of whether Southern African Development Community (SADAC) countries train healthcare personnel on behalf of the MOH.	Healthcare personnel training by the SADAC countries <ul style="list-style-type: none"> • Question 2.5.4 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of processes that are carried out or are in place to strengthen clinical supervision.	Strengthening of clinical supervision <ul style="list-style-type: none"> • Question 2.6 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of conduction of clinical supervisions in OPDs and healthcare centres by the DHMT.	Conduction of clinical supervisions <ul style="list-style-type: none"> • Question 2.1 (DHMT) • Question 2.1 (OPDs) 		<ul style="list-style-type: none"> • Frequency
To assess the available human resource management system that includes support, clinical	Frequency of type of documents used by the DHMT during clinical supervision of OPDs and healthcare	Clinical supervision document <ul style="list-style-type: none"> • Question 2.2 (DHMT) • Question 2.2 (OPDs) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
supervision and performance monitoring.	centres.	<ul style="list-style-type: none"> Question 2.1 (Healthcare centres) 		
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of the number of clinical supervisory visits on NCD management carried out by the DHMT in OPDs in district hospitals and healthcare centres in the past 6 months.		Number of clinical supervisory visits <ul style="list-style-type: none"> Question 2.3 (DHMT) Question 2.3 (OPDs) Question 2.2 (Healthcare centres) 	<ul style="list-style-type: none"> Frequency Percentages
To assess available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of provision of recommendations of changes in NCD management at OPDs and healthcare centres during clinical supervisory visits by the DHMT.	Recommendations provided during clinical supervisory visits <ul style="list-style-type: none"> Question 2.3.1 (OPDs) Question 2.2.1 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of implementation of changes recommended by the DHMT during clinical supervisory visits on NCD management at the OPDs and healthcare centres.	Implementation of recommendations provided during clinical supervisory visits <ul style="list-style-type: none"> Question 2.3.1 (DHMT) Question 2.3.2 (OPDs) Question 2.3 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of examples of changes that were made in healthcare centres as a result of clinical supervisory visits on NCD management in the past 6 months.	Examples of changes made in NCD management <ul style="list-style-type: none"> Question 2.3.2 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess the available human resource management system that includes support, clinical supervision and performance monitoring.	Frequency of examples of changes implemented in OPDs in district hospitals and healthcare centres as a result of clinical supervisory visits on NCD management in the past 6 months.	Examples of changes implemented in NCD management <ul style="list-style-type: none"> Question 2.3.3 (OPDs) Question 2.4 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		centres)		
To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.	Frequency of delivery of adequate professional development and continuing education support on NCD management for health workers in different levels of the health system.	Professional development for healthcare workers <ul style="list-style-type: none"> • Question 2.7 (MOH) Continuing education support for healthcare workers <ul style="list-style-type: none"> • Question 2.7 (MOH) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of existing types of training for health workers.	Type of training for health workers <ul style="list-style-type: none"> • Question 2.8 (MOH) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of professional development and continuing education support for health workers on NCD management at health facilities.	Frequency of provision of adequate professional development and continuing education support on NCD management for health workers in OPDs and healthcare centres.	Provision of professional development for health workers <ul style="list-style-type: none"> • Question 2.15.1 (DHMT) Provision of continuing education support for health workers <ul style="list-style-type: none"> • Question 2.15.2 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of existence of training for health workers in OPDs and healthcare centres.	Type of training for health workers in OPDs and healthcare centres <ul style="list-style-type: none"> • Question 2.16 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of type of topics covered during in-service training or continuing education support on NCD management.	In-service training/continuing education support topics <ul style="list-style-type: none"> • Question 2.17 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of training of healthcare personnel in OPDs and healthcare centres on how to use equipment used in the diagnosis and management of NCDs.	Healthcare personnel training on usage of equipment <ul style="list-style-type: none"> • Question 6.6 (DHMT) • Question 6.5 (OPDs) • Question 6.5 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of existence of a training plan on NCD management at the OPDs and the healthcare centres.	Training plan on NCD management <ul style="list-style-type: none"> • Question 2.13 (OPDs) • Question 2.19 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of type of topics covered in trainings on NCD management at the OPDs and the healthcare centres.	NCD management training topics <ul style="list-style-type: none"> • Question 2.14 (OPDs) • Question 2.20 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of holding training sessions on NCD management at the OPDs and the healthcare centres.	Training sessions frequency <ul style="list-style-type: none"> • Question 2.15 (OPDs) • Question 2.21 (healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of presence of high attrition rates of health professionals at the DHMT, OPDs, and the healthcare centres.	Attrition rates of healthcare personnel <ul style="list-style-type: none"> • Question 2.9 (MOH) • Question 2.9 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of reasons for high attrition rates at the DHMT, OPDs, and healthcare centres.	Reasons for high attrition rates of healthcare personnel <ul style="list-style-type: none"> • Question 2.10 (MOH) • Question 2.9.1 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of cadres of healthcare personnel with high attrition rates at the DHMT, OPDs, and the healthcare centres.	Cadres of healthcare personnel with high attrition rates <ul style="list-style-type: none"> • Question 2.11 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.	Frequency of participation of the community in decision-making in improving service quality in NCD management at the national level, district level and the PHC level.	Community participation in decision-making <ul style="list-style-type: none"> • Question 2.12 (MOH) • Question 2.10.1 (DHMT) Community participation in improving service quality		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		<ul style="list-style-type: none"> Question 2.12 (MOH) Question 2.10.2 (DHMT) 		
To assess the integration of traditional leaders, community and traditional healers with healthcare to enhance health promotion in NCD management.	Frequency of kind of community involved in decision-making and in improving service quality in NCD management at the national, district and PHC levels.	Community involved in the decision-making <ul style="list-style-type: none"> Question 2.13 (MOH) Question 2.11 (DHMT) Community involved in improving service quality <ul style="list-style-type: none"> Question 2.13 (MOH) Question 2.11 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of existence of collaborative activities related to NCD management between the DHMT and the non-public health services at the district level.	Collaborative activities with non-public health services <ul style="list-style-type: none"> Question 2.12 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of a list of collaborative activities related to NCD management between the DHMT and the non-public health services at the district level.	List of NCD collaborative activities with non-public health services <ul style="list-style-type: none"> Question 2.12.1 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of arrangements in place for the non-public health facilities in the district in relation to NCD management.	Arrangements in place for non-public health facilities in relation to NCD management <ul style="list-style-type: none"> Question 2.13 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of existence of collaborative activities related to NCD management at the OPDs and the healthcare centres with traditional healers in their catchment areas.	Collaborative activities with traditional healers <ul style="list-style-type: none"> Question 2.4 (OPDs) Question 2.10 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of type of collaborative activities related to NCD management undertaken by OPDs and healthcare centres together with traditional	Collaborative activities undertaken with traditional healers <ul style="list-style-type: none"> Question 2.5 (OPDs) 		<ul style="list-style-type: none"> Frequency Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
	healers.	<ul style="list-style-type: none"> Question 2.11 (Healthcare centres) 		
