Documentation of medicine logistics in primary health care clinics in the Dr Kenneth Kaunda district

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ABSTRACT

Title: Documentation of medicine logistics in primary health care clinics in the Dr Kenneth Kaunda district

Keywords: Primary health care, essential medicine, availability, health care services, documentation systems, medicine logistics, sub-district pharmacists, clinic managers, Dr Kenneth Kaunda district, standard operating procedures, budgets, nurses, clinic managers

Health systems throughout the globe face challenges with rising drug costs, decisions regarding the implementation of new drug therapies or using conventional drug therapies, access to drugs across different income groups and geographical barriers (Govindaraj *et al.,* 2000:5; Wiedenmayer *et al*., 2006:6). South Africa is an upper middle income developing country with an estimated population of 50.59 million, facing major challenges in the health sector (WHO, 2011:170; Engelbrecht & Crisp, 2010:18; Stats SA, 2011:2; Dambisya & Modipa, 2009:4). In South Africa the second largest expenditure item in the health system is medicine (DOH, 2011:68). Managing drug supply is essential and managers should focus on procurement, selection, distribution and use to ensure uninterrupted supply.

The general objective of this study was to investigate the current documentation systems in the Dr Kenneth Kaunda district regarding medicine logistics.

A mixed method study was done to record information using survey forms and doing observations in primary health care clinics and community health care centres within the DKK district. The research period was from 1 January 2010 until 31 March 2012.

The results revealed that the availability of pre-selected essential drugs within PHC clinics were above 80% except for ibuprofen tablets that were only available in 68% of the clinics. Clinic managers indicated that the majority of the required services are rendered within clinics in the DKK district. Twenty seven of the thirty four services mentioned in the research study were provided in 77% of the clinics.

Daily clinic registers are used in 55% of the clinics to capture patient information. According to the results, 53.85% administration clerks, 42.31% professional nurses and 7.7% health councillors are responsible for completing patient registers upon entering the clinic. The results revealed that recorded patient information is used for statistical purposes (67%) and DHIS (25%). The results revealed that professional nurses within the DKK are responsible for dispensing medicines, and SOP's for dispensing are used in 70% of these clinics. The results also revealed that 80% of registered nurses are responsible for maintaining the

medicine room. According to the results, medication is stored in the medicine rooms (30%), consulting rooms (27%) and store rooms (5%). Results revealed that 75% of clinics used standard operating procedures to order their medicine stock and are managed by 23% of sub-district pharmacists, 35% of professional nurses and 40% of clinic managers.

The results revealed that minimum and maximum drug estimations, stock cards, frequent stock checking and limiting access to medicine/store rooms to ensure optimum stock levels. The results also revealed that 88% of the clinics in the DKK district had no computer systems. Sub-district pharmacists play an essential role in monitoring budgets, supplying essential medicine, improving quality of care, managing expired stock and visiting clinics on a routine basis.

The limitations for this study were stipulated and recommendations for further research regarding medicine logistics were also made.

OPSOMMING

Titel: Dokumentasie van medisyne logistieke in primêre gesondheidssorg klinieke in die Dr Kenneth Kaunda distrik

Sleutelwoorde: primêre gesondheidsorg, essensiële medisyne, beskikbaarheid, gesondheidsorg dienste, dokumentasie sisteme, medisyne logistieke, sub-distrik aptekers, kliniekbestuurders, Dr Kenneth Kaunda distrik, geskrewe standaard werkmetodes, begrotings, verpleegsters, kliniekbestuurders

Gesondheidsisteme regoor die wêreld beleef tans uitdagings rakende stygende geneesmiddelkoste, implementering van nuwe en kovensionele geneesmiddelterapieë, toegang tot geneesmiddels vir verskillende inkomste groepe en geografiese grenspale Govindaraj *et al.,* 2000:5; Wiedenmayer *et al*., 2006:6). Suid-Afrika is ’n middelinkomste, ontwikkelende land met ‘n geskatte bevolking van 50.59 miljoen wat groot uitdagings in die gesondheidsektor beleef (WHO, 2011:170; Engelbrecht & Crisp, 2010:18; Stats SA, 2011:2; Dambisya & Modipa, 2009:4). Medisyne is Suid-Afrika se tweede grootste uitgawe in die gesondheidsisteem (DOH, 2011:68). Die voorsiening van medisyne is essensieël en bestuurders moet veral fokus op die verkryging, seleksie, verspreiding en gebruik om ononderbroke voorsiening te verseker.

Die algemene doelwit van hierdie studie was om die huidige dokumentasie sisteme rakende medisyne logistieke in die Dr Kenneth Kaunda distrik te ondersoek.

‘n Gemengde studiemetode was gebruik vir data versameling in primêre gesondheidsorgklinieke en gemeenskaps gesondheidsorgsentrums in die DKK distrik. Die navorsingstydperk het gestrek vanaf 1 Januarie 2010 tot 31 Maart 2012.

Die resultate het getoon dat die beskikbaarheid van vooraf geselkteerde essensiësele medisyne in primêre gesondheidsorgklinieke was 80% en hoër, behalwe vir ibuprofen tablette wat net in 68% van die klinieke beskikbaar was. Kliniekbestuurders het aangetoon dat die meerderheid noodsaaklike in klinieke in die DKK distrik uitgevoer word. Sewe-en-twintig van die 34 dienste wat gemeld is gedurende die navorsingperiode is in 77% van die klinieke uitgevoer.

Daaglikse kliniekregisters word in 55% van die klinieke gebruik om pasiëntinligting te dokumenteer. Volgens die resultate, is 53.85% administrasie klerke, 42.31% professionele susters en 7.7% gesondheidraadgewers verantwoordelik vir die voltooiing van registers wanneer pasiënte die kliniek besoek. Die resultate het getoon dat gedokumenteerde

pasiëtinligting in 67% van die gevalle gebruik word vir statistiese doeleindes en in 25% van die gevalle vir die distrik gesondheidinligtingsisteem.

Kliniekbestuurders het getoon dat professionele susters in die DKK distrik verantwoordelik is vir die reseptering van medisyne, en in 70% van die klinieke word geskrewe standaard werkmetodes gebruik om te resepeteer. Volgens die resultate, word medisyne in 30% van die klinieke in die medisynekamer gestoor, 27% van die gevalle in konsultasiekamers en in 5% van die gevalle word medisyne in die stoorkamer gestoor. Resultate het getoon dat 75% van die klinieke geskrewe standaard werkmetodes gebruik om medisyne te bestel. Die prosedure word in 23% van die klinieke deur sub-distrik aptekers, in 35% klinieke deur professionele susters en in 40% van klinieke deur kliniekbestuurders bestuur.

Resultate het getoon dat die minimum en maksimum vasstelling van medisyne, voorraadkaarte, die gereelde nagaan van voorraad, en die beheer van toegang tot die medisyne-/stoorkamer optimum voorraadvlakke verseker. Die resultate het getoon dat in 88% van die klinieke in die DKK distrik geen rekenaarsisteme geïnstalleer was nie, die klinieke gebruik bestelvorms en binkaarte om medisyne te bestel vanaf die hospitaal. Die resultate het ook getoon dat die sub-distrik apteker 'n breë praktiseringsveld. Begrotings speel 'n belangrike rol in medisyne logistieke. Dokumentasie sisteme is belangrik in die bestuur van medisyne logistieke.

Die tekortkominge van die studie word gegee en aanbevelings vir verdere navorsing aangaande medisyne logistieke.

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LIST OF ABBREVIATIONS

ANC	African National Congress
ARV	Antiretroviral drugs
CHC	Community Health Centre
COPC	Community-Orientated Primary Care
DHS	District Health System
DHIS	District Health Information System
DKK	Dr Kenneth Kaunda
DOB	Date of Birth
DOH	Department of Health
DSM	Drug Supply Management
DSMIS	Drug Supply Management Information Systems
EDL	Essential Drugs List
GNP	Gross National Profit
GPP	Good Pharmacy Practice
HIS	Health Information System
HPCSA	Health Professions Council of South Africa
HST	Health Systems Trust
MCC	Medicines Control Council
MDG	Millennium Developmental Goals
NCS	National Core Standards
NDOH	National Department of Health

NDP	National Drug Policy
NHA	National Health Act
NHS	National Health System
NWP	North West Province
PHC	Primary Health Care
SANC	South African Nursing Council
SAPC	South African Pharmacy Council
SD	Standard deviation
STG	Standard Treatment Guidelines
WHO	World Health Organization

LIST OF DEFINITIONS

Clinic

A clinic is a static structure and nurse driven which renders basic health services (DoH, 1996:69). Clinics are entry level health facilities in South Africa, varying in size, staffed by nurses, providing health services to the need of the community (Benatar *et al.,* 2004:432).

Community Health Centre (CHC)

Delivers 24-hour care, is a fixed structure and provides a greater variety of health care services than a clinic (DOH, 1996:70). CHC's are in the health structure continuum between a fixed clinic and district hospital. As mentioned they provide a wider variety of health services, are open 24-hours in a seven day week, they have an emergency unit and a full-time/resident doctor available (Benatar *et al*., 2004:432).

District

According to OALD (2010:339) a district is "*an area of a country, town or state that has official boundaries (=borders), for administrative purposes."*

Essential Drug List (EDL)

According to the WHO (2002:16), "essential medicines are those that satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford. The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations; exactly which medicines are regarded as essential remains a national responsibility."

Health district

Forms part of a local government and takes over the responsibilities of the central ministry of health, it is large enough to approve investment and management costs but small enough to monitor demographic and socioeconomic factors (WHO, 2010:1).

Logistics

According to Stanley (1999:3), *"logistics are the management of the way resources are moved to the areas where they are required."*

National Core Standards

The Office of Standards Compliance developed the National Core Standards for Health Establishments in South Africa, to assist in setting a benchmark for quality care against which delivery of services can be monitored (DOH, 2011:8).

National Drug Policy

The NDP was launched in 1996, and in correlation with the National Health Policy aims to provide health for all (Dennill *et al.,* 1998:185).

Primary Health Care (PHC)

According to the World Health Organization (1978:4-5), PHC is essential care that is universally attainable to individuals in a community. It forms a fundamental part of the country's health system along with social and economic development of the community. It is the first level of contact of individuals from the community with the national health system, and constitutes the first level of a continuing health care service.

Supply chain

The network of retailers, distributors, transporters, storage facilities, and suppliers that participate in the sale, delivery, and production of a product (Staley, 1999:3).

Prescribing

According to the Nursing Act, 1978 (50 of 1978) prescribing is defined as *"giving the written directions regarding those treating, nursing care, co-ordinating, collaborating and patient advocacy functions essential to the effective execution and management of the nursing regimen."*

Treatment

Treatment is defined as "*selection and performance of those therapeutic measures essential to the effective execution and management of the nursing regimen"* (Nursing Act, 50 of 1978).

PHC facility manager

A staff member appointed to manage activities and personnel within the PHC clinic, referred to as the sister in charge (DOH, 2009:11).

Supervisor

A manager appointed to observe and facilitate activities within a PHC clinic and ensuring the activities are executed according to standards (DOH, 2009:11).

Utilisation rate

It is an indicator that measures rate at which PHC services are utilised by the catchment population, represented as the average number of visits per person per year in the catchment population (Day *et al*., 2012:263).

Chapter 1

Orientation to the study

"Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity." (World Health Organization, 1978)

Figure 1.1: Outline for Chapter 1

1.1 Introduction

All human beings could benefit from medicines when used correctly, and should have access to necessary medicines when needed. According to the Patients' Rights Charter of South Africa every patient has the right towards health care, which includes access to medicine (Department of Health, 1996a).

1.2 International views on Primary Health Care

Health care was universally in pandemonium during the early 1970s with disintegrated health systems (Dennill *et al.,* 1998:2), hence the Primary Health Care (PHC) concept emerged (Schaay & Sanders, 2008:4). In 1978 the Declaration of the Alma-Ata addressed PHC, a core issue, emphasising the World Health Organisation's (WHO) goal – Health For All. The PHC approach is essential and focuses on health districts, and acts as a driver for the health care delivery system (World Health Organization, 2007:5). Governments adopted the PHC concept, after the Alma-Ata conference in 1978, and goals were set to achieve Health For All by the year 2000 (Kurian *et al*., 2009:2). The quality of provided PHC has been neglected in developing countries in the past; following the Alma-Ata declaration in 1978 access to health services were more equated and adequate PHC was provided through health service coverage (Bamford, 1997:9).

Governments are continually reassessing their roles and responsibilities in framing and implementing health policies in relation to population health, organising and delivering health care (World Health Organization, 2003). Equity in health remains an important goal for health systems and the delivery of health care (World Health Organization, 2003).

Non-governmental organisations have traditionally played an active part in the delivery of PHC. The key to an effective PHC model in the near future will be the ability to adapt to rapid changing circumstances, responsiveness to defined needs and sufficient resources (World Health Organization, 2003). Regions across the world have implemented primary health care concepts, which will be briefly discussed. Regions of the Americas have embraced PHC in order to provide Health For All. The concept of the Alma-Ata has contributed to improve access to essential services. Although a lot of progress has been made there are still countries that have not benefited from the progress made by the Region, due to political, social and economic crises (World Health Organization, 2003).

Despite different demographic profiles, economic and social challenges within the South-East Asia Region, the PHC concept is utilised throughout the region. Major improvements in

coverage and access have taken place as well as the general health status of the population and community development (World Health Organization, 2003).

PHC has varied across the European Region due to different health care systems (World Health Organization, 2003). Since 1980 the Region has used a PHC approach to reach their goal: Health For All. Eastern Europe has been bombarded with many political changes that influenced health care tremendously. The official health care system is differentiating between countries, although the overall trend is to integrate healthcare components into a systems approach (World Health Organization, 2003).

The PHC movement was restated at the first PHC conference in the Arab world in February 2003. Several efforts have been launched by countries within the Eastern Mediterranean Region to reorganise PHC: increased reliance on a sub-national approach, strengthening and employment of a government official and district capacities in planning, finance and management (World Health Organization, 2003).

Western Pacific Regions have diversity in implemented PHC models. PHC has been implemented in the strategic planning in most of the countries within the region, hence the relevancy of fundamental PHC concepts (World Health Organization, 2003).

Health outcomes and the persistence of inequity still remains a major concern within developing countries. Many diseases can be prevented and cured with affordable technologies. Attaining drugs, vaccines, information, and other forms of prevention, care or treatment to those who need them is difficult because of timely procurement, reliable drugs, sufficient quantities and reasonable costs of drugs World Health Organization, 2007:1-2).

There are six building blocks that the WHO identified to achieve their goals for an effective health system which is illustrated in figure 1.2. All of the mentioned building blocks below are needed to improve outcomes, these six building blocks construct the WHO's health system framework (World Health Organization, 2007:3):

- Service delivery

Delivering health services where interventions are effective, safe, of good quality, and can be provided at any time and place to those who need them, with a minimum waste of resources.

- Health workforce

Obtaining the best health outcomes, given the available resources and circumstances, the health workforce has to be responsive, fair and efficient.

- Health information system

It is important for such systems to function optimally in order to ensure the production, analysis, distribution and use of reliable and relevant information on health causes, performance and status.

- Medical products, vaccines and technologies

Equitable access to essential drugs and technology is substantial, and must be of acceptable quality, safety, efficacy and cost-effective, ensuring a well-functioning health system.

- Health financing

Adequate funds are needed to maintain a functioning health system, to ensure that people can benefit from it and to protect them from financial catastrophe.

- Leadership and governance

Strategic policy frameworks need to be implemented by governments to ensure the provision of appropriate regulations.

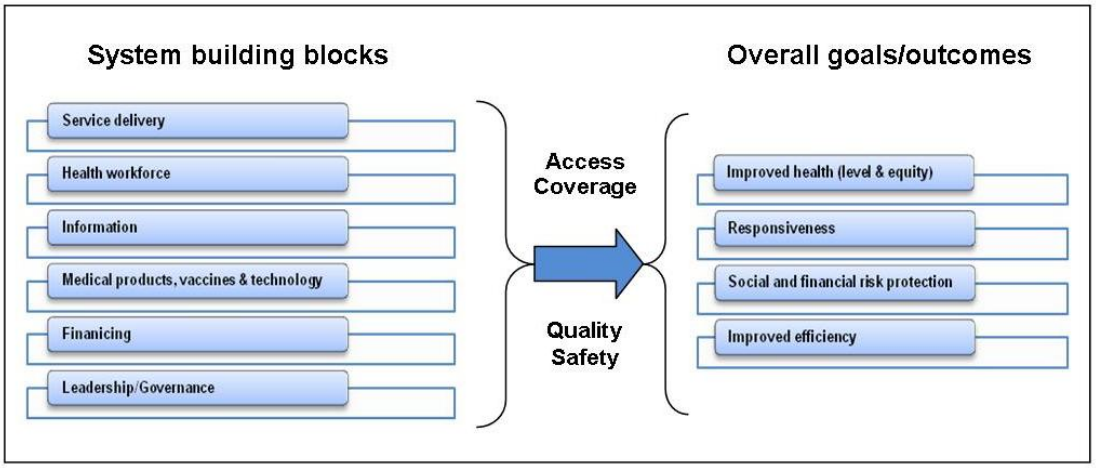


Figure 1.2: The WHO health system framework

In a broad spectrum of health systems it is important to utilise existing resources to the maximum. Health care workers could be more productive if they have access to critical material, information, defined roles, responsibilities, supervision and an ability to delegate tasks appropriately (World Health Organization, 2007:8).

According to a recent survey done in 39 mainly low- and low-middle-income countries, the availability of essential drugs in the public sector was 20%, whilst the availability in the private sector is 56% (World Health Organization, 2007:9). An estimated 50% of medical equipment in developing countries is not used, either because of a lack of spare parts or maintenance, or because of health care workers' lack of knowledge on operating equipment (World Health Organization, 2007:9). The health care sector is bombarded with the introduction of new medicines, vaccines and technologies; this causes strain on staffing, training, health financing and service delivery (World Health Organization, 2007:10).

Mentioned earlier equitable access to essential drugs and technology is substantial, and must be of acceptable quality, safety, efficacy, scientifically sound and be cost-effective, ensuring a well-functioning health system. According to the World Health Organization (2007:20), the following are needed to attain the mentioned objectives:

- National policies, standards, guidelines and regulations;
- International trade agreements and to discuss prices;
- Trustworthy manufacturing practices and quality assessment;
- Procurement, supply, storage and distribution systems; and
- Rational use of essential medicines, commodities and equipment using guidelines to assure adherence, reduce resistance and maximize patient safety.

African regions still face major constraints, although certain output indicators for selected disease-control programmes have improved, equity and access to health care is still limited.

1.3 History of PHC in South Africa

In the early 1940's the Pholela Health Centre model, the forerunner to community-orientated primary care, was of the earliest demonstration efforts to conceptualise the practice of PHC (Kautzky & Tollman, 2008:18). The health system mentioned had its own strengths and weaknesses and caused many practitioners to emigrate, and caused the system to collapse by 1960

(Kautzky & Tollman, 2008:20). During the Soweto upraise in 1976, PHC nurses took initiative to manage PHC clinics and to provide essential health services at clinic level, changing the course of health care at clinic level in the South African system (Kautzky & Tollman, 2008:22).

During 1977 and 1978 the Health Act was divided in two main streams, where curative services were the responsibility of the provinces opposed to preventative measures that were the responsibility of the local government, hence the Alma-Ata Declaration failed to have an effect on a fragmented health system in South Africa (Coovadia *et al*., 2009:820).

The apartheid era caused two developmental issues in the country's' health system: racial fragmentation, segregation and discrimination of health services and the deregulation of the South African health sector (Kautzky & Tollman, 2008:20; ANC, 1994:7; Dambisya & Modipa, 2009:4; Thomas *et al*., 2004:3). In 1994, after the African National Congress (ANC) was elected as the new ruling democratic party, they introduced a people-orientated health care system – a PHC system – that was "free" at public level for all South Africans at the point of delivery (Kautzky & Tollman, 2008:18; Coovadia *et al*., 2009:820; Mashiri *et al*., 2009:164).

The ANC initiated a National Health System premised on a PHC approach, framed by the Alma Ata Declaration, of which the principles restructured the health system (ANC, 1994:19; 23). A single Ministry of Health was implemented to integrate all health services, to decentralise health services through a district health system (DHS), and to make PHC facilities accessible and free of charge to all South Africans since 2006 especially in rural areas and deprived communities (Kautzky & Tollman, 2008:23; ANC, 1994:19, Harrison, 2009:14).

Accomplishing a unitary Ministry of Health was fairly easy; but integrating local and provincial health systems at district level was laden with unforeseen obstacles (Kautzky & Tollman, 2008:23). In the 1996 Constitution great uncertainty rose because of a local government burdened with primary health services, and a provincial government with comprehensive health service provision; this created confusion amongst entities because of unclear role classification (Kautzky & Tollman, 2008:23).

In 2004 a National Health System was legislated by the National Health Act (61 of 2003):

- The public and private sector was incorporated

- Providing equitable health-care services for patients not belonging to a medical scheme; and
- Establishing a DHS in order to implement PHC throughout South Africa (Coovadia *et al*., 2009:820).

1.4 Current PHC structures in South Africa

The Constitution of the Republic of South Africa Act (108 of 1996) states that "*everyone has the right to have access to health care services"* (South Africa, 1996b). PHC clinics form the cornerstone for the delivery of health services utilised by the Department of Health (South Africa, 2010:ii). Providing better quality care is essential in South Africa's current predicament with ineffective health outcomes; of equal importance is the restoration of health personnel and patients' confidence in the health care system (Motsoaledi, 2011:5). Policy and practice present gaps at PHC level and improving PHC services are noted to hindered (Barron *et al.*, 2003).

Despite major improvements over the past 17 years, there are still some interventions needed, to provide patients with acceptable and proper health care (Motsoaledi, 2011:5). According to Matsoso (2011:6-7), South Africa faces major challenges in providing health care to all and to reach outcomes linked to the Millennium Development Goals (MDG). National Core Standards have been established to deliver decent, safe and quality care and to bridge the policy-implementation gap, and is seen as the basis for quality (Lourens, 2012:3).

The National Health Act (61 of 2003) states that developing structures to monitor health establishments with health care standards will cultivate quality health services (Hassim *et al*., 2008:xi). The National Core Standards are divided into seven domains: the first three domains are directly involved in health systems for delivering quality care to the citizens of South Africa, whilst the remaining domains are the support vehicle that ensures core standards are met (Department of Health, 2011a:10). Figure 1.3 indicates the structure of the South African health sector. The NHA passed in 2004, transformed the health system by entrusting provinces to co-ordinate the DHS and PHC (Coovadia *et al*., 2009:828). The mentioned movement within the DOH caused local authorities to abandon their preventative and promotive health functions (Coovadia *et al*., 2009:8209).

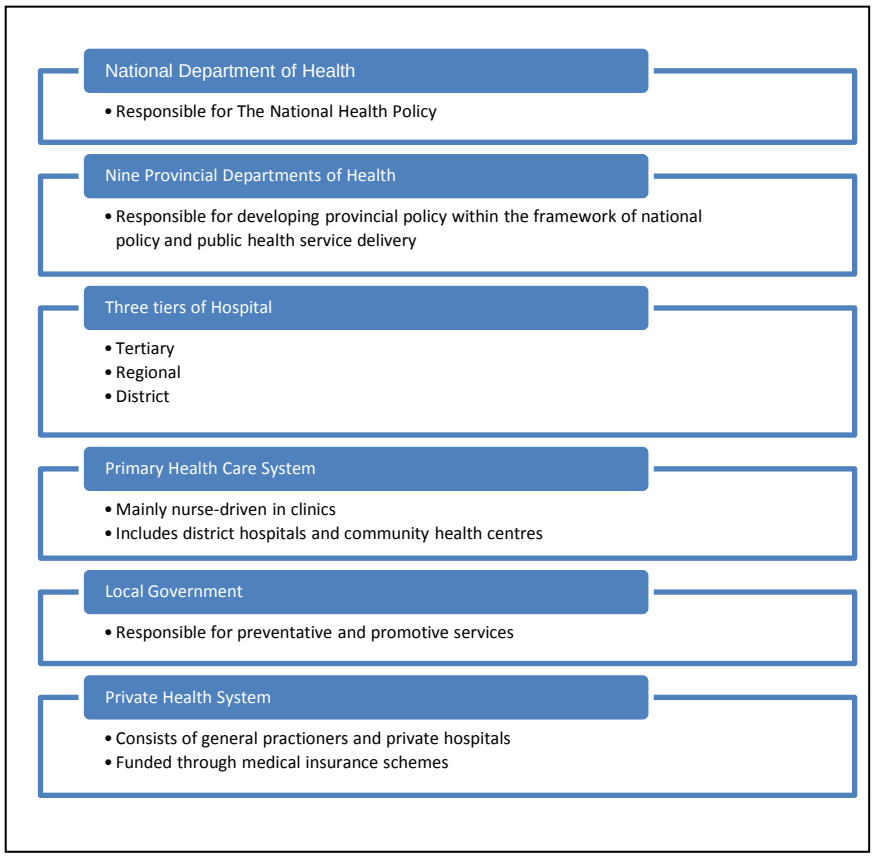


Figure 1.3: Structure of the South African Health Sector

The distribution of health facilities in South Africa does not comply with the WHO norm of 10 000 population per clinic, the country's population per clinic is estimated at 13 718. In 2009 there were 3595 clinics and 332 CHC's in South Africa (Department of Health, 2010b:16).

Annually 8% or more of the gross national profit (GNP) is spent on the National Health System (private and public sector) (Department of Health, 2007:2). On average 60% is spent on the private sector which constitutes 20% of the population where as 80% of the population relies on health care provided by the public health care system and only receives 40% of the expenditure (Department of Health, 2007:2; Dambisya & Modipa, 2009:2). From 2002 until 2010 there has been a considerable growth in the number of pharmacists employed in the public sector (1234-3285) in South Africa hence the introduction of a prerequisite of one year of community service for all health professions by the Department of Health (Department of Health, 2011b:22; Bheekie *et al.,* 2011:2547). Assisting the public sector with high quality health care professionals and relieving pressure that exist within PHC facilities.

Figure 1.4 below illustrates the structure that will be followed to measure the standards that have been set in each domain (Department of Health, 2011:16).

Figure 1.4: Seven domains of the National Core Standards

According to Matsoso (2011:14), a price reduction strategy was adopted, which managed to save on antiretroviral drugs (ARV's) and will be applied to other essential drugs in the public sector. Six priorities have been identified for the first phase of implementing the National Core Standards:

- Facilities that are clean and hygienic;
- Reduce queues;
- Minimize waiting times;
- Amend the safety of patients;
- Acquired infections in facilities must be restricted; and
- Essential medicines must be attainable through adequate procurement and supply management (Matsoso, 2011:7; Engelbrecht & Crisp, 2010:202).

The National Health Act (61 of 2003) authorizes the Minister of Health to merge the current health system and transform it into a system for universal coverage. He also stated that funding will be allocated and the necessary health service delivery mechanisms will be implemented to create an efficient, equitable and sustainable health system in South Africa (Engelbrecht & Crisp, 2010:18). The National Health Minister, Minister Motsoaledi set an agenda for the country in which one of the main aspects were to improve health system effectiveness (Engelbrecht & Crisp, 2010:19).

The agenda must be supported by clearly defined health policies, and the development of national, provincial and district health strategies that in turn guide resourcing. There are

currently 237 sub-districts in South Africa of which, 20% are defined as very deprived and attention needs to be given to resources, access to services and development (Coovadia *et al*., 2009:827).

Quality health care is the key to the development of any nation in the world, therefore, health care services should be available and accessible to those who are in need regardless of their socio-economic and geographical location (South Africa, 2010:ii).

1.5 Department of Health: South Africa

The central goal of the government in terms of healthcare services is to improve access to health services and achieve superior clinic and patient outcomes for the public sector (Department of Health, 2009:20). One of the goals of the government is to introduce the National Health Insurance (NHI) system. The NHI system will be based on:

- Health coverage for all;
- Containment of costs;
- Health care financing that is equitable;
- Risk equalisation; and
- Simplified administration (Department of Health, 2009b:20).

South Africa's health care system operates as a two-tier system:

- Private health care sector that caters for 20% of the South African population and funded by medical insurance; and
- Public health care sector (operates as a quasi-federal system) that supports 80% of the population, thus services are free at PHC level, but patients are charged at secondary and tertiary levels proportional to income (Patel *et al*., 2008:549).

In order to maintain an accessible, caring and high quality health system certain structures must be followed to achieve key priorities. Legislative mandates and policy frameworks used during the course of the study will be discussed in detail in Chapter 2:

- Constitution of the Republic of South Africa Act (108 of 1996);
- National Health Act (61 of 2003);
- Pharmacy Act (53 of 1974); and
- Nursing Act (33 of 2005).

Policy frameworks:

- National Drug Policy;
- National Core Standards;
- Millennium Development Goals;
- Good Pharmacy Practice (GPP);
- Drug Supply Management Information Systems (DSMIS);
- The Primary Health Care Package for South Africa: a set of norms and standards; and
- Standard Treatment Guidelines (STG) and Essential Drug List (EDL).

South Africa is an upper middle income developing country with an estimated population of 50.59 million and which faces major challenges in the health sector (World Health Organization, 2011:170; Engelbrecht & Crisp, 2010:18; Stats SA, 2011:2; Dambisya & Modipa, 2009:4). Comparing South Africa's health system to other similar developing countries South Africa is not performing at its best (Engelbrecht & Crisp, 2010:18). South Africa's high health expenditure contradicts the persistently low health outcomes (Schellack *et al*., 2011:559).

According to Kautzky and Tollman (2008:24-26), in order to provide district-based health services in South Africa, critical posts need to be filled, with adequately trained health personnel, in order to maintain primary health care. District health centres and clinics are affected by emigrating health personnel and the rural/urban and public/private inequalities in resources cause's barriers in achieving optimum health. Despite progress over the past 17 years, emerging needs of the population still need to be met by the current district health system because of health outcome differentials. Medicine procurement in the public sector operates on a state tender system (Patel *et al*., 2008:549).

In June 2011 there were 162 630 various health professionals registered with the Health Professions Council of South Africa (HPCSA). The South African Nursing Council (SANC) had 231 086 registered nurses in 2010, whilst the South African Pharmacy Council (SAPC) had 12 813 pharmacists and 9 071 pharmacist assistants registered (Department of Health, 2011b:24). According to the SAPC (2011:8) of the 12 813 registered pharmacists only 29% are practising in the public sector. The Department of Health (2007:3) identified areas in the private as well as public sector that need to receive attention in order to improve quality care (Department of Health, 2011b:3):

- Under-use and overuse of services;
- Preventable errors;
- Scarcity and insufficient use of resources;
- Insufficient diagnosis and treatment;
- Complications regarding the relocation of funds;
- Poor information due to insufficient referral systems;
- Drug shortages and inadequate record keeping; and
- Insufficient delivery systems.

1.6 North West Province: Dr Kenneth Kaunda District

According to Statistics SA's mid-year population estimates (2011:3) the North West province (NWP) comprises only 6.43% (3 253 390) of the total population of South Africa. Expenditure on health personnel in the public sector has increased with 19.5% from 2006/07 to 2010/11 (Department of Health, 2011b:23). There are 0.38 pharmacists per 10,000 population in the public sector, compared to 9.73 pharmacists per 10,000 population in the private sector which gives a total of 1.44 pharmacists per 10,000 population for the North West province (Department of Health, 2011b:29). The province has a low population density with dismantled infrastructures especially in rural areas and regarded as one of the poorest (Cloete, 2010:49). In 2003 a National Primary Health Care Facilities Survey was conducted. Conclusions and recommendations made during the survey, specifically for the North West Province (Reagon *et al*., 2004:5):

- A total of 348 CHC's (Community Health Centre) and clinics were operational in the NWP;
- Communication within the province needed attention;
- Maintenance plans must be implemented;
- Few facilities had a full list of EDL drugs in stock;
- Dispensing data is collected by means of a drug register;
- Enrolled Professional Nurses 129, Staff nurses 19, Nursing assistants 64 in NWP;
- There were no full-time pharmacists or pharmacist-assistants enrolled at the PHC facilities in the NWP;
- 9% of the facilities surveyed in NWP had a working computer; and
- 17% of facilities surveyed in the NWP had all EDL drugs readily available (Reagon *et al*., 2004:5).

In 2008 a decision was made to divide the North West Province into four districts consisting of 21 local municipalities:

- Bojanala Platinum;
- Dr Ruth Mompati;
- Dr Kenneth Kaunda; and
- Ngaka Modiri Molema (Department of Health, 2008:2).

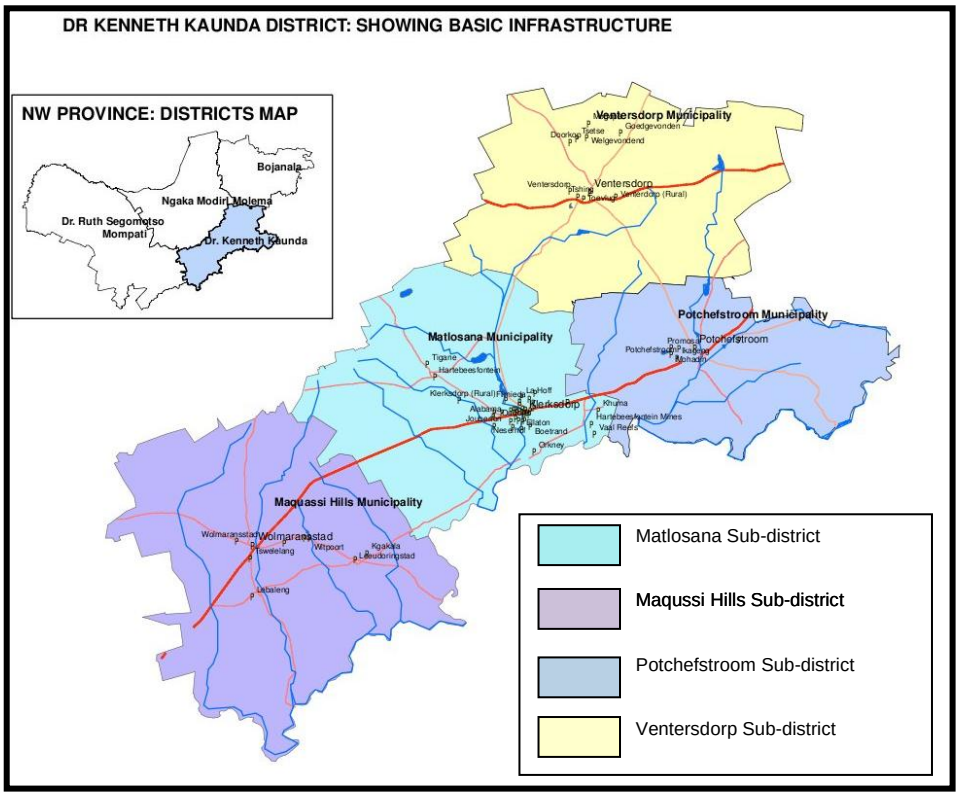


Figure 1.5: A map of the DKK district within the North West Province

The research study undergone was done in the DKK district consisting of four sub-districts as illustrated in figure 1.5 (National Heritage Council, 2009) above:

- Potchefstroom;
- Ventersdorp;
- Matlosana; and
- Maquassi Hills (StatsSA, 2009:7).

The population in the DKK district is 636 165 of which an estimate of 24.1% has medical aid coverage; the 5th highest in the country (Day *et al.*, 2009:199; HST, 2009:251). The nurse clinical workload has decreased from 47.2 to 30.8 patients per nurse per day from 2005/06

to 2008/09 (HST, 2009:251). Effective service delivery depends on the competence of members of the district health management team as well as management teams at PHC clinics, community health centers, public hospitals and other health posts (World Health Organization, 2010a:1; Chopra *et al*., 2009:1029).

South Africa uses a closed tender system for drug procurement in the public sector (Kishuna, 2003:4). The tender process in South Africa is managed at national level with opportunity given to provinces to provide their inputs (Kishuna, 2003:4). Provinces acquire medicines by quantifying their drug requirements derived on the EDL and requests drugs that are not on the list. Once tenders are approved, provinces are then notified to use designated suppliers and purchase from them directly (Patel *et al*., 2008:549).

Distribution of medicine occurs at two levels, first between the manufacturer and distributor to the provincial depot, for the NWP it is situated in Mafikeng (Mmabatho Medical Store). Secondly, hospitals then order their stock on an electronic system (RX Solutions) from stores. Stock is received on a weekly basis from the medicine store, clinics then order stock on a specified list provided by the hospital (manually) and receive their stock biweekly (Patel *et al*., 2008:550). Few studies have been done on distribution of medicine in developing countries, in 2000, less than 1% of the publications on Medline, were related to health services and systems research (World Health Organization, 2007:9; Patel *et al*., 2008:557). Figure 1.6 gives an illustration of the distribution process followed in the DKK district.

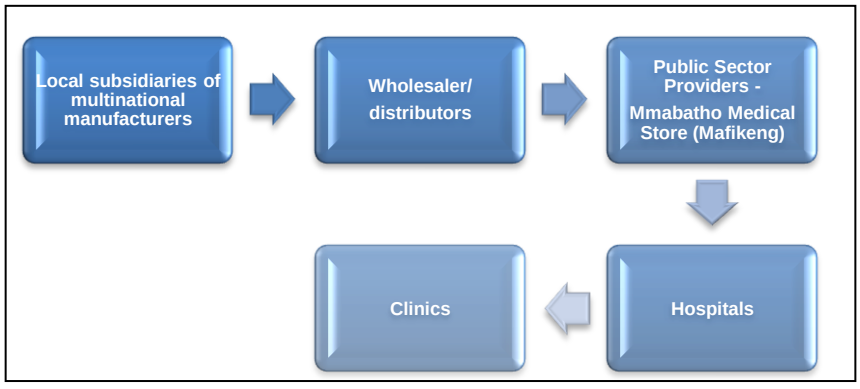


Figure 1.6: Drug Supply Management in Dr Kenneth Kaunda (North West Province)

1.7 Significance of the study

Essential medicines form an integral part of delivering adequate and efficient health care to citizens and reducing the burden of disease (Tetteh, 2007:569). The availability and quality of essential medicine is important for improving public health (Patel *et al*., 2008:547).