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of existence of an institutional structure for a community-based service delivery system in NCD management.	Community-based service delivery system <ul style="list-style-type: none"> Question 2.14 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of availability of community health workers (CHWs) working together with healthcare centres in the PHC level.	CHWs' availability <ul style="list-style-type: none"> Question 2.15 (MOH) Question 2.4 (DHMT) Question 2.5 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess guidelines on roles of community health workers in NCD management.	Frequency of availability of guidelines stating the relationship between the CHWs and the healthcare centres in the PHC level.	CHWs' guidelines availability <ul style="list-style-type: none"> Question 2.15.1 (MOH) Question 2.5 (DHMT) Question 2.6 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess guidelines on the roles of community health workers in NCD management.	Frequency of issues covered by the guidelines in terms of the relationship between the healthcare centre and the CHWs in managing NCDs.	Issues covered in CHWs' guidelines <ul style="list-style-type: none"> Question 2.15.2 (MOH) Question 2.6 (DHMT) Question 2.7 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of community activities related to NCD prevention and management carried out by CHWs.	Community activities done by CHWs <ul style="list-style-type: none"> Question 2.7 (DHMT) Question 2.8 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of type of sources of funding for CHWs.	CHWs funding <ul style="list-style-type: none"> Question 2.16 (MOH) Question 2.8 (DHMT) Question 2.9 (Healthcare facilities) 		<ul style="list-style-type: none"> Frequency Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of the number of health professionals to be allocated to the DHMT, OPDs and healthcare centres as stated in the district health plan.		Number of health professionals at the district and PHC levels <ul style="list-style-type: none"> Question 2.17 (MOH) 	<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of the indication of whether all posts of professionals are currently filled by health professionals in the DHMT, OPDs and the healthcare centres.	Posts of health professionals at district and PHC levels <ul style="list-style-type: none"> Question 2.18 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of the number of currently employed qualified healthcare personnel for the management of NCDs at the OPDs and healthcare centres.		Number of healthcare personnel <ul style="list-style-type: none"> Question 2.20 (DHMT) Question 2.21 (DHMT) Question 2.17 (OPDs) 	<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of the type of healthcare professionals available in the OPDs.	Type of healthcare professionals <ul style="list-style-type: none"> Question 2.16 (OPDs) 		<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of the indication of whether the participant's department in the OPDs is adequately staffed with healthcare personnel for the management of NCDs.	Department staffing at OPDs in district hospitals <ul style="list-style-type: none"> Question 2.18 (OPDs) 		<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of list of healthcare personnel and reasons why their number is inadequate.	Reasons for the inadequate number of healthcare personnel <ul style="list-style-type: none"> Question 2.22.3 (DHMT) Question 2.19 (OPDs) 		<ul style="list-style-type: none"> Frequency
To describe the profile of health personnel managing NCDs in each health facility.	Frequency of adequate staffing of health facilities with healthcare personnel for the management of NCDs.	Health facility staffing <ul style="list-style-type: none"> Question 2.22 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe strategies used for	Frequency of existence of employees benefits at the DHMT, OPDs and the	Employees benefits <ul style="list-style-type: none"> Question 2.14 (DHMT) 		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
hiring and retention of health personnel in health facilities.	healthcare centres.	<ul style="list-style-type: none"> • Question 2.12 (OPDs) • Question 2.18 (Healthcare centres) 		<ul style="list-style-type: none"> • Percentages
Conduction of health promotion activities by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of conduction of health promotion activities within the community on NCD management by staff at the OPDs and healthcare centres.		Health promotion activities <ul style="list-style-type: none"> • Question 2.18 (DHMT) 	<ul style="list-style-type: none"> • Frequency
Conduction of health promotion activities by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of the list of health promotion activities conducted by staff in OPDs and healthcare centres on NCD management within the community.	List of health promotion activities <ul style="list-style-type: none"> • Question 2.18.3 (DHMT) 		<ul style="list-style-type: none"> • Frequency
Conduction of health promotion activities by health workers in health facilities. To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of conduction of health promotion activities on prevention and management of NCDs for patients and the community.	Conduction of health promotion activities on the prevention of NCDs <ul style="list-style-type: none"> • Question 2.6.1 (OPDs) • Question 2.12.1 (Healthcare centres) Conduction of health promotion activities on management of NCDs <ul style="list-style-type: none"> • Question 2.6.2 (OPDs) • Question 2.12.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
Conduction of health promotion activities by health workers in health facilities.	Frequency of topics covered in health promotion activities on prevention and management of NCDs for patients and	Topics on health promotion activities on the prevention of NCDs	•	<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	the community.	<ul style="list-style-type: none"> • Question 2.7 (OPDs) • Question 2.13 (Healthcare centres) Topics on health promotion activities on management of NCDs <ul style="list-style-type: none"> • Question 2.8 (OPDs) • Question 2.14 (Healthcare centres) 		
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of existence of non-public health providers at the OPDs and the healthcare centres areas that provide healthcare services to patients with NCDs.	Non-public health providers' availability <ul style="list-style-type: none"> • Question 2.9 (OPDs) • Question 2.15 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of collaborative activities related to NCD management undertaken by the OPDs and the healthcare centres together with the non-public health services.	Collaborative activities with non-public health providers <ul style="list-style-type: none"> • Question 2.10 (OPDs) • Question 2.16 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe collaborative activities among public and private health facilities including the community in relation to NCD management.	Frequency of a list of collaborative activities related to NCD management undertaken by the OPDs and the healthcare centres with the non-public health services.	List of collaborative activities with non-public health providers <ul style="list-style-type: none"> • Question 2.11 (OPDs) • Question 2.17 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of satisfaction of healthcare personnel with their working conditions in OPDs and healthcare centres.	Working conditions satisfaction <ul style="list-style-type: none"> • Question 2.19 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe strategies used for hiring and retention of health personnel in health facilities.	Frequency of reasons why healthcare personnel is not satisfied with their working conditions at OPDs and healthcare centres.	Reasons for non-satisfaction with working conditions <ul style="list-style-type: none"> • Question 2.19.3 (DHMT) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess the availability of NCDs STGs and EML at health facilities.	Frequency of availability of STGs for management of hypertension, diabetes mellitus, asthma and epilepsy.	STGs availability <ul style="list-style-type: none"> • Question 3.1 (MOH) • Question 3.1 (DHMT) • Question 3.1 (OPDs) • Question 3.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of NCDs STGs and EML at health facilities.	Frequency of use of STGs in OPDs and healthcare centres in the management of hypertension, diabetes mellitus, asthma and epilepsy.	STGs in use <ul style="list-style-type: none"> • Question (OPDs) • Question (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of NCDs STGs and EML at health facilities.	Frequency of availability of a formal EML consistent with population health priorities in the management of NCDs at the district and PHC levels.	EML availability for the district and PHC levels <ul style="list-style-type: none"> • Question 3.2 (MOH) • Question 3.2 (DHMT) • Question 3.3 (OPDs) • Question 3.3 (Healthcare centres) • Question 3.3 (MOH) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of NCDs STGs and EML at health facilities.	Frequency of the inclusion of drugs used in the management of hypertension, diabetes mellitus, asthma and epilepsy at the OPDs and the healthcare centres in the EDL.	Drugs in the EML <ul style="list-style-type: none"> • Question 3.2.1 (DHMT) • Question 3.3.1 (OPDs) • Question 3.3.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of NCDs STGs and EML at health facilities.	Frequency of reference books used at OPDs and healthcare centres to diagnose and manage NCDs.	Handbooks/reference books <ul style="list-style-type: none"> • Question 3.2.2 (DHMT) • Question 3.2 (OPDs) • Question 3.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess updating of the national EML so that it is in line with the prevailing burden of NCDs.	Frequency of alignment of medicine selection for the management of NCDs at the PHC level with the	Medicine selection in line with the EML <ul style="list-style-type: none"> • Question 3.4 (MOH) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
	national EML.			