Distributing drugs is noted for delivering drugs from the manufacturer to the patient, which includes, ordering, transportation and storage of drugs (Patel *et al*., 2008:548). The availability of too much not needed medicine in the market may lead to a lack of consistent supply of essential drugs (Indian Medical Council, 2002:12).

According to Mashiri *et al.* (2009:170) many hospitals and clinics do not have pharmacists due to scarcity, and some vacancies have not been filled for years on end. Improved communication amongst health personnel and key players in the distribution and supply of medicine is important to ensure quality and eliminate gaps that are currently present (Patel *et al*., 2008:548). In order to achieve the objectives set in the NDP, a strategy needs to be in place in order to improve not only supply and distribution, but also to develop appropriate human resources (Department of Health, 2008:xx). The sustainability, accessibility and availability of essential drugs are essential for the functioning of health services (Indian Medical Council, 2002:17; McCabe *et al.*, 2011:12). Drug and medical supplies inventory management skills are limited (Mashiri *et al*., 2009:170).

Community participation is necessary enabling them to benefit from global advances in medical technology and improve health outcomes (World Health Organization, 2010a:2). According to the World Health Organization (2010a:3), there are three vital components in assuring quality health care services:

- Health infrastructure;
- Medicine technologies; and
- Health technologies.

The challenge still persists in providing, developing and managing effective procurement, distribution and rational use of above mentioned components in order to provide and improve quality services at district and lower levels. Structures to enhance information management systems remain inadequate and progress toward MDGs is vague (World Health Organization, 2010a:3). A major challenge that still burdens South Africa's health system is insufficient human resources and the yearly estimate of 30% pharmacist graduates going abroad undermines the delivery of pharmaceutical services and provision of rational drug use (Schellack *et al*., 2011:560)

1.8 Demarcation of the study field

The study was limited to the PHC clinics (community health centers and static PHC clinics) in the DKK district of the North West province in South Africa. The target group was the sub-

district pharmacists and operational managers/clinic managers of the primary health care clinics. The focus was on documentation systems of medicine logistics at clinic level.

1.9 Research problem

An estimate of 80% of the South African population has access to essential health interventions; despite this figure there are still major improvements to be made. The health services provided at PHC facilities is still burdened by access constraints like:

- Limited operating hours of facilities;
- Insufficient human resources at facilities;
- Income loss due to long waiting hours at clinics;
- Lack of essential medicines at facilities; and
- Poor quality of health services provided (Schellack *et al*., 2011:561).

Major challenges still remain in the health sector, especially for policy makers. Quality care and certain service indicators such as waiting time, patient satisfaction and health management issues must be addressed as it is costly and hinder efficiency (Harrison, 2009:2). The prevention and treatment of chronic diseases are a raising concern in on the health system, emphasising the urgency of new health financing, thus considering a new health mechanism such as the National Health Insurance (NHI) (Harrison, 2009:3).

Utilisation of the National Health Act (61 of 2003), Pharmacy Act (53 of 1974), Nursing Act (33 of 2005), National Drug Policy (NDP), National Core Standards, Millennium Development Goals (MDG), Good Pharmacy Practice (GPP), Drug Supply Management Information Systems (DSMIS), The Primary Health Care Package for South Africa: a set of norms and standards and Standard Treatment Guidelines (STG) and Essential Drug List (EDL) will serve as guidelines and reference to analyse drug management and documentation systems at clinic level. Ultimately recommendations may be provided towards health care personnel to optimise medicine logistics. A total number of 36 clinics out of 43 clinics participated in the research study from the whole of the DKK district (refer to sections 1.13.3.5 and 3.5).

Comprehensive information on health facilities remains a major concern as few surveys or audits have been done on this subject for several years, thus, various research indicate that affordability, access to facilities and quality of care remain inadequate in the public sector (Day & Gray, 2010:311). In 2009, StatsSA performed a General Household Survey, which indicated that there is a low satisfaction rate (54.3%) amongst users visiting public health

care. By provinces, the lowest levels of satisfaction with public healthcare were reported by respondents in the Free State, North West and Mpumalanga (StatsSA, 2009).

The South African pharmaceutical sector reflected on its shortcomings, the lack of equity in access to essential drugs, rising prices, evidence of irrational drug use, losses through malpractice and deficient security, cost-ineffective procurement and logistic practices (Department of Health, 1996:3).

In South Africa the second largest expenditure item in the health system is medicine (Department of Health, 2011b:68). Pharmacists within the public sector are inadequate to manage the supply chain to PHC level (Department of Health, 2011b:68). Most pharmacists seek ideal working conditions and better remuneration packages within the private sector, resulting in under-staffing, increased workload and high vacancy rates (56%) in the public sector (Bheekie *et al.,* 2011:2547-2548). This raises major concerns for medicine logistics, health budgets and the provision of quality health care for all at clinic level.

1.10 Research aim

The aim of the study is to investigate the documentation system used for medicine logistics at the primary health care clinics in the Dr Kenneth Kaunda District in the North West Province.

1.11 Research questions

Some research questions can be formulated according to the above statement:

- What is the availability of essential drugs at PHC clinics in the DKK district?
- What services are provided at PHC clinics in the DKK district?What concepts regarding patients' documentation and medicine logistics are implemented within the PCH facilities in the DKK district?
- What measures are implemented to monitor, document and utilize information regarding medicine stock within the PHC setting?
- What role does the sub-district pharmacists play in the PHC setting including medicine logistics?

1.12 Study objectives

The research study consisted of two phases, namely a literature overview and an empirical investigation. The research objectives of the two phases included the following:

- **Phase 1: Literature study**

The specific research objectives of the literature overview were to:

- make use of the available literature to conceptualise the PHC approach.
- examine current PHC structures within South Africa.
- conclude legislative mandates and policy frameworks that is implemented by the NDOH in South Africa.
- explain the medicine logistics concept within the DKK district.

- **Phase 2: Empirical investigation**

The specific research objectives of the empirical study included the following:

- Evaluate the availability of essential drugs at PHC clinics in the DKK district.
- Indicate services provided at PHC clinics in the DKK district.
- Determine what documentation systems are implemented (including patient and medicine information) within PCH facilities in the DKK district
- Conclude what measures are implemented to monitor, document and utilize information regarding medicine stock within the PHC setting.
- Determine the role of the sub-district pharmacist in the PHC setting including medicine logistics.
- Conclude if SOPs are used in PHC clinics in the DKK district.
- Determine the impact of budgets allocated to PHC clinics on medicine logistics.
- Make recommendations to manage medicine logistics at primary health care level.

1.13 Research methodology

This section will be used to briefly justify the theory that informs the study, substantiate and explain the research methodology, design and ethical considerations undertaken to carry out this research project.

According to Welman *et al*. (2005:ix), the main purpose of research methodology is to explain the nature and process of research in order to enable readers to conduct their own research to find answers to their specific research problems. Health services research is concerned with the relationship between the provision, effectiveness and efficient use of health services and the health needs of the population (Bowling, 2009:6).

The research method was divided into a literature phase and an empirical phase to solve general research questions and objectives and eventually to meet the research aim.

1.13.1 Literature overview

The literature review entails an overview on frameworks that influences the selection, procurement, distribution and distribution of essential medication, and the documentation thereof. The literature review also focussed on guidelines that have been implemented to ensure efficient and quality health care and administration of these processes.

1.13.2 Empirical investigation

After a thorough review of the literature, the researcher compiled questionnaires for clinic managers and sub-district pharmacists to determine what documentation systems are used for medicine logistics at PHC clinics in the DKK district. The researcher did observations in the storerooms/ medicine rooms of the PHC clinics in the DKK district to determine the availability of tracer drugs and factors influencing the quality and availability of these drugs. The empirical investigation comprises several phases with a complete discussion in chapter 3.

1.13.3 Research Design

Research designs are procedures for collecting, analyzing, interpreting, and reporting data in research studies (Creswell *et al*., 2010:58). The final interpretation should be an honest report of the findings as well as a description based on the data that was collected. The study design selected for this study is a mixed method with a quantitative and a qualitative section. The quantitative techniques were dominant, because the focus was to find variables that influence documentation of medicine logistics in PHC clinics. These concepts are now briefly discussed.

1.13.3.1 Mixed methodology research

Mixed methods research is empirical research that involves the collection and analysis of both qualitative and quantitative data (Punch, 2009:288). According to Creswell (2009:203-225), mixed methods utilises the strengths of both qualitative and quantitative research. Mixed methods research also is an attempt to legitimize the use of multiple approaches in answering research questions, rather than restricting or constraining researchers' choices. It is an expansive and creative form of research, not a limiting form of research. Many research questions and combinations of questions are best and most fully answered through mixed research solutions. In order to mix research in an effective manner, researchers first need to consider all of the relevant characteristics of quantitative and qualitative research (Johnson & Onwuegbuzie, 2004:17-18). The mixing of methods or techniques has the advantage of being able to accommodate both the, subjective, where insights, feelings and emotions count and are obtained through the use of qualitative methods, and the specifically numerical quantitative data.

1.13.3.2 Quantitative research

Quantitative research emerged around 1250 A.D. and was driven by investigators with the need to quantify data. Since then quantitative research has dominated the western culture as the research method to create meaning and new knowledge (Williams, 2007:66). Creswell (2009:232) defines quantitative research as a means for testing objective theories by examining the relationship among variables. These variables can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures. According to Johnson and Onwuegbuzie (2004:18), the major characteristics of quantitative research are a focus on:

- Deduction;
- Confirmation;
- Theory/hypothesis testing;
- Explanation;
- Prediction;
- Standardised data collection; and
- Statistical analysis.

According to Williams (2007:66), quantitative research creates meaning through objectivity uncovered in the collected data. Quantitative research can be divided into experimental and

non-experimental designs. For the purposes of this study a non-experimental quantitative approach was followed. Quantitative data includes: instruments, checklists and records (Creswell, 2008:8). According to Sibanda (2009:3) quantitative research projects can generalise concepts more widely, predict results and investigate causal relationships. Quantitative research is empirical research where the data is presented in numbers (Punch, 2009:3).

1.13.3.3 Qualitative research

According to Creswell (2009:232), qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Characteristics of qualitative research as mentioned by (Johnson & Onwuegbuzie, 2004:18) include the following:

- Induction;
- Discovery;
- Exploration;
- Theory/hypothesis generation;
- The researcher is the primary “instrument” to collect data; and
- Qualitative analysis.

The reason for including qualitative research in the study is because it gives the researcher a rich meaningful description rarely in the form of words, which translates data and makes it understandable (Neuman, 2010:177). Qualitative data gives the reader an idea and feel for particular people, events in concrete settings and relies on the principles from interpretive or critical social science (Neuman, 2010:165). Qualitative data includes: interviews, observations, documents and audio-visual materials (Creswell, 2008:8). Data collecting instruments used in this research study were questionnaires and observation.

1.13.3.4 Phases of the study

The data collection process was divided into three phases mentioned below.

- **Phase 1**

During phase one survey A was delivered to operational or clinic managers of PHC clinics in the Dr Kenneth Kaunda district (DKK), depending on the availability of mentioned managers. The questionnaire consisted of open and closed-ended questions.

- **Phase 2**

Phase two consisted of an open-ended questionnaire to determine the role of the sub-district pharmacist in the medicine logistic process.

- **Phase 3**

Phase three was completed by the researcher. Observations were done in the medicine store room and stock cards were photocopied to calculate the percentage availability of pre-determined essential drugs.

1.13.3.5 Study population

The North West Province is divided into four districts: Bonjanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompati and Dr Kenneth Kaunda. Primary health care clinics in the Dr Kenneth Kaunda district were selected for the purpose of the research study. The DKK district is divided into four sub-districts: Potchefstroom, Ventersdorp, Matlosana and Maquassi Hills. The four sub-districts have a joint total of 43 (PHC facilities and CHC centeres), mobile clinics and pharmacies within the hospital where not included in the research study. Due to time constraints, demographic location, services provided and one clinic used for pre-testing, six clinics were left out of the research study. The researcher sent 35 survey forms out to clinic managers within the DKK district, of which 26 returned the survey forms. Observations were done in 25 of the clinics in the DKK district. The following clinics were visited during the research study:

- Potchefstroom sub-district

The sub-district consists of nine clinics, one clinic was used to pre-test the survey form, and thus eight clinics were visited during the research study. Clinics visited within the Potchefstroom sub-district:

- Boiki Tlapi CHC
- Promosa CHC
- Steve Tshwete PHC clinic
- Top City PHC clinic
- Mohadin PHC clinic
- Lesego PHC clinic
- Potchefstroom PHC clinic
- Gateway PHC clinic

- Boskop PHC clinic (pre-test)

During the study the research study the researcher was able to perform observations in all nine clinics.

- Ventersdorp sub-district

There are nine clinics within the sub-district; only four clinics were included in the research study. All of the clinics will be mentioned for integrant purposes.

- JB Marks CHC
- JB Marks PHC
- Gateway PHC clinic
- Magopa PHC clinic
- Rysmierbult PHC clinic (was not included for research purposes)
- Settlement Clinics (Boikhutso, Boikhutsong, Goedgevanden, Welgevanden, Tsetse) (was not included for research purposes)

Observations were done in all of the included clinics.

- Maquassi Hills sub-district

There are eight clinics within the Maquassi Hills sub-district, as with Ventersdorp sub-district the researcher was not able to visit all of the clinics and not all of the clinics could be observed. Clinics within the sub-district:

- Leeudoringstad CHC
- Tswelelang CHC
- Kgakala PHC clinic
- Tswelelang PHC clinic
- Makwassie PHC clinic
- Wolmeranstad PHC clinic
- Segametsi PHC clinic
- Bophelo PHC clinic

Only six of the clinics could be visited for observations (refer to 3.1.5 in chapter 3).

- Matlosana sub-district

There are 16 clinics within the sub-district, 15 clinics were included in the study. The researcher visited seven clinics to perform observations and 12 clinics completed the questionnaires.

- Tigane CHC
- Botshabelo CHC
- Grace Mokhomo CHC
- Jouberton CHC
- Delekile Khoza PHC clinic
- Alabama PHC clinic
- Parkstreet PHC clinic
- Khuma PHC clinic
- Marcus Zenzile PHC clinic
- Stilfontein PHC clinic
- Kanana PHC clinic
- Majara Sephapo PHC clinic (was not included for research purposes)
- Orkney PHC clinic
- Empilisweni PHC clinic
- NM Pretorius PHC clinic
- Tsholofelo PHC clinic

The population for this study was carefully selected (only PHC clinics and CHC centres were for the purposes of this study) due to limited time, travelling costs, distances between clinics and the availability of personnel.

The target population was selected according to the outlay of the questionnaire. The questionnaire was divided into 3 sections, and it was decided by the researcher that each section will be completed by the four sub-district pharmacists and clinic managers as well as observations made by the researcher self within the DKK district.

1.13.3.6 Data collection

According to Sibanda (2009:20) there are two important aspects to remember when collecting data:

- Data collectors must be consistent.

- Data recording must be accurate, and caution must be taken to avoid double entries.

Data collection was concurrent, while the questionnaires were collected at the PHC clinics, observations were made within the medicine/storage room. Due to nurses' workload limited time was available to complete questionnaires and to supervise while the researcher did the observations, thus concurrent data collection was an effective approach. This approach saved time and was more cost-effective because the researcher did not have to revisit the clinics multiple times for data collection. The mentioned approach could have had an influence on the response rate and quality of completed questionnaires, due to respondents feeling rushed, not completing it themselves and the quality of responses. A questionnaire consisting of three sections was distributed amongst the selected participants within the district.

Participants included: sub district pharmacists and operational managers or if absent the clinic manger. Participants were given one week to complete the questionnaires, followed by observations made by the researcher. Each clinic was visited before-hand, to introduce the researcher and explain the significance of the study as well as instructions on completing the questionnaire. Observations were done at each clinic in the medicine rooms and after the observations were done, stock cards were also evaluated. Stock cards of the selected tracer drugs mentioned in Survey C were copied and a physical count was also done. The physical count on the day that the observations were made was compared to the stock cards' last entry. Stock cards could not be copied at all of the 35 clinics, due to limited time of sub-district pharmacists, personnel shortages and the availability of stock cards. In prior mentioned cases the researcher still counted the stock to provide an overview of the availability of tracer drugs (core drugs that have to be available in clinics at all times) at clinics where stock cards could not be photocopied.

1.13.3.7 Study limitations

Due to time constraints, demographic location and relativity of the study some clinics were excluded from the study, like mobile clinics, settlement clinics and hospital pharmacies. In some cases new clinic managers were employed and didn't know about the questionnaires and the researcher had to inform them thus prolonging the process. In some cases clinic managers were unavailable because of meetings and training and the researcher had to revisit clinics delaying progress. Some questionnaires were not completed by the sub-district pharmacist due to extensive workload at the hospital pharmacy. The researcher had to

schedule appointments with each sub-district pharmacist to inform them of the research study. The sub-district pharmacists had to accompany the researcher to all the clinics' during the first phase. During the second phase the researcher went to do observations in the clinics store rooms/medicine rooms and to collect questionnaires. This amounted to a delay in processing results.

1.13.3.8 Research period

The study was conducted over a period of 32 weeks. Data were collected between March 2011 and October 2011. The reason for the extensive period was due to clinic managers that received questionnaires and didn't have time to complete them in time, thus the researcher had to visit clinics more than once in order to collect questionnaires. In some cases new clinic managers were employed and didn't know about the questionnaires and the researcher had to inform them thus prolonging the process.

1.13.3.9 Ethical consideration

Before and during the process of data collection ethical considerations such as voluntary participation, informed consent, safety in participation, privacy, confidentiality, anonymity, trust and withdrawal of participants at any stage must be apprehended at all time. Permission from the North West Department of Health as well as The Ethical Committee of the North-West University was obtained to perform this research study (NWU-00002-12-S5). A more detailed description of the research design and methodology will be discussed in chapter 3.

1.14 Outline of the dissertation

Chapter 1: Orientation to the study

Chapter 2: PHC services and the importance of essential medicine

Chapter 3: Research Methodology

Chapter 4: Results and Data analysis

Chapter 5: Conclusion

1.15 Chapter summary

Chapter 1 explained and clarified the rationale for this research study. The researcher highlighted the uniqueness of this study and explained the key terms that are to be understood within the context of the study. The research design and methodology adopted to investigate the research problem were justified within the chapter. Chapter 2 will provide the reader with insight, regarding medicine logistics within the PHC clinic setting, the role of the sub-district pharmacists and the day-to-day functioning of a PHC clinic.

Chapter 2

PHC services and the importance of essential medicine

2.1 Introduction

Health systems throughout the globe face challenges with rising drug costs, decisions regarding the implementation of new drug therapies or using conventional drug therapies, access to drugs across different income groups and geographical barriers (Govindaraj *et al.,* 2000:5; Wiedenmayer *et al*., 2006:6). According to Byleveld *et al.* (2008:6), international research confirms that the lack of appropriate management of health systems and delivering effective health care are interdependent.

2.2 Global perspective on essential drugs

According to the World Health Organization (2011a:19) the low availability and high cost of essential drugs still persists in developing countries, as surveys indicate that selected generic medicines were available in only 42% of the health facilities in the public sector and a mere 64% in the private sector of low to middle income countries. Priority status must be given to medicines on the National essential medicines list to effectively treat pressing diseases in a country (Hutchings *et al*., 2010:205). According to the WHO (2003:2) less than 20% of the Member States have adequate drug regulation systems, and of the mentioned percentage it is mostly industrialized countries. Essential drugs are important in the prevention and control of diseases (Timmermans & Sharma, 2006:3). A major concern is inadequate access to essential drugs and confounded pharmaceutical expenditures in the developing countries due to prodigal drug supply management (Govindaraj *et al*., 2000:10). Effective use of existing interventions could prevent 70% of the global burden of disease (Kurian *et al*., 2009:3). The efficient supply of essential medicine is crucial and will result in health gains and patient confidence in the health system (Indian Medical Council, 2002:17).

Global health care have been revolutionised by the pharmaceutical industry, but inadequate health systems prevent patients from accessing essential medicines (Management Sciences for Health, 2009:1). According to Brundtland (2003:12), accessing essential medicine depends on key factors:

- Rational drug selection;
- Affordable drug prices;
- Sustainable financing; and
- Reliable supply systems.

According to Timmermans and Sharma (2006:4), rational drug use still raises major concerns:

- One-third of the global population still lack access to essential drugs;
- An estimate of 75% antibiotics is still incorrectly prescribed;
- Patient adherence still remains a global challenge since an average of only 50% take their medication correctly;
- Anti-microbial resistance is threatening the world of medicine especially HIV/AIDS, tuberculosis and malaria; and
- Certain countries still fail drug quality tests, good manufacturing practices, struggling to implement quality assurance and drug regulatory authorities.

Rational drug use still remains a major concern throughout the globe, because of incorrect prescriptions, and patients failing to take medication correctly which contributes to the global spread of antimicrobial resistance (Wiedenmayer, 2006:3). In developing countries pharmaceuticals may constitute up to 40 percent of the health care budget, though there are still countries where people do not have access to essential drugs and limited funds are often spent on unnecessary drugs (Olson, 2012:289). The PHC system cannot thrive without crucial resources like medicines (Kurian *et al*., 2009:2).

Key components for a sustainable and affordable health care system are (Wiedenmayer, 2006:4; Kurian *et al*., 2009:2):

- Public health interventions;
- Pharmaceutical care;
- Rational medicine use; and
- Effective medicine supply management.

The components mentioned above are important and necessary to ensure the safety, efficiency and quality of medicines (Wiedenmayer, 2006:4; Kurian *et al*., 2009:2).

According to Wagstaff and Claeson (2004:111), when it comes to drugs there are a few issues that need to be addressed:

- National shortages;
- Availability of drugs for financially deprived patients;
- Inappropriate prescribing;
- Irrational drug use;
- Insufficient logistics systems; and

- Inadequate and counterfeit quality of drugs.

2.3 General health aspects in South Africa

South Africa's history had a definite effect on health care, health policies and services of the present day (Coovadia *et al.,* 2009:817). In May 1994 the new ruling party after the first democratic elections the ANC inherited a well resourced but fragmented health system in comparison with other middle-income countries (Coovadia *et al*., 2009:828; Rispel & Setswe 2007:4). The main concept of the health plan was to provide health care to the population and that it is in each individual right to achieve optimal health care (Dennill *et al*., 1999:42). Key challenges presented themselves within the public sector in 1994:

- Inequalities in the distribution of infrastructure, financial and human resources between geographical areas;
- Different levels of care have inefficient distribution of resources;
- Over 80% of resources allocated to hospitals; and
- A mere 11% allocated towards PHC services (Coovadia *et al*., 2009:828; WHO, 1999a:6).

Since 1994 allocated resources towards the health-sector have been stagnant, whilst the expenditure in the private sector has increased substantially (Coovadia *et al*., 2009:828). When the ANC came to office in 1994, there was no essential drug concept; a mere 2600 different pharmaceutical products were bought by the public sector which consisted mostly of hospital products (WHO, 1999a:6). The new government achieved several successes, and they transformed the public health system into an integrated, comprehensive national system, to deliver essential health care to previously deprived people (Coovadia *et al*., 2009:828).

The National Health System was established by the Department of Health to ensure that all citizens have access to good-quality health care (ANC, 1994:46-47; Department of Health, 2007:2). The framework is essential for planning, for protecting the public as consumers of health care from exploitation and abuse, and for mediating between conflicting interests. The framework includes the powers, functions, rules and regulations of all the various health authorities and of statutory bodies such as the Medicines Control Council (MCC) and the Councils that register health professionals (ANC, 1994:46-47).

Pharmaceutical personnel in South Africa has been estimated by the WHO at 12 521 in 2010, with a density of 2.8 per 10 000 population (WHO, 2011:122). The NHA (61 of 2003)

was passed by Parliament to ensure that everyone has the right of access to health care services (Hassim *et al.*, 2008:xi).

A major concern still persists regarding the funding of health, thus the ANC is proposing to introduce a National Health Insurance (NHI) system within the next two years (Verwey *et al*., 2009:6). During the 2009/10 financial year, expenditure on health constituted one fifth of the national budget, meaning R17,1 billion is allocated towards the national Department of Health, of which R15,6 is granted to the 9 provinces (Verwey *et al*., 2009:6). The public sector comprises the majority of the patients in the health care system a mere 41,9 million uninsured patients which leads to an estimate expenditure of R84,5 billion (Department of Health 2010a:30).

South Africa is characterised by a two-tier health system, a public sector and private sector; this a perfect model for inequity as the public sector serves about 86% of the population. (Department of Health 2010a:30).

2.3.1 District Health Information System (DHIS)

The demand for health information is increasing as it supplies vital facts to health care personnel in their efforts to make insightful decisions to reach goals (Rommelmann *et al.*, 2005:569; Shaw, 2005:632; Garrib *et al*., 2008:549). A health information system (HIS) is managed by gathering various available data from a variety of sources (Garrib *et al.*, 2008:549). The aim of a HIS is to effectively collect data from public health facilities, to assist with decentralised decision making and to use available resources to improve the overall quality of health and health services in a community (Garrib *et al*., 2008:549; Shaw, 2005:632; Barron *et al.,* 2003). HISs collects, analyzes and converts data to the extent that it could be used to make important decisions or to determine required actions, thus data must be reliable, accurate and timely (Garrib *et al*., 2008:549). The District Health Information System (DHIS) was introduced in South Africa in 1996 and in 2001 it was extended to the entire country (Garrib *et al*., 2008:549).

The DHIS operates on basic principles:

- It assists health care workers in analyzing their levels of service provision;
- Predicting health service requirements;
- Determining if health service targets are reached. (Garrib *et al*., 2008:549);
- It supports the PHC approach;
- Essential collected data is used to calculate valuable indicators; and

- It can be integrated and supports other information systems (Garrib *et al*., 2008:549; Shaw, 2005: 632)

The Initiative for Sub-district Support (ISDS) wrestles with improving technical aspects of PHC delivery, whilst developing and capacitates human resources (Barron *et al.,* 2003). According to Garrib *et al*. (2008:549-550) and Rommelmann (2005:569) the DHIS still needs to overcome certain barriers like submission of data due to:

- Non-delivery of forms;
- Health care workers that have a poor understanding of indicators;
- Collected data quality is unreliable;
- Data summaries are not maintained by facility managers; and
- Feedback to facility personnel is poor.

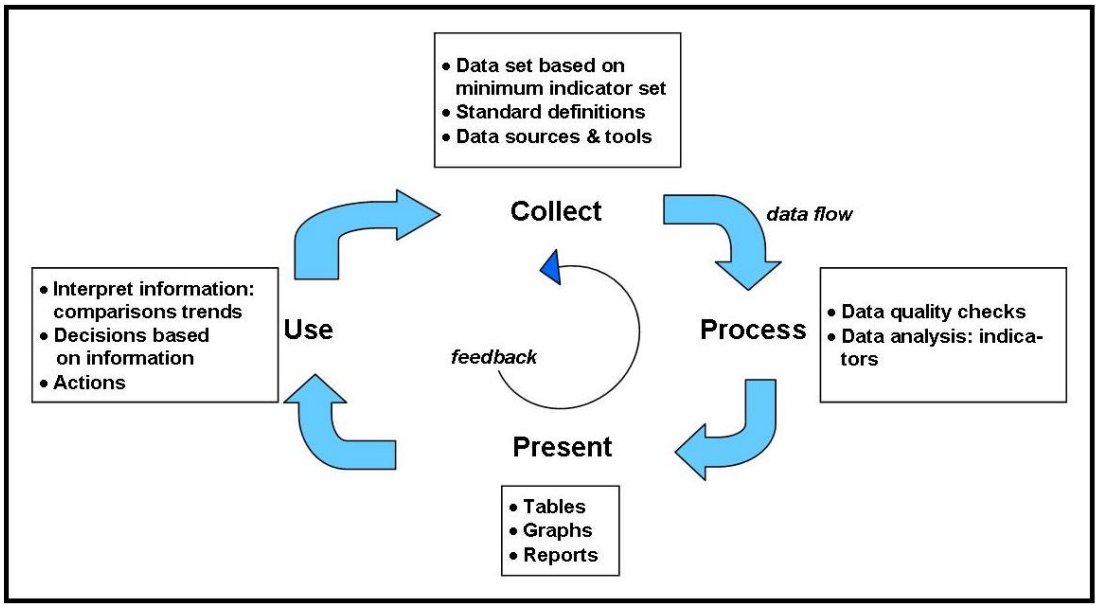


Figure 2.1: The information model cycle

Figure 2.1 illustrates the information cycle adapted by the DHIS (Garrib *et al*., 2008:550). The cycle follows a chronological order. Data on services provided, infrastructure and human resources are collected periodically at public health facilities as part of clinic surveys. A paper-based system of registers, tally sheets and monthly data-collection forms are used to collect data. Data is sent to sub-district or district level, where information is entered into a computer using DHIS software on a monthly basis. Data are analysed and reports are submitted to district, provincial and national level.

Feedback is the responsibility of clinic supervisors and is essential to clinic staff in order to improve services (Garrib *et al*., 2008:550). Health care workers are burdened with heavy workloads and time to collect information is scarce. A major concern is that information-related duties are allocated to junior staff members. Prior mentioned staff members may not consist of adequate skills in recognising problems and taking action to solve them. Dedicated information clerks stationed at each clinic that collects and validates data will improve data quality and relieve the time burden on clinic staff (Garrib *et al*., 2008:552; Shaw, 2005:633).

2.3.2 North West Province: Dr Kenneth Kaunda District

According to the Anon (2009:18), the NW province expenditure for the term 2008/09 on health was 22.6%, slightly lower than the national average (29.2%). The annual population growth rate of the Dr Kenneth Kaunda district has declined since 2000 at 1.3% per year according to the DKK district municipality's annual report (Anon., 2009:7).

2.4 PHC services in South Africa

According to De Maeseneer (2009:133), countries with extensive primary health care leads to cost-effective health systems, high quality services, prevention and early diagnosis of diseases and the management of health problems. Primary health care services are implemented to prevent and intervene leading causes such as mortality, morbidity and disability in South Africa (Van Rensburg *et al*., 2004:422). The PHC concept focuses on the preventive, promotive, curative, rehabilitative services and core norms and standards will be set to achieve these quality services (Van Rensburg *et al*., 2004:422). The benefit of the PHC package is that it serves as a guideline to how services must be made available at the different levels of health care to provide continuous care (Van Rensburg *et al*., 2004:422). Fixed and mobile clinics, CHC's and district hospitals form the basis of service delivery, where the DHS is the main framework for implementing the service packages (Van Rensburg *et al*., 2004:428).

The Department of Health's annual report envisioned an accessible, caring and high quality health system (Department of Health, 2011c:1). The new PHC model has been developed to stress the importance of the patient's needs, to promote health and prevent disease, to focus on rehabilitation and referral services rather than focus on curative measures only (Department of Health, 2011c:20). The new PHC model consists of three pillars:

- Implementations of PHC outreach teams;

- Establishing medical teams in support of PHC; and
- School health services are strengthened (Department of Health, 2011c:20-21).
- Implementing an efficient PHC system requires the following;
- Adequate and sufficient number of human resources;
- Availability of infrastructure according to standard guidelines/norms;
- Available financial resources; and
- Essential medicines need to be safe, affordable, attainable and accessible (Kurian *et al*., 2009:9).

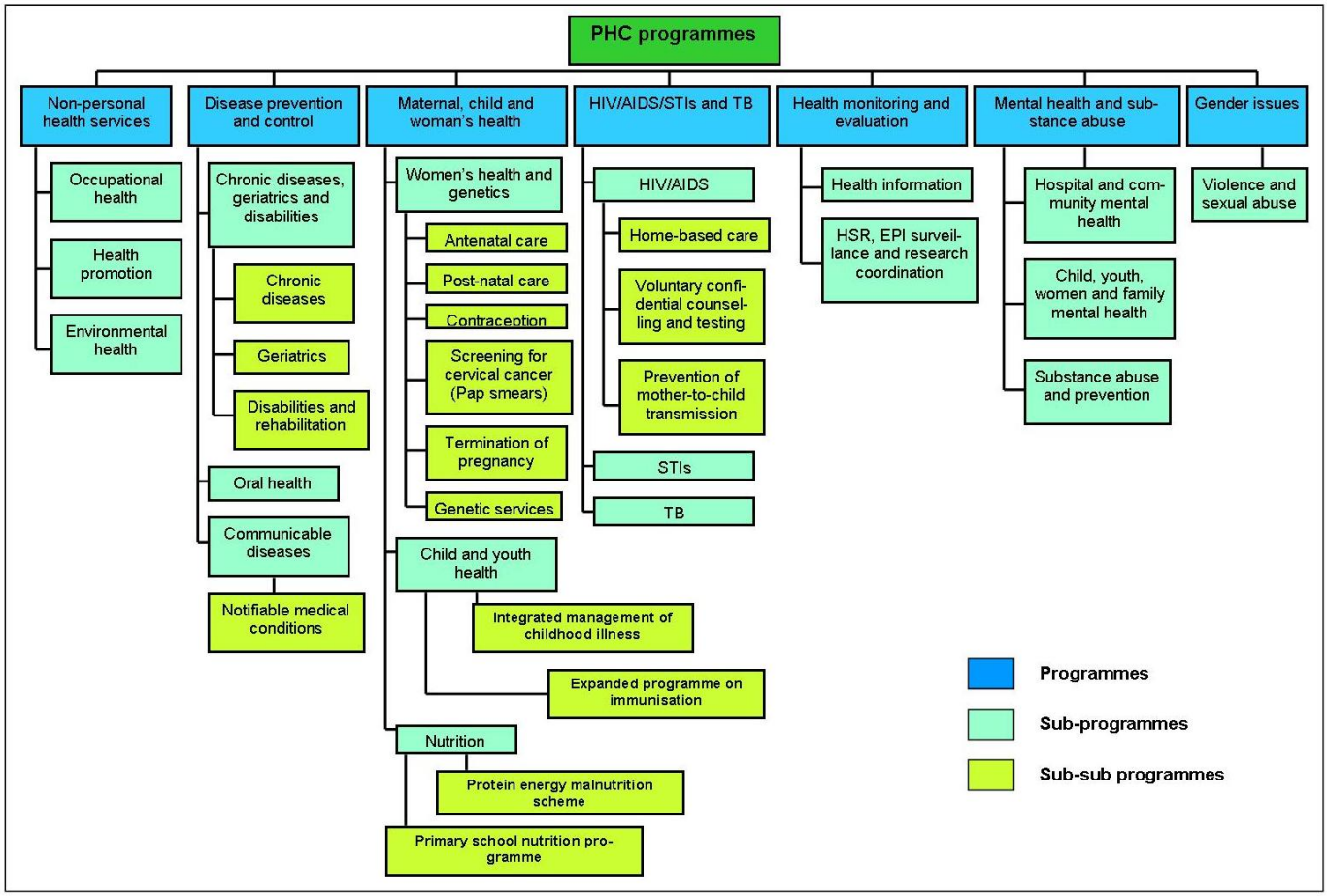


Figure 2.2: PHC services

Figure 2.2 above, (Van Rensburg *et al*., 2004:423) gives an illustration of programmes, sub-programmes and sub-sub programmes provided in PHC facilities.

2.4.1 Clinic supervision

Clinic supervision plays a crucial role in delivering quality of health care as well as technical support towards service providers. Supervisors are responsible for ensuring that resources are used effectively and are available for providing services:

- Adequately trained human resources;
- Drugs, supplies and equipment;
- Norms, standards and guidelines;
- Infrastructures are maintained;
- Clinics must operate at convenient hours with enough staff; and
- Privacy and confidentiality must be respected by health care workers (South Africa, 2003:1).

Managing PHC clinics entail important components:

- Administrative tasks have to be performed and kept up to date;
- Clinics have to be visited continuously, thus scheduling visits will enable them to do so;
- Planning the contents of visits;
- Monitoring the performance of clinics; and
- Reporting on visits (Anon., 2006:3).

A considerable amount of time and effort had been invested in establishing a DHS. Guidelines were formulated for clinic and CHC managers to improve management, ensure quality of care and to gain patients' trust (Pillay & Asia, 1999:1). Thus a checklist was developed for clinic and CHC managers to ensure that vital aspects on PHC level receive attention on a monthly basis. The checklist consists of the following categories:

- General leadership and planning;
- Staff;
- Finance;
- Transport/communication;
- Visits to clinic by supervisor;
- Community;
- Organisation of services/quality/client satisfaction;
- Equipment and facility;
- Drugs and supplies; and
- Information and documentation (Pillay & Asia, 1999:1-5).

A Clinic Supervision Manual is available and structured to assess the support required by clinics. All PHC clinics should be visited by a supervisor on a monthly basis accompanied by a written report (Barron, *et al.,* 2003:17).

2.4.2 Core norms and standards for health clinics

According to the Department of Health (2000:5), a norm is defined as "*a statistical normative rate of provision or measureable target outcome over a specified period of time.*"

2.4.2.1 Core norms

- Providing integrated PHC services for at least eight hours per day, five days a week;
- Patients must gain access to clinics within five kilometres where they live;
- Clinics are visited monthly by support personnel to monitor the quality of services provided;
- A PHC course must be completed by at least one member of the nursing staff;
- Doctors and health care professional visit clinics periodically;
- Clinic managers receive training in managing PHC facilities;
- PHC services and facilities are evaluated annually to reduce the gap that may exist between the need and provision of services and information regarding the facility needs to be collected;
- There is an annual plan based on this evaluation;
- Procedures are in place to perform at least one clinic audit; and
- Patient satisfaction is monitored in order to evaluate the community's perception on the quality of clinic services (Anon., 2006:1).