To assess updating of the national EML so that it is in line with the prevailing burden of NCDs.	Frequency of reasons why medicine selection for the management of NCDs at the PHC level is not in line with the national EML.	Reasons for non-alignment of medicine selection with the EML <ul style="list-style-type: none"> • Question 3.5 (MOH) 		• Frequency
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of ordering drugs used in the management of NCDs by the OPDs and the healthcare centre from the supplier.	Drugs order frequency <ul style="list-style-type: none"> • Question 3.6 (DHMT) • Question 3.6 (OPDs) 		• Frequency
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of time it takes for the OPDs and the healthcare centres to receive their drug orders from the supplier.	Time of delivery of drugs <ul style="list-style-type: none"> • Question 3.7 (DHMT) • Question 3.7 (OPDs) 		• Frequency
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of measures taken when transport for delivering drugs to the OPDs and the healthcare centres in remote areas is not available due to bad weather conditions in the mountains.	Unavailability of transport to deliver drugs <ul style="list-style-type: none"> • Question 3.8 (DHMT) • Question 3.8.1 (DHMT) 		• Frequency
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of determination of the minimum and maximum drug stock levels.	Determination of minimum drug stock levels <ul style="list-style-type: none"> • Question 3.9.2 (DHMT) • Question 3.8.2 (OPDs) Determination of maximum drug stock levels <ul style="list-style-type: none"> • Question 3.9.1 (DHMT) • Question 3.8.1 (OPDs) 		• Frequency
To assess the type and availability of medicines used in NCD management at the health facilities.	<ul style="list-style-type: none"> • Calculation of the minimum and maximum drug stock levels. 	Calculation of minimum drug stock levels <ul style="list-style-type: none"> • Question 3.11 (DHMT) • Question 3.10 (OPDs) Calculation of maximum drug		• Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		stock levels <ul style="list-style-type: none"> • Question 3.10 (DHMT) • Question 3.9 (OPDs) 		
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of NCDs drugs available at the OPDs and the healthcare centres in the past 3 months.	NCD drugs available in past 3 months <ul style="list-style-type: none"> • Question 3.4 (OPDs) • Question 3.4 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess type and availability of medicines used in NCD management at the health facilities.	Frequency of NCDs drugs out-of-stock at the OPDs and the healthcare centres in the past 3 months.	NCD drugs out-of-stock in past 3 months <ul style="list-style-type: none"> • Question 3.4 (OPDs) • Question 3.4 (Healthcare centres) • Question 3.12 (DHMT) • Question 3.11 (OPDs) • Question 3.6 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of reasons for the unavailability of drugs used in the management of diabetes mellitus, hypertension, asthma and epilepsy in the past 3 months in healthcare centres.	Reasons for unavailability of NCD drugs in healthcare centres <ul style="list-style-type: none"> • Question 3.13 (DHMT) • Question 3.12 (OPDs) • Question 3.7 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of actions taken when drugs used in the management of diabetes mellitus, hypertension, asthma and epilepsy were out-of-stock in the past 3 months in healthcare centres.	Actions taken during NCD drugs unavailability <ul style="list-style-type: none"> • Question 3.14 (DHMT) • Question 3.13 (OPDs) • Question 3.8 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the type and availability of medicines used in NCD	Frequency of suppliers of drugs used in the management of NCDs at the	Suppliers of NCD drugs <ul style="list-style-type: none"> • Question 3.3 (DHMT) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
management at the health facilities.	OPDs and healthcare centres.	<ul style="list-style-type: none"> Question 3.5 (OPDs) Question 3.5 (Healthcare centres) 		
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of method of quantification used for drug needs/consumption forecasting at the national level.	Methods of quantification for drug needs/consumption forecasting <ul style="list-style-type: none"> Question 3.6 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of accuracy of the forecasts of drug needs/consumption.	Forecasts of drug needs/consumption accuracy <ul style="list-style-type: none"> Question 3.7 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of the efficiency of the procurement process at the MOH, i.e. getting the best drugs for the best price at the right time.	Procurement process <ul style="list-style-type: none"> Question 3.8 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of reasons why the procurement process at the MOH is inefficient.	Reasons for inefficient procurement process <ul style="list-style-type: none"> Question 3.8.1 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of existence of the procurement system to manage the procurement process at the national level.	Procurement system management <ul style="list-style-type: none"> Question 3.8.2 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of the existence of guidelines on monitoring of medical products.	Medical products monitoring guideline availability <ul style="list-style-type: none"> Question 3.9 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency if quality and safety monitoring systems available at the national level.	Quality and safety monitoring systems availability <ul style="list-style-type: none"> Question 3.10 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe guidelines on quality control, selection, procurement, storage and distribution of drugs.	Frequency of the type of procurement method used at the national level to purchase medicines and medical devices for the country.	Type of procurement method <ul style="list-style-type: none"> Question 3.11 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess type and availability of	Frequency of purchase of drugs used	Purchase of drugs		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
medicines used in NCD management at the health facilities.	in the management of NCDs by the population in the area of the district hospital or healthcare centres.	<ul style="list-style-type: none"> • Question 3.14 (OPDs) • Question 3.9 (Healthcare centres) 		<ul style="list-style-type: none"> • Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of the description of the process used by the DHMT to request for and deliver drugs used in the management of NCDs at the healthcare centres.	Drugs requisition process <ul style="list-style-type: none"> • Question 3.4 (DHMT) Drugs delivery process <ul style="list-style-type: none"> • Question 3.5 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To assess the availability of drug supply management tool(s).	Frequency of drug supply management tools used at the OPDs and the healthcare centres.	Use of drug supply management tools <ul style="list-style-type: none"> • Question 3.15 (DHMT) • Question 3.15 (OPDs) • Question 3.10 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of drug supply management tool(s).	Frequency of dissemination of drug supply management tools to the OPDs and the healthcare centres.	Dissemination of drug supply management tools <ul style="list-style-type: none"> • Question 3.16 (DHMT) • Question 3.16 (OPDs) • Question 3.11 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability of drug supply management tool(s).	Frequency of unavailability of drug supply management tools.	Drug supply management tools unavailability <ul style="list-style-type: none"> • Question 3.16.1 (DHMT) • Question 3.17 (OPDs) • Question 3.12 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess availability of drug supply management tool(s).	Frequency of measures taken to make sure that unavailable drug supply management tools were available at the OPDs and the healthcare centres.	Measures taken during unavailability of drug supply management tools <ul style="list-style-type: none"> • Question 3.16.2 (DHMT) • Question 3.18 (OPDs) • Question 3.13 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		(Healthcare centres)		
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of conduction of training on drug supply and medical supplies management for pharmaceutical staff in OPDs and healthcare centres in the past 6 months.	Drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17 (DHMT) • Question 3.19.1 (OPDs) Medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17 (DHMT) • Question 3.19.2 (OPDs) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of the number of training on drug supply and medical supplies management conducted for pharmaceutical staff in OPDs and healthcare centres in the past 6 months.		Number of drug supply management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.3.1 (DHMT) • Question 3.20.1 (OPDs) Number of medical supplies management training for pharmaceutical staff <ul style="list-style-type: none"> • Question 3.17.3.2 (DHMT) • Question 3.20.2 (OPDs) 	<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of topics covered in drug supply and medical supplies management training for pharmaceutical staff at the OPDs and the healthcare centres.	Topics for drug supply management training <ul style="list-style-type: none"> • Question 3.17.4 (DHMT) • Question 3.21 (OPDs) Topics for medical supplies management training <ul style="list-style-type: none"> • Question 3.17.5 (DHMT) • Question 3.22 (OPDs) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of changes made with regard to drug supply and medical supplies management as a result of the training sessions by pharmaceutical staff at the OPDs and the healthcare centres.	Changes made due to drug supply management training <ul style="list-style-type: none"> • Question 3.17.6.1 (DHMT) • Question 3.23.1 (OPDs) Changes made due to medical supplies management training <ul style="list-style-type: none"> • Question 3.17.6.2 (DHMT) • Question 3.23.2 (OPDs) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of examples of recent changes made with regard to drug supply and medical supplies management training by pharmaceutical staff in the past 6 months at the OPDs and the healthcare centres.	Examples of changes made due to drug supply management training <ul style="list-style-type: none"> • Question 3.17 (DHMT) • Question 3.24 (OPDs) Examples of changes made due to medical supplies management training <ul style="list-style-type: none"> • Question 3.17 (DHMT) • Question 3.24.1 (OPDs) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of holding refresher training sessions on drug supply and medical supplies management for pharmaceutical staff in OPDs.	Frequency of drug supply management refresher trainings <ul style="list-style-type: none"> • Question 3.25 (OPDs) Frequency of medical supplies management refresher trainings <ul style="list-style-type: none"> • Question 3.25 (OPDs) 		<ul style="list-style-type: none"> • Frequency
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of conduction of training on drug supply and medical supplies management for non-pharmaceutical staff in OPDs and healthcare centres in the past 6 months.	Drug supply management training for non-pharmaceutical staff <ul style="list-style-type: none"> • Question 3.18 (DHMT) • Question 3.14.1 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		(Healthcare centres) Medical supplies management training for non-pharmaceutical staff <ul style="list-style-type: none"> • Question 3.18 (DHMT) • Question 3.14.2 (Healthcare centres) 		
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of the number of training on drug supply and medical supplies management conducted for non-pharmaceutical staff in OPDs and healthcare centres in the past 6 months.		Number of drug supply management training <ul style="list-style-type: none"> • Question 3.18.1.1 (DHMT) • Question 3.15.1 (OPDs) Number of medical supplies management training <ul style="list-style-type: none"> • Question 3.18.1.2 (DHMT) • Question 3.15.2 (Healthcare centres) 	<ul style="list-style-type: none"> • Frequency • Percentages
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of topics covered in drug supply and medical supplies management training for non-pharmaceutical staff at the OPDs and the healthcare centres.	Topics for drug supply management training <ul style="list-style-type: none"> • Question 3.18.2 (DHMT) • Question 3.16 (Healthcare centres) Topics for medical supplies management training <ul style="list-style-type: none"> • Question 3.18.3 (DHMT) • Question 3.17 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of changes made with regard to drug supply and medical supplies management as a result of the training sessions by non-	Changes made due to drug supply management training <ul style="list-style-type: none"> • Question 3.18.4.1 (DHMT) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
	pharmaceutical staff at the OPDs and the healthcare centres.	<ul style="list-style-type: none"> Question 3.18.1 (Healthcare centres) Changes made due to medical supplies management training <ul style="list-style-type: none"> Question 3.18.4.2 (DHMT) Question 3.18.2 (Healthcare centres) 		
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of examples of recent changes made with regard to drug supply and medical supplies management training by non-pharmaceutical staff in the past 6 months at the OPDs and the healthcare centres.	Examples of changes made due to drug supply management training <ul style="list-style-type: none"> Question 3.18.5 (DHMT) Question 3.19 (Healthcare centres) Examples of changes made due to medical supplies management training <ul style="list-style-type: none"> Question 3.18.5 (DHMT) Question 3.19.1 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To describe the availability of training of health workers in health facilities on NCD management.	Frequency of holding refresher training sessions on drug supply and medical supplies management for non-pharmaceutical staff in healthcare centres.	Frequency of drug supply management refresher training <ul style="list-style-type: none"> Question 3.20 (Healthcare centres) Frequency of medical supplies management refresher training <ul style="list-style-type: none"> Question 3.20 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of the availability of an order preparation schedule prepared by the DHMT pharmacist at the OPDs and healthcare centres.	Order preparation schedule availability <ul style="list-style-type: none"> Question 3.19 (DHMT) Question 3.27 (OPDs) Question 3.21 		<ul style="list-style-type: none"> Frequency Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		(Healthcare centres)		
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of how OPDs and healthcare centres know when it is time to order drugs in the absence of an order preparation schedule.	Ordering drugs during unavailability of an order preparation schedule <ul style="list-style-type: none"> • Question 3.19.3 (DHMT) • Question 3.27.1 (OPDs) • Question 3.21.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of the availability of an NDSO order delivery schedule in the OPDs and the healthcare centres.	NDSO order delivery schedule availability <ul style="list-style-type: none"> • Question 3.20 (DHMT) • Question 3.26 (OPDs) • Question 3.22 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the type and availability of medicines used in NCD management at the health facilities.	Frequency of how OPDs and healthcare centres calculate the quantity of drugs to order in the absence of an NDSO order delivery schedule.	Calculation of quantity of drugs during unavailability of an NDSO order delivery schedule <ul style="list-style-type: none"> • Question 3.20.3 (DHMT) • Question 3.26.1 (OPDs) • Question 3.22.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the profile of personnel for NCD management.	Frequency of the availability of management, professional and/or clinical personnel employed to implement an effective HSIS.	Availability of HSIS personnel <ul style="list-style-type: none"> • Question 4.1 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the profile of personnel for NCD management.	Frequency of the implementation of HSIS at the national, district and the PHC levels.	HSIS implementation at different levels of the health system <ul style="list-style-type: none"> • Question 4.2 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the type of HIS capacity-building activities that have taken place over the past year for HIS staff at the national, district and the PHC	HIS capacity-building activities <ul style="list-style-type: none"> • Question 4.3 (MOH) • Question 4.4 (MOH) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
	levels.			