2.4.2.2 Core standards

A standard is defined as *"a statement about a desired and acceptable level of health care"* (Department of Health, 2000:5).

- **References, prints and educational materials**
  - Policies, protocols, treatment guidelines and other resource materials/references must be readily available to provide staff with relevant clinic information and to guide them in their work (Pillay & Asia, 1999:17). The following references must be available at PHC and CHC clinics:
  - STGs and EDL manuals in PHC clinics;
  - A collection of up to date reference books that is kept in the clinic;
  - Documents, policies, acts and related protocols related to service delivery must be kept in clinics;

- The Patients Rights Charter and Batho Pele documents must be present in clinics; and
- Educational materials must be visible in clinics and presented in local languages (Anon., 2006:1)

- **Medicines and supplies**

According to Pillay and Asia (1999:16), the clinic or CHC manager is responsible for managing medicines and supplies, and to ensure that:

- Suitable medicine room with adequate security and medicine cupboards are lockable under appropriate conditions;
- Stock cards are used and kept up-to-date;
- Medicines and supplies are ordered according to the EDL, with SOPs to control and order stock on time and organise stock according to a system “FEFO” (first expire, first out);
- Verify drugs received against the order that was placed, and report any discrepancies;
- Monthly stock-outs must be recorded;
- Procedures must be in place to order emergency stock when needed;
- Rational prescribing is essential; and
- Electricity and unusable water must be available (Anon., 2006:2).

- **Records**

Records are essential and is a useful tool for assessing data completeness (South Africa, 2009:iii). Activities of specific organisational units rely on registers, ledgers and filing systems to maintain adequate records (Olson, 2012:280). Essential record-keeping documents:

- Standard operating procedures must be in place to collect and utilize information gathered in the clinic;
- Daily service registers, road to health charts, patient treatment cards, notification forms and laboratory request forms and transfer forms must be available in the clinics;
- Notifiable medical conditions are reported according to protocol;
- Registers and monthly reports must be kept up to date; and

- The clinic has a patient carry card or filing system that allows continuity of health care (Anon, 2006:3).

2.5 Essential drugs in South Africa

Essential drug lists are vital tools in a broad spectrum of health aspects; it maintains and improves health, provides support toward national policies in regard to use and availability of essential drugs and to promote primary health care by rationalising drug selection, use and their cost (Hutchings *et al*., 2010:205). The market has been bombarded with hundreds of new drugs over the past few decades, thus challenges rise to control the quality, safety and rational drug use (Wiedenmayer *et al*., 2006:3). The EDL is used by Provinces to quantify their drug requirements, and are informed when tenders are awarded and thus notified which suppliers are preferred (Patel *et al*., 2008:549). The South African Medicine Control Council has a strict policy that only drugs that are registered with the council may be used within the country (Kishuna, 2003:4).

In May 1996 the EDL and STGs were distributed to provinces to use in public health care facilities. In 1998 the documents were reviewed and currently the 2003 edition is being used in facilities (Harrison, 2009:14). Since implementing the guidance tools, essential drugs have increased to 86% availability at PHC clinics (Harrison, 2009:14).

There are three critical areas that need to be addressed regarding medicine; these areas are inter-related and pose challenges to provide Health For All (Sharma, 2009:2):

- Accessibility of essential drugs;
- Affordability of essential drugs; and
- Rational drug use.
- Patients criticize the value of a PHC facility on a basis of approachable and knowledgeable medical staff and the availability of essential medicines (Kurian *et al*., 2009:2). The availability of drugs depends on a flourishing public health system and their ability to provide essential drugs (Sharma, 2009:3). The WHO has set guidelines for selecting essential drugs; the criteria for selection are adapted by each government to satisfy the needs of the population:
- Relevant to prevalence of disease;
- Efficacy and safety must be proven;
- Adequate quality, bioavailability and stability;
- Cost-benefit in terms of the total treatment;

- Preference to locally manufactured drugs and with adequate pharmacokinetic properties; and
- Single compounds (Olson, 2012:283).

Figure 2.3 gives an indication of the flow of drug regulation and all the required structures, processes and possible outcomes (adapted from the WHO Essential Drug Monitor, 2003:4)

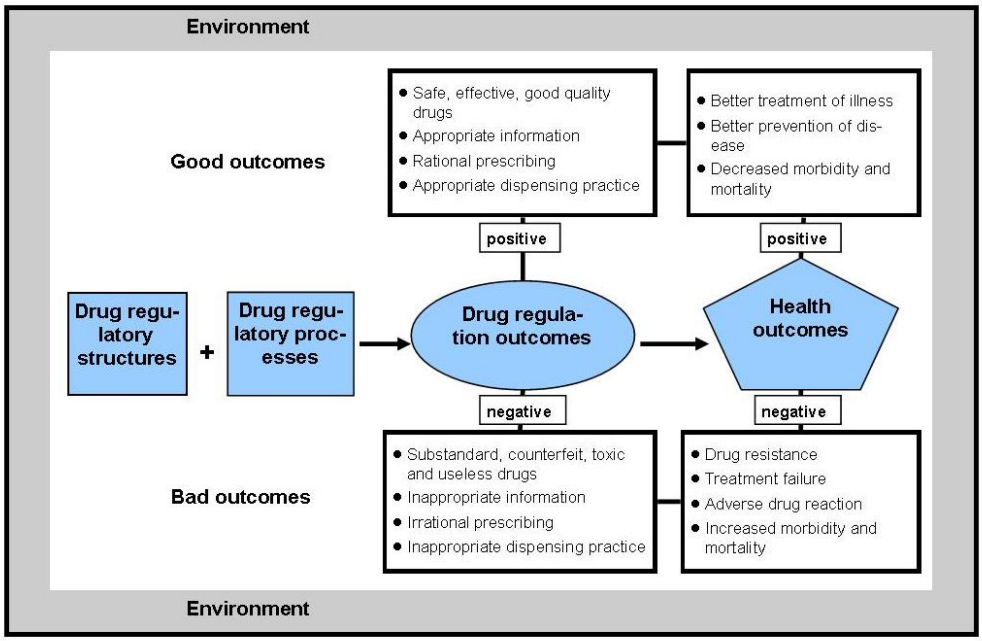


Figure 2.3: Drug regulation – interconnections between structures, processes and outcomes

There are three critical areas that need to be addressed regarding medicine; these areas are inter-related and pose challenges to provide Health For All (Sharma, 2009:2):

Concerns arise when the supply of medicine between the different levels of healthcare are inequitable, hospitals and urban facilities are better supplied than rural areas; this causes patients to by-pass the primary care level and overcrowd hospitals where they know drugs are available (Griffiths, 1998:2.2).

According to Wagstaff and Claeson (2004:111), health systems thrive on a two tier system relying on inputs from human resources and drugs. Weaknesses in prior mentioned policies can cause barriers to reach MDGs. Progress towards the MDGs could be accelerated when policies on pricing, procurement and logistics management are combined with sufficient information for consumers and other health care providers, increasing the availability of drugs, vaccines and consumables (Wagstaff & Claeson, 2004:111). Pharmaceutical Policy and Planning is implemented for the following reasons:

- Provides standard treatment guidelines for medical conditions at all levels of health care;
- Specifications are developed for medicines on national tender;
- Procurement and supply of essential medicines to provinces are continuously monitored;
- Individuals (pharmacists, pharmacist-assistants and nurses) and facilities are regulated where dispensing takes place; and
- Policies concerning traditional medicines are developed (Department of Health, 2011c:16).

The MDGs set by the Department of health is interdependent to a well functioning PHC system. Primary health care services are provided through the District Health System and have improved planning and monitoring of service utilisation (South Africa, 2007b:37). District Health Services promotes and co-ordinates the development of the district health system and the implementation of primary health care and activities are monitored (Department of Health, 2011c:17). The District Health Management Team in accordance with national health strategic plans has to prepare an annual operational plan based on health situation analysis within the district (WHO, 2008:11). The health situation analysis should address the following:

- The functionality of the district health system;
- The availability and utilization of health services;
- Accessing quality care at PHC clinics is still a major concern; and
- Availability of financial resources, human resources, technology and equipment (WHO, 2008:11).

According to the WHO (2008:4), the main objective of a health system is to improve overall health of a population through the provision of equitable, essential and good quality health services.

2.6 Managing drug supply

Developing countries can prevent and alleviate the burden of disease with cost-effective essential drugs, a major concern still persists due to patients not complying to treatment, having limited access to medicines, or misuse their medication (Embrey, 2012:2). According to the WHO (2001:2), the Pharmaceutical Cluster of South Africa's DOH is putting great emphasis on:

- Selection;
- Distribution;
- Procurement;
- Financial resources;
- Management information systems; and
- Training of pharmacist assistants.

A situation analysis is important in identifying issues and generates possible solutions, in order to improve drug supply and management (Barron *et al.,*, 2003:25). The results from the analysis should be discussed with relevant staff (Barron, Monticelli & Leon, 2003:25).

In the healthcare sector, supply chain cost can reach as high as 38% of the cost of goods (Wagstaff & Claeson, 2004:120). Drugs are an important resource in the health sector for it can help save lives, improve health and contribute to trustworthiness of health services (Embrey, 2012:2). Over the past decades a considerable amount of insight has been gained from managing of drug supplies:

- A NDP sets a firm foundation for managing drug supply;
- Effective and efficient management saves money and improves performance;
- Rational drug use requires more than drug information;
- Continuous assessment and monitoring are essential; and
- Informed drug selection regulates all other improvements (Embrey, 2012:2).

Managing drug supply is organised around four functions of the drug management cycle as illustrated in figure 2.4:

- Selection;
- Procurement;
- Distribution; and
- Use (Embrey, 2012:2; Griffiths, 1998:1.1).

Norms and standards are essential in managing pharmaceutical expenditure, procurement and distribution – a process now devolved from the provinces to local level – are being developed as benchmarks (WHO, 2001:2). The importance of norms and standards are to maintain and improve the drug supply system during the transfer of responsibilities (WHO, 2001:2).

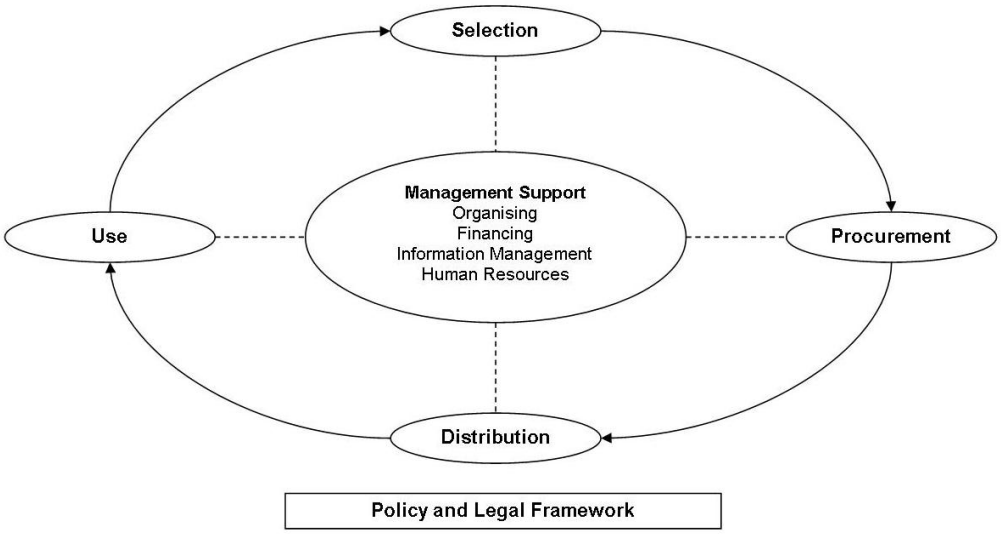


Figure 2.4: Drug Management Cycle (Embrey, 2012:19)

Norms and standards are essential in managing pharmaceutical expenditure, procurement and distribution – a process now devolved from the provinces to local level – are being developed as benchmarks (WHO, 2001:2). The importance of norms and standards are to maintain and improve the drug supply system during the transfer of responsibilities (WHO, 2001:2).

2.6.1 Selection

Selection in the drug management cycle involves revision of current health problems, determining treatment of choice, selecting drug and dosage forms, and deciding which essential drugs will be available at different levels of health care (Embrey, 2012:8). Drugs are expensive and pharmaceuticals can constitute up to 40% of a country's health care budget (Timmermans & Sharma, 2006:13). The rationale for selecting only essential drugs that are absolute may lead towards:

- A better supply of drugs;
- More rational prescribing of essential drugs;
- Cost-effectiveness of drugs;
- Rational patient use and adherence (Timmermans & Sharma, 2006:14).

2.6.2 Procurement

Procurement establishes the quantity and quality of required drugs, contract terms, tender processes, methods for the procurement process and defines which drugs are most effective to control drug expenditure (Embrey, 2012:8; Timmermans & Sharma, 2006:13).

The pharmaceutical procurement process consists of various steps, is complex and a major determinant of the availability of drugs and health costs (WHO, 1999:3; Barraclough & Clark 2012:335). Government policies and regulations as well as institutional structures often lack adequacy, hindering efficiency in response to the modern pharmaceutical market (WHO, 1999:3). Written policies for procurement, storage and distribution must be available (SAPC, 2010:44). Efficient procedures must be incorporated for procurement and distribution systems to:

- Select cost-effective essential drugs to treat the majority of conditions prevalent to a country;
- Determine the needs;
- Pre-select potential suppliers;
- Regulate procurement and delivery;
- Ensure adequate product quality; and
- Supervise the procurement system and supplier performance (WHO, 1999b:3; Barraclough & Clark, 2012:335).
- According to the World Health Organization (1999b:3), failing to uphold and manage the procurement cycle can lead to a lack of access to essential drugs and to waste. The procurement process must be monitored and managed efficiently and with transparency to uphold suppliers' interest and to retain suppliers in competing for procurement contracts, to prevent fewer choices and high drug prices. Major concerns in the procurement process are due to the following:
- Rules, regulations and structures are insufficient;
- Inexperienced staff in the public sector with limited market knowledge;
- Inadequate procurement policies;
- Insufficient government funding;
- Benefactor agencies with conflicting interests;
- Drug procurement at provincial or district level is crippled; and
- Lack of trained procurement staff (WHO, 1999b:5; Timmermans & Sharma, 2006:29).

Written policies are necessary to ensure that:

- Products are readily available when required;
- Procurement and distribution processes are documented;
- When necessary batch recalls of medicines can be made; and
- Optimum storage conditions are monitored continuously.

Patients receive stock that has been stored under optimum conditions, are safe and expiry dates that give patients sufficient time to use the medication before it expires (SAPC, 2010:44). All public sector institutions procure essential drugs through the public sector tender system. (Department of Health, 1996b:13; Patel *et al*., 2008:549).

The government will thus reserve the right to consider procurement on the international market, which includes the options of parallel importation and purchasing on the international generic market. A central coordinating body, COMED oversees the procurement process with active participation from each province (Patel *et al*., 2008:549). Drug procurement and distribution to the public sector is limited to drugs on the EDL, and products registered for use in South Africa. Drugs will be repacked at provincial depots and patient ready packs will be delivered to district hospitals, where they will send it to PHC facilities. Packs must be labelled with the trade name as well as the generic name directly above or under the trade name (Department of Health, 1996b:13).

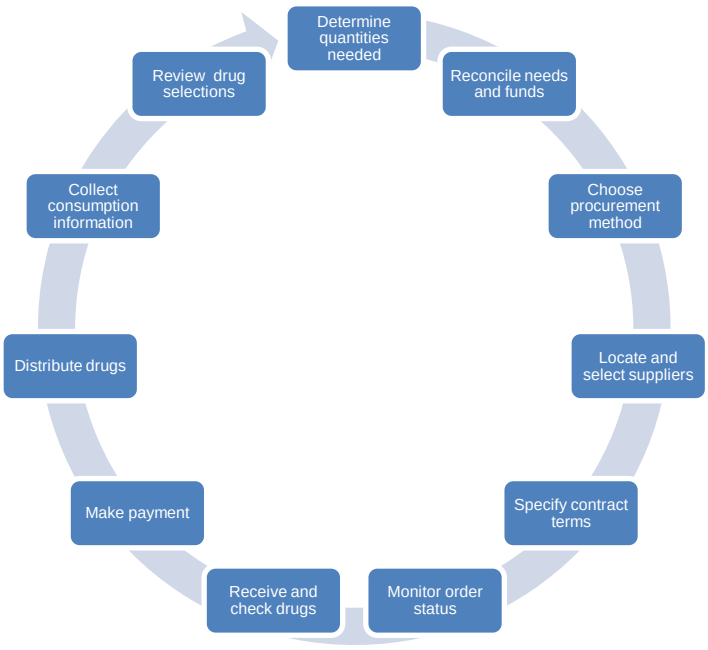


Figure 2.5: Procurement cycle

Figure 2.5 above, gives an illustration of the procurement cycle, the cycle begins at determining quantities of medicine stock and ends at reviewing drug selections (Barraclough, 2012:324).

Standard Operating Procedures (SOPs) are guidelines to cover all administrative procedures to manage and effectively control the storage and distribution of drugs and medical supplies, including methods to define minimum and maximum stock levels, guidelines on systematic stock rotation and handling of expired and obsolete stock. The turn-over of drugs and medical supplies will be monitored with the aid of a systematic and practical information gathering process. The information will be used to determine the quantities to be procured (Department of Health, 1996b:14; South African Pharmacy Council, 2010:215-216).

2.6.3 Distribution

Distribution in the drug management cycle includes, clearing customs, controlling stock, delivering from depots to health facilities and to manage stores (Embrey, 2012:8). A stock list must be prepared for clinics, which must be made available to nursing staff that will be responsible for obtaining stock (Embrey, 2012:8). Management at medical stores are crucial for distributing essential drugs towards health care facilities. The objectives are to:

- Ensure an uninterrupted supply of drugs and medical supplies;
- Ensure that drugs maintain quality and effectiveness throughout the whole distribution process;
- Minimise losses through expiration and deterioration;
- Ensure measurements are in place to prevent theft and corruption;
- Administer accurate inventory records;
- Adequate stock information to forecast needs; and
- Efficiently manage transport (Timmermans & Sharma, 2006:53).

Written SOP's must be made available on how to order stock from the pharmacy and the responsibilities of the nursing staff in the process and signing relevant requisition documents, that comply with the latest requirements of the Medicines and Related Substance Act (101 of 1965) (South Africa, 1997:13). A record must be kept for a minimum of five years, and each requisition must be dated and signed. Stock checking is crucial and must be performed at least once per month to maintain stock rotation, minimise wastage and prevents over-stocking (SAPC, 2010:57).

2.6.4 Use

Use is the prescribing, diagnosing, and dispensing of drugs, thus ensuring patient compliance (Embrey, 2012:8). Prescribing of drugs above schedule 2 must be administered by a pharmacist, except as provided in the regulations of the Medicines and Related Substance Control Act (101 of 1965), will not be permitted. Similarly, prescribing by nurses

will only be in accordance with provisions of the Act (101 of 1965). The distribution of cold-chain items, such as vaccines, will be the responsibility of public sector depots, according to guidelines of the EPI Review Committee (Department of Health, 1996b:15).

The objective is to ensure that all drugs are prescribed by generic name in accordance with recommended standard treatment protocols and EDL. At PHC level prescribing will be competency, not occupation, based. The Department of Health will collect, evaluate and disseminate systematic data on drug utilisation to monitor and act on policy adherence (Department of Health, 1996b:18). A full evaluation of the National Drug Policy will take place every three years, this has not been done since the development of the NDP, but will be reviewed in 2012 (Department of Health, 1996b:27). The accessibility of health facilities and the availability of qualified health professionals especially nurses are core components for a thriving health care system, but drugs are essential for the following reasons:

- Drugs improve health and saves lives;
- Drugs promote trustworthiness toward health services;
- Drugs are expensive;
- Drugs differ from other consumer products; and
- Management, supply and use of drugs can be improved (Embrey, 2012:3).

Physical stock counts are important for reordering purposes and determining the inventory value; the best way to determine the quantity of stock is cyclic counting (Dias, 2012:444). Minimum and maximum stock levels were used by the clinics visited whilst performing the observations. The mentioned formula is performed at certain intervals determined by the Department of Health for clinics. A maximum level is determined for each stock item to last until the next ordering date, and a minimum stock level is used as an indicator to when to reorder stock (Dias, 2012:455; SAPC, 2010:55).

Standard reorder parameters can be used to determine a minimum and maximum level for each stock item (Dias, 2012:455; Allers *et al*., 2003:34):

- Average monthly consumption (C_A);
- Supplier lead time (LT);
- Procurement period (PP) - (time until the next order will be placed);
- Safety stock (SS) - (additional stock to cover stock outs until stock is received);
- Stock on hand in inventory (S_I);
- Stock on order but not yet received (S_O); and
- Quantity of stock back-ordered to lower levels (S_B).

Minimum stock levels are calculated by multiplying the average consumption with the lead time, plus any additional safety stock. The equation for calculating the minimum stock (S_{MIN}):

$$\text{Minimum stock} = (LT \times C_A) + SS$$

Maximum stock (S_{MAX}) levels can be calculated as the minimum stock plus the procurement period multiplied by the average consumption; the equation:

$$S_{MAX} = S_{MIN} + (PP \times C_A)$$

2.6.5 Inventory control

Inventory management plays a critical role in the management of drugs; if the system is managed poorly it can lead to financial losses, drug shortages and inadequate patient care (Dias, 2012:442). Stock records form the core for an effective inventory management system and can be either manual or computerised. Manual stock records used includes, vertical file cards, “Kardex” system, bin cards and ledger systems, for the purposes of this study the focus will fall upon the use of bin cards. Bin cards are filed with the stock making monitoring of stock manageable and serve as a reminder to order stock (Dias, 2012:443). Whether a manual or computerised system is used it is important that it be current and accurate (Dias, 2012:443).

Inventory control at facility level is important and done for the following purposes:

- Receipts and issuance of stock need to be recorded;
- Stock need to be maintained between deliveries;
- Stock must be cost-effective and annual budget must be maintained;
- Storage must be safe, secure and adequate; and
- Expiry dates must be checked continuously (Sallet, 2012:901).

Inventory management is essential and is beneficial for both facilities and patients; stock outs can be minimised, patients can receive drugs promptly, administrative costs can be decreased and monitoring the system ensures accountability for supplies (Sallet, 2012:901).

Problems that arise from poor stock controlling can lead to serious implications; patient conditions may worsen or they may die if medicines are out of stock. Patients that cannot receive essential medicines from PHC facilities lose confidence in facilities and seek hospital treatment instead, thus being much more expensive. Continuous stock outs can lead to poor prescribing habits (Sallet, 2012:901).

Maintaining stock is crucial; failing to maintain standards will lead to:

- Overstocking – that can lead to expired stock, increased costs, wastage and tying up the available budget;
- Inadequate storage may lead to spoiled stock;
- Deficient stock records and mediocre security will provoke theft; and
- Changing prescriber's policy may discard the use of some drugs (Sallet, 2012:901-902).
- Standard forms used for inventory control include (Allers *et al*., 2003:34):
- Stock cards;
- Bin cards;
- Requisition vouchers;
- Receiving forms;
- Delivery vouchers;
- Expired stock disposal forms; and
- Physical inventory forms;

Deliveries should be formally received. The number of packages delivered must be noted in a register and must be signed by both the deliverer and receiver (Sallet, 2012:908).Supplies should be checked individually, using a checklist and their receipt recorded on their supply documents. The copy of the original requisition form should be compared to documents from the issuing facility to prevent later disputes. The hospital pharmacy must be notified in any of the following situations:

- Missing or open boxes;
- Differences in ordered and received quantities;
- Items received that were not ordered;
- Damaged, missing, broken or poor-quality stock; and
- Receiving, unpacking and checking stock all contribute to the quality assurance system, delivery documents should be signed and filed for future reference and kept for a minimum of two years (Sallet, 2012:908).

When products are received and there is no expired or damaged stock, the following procedures can be performed (Allers *et al*., 2003:19; SAPC, 2010:45):

- Count units of each of the items ordered and compare it to the issue voucher;
- Record the quantity and delivery date on the stock card;
- Ensure that the products' expiry dates are visibly indicated; and

- Arrange products in the store room according to FEFO (first expire, first out).

2.6.6 Drug Management Information System

An effective Drug Management Information System (DMIS) is able to reduce large volumes of information used for planning activities, estimating demand, allocating resources and monitoring the drug management system (Frye, 2012:956). A DMIS allows for variation, and ensures that management decisions on drug supply will be based on reliable data (WHO, 2001:2). Indicators are used at all levels for monitoring staff performance and the unit that they are responsible for (Frye, 2012:955). The operational systems level of DMIS contains four subsystems: selection, procurement, distribution and use. Information within mentioned sub-systems is essential to administer finances, drug stocks and personnel (Frye, 2012:957). Documents that form the basis of the information system are:

- Record-keeping documents;
- Data reporting forms; and
- Feedback reports.

According to Allers *et al.* (2003:32), the minimum information required to be filled on a stock card includes:

- Product name;
- Description (dosage form and strength);
- Stock on hand/ beginning stock balance;
- Receipts;
- Issues;
- Losses/adjustments
- Closing stock balance; and
- Transaction reference.

A drug supply system functions optimally when staff uses available information to base their decisions on (Frye, 2012:958). Analysis and use of data are important at every level of the management cycle (Frye, 2012:957). Table 2.1 below gives an outline of information users and their need of information at each level of the system (Frye, 2012:958).

Table 2.1: Information users and information needs

Level and Function	Users	Information Needs
National		
Selection	National essential drugs committee	Morbidity patterns Standard treatment strategies
Procurement	Procurement unit	Drug utilization rates Lead times Supplier performance Prices Funds available for procurement
Drug use education	Training unit	Number of staff trained in essential drug use Number of public education messages developed and campaigns conducted
Financial management	Finance unit	Operating costs Revenues Value of inventory Stock turnover rates Stock fund growth or loss
Provincial/District		
Warehousing	Medical stores manager	Drug utilization rates Maximum and minimum stock levels Lead times for requisitions from national level Shelf life Warehouse maintenance and equipment needs Stock losses
Distribution	Logistics manager	Distribution schedules Vehicle utilization records Maintenance and fuel costs
Facility		
Use	Medical director, pharmacist	Prescription patterns Patient adherence Drug availability Patient load
Inventory control	Storekeeper	Maximum and minimum stock levels Lead times for requisitions Prices Drug utilization rates Shelf life Cold storage temperature variations

Figure 2.7 below is a schematic illustration of the flow of documents in a basic supply system DMIS (Frye, 2012:961).

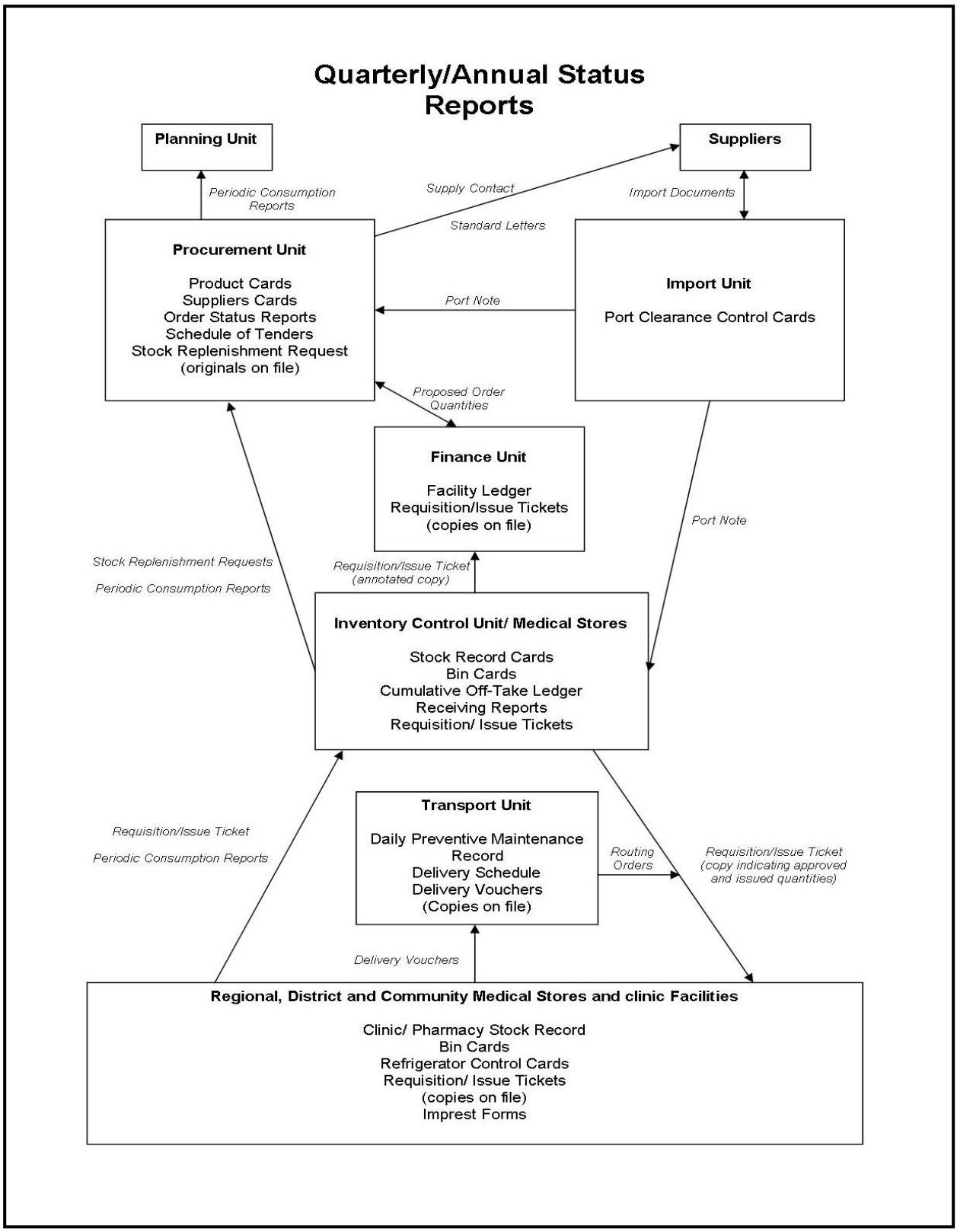


Figure 2.7: Flow of documents in a basic supply system

Table 2.2 below defines the forms and records used in a basic supply system and where it originates from and who does the maintenance (Frye, 2012:961).

Table 2.2: Forms and records for a basic supply System DMIS

	Originated/ Maintained by
Forms	
Supply contract—statement of the terms of supply, usually publicized with the call for offers, specifying exact drug requirements, dosage forms, quality standards, labeling and packaging, delivery date, and other supply details.	Procurement unit
Standard letters—from letters used in correspondence with suppliers to provide and obtain information regarding outstanding orders.	Procurement unit
Import documents—used to confirm the supply contract, guarantee payment, and certify the quantity and quality of shipment contents, and to provide other types of trade information.	Procurement, supplier, shipper, banks
Port note—notification from import unit to to procurement and medical stores that a specific shipment has arrived and has been cleared from port.	Import unit
Receiving report—notification to inventory control that a specific shipment has been received; indicates damages, short shipments, and other problems.	Medical stores
Requisition/issue ticket—request for specific quantities of standard items from medical stores; amended by inventory control if stocks are low; filled by medical stores; copies provide audit trail; return copy is packing slip.	Medical stores, health facilities
Stock replenishment request—request to procurement to begin the procurement cycle for specific items; sent at reorder level or reorder interval.	Inventory control
Proposed order quantities—proposed order quantities for a single procurement cycle; finance unit estimates cost and adjusts if needs exceed available funds.	Procurement
Routing order—delivery order for drivers; provides a record of vehicle movements, indicates the order of deliveries (planned to minimize travel).	Transport unit
Delivery voucher—signed receipt indicating that a specific shipment of drugs has been delivered in tact.	Medical stores, health facilities
Imprest forms—simplified supply requisitions for use by smaller clinical facilities and individual health workers	Health centers and workers
Records	
Product cards—product specifications and supplier history for each item; used to prepare bid specifications and select suppliers.	Procurement unit
Supplier cards—record of experiences with individual suppliers, including delivery record, adherence to contract, drug and packaging quality, and other performance factors; used in supplier selection.	Procurement unit
Order status cards—used to monitor the status of outstanding orders to reduce lead times, supplier defaults, and port delays.	Procurement unit
Schedules of tenders—summaries of offers from each supplier on each product in a tender purchase.	Procurement unit
Port clearance control cards—used for a manual control system to monitor port-clearing activities and thereby shorten port delays.	Import unit
Stock record cards—cards or a ledger used to record stock balances, issues, receipts, and outstanding orders; essential in inventory decisions such as when and how much to order.	Medical stores, health facilities
Bin cards—similar to stock record cards but kept in medical stores with the physical stock to record supply movement in and out of the stores.	Medical stores
Facility ledger, cumulative off-take ledger—records indicating the quantity and cost of drugs issued to individual facilities; used for budgeting, billing, and/or estimating future needs.	Finance unit, inventory control
Daily preventive maintenance record—checklist of daily vehicle maintenance activities used to promote preventive maintenance.	Transport unit
Delivery schedule—monthly timetable for requisition and deliveries; prepared for maximum staff and vehicle efficiency.	Transport unit
Refrigerator control cards—temperature and maintenance log to ensure proper cold-chain storage	Clinical facilities
Reports	
Quarterly and annual report—to national level *Feedback report*—from national level to warehouse/facilities	

2.6.7 Challenges for drug management

According to Embrey (2012:19), much has been gained during the last few decades in the management of drugs, though gaps still remain in the need and supply of drugs in less urbanised populations. Managers and policy-makers are still faced with major challenges:

- Gaining financial stability;
- Public drug supply needs to be improved and be more efficient;
- Reconstructing the government's role;
- Safety, efficacy, and quality, and
- Financial resources and expenditures have to be balanced to achieve financial viability and to support a level of demand (Embrey, 2012:21).

2.7 National Core Standards

In chapter 1 the seven domains of the National Core Standards were mentioned; each of the seven domains can be broken down in sub-domains which will be briefly discussed and are, according to the WHO, directly linked to quality and safety. Table 2.3 illustrates the structure of the domains and sub-domains set by the National Core Standards. The National Core Standards is a combination of policies and guidelines to set measurable standards to provide quality health services (Bradley *et al.* 2011:42).

According to the National Core Standards there are many aspects that need attention, and to improve standards will take time, thus six areas have been identified at facilities that need attention (Department of Health, 2011a:15; Lourens, 2012:3):

- Human resource values and attitudes;
- Cleanliness;
- Reduce waiting times;
- Patient safety and security;
- Preventing and controlling infections; and
- Availability of essential medicines and supplies.

Certain standards and criteria have been established in order to respect patient rights in accordance with the Batho Pele principles and the Patient Rights Charter.

Some of these aspects have been identified by the researcher, in accordance with data captured in the surveys mentioned in chapter one (appendix) and relevant towards the

study. Table 2.3 below describes the sub-domains, standards and criteria of the first domain: patient rights (Department of Health, 2011a:12)

Table 2.3: Structure of domains and sub-domains

Domain 1 Patients Rights:

- Respect and dignity
- Information to patients
- Physical access
- Continuity of care
- Reducing delays in care
- Emergency care
- Access to package of services
- Complaints management

Domain 2 Patient Safety-Clinical governance & Clinical Care:

- Patient care
- Clinical management for improved health
- Clinical leadership
- Clinical risk
- Adverse events
- Infection, prevention and control

Domain 3 Clinical Support Services:

- Pharmaceutical services
- Diagnostic services
- Therapeutic and support services
- Health and technology services
- Sterilisation services
- Mortuary services
- Efficiency management

Domain 4 Public Health:

- Population based service planning and delivery
- Health promotion and disease prevention
- Disaster preparedness
- Environmental control

Domain 5 Leadership & Corporate Governance:

- Oversight and accountability
- Strategic management
- Risk management
- Quality improvement
- Effective leadership

Domain 6 Operational Management:

- Human resource management & development
- Employee wellness
- Financial resource management
- Supply chain management
- Transport and fleet management

Domain 7 Facilities and Infrastructure:

- Building and grounds
- Machinery and utilities
- Safety and security
- Hygiene and cleanliness
- Waste management
- Linen and laundry
- Food services

According to section 27 of the Constitution (1996) (1) everyone has the right to have access to health care services, including reproductive care; and (2) the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive

realization of each of these rights. Table 2.4 below describes certain standard that need to be met in domain one (Department of Health, 2011a:18-19).

Table 2.4: Patients access to information, facilities and services

Sub-domain	Standard	Criteria
Access to information for patients	Staff is identifiable, service information is available, operating hours are clearly indicated, service areas are clearly signposted.	• All staff must be easily identifiable • Services provided at health establishments must be easily attainable at the help desk • Operating hours need to be clearly indicated at the entrance of each health establishment • Key services provided at the health establishment need to be clearly signposted
Physical access	Health services are easily accessible and safe for patients including for the disabled	• Health establishments need to be easily accessible and safe • Accessibility accommodates patients with disabilities and the elderly • Ablution facilities are available for patients with disabilities • Visually and hearing impaired patients must be able to receive information at facilities
Access to a package of services	Provided services must meet national guidelines and licensing specifications	• Services provided at health establishments have to meet national guidelines and licensing specifications

The second domain covers patient safety and clinical governance to ensure the quality of nursing, ethical aspects regarding practice and clinical care.