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the existence of structures to lead and manage HSIS in NCD management.	Structures to lead and manage HSIS <ul style="list-style-type: none"> • Question 4.5 (MOH) 		• Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of structures in place to lead and manage HSIS in NCD management.	HSIS structures in place to lead and manage HSIS <ul style="list-style-type: none"> • Question 4.5.1 (MOH) 		• Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the definition of core set of indicators and data requirements for NCD statistics.	NCD statistics definition <ul style="list-style-type: none"> • Question 4.6 (MOH) 		• Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of NCD statistics in place to be used in the management of NCDs.	NCD statistics in place <ul style="list-style-type: none"> • Question 4.7 (MOH) 		• Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the selection of core indicators for NCD management.	Explicit criteria for core indicators selection <ul style="list-style-type: none"> • Question 4.8 (MOH) 		• Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the definition of core indicators for NCD management in collaboration with key stakeholders.	Identification of core indicators <ul style="list-style-type: none"> • Question 4.9 (MOH) 		• Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the existence of coordinated and integrated management of data on NCDs at the national level from across different information sub-systems.	Management of NCD data at the national level <ul style="list-style-type: none"> • Question 4.10 (MOH) 		• Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of strategies in place for the management of information in a coordinated and integrated fashion at the national level.	Management of information in a coordinated and integrated fashion <ul style="list-style-type: none"> • Question 4.11 (MOH) 		• Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of whether the data on NCDs is being analysed and synthesised to produce useful information about population health status, population needs, and health system performance.	Analysis and synthesis of NCDs data <ul style="list-style-type: none"> Question 4.17 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the availability of population projections by age and sex for the current year at the DHMT, OPDs and the healthcare centres.	Availability of population projections by age and sex <ul style="list-style-type: none"> Question 4.18 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the indication of whether NCD data from population-based surveys is used to analyse the different needs and experiences of women, men, girls, and boys.	NCDs data from population-based surveys <ul style="list-style-type: none"> Question 4.19 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the indication of whether NCDs data from routine HIS and facility surveys is used to analyse the different needs and experiences of women, men, girls, and boys.	NCDs data from routine HIS <ul style="list-style-type: none"> Question 4.19 (MOH) NCDs data from facility surveys <ul style="list-style-type: none"> Question 4.19 (MOH) 		<ul style="list-style-type: none"> Frequency
To describe the type of data collected and kept at the health facilities on NCDs.	Frequency of the type of information submitted to the DHMT by the OPDs and the healthcare centres regarding NCDs.	Type of information on NCDs submitted to the DHMT <ul style="list-style-type: none"> Question 4.15 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of person(s) who collect data on NCD management from patients at the OPDs and the healthcare centres.	Data collectors <ul style="list-style-type: none"> Question 4.6 (OPDs) Question 4.6 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To describe type of data collected and kept at the health facilities on NCDs.	Frequency of the type of information collected at the OPDs and the healthcare centres on NCDs.	Type of information collected on NCDs <ul style="list-style-type: none"> Question 4.8 (OPDs) Question 4.8 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe type of data collected and kept at the health facilities on NCDs.	Frequency of method of keeping collected information on NCD management at the DHMT, OPDs and the healthcare centres.	Format of keeping collected NCD information <ul style="list-style-type: none"> • Question 4.16 (DHMT) • Question 4.7.1 (OPDs) • Question 4.7.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe type of data collected and kept at the health facilities on NCDs.	Frequency of storage of collected information on NCD management at the OPDs and the healthcare centres.	Place where collected NCD information is kept <ul style="list-style-type: none"> • Question 4.9 (OPDs) • Question 4.9 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of the availability of a data collection tool for capturing information on NCD management at the OPDs and the healthcare centres.	Availability of data collection tool <ul style="list-style-type: none"> • Question 4.7 (OPDs) • Question 4.7 (healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of submission of health statistics on NCD management by the DHMT, OPDs and the health care centres.	Submission of health statistics reports <ul style="list-style-type: none"> • Question 4.1 (DHMT) • Question 4.1 (OPDs) • Question 4.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of questions about health statistics reports.	Health statistics reports <ul style="list-style-type: none"> • Question 4.2 (DHMT) • Question 4.2 (OPDs) • Question 4.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of places where health statistics on NCD management is submitted by the OPDs and the healthcare centres.	Places to submit health statistics <ul style="list-style-type: none"> • Question 4.1.1 (OPDs) • Question 4.1.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of analysis of health statistics by the staff of the DHMT, OPDs and the healthcare centres.	Analysis of health statistics <ul style="list-style-type: none"> • Question 4.7 (DHMT) • Question 4.10 (OPDs) • Question 4.10 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of example of how the analysed health statistics data is presented at the DHMT, OPDs and the healthcare centres.	Presentation of analysed health statistics <ul style="list-style-type: none"> • Question 4.8 (DHMT) • Question 4.10.1 (OPDs) • Question 4.10.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of the use of health statistics on NCD management by the staff at the DHMT, OPDs and the healthcare centres in decision-making.	Use of health statistics <ul style="list-style-type: none"> • Question 4.9 (DHMT) • Question 4.11 (OPDs) • Question 4.11 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of examples of how the staff at the DHMT, OPDs and the healthcare centres use the health statistics on NCD management in decision-making.	Examples of how health statistics are used <ul style="list-style-type: none"> • Question 4.10 (DHMT) • Question 4.11.1 (OPDs) • Question 4.12 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of the list of indicators available in the health information statistics regarding NCDs.	Indicators for health information statistics on NCDs <ul style="list-style-type: none"> • Question 4.3 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe all factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively.	Frequency of difficulties encountered during preparation and submission of health statistics reports on NCDs.	Preparation of health statistics reports on NCDs difficulties <ul style="list-style-type: none"> • Question 4.4.1 (DHMT) • Question 4.3.1 (OPDs) • Question 4.3.1 (Healthcare centres) Submission of health statistics		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		reports on NCDs difficulties <ul style="list-style-type: none"> • Question 4.4.2 (DHMT) • Question 4.3.2 (OPDs) • Question 4.3.2 (Healthcare centres) 		