Table 2.5: Patient care and clinical management of priority health connections

Sub-domain	Standard	Criteria
Patient care	Nursing protocols are followed to treat and care for patients, meet basic needs and contribute to recovery	• Standard operating procedures are in place to deliver and optimise basic health care services • Evidence confirm that health care provided optimises outcomes
Clinical management of priority health connections	Health care provided contributes to national priorities i.e. millennium development goals	• Guidelines available for implementing health initiatives and programmes • Evidence confirm that programmes and health initiatives are implemented at health establishments according to current guidelines • Data should be collected and analysed regularly regarding outcomes of health programmes and initiatives and shortcomings should be addressed

Table 2.5 above (Department of Health, 2011a:22), explains the standards and criteria set for patient safety, clinical governance and clinical care in domain two (Department of Health, 2011a:22).

Domain 3 includes the entire scope of clinical support services including the availability of medicines, thus monitoring the efficiency of all services provided to patients; table 2.6 below (Department of Health, 2011a:26-27) explains the standards and criteria of clinical support services (Department of Health, 2011a:26).

Table 2.5: Pharmaceutical service standards and criteria

Sub-domain	Standard	Criteria
Pharmaceutical services	Medicine and medical supplies are in stock and deliveries on time	• Medicines are in stock in accordance with the EDL or National formulary • Medical supplies to provide services are in stock • Contractual obligations are adhered to regarding the supply and delivery of medicines • During operating hours access to essential medicines have to be ensured • Access to medicines is essential for health care workers especially after hours
	Appropriate measures are in place for stock shortages and medicines and medical supplies are managed accordingly	• Medicines are stored according to all relevant acts, rules and regulations • Computerised or stock card system is in place to keep medicine stock updated • Schedule 5 and 6 medicines are distributed and handled according to the GPP guidelines • Medical supplies comply with medicine supply management principles • Up-to-date stock management system
	Treatment guidelines are used to prescribe medicines and to give appropriate instructions on use	• A functional Pharmaceutical and therapeutics Committee in the district • Medicines are dispensed according to set regulations (Pharmacy Act 53 of 1974 and Medicines and Substance Act 101 of 1965) • Advice on the use of medicine is given to patients to ensure compliance • Prescribing of medicine complies with standard treatment guidelines
	Adverse reactions are reported and patients are properly cared for	• A system is in place to report adverse drug reactions

Domain 6 covers the day-to-day management operations to ensure that patients receive safe and effective patient care; table 2.6 below (Department of Health, 2011a:40), explains some of the standards and criteria for managing information and medical records (Department of Health, 2011a:40). The National Core Standards are implemented as basis for quality and to provide health establishments with mandatory standards (Department of Health, 2011a:8).

Figure 2.13: Information management and medical record standards and criteria

Sub-domain	Standard	Criteria
Information management	Systems collects, stores and provides data to meet management's needs	• Staff have been adequately trained to uses resources set available • Functional computers are used where available • System failures can be handled by staff and managers
	Collected information is used by management to plan and make decisions	• Health establishments submits all required information • Information submitted is used to support planning and decision-making
	Confidential information is protected according to legislation	• Only authorised personnel have access to secured patient information • SOP's exist for the disposal of patient records
Medical Records	Patient information is recorded according to clinical, ethical and legal requirements	• Patient records must be completed according to regulation and statutory requirements • Confidentiality when handling patient records are maintained at all times
	An efficient system must be in place to easily archive and retrieve patient records	• Staff is trained and dedicated to archive patient records according to regulation • Appropriate processes and infrastructure are in place to file and retrieve patient files for efficient and effective services

South Africa identified eight MDGs to commit to the global development agenda. The eight MDGs are:

- Eradicate extreme poverty and hunger;
- Achieve universal primary education;
- Promote gender equality and empower woman;
- Reduce child mortality;
- Improve maternal health;
- Combat HIV/AIDS, malaria and other diseases;
- Ensure environmental sustainability; and
- Develop a Global Partnership for Development (Department of Health, 2011c:2-3).

The Strategic Plan of the National Department of Health set out a 10 Point Plan for the term 2009-2014, aiming at a functional health system that reaches outcomes set (Department of Health, 2010a:3).

The 10 Point Plan consists of the following priorities:

- Provision of strategic leadership;
- Implementing National Health Insurance;
- Improving quality of health services;
- Restoring and improving the health care system and its management;
- Improving human resource management, planning and development;
- Restoration of infrastructures;
- Implementing HIV & AIDS and STI National Strategic Plan 2007-11 and increasing focus on TB and other communicable diseases;
- Mass mobilisation for better health for the population;
- Drug Policy review; and
- Strengthening research and development.

The public sector's drug supply and management system is continually monitored in terms of the ability of suppliers to supply medicines. Stock outs occur due to the following factors:

- Financial constraints;
- Inappropriate budget allocations for pharmaceuticals at provincial level;
- Suspension of accounts; and
- Suppliers not adhering to lead times (Department of Health, 2010a:9).

2.8 National Drug Policy

A NDP is a written guide for action; this document is composed by the government and sets goals for the pharmaceutical sector and strategies to achieve them (Dukes, 2012:64). The NDP is a framework and provides structure, regulation and acts as a guideline for all the different role players in the health sector especially the pharmaceutical sector to form a foundation for managing essential drug programmes (Dukes, 2012:64-65). One of the standard and key indicators used during this study is to evaluate the percentage essential drugs available at health care facilities. Mentioned indicators are measured at a point in time and allow current programmes to be compared to certain performance standards, to recognise weaknesses and strengths, and to assist the pharmaceutical sector in improving in certain areas (Dukes, 2012:65).

The Minister of Health assigned a Drug Policy Committee in 1994 and appointed them with guidelines to develop the NDP (Department of Health, 1996b:1). The NDP was implemented in 1996 with a main objective to serve the health needs of South Africa. The Drug Policy will be applied to assist in the following way:

- Offering an incisive approach to manage pharmaceutical services;
- Offers guidelines to different health entities in ways they can contribute in achieving the policy's aim;
- Developing an adequate pharmaceutical infrastructure to reduce wastage and improve efficiency; and
- Facilitates the entire cycle of programmes for human resource development in health care (Department of Health, 1996b:2).

2.8.1 Legislation and Regulations

According to the Department of Health (1996b:6), the aim of implemented legislation and regulations of drugs are to ensure that when medicines reach patients that they are of sufficient quality, safe, effective and that they meet approved standards and specifications.

In general when considering aspects regarding drug legislation the following must be kept in mind:

- Medicinal products and activities that have to be regulated has to be defined;
- Clear aims and objectives have to be stipulated;
- Administrative bodies with clear structural and functional relationships have to be available to implement adequate drug regulations;
- All parties involved in regulating drugs must be equipped with clearly defined roles, responsibilities, rights and functions;
- Human resources handling drugs must be qualified according to defined standards;
- Systems must be implemented to ensure that all parties involved in drug regulation are licensed and inspected, thus persons, premises and practices involved in drug regulation must comply with standards and drug legislation that has been laid down;
- Norms, standards and specifications regarding safe, efficient and quality drug products has to be defined, as well as appropriate product information;
- Terms and conditions for suspending licences to import, manufacture, export, distribute, sell, supply or advertise drugs must be clearly stated;
- Administrative measures and legal sanctions must be in place and well established in order to persecute parties that violate drug legislation;

- Systems must be implemented to ensure transparency and accountability of drug regulatory authorities to the government, public and consumers; and
- Systems must be in place to ensure government oversight (WHO, 2003:2).

2.8.1.1 Medicine Control Council

The MCC is a statutory body that was established in terms of the Medicines and Related Substances Act (101/1965), to oversee the regulation of medicines in South Africa. The MCC is appointed by the Minister of Health to ensure that drugs reaching patients are safe, effective and meet acceptable standards of quality (HST). The MCC reviews legislation and regulations in order to assist the NDP in reaching goals and frequently intercede with relevant departments and organisations active in the implementation of the policy (Department of Health, 1996b:6).

2.8.1.2 Registration/licensing of practitioners and premises

Medical practitioners and nurses will not be permitted to dispense drugs except where separate pharmaceutical services are not available. A license issued by the MCC is necessary for medical practitioners and nurses to dispense medicine. Inspection functions will be delegated by each province and licenses will be reviewed and renewed annually (Department of Health, 1996b:6).

2.8.2 Drug pricing

All drugs at PHC level have to be supplied free of charge. At secondary and tertiary levels a fixed affordable co-payment will be levied for drugs supplied. A system of exemption will be established for patients without the resources to meet such payment to ensure that they are not deprived of treatment (Department of Health, 1996b:9).

2.8.3 Drug selection

The aim to achieve optimal drug selection is to promote the rational choice of drugs and associated items to be used in South Africa, in accordance with the essential drugs concept. The Essential Drugs Programme (EDP) is developed and includes Essential Drugs List (EDL) and Standard Treatment Guidelines. The National Essential Drugs List Committee (NEDLC) appointed by the Minister of Health is responsible for selecting drugs used in the public sector and drawing up a National Essential Drug List (NEDL) using generic names. The list has been formulated for the three levels of health care provision (Department of Health, 1996b:11, Olson, 2012:289; Hutchings *et al*., 2010:205; Kurian *et al*., 2009:4).

Criteria for selecting drugs on NEDL:

- The majority of the population's health care needs must be satisfied;
- Guaranteed of quality, including stability, bio-availability efficacy and safety;
- Having the most beneficial risk-benefit ratio;
- Include, if possible, products with only one pharmacological active ingredient. Exception will be made where benefits exceed the risk and where two pharmacological active ingredients are synergistically more effective than one ingredient; and
- When two or more drugs are equivalent in above respects, preference will be given to those which have:
    - Best cost-effectiveness;
    - Best researched;
    - Most reliable local manufacturer;
    - Best pharmacokinetic properties; and
    - Best patient compliance (Hutchings *et al*., 2010:205-206; Wiedenmayer *et al*., 2006:59

The NEDL will serve as a foundation for the basic health care package, procurement and use of drugs, standard treatment guidelines and training in rational prescribing, drug information to health care providers, support to the national pharmaceutical industry and drug donations (Department of Health, 1996b:11-12). Essential medicines can be selected according to primary or secondary criteria (Wiedenmayer *et al*., 2006:59).

2.9 Good Pharmacy Practice

The South African Pharmacy Council compiles a manual for pharmacists and other health care providers, to equip them with standards and to encourage them to provide the best possible quality health care.

2.9.1 Designation of dispensary or medicine room

According to the SAPC (2010:31) a responsible pharmacist's must register with the Council for the Primary Health Facilities that will be managed under the pharmacist supervision. The SAPC (2010:33) stipulates that when dispensing or other services are performed it must be done in a designated area or assigned room, and a medicine room used as a storage area for medication. The following standards must be upheld in a PHC clinic:

- Dispensing practices must be performed in the consulting rooms and not in the medicine room;
- Medicines may not be stored in consulting rooms unless it is been fitted with a air-conditioner and the temperature is controlled;
- Medicines stored in the medicine room, are transported on a tray to the consulting rooms, on a daily basis; and
- Access to the medicine room must be controlled and the licensed dispenser must have direct access to the room (SAPC, 2010:33).

2.9.2 Conditions of the dispensary or medicine room

The SAPC (2010:34) imposes that the medicine room must be kept clean in such a way that it will prevent pest infestations, light conditions and temperature has to comply with regulations for the storage conditions of medicines, the temperature in the medicine room must be below 25°C, a functioning air-conditioner and refrigerator and a wash basin with hot and cold water.

2.9.3 Storage areas in a dispensary or medicine room

Storage areas must be equipped with sufficient shelving, washable surfaces in order to maintain hygienic conditions, no medicines may be stored on the floor, storage areas must be self-contained and secure, and areas must be large enough to maintain efficient stock rotation (SAPC, 2010:34). Storage of medicines must be monitored and kept at an optimum level with approved store-keeping procedures and an effective and adequate stock control system must be maintained (SAPC, 2010:46).

2.9.4 Reference sources

Where dispensing of medicine takes place at a PHC clinic, the following reference sources must be available:

- EDL/STG;
- Latest edition of the Daily Drug Use or similar interactions reference;
- Latest edition of either the MDR or SAMF; and
- A Good Pharmacy Practice Manual (SAPC, 2010:36).

2.9.5 Cold storage of pharmaceuticals

All thermo labile medicine items must be kept in a refrigerator; it has to be stored within the clinic so that it is easily accessible to health care personnel, only pharmaceuticals may be stored in the fridge, the temperature of the refrigerator must be maintained between 2°C and 8°C, temperatures must be monitored continuously and charted twice daily and a WHO approved dial thermometer or alcohol or mercury thermometer must be used and must be hung from the middle shelf to monitor temperature effectively (SAPC, 2010:47).

2.9.6 Minimum standards for record keeping procedures

Computer technology is preferred when developing patient records, privacy must always be maintained and contain the following information of the patient:

- full name and surname;
- address and telephone number;
- gender;
- current mass;
- name of prescriber and date of consultation;
- history of medicines obtained;
- prescription number and date;
- allergies;
- adverse drug reactions;
- family history;
- lifestyle habits e.g. smoking; and
- chronic conditions (SAPC, 2010:75).

Patient records must be easily retrievable and information regarding a patient's history can be obtained from the records (SAPC, 2010:76).

2.9.7 Standard Operating Procedure (SOP)

According to the GPP standard operating procedures are guidelines or steps that has to be followed to complete assignments or a job, in a safe manner and in a way that is not harmful to the environment; in the end maximising operational and production requirements

The following SOP's must be in place at a primary health care facility:

- good housekeeping;

- daily routine and working hours;
- enquiry or complaint procedures;
- pest elimination;
- effective stock rotation;
- stock-taking;
- removal of S1-S6 expired, damaged and contaminated stock;
- unusable stock;
- stock that needs special handling requirements;
- handling of returned stock from patients;
- recall of medicine;
- receiving of medicine;
- storage of medicine;
- procurement of medicine;
- handling products complaints;
- handling of S5 and S6 medicines; and
- cold chain management (SAPC, 2010:215-216).

2.10 Summary

Chapter 2 gave some insight into the PHC approach adopted by South Africa, the DHIS, the National Core Standards, the GPP, goals achieved and challenges that still persist within the Department of Health. The importance of the essential drug concept was explained with the focus on medicine logistics in the Dr Kenneth Kaunda district. Managing drug supply is essential and managers should focus on procurement, selection, distribution and use to ensure uninterrupted supply.

Chapter 3

Research design and methodology

3.1 Introduction

The chapter contains a discussion of the research methodology used in conducting the research. The structure of chapter 3 and topics covered are depicted in Figure 3.1. Research is one of the ways of collecting accurate, sound and reliable information about the effectiveness of your interventions, thereby providing the researcher with evidence of its effectiveness (Kumar, 2011:4). Research in the health sciences is multidimensional in that it is concerned with clinical research, education, management, ethics, historical research, legislation and social aspects related to health care sciences. Thus it spans a wide field of investigation (Brink, 2006:4).

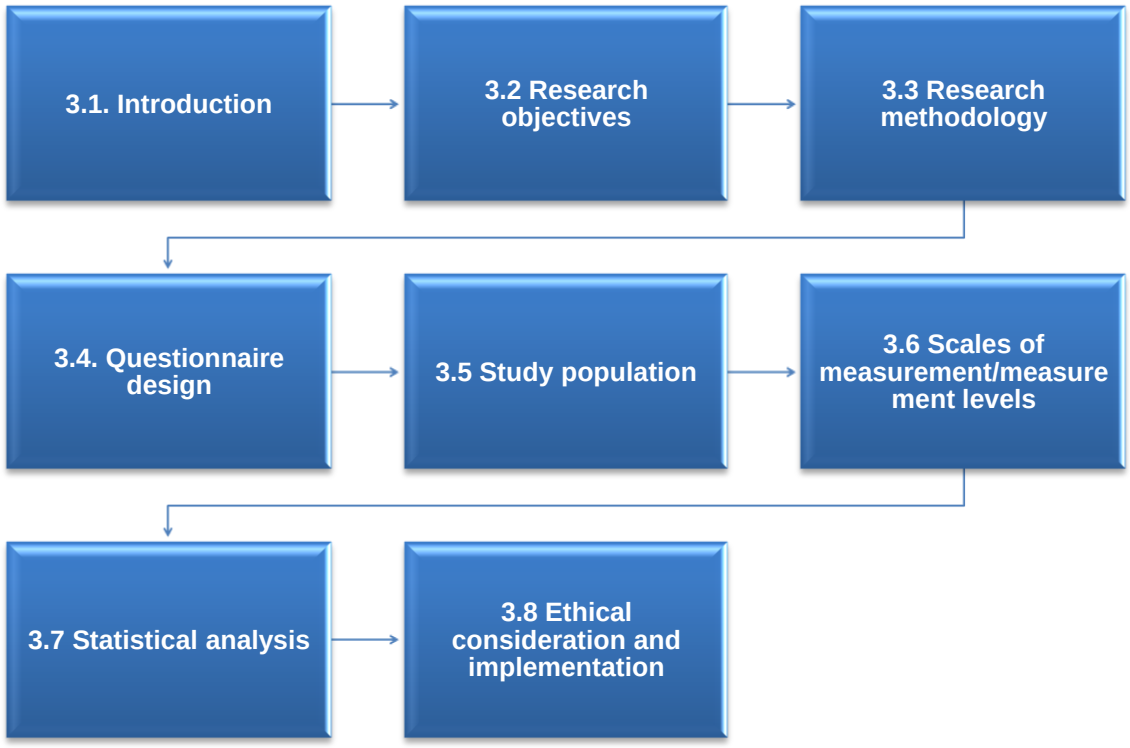


Figure 3.1: Outline of Chapter 3

3.2 Research objectives

The research objectives can be divided into general and specific objectives. In this study the specific objectives of both the literature study and empirical investigation will be discussed.

3.2.1 General research objective

The general objective of this study was to investigate documentation of medicine logistics in PHC clinics in the Dr Kenneth Kaunda district in the North West province.

3.2.2 Specific research objectives

The research study consisted of two phases, namely a literature overview and an empirical investigation. The research objectives of the two phases included the following:

3.2.2.1 Literature study

The specific research objectives of the literature overview were:

- To make use of available literature to conceptualise the PHC approach.
- To examine current PHC structures within South Africa.
- To conclude legislative mandates and policy frameworks that is implemented by the NDOH in South Africa.
- To explain the medicine logistics concept within the DKK district.

3.2.2.2 Empirical investigation

An empirical investigation was performed using self-structured questionnaires. These questionnaires were completed by clinic managers in PHC clinics or CHC centres and sub-district pharmacists of the DKK district. The researcher performed observations in the storerooms/ medicine rooms of PHC clinics and CHC centres to determine the availability of selected tracer drugs and certain factors that influence the quality and availability of these drugs.

The study was a mixed method (quantitative and qualitative) as the aim was to determine how documentation regarding medicine logistics influence the availability of tracer drugs and the effect of SOPs in the PHC clinic/CHC centres environment. The objective of the questionnaires was to provide insight in the role of sub-district pharmacists in allocating annual budgets to clinics and their expertise in managing medicine logistics. The specific objectives of the empirical study included the following:

- Evaluate the availability of essential drugs at PHC clinics in the DKK district;
- Indicate services provided at PHC clinics in the DKK district;
- Determine what documentation systems are implemented (including patient and medicine information) within PCH facilities in the DKK district;
- Conclude what measures are implemented to monitor, document and utilize information regarding medicine stock within the PHC setting;
- Determine the role of the sub-district pharmacist in the PHC setting including medicine logistics;
- Conclude if SOPs are used in PHC clinics in the DKK district;
- Determine the impact of budgets allocated to PHC clinics on medicine logistics; and
- Make recommendations to manage medicine logistics at primary health care level.

3.3 Research methodology

The research methodology selected for the research study will explain the logistics behind the selected research design and techniques.

3.3.1 Research design

The main focus of the research was to investigate the documentation of medicine logistics in PHC clinics in the Dr Kenneth Kaunda district in the North West Province of South Africa. It is essential to choose an appropriate study design to ensure that results reported are valid (Sibanda, 2009:6). The study followed a mixed method approach, thus according to Creswell (2009:230):

> "Mixed methodology research is an approach to enquiry that combines or associates both qualitative and quantitative forms of research. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study."

Johnson and Onwuegbuzie (2004:17) and Rocco *et al.* (2003:19) define mixed methods as the combination of quantitative and qualitative research techniques into one study. A mixed method design is based on the philosophy of pragmatism and adopts a pragmatic approach of using multiple tools, and mixing of both qualitative and quantitative data to test hypotheses and provide multiple perspectives on a problem (Creswell, 2009:203; Johnson & Onwuegbuzie, 2004: 14). Mixed methods research designs are combinations of quantitative and qualitative techniques to answer research questions in a creative manner (Teddlie & Yu,

2007:77). Combining qualitative and quantitative methods may be of significant value considering that (Creswell, 2008:11):

- Qualitative or quantitative approaches may be less sufficient on their own.
- Qualitative and quantitative provide different angles towards a research study.
- The combination of quantitative and qualitative approaches can provide more evidence.
- Mixed methodology is the latest methodological development.

Mixed method methodology creates the opportunity for researchers to not limit them to a single approach, thus providing them with choice (Johnson & Onwuegbuzie, 2004:17). The problems addressed by social and health science researchers are complex, and the use of either quantitative or qualitative approaches by themselves is inadequate to address these complexities (Creswell, 2009:203). Their combined use provides an expanded understanding of research problems and quantitative and qualitative researchers utilises empirical observations to approach research questions (Creswell, 2009:203; Johnson & Onwuegbuzie, 2004: 15).

According to Kumar (2011:394), qualitative research is based upon the philosophy of empiricism, follows an unstructured, flexible and open approach to enquiry, aims to describe rather than measure, believes in an in-depth understanding and small samples, and explores perceptions and feelings rather than facts and figures. The rationale of quantitative research is to gather numerical data in an observed population (Sibanda, 2009:2). Quantitative research is a second approach to enquiry in the social sciences that is rooted in rationalism, follows structured, rigid, predetermined methodology, direction of narrowly defined research questions, emphasises greater sample size, aims to quantify the variation in phenomenon, and tries to make generalisations to the total population (Kumar, 2011:394; Borrego *et al*., 2009:54).

Creswell (2009:11) interprets quantitative, qualitative and mixed approaches as strategies of inquiry that provide specific direction for procedures in a research design. According to Borrego *et al*. (2009:53), no method is inferior; the choice must be driven by the research questions. Qualitative research in Creswell's (2009:232-233) point of view is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves:

- Emerging questions and procedures;
- Collecting data in the participants' setting;
- Analysing the data inductively, building from particulars to general themes; and

- Making interpretations of the meaning of data (Creswell 2009:232-233).

The final written report has a flexible writing structure. On the other side of the continuum, quantitative research is for testing objective theories by examining the relationship among variables. These variables can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures. The final written report has a set structure consisting of introduction, literature and theory, methods, results and discussion.

According to Kumar (2011:138) there are two approaches in gathering information about a situation, people, problem or phenomenon. The approaches in gathering data can be categorised in primary data and secondary data. Primary data is information collected for the first time for the specific purpose of a study by the researcher or somebody else. Sources that provide primary data are in the form of interviews, observations and questionnaires. Secondary data is information which have already been collected and analysed by someone else which is extracted for the purpose of the study. Secondary sources include books, journals, previous research studies, client or patient information already collected.

3.4. Questionnaire design

According to Dung (2006:2), a survey is a structured questionnaire given to a sample of the population to enquire specific information for a research study. There are some aspects that have to be considered when designing or constructing a questionnaire (such as the arrangement of questions and length in a questionnaire, check if the questionnaire has been reviewed and approve the overall appearance), as mentioned by Brink (2006:150-151).

The arrangement of questions in a questionnaire is critical. It is important that the questions are arranged in a way that is logical and relevant to the respondent. The order of questions can affect the quality of information, and the interest of a respondent to participate in a study. The questionnaire used for this study was constructed in such a way that it minimises confusion, and keep the respondents interested in completing the questionnaire. A sequence of questions had been categorised in a logical manner to be completed with ease by the respondents, according to Maree and Pietersen (2007:160); Neuman (2010:330); Kumar (2011:158) and Brink (2006:150).

Attention needs to be given to the appearance of a questionnaire, thus the appearance must be of professional quality. Maree and Pietersen (2007:159) mentioned a few aspects that may encourage a respondent to take time to complete the questionnaire (for example that it should appear user friendly, must be printed in a readable font, and have clear instructions and brevity). For the purpose of this study a cover letter as well as permission letter was

included in each questionnaire explaining the aims and objectives of this study, as well as instructions on completion of the questionnaire. The questionnaires were distributed at the PHC clinics by the researcher, explaining to the respondents what is expected of them.

According to Brink (2006:150), a questionnaire must be of sufficient length in order to obtain the necessary information, but not so long that it bores the respondent. A long questionnaire may discourage a response and can prove costly.

It is essential that the researcher includes a cover letter with a questionnaire. It should include the following (Kumar, 2011:150-151):

- An introduction of the researcher and university represented;
- Main objectives and relevance of the study;
- Convey general instructions for completion of the questionnaire;
- Respondents must be assured of the anonymity of the information provided by them;
- A contact number must be provided in case of any uncertainties; and
- Give a word of appreciation for their participation in the study.

The questionnaires used for the purpose of this research study were administered at PHC clinics. Questionnaires were left at clinics for completion and a collection date was scheduled with the clinic manager, this can contribute to low response rates. The purpose of the study is explained to chosen respondents, and their participation is requested towards the study. These types of questionnaires are time consuming with a low response rate, self-selecting bias, opportunity to clarify are sometimes lacking, it is possible for respondents to consult with others, incomplete questionnaires can cause serious setbacks (Kumar, 2011:149 and Neuman, 2010:337).

A questionnaire (Appendix A, B and C) was developed and reviewed by personnel from the academic institution and pharmacists in the public health care sector in the North West Province. The questionnaire was divided into three sections. Section A used quantitative and qualitative methods, thus the questionnaire consisted of open-ended and closed-ended questions. Section A requested information on:

- demographics of clinics;
- patient visits;
- services provided at clinics;
- structure of personnel at the clinics;
- documentation systems used to document patient and drug information;

- references used at PHC clinics;
- responsibilities of personnel;
- medicine stock at PHC clinics, and
- management tasks at PHC clinics.

The second section (Section B) was directed at the sub-district pharmacists and a structured questionnaire with open-ended questions were provided in order to clarify certain aspects of their job description:

- the role of the sub-district pharmacist in PHC clinics;
- medicine logistics; and
- the role sub-district pharmacists play in conducting annual budgets.

The third section (Section C) was a qualitative method (observations) made by the researcher:

- focusing on the outlay of the store/medicine room;
- working conditions of electrical equipment; and
- the availability of medication at PHC clinics.

Preliminary versions of the questionnaires were drawn up and evaluated by a sub-district pharmacist, two members of the university and the district pharmacist before the final version was selected.

3.4.1 Questionnaire administration

Meetings were held with the four sub-district pharmacists to confirm the total number of PHC clinics in each sub-district, the demographics of each clinic and the clinic manager at each clinic. The researcher visited each clinic along with the sub-district pharmacist, informing the clinic manager of the procedure upon completing the questionnaire. The time duration for completing the questionnaire was one week - in the week of collecting the questionnaires the clinic observations were done by the researcher. A covering letter was used (see Appendix A, B and C) to motivate and inform the reader why they should participate in the study. The aim as well as the importance of the study was explained. A guarantee of confidentiality and anonymity was offered.

3.4.2 Data instruments used

According to Brink (2009:141), the process of data collection is of critical importance to the success of a study. The researcher should be familiar with the data-collection techniques in

order to select the best suitable technique for the purpose of the research study. In this study the techniques used were observations as well as questionnaires to gather primary data. In an attempt to design a questionnaire, the researcher should gather knowledge from previous research on the study topic (Welman *et al*., 2005:174). Designing a questionnaire follows a basic standard format which can be divided into two phases, the design and planning phase and the data collection phase (Creswell, 2009:146-147; Neuman, 2010:312-313). According to Welman *et al.* (2005:174), only questions relating to the research questions should be included in a questionnaire. An example of a checklist of questions for designing and planning a questionnaire is provided below:

- Is the purpose of the survey method stated?
- Are the reasons for choosing the design mentioned?
- Is the nature of the survey identified?
- Are the population and its size mentioned?
- Will the population be stratified? If so, how?
- How many people will be in the sample? On what basis was this size chosen?
- What will be the procedure for sampling these individuals?
- What instrument will be used in the survey? Who developed the instrument?
- What are the content areas addressed in the survey? Scales?
- What procedure will be used to pilot or field test the survey?
- What is the timeline for administering the survey?
- What are the variables in the study?

In the data collection phase there are basic steps to be followed:

- Locate and contact the respondents;
- Make introductory statements or provide instructions;
- Ask questions and record answers;
- Thank respondents and continue to next respondent; and
- End data collection and organise data (Neuman, 2010:232).

The design of a well-defined questionnaire requires the researcher to give attention to the following:

- Meet the objectives of the enquiry;
- Demonstrate a fit between its contents and the research problem, and objectives;
- Obtain the most complete and accurate information possible, and do so within reasonable limits of time and resources;

- Appearance of questionnaire;
- Question sequence;
- Wording of questions; and
- Response categories (Brink, 2006:147; Maree & Pietersen, 2007:158-159).

When carefully considered and applied, the questionnaire should be a natural, ready-to-use instrument to elicit information. In order to increase the response rate the researcher should give instructions on completion of the questionnaires that are simple, clear and concise. It is of great importance that questions will be written in such a manner that it will have the same meaning for all the respondents. Questions not carefully worded may result in answers, and therefore data, that are meaningless. The following guidelines were considered in the design of the questionnaires:

- Double-barrelled, ambiguity, and leading questions were avoided;
- Jargon, slang and abbreviations were avoided;
- Emotional language, prestige bias and sensitive questions were avoided;
- Negative questions were avoided because it causes confusion;
- Complex questions were broken up, to be understandable and give reliable results; and
- Unbalanced or overlapping response categories were avoided (Kumar, 2011:156; Brink, 2006:149-150; Maree & Pietersen, 2007:160 and Neuman, 2010:313-317).

3.4.2.1 Open- and closed-ended questions

Two types of questions were used in this research study (Creswell, 2008:8):

- Open-ended questions – respondents answered questions in their own words (qualitative data); and
- Closed-ended questions – respondents had to choose from given alternatives (quantitative data).

According to Kumar (2011:151), the researcher has to decide in what manner the information gathered from the two types of question, will be used. The way the researcher frames the questions are of great importance because it determines the unit of measurement which could be used to classify the responses.

- **Open-ended questions: advantages and disadvantages**

The greater part of the questionnaires consisted primarily of open-ended questions for the following reasons:

- They provide richer, more diverse data and questions are easier to construct (Brink, 2006:149);
- According to Kumar (2011:153) open-ended questions provide respondents with the opportunity to express them freely and virtually eliminate the possibility of researcher' bias;
- Respondents can give honest answers and detail;
- The respondent's thinking process is revealed;
- Complex questions can be adequately answered;
- Thematic analysis of respondents will yield extremely interesting information, categories and subcategories (Maree & Pietersen, 2007:161);
- Unanticipated findings can be discovered; and
- They reveal a respondent's logic, thinking process, and frame reference (Neuman, 2010:325).

There are some disadvantages to open-ended questions according to Neuman (2010:325) and Maree and Pietersen (2007:161):

- Different respondents give different degrees of detail in answers;
- Responses may be irrelevant or buried in useless detail;
- Comparisons and statistical analysis become very difficult;
- Coding of answers may be difficult;
- Articulate and highly literate respondents have an advantage;
- Questions may be too general for respondents who lose direction;
- A greater amount of respondent time, thought, and effort is necessary;
- Respondents can be intimidated by questions; and
- Answers take up a lot of space in the questionnaire.

- **Closed-ended questions: advantages and disadvantages**

Data obtained from the administration of closed questions are easier to code and analyse, quick to answer, the response choices can clarify question meanings, fewer irrelevant or confused answers to questions, and less literate respondents are not at a disadvantage (Maree & Pietersen 2007:161-164; Neuman, 2010:325).

It is important to notice that there are some disadvantages to consider with closed-ended questions:

- Questions could suggest ideas that the respondent would not otherwise have;
- Respondents with no opinion or no knowledge can answer anyway, and misinterpretation of questions can go unnoticed;
- Respondents can be frustrated because their desired answer is not a choice or that there are too many choices;
- Clerical mistakes or marking the wrong response is possible;
- These questions are more difficult to construct than open-ended questions; and
- Answers are simple with no detail thus lack depth and variety (Kumar, 2011:153-154; Maree & Pietersen, 2007:164; Brink, 2006:149).

3.4.3 Observations

The second method used to collect data was the use of observations. According to Dung (2006:16), observations are used to record behavioural patterns, objects and events to obtain information on a subject of interest. Secondary sources of data collection were also used in this research study. Public documents were analysed as well as stock cards from the PHC clinics. While using these types of data the following issues were kept in mind:

- Validity and reliability;
- Personal bias;
- Availability of data; and
- Format (Kumar, 2011:164).

Kumar (2011:140) and Nieuwenhuis (2007:84) mentioned that observation is an essential data gathering technique, which is a purposeful, systematic and a selective way of watching and listening to an interaction or phenomenon as it takes place in different settings. It is important for the researcher to clearly define the purpose and focus of the observation in order to know what to observe. The focus of the research study should be linked to the research question. A researcher should never seek data aggressively; rather observe events in their natural setting. Respondents are sometimes unaware of answers because it is sometimes difficult for them to detach themselves from the interaction thus the appropriateness of observations. Nieuwenhuis (2007:85) and Creswell (2009:179) mentioned that there are four types of observation:

- Complete participant – researcher conceals role;
- Observer as participant – role of researcher is known;

- Participant as observer – observation role secondary to participant role; and
- Complete observer – researcher observes without participating.
- For the purpose of the research project a non-participant (complete observer) structured observation was selected. A non-participant observation is where the researcher remains passive, watching and listening to activities and drawing conclusions in the end (Kumar, 2011:141). There are some disadvantages that the researcher should be aware of when using observation as a data collection method:
- If respondents are aware that they are being observed, they may change their behaviour;
- There is the possibility of observer bias;
- The interpretations drawn from observations may vary from observer to observer;
- There is the possibility of incomplete observation and/or recording, which varies with the method of recording;
- Researcher may be seen as intrusive; and
- Private information may be observed that the researcher cannot report (Creswell, 2009:179).

According to Creswell (2009:179), there are some advantages to observation:

- The researcher has a first-hand experience with participants;
- The researcher can record information as it occurs;
- Unusual aspects can be noticed during observation; and
- Useful in exploring topics that may be uncomfortable for participants to discuss.

There are many ways of recording observations. The selection of a method of recording depends upon the purpose of the observation. Two methods of recording were used: narrative and categorical.

The result of observation can be recorded and analysed qualitatively or quantitatively. There are a number of contexts where observations are an appropriate or necessary part of management research. Observations can provide useful information about the workplace (Welman *et al*., 2005:170). Observation is essentially a simple research method. According to Welman *et al*. (2005:171), the main steps in planning and conducting an observational research project are as follows:

- Choose a site;
- Choose an observation point;
- Choose a suitable study time;

- Decide on continuous observation or sampling;
- Decide on number and length of sampling periods;
- Decide on what to observe;
- Divide into zones;
- Design a recording sheet;
- Conduct study; and
- Analyse data.

The following aspects should be considered when observation has been used:

- Is observation an appropriate approach to obtain the necessary information to answer the research question?
- What or who has to be observed?
- Was a structured or unstructured approach used and to what extent was the researcher involved?
- Where did the observations actually take place?
- How were data recorded?
- What steps were taken to minimise observer bias?

3.5 Study population

In the research study undertaken both sources were used with specific emphasis on observations and questionnaires (primary data) and budget allocations, availabilities and stock cards (secondary data). The research study was conducted in a selected sample of 35 clinics in the Dr Kenneth Kaunda District, not all of the data was received back (refer to 1.13.3.5, chapter 1).

Three out of four questionnaires were received back from the sub-district pharmacists, which represented a 75.00 % return. A total of 26 questionnaires were received back from the clinic managers, which represented a 72.20 % return. Observations could be made in 69.4 % of the clinics by the researcher.

3.5.1 Maquassi Hills sub-district

Table 3.1 below gives an indication of all the clinics in the Maquassi Hills sub-district, the return of questionnaires and observations done within these facilities. During the research study structured questionnaires were sent to all of the operational/ clinic managers, but only five were returned.

Table 3.1: Research sites included in the study for Maquassi Hills sub-district

	Sub-districts	PHC Clinics	Observations
Respondents	Pharmacists	Clinic Managers	Researcher
Facilities	Maquassi Hills	Leeudoringstad CHC Tswelelang CHC Kgakala Tswelelang Clinic Makwassie Wolmaranstad Clinic Segametsi Bophelo	Observations made as a non-participant by the researcher at some of the clinics.
Sub -total	1	8	8
Return	0	5	6
Total (questionnaires & observations)	11		

Reasons for not returning survey A to the researcher, could be due to time constraints, clinics being too busy, not understanding questions, losing questionnaires or simply forgetting to complete the questionnaire. The researcher was able to make observations in six of the clinics, but was not able to photocopy the stock cards due to time constraints. Some of the clinics did not have any stock cards thus a physical stock count was performed by the researcher. Survey B was not completed by the sub-district pharmacist.