To describe all factors influencing recording and reporting of information on outpatients with NCDs either positively or negatively.	Frequency of the description of the main constraints encountered during preparation and submission of the health statistics reports on NCDs.	Description of constraints for preparation of health statistics reports on NCDs <ul style="list-style-type: none"> • Question 4.5 (DHMT) • Question 4.4 (OPDs) • Question 4.4 (Healthcare centres) Description of constraint for submission of health statistics reports on NCDs <ul style="list-style-type: none"> • Question 4.6 (DHMT) • Question 4.5 (OPDs) • Question 4.5 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of provision of feedback to OPDs and healthcare centres in response to submission of reports on NCD management.	Provision of feedback on submitted reports on NCD management <ul style="list-style-type: none"> • Question 4.11 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe the level of recording and reporting of information on outpatients with NCDs.	Frequency of obtaining feedback from the national level and the district level in response to reports that were submitted by the DHMT, OPDs and the healthcare centres on NCDs in the past 6 months.	Obtaining feedback on submitted reports on NCD management <ul style="list-style-type: none"> • Question 4.13 (DHMT) • Question 4.12 (OPDs) • Question 4.13 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the level of recording and reporting of information on	Frequency of examples of feedback received from the national and the district levels in response to report that	Examples of feedback obtained <ul style="list-style-type: none"> • Question 4.14 (DHMT) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
outpatients with NCDs.	were submitted by the DHMT, the OPDs and the healthcare centres in the past 6 months.	<ul style="list-style-type: none"> Question 4.13 (OPDs) Question 4.14 (Healthcare centres) 		
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of health activity monitoring mechanisms for NCD management showing recent health achievements in the district.	Recent health achievement reflected on health activity monitoring mechanisms <ul style="list-style-type: none"> Question 4.12 (DHMT) 		<ul style="list-style-type: none"> Frequency
To describe the use of data on NCDs by health workers for decision-making at the district and primary healthcare levels.	Frequency of the availability of charts and diagrams to OPDs in district hospitals and healthcare centres in the district.	Availability of charts and diagrams to health facilities <ul style="list-style-type: none"> Question 4.12.1 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the availability of functioning equipment for NCDs data.	Availability of equipment used for NCDs data <ul style="list-style-type: none"> Question 4.12 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the availability of computers to permit rapid compilation of district data at all levels of the healthcare system.	Availability of computers <ul style="list-style-type: none"> Question 4.14 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the availability of data collection supplies at the national, district and the PHC levels.	Data collection supplies availability <ul style="list-style-type: none"> Question 4.13 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of existence of basic ICT infrastructure at the MOH, DHMTs, OPDs and the healthcare centres.	ICT infrastructure in place <ul style="list-style-type: none"> Question 4.15 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the availability of support for ICT equipment at the national level, district level and the PHC levels.	Availability of support for ICT equipment <ul style="list-style-type: none"> Question 4.16 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the existence of a designated and functioning institutional mechanism.	Institutional mechanism charged with analysis of NCD data <ul style="list-style-type: none"> Question 4.20 (MOH) 		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of the existence of an effective system for disseminating HSIS information at the national, district and the PHC levels.	Availability of a system for HSIS information dissemination <ul style="list-style-type: none"> • Question 4.21 (MOH) 		• Frequency
To assess structures in place to lead and manage HSIS in the management of NCDs.	Frequency of HSIS information dissemination systems in place.	HSIS information dissemination systems in place <ul style="list-style-type: none"> • Question 4.22 (MOH) 		• Frequency
To assess the use of data on NCDs from health facilities countrywide to inform decision-making at the national level.	Frequency of the use of NCDs information from the HIS as a foundation for deciding allocation of human and financial resources at the national level, district level and the PHC level.	Human resource allocation <ul style="list-style-type: none"> • Question 4.23 (MOH) Financial resource allocation <ul style="list-style-type: none"> • Question 4.23 (MOH) 		• Frequency
To assess the existence and implementation of NHMIS policy in governing data for NCDs.	Frequency of existence of a NHMIS policy.	NHMIS policy availability <ul style="list-style-type: none"> • Question 4.24 (MOH) 		• Frequency
To assess the existence and implementation of NHMIS policy in governing data for NCDs.	Frequency of whether an existing NHMIS policy caters for management of information for NCDs.	Inclusion of NCD management in the NHMIS policy <ul style="list-style-type: none"> • Question 4.24.1 (MOH) 		• Frequency
To assess the existence and implementation of NHMIS policy in governing data for NCDs.	Frequency of an outline of what the NHMIS policy says about management of information for NCDs.	NCDs information management according to NHMIS policy <ul style="list-style-type: none"> • Question 4.24.2 (MOH) 		• Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of clearly defined and agreed upon financing responsibilities among the different stakeholders.	Financing responsibilities <ul style="list-style-type: none"> • Question 5.1 (MOH) 		• Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of the existence of a joint annual review and planning processes where financial commitments are made, involving all major development partners.	Availability of a joint annual review process <ul style="list-style-type: none"> • Question 5.2.1 (MOH) Availability of a joint planning process <ul style="list-style-type: none"> • Question 5.2.2 (MOH) 		• Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess resources allocation procedures at the national level for NCD management.	Frequency of indicator for financial commitments made, involving major development partners.	Indicator for financial commitments <ul style="list-style-type: none"> • Question 5.3 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of a timely and predictable collection/disbursement of committed funds for NCD management.	Committed funds for NCD management <ul style="list-style-type: none"> • Question 5.4 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of reasons why committed funds for NCD management are not collected/disbursed in a timely and predictable fashion.	Reasons for untimely collection/disbursement of committed NCD management funds <ul style="list-style-type: none"> • Question 5.4.1 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of the existence of risk-pooling mechanisms, especially those targeting the most vulnerable (i.e. poor and marginalised populations) in the management of NCDs.	Risk-pooling mechanisms in place <ul style="list-style-type: none"> • Question 5.5 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of risk-pooling approaches used.	Risk-pooling approach used <ul style="list-style-type: none"> • Question 5.5.1 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of effective use of budgets for planning and implementation in NCD management.	Effective use of budgets for planning <ul style="list-style-type: none"> • Question 5.6.1 (MOH) Effective use of budgets for implementation <ul style="list-style-type: none"> • Question 5.6.2 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resources allocation procedures at the national level for NCD management.	Frequency of performance indicators used in budgets for planning and implementation of NCD management.	Performance indicators used in budgets for planning and implementation <ul style="list-style-type: none"> • Question 5.7 (MOH) 		<ul style="list-style-type: none"> • Frequency
To describe availability of necessary non-medical and medical equipment at different	Frequency of provision for replacement of equipment used in the diagnosis and monitoring of NCDs in	Provision for replacement of equipment in the budget <ul style="list-style-type: none"> • Question 6.5 (MOH) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
levels of healthcare.	the budget at the district and the PHC levels.			