3.5.2 Potchefstroom sub-district

During the course of the research study the researcher was able to visit all nine clinics; one clinic was used for a pilot to test the questionnaire. Observations could be made in all eight clinics, and seven clinics returned their questionnaires. The questionnaire sent to the sub-district pharmacist was received back. Table 3.2 below gives an indication of facilities visited in the Potchefstroom sub-district.

Table 3.2: Research sites included in the study for Potchefstroom sub-district

	Sub-districts	Primary Health Care Clinics	Observations
Respondents	Pharmacists	Clinic Managers	Researcher
Facilities	Potchefstroom	Boiki Tlapi CHC Steve Tshwete Top City Mohadin Lesego Promosa CHC Potchefstroom Clinic Gateway Boskop	Observations made as a non-participant by the researcher at some of the clinics
Sub -total	1	9	9
Return	1	7	8
Total (questionnaires & observations)	16		

3.5.3 Ventersdorp sub-district

Table 3.3: Research sites included in the study at Ventersdorp sub-district

	Sub-districts	Primary Health Care Clinics	Observations
Respondents	Pharmacists	Clinic Managers	Researcher
Facilities	Ventersdorp	JB Marks CHC (new) JB Marks PHC (old) Gateway Clinic Settlement Clinics* Rysmierbult Clinic Magopa Clinic	Observations made as a non-participant by the researcher at some of the clinics.
Sub –total	1	10	10
Return	1	2	4
Total (questionnaires & observations)	6		

*There are five settlement clinics: Boikhutso, Boikhutsong, Goedgevanden, Welgevanden and Tsetse

PHC facilities visited in the Ventersdorp sub-district is indicated in table 3.3 above. Only four clinics were used for the research study because of the distance between clinics and services provided at some clinics were not relevant to the study.

3.5.4 Matlosana sub-district

Table 3.4: Research sites included in the study at Matlosana sub-district

	Sub-districts	Primary Health Care Clinics	Observations
Respondents	Pharmacists	Clinic Managers	Researcher
Facilities	Matlosana	Tigane CHC Delekile Khoza Alabama Parkstreet Botshabelo CHC Khuma Marcus Zenzile Stilfontein Grace Mokhomo CHC Kanana Orkney Jouberton CHC Empilisweni NM Pretorius Tsholofelo	Observations made as a non-participant by the researcher at some of the clinics.
Sub –total	1	15	15
Return	1	13	7
Total (questionnaires & observations)	20		

During the research period a number of clinics were visited within the Matlosana sub-district as indicated in table 3.4 above. Due to logistical restrictions only fifteen clinics were visited in the Matlosana sub-district during the study. Observations were done at only seven clinics, due to the absence of managers and time constraints during visits.

3.6 Scales of measurement / measurement levels

In this study four levels of measurement were used, namely the nominal, ordinal, interval and ratio level. According to Neuman (2010:157-159), there are two reasons for using scales; firstly, scales help in the conceptualisation and operationalisation processes. Scales show the fit between a set of indicators and a single construct. Secondly, scaling produces quantitative measures and can be used with other variables to test hypotheses. The scale of measurement will ultimately dictate the statistical procedures that can be used in processing the data.

In some questions in the questionnaires, scales were used to measure participants' opinions and the way they interpret certain aspects concerning PHC clinics. Scales are generally used to produce quantitative measures, which can be used with other variables to test hypotheses.

3.6.1 Validity and Reliability of measurement

Validity and reliability of the researcher's measurement instruments influence the extent to which the researcher can learn from the phenomenon under study, the probability that statistical significance in data analysis will be obtained, and the extent to which meaningful conclusions can be drawn from data (Leedy & Ormrod, 2010:28). For the purposes of the study, clinic managers and sub-district pharmacists completed the questionnaires on their own, thus trustworthiness was not compromised by the researchers own impressions and ideals.

3.6.1.1 Validity

According to Brink (2006:118); Leedy and Ormrod (2010:28), establishing validity requires:

- Determining the extent to which conclusions effectively represent empirical reality; and
- Assessing whether constructs devised (questions, questionnaires or observations) by the researcher, represent or measure what it was intended to measure, given the context in which it is applied.

The validation process involves testing the instrument in the population for which it is to be used to ensure that the respondents would render a true reflection of the attributes of interest. Establishing the validity of the scores in a survey helps to identify whether an instrument might be a good one to use in survey research (Creswell, 2010:149). The four most common types of validity mentioned by Brink (2006:160); Neuman (2010:212); Pietersen and Maree (2007:217) are face, content, construct and criterion validity.

- **Face validity**

Face validity is the first task the researcher should perform in establishing the accuracy of the data-collection method (Brink, 2006:160). It is the easiest and most basic form of validity (Neuman, 2010:212). The purpose of face validity is to judge if the instrument measures what it is supposed to measure. This procedure may give insight in the development of a research instrument, regarding clarity and readability (Kumar, 2010:179; Brink, 2006:160). Various persons were involved during the developmental phase of the questionnaires to judge the face-validity (refer to section 3.4).

- **Content validity**

According to Brink (2006:160), content validity is an assessment of how well the instrument represents all the components of the variable to be measured. The researcher, readership and experts in the field must judge the extent to which statements or questions represent the issue they are supposed to measure (Kumar, 2010:180). Neuman (2010:142) mentions three steps regarding content validity:

- Specify the content in a construct's definition;
- Sample from all areas of the definition; and
- Finally, develop an indicator that taps all of the various parts of the definition.

In this study questionnaires were spread within the DKK district to clinic managers and sub-district pharmacists. The questionnaires included open and closed questions; the former was included to give the participants the opportunity to give their own opinion regarding certain issues and the latter for participants to answer sensitive questions. Observations were done by the researcher as a non-participant, to observe the medicine/ storage rooms and medicine stock cards in PHC clinics, to form an idea around medicine logistics. The contents of the questionnaires were also evaluated by various persons with experience in the field.

- **Construct validation**

This type of validity is the most important and most frequently used form of validity. It is used to explore the relationship of the instrument's results to measures of the underlying theoretical concept(s) of the instrument rather than irrelevant constructs or measurement error (Brink, 2006:162; Welman *et al.*, 2005:142). According to Kumar (2010:180-181), it is based upon statistical procedures, and determined by ascertaining the contribution of each construct to the total variance observed in a phenomenon. The greater the variance attributable to the constructs, the higher is the validity of the instrument. Construct validity is the ability of an instrument to measure the construct that it is intended to measure (Brink, 2006:162, 200).

- **Criterion-related validity**

The term refers to a pragmatic approach to establish a relationship between the scores on the instrument in question and other external criteria. The researcher can measure the validity of the instrument by comparing it to another measure that is known (Brink, 2006:160). The result of certain questions is validated with some criterion external to the study.

3.6.1.2 Reliability

Brink (2006:207) and Leedy and Ormrod (2010:29) defines reliability to be the consistency and dependability of research with which a measuring instrument yields a certain result when the entity being measured hasn't changed. In other words, reliability is the extent to which a measuring instrument is repeatable and consistent (Pietersen & Maree, 2007:215). Reliability therefore means that the information provided by the instrument (for example, a questionnaire) does not vary as a result of characteristics of the instrument itself. Factors affecting the reliability of a research instrument (Kumar, 2010:182):

- Wording of questions;
- Physical setting;
- Respondent's mood;
- The nature of interaction; and
- The regression effect of an instrument.

Research tools cannot be 100 percent effective, because it is impossible to control the factors affecting reliability. There are three characteristics of reliability that are commonly used according to Brink (2006:163):

- Stability;
- Internal consistency; and
- Equivalence reliability.

Only internal consistency - also known as internal reliability - is relevant for this research study, and will be discussed briefly.

According to Brink (2006:164) and Pietersen and Maree (2007:216), internal consistency addresses the extent to which all items on an instrument measure the same variable, thus there must be a high degree of similarity among them. A measure of this degree of similarity is an indication of the internal reliability of the instrument. This type of reliability is appropriate only when the instrument is examining one concept or construct at a time. Entered data were also checked and verified for accuracy to increase validity and reliability of the data. Clinic managers and sub-district pharmacists completed the questionnaires according to their own knowledge and experience. The observations were made solely on what could be observed and the availability of certain services within facilities by using a checklist.

3.7 Statistical analysis

Data in this study were analysed by using Excel. According to Sibanda (2009:30) Excel is an appropriate programme to use for entering data, manipulating data and to quickly summarise data, though analytical tools are limited.

3.7.1 Standard deviation (SD)

According to Neuman (2010; 391), standard deviation is the most complex equation to calculate. Standard deviation is "a measure of dispersion for one variable that indicates an average distance between the scores and the mean" (Neuman, 2010; 391). Standard deviation is used to measure variability (Boddy & Smith, 2009:10; Brown, 2011; Dalgaard, 2008:5).

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Where:

s = standard deviation

Σ = means “sum of”

x = value in the data set

$\overline{x}$ = arithmetic mean

n = number of observations

This equation was used wherever the average was calculated to show the spread of data from the average e.g. the distribution of data around average cost as well as around average items per prescriptions. Standard deviation will be abbreviated as SD.

3.7.2 Arithmetic mean

The most common statistical measure of central tendency is the mean. It is the sum of the data values divided by the number of items (Doane & Seward, 2007:119).

The arithmetic mean was calculated as follows (Freedman *et al.,* 2007:10):

$$\overline{x} = \frac{\sum x}{n}$$

Where:

$\overline{x}$ = arithmetic mean

x = value in the data set

Σ = means “sum of”

n = number of observations

The arithmetic mean was used in the empirical chapter and referred to as average e.g. average patients that visit clinics in the DKK district and the average personnel distribution within PHC clinics in the DKK district.

3.7.3 Frequency

The frequency will be used to determine the following:

- The total number of patients that visit clinics per month;
- The total of PHC personnel responsible for completing patient registers when patients enter the clinics;

- The total number of health care personnel responsible for organising patient files and the accessibility of files to personnel at PHC in the DKK district;
- The total number of clinics within the DKK district that use SOPs for dispensing medication; ordering stock and receiving stock;
- The total number of factors that lead to stock-outs in the PHC clinics;
- Total number of measures implemented against theft in PHC clinic in the DKK district; and
- The total number of tracer drugs available at each clinic.

3.8 Ethical consideration and implementation

According to Neuman (2010:143), ethics begins and ends with the researcher. A researcher's personal moral code is the strongest defense against unethical behaviour. The way each profession serves society is continuously changing in accordance with society's needs and expectations and with the technology available for the delivery of a service. Any judgement about whether a particular practice is ethical is made on the basis of the code of conduct prevalent at that point in time. In research, any dilemma stemming from a moral quandary is the basis of ethical conduct.

There are certain behaviours in research – such as causing harm to individuals, breaching confidentiality, using information improperly and introducing bias – that are considered unethical in any profession (Kumar, 2011:242). A researcher is responsible for conducting research in an ethical manner. Failure to do so undermines the scientific process and may have negative consequences. To conduct research ethically, the researcher must:

- Carry out the research competently;
- Manage resources honestly;
- Acknowledge fairly those who contribute guidance or assistance;
- Communicate results accurately; and
- Consider the consequences of the research for the field of study in particular, and for society in general (Brink, 2006:30).

3.8.1 Fundamental ethical principles

According to Brink (2006:31), there are three fundamental ethical principles that guide researchers:

- Respect for participants;
- Respect for beneficence; and

- Respect for justice.

These principles are based on the human rights that need to be protected in research, namely, the right to self-determination, to privacy, to anonymity and confidentiality, to fair treatment and to be protected from discomfort and harm. Neuman (2010:155) mentioned that the basic principles of ethical social research are:

- Ethical responsibility rests with the individual researcher;
- Do not exploit subjects or students for personal gain;
- Some form of informed consent is highly recommended or required;
- Honour all guarantees of privacy, confidentiality, and anonymity;
- Do not coerce or humiliate subjects;
- Use deception only if needed, and always accompany it with debriefing;
- Use the research method that is appropriate to a topic;
- Detect and remove undesirable consequences to research subjects;
- Anticipate repercussions of the research or publication of results;
- Identify the sponsor who funded the research;
- Cooperate with host nations when doing comparative research;
- Release the details of the study design with the results;
- Make interpretations of results consistent with the data;
- Use high methodological standards and strive for accuracy; and
- Do not conduct secret research.

3.8.2 Ethical issues to consider concerning research participants

There are many ethical issues to consider in relation to the participants of a research activity.

3.8.2.1 Collecting information

Research is required in order to improve conditions. Before the researcher begins to collect information, the relevance and usefulness of the research study must be considered and the ethical committee must be convinced of the study as well (Kumar, 2011:244). As researchers anticipate data collection, they need to respect the participants and the sites (so that they are left undisturbed) for research. An important aspect to consider is not to put participants at risk, and to respect vulnerable populations (Creswell, 2009:89-90). When the researcher visited the PHC clinics', to collect the data for the research study, the researcher strived to minimise the disruption in the clinics daily activities. According to Brink (2006:37), the researcher is responsible for ensuring that the subject invited to participate in the study is

not unduly influenced to participate, or coerced, which is that the participant is made to feel that participation is compulsory.

3.8.2.2 Seeking consent

In every discipline it is considered unethical to collect information without the knowledge of participants, and their expressed willingness and informed consent is required. Informed consent implies that subjects are made adequately aware of the type of information you want from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study, and how it will directly or indirectly affect them (Kumar, 2011:244). According to Brink (2006:37), a prospective subject has to decide voluntarily whether or not to participate in a study, and must be given time to do so. The participant must feel confident that refusal to participate will not prejudice them in any way. Voluntary consent is obtained only once the subject has demonstrated a clear understanding of the essential information provided in the informed consent form. The participants were given a letter (refer to appendix A) informing them about the research project, asking for their assistance in completing the anonymous survey (verbal consent was received from participants).

3.8.2.3 Seeking sensitive information

Information sought can pose an ethical dilemma in research. Certain types of information can be regarded as sensitive or confidential by some people and thus an invasion of privacy. In collecting data you need to be careful about the sensitiveness of the respondents. The dilemma the researcher faces is whether one should ask sensitive or intrusive questions. According to Kumar (2011:245), it is not unethical to ask sensitive or intrusive questions, as long as the respondents are informed about the rationale behind the questions, and that are allowed sufficient time to decide if they want to partake without inducement.

3.8.2.4 Maintaining confidentiality

Sharing information about a respondent with others for purposes other than research is unethical. The researcher must ensure that the information provided by respondents is kept anonymous. It is of great importance that the collected data's source cannot be identified. It is unethical to be negligent in not protecting the confidentiality and anonymity of the information gathered from respondents (Kumar, 2011:246).

3.8.3 Ethical issues to consider relating to the researcher

3.8.3.1 Avoiding bias

Bias on the part of the researcher is unethical. Bias is a deliberate attempt either to hide what you have found in your study, or to highlight something disproportionately to its true existence (Kumar, 2011:246).

3.8.3.2 Using inappropriate research methodology

A researcher has an obligation to use appropriate methodology, within the researcher's knowledge base, in conducting a study. It is unethical to deliberately use a method or procedure you know to be inappropriate to prove or disapprove something that you want to, such as by selecting a highly biased sample, using an invalid instrument or by drawing wrong conclusions (Kumar, 2011:247).

3.8.3.3 Incorrect reporting

To report the findings in a way that changes or slants them to serve the researcher's own or someone else's interest is unethical. Correct and unbiased reporting of the findings are important characteristics of ethical research practice (Kumar, 2011:247).

3.8.3.4 Inappropriate use of the information

The use of information in a way directly or indirectly affecting respondents adversely is unethical. Sometimes it is possible to harm individuals in the process of achieving benefits for organisations. According to Kumar (2011:247), it is ethical to ask questions provided the researcher tells respondents of the potential use of the information, including the possibility of its being used against some of them, and the researcher let the respondents decide if they want to participate.

The researcher submitted a research proposal along with the necessary consent forms to the appropriate ethics committee for review, prior to beginning the research project. Ethical approval to conduct the study was obtained from the North-West University, Potchefstroom Campus, Research and Ethics Committee. To ensure confidentiality of respondents no names of clinic managers and sub-district pharmacists were recorded. Only classification of sub-districts and survey numbers were used.

The submission of the research proposal for review by a committee or board is a policy that protects the researcher and the research subjects (Brink, 2006:42). Researchers may be

subject to litigation and could lose professional indemnity if they are not seen to have adhered to the appropriate code of ethics (Welman *et al*., 2005:181).

3.9 Summary

In this chapter the methodology used in this study was discussed. The research design and study sites were described. Discussion surrounding the sample included the sampling frame, the sample size, inclusion and exclusion criteria and sampling procedures. Data collection instruments and procedures were detailed. A discussion of the data analysis procedures and methods to ensure reliability and validity followed. The results from the data collected for this study are presented in chapter 4.

Chapter 4

Results and Discussion

4.1 Introduction

In this chapter the results of the empirical investigation will be reported and discussed.

The aim was to investigate the documentation systems used for medicine logistics at the primary health care clinics in the Dr Kenneth Kaunda District in the North West Province.

The results of documentation will be discussed according to table 4.1 below.

4.1.1 Annotations

- PHC clinics and CHC centres will be referred to as clinics unless stated otherwise.
- It was noted that not all the respondents answered all the questions; therefore, the frequencies indicated in the tables and figures are often less than the total number of respondents.
- If all the respondents answered a question, the total number 26 was indicated. In other cases, the actual figure was indicated as the n value and missing values were noted.
- Questions 1.1 and 1.2 are the same for all three sections (demographics for all three sections).
- The Good Pharmacy Practice document of the South African Pharmacy Council will be used as a guideline to support certain statements. (SAPC, 2010)
- In this chapter reference is made to pharmacist assistants, it includes both basic and post-basic pharmacist assistants.
- The room where medicine is stored for the purpose of this study is referred to as a medicine room.
- Stock in the context of this research study includes medicine as well as pharmaceutical supplies such as sutures, gauze, catheters and needles.
- For the purposes of this research study clinic managers and facility managers are synonyms.
- In Section B of chapter 4, the researcher combined all the results from the three sub-district pharmacists.
- For the purposes of this study respondents were allowed to choose more than option at certain questions, thus the total > 100%.

Table 4.1: Outline of questions during the research study

Clinic managers	
Questions	**Item description**
	Biographical information
1.1 – 1.5	Demographics, patient visits per clinic, services provided and personnel distribution
	Functions and roles of health care workers
1.6 – 1.22	Documentation and logistics regarding the PHC clinic
	Medicine stock
1.23 – 1.36	Managing of medicine stock at PHC clinics and CHC centres
	Managing PHC facilities
1.37 and 1.39	Routine PHC facility management tasks
Sub-district pharmacists	
Questions	**Item description**
1.3	Role of the sub-district pharmacists
1.4	Role that sub-district pharmacists play in medicine logistics
1.5	Duties of sub-district pharmacists
1.6	Role of the sub-district pharmacist in conducting an annual clinic budget
1.7	Conducting an annual clinic budget
Observations	
Questions	**Item description**
1.3	Percentage availability of (10 preselected) tracer drugs at PHC clinics and CHC centres
1.4	• Premises and layout of PHC clinics and CHC centres • Medicine room • Thermolabile medicines • Stock control

4.2 Section A

This section was completed by the clinic managers of the different PHC clinics and CHC centres.

4.2.1 Biographical information

Information was collected on geographic location of the clinics, the average patients that visit the clinics, operating hours of clinics, services provided at the clinics and personnel distribution within the DKK district.

4.2.1.1 Demographics and patients that visit clinics (refer to question 1.1-1.3)

Refer to chapter one for a more extensive explanation regarding the DKK district. During the research study four sub-districts within the DKK district were visited: Potchefstroom, Ventersdorp, Maquassi Hills and Matlosana. Table 4.2 below contains the average number of patient visits per clinic within each sub-district. The question was completed by 23 of the 26 respondents, thus three did not respond to the question. Table 4.2 is divided into two

categories, PHC clinics (n=19) and CHC centres (n=4). An average of 2 842.58 (±1 630.31) patients visit PHC clinics per month in the DKK district. Matlosana has the highest average of 4 112.5 (±1 630.31) patients visiting clinics whilst Maquassi Hills has the lowest average of 1 519.4 (±803.45) patient visits per clinic.

Table 4.2: Average number of patients that visit clinics per month in the sub-districts

	Primary Health Care clinics			Community Health Care centres		
Sub-districts	**(n)**	**Average number of patient visits**	**Standard deviation**	**(n)**	**Average number of patient visits**	**Standard deviation**
Potchefstroom	6	2 252.00	±1 280.85	0	0	0
Ventersdorp	0	0	0	1	2 500.00	0
Maquassi Hills	5	1 519.40	±803.45	0	0	0
Matlosana	8	4 112.50	±1 378.86	3	5 433.33	±1 887.68
Total	19	2 842.58	±1 630.31	4	4 700.00	±2 127.60

The average number of patients that visit CHC centres are 4700 (±2 127.6) per month in the DKK district. There are nine CHC centres in the DKK district but only four responded. Matlosana has the highest average of 5 433.33 (±1 887.68) patients visiting clinics per month because of the dense population within the sub-district. According to Leon (2012b:72), the DKK district has the forth lowest utilisation rate in South Africa.

During the research study it was noted that in question 1.3 in section A of the questionnaire, Potchefstroom sub-district had a zero value for the average number of patients that visited CHC centres, because the questionnaires were not received back, several follow-ups were done with no results. Ventersdorp sub-district had a zero value for the average number of patients in PHC clinics; because only two questionnaires were received of which only one clinic managers completed the question. According to Buthelezzi *et al*. (1997:5) the average number of patients seen by nurses in the North West province was 570 per month. The average nurse clinical workload in South Africa is 23.7 patients per nurse per day (Smith, 2009:28) where as in the North West province the average workload is 33.3 patients per nurse per day (Monticelli, 2009:199).

4.2.1.2 Services provided according to the PHC package of South Africa (refer to question 1.4)

According to the PHC facility supervision manual (Department of Health, 2009b:63), there are currently sixteen health care programmes implemented in PHC clinics and CHC centres. In this research study only selected programmes were evaluated, thus only those relevant to the study are discussed. In order to improve the health status of South Africans, focus

should be based on the appropriate selection of treatments and use of services (Department of Health, 2007a:5).

Table 4.3: Services provided at PHC clinics and CHC centres in the DKK district

	Services provided (n=26)			
	Yes	**%**	**No**	**%**
Blood pressure monitoring	26	100	0	0
Performance of peak flow tests	26	100	0	0
Performance of HIV tests	25	96.2	1	3.8
Cholesterol monitoring services	22	84.6	4	15.4
Glucose monitoring	26	100	0	0
Pregnancy testing services	26	100	0	0
Urine analysis	25	96.2	1	3.8
Women's reproductive care				
Antenatal care	22	84.6	4	15.4
Delivery of child	7	26.9	19	73.1
Postnatal care	23	88.5	3	11.5
Family planning	23	88.5	3	11.5
Pap smears/VIA	23	88.5	3	11.5
Integrated management of childhood illness	26	100	0	0
Diseases prevented by immunisation	26	100	0	0
Management of communicable diseases				
Cholera and diarrhoeal disease control	24	92.3	2	7.7
Dysentery	24	92.3	2	7.7
Helminths/worms	26	100	0	0
Sexually transmitted infections (STI)	26	100	0	0
Malaria	15	57.7	11	42.3
Rabies	12	46.2	14	53.8
Tuberculosis	25	96.2	1	3.8
Leprosy	7	26.9	19	73.1
Prevention of hearing impairment due to otitis media	21	80.8	5	19.2
Rheumatic fever	20	76.9	6	23.1
Oral health	12	46.2	14	53.8
Mental health	24	92.3	2	7.7
Victims of sexual offenses, domestic violence and gender violence	15	57.7	11	42.3
Chronic diseases (treatment)				
Diabetes	23	88.5	3	11.5
Hypertension	24	92.3	2	7.7
Epilepsy	25	96.2	1	3.8
Management of asthma	23	88.5	3	11.5
Stroke	22	84.6	4	15.4
Obstructive lung disease	22	84.6	4	15.4
Renal disease	16	61.5	10	38.5

PHC facilities operate eight hours a day for five days per week, where as CHC centres operate 24 hours per day for seven days per week. According to respondents, three 12% (3; n=26) indicated that they provide 24 hour services (CHC centres), 23 (88%; n=26) respondents confirmed that their clinics were open between eight am to five pm (PHC clinics).

PHC clinics have two days per week where staff work two extended hours, each clinic's two days differ (other hours) but they are open from five pm to seven pm 27% (7; n=26). Respondents had to indicate yes or no if services were provided or not. There were 26 respondents that completed this question (n=26), all four sub-districts' information were tabulated in Table 4.3 above. According to Cullinan (2006:7), nurses are responsible for running clinics, PHC clinics and CHC centres have to cover a comprehensive range of preventative, promotional, curative and rehabilitative services. According to the South African Pharmacy Council (2010: v-vi), there are minimum standards for screening and monitoring services. The following screening and monitoring services are provided at PHC clinics and CHC centres:

- Blood pressure monitoring;
- Performance of peak flow tests;
- Performance of HIV tests;
- Cholesterol monitoring services;
- Glucose monitoring;
- Pregnancy testing services; and
- Urine analysis.

All 26 PHC clinics and CHC centres indicated that they perform blood pressure monitoring, peak flow testing, glucose monitoring and pregnancy testing services. Urine analysis and HIV testing are done in 25 of the clinics thus giving a response rate of 96.2%. Monitoring cholesterol is done in 22 clinics (84.62%). Some of the clinics provide the service but patients are referred to hospitals or blood is sent away for laboratory testing and the patient can come back when the results are available and counselling or advice can be given to a patient.

Women's reproductive care, according to the DOH (2000:16) is services that are provided in an integrated manner and it focuses on antenatal, delivery, postnatal and family planning care. According to the completed questionnaire, 22 clinics provide antenatal care which represents 84.62% of the clinics in the DKK district. In 1998 only 39.3% of clinics in the North West province provided antenatal care (Pick *et* al., 1998:52). One of the norms for

reproductive care is to increase deliveries done at clinics from the existing level to at least 75% (Department of Health, 2009b:64). Considering the previous statement only seven clinics are equipped to do deliveries in the DKK district, thus a mere 26.92% of the clinics that took part in the research study. The delivery rate in facility indicator measures the proportion of all deliveries that take place in public health facilities under the supervision of trained personnel (Moodley, 2012:101).The average delivery rate in the 52 districts within South Africa in 2010/11 was 84%. The North West province delivery rate is slightly lower than the national average with a 76.2% average rate (Monticelli, 2012:244).

Postnatal care, family planning and PAP smears were performed in 23 clinics, an 88.46% representation of clinics used in this research study. According to Pick *et* al. (1998:52) family planning, postnatal care and PAP smears were provided in 78.6%, 53.6% and 32% of the clinics respectively in the North West province, these services have increased according to the presented results. Regular auditing of PHC clinics and maternity wards are essential to promote the quality of maternal health services (Barron *et al.*, 2003:37). According to Barron *et al.* (2003:40) it is essential to understand the meaning of basic indicators in order to utilise information and assess the quality of care within an obstetric unit.

Integrated management of childhood illnesses (IMCI) includes promotive, preventative, curative and rehabilitative services. These services are provided at all times according to IMCI provincial protocols during the clinics operating hours (DOH, 2000:20). During the study it was found that all of the 26 (100%) clinics under study provided these services. A research study done on improving the quality in PHC settings in South Africa presented that 51.03% of patients that participated in the research study indicated that clinics should operate 24 hours per day (Tshabalala, 2002:64).

Immunisation coverage is measured by children under the age of one year that has completed their immunisation course (Monticelli *et.al.*, 2009:7). Immunisation is an essential service implemented to prevent diseases. These services are available at clinic level and during the clinics' operating hours. Immunisations are amongst the most successful and cost-effective health interventions in South Africa (Jassat, 2012:40). The whole system is based on continuous and monitored cold chain availability of vaccines (DOH, 2000:24). During the research study it was found that all of the 26 (100%) clinics provided immunisation services. According to Pick *et al*. (1998:52) 53.6% of clinics provide immunisation services, thus showing that these services have improved over the past decade. The average immunisation coverage for 2010/11 in South Africa was 86.7% (Jassat, 2012:41). The average immunisation coverage for children under one year in the

DKK district in 2010/11 was 65.2% the third lowest rate of the 52 districts (Monticelli, 2012:250).

According to Monticelli (2009:105), one of the contributors to morbidity and mortality in young children is diarrhoeal diseases. In 2010/11 the national average incidence of diarrhoea was 109.3 cases per 1000 children under the age of five years and 100.8 cases per 1000 children in the North West province (Monticelli, 2012:244). Cholera and diarrhoeal disease control forms part of a clinic's daily services in order to prevent and control outbreaks (DOH, 2000:31). A 92.31% (24 clinics) positive response rate was observed in the questionnaires by clinic managers on providing cholera and diarrhoeal disease control in the DKK district. Dysentery is diarrhoea with visible blood in the stool. An outbreak is an unusual increase with bloody diarrhoea or deaths because of the disease (DOH, 2000:32). Twenty four (92.31%) clinics responded "yes" for providing services to treat dysentery at their clinics in the DKK district. Districts within the North West province have some of lowest diarrhoeal incidences (Monticelli, 2009:106). The diarrhoeal incidence for children under the age of five years in 2010 for the DKK district was 70% (Monticelli, 2012:250).

Two important diseases caused by helminths in South Africa are schistosomiasis and cysticercosis (DOH, 2000:33). These diseases have high morbidity rates yet they are preventable and treatable (DOH, 2000:33). Clinic managers in the DKK district had a 100% (n=26) response rate to provide treatment for helminths.

The average STI incidence in South Africa during 2010/2011 was 3.9%, meaning for every 100 people older than fifteen years of age 3.9 patients were treated for STIs in the public sector (Gerritsen, 2012:85). The average STI incidence for the same period in the DKK district was 1.9% (Monticelli, 2012:250). According to the DOH (2000:36), STI services are available daily at clinics; these services are implemented to prevent and manage STIs. STI services are a component of the control of HIV/AIDS and services for reproductive health. These services are provided in 26 of the clinics (100%) in the DKK district. STI services are provided in 92.9% of clinics in the North West province where HIV testing is only available in 46% of the clinics (Pick *et al.*, 1998:52). There have been improvements across the country for patients testing for HIV (Doherty, 2009:66).

Malaria is a disease that is effectively controlled in South Africa though seasonal outbreaks and can occur in endemic areas (DOH, 2000:41). In the DKK district only 15 clinics (57.69%) provided treatment for malaria cases, though the DKK district is not an endemic area. Four of the clinics (15.38%) indicated that they refer malaria cases to the nearest state hospital.

Rabies in general is usually referred to hospitals, though clinics need to be aware of the different categories:

- **Category 1:** contact with an infected animal, but the patient's skin is intact. No treatment is needed but if the patient's history is unreliable the patient will be vaccinated.
- **Category 2:** contact with infected animal, no bleeding but the patient's skin is broken. Patients are vaccinated.
- **Category 3:** bites and scratches by infected animals that penetrate the skin are treated in hospitals with immunoglobulin and rabies vaccines (DOH, 2000:33). The response rate for treating rabies at the clinics in the DKK district were 46.15% (n=12). Two clinics indicated that they refer these types of cases to the nearest state hospitals.

TB still remains a major public health issue in South Africa (Loveday, 2009:93). PHC clinics should have at least one staff member that is trained in TB management. Patients get tested on suspicion by using sputum smear microscopy followed screening of families in contact with TB patients. Patients receive treatment, a follow-up date is given to the patient and the TB register is completed, mentioned steps are done according to national protocols (DOH, 2009b:102). TB services are provided at 25 clinics (96.15%) in the DKK district as indicated by clinic managers. PHC clinics together with staff members need training, on-going supervision, mentoring and support from all levels of the continuum (Barron *et al.,* 2003:44). In 1998 a study was done to measure the quality of care in South African clinics and hospitals. The North West province provided 89.3% of TB services with 60.7% of drugs available at clinics (Pick *et al*., 1998:33). The TB cure rate in the North West province is of the lowest in South Africa with a 64.6% cure rate in 2009 (Monticelli, 2012:244).

Leprosy is a global disease. Multi drug treatment is available to cure patients, prevent further treatment and to eliminate the disease at global level. Clinic managers of seven clinics (26.92%) in the DKK district indicated that they provide treatment for leprosy patients; three clinics indicated that they refer patients to the nearest state hospital.

Clinics provide treatment for otitis media that is an infection of the middle ear, that if untreated will lead to hearing impairment (DOH, 2000:49). Twenty one clinics (80.77%) of the DKK district provide treatment for otitis media, according to clinic managers.

Rheumatic fever is a condition where the body develops antibodies against its own tissue following a streptococcal throat infection (South Africa, 2008:69). It usually occurs

in children between the ages of 3 until 15. The response rate of clinic managers in treating Rheumatic fever were 76.92% (n=20).

PHC facilities should at least provide basic primary oral health care services that consist of promotive and preventive oral health care, basic treatment services and emergency relief of pain and sepsis (DOH, 2009b:129). Twelve clinics (46.15%) provide basic oral health services.

Integrated comprehensive PHC consists of two components: Mental health and substance abuse. The aim of the services provided by PHC facilities is to improve mental health and the overall social well-being of the patients and communities (DOH, 2009b:115). All PHC facilities are regularly visited by trained staff in order to treat patients with mental disorders based within the district (DOH, 2009b:115). In the DKK district, 24 clinic managers (92.31%) indicated that they treat patients with mental disorders.

PHC facilities has established working relationships with the South African Police Service, the Department of Justice and Social Welfare who visits clinics at least twice per year to assist victims of sexual offenses, domestic violence and gender violence (DOH, 2009b:133). Facilities provide counselling, referral of victims, STI prophylaxis, HIV testing, emergency contraception, care of injuries, legal advice and documentation of evidence (DOH, 2009b:133). Fifteen clinics (57.69%) assist patients that are victims of sexual offenses, domestic violence and gender violence, though according to the PHC facility supervision manual all facilities have trained personnel to identify and manage these types of situations (DOH, 2009b:133).

Non-communicable diseases have become a major concern internationally and nationally (Monticelli, 2012:244) and has attracted global attention in the past year (Gómez-Olivé, 2012:76). Chronic diseases is a major concern globally and is the cause of 63% of all death worldwide (Gómez-Olivé, 2012:76; Mattke *et al.*, 2011:1). Diabetes mellitus according to Beers (2006:1274) is a disease that can lead to hyperglycaemia because of impaired insulin secretion and changes in levels of peripheral insulin resistance. Clinic managers of 23 clinics (88.46%) in the DKK district confirmed that they treat patients with diabetes. If the level of treatment falls beyond their scope of practice they refer patients to the nearest state hospital.

According to the DOH (2000:71), the main objective of treating patients with hypertension is early detection of the disease and to decrease organ damage, other cardiovascular complications, stroke and adverse interaction with diabetes. Twenty four clinics (92.31%)

treat patients with hypertension in the DKK district. The detection rate for hypertension is in the DKK district is 0.2% of PHC headcount over five years (Monticelli, 2012:250).

Epilepsy according to Beers (2006:1822) is a disorder that causes seizures. Seizures are abnormal, unregulated electrical discharge within the brain's gray matter that decreases or interrupts brain function. Clinic managers of the DKK district indicated that 25 of the clinics (96.15%) provided services in treating patients with epilepsy.

Asthma is the second most important chronic disease in South Africa after HIV/AIDS, and the eighth leading contributor to the burden of disease (Mash *et al*., 2009:892). The aim for chronic diseases like asthma is to manage the disease in infants, children and adults. Treatment schedules ranges from mild or moderate to severe asthma. Services for recognising, assessing, initiating therapy and referring patient with acute bronchospasm and related causes are in place (DOH, 2000:22). Access to essential drugs to treat asthma is better in South Africa than in other Sub-Saharan countries (Mash *et* al., 2009:892). Twenty three (88.46%) clinics within the DKK district manage asthma. Twenty two clinics (84.62%) in the DKK district treat patients with other obstructive lung diseases like chronic obstructive pulmonary disease, bronchitis and bronchiectasis. Asthma constitutes 1.5% of all death in South Africa (Ehrlich & Jithoo, 2005:123).

Strokes are characterised by miscellaneous disorders involving sudden, focal interruption of cerebral blood flow, causing neurologic deficit (Beers, 2006:1788). The response rate of clinics treating patients that suffer from strokes were 84.62% (n=22).

Patients that suffer from renal failure are classified either as acute or chronic. Acute renal failure develops rapidly over a few days, whilst chronic renal failure can progress over months and even years (Beers, 2006:1980). Patients are usually referred to hospital if therapy falls beyond the scope of practice of a professional nurse. The response rate was 62% for providing this type of service at PHC clinics. In terms of the PHC package, it is not compulsory to have all the services available at one clinic, should there be more than one clinic in the vicinity (Wentzel, 2008:206). The responsibility of implementing PHC services falls upon the clinic manager and the clinic supervisor (Wentzel, 2008:208).

4.2.1.3 Personnel distribution in PHC facilities within the DKK district (refer to question 1.5)

Table 4.4 below, indicates the personnel distribution per clinic in the DKK district is given. In the Matlosana sub-district 12 questionnaires were received back from the clinic managers. Matlosana sub-district has four CHC centres and 12 PHC clinics. The sub-district consists of

133 nursing staff, 11 medical staff (doctors and pharmacist assistants) and 68 other personnel (security, clerks and cleaners). Table 4.4 below, gives an average of personnel per clinic in each sub-district. The average number of nursing staff per clinic in Matlosana is 11.08 (±5.88) nurses per clinic, 0.92 (±0.74) medical staff per clinic and 4.83 (±3.68) other personnel per clinic.