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in diagnosis and management of NCDs.	Frequency of the existence of a budget at the DHMT, OPDs and the healthcare centres.	Availability of a budget <ul style="list-style-type: none"> • Question 5.1 (DHMT) • Question 5.1 (OPDs) • Question 5.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of the level of authority the DHMT, OPDs and healthcare centres have on the use of the budget.	Authority over budget <ul style="list-style-type: none"> • Question 5.2 (DHMT) • Question 5.2 (OPDs) • Question 5.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of the involvement of the DHMT, OPDs and the healthcare centres in the development of a budget for NCDs.	Involvement in the development of a budget <ul style="list-style-type: none"> • Question 5.4 (DHMT) • Question 5.4 (OPDs) • Question 5.4 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of an explanation of how the DHMT, OPDs and the healthcare centres are involved in the development of a budget for NCDs.	Explanation of involvement in the development of a budget <ul style="list-style-type: none"> • Question 5.4.1 (DHMT) • Question 5.4.1 (OPDs) • Question 5.4.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess resource allocation procedures at the national level for NCD management.	Frequency of the existence of planning and budgeting procedures to strengthen service delivery performance in NCD management.	Existence of planning procedures <ul style="list-style-type: none"> • Question 5.8.1 (MOH) Existence of budgeting procedures <ul style="list-style-type: none"> • Question 5.8.2 (MOH) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess resource allocation procedures at the national level for NCD management.	Frequency of the use of planning and budgeting procedures by the DHMT, OPDs and the healthcare centres to strengthen service delivery performance in NCD management.	Use of planning procedures to strengthen service delivery <ul style="list-style-type: none"> Question 5.9.1 (MOH) Use of budgeting procedures to strengthen service delivery <ul style="list-style-type: none"> Question 5.9.2 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the use of the information on population health needs on NCD management to inform resource allocation decisions.	Use of information on population health needs <ul style="list-style-type: none"> Question 5.10 (MOH) Question 5.6 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of if the information on population health needs on NCD management is not used to inform resource allocation decisions, what is used?	Population health needs information not used to inform resource allocation decisions <ul style="list-style-type: none"> Question 5.10.1 (MOH) Question 5.6.1 (DHMT) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the type of analysis used to inform resource allocation decisions for NCDs.	Type of analysis used to inform resource allocation decisions <ul style="list-style-type: none"> Question 5.11 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of achievement of cost-savings through reform/innovation in procurement and contracting practices by the MOH.	Cost-saving through reform/innovation in procurement practices <ul style="list-style-type: none"> Question 5.12.1 (MOH) Cost-saving through reform/innovation in contracting practices <ul style="list-style-type: none"> Question 5.12.2 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the existence of procurement and contracting practices.	Procurement and contracting practices in existence <ul style="list-style-type: none"> Question 5.13 (MOH) 		<ul style="list-style-type: none"> Frequency
To assess resource allocation procedures at the national level	Frequency of easy flow of financing for NCD management from source to	Flow of financing from source to intended end user		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
for NCD management. To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	intended end user.	<ul style="list-style-type: none"> • Question 5.14 (MOH) • Question 5.7 (DHMT) 		
To assess resource allocation procedures at the national level for NCD management. To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of reasons why financing for NCD management does not flow easily from source to intended end user.	Reasons for financing not flowing easily from source to intended end user <ul style="list-style-type: none"> • Question 5.14.1 (MOH) • Question 5.7.1 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the availability of sufficient financing to pay for the needed healthcare personnel in the management of NCDs.	Available financing for healthcare personnel <ul style="list-style-type: none"> • Question 5.19 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the existence of a functional system for revenue and expenditure tracking in NCD management.	Availability of a system for revenue tracking <ul style="list-style-type: none"> • Question 5.15.1 (MOH) Availability of a system for expenditure tracking <ul style="list-style-type: none"> • Question 5.15.2 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resource allocation procedures at the national level for NCD management.	Frequency of the process of tracking of revenue and expenditure in NCD management.	Revenue tracking <ul style="list-style-type: none"> • Question 5.16 (MOH) Expenditure tracking <ul style="list-style-type: none"> • Question 5.17 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess resource allocation procedures at the central level for	Frequency of verification of accuracy of financial records on NCD management.	Accuracy of financial records <ul style="list-style-type: none"> • Question 5.18 (MOH) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
NCD management.				
To assess resource allocation procedures at the national level for NCD management.	Frequency of the process used to verify financial records for NCD management for accuracy.	Verification process of financial records <ul style="list-style-type: none"> • Question 5.18.1 (MOH) 		<ul style="list-style-type: none"> • Frequency
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of financial monitoring systems used by the DHMT, OPDs in district hospitals and the healthcare centres.	Financial monitoring systems <ul style="list-style-type: none"> • Question 5.3 (DHMT) • Question 5.3 (OPDs) • Question 5.3 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of the existence of planning and budgeting procedures to strengthen service delivery performance in NCD management.	Availability of planning procedures <ul style="list-style-type: none"> • Question 5.5.1 (DHMT) Availability of budgeting procedures <ul style="list-style-type: none"> • Question 5.5.2 		<ul style="list-style-type: none"> • Frequency
To describe the process of budget allocation in different levels of healthcare towards medication and medical devices used in the diagnosis and management of NCDs.	Frequency of the use of planning and budgeting procedures to strengthen service delivery performance in NCD management by OPDs and healthcare centres.	Use of planning procedures by health facilities <ul style="list-style-type: none"> • Question 5.5.3.1 (DHMT) Use of budgeting procedures by health facilities <ul style="list-style-type: none"> • Question 5.5.3.2 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To describe payment for some of the services provided at the health facilities by outpatients with NCDs.	Frequency of charging of fees to patients with NCDs for some of the services offered at the OPDs and the healthcare centres.	Fees charged for some of the NCD services provided <ul style="list-style-type: none"> • Question 5.5 (OPDs) • Question 5.6 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe payment for some of the services provided at the health facilities by outpatients with NCDs.	Frequency of a list of NCD services fees are charged for at the OPDs and the healthcare centres.	NCDs services that fees are charged <ul style="list-style-type: none"> • Question 5.5.1 (OPDs) • Question 5.6.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To describe payment for some of the services provided at the health facilities by outpatients with NCDs.	Frequency of payment methods used for paying for services provided for patients with NCDs at the OPD and the healthcare centres.	Payment methods used for NCDs services <ul style="list-style-type: none"> • Question 5.5.2 (OPDs) • Question 5.6.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe payment for some of the services provided at the health facilities by outpatients with NCDs.	Frequency of charging of fees for drugs used in the management of NCDs in the OPDs and the healthcare centres.	Fees charged for NCDs drugs <ul style="list-style-type: none"> • Question 5.6 (OPDs) • Question 5.7 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To describe payment for some of the services provided at the health facilities by outpatients with NCDs.	Frequency of payment methods used for paying for drugs used in the management of NCDs at the OPDs and the healthcare centres.	Payment methods used for NCDs drugs <ul style="list-style-type: none"> • Question 5.6.1 (OPDs) • Question 5.7.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of service delivery sites being well distributed and well-equipped to deliver essential services for NCD management at the district and the PHC level.	Well distributed service delivery sites <ul style="list-style-type: none"> • Question 6.1 (MOH) Well-equipped service delivery sites <ul style="list-style-type: none"> • Question 6.1 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of the existence of guidelines for procedures on maintenance of infrastructure used for NCD management at the district level and the PHC level.	Availability of guidelines for procedure on the maintenance of infrastructure <ul style="list-style-type: none"> • Question 6.2.1 (MOH) • Question 6.2.2 (MOH) 		<ul style="list-style-type: none"> • Frequency
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities. To assess the restoration of health infrastructure and equipment at different levels of	Frequency of the existence of a maintenance plan for equipment used in the diagnosis and monitoring of NCDs at the DHMT, OPDs and healthcare centres.	Availability of a maintenance plan for equipment <ul style="list-style-type: none"> • Question 6.6 (MOH) • Question 6.4 (DHMT) 		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
healthcare.				