Table 4.4: Division of health care workers in PHC clinics between the sub-districts

		Personnel								
		Nursing staff	Average	SD	Medical staff	Average	SD	Other staff	Average	SD
Sub-districts	Potchefstroom (n=7)	43	6.14	2.14	10	1.43	0.55	19	2.71	1.51
	Ventersdorp (n=2)	15	7.50	0.71	0	0	0	13	6.50	4.95
	Maquassi Hills (n=5)	23	4.60	1.14	1	0.20	0	11	2.20	1.10
	Matlosana (n=12)	133	11.08	5.88	11	0.92	0.74	58	4.83	3.68
	Total (n=26)	214	8.23	5.08	22	0.85	0.63	101	3.88	3.17

Clinic managers from the Maquassi Hills sub-district sent back five of the questionnaires (n=5). Maquassi Hills consists of eight clinics (two CHC centres and six PHC clinics) as mentioned only five clinics responded to the questionnaire. For this question medical personnel included medical doctors and pharmacist assistants, and other personnel included clerks, cleaners and security. There are 4.60 (±1.14) nurses per clinic, 0.2 medical staff per clinic and 2.20 (±1.10) other personnel per clinic. Medical doctors visit clinics periodically thus the reason for the low average. Certain services are not rendered at clinics due to:

- Staff shortages;
- Lack of training staff;
- Insufficient equipment;
- Unsuitable infrastructure; and
- Some services were identified as unnecessary (Wentzel, 2008:206)

Ventersdorp consists of one CHC centre, three PHC clinics and five Settlement clinics. Some of the clinics were left out of the research study due to distances between the clinics and the availability of the sub-district pharmacist to accompany the researcher to some of

the clinics. Two clinic managers responded (n=2) and indicated that no medical personnel visited the clinics. The layout of personnel structures within the Ventersdorp sub-district consisted of 7.5 (±0.71) nurses per clinic, no medical staff and 6.5 (±4.95) other personnel per clinic.

Potchefstroom sub-district consists of nine clinics (2 CHC centres and 7 PHC clinics). One clinic was used as a pilot, thus only eight clinics were used for the research study. Clinic managers of seven clinics (n=7) responded. There are 6.14 (±2.14) nurses per clinic, 1.43 (±0.55) medical personnel per clinic and 2.71 (±1.51) other staff members per clinic.

According to Wentzel (2008:196), the number of vacant posts within clinics has a negative influence of rendering efficient and quality health care services.

4.2.2 Functions and roles of health care workers

Functions and responsibilities of health care workers will be discussed in the following section.

4.2.2.1 Methods to capture patient information (refer to question 1.6)

Figure 4.1 below, gives an indication of registers used to record patient information upon visiting clinics. Clinic managers indicated that 55% of clinics use a daily clinic register (E-Tool), 26% use a daily headcount register and 19% use other documentation to register patients.

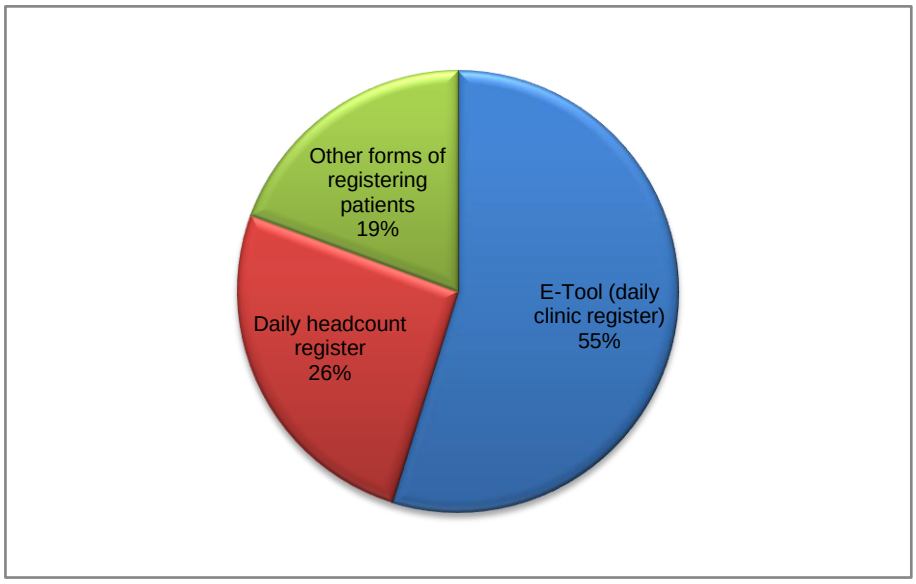
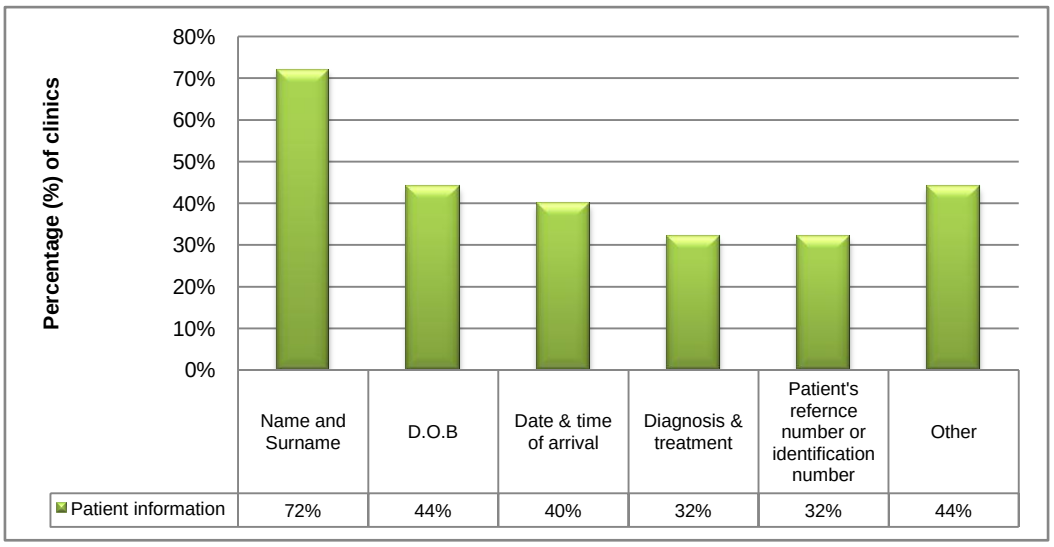


Figure 4.1: Registers used to document patient information when patients visit PHC clinics in the DKK district (n=26)

According to the DOH (2009b:16), each PHC facility has a standard health information system to capture information and use data. All information regarding patients must be recorded and kept up to date (DOH, 2009b:16). Developing standardised tools for reporting purposes at each facility remains a challenge. Depending on the workload of health care workers they complete tally sheets or tick registers on a daily, weekly or monthly basis that summarises recorded inputs (Rohde *et al.,* 2008:202).

4.2.2.2 Patient information documented in registers (refer to question 1.7, section A of survey)



***Respondents were allowed to choose more than one option**

Figure 4.2: Patient information captured in registers in PHC clinics in the DKK district (n=25)

Figure 4.2 above, focuses on vital patient information that has to be recorded in the registers upon entering the clinic. Clinic managers indicated that the following are entered in the registers (refer to Appendix D):

- Name and surname 72 % (18; n=25);
- DOB 44% (11; n=25);
- Other information 44% (11; n=25);
- Date and time of arrival of patient 40%; n=25);
- Diagnosis and treatment 32% (8; n=25); and
- Patients reference number or identification number 32% (8; n=25).

According to the results a lot of controversy exists between clinics in the DKK district on what patient information to record upon their entering PHC facilities.

4.2.2.3 Health care workers responsible for completing registers (refer to question 1.8)

Table 4.5 below, gives an indication of health care personnel responsible for completing the daily headcount registers when patients enter clinics in the different sub-districts of the DKK district.

Table 4.5: PHC personnel responsible for completing patient registers when patients enter the clinic

Human resources			
Sub-districts	**Administration clerks**	**Professional nurses**	**Health councillors**
Potchefstroom (n=7)	86%	14%	14%
Ventersdorp (n=2)	50%	50%	0
Maquassi Hills (n=5)	20%	60%	20%
Matlosana (n=12)	50%	50%	0
Total (n=26)	53.85%	42.31%	7.7%

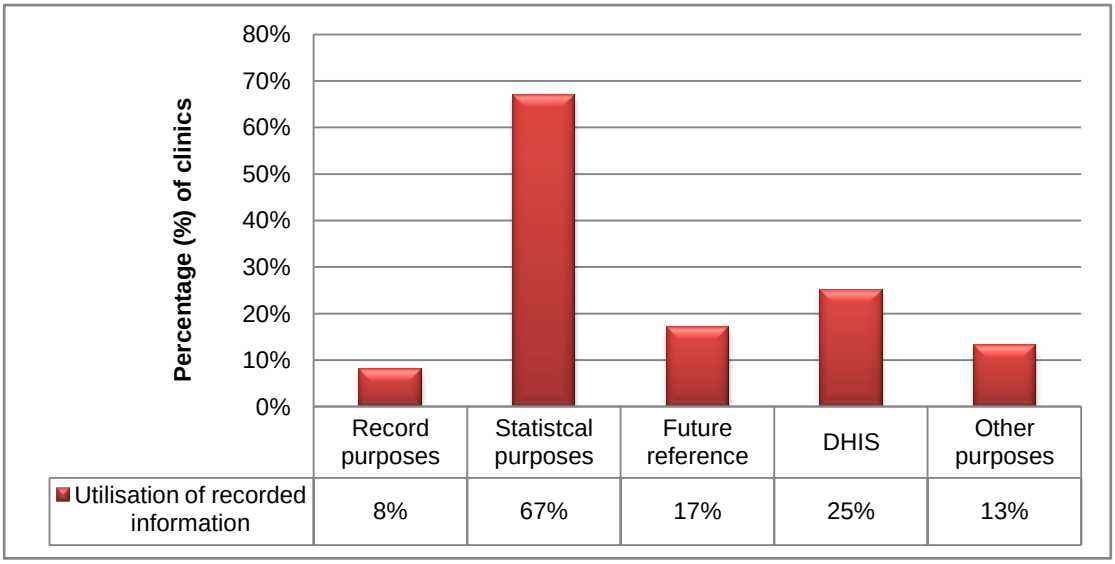
***Respondents were allowed to choose more than one option**

In the Potchefstroom sub-district the responsibility for completing mentioned registers falls upon administration clerks 86% (6; n=7), in some cases it can happen that professional nurses (PN) 14% (1; n=7) and health councillors must (1; n=7) fill the registers. In the Ventersdorp sub-district 50% of administration clerks (1; n=2) as well as 50% (1; n=2) of PN complete daily headcount registers. Maquassi Hills sub-district has 20% (1; n=5) of administration clerks completing daily headcount registers whilst 60% (3; n=5) of PN have to complete registers and 20% (1; n=5) of the available health councillors have to fulfil these duties. In the Matlosana sub-district 50% (6; n=12) of the administration clerks and 50% (6; n=12) of PN have to complete daily headcount registers. The information recorded in these registers is used for the DHIS and to calculate average patient visits per clinic per month (Barron *et al.*, 2003:23). Each PHC facility should be appointed one responsible staff member to accurately document information (Barron *et al.*, 2003:23).

4.2.2.4 Utilisation for documented information (refer to question 1.9)

Figure 4.3 below, indicates the utilisation of recorded patient information in the DKK district. Clinic managers indicated that 67% (16; n=24) of recorded patient information is used for statistical purposes, 25% (6; n=24) said that data are used for the DHIS, 17% (4; n=24) said it will be used for future reference, 8% (2; n=24) indicated that it is used for record purposes and 13% (3; n=24) is utilised for other purposes.

In order to promote capturing of quality data the focus must be on the point of collecting data at the PHC clinics (Barron *et al.*, 2003:23).

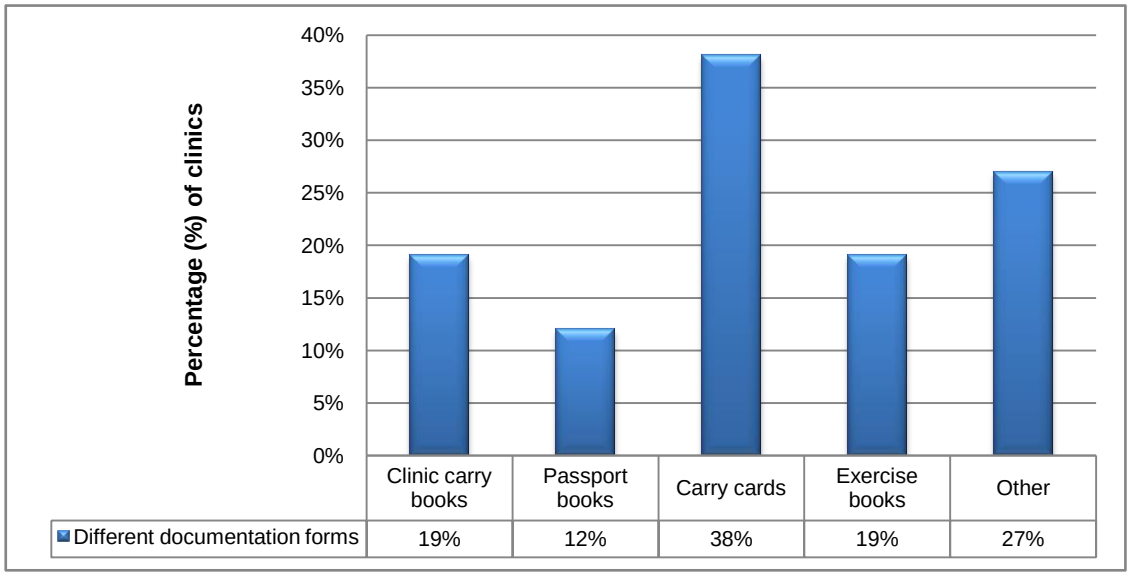


***Respondents were allowed to choose more than one option**

Figure 4.3: Utilisation of recorded patient information within the DKK district (n=24)

According to Rohde *et al.* (2008:196), the basic source of information for health managers is routine data collection that is done on a monthly basis in PHC facilities (refer to Appendix D).

4.2.2.5 Documentation that patients keep with them (refer to question 1.10)



***Respondents were allowed to choose more than one option**

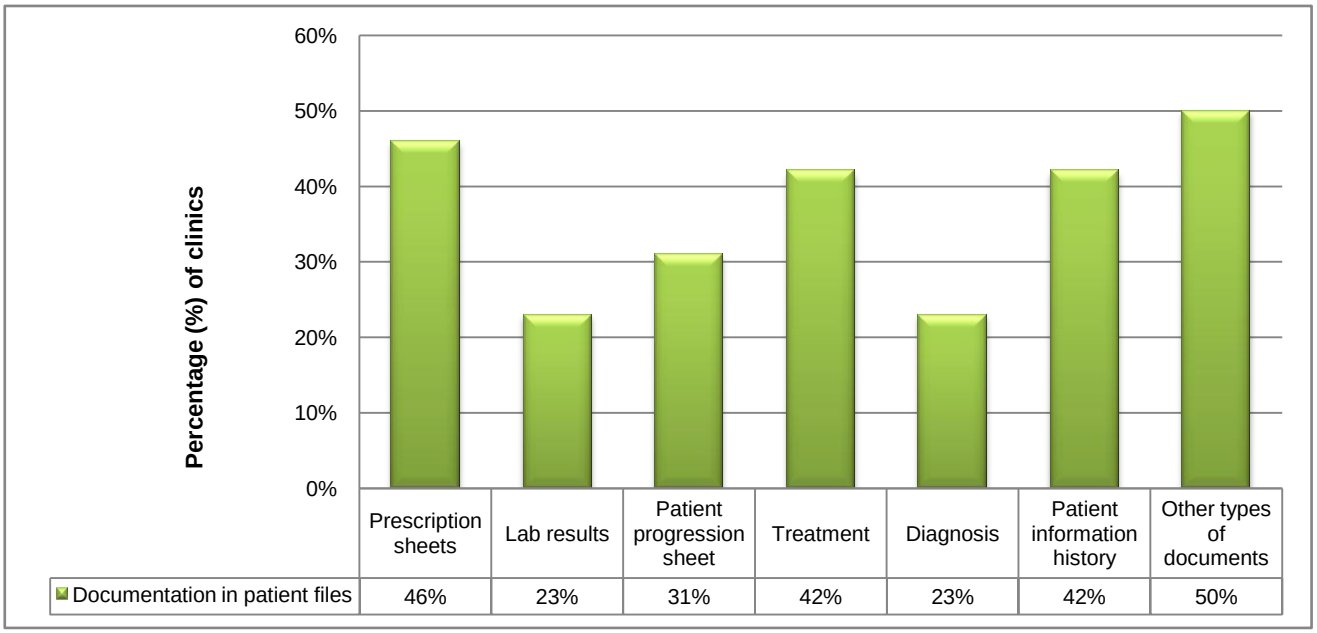
Figure 4.4: Percentage of different documentation forms kept by patients regarding their treatment (n=26)

Figure 4.4 above, illustrates documentation that patients keep with them regarding their diagnosis and treatments. Clinic carry books are being phased out because of its expensive nature. Patients need to get acquainted with new systems implemented by the North West Department of Health and be reminded by staff to bring documents with them when visiting the clinic.

4.2.2.6 Documentation kept in patient files at PHC facility (refer to question 1.11)

An open ended question for suggestion and comments yielded the following results (figure 4.5 below) for documentation kept in patient files in the DKK district:

- Forty-six percent of respondents (12; n=26) indicated that prescription sheets and 50% (13; n=26) miscellaneous documents are kept in patient files.
- Only 11 (42%; n=26) of the respondents indicated that treatments and patient information history are kept in files.
- Twenty-three percent (6; n=26) of respondents indicated that patient diagnosis and laboratory results are kept in files whilst 31% (8; n=26) indicated that patient progression sheets are kept in files.



***Respondents were allowed to choose more than one option**

Figure 4.5: Documentation kept in patient files in PHC clinics in the DKK district (n=26)

4.2.2.7 Patient back-up files (refer to question 1.12)

During the research study the researcher concluded that 96% of the clinics within the DKK district kept patient back-up files within the PHC facilities (26; n=26). The four sub-districts had the following response rates:

- Potchefstroom 100% (7; n=7);
- Ventersdorp 100% (2; n=2);
- Maquassi Hills 100% (5; n=5); and
- Matlosana 92% (11; n=12).

According to Singh (2010:65), 77.7% of clinics interviewed in the Eastern Cape did not have sufficient space for filling patient files.

4.2.2.8 Organising back-up files and accessibility of patient files (refer to question 1.13 and 1.14)

Table 4.6: Health care personnel responsible for organising patient files and accessibility of files to personnel at PHC in the DKK district

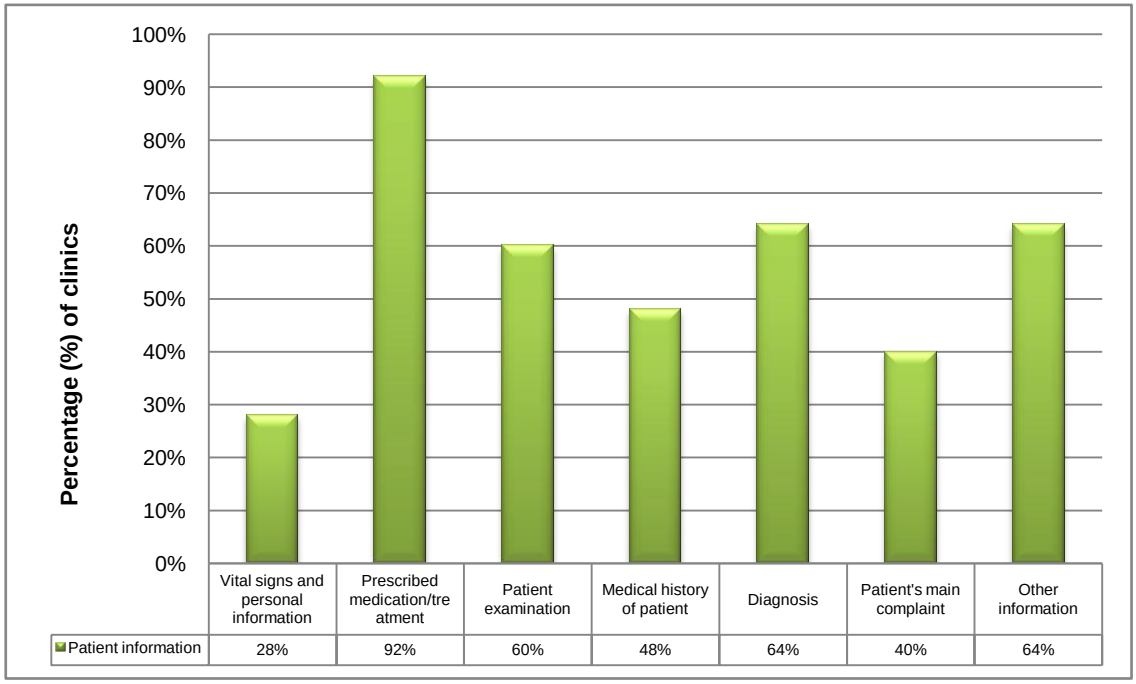
Sub-district	Administration clerk	Nursing staff	Data capturer	Other personnel	Total (n=26)	Accessibility of patient files
Potchefstroom (n=7)	6	2	1	1	10	86%
Ventersdorp (n=2)	2	0	0	0	2	50%
Maquassi-Hills (n=5)	2	1	5	1	9	60%
Matlosana (n=12)	11	0	3	2	16	75%
Total (n=26)	81%	12%	35%	15%	70%	73%

***Respondents were allowed to choose more than one option**

Table 4.6 above, indicates the health care personnel responsible for managing and organising patients' files within the facility, keeping in mind that all patient information is strictly confidential. In some cases more than one staff member will be responsible for managing patient files. Administration clerks (81%) (21; n=26) and data capturers (35%) (9; n=26), are according to respondents, responsible for organising patient files. Table 4.6 also illustrates the accessibility of patient files to all staff members. Respondents in the DKK district indicated that 73% (19; n=26) of personnel working at clinics have access to patient files, though as already stated patient files are strictly confidential.

4.2.2.9 Recorded information during consultation with a professional nurse or doctor (refer to question 1.15)

In figure 4.6 below, respondents were given an open ended question where they could supply all relevant information documented when a patient is consulted by a doctor or nurse. According to the majority (92%; n=25) of respondents stated that they record the prescribed medication/treatment and only (28%; n=25) indicated that they record vital signs and personal information.



***Respondents were allowed to choose more than one option**

Figure 4.6: Patient information documented when consulted by a doctor or nurse (n=25)

4.2.2.10 Health care personnel responsible for issuing medication (refer to question 1.16)

Respondents indicated that the responsibility of dispensing medication fell upon professional nurses 100% (26; n=26) and in some cases like Potchefstroom sub-district, 29% (2; n=7) and Matlosana sub-district 17% (2; n=12) of doctors also prescribed medication. One of the respondents wrote the following comment *"all professional nurses on duty do dispense regardless of having a dispensing course or not but with the letter from the Department of Health that authorise such practices."* According to the SAPC, a pharmacist, pharmacist intern and/or post basic pharmacist assistant working under the indirect supervision of a pharmacist may supply medication in a pharmacy. In cases where the pharmaceutical services in a Primary Health Care facility are not provided by a pharmacist they may be

provided by a post basic pharmacist working under the indirect supervision of a pharmacist (in a dispensary) or a nurse licensed to dispense medicines (in a medicine room) (South African Pharmacy Council, 2010:30). A research study performed in the Eastern Cape, presented the following results (n=10):

- Sixty percent of the dispensaries were staffed with pharmacist assistants;
- Eighty percent are staffed with post basic pharmacist assistants;
- Only one clinic had a registered nurse performing dispensing duties; and
- At three of the dispensaries had pharmacists only working one day per week and rotating between five clinics (Singh, 2010:69).

According to Engelbrecht (2010:28) 59.3% of prescriptions are written and dispensed by nurses in the absence of pharmacists. According to the WHO (2001:3), nurses form the backbone of the PHC system, and prescribing essential medicines by them are of great importance at mentioned facilities.

4.2.2.11 Steps followed in dispensing medication (refer to question 1.17)

Question 1.17 in section A of the questionnaire requested information regarding the steps followed to dispense medication by health care personnel in PHC clinics. Ninety-six percent of the respondents (96%) (24; n=25) completed the question, and the following responses were documented:

- "*Medication is signed out of the medicine room and stored in a lockable cupboard in the consulting room by a professional nurse daily.*
- *A doctor/professional nurse prescribes medication to patients.*
- *The patient and legibility of the prescription is confirmed.*
- *Patient must undergo examinations to diagnose the illness.*
- *Medicine is dispensed from an installed medicine cupboard located in the consulting room.*
- *Before medication is dispensed to a patient the condition and expiry dates of the medicine is verified.*
- *The treatment is explained by the professional nurse (PN) to the patient.*
- *Diagnosis and treatments must follow the EDL.*
- *PN must give patients clear instruction on the correct use of medication.*
- *Medication must be dispensed with a clear legible label that contains: name, quantity, strength, dosage form, route, duration and frequency.*
- *Possible side-effects must be explained to the patient.*

- *The patient must be given an opportunity to ask questions related to his/her illness or medication regime.*
- *All patient information must be entered in his/her file.*
- *Professional nurses must sign the prescription and the date must be supplied.*
- *Provide the patient with a follow-up date if necessary."*

4.2.2.12 Dispensing medication according to SOPs (refer to question 1.18)

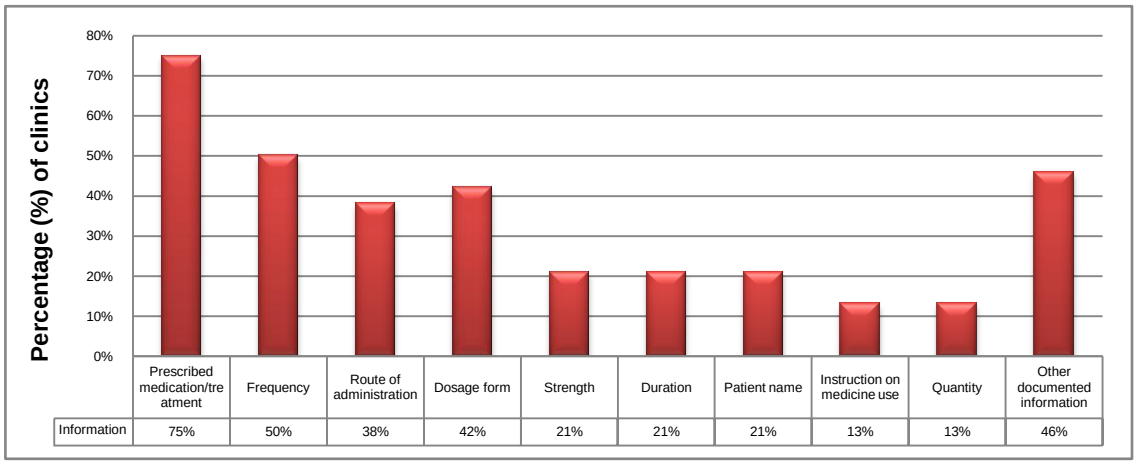
Standard operating procedures are guidelines for completing assignments, gathering and using vital information, it is used for administrative purposes to manage and control storage and distribution of drugs and medical supplies in PHC facilities (Anon., 2006:3; SAPC, 2010:215-216 and Department of Health, 1996b:14).

Table 4.7: Determining if SOPs for dispensing medication are used in PHC clinics in the DKK district

Sub-district	**Clinics using SOPs for dispensing medicine**			
	Yes	**%**	**No**	**%**
Potchefstroom (n=6)	5	83%	1	17%
Ventersdorp (n=2)	2	100%	0	0
Maquassi-Hills (n=5)	4	80%	1	20%
Matlosana (n=10)	5	50%	5	50%
Total (n=23)	16	70%	7	30%

According to table 4.7 above, the overall response rate for the DKK district is an appeasing 70% (16; n=23), though concern is raised with clinics within the Matlosana sub-district, that only 50% (5; n=10) uses SOPs. According to Singh (2010:69), 50% (n=10) of the dispensaries at clinics taking part in the research study had SOPs for dispensing medication.

4.2.2.13 Documented information regarding medication (refer to question 1.19)



***Respondents were allowed to choose more than one option**

Figure 4.7: Documented patient information relating to dispensing medicine after consultation (n=24)

In figure 4.7 above, the information regarding medicine dispensing and the documentation thereof are illustrated. Seventy five percent (18; n=24) of respondents indicated that prescribed medication/treatment is essential information to document. It is concerning that respondents did not rate strength of medication, duration of therapy and the patient's name (all scoring 21%) (5; n=24) as not important. Instructions on medication usages and quantity of medication dispensed scored 13% (3; n=24), these are vital information especially quantity because it is directly related to stock in the medicine room.

4.2.2.14 References in PHC facilities (refer to question 1.20)

According to the South African Pharmacy Council's (2011:11), PHC clinics inspection questionnaire, mentioned reference sources (indicated with a *) in table 4.8 below, must be available in PHC facilities. References indicated with an asterisk must be available in PHC clinics. The NDOH – adult STGs and paediatric STGs were only available at clinics within the Matlosana sub-district.

The PHC STGs were available in 80% or more of the clinics in the DKK district, except for the Matlosana sub-district where only 50% of the clinics had the PHC STGs references available within the clinics. The GPP should be available as a reference source in each clinic, during the research study, respondents indicated that only 20% of the clinics in Maquassi Hills and 8% of clinics within the Matlosana sub-district had the latest edition of the GPP manual. None of the other two sub-districts indicated that they had GPP manuals available within the clinics.

Table 4.8: Availability of reference sources in PHC clinics in the DKK district (n=26)

			Sub-district			
		Reference sources	Potchefstroom (n=7)	Ventersdorp (n=2)	Maquassi Hills (n=5)	Matlosana (n=12)
Reference sources		NDOH – adult STGs for hospitals *	0	0	0	8%
		NDOH –paediatric STGs for hospitals*	0	0	0	17%
		NDOH –PHC STGs*	86%	100%	80%	50%
		EDL 2009	100%	50%	60%	92%
		A list of non-substitutable substances	29%	50%	20%	0
		Latest edition of the GPP manual*	0	0	20%	8%
		Recent edition MDR or SAMF*	57%	0	20%	25%
		A daily drug use*	0	50%	0	0
		Other medicine related reference books	71%	100%	60%	17%

*Respondents were allowed to choose more than one option

4.2.2.15 Health care workers responsible for dispensary/medicine room (refer to question 1.21)

According to the SAPC (2011:11), each clinic should have a copy of either the latest edition of the MDR or SAMF. In the Potchefstroom sub-district 57% (4; n=7) of the respondents indicated that they had one of the two reference sources. Respondents in Maquassi Hills indicated that only 20% (1; n=5) had a copy of the reference source, and in the Matlosana sub-district only three of the clinics had an MDR or SAMF (25%; n=12). In

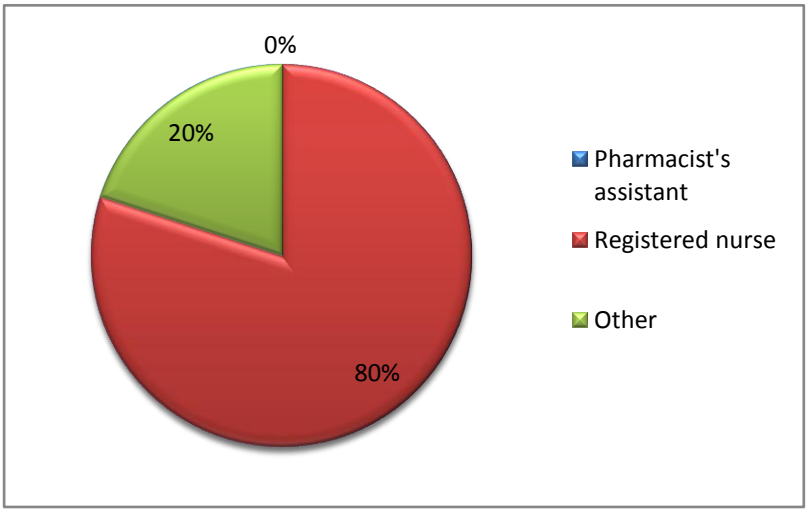


Figure 4.8: Designated health care personnel responsible for the medicine/store room (n=25)

Ventersdorp only one clinic had a copy of the Daily Drug Use (Tincture Press Publications). Clinics in the DKK district are under sourced when it comes to the availability of adequate reference sources.

In figure 4.8 above, an indication of human resources designated to operate in the medicine/store room is given. There are no pharmacist assistants in the PHC clinics that were visited by the researcher, it would be ideal if they could be assigned to PHC facilities but due to a lack of human resources this is not possible for the moment being. In 2010 there were 9071 pharmacist assistants registered with the South African Pharmacy Council (DOH, 2011b:24).

4.2.2.16 Storage of medication (refer to question 1.22)

Figure 4.9 below gives an illustration of where medicine is stored within the PHC facilities. Nurses usually enter medicine/ store rooms each morning and sign out medicine on stock cards that they will need during the day for their consulting rooms. According to Singh (2010:65), 55.6% (n=9) of the clinics that participated in the research study had sufficient space to store medicine stock.

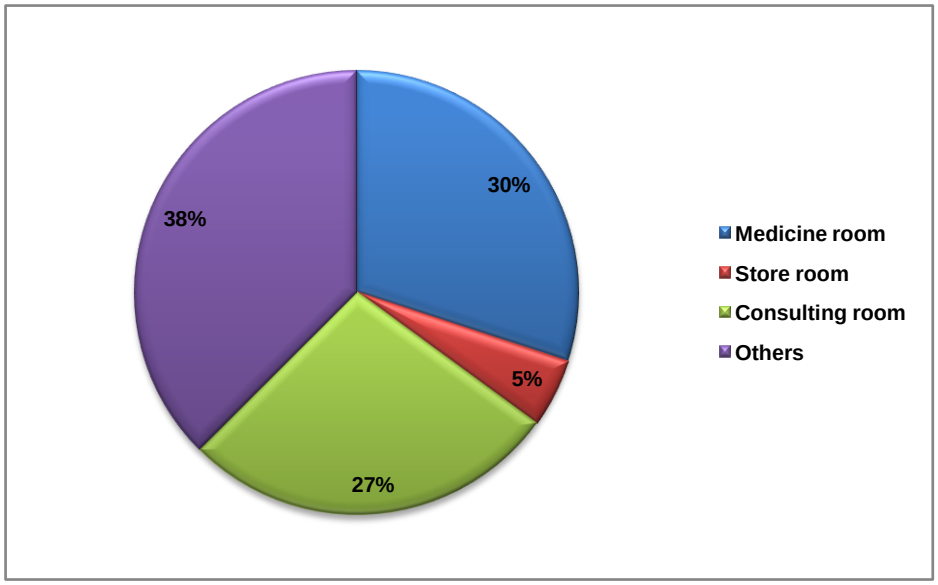


Figure 4.9: Designated areas in PHC clinics where medicines are stored in the DKK district (n=26)

4.2.3 Medicine stock

Structures, procedures and guidelines influencing medicine stock will be discussed below.

4.2.3.1 Utilisation of SOPs (refer to question 1.23)

In table 4.9 below 75% (18; n=24) respondents indicated that they use SOPs to order medicine stock. The Matlosana sub-district had the lowest percentage of clinics utilising SOPs, when ordering stock.

Table 4.9: Percentage of PHC clinics that utilise SOPs for ordering medicine stock in the DKK district (n=24)

Sub-district	Percentage of PHC clinics that utilise SOPs for ordering medicine stock
Pothefstroom	83% (5; n=6)
Ventersdorp	100% (2; n=2)
Maquassi Hills	80% (4; n=5)
Matlosana	64% (7; n=11)
Total	75% (18; n=24)

4.2.3.2 Health care workers responsible for managing SOPs (refer to question 1.38)

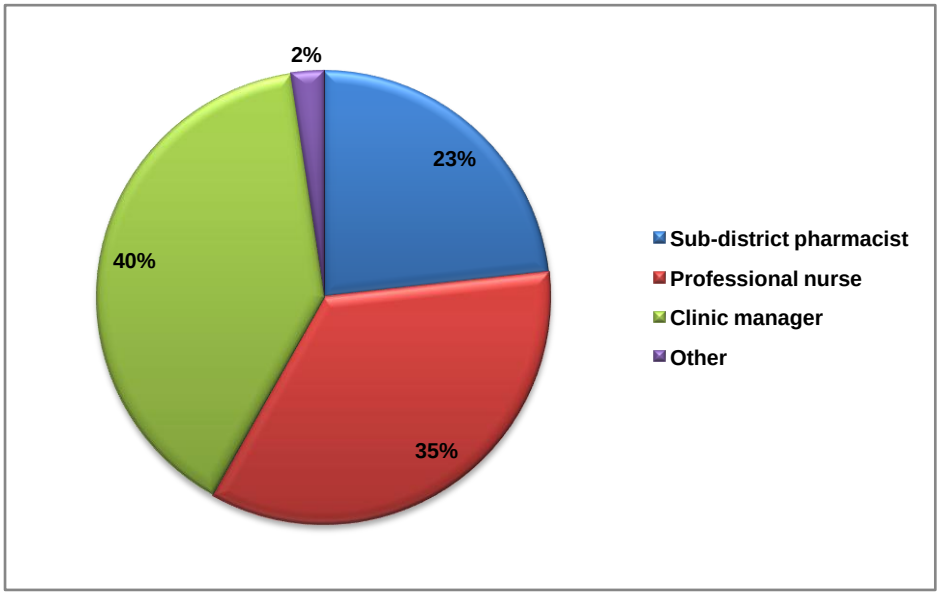


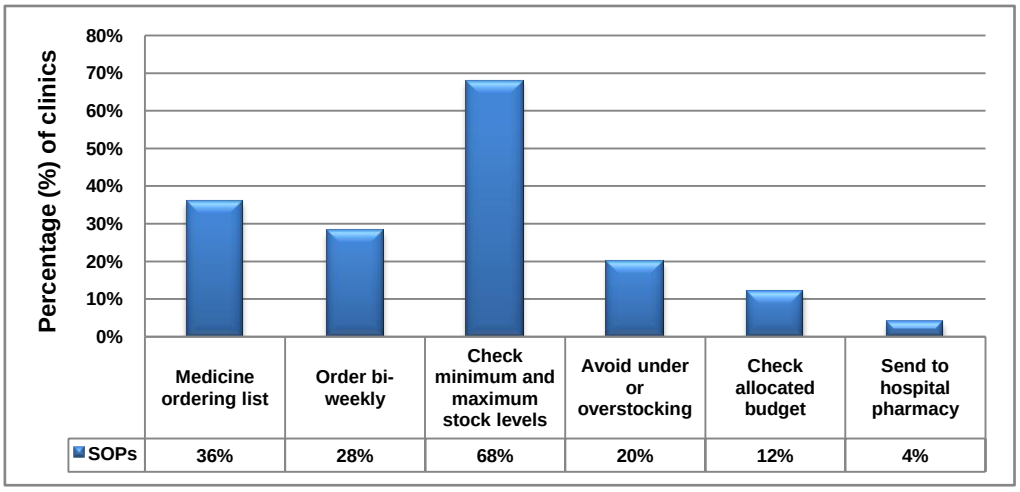
Figure 4.10 Illustration of health care workers in the DKK district responsible for standard operating procedures (n=25)

Figure 4.10 above gives an illustration of health care personnel responsible for managing SOPs. Some respondents chose more than one option. According to 68% (17; n=25) of respondents, clinic managers are responsible for implementing and managing SOPs. Many respondents (60%; 15; n=25) indicated that professional nurses 60% (15; n=25) also implement and manage SOPs.