To assess the restoration of health infrastructure and equipment at different levels of healthcare.	Frequency of maintenance procedure for equipment used in the diagnosis and monitoring of NCDs at the DHMT, OPDs and the healthcare centres in the absence of a maintenance plan.	Unavailability of a maintenance plan for equipment <ul style="list-style-type: none"> • Question 6.4.4 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To assess the restoration of health infrastructure and equipment at different levels of healthcare.	Frequency of activities carried out to maintain equipment used in NCDs diagnosis and management.	Activities carried out to maintain equipment <ul style="list-style-type: none"> • Question 6.7 (DHMT) • Question 6.6 (OPDs) • Question 6.6 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the restoration of health infrastructure and equipment at different levels of healthcare.	Frequency of availability of maintenance personnel responsible for maintaining and restoring medical devices used in the management of NCDs.	Availability of maintenance personnel <ul style="list-style-type: none"> • Question 6.7 (OPDs) • Question 6.7 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the restoration of health infrastructure and equipment at different levels of healthcare.	Frequency of the procedure followed when medical devices used in the management of NCDs have to be repaired or maintained in the absence of maintenance personnel.	Unavailability of maintenance personnel <ul style="list-style-type: none"> • Question 6.7.1 (OPDs) • Question 6.7.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of the availability of a standard list of equipment for diagnosis and monitoring of NCDs in OPDs and healthcare centres.	Availability of a standard list of equipment <ul style="list-style-type: none"> • Question 6.3 (DHMT) • Question 6.3 (OPDs) • Question 6.3 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of available equipment for diagnosis and monitoring of NCDs at the OPDs and the healthcare facilities.	Available equipment for diagnosis and monitoring of NCDs <ul style="list-style-type: none"> • Question 6.5 (DHMT) 		<ul style="list-style-type: none"> • Frequency • Percentages

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		<ul style="list-style-type: none"> • Question 6.4 (OPDs) • Question 6.4 (Healthcare centres) 		
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of functional equipment for diagnosis and monitoring of NCDs at the OPDs and the healthcare facilities.	Functional equipment for diagnosis and monitoring of NCDs <ul style="list-style-type: none"> • Question 6.5 (DHMT) • Question 6.4 (OPDs) • Question 6.4 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities.	Frequency of availability of adequate transportation in the management of NCDs.	Availability of transportation <ul style="list-style-type: none"> • Question 6.3 (MOH) • Question 6.1 (DHMT) • Question 6.1 (OPDs) • Question 6.1 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the availability and management of infrastructure and equipment used for NCDs at health facilities. To assess the restoration of health infrastructure and equipment at different levels of healthcare.	Frequency of availability of adequate resources to maintain transportation at the DHMT, OPDs and the healthcare centres.	Availability of resources to maintain transportation <ul style="list-style-type: none"> • Question 6.4 (MOH) • Question 6.2 (DHMT) • Question 6.2 (OPDs) • Question 6.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages
To assess the profile of pharmacists in the management of NCDs.	Frequency of availability of pharmacists involved in the management of NCDs in the sectors of the health system of Lesotho.	Availability of pharmacists in sectors of the health system of Lesotho <ul style="list-style-type: none"> • Question 7.1 (MOH) • Question 7.1 (DHMT) 		<ul style="list-style-type: none"> • Frequency
To assess the profile of pharmacists in the management of NCDs.	Frequency of reasons for unavailability of pharmacists in some sectors of the health system of Lesotho.	Reasons for unavailability of pharmacists in some sectors of the health system of Lesotho		<ul style="list-style-type: none"> • Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
		<ul style="list-style-type: none"> Question 7.2 (MOH) Question 7.2 (DHMT) 		
To assess the profile of pharmacists in the management of NCDs.	Frequency of availability of pharmacists involved in the management of NCDs in OPDs and healthcare centres.	Availability of pharmacist involved in the management of NCDs <ul style="list-style-type: none"> Question 7.1 (OPDs) Question 7.1 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the profile of pharmacists in the management of NCDs.	Frequency of availability of the pharmacist in the healthcare centre pharmacy.	Availability of pharmacist at the healthcare centres pharmacy <ul style="list-style-type: none"> Question 2.22 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the profile of pharmacists in the management of NCDs.	Frequency of the need for the pharmacist in the healthcare centre pharmacy.	Need of pharmacists in healthcare centres <ul style="list-style-type: none"> Question 2.23 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the profile of pharmacists in the management of NCDs.	Frequency of motivation of why a pharmacist is needed in the healthcare centre pharmacy.	Motivating for the need of pharmacist <ul style="list-style-type: none"> Question 2.24 (Healthcare centres) 		<ul style="list-style-type: none"> Frequency Percentages
To assess the role of pharmacists in the management of NCDs.	Frequency of activities currently being carried out by pharmacists in the management of NCDs at the pharmaceutical directorate and the NCD unit.	Activities carried out by pharmacists at the national level <ul style="list-style-type: none"> Question 7.4 (MOH) 		<ul style="list-style-type: none"> Frequency

Objectives	Measurement	Variable / Question number		Statistical analysis
		Categorical	Continuous	Descriptive
To assess the role of pharmacists in the management of NCDs.	Frequency of activities currently being carried out by pharmacists in the management of NCDs at the DHMT, OPDs and the healthcare centres.	Activities carried out by pharmacists at the district and the PHC levels <ul style="list-style-type: none"> • Question 7.3 (MOH) • Question 7.3 (DHMT) • Question 7.2 (OPDs) • Question 7.2 (Healthcare centres) 		<ul style="list-style-type: none"> • Frequency • Percentages