4.2.3.3 Occurrence of ordering medicine stock (refer to question 1.24)

Question 1.24 in section A, an open ended question, determined the frequency of ordering medicine stock from the hospital pharmacy. The answer was unanimous 100% (26; n=26) for all four sub-districts in the DKK district, twice per month. According to a research study performed by Wentzel (2008:204), the availability of medicine and medical consumables is the responsibility of the clinic managers.

4.2.3.4 SOPs for ordering medicine (refer to question 1.25)



***Respondents were allowed to choose more than one option**

Figure 4.11: Description of SOPs used for ordering medicines in PHC clinics (n=25)

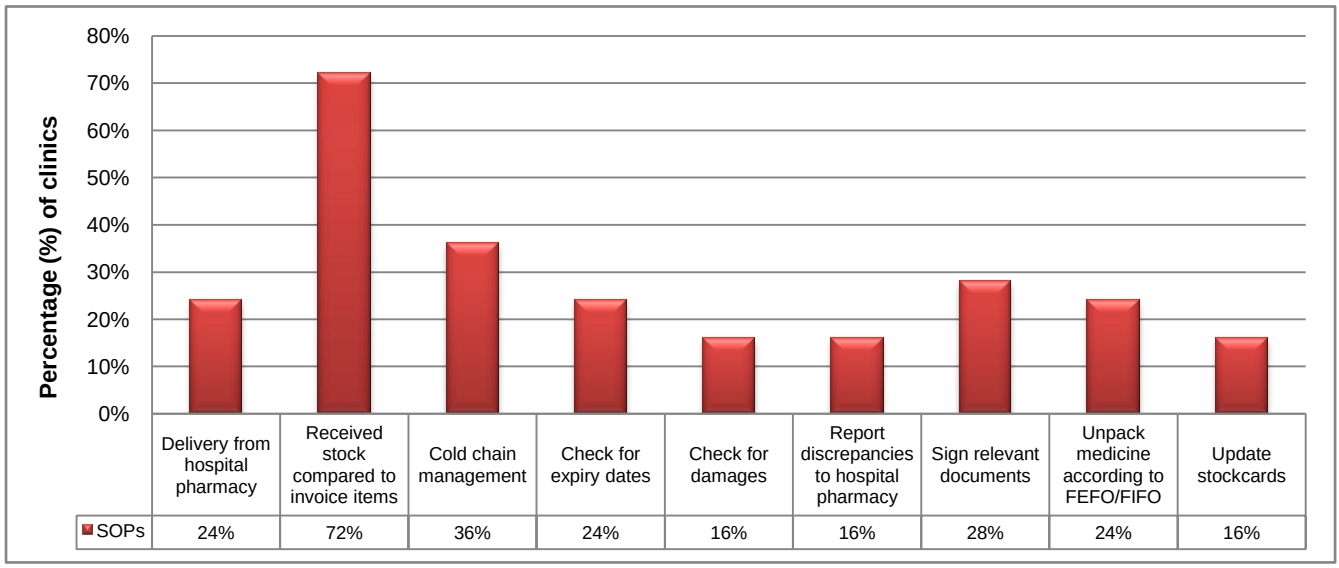
An open ended question was provided for respondents to comment on SOPs for ordering medicine stock. According to figure 4.11 above, 68% (17; n=25) of the respondents indicated that to monitor minimum and maximum stock levels before ordering is essential, whilst 4% (1; n=25) of respondents thought it necessary or important to send orders to the hospital pharmacy. According to Singh (2010:83), medication was ordered according to minimum and maximum levels in 63.4% (26; n=41) of the clinics in the Eastern Cape.

There are many risks involved when facilities do not have an up dated stock card with all the requirements namely:

- An accurate order for medication cannot be placed;
- Unaccountable loss of medication; and
- Theft of medication (Singh, 2010:83).

There is a high risk when having no system in place to order stock it can lead to over ordering, under ordering and even stock-outs.

4.2.3.5 SOPs for receiving medicine (refer to question 1.26)



***Respondents were allowed to choose more than one option**

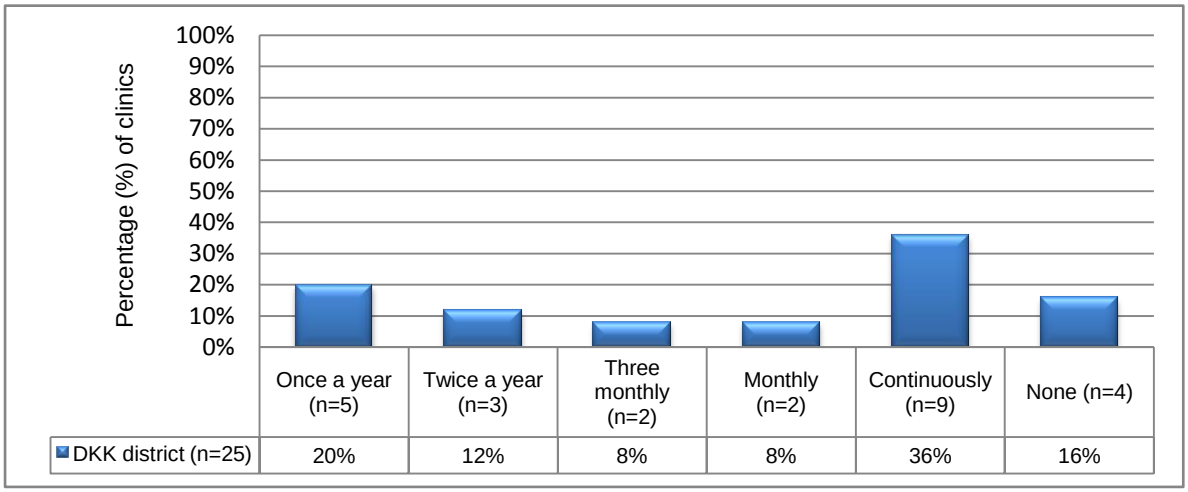
Figure 4.12: Description of SOPs used for receiving medicine stock in PHC clinics (n=25)

In figure 4.12 below, respondents were required to comment on SOPs for receiving stock. It is noted that when medicine stock is received from the hospital pharmacy it is compared to the accompanying invoice, according to 72% (18; n=25) of respondents. Updating stock cards, examining stock for damages and reporting discrepancies to hospital pharmacies raise major concerns, because these factors according to clinic manager's responses are not considered important (16%) (4; n=25).

4.2.3.6 Inventory control (stock taking) (refer to question 1.27)

Figure 4.13 below, gives an indication of how often stock taking occurs during the year. Sixteen percent (4; n=25) of clinics within the DKK district indicated that they don't do stock taking. Thirty six percent (9; n=25) indicated that they continuously do stock taking through out the year. According to Bossert *et al*. (2007:77), inventory control recites to the logistics functions of product handling, withdrawal, use and adequate information for stock

management. It is thus recommended that stock is handled on the FEFO (first-to-expire-first out) basis.



*Respondents were allowed to choose more than one option

Figure 4.13: Illustrating the percentage of stock take intervals at PHC clinics in the sub-districts (n=25)

Standard operating procedures for inventory management are of utmost importance in ensuring the availability of medicines. Standard operating procedures assist in the process of ordering stock, stock rotation and maintaining adequate levels of stock. The GPP guideline expects all institutions to have available and implement these SOPs (South African Pharmacy Council, 2010: 2).

4.2.3.7 Problems in receiving stock (refer to question 1.28)

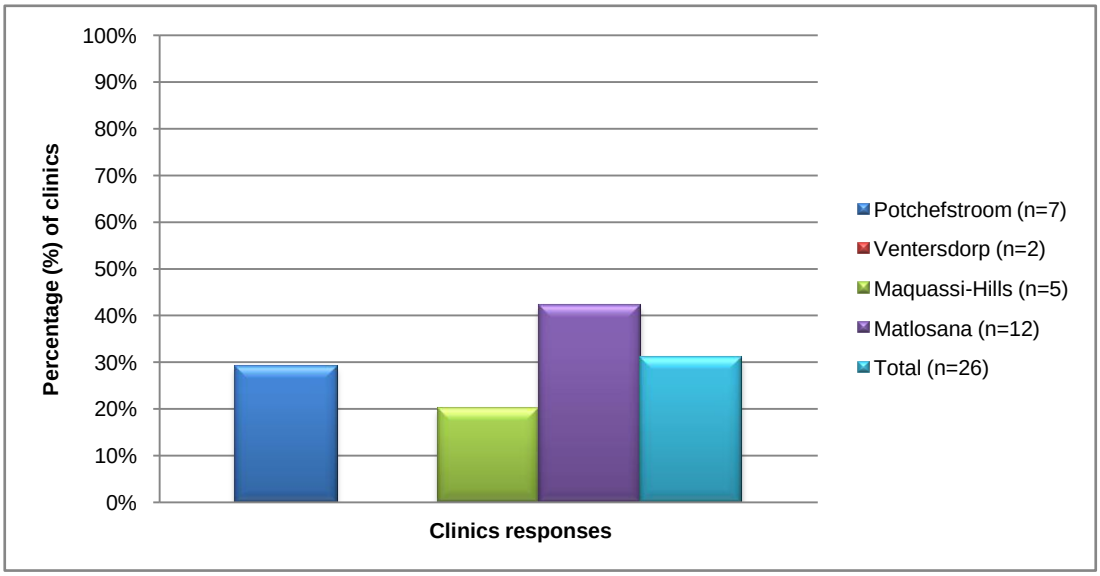
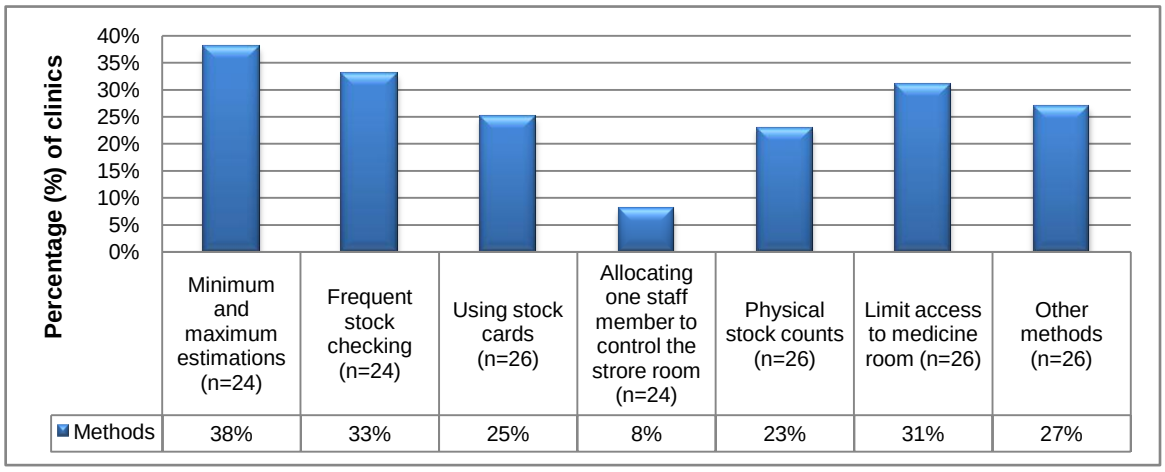


Figure 4.14: Percentage of PHC clinics having problems in the past six months with receiving medicine stock (n=26)

In figure 4.14 above, respondents were asked to indicate if they had problems with receiving medicine stock within the past six months. According to the above figure, 69% (18; n=26) had no problems and 31% (8; n=26) indicated that they encountered problems during the past six months. Matlosana sub-district encountered the most problems (42%) (5; n=12) during this period. These problems are indicated in Table 4.9 (question 1.31).

Respondents were given an open ended question, where they could comment on methods that are used to keep medicine stock at optimum levels within the PHC continuum. Figure 4.15 below, indicates that performing minimum and maximum drug estimations 38% (9; n=24) in accordance with frequent stock checking and 33% (8; n=24) are important measures to ensure optimum stock levels. Respondents did not consider it necessary to allocate one staff member to manage and control the medicine/store room (8%) (2; n=24).

4.2.3.8 Monitoring stock to assure optimal stock levels (refer to question 1.29 & 1.30)



***Respondents were allowed to choose more than one option**

Figure 4.15: Description of methods to ensure medicine stock levels are optimal at PHC clinics in the DKK district

Figure 4.15 above, gives an indication of precautionary measures implemented to monitor medicine stock. One of the most important measures implemented is monitoring medicine stock using stock cards (88%) (23; n=26). Some attention needs to be given to limiting access to the medicine/store room (19%) (5; n=26) and only allowing authorised personnel access to the medicine/ store room (12%) (3; n=26), if implemented more strictly it could have a considerable impact on effectively monitoring medicine stock.

According to Singh (2010:70) sixty percent (6; n=10) of the facilities maintained their stock control cards/bin cards. Monitoring stock levels is highly dependent on good record keeping. All the facilities used bin cards as a means to record medication stock levels. The purpose of

a bin card as an inventory management system is to obtain the right medication, monitor the medication intake and flow of goods within the system.

4.2.3.9 Stock discrepancies (refer to question 1.31)

Table 4.10 below, indicates major reasons for medicine stock not kept at optimum levels. Respondents completed the closed ended question and the following was observed. According to clinic managers, the main reasons why stock is not kept at optimum level are due to budget constraints, personnel shortages, no suitable support system (e.g. a computer) and a lack of shelving and storage space.

Table 4.10: Factors that lead to stock-outs in PHC clinics in the DKK district

Reasons for medicine stock not kept at optimal level	Potchefstroom (n=5)	Ventersdorp (n=2)	Maquassi Hills (n=5)	Matlosana (n=11)	Total (n=23)
Budget constraints	3	1	1	9	14
Personnel shortage	1	2	2	3	8
Personnel not competent	0	1	1	0	2
Over – ordering	0	0	0	1	1
Deliveries not on time	1	0	0	1	2
No suitable support system	1	0	3	5	9
Lack of storage space or shelving	4	0	1	4	9
Other	0	0	1	1	2

***Respondents were allowed to choose more than one option**

4.2.3.10 Computers (refer to question 1.32-1.35)

Questions 1.32 -1.35 established the availability of computers at each of the PHC facilities, what they are used for, if they had any problems with computers and what the problems were. It was found that three clinics had the computers of which only one of the clinics' was in a working condition. Potchefstroom sub-district had one clinic (14%; n=7) with a computer but it was out of order due to technical faults. In the Matlosana sub-districts two clinics were equipped with computers but only one computer 8% (1; n=12) was in a working condition the other clinic's computer was broken. Thus it could be concluded that out of the 26 clinics (4%) only one clinic had a computer that is utilised for the following:

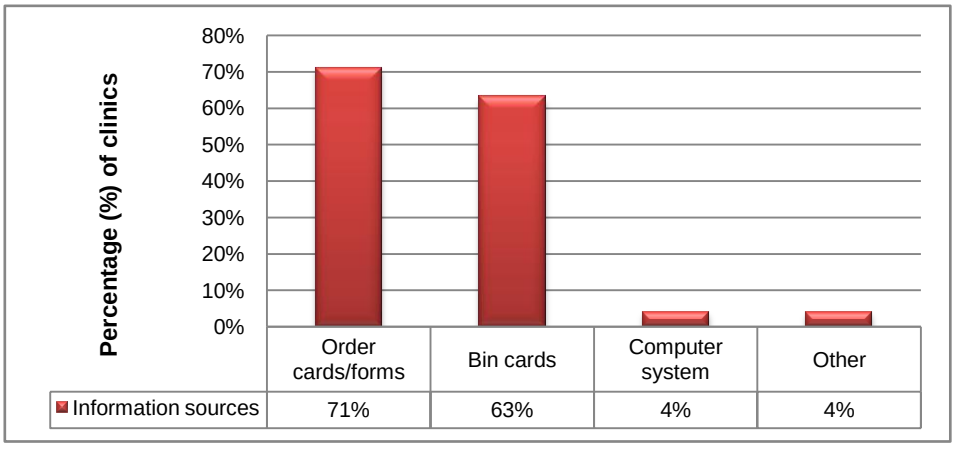
- Purchasing purposes;
- Stock control;
- Used to store clinic information;
- Drug information;
- To store patient profiles; and
- Dispensing purposes.

Two clinics (8%) (2; n=26) had computers but were out of order. Twenty three clinics (88%) (23; n=26) had no computer.

According to Singh (2010:73), the results gathered during the research study performed in the Eastern Cape showed that 70% (7; n=10) of the facilities had a computer which was in working order while 30% (3; n=10) of the facilities had a computer which was not functional. A computerised medicine inventory system decreases errors and increases the accuracy of maintaining stock levels of medicines. Thus effort should be made to equip clinics within the North West province with computers.

4.2.3.11 Information sources utilised for purchasing stock (refer to question 1.36)

Figure 4.16 below, gives an indication of information sources used for purchasing purposes. Respondents indicated in the closed-ended question that the majority used order cards/forms 71% (17; n=24) and bin cards (63%) (15; n=24) for purchasing purposes in the DKK district.



***Respondents were allowed to choose more than one option**

Figure 4.16: Illustration of information sources used for purchasing purposes (n=24)

4.2.4 Managing PHC facilities

This section indicates routine tasks that have to be managed by clinic staff members.

4.2.4.1 Maintenance of physical facilities (refer to question 1.37)

Question 37 was a closed ended question; the question was divided into three sections (Section A, B and C) for respondents to complete. Table 4.11 below, gives an indication of maintenance to the physical facility and who the responsible persons are. There are some areas of concern, sweeping and scrubbing of floors amount to 52% (13; n=25), garbage removal 52% (13; n=25) and cleaning of bins, shelves and cupboards 36% (9; n=25) are not high on clinic staff's priority list.

Table 4.11: Indication of occurrences of maintenance of physical facilities and the persons responsible for these tasks

	Occurrence				Responsible person for tasks (n=23)				
Tasks (n=25)	**Daily**	**Weekly**	**Monthly**	**n**	**Sub-district Pharmacist**	**Clinic manager**	**Professional nurse**	**Other**	**n**
Sweep or scrub floors	13	8	1	22	0	3	3	15	21
Remove garbage	13	8	1	22	0	3	4	17	24
Clean bins, shelves, and cupboards, if needed	9	9	7	25	0	1	5	14	20
Ensure that aisles are clear	13	5	0	18	0	2	7	7	16
Ensure adequate ventilation and cooling	20	3	1	24	0	6	15	6	27
Visually inspect fire extinguishers to ensure that pressures are maintained and extinguishers are ready for use	6	6	10	22	1	5	9	8	23
Monitor store security and safety	22	2	1	25	0	13	14	2	29
Inspect the storage structure for damage, including the walls, floors, roof, windows, and doors	13	3	9	25	1	14	13	6	32
Check for signs of rodents, insects, or roof leaks	16	4	5	25	0	10	13	8	31
Run generator to ensure the system is working correctly; check the level of fuel and add fuel, if needed	0	2	1	3	0	0	0	2	2
Monitor product quality (visually inspect commodities and check expiry dates)	8	8	5	21	1	8	16	5	30

***Respondents were allowed to choose more than one option**

Mentioned tasks are done daily, some clinics perform these tasks weekly and even monthly, thus hygienic conditions are not promoted and can lead to insect and rodent infestation. It is essential to monitor fire extinguishers and generators to ensure that they are in optimal working condition if needed.

4.2.4.2 Storage conditions (refer to question 1.37)

Table 4.12: Monitoring storage conditions and the responsible staff controlling these processes

Tasks (n=26)	Occurrence				Responsible person for tasks (n=25)				
	Daily	Weekly	Monthly	n	Sub-district Pharmacist	Clinic manager	Professional nurse	Other	n
Monitor storage conditions	17	5	0	22	1	11	11	3	26
Clean receiving, storage, packing, and areas	12	14	0	26	0	8	9	10	27
Ensure that products are protected from direct sunlight	20	5	0	25	0	11	16	6	33
Ensure that products are stacked correctly	13	10	1	24	1	10	16	4	31
Store products using correct proce-dures; rearrange commodities to facilitate the first-to-expire, first-out (FEFO) policy.	14	12	1	27	0	11	19	5	35

***Respondents were allowed to choose more than one option**

Table 4.12 above gives an indication of how storage conditions get monitored, and which staff members are allocated to perform these tasks.

4.2.4.3 Stock management (refer to question 1.37)

Table 4.13: Management of stock and the responsible persons for evaluating these tasks

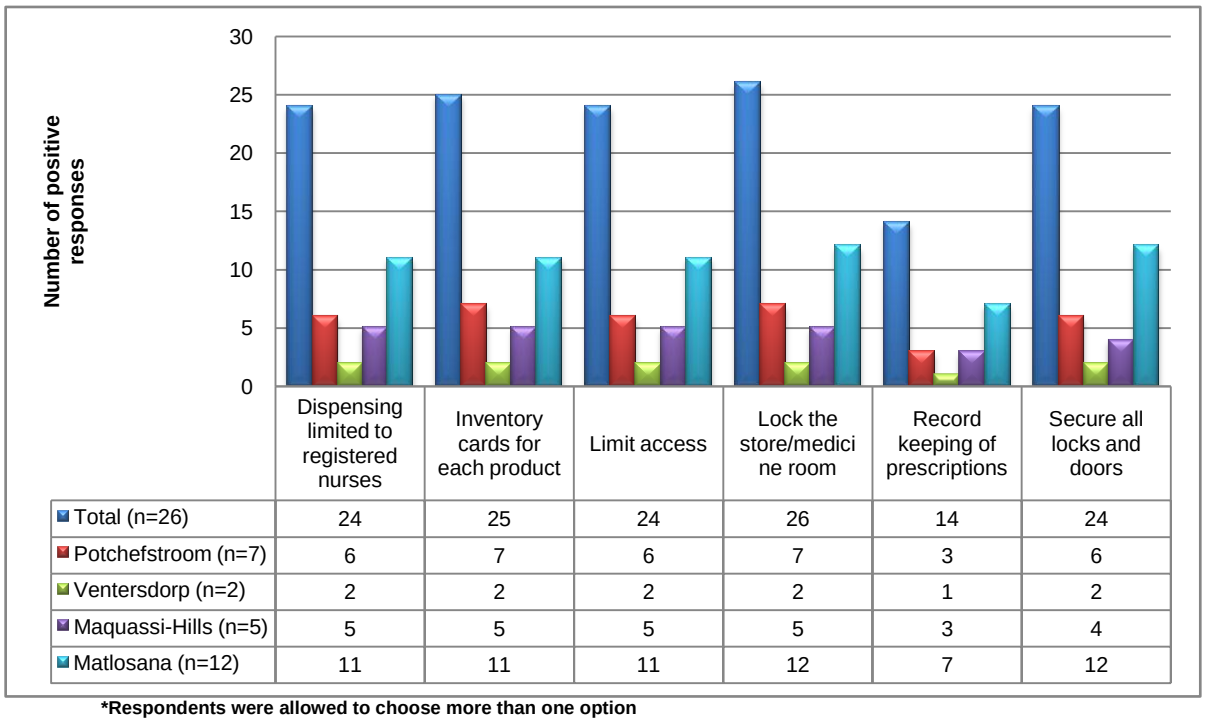
Tasks (n=26)	Occurrence			Responsible person for tasks (n=25)				
	Daily	Weekly	Monthly	Sub-district Pharmacist	Clinic manager	Professional nurse	Other	n
Use established procedures to dispose of expired or damaged products	6	10	8	1	8	15	4	28
Monitor stock levels, stock quantities	5	16	5	2	8	17	5	32
Submit emergency order (as needed, using local guidelines)	9	11	4	0	11	15	2	28
Conduct physical inventory or cycle count, and update stock keeping records	5	12	7	2	9	12	4	27
Assess stock situation	6	11	6	1	10	11	3	25
Update back-up file for computerised inventory control records	1	5	3	0	3	5	3	11
Complete and submit requisition form (indent or "pull" systems)	1	9	4	0	7	11	3	21
Determine issue quantity and issue products ("push" systems).	1	6	3	2	5	6	2	15
Monitor product quality (visually inspect commodities and check expiry dates)	2	10	9	0	9	15	3	27
Receive products	1	17	3	0	8	18	6	32
Update bin cards	8	13	3	0	7	19	7	33
Update stock records and maintain files	5	12	4	0	6	18	5	29
Ensure that products are stacked correctly	4	13	3	0	8	18	5	31
Separate expired stocks and move to secure area	4	13	6	1	11	15	3	30
Complete required reporting and documentation	3	9	8	1	13	14	2	30
Reassess maximum/minimum stock levels, and adjust if needed	2	8	12	7	8	9	2	26

***Respondents were allowed to choose more than one option**

Respondents indicated the importance of managing stock and who is responsible for performing these tasks. Table 4.13 above gives a visual indication of gathered information from the questionnaire. It is noted in the table above that some clinics (19%) (5; n=26) only monitor stock levels monthly. This raises concern because medicine is ordered bi-weekly and this can lead to under or over-stocking. Another concern is that stock cards are updated only in five clinics (19%; n=26).

4.2.4.4 Implemented measures against theft (refer to question 1.39)

Figure 4.17 below, indicates respondents were given a close ended question to determine if they implemented mentioned precautionary measure against theft. According to respondents' answers, most of the clinics have implemented measures to prevent theft. According to only 54% (14; n=26) of the respondents, record keeping of prescriptions and to keep dispensing registers up to date are used as precautionary measures. Prescriptions must be kept in a safe and secure area for a minimum of three years.



	Dispensing limited to registered nurses	Inventory cards for each product	Limit access	Lock the store/medicine room	Record keeping of prescriptions	Secure all locks and doors
Total (n=26)	24	25	24	26	14	24
Potchefstroom (n=7)	6	7	6	7	3	6
Ventersdorp (n=2)	2	2	2	2	1	2
Maquassi-Hills (n=5)	5	5	5	5	3	4
Matlosana (n=12)	11	11	11	12	7	12

***Respondents were allowed to choose more than one option**

Figure 4.17: Measures implemented against theft at PHC facilities in the DKK district (n=26)

4.3 Section B

Section B was completed by the sub-district pharmacists, regarding their roles within the PHC setting, compiling budgets and job descriptions

4.3.1 Sub-district pharmacists

All the questions in Survey B were open-ended questions, which gave respondents the opportunity to fully express themselves and not limit them, and to give insight on certain subjects that was unclear to the researcher. The responses to the posed questions were summarised and will be provided in text below. Supervisory visits are considered essential to improve quality of care at PHC level in the public sector. The supervision rate is the number of fixed PHC facilities visited by a clinical supervisor at least once a month, as a proportion of the total number of fixed PHC facilities in the district or sub-district. These visits provide a system for identifying and addressing problems early at facility level (Leon, 2012a:37). The supervision monthly rate in the DKK district was 59.1% in 2010 (Monticelli, 2012:250).

4.3.1.1 The role of the sub-district pharmacists in the PHC setting in the DKK district (refer to question 1.3) (n=3).

According to the respondents, the role of a sub-district pharmacist is the following:

- To manage pharmaceutical and surgical services.
- To effectively manage and dispense per patient prescriptions.
- Prescriptions mentioned above are especially for down-referrals of ART and EDL medication.
- To be the link between the District Pharmacist and the clinics.
- To perform routine visits to clinics and ensure the effective flow of medicine (especially tracer drugs). The average supervisory visits rate for PHC facilities in South Africa is 68.8% (Leon, 2012a:37). According to Monticelli (2012:243) the North West province average supervisory rate was 56.9% and has not improved considerably over the past five years.
- To receive expired stock and manage stock according to protocols.
- To write clinic reports.
- To lighten the workload on professional nurses.
- To support and assist professional nurses with knowledge and expertise.
- PHC facility supervisors are responsible for ensuring that captured information is accurate and valid by ensuring that PHC registers are properly used, monthly PHC

- reports are completed, feedback is provided and accomplishments are thoroughly monitored (DOH, 2009b:21).

4.3.1.2 The role of the sub-district pharmacist regarding medicine logistics in the PHC setting of the DKK district (refer to question 1.4) (n=3).

According to the respondents, the role of a sub-district regarding medicine logistics include the following:

- To procure and issue pharmaceutical supplies.
- To control the storage of pharmaceutical and surgical supplies.
- To control and issue of S5 and special programme medication in clinics.
- To record statistics and keep records of clinics on a monthly basis.
- To implement and manage SOP's, provincial and national protocols.
- To manage clinic orders and send orders to clinics.
- To ensure that clinics don't over-stock on medicine and other supplies.
- To ensure that clinics comply with ordering dates.
- To prevent duplicate invoicing.
- To co-ordinate all systems, transport and queries.

4.3.1.3 The job description of a sub-district pharmacist in the DKK district (refer to question 1.5) (n=3):

According to the respondents, the following forms part of a sub-district pharmacist's job description:

- To do routine clinic visits.
- To manage ARV down-referrals, psychiatric medicine and EDL medicine.
- To control and manage expired stock in clinics.
- To work in close relation with surrounding clinics and settlements by distributing pharmaceutical and surgical products and to ensure quality care to local and the rural communities.
- To monitor annual budgets.
- To implement, manage and control drug supply to all facilities.
- To give pharmaceutical care (prescriptions on per patient basis).
- To improve quality of care in all clinics.
- To perform pharmacovigilance (activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem).

- Routine visits by the sub-district pharmacist is essential as they provide support, improve performance through training, reviewing and monitoring services and individual performance and inspecting mandatory or statutory functions (DOH, 2007b:22).

4.3.1.4 The role of sub-district pharmacists' in conducting an annual clinic budget (refer to question 1.6) (n=3):

- To monitor budgets after funds are allocated to sub-districts.
- To compile monthly budget reports for journals from clinic budget to the hospital.
- To assist clinics in compiling minimum and maximum stock levels.
- To ensure that clinics operate between the specific boundaries (that they order according to their minimum and maximum stock levels).
- To work in close relation with the financial clerk, submitting monthly reports and to avoid over-issuing.
- To monitor all expenditures on a weekly basis, as orders are processed.
- Management receive monthly reports on all expenditures relating to pharmaceuticals.
- To conduct an audit on PHC facilities to investigate increases or irrational expenditure. Auditing clinics is essential in patient care as it brings together professionals from all over the continuum to promote, develop, enhance and contribute towards better management of resources (DOH, 2007b:21).

4.3.1.5 Description on how an annual budget is conducted for clinics in the DKK district (refer to question 1.7) (n=3).

Respondents provided the following information to conduct annual budgets:

- Budgets are allocated to sub-districts at a provincial level.
- Budgets are divided accordingly at district level per clinic.
- Each facility is allocated an amount (a percentage of the total budget). This is done according to their usage or requirements of the previous financial year.
- The allocation is done by the State Accountant and the sub-district/district pharmacist.
- Invoice/return value reports are sent on a monthly basis to the Department of Health.
- As clinics places orders, the value of their budget gets less (Rx Solution Program).

According to Thomas *et* al., (2004:27), in some provinces the degree of financial decentralisation to local government levels are limited. Non-hospital PHC averages 75% of all finance within the Provincial Departments of Health (Thomas *et al.*, 2004:27).

4.4. Section C

The observations made by the researcher were performed on the day of collecting completed questionnaires. The sister in charge or facility manager gave access to the medicine room. The researcher also copied stock cards with a photocopy machine, of the ten preselected tracer drugs. Observations were made solely on what could be observed at that point in time.

4.4.1 Observations made by the researcher

The researcher observed four aspects within PHC facilities in the DKK district:

- The dispensary or medicine room;
- Thermolabile medicine;
- Stock control; and
- Stock cards (refer to Appendix E)

4.4.1.1 Dispensary or medicine room (refer to question 1.5)

Table 4.14: Observation within the medicine/ dispensary room (n=25)

Dispensary or medicine room	Doesn't comply	%	Complies	%
Temperature in the dispensary or medicine room is below 25°C	6	24	19	76
Temperature in the dispensary or medicine room is controlled 24 hours a day as demonstrated by a maximum/minimum thermometer	13	52	12	48
There is an air conditioner in the dispensary or medicine room and it is in good working condition	7	28	18	72
Only the pharmacist's assistant (post-basic) or licensed dispenser at all times has keys to the dispensary or medicine room where schedules 1-5 items are kept	3	12	22	88
There is sufficient security to prevent unauthorised access to medicines	2	8	23	92
The storage area is large enough to allow for orderly arrangement of stock and proper stock location	18	72	7	28
Dispensary or medicine room is situated so that products are protected from potentially harmful influences	1	4	24	96
All goods are stored off the floor	8	32	17	68
Supplies are stored neatly on shelves or in boxes	2	8	23	92

In table 4.14 above, the researcher observed the medicine/dispensary room. There were only two areas of concern, the temperature of medicine/dispensary rooms weren't controlled (52%) (13; n=25) in all of the PHC facilities as this is a prerequisite of the SAPC. Another concern though less important was that there were some clinics that stored goods on the floor 32% (8; n=25) because of limited space and inadequate shelving 72% (18; n=25). An efficient distribution system is directly influenced by medicine usage patterns in the public sector (John *et al*., 2007:38).

4.4.1.2 Thermolabile medicine (refer to question 1.5)

Table 4.15 Observations done on thermolabile medicine (n=25)

Thermolabile medicine	Does not comply	%	Complies	%
Only medicine is stored in the refrigerator	1	4	24	96
Is the refrigerator in a good working condition?	2	8	23	92
Is the refrigerator fitted with a warning system to indicate that refrigeration has failed or temperatures are above or below 2°C and 8°C	2	8	23	92
Is the temperature of the refrigerator controlled 24 hours a day as demonstrated by a WHO approved dial thermometer or alcohol mercury thermometer	4	16	21	84
Are other vaccines packed away from the freezer plate?	3	12	22	88
Are there any vaccines packed in the door of the fridge?	8	32	17	68
Are there stock cards available for all the vaccines in the fridge?	16	64	9	36
Is there a designated person responsible for maintaining the cold chain?	2	8	23	92

During the observation of thermolabile products in table 4.15 above, the researcher found that some vaccines were stored in the door of the fridge (32%) (8; n=25). According to the SAPC (GPP manual), no vaccines may be stored in the door of the fridge (SAPC, 2010:50). Another area of concern was that only 36% (9; n=25) of the clinics kept stock cards of thermolabile medicine. According to Pick *et al.* (1998:16) 88% of rural clinics and 97% of urban clinics had refrigerators that were functioning.

4.4.1.3 Stock control (refer to question 1.5)

Table 4.16: Observations done on stock control systems (n=25)

Stock control system	Doesn't comply	%	Complies	%
Is there a computerised programme used for dispensing?	24	96	1	4
Is there a book/permanent record for S1-S5 medicines kept as required in Regulation 11 (1) 0f Act 101 of 1965?	1	4	24	96
Are S5 medicines locked away and the key under control of an authorised person in terms the Medicine Act (Act 101 of 1965)	1	4	24	96

In table 4.16 above the researcher found only one computer (4%; n=25) in all 25 clinics observed.

4.4.1.4 Stock control using stock cards (refer to question 1.5)

Table 4.17: Observations done by evaluating stock cards (n=25)

Stock cards	Doesn't comply	%	Complies	%
Product generic name	0	0	25	100
Strength	1	4	24	96
Dosage form	5	20	20	80
Code	20	80	5	20
Minimum stock level	24	96	1	4
Maximum stock level	24	96	1	4
Date	0	0	25	100
Ordered from/issued to	0	0	25	100
Stock received	0	0	25	100
Stock issued	0	0	25	100
Stock balance	0	0	25	100

Table 4.17 above gives an indication of the thoroughness of completed stock cards. Aspects that raise major concern is minimum and maximum stock levels that are not indicated on the stock cards (96%, 24; n=25). Minimum and maximum stock levels are used to estimate orders, to prevent under or over-stocking and are used to conduct clinics annual budgets.

4.5 Stock cards

During the observation process the researcher evaluated stock cards of ten preselected tracer drugs at each of the 25 PHC facilities. All the tracer drugs available within the PHC were written onto paper and put into a box. The researchers' study leader selected 10 drugs to use within the study. The researcher first determined if the tracer drugs were available and then counted the stock if drugs were available. The second step was to photocopy the

stock card and on the day of visitation evaluated the last entered dates' amount of stock. The following tracer drugs were monitored:

- Amoxicillin 125mg/5ml suspension;
- Rifam 300mg INH 150mg tab 40's;
- Medroxyprogesterone inj 150mg/ml;
- Ibuprofen tab 15's;
- Flucloxacillin caps 250mg 20's;
- Paracetamol syr 50ml;
- Co-Trimoxazole tab 56's;
- Paracetamol 500mg tab 10's;
- Salbutamol M.D.I. Complete 300msg 200 dose; and
- Nifedipine 30mg XL 28's.

4.5.1 Percentage availability of tracer drugs in the Potchefstroom sub-district (refer to question 1.3 and Appendix F)

Table 4.18 Availability of tracer drugs at each clinic in the Potchefstroom sub-district:

Potchefstroom (n=8)	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Clinic 5	Clinic 6	Clinic 7	Clinic 8
Amoxicillin 125mg/5ml suspension	Available	Not available	Available	Available	Available	Available	Available	Available
Rifam 300mg INH 150mg tablets 40's	Available	Not available	Available	Available	Available	Not available	Available	Not available
Medroxyprogesterone injection 150mg/ml	Available	Not available	Available	Available	Available	Available	Available	Available
Ibuprofen tablets 15's	Available	Available	Available	Available	Not available	Available	Not available	Not available
Flucloxacillin capsules 250mg 20's	Available	Available	Available	Available	Not available	Available	Available	Available
Paracetamol syrup 50ml	Available	Not available	Available	Not available	Available	Available	Available	Available
Co-Trimoxazole tablets 56's	Available	Available	Available	Available	Available	Available	Available	Not available
Paracetamol 500mg tablets 10's	Available	Available	Available	Available	Available	Available	Available	Not available
Salbutamol M.D.I. Complete 300msg 200 dose	Available	Available	Available	Available	Available	Available	Available	Available
Nifedipine 30mg XL 28's	Available	Available	Available	Available	Available	Available	Available	Available
% Tracer drugs available at each clinic	**100**	**60**	**100**	**90**	**80**	**90**	**90**	**60**

In table 4.18 above, the researcher observed that there were only two clinics that had availabilities of 60% or more. The reason for low availabilities could be because of clinics waiting for stock or that they were under stocked on some of the drugs.

4.5.2 Percentage availability of tracer drugs in the Ventersdorp sub-district (refer to question 1.3 and Appendix G)

Table 4.19 Availability of tracer drugs at each clinic in the Ventersdorp sub-district:

Ventersdorp (n=4)	Clinic 1	Clinic 2	Clinic 3	Clinic 4
Amoxicillin 125mg/5ml suspension	Available	Not available	Available	Available
Rifam 300mg INH 150mg tablets 40's	Available	Not available	Available	Not available
Medroxyprogesterone injection 150mg/ml	Available	Not available	Not available	Not available
Ibuprofen tablets 15's	Available	Not available	Available	Available
Flucloxacillin capsules 250mg 20's	Available	Available	Available	Available
Paracetamol syrup 50ml	Available	Not available	Available	Available
Co-Trimoxazole tablets 56's	Available	Available	Available	Available
Paracetamol 500mg tablets 10's	Available	Not available	Available	Available
Salbutamol M.D.I. Complete 300msg 200 dose	Available	Available	Available	Available
Nifedipine 30mg XL 28's	Available	Available	Available	Available
% Tracer drugs available at each clinic	**100**	**40**	**90**	**80**

According to the researcher in table 4.19 above, clinic 2 showed low availability (40%) for tracer drugs, out of the ten drugs only four of the items were available at the time of visitation. This clinic has only a few staff members, and the medicine room is small.

4.5.3 Percentage availability of tracer drugs in the Maquassi Hills sub-district (refer to question 1.3 and Appendix H)

Table 4.20 below indicates the availability of tracer drugs at Maquassi Hills sub-district; all of the clinics had availabilities above 50%. It could be assumed that their drug management systems are well oiled and that staff is fully aware of their roles and functions in the quality care process.

Table 4.20 Availability of tracer drugs at each clinic in the Maquassi Hill sub-district

Mquassi Hills (n=6)	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Clinic 5	Clinic 6
Amoxicillin 125mg/5ml suspension	Available	Available	Available	Available	Not available	Available
Rifam 300mg INH 150mg tablets 40's	Available	Available	Available	Available	Available	Available
Medroxyprogesterone injection 150mg/ml	Available	Available	Not available	Available	Available	Available
Ibuprofen tablets 15's	Available	Available	Available	Available	Not available	Available
Flucloxacillin capsules 250mg 20's	Available	Available	Not available	Available	Available	Available
Paracetamol syrup 50ml	Available	Available	Available	Available	Not available	Available
Co-Trimoxazole tablets 56's	Available	Available	Available	Available	Available	Available
Paracetamol 500mg tablets 10's	Available	Available	Available	Available	Available	Available
Salbutamol M.D.I. Complete 300msg 200 dose	Available	Available	Available	Available	Available	Available
Nifedipine 30mg XL 28's	Available	Available	Available	Available	Available	Available
% Tracer drugs available at each clinic	100	100	80	100	70	100

4.5.4 Percentage availability of tracer drugs in the Matlosana sub-district (refer to question 1.3 and Appendix I)

In table 4.21 the availabilities are provided for each of the clinics visited by the researcher, all of the availabilities were above 50%. This clearly shows it is the result of a well managed procurement, selection, distribution and use cycle.

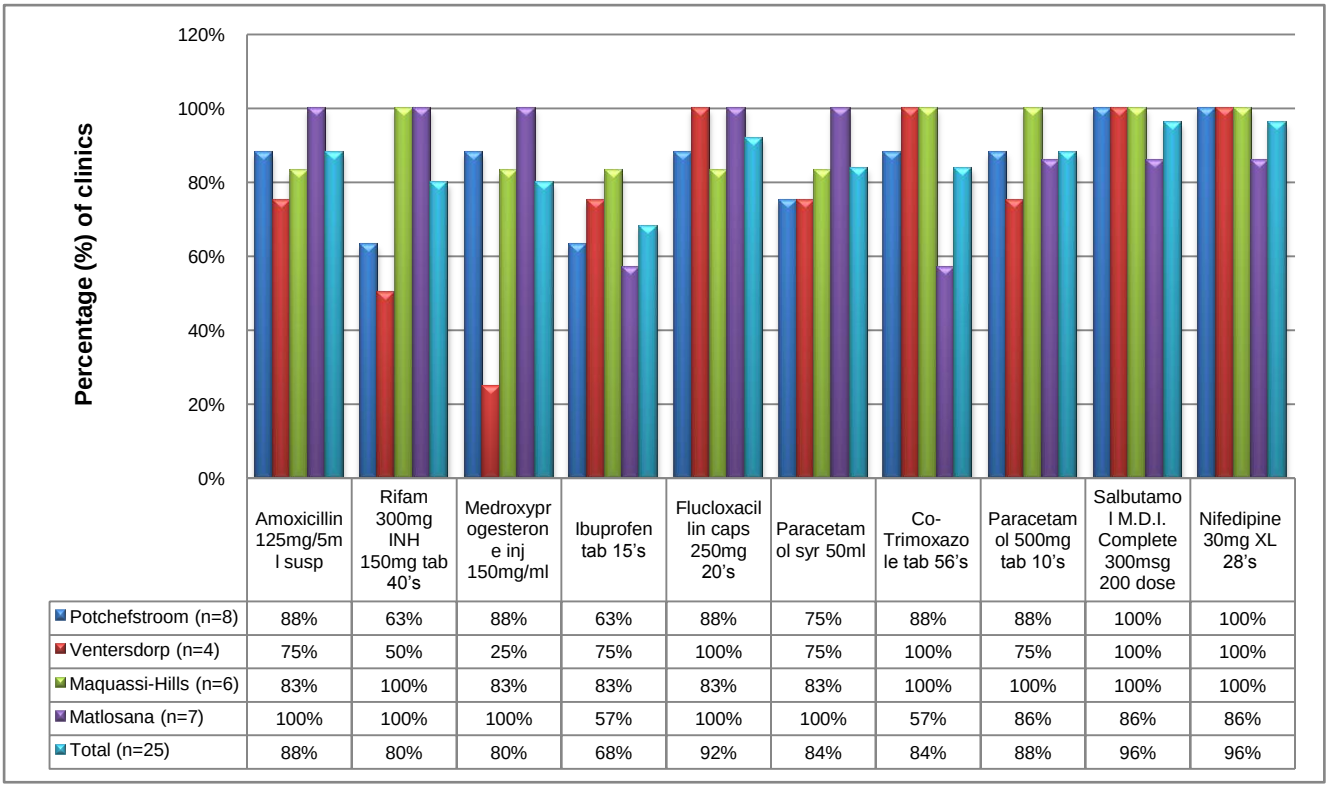
Table 4.21 Availability of tracer drugs at each clinic in the Matlosana sub-district

Matlosana (n=7)	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Clinic 5	Clinic 6	Clinic 7
Amoxicillin 125mg/5ml suspension	Available	Available	Available	Available	Available	Available	Available
Rifam 300mg INH 150mg tablets 40's	Available	Available	Available	Available	Available	Available	Available
Medroxyprogesterone injection 150mg/ml	Available	Available	Available	Available	Available	Available	Available
Ibuprofen tablets 15's	Not available	Available	Not available	Available	Not available	Available	Available
Flucloxacillin capsules 250mg 20's	Available	Available	Available	Available	Available	Available	Available
Paracetamol syrup 50ml	Available	Available	Available	Available	Available	Available	Available
Co-Trimoxazole tablets 56's	Available	Available	Not available	Available	Not available	Available	Not available
Paracetamol 500mg tablets 10's	Available	Not available	Available	Available	Available	Available	Available
Salbutamol M.D.I. Complete 300msg 200 dose	Not available	Available	Available	Available	Available	Available	Available
Nifedipine 30mg XL 28's	Not available	Available	Available	Available	Available	Available	Available
% Tracer drugs available at each clinic	**70**	**90**	**80**	**100**	**80**	**100**	**90**

4.5.5 Percentage availability of tracer drugs in the DKK district (refer to question 1.3)

In figure 4.18 below, the availabilities of the ten tracer drugs that was preselected are shown. The graph gives an illustration of the availability of tracer drugs per sub-district and then the overall availability for the DKK district. All of the drugs average above 80%, the only concern is Ibuprofen tablets that had an average of 68% (17; n=25).

Stock cards were evaluated and the researcher compared the stock written on the card to the physical stock count performed by the researcher. The tables can be seen in Appendix D. In some of the clinics the same amount was counted but in many it differed. The reason being that nurses take stock to their consulting rooms, or that physical stock taking is not performed often. According to Tshabala (2002:69) of the 9245 respondents that participated in the research study 74.02% reported that they received all their medication that was prescribed.



	Amoxicillin 125mg/5ml susp	Rifam 300mg INH 150mg tab 40's	Medroxyprogesterone inj 150mg/ml	Ibuprofen tab 15's	Flucloxacillin caps 250mg 20's	Paracetamol syr 50ml	Co-Trimoxazole tab 56's	Paracetamol 500mg tab 10's	Salbutamol M.D.I. Complete 300msg 200 dose	Nifedipine 30mg XL 28's
Potchefstroom (n=8)	88%	63%	88%	63%	88%	75%	88%	88%	100%	100%
Ventersdorp (n=4)	75%	50%	25%	75%	100%	75%	100%	75%	100%	100%
Maquassi-Hills (n=6)	83%	100%	83%	83%	83%	83%	100%	100%	100%	100%
Matlosana (n=7)	100%	100%	100%	57%	100%	100%	57%	86%	86%	86%
Total (n=25)	88%	80%	80%	68%	92%	84%	84%	88%	96%	96%

Figure 4.18 Percentage tracer drugs available in PHC facilities in the DKK district (n=25)

4.6 Chapter summary

In chapter 4 the empirical data gathered from the survey to investigate the documentation systems used for medicine logistics at the primary health care clinics in the Dr Kenneth Kaunda District in the North West Province were presented. The response rate for the separate surveys during the research study was:

- Survey A: Clinic managers response rate of 72%;
- Survey B: Sub-district pharmacists response rate of 75%; and
- Survey C: Observations made by the researcher with a response rate of 69%.

Open and closed-ended questions were used in the surveys for respondents that had to complete survey A and B. Data analysis was done in Excel. The following factors were investigated during the research study:

- Availability of essential (tracer drugs);
- Services provided at PHC facilities;
- Methods used to document patient information;
- Responsible staff for documenting patient information;
- How medicine information is captured;

- What is the use of documented information;
- Systems in place to monitor medicine stock;
- Sub-district pharmacists role in the PHC setting as well as medicine logistics;
- Whether SOP's used in PHC facilities?; and
- Impact of allocated budgets on medicine logistics.

The researcher found that the availability of tracer drugs within the DKK district were "satisfactory". Most of the clinics that took part in the research study provided all the required services, though some services are referred to and treated at hospital level; the overall calculated results were satisfactory. It was concluded that the majority of the PHC facilities uses E-Tool (daily clinic register), but there are other registers also used to document patient information. Administration clerks usually document patient information upon entering the clinic, whilst professional nurses or doctors document patient information and medicine information upon consultation.

Documented information is sent away to be analysed by the DHIS, and decisions on certain aspects are based on analysed data. PHC facilities use stock cards and minimum and maximum stock levels to monitor and order stock. It was concluded by the researcher that sub-district pharmacists play a supportive role and that professional nurses rely on their expertise and knowledge. SOP's are used in clinics to dispense medication and order and receive stock. Clinics rely on budgets in order to provide quality care services, thus sub-district pharmacists play a role in assisting clinics to help monitor medicine levels and prevent them from over or under stocking. Documentation systems play a massive role in monitoring medicine logistics; without them clinic staff will have no available data to base their decisions on, minimum and maximum stock levels will have no use and patient files will have no use.

Chapter 5 follows and deals with the concluding perspectives of this study.

CHAPTER 5

Conclusions, limitations and recommendations

5.1 Introduction

The conclusions of this study, drawn from the results in chapter 4 (empirical investigation) are presented here. The limitations encountered during the study as well as the recommendations for future studies are also included in this chapter.

5.2 Conclusions

The conclusions of the study presented in this section were based on specific objectives of the literature review and empirical investigation of the study, as stated in sections 1.12 and 3.2.2.

5.2.1 Conclusions based on the literature review

- *The **first research objective** of the literature review was to make use of the available literature to conceptualise the PHC approach.*

The Alma Ata Declaration of 1978 altered health policies decisively; the policy put PHC to the forefront (Reerink & Sauerborn, 1996:132). According to Rowe *et al*. (2005:1) adequately trained health care workers are a crucial component for delivering health interventions in low and middle income countries. The PHC approach forms an integral part as it focuses on health districts and acts as a driver for the health care system in general. The health care sector is bombarded with the continuous introduction of new medicines, vaccines and technology. This causes strain on health care personnel, health financing and service delivery. Health systems must thus utilise available resources to the maximum (refer to section 1.2). Two key issues still remains a threat to PHC: access and affordability (Reerink & Sauerborn, 1996:132).

- *The **second research objective** was to examine current PHC structures within South Africa.*

According to the DOH (2011:28) key reforms are required to transform the current health care system to attain set outcomes, the first step towards this goal is to return PHC as the essential building block to deliver health services. The PHC concept is endorsed in policy documents to ensure an accessible, affordable, acceptable, equitable and efficient approach towards a well managed health system (DOH, 2011:28). The National Health Act (61 of

2003) states that developing structures to monitor health establishments that provide health services will cultivate quality health care services. Providing quality health care is inevitable and essential to the development of any nation, thus services must be available and accessible to all (refer to section 1.4 and 2.4). South Africa has a decentralised district health system with a PHC approach (Thomas *et al.,* 2004:3).

- *The **third research objective** was to determine the legislative mandates and policy frameworks that are implemented by the NDOH in South Africa.*

The National Health Act (61 of 2003) states that provinces and municipalities have to implement the district health system with certain principles one of which is equity (Thomas *et al.,* 2004:3). The NDOH is responsible for determining policy and has minimum input towards allocation of funding (Thomas *et al.,* 2004:3). Only legislative mandates and policies relevant towards the study are mentioned: Constitution of the Republic of South Africa Act (108 of 1996), National Health Act (61 of 2003), Pharmacy Act (53 of 1974), Nursing Act (33 of 2005), The National Drug Policy, National Core Standards, MDGs, GPP, DSMIS, the PHC package for South Africa – a set of norms and standards, STGs and an EDL. Mentioned mandates and frameworks are essential to sustain a high quality health system (refer to sections 1.5, 2.4.2, 2.7, 2.8, and 2.9).

- *The **fourth research objective** was to explain the medicine logistics concept within the DKK district.*

Logistics systems that are efficient, ensures that essential medicines move down the supply chain towards the service delivery point in the end researching the end user (Bossert *et al*., 2007:73). Adequate Logistics Management Information Systems (LMIS) is an essential tool for effective logistic systems (Bossert *et al*., 2007:77). Medicine or pharmaceutical logistics in the DKK district is concerned with supply chain management; all the factors influencing essential medicines, managing the cold chain and theft (refer to sections 1.6, 2.2, 2.3.2, 2.5, 2.6, 2.9).

5.2.2 Conclusions based on the empirical investigation

- *The **first research objective** of the empirical investigation was to evaluate the availability of essential drugs at PHC clinics in the DKK district.*

As mentioned in chapter 4, 10 tracer drugs were pre-selected to evaluate their availability at the PHC facilities visited by the researcher. The researcher found that the availabilities for the pre-selected tracer drugs were (all the clinics in the DKK district):

- Amoxicillin 125mg/5ml suspension 88% (n=25)
- Rifam 300mg INH 150mg tab 40's 80% (n=25)
- Medroxyprogesterone injection 150mg/ml 80% (n=25)
- Ibuprofen tablets 15's 68% (n=25)
- Flucloxacillin capsules 250mg 20's 92% (n=25)
- Paracetamol syrup 50ml 84% (n=25)
- Co-Trimoxazole tablets 56's 84% (n=25)
- Paracetamol 500mg tab 10's 88% (n=25)
- Salbutamol M.D.I. Complete 300msg 200 dose 96% (n=25)
- Nifedipine 30mg XL 28's 96% (n=25)

The overall availability of tracer drugs was high in the PHC facilities in the DKK district (refer to section 4.5.5). During the researchers' visits to the PHC facilities it was found that the clinics would either receive stock the following day or had just received stock, but as noted only stock on the shelves in the stock room was counted. Clinic one in Potchefstroom sub-district had an availability of 60% (n=8) for all of the 10 tracer drugs, and clinic two in Ventersdorp sub-district had an availability of 40% (n=4) for the same tracer drugs. Clinic two in Ventersdorp is probably under staffed and they were waiting for stock from the hospital pharmacy (refer to section 4.5).

- *The **second research objective** was to indicate services that are provided at PHC clinics in the DKK district.*

According to the results from the survey, 26 clinic managers indicated that they provide the following services: monitoring blood pressure, performing peak flow tests, monitoring glucose, pregnancy testing, integrated management of childhood illnesses, immunisation to prevent diseases, treating patients with helminths/worms, treating patients with STIs (refer to section 4.2.1.2).

The clinic mangers of 25 clinics (96.2%) indicated that they performed HIV tests, urine analysis, manages tuberculosis and treats epilepsy. Twenty four of the clinic managers (92.31%) indicated that they managed communicable diseases like cholera, diarrhoea and dysentery, to treat patients with mental illnesses and chronic diseases (refer to section 4.2.1.2).

Post natal care, family planning, pap smears, diabetes and the management of asthma services are provided in 23 of the PHC facilities (88.46%). Clinic managers of 22 clinics

(84.62%) confirmed that they performed the following services: cholesterol monitoring, antenatal care, treatment of strokes and obstructive lung diseases (refer to section 4.2.1.2).

Some clinic managers indicated to provide services at some of the PHC facilities within the DKK district. Services like the delivery of babies, treating malaria, rabies, leprosy, the prevention of hearing impairment due to otitis media, treating patients with rheumatic fever and renal diseases and tending to patients oral health needs. Some of the mentioned diseases and services are referred to hospital level if services go beyond the scope of practice of clinic nurses (refer to section 4.2.1.2).

PHC facilities operates between eight o'clock am to five o'clock pm, clinics have extended hours two times per week till seven o'clock pm. CHCs operate 24 hours per seven day week (refer to section 4.2.1.2).

- *The **third research objective** was to determine what documentation systems are implemented (including patient and medicine information) within PCH facilities in the DKK district*

Daily clinic registers (n=26; 55%) and daily headcount registers (n=26; 26%) are methods (refer to section 4.2.2.3) used by administration clerks (n=26; 53.85%) and professional nurses (n=26; 42.31%) to capture patient information upon entering the clinics (refer to section 4.2.2.1). The following information is recorded in registers upon patients entering PHC facilities: patients name and surname date of birth, time of arrival and date, diagnosis and treatment, patients' reference number or identification number (refer to section 4.2.2.2). Patient information recorded during consultation with a doctor or professional nurse include the following according to clinic managers: vital signs and personal information, prescribed medication/treatment, examination of patients, and medical history of patients, diagnosis and patient's main complaint (refer to section 4.2.2.9).Recorded patient information is utilised for the following reasons: record and statistical purposes, future references and for the district health information system (refer to section 4.2.2.4).

According to clinic managers patients keep the following documentation with them regarding their diagnosis and treatment (refer to section 4.2.2.5): carry books (n=24; 19%), patient books (n=24; 12%), carry cards (n=24; 38%) and exercise books (n=24; 19%). Prescription sheets, laboratory results, patient progression sheets, diagnosis, treatments and patient history are documentation kept in patient files in PHC facilities (refer to section 4.2.2.6). Clinic managers indicated that patient back-up files are kept in facilities (refer to section 4.2.2.7) and that administration clerks are mainly responsible for organising patient files in the facilities (refer to section 4.2.2.8). The accessibility of patient files to all staff

members is 73% (n=26) in the PHC facilities which raises some concern regarding patient confidentiality (refer to section 4.2.2.8).

- *The **fourth research objective** was to conclude what measures are implemented to monitor, document and utilize information regarding medicine within the PHC setting.*

The responsibility of dispensing medication in PHC facilities falls upon professional nurses, and during doctor visitations to clinics they also dispense (refers to section 4.2.2.10). According to clinic managers there are certain steps followed when medication is dispensed (refer to section 4.2.2.11). Information recorded after consultation relating to a patients medicine regime: the prescribed medication/treatment, the frequency of taking medicine, the route of medicine administration, the dosage form, the strength of the given medicine, the duration of the treatment, the patients name, instructions on the use of medication and the quantity (refer to section 4.2.2.13).

Health care workers responsible for the medicine room according to the clinic managers are predominantly nurses in the PHC facilities (refer to section 4.2.2.15). According to clinic managers the majority of medicine supplies are stored (refer to section 4.2.2.16) in the medicine room (68%; n=26). Medicine stock is ordered bi-weekly from the hospital pharmacy (refer to section 4.2.3.3). Inventory control is essential in monitoring medicine supplies and clinic mangers indicated that stock taking takes place, once a year, twice a year, three times per month, once per month, continuously and some indicated that they don't perform stock taking (refer to section 4.2.3.6).

Clinic managers indicated that no problems (69%; n=26) were encountered with receiving stock within the past six months, whilst 31% (n=26) indicated that budget constraints, personnel shortages, human resources not competent, over stocking, deliveries not on time, no suitable support system and a lack of storage space and shelves led to problem with receiving stock (refer to sections 4.2.3.7 and 4.2.3.10). Precautionary measures are implemented to keep medicine stock at an optimum level in PHC facilities: minimum and maximum estimations usually done in co-ordinance with the sub-district pharmacist, frequently checking or monitoring stock, the utilization of stock cards.

The availability of computer systems within PHC facilities is rare. According to clinic managers there are two clinics equipped with computers, but are out of order whilst one clinic in the Matlosana sub-district had a working computer (refer to section 4.2.3.11). These computers could be utilised for the following purposes: purchasing, stock control, to store

clinic information, to gather drug information, to store patient profiles and for dispensing (refer to section 4.4.1.3).

Certain information sources within the PHC facilities are utilised to order stock from the hospital pharmacy. According to the clinic managers they use either order cards or bin cards to order stock (refer to section 4.2.3.12).

The researcher performed observations in 25 clinics and observed the following: the medicine room, thermo liable medicine, stock control methods and the evaluation of stock cards. The researcher concluded that most of the clinics complied with regulation, but clinics still struggle to record temperatures within the medicine room and the fact that medicine rooms are too small for orderly arrangement and thus leads to storing goods on the floor (refer to section 4.4.1.1).

Maintaining the cold chain is essential as variance in temperature could lead to vaccines that are not potent, or freezes and causes abscesses. According to the researcher's observations there are only two major concerns, one is that few clinics keep stock cards of vaccines or fridge items and the other is that some items are kept in the door which is against the GPP regulations (refer to section 4.4.1.2).

As already mentioned minimum and maximum stock levels are important for decision making. The researcher observed the opposite as only 4% (n=25) of clinics had written minimum and maximum levels on their stock cards (refer to section 4.4.1.4). In order to effectively manage District Health Services it is essential to have a well functioning PHC information system (DOH, 2009:21).

- *The **fifth research objective** was to determine the role of sub-district pharmacists within the PHC setting including medicine logistics.*

The researcher concluded that sub-district pharmacists play a specific and important role in the PHC setting especially functions concerned with medicine logistics. Sub-district pharmacists procure, issue and manage pharmaceutical and surgical supplies to all of the facilities (refer to sections 4.3.1.1, 4.3.1.2, 4.3.1.3). They form the link between the district pharmacist and the clinics (4.3.1.1). Sub-district pharmacists are responsible to ensure that medicine is stored correctly and manage expired stock according to protocols (refer to sections 4.3.1.1, 4.3.1.2, 4.3.1.3). Routine visits to clinics are performed by sub-district pharmacists to ensure the effective flow of medicine, to make sure that minimum and maximum stock levels are correct to prevent over- and under-stocking (refer to section 4.3.1.1). Sub-district pharmacists are responsible for implementing and managing SOPs as

well as provincial and national protocols (refer to section 4.3.1.2). To perform pharmaceutical services, to manage and control schedule 5 drugs, to record statistics and write monthly reports (refer to sections 4.3.1.1, 4.3.1.2, 4.3.1.3). Sub-districts pharmacists strive to lighten the workload on clinic nurses assist them with their knowledge and expertise, they manage clinic orders and send orders to the PHC facilities and to ensure that they comply with their ordering dates. Lastly to co-ordinate all systems, transport and queries (refer to section 4.3.1.2).

- *The **sixth research objective** was to conclude if SOPs are used in PHC clinics in the DKK district.*

The researcher concluded that in 70% (n=23) of the facilities SOPs were used to dispense medication (refer to section 4.2.2.12). Clinic managers of the DKK district indicated that 75% (n=24) of the PHC facilities used SOPs to order their medicine supplies (refer to sections 4.2.3.1, 4.2.3.4) and that the responsibility of managing and utilising SOPs (refer to section 4.2.3.2) fall upon 68% (n=25) of the clinic managers and if absent or unavailable professional nurses (60%; n=25). According to clinic managers certain SOPs must be followed when receiving medicine stock (refer to section 4.2.3.5).

- *The **seventh research objective** was to determine the impact of budget allocations to PHC clinics regarding medicine logistics.*

According to the sub-district pharmacists, budgets are allocated to sub-districts at provincial level, budgets are divided at district level per clinic, and each facility is allocated an amount. These allocations are done according to the PHC facilities' usage or requirements of the previous financial year. The allocation is done by the State Accountant and the sub-district/district pharmacist. Invoice/return value reports are sent on a monthly basis to the DOH. As clinics place orders at the hospital pharmacy their budgets are reduced. The programme used in hospital pharmacies is better known as Rx Solutions.

- *The **eighth research objective** was to determine how PHC facilities are managed.*

Maintenance of physical facilities is important for hygienic purposes and for the overall cleanliness of the facility (refer to section 4.2.4.1). Adequate storage conditions are essential to maintain the cold chain as well the effectiveness of medicine stored in the medicine room (refer to section 4.2.4.2). Managing stock is essential to ensure that facilities do not under - stock or over-stock and to prevent medicine from expiring thus preserving allocated budgets (refer to section 4.2.4.3). Measures implemented against theft is crucial to ensure that access to medicine rooms are limited to authorised personnel only (refer to section 4.2.4.4).

5.3 **Limitations**

Certain limitations were identified during the course of this study and should be taken into account when evaluating the results and conclusions (refer to 1.13.3.7, chapter 1):

- Limited literature was available concerning medicine logistics within the DKK district.
- During the research study only 26 of the 35 clinic managers responded to the questionnaire and 25 of the 35 clinics were visited for observations.
- Due to time constraints and demographic location some clinics were left out of the study.
- In some cases new clinic managers were employed and didn't know about the questionnaires and the researcher had to inform them thus prolonging the process.
- In some cases clinic managers were unavailable because of meetings and training and the researcher had to revisit clinics delaying progress.
- Some questionnaires were not completed by the sub-district pharmacist due to extensive workload at the hospital pharmacy.
- During the research period clinics were only visited once for observations, thus no comparisons could be made on issues like thermo liable medicine, stock cards, stock control and aspects regarding the medicine room.
- Data analysis were done by the researcher self using Microsoft Excel 2007.

5.4 Recommendations

The following recommendations for further research can be made on the basis of the results of this study and based on aspects that were not investigated due to the limited scope, nature and extent of this study. Some of the recommendations suggested may be within the local management's control whilst others may require policy changes from the provincial head office. The following recommendations can be made from this research:

- Determine the availability and possible influence of all the drugs on the essential drug list at clinic level in all of the PHC facilities within the DKK district.
- Investigate the reliability and relevance of services provided at PHC facilities.
- Further investigation should be conducted on installing computer systems with Rx Solutions within the PHC facilities in order to lessen paper workload on clinic staff.
- The number of nurses, doctors, counsellors and pharmacists need to be expanded and brought in line with national core norms and standards.

- Facility managers need to ensure that all personnel are trained and mentored on proper inventory control.
- Facility managers need to ensure that the stock cards are maintained and that minimum and maximum values for each medication are calculated each month.
- Facility managers need to develop and implement Standard Operating Procedures for ordering, receiving and out of stock scenarios of medicines.
- Further studies could be performed in centralising computer systems within the DKK district in order to send more accurate data to the DHIS.
- Determining what impact pharmacist assistants could have on managing medicine related functions within the PHC facilities.
- In the future comparative research studies could be performed on mentioned subjects within this study.
- To explore patient views on current public health issues, and finding ways in cooperation with the DOH, to resolve these issues.

5.5 Chapter summary

This chapter included the conclusion with regard to the specific objectives that were set for the study and the recommendations made for future studies. The limitations of the study were also noted in this chapter.

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APPENDICES

Index

APPENDIX A

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

MUSA

(Completed by the clinic managers)

SURVEY

MEDICINE LOGISTICS IN PRIMARY HEALTH CARE CLINICS IN THE DR KENNETH KAUNDA DISTRICT

RESEARCH ENTITY: MEDICINE USAGE IN SOUTH AFRICA

FACULTY OF HEALTH SCIENCES

NORTH-WEST UNIVERSITY: POTCHEFSTROOM CAMPUS

(SECTION A)

Co workers:

Prof. M.S. Lubbe

Mrs. H.E. Bekker

Mr. W.D. Basson

Mrs. A v.d. Westhuizen

Mrs. R van Reenen

Mrs. M Vorster

Mrs. E Du Plessis

Mrs. C Swanepoel

Mrs A van Vuuren

Dear Colleague

MEDICINE LOGISTICS AT PRIMARY HEALTH CARE CLINICS

The traditional institution-based delivery of health care services in South Africa has played a major role in contributing towards providing access to health care for a significant proportion of the population. Poor drug management, particularly in the public sector of developing countries, is critical, but major improvements are possible that can save money and improve access.

Delivery systems, service delivery and drugs need to be well managed, supervised and monitored in order to meet health care needs, simultaneously utilising scarce financial resources in order to contain increasing drug costs and ensure sustained availability and accessibility of essential drugs. Two key features of health system strengthening can be noted in South Africa. These are the need to further strengthen the health information system, including the use of data for planning and management, and the need to ensure that management systems help in improving the quality of care provided at all levels of the health system, both public and private. As the provision of health care services is labour intensive, the availability of a well-trained, motivated and appropriately-sized cadre of health professionals is vital.

The aim of the study is to ***investigate the documentation system used for medicine logistics at the primary health care clinics in the Dr Kenneth Kaunda district in the North West Province.*** The National Health Bill, Good Pharmacy Practice, National Drug Policy, Essential Medicine Concept, Core Norms and Standards for Primary Health Care Clinics and the National Health System may be used as guidelines and reference to analyse drug management and documentation systems at clinic level. Ultimately recommendations may be provided towards health care personnel to optimise medicine logistics. Clinics (36) will be participating in this study from the whole of the Dr Kenneth Kaunda district.

You have been selected to take part in this survey, which cannot be completed without your assistance. I would appreciate it if you could spare the time to complete the anonymous survey. The concept of the survey will be in the form of a questionnaire. The survey form is divided into three sections (A, B and C). The health personnel that have been identified to complete the survey form are the Sub-district pharmacists of the Dr Kenneth Kaunda district.

and they will complete section B of the survey, as well as the professional nurses in charge of the 36 primary health care clinics or the nurse who is in charge of medicine logistics, who will be requested to complete section A of the survey. Section C will be an observational study done by the researcher. Each colleague will be contacted to arrange an appropriate date, time and place to complete the survey form. The survey form will be taken to the clinics by the sub-district pharmacist a week before the researcher's observation study will be made, thus giving the professional nurse and sub-district-pharmacist the opportunity to ask questions if some aspects are unclear in the survey form.

Your contribution towards the study is appreciated.

Anje van der Westhuizen

(M.Pharm student at the North-West University, Research entity: Medicine Usage in South Africa, School of Pharmacy)

SECTION A: Professional nurse

MEDICINE LOGISTIC DOCUMENTATION PROJECT

Date of personal interview:

D	D	/	M	M	/	Y	Y	Y	Y

Language preference for interview:

English	Afrikaans

1.1 Classification of institution

Classification:	Primary health care clinic (static)	
	Health centre (static)	
	Primary health care clinic (mobile)	
	Settlement clinic (VSD)	

1.2 Health region where primary health care clinic is situated

Maquassi Hills sub-district (A)	
Matlosana sub-district (B)	
Potchefstroom sub-district (C)	
Ventersdorp sub-district (D)	

1.3 Average number of patient visits per month at the clinic?

_____

DOCUMENTATION AND LOGISTICS REGARDING THE PRIMARY HEALTH CARE CLINIC

1.4 Services provided at the primary health care clinics.

(Please indicate with an (x) which services and operating hours apply at your clinic. Indicate more than one option if necessary.)

	Service		Operating hours		
			24 hour clinic	Clinic hours 8-5	Other hours
	Yes	No			
Screening and Monitoring services					
Blood pressure monitoring					
Performance of Peak flow tests					
Performance of HIV tests					
Cholesterol monitoring services					
Glucose monitoring					
Pregnancy testing services					
Urine analysis					
Women's reproductive care • antenatal care • delivery of child • postnatal care • family planning • Pap smears/VIA					
Integrated management of childhood illness					
Cholera and diarrhoeal disease control					
Dysentery					
Helminths/worms					
Diseases prevented by immunisation					
Helminths/worms					
Sexually transmitted illnesses (STIs)					
Malaria					
Rabies					
Tuberculosis					
Leprosy					
Prevention of hearing impairment due to Otitis Media					
Rheumatic Fever					
Oral health					
Mental health					
Victims of sexual offenses, domestic violence and gender violence					
Chronic diseases (treatment) • Diabetes • Hypertension • Epilepsy • Asthma • Stroke • Renal diseases • Obstructive lung disease					

1.5 Structure of personnel at primary health care clinic level

Please indicate the following and ensure that you refer to all appropriate options:

Health care personnel:	Number of personnel working at the clinic
Nursing profession:	
Chief professional nurse	
Senior professional nurse	
Professional nurse	
Auxiliary nurses	
Medical profession:	
Doctors	
Pharmacist assistants	
Other personnel: • Clerks • Cleaners • Security	

1.6 What register do you use to document patient information when a patient enters the primary health care clinic?

_____
_____

1.7 What patient information is documented in the registers mentioned above?

_____
_____

1.8 Who is responsible for completing the registers mentioned above?

_____
_____

1.9 What happens to the information documented in the register?

_____
_____

1.10 What documentation do the patients keep with them regarding their treatment?

_____
_____

1.11 What type of documentation is kept in the patient files at the primary health care clinic?

_____
_____

1.12 Are patient back-up files kept in the primary health care clinic?

Yes	No

1.13 Who is in charge of organising the patient files in the primary health care clinic?

_____

1.14 Do all staff members have access to the patient files in the primary health care facility?

Yes	No

1.15 When a doctor or nurse consults with a patient, what patient information is documented?

_____

_____

1.16 Who is responsible for dispensing medication in the primary health care clinic?

_____

_____

1.17 Briefly describe the steps being followed during dispensation of medication in the primary health care clinic.

_____

_____

1.18 Are there standard operating procedures for dispensing medication at the primary health care clinic?

Yes	No

1.19 What is documented with regard to dispensing medicine after consultation with a patient?

_____

_____

1.20 According to the Good Pharmacy Practice Guidelines of the South African Pharmacy Council there must be copies of the following references in a primary health care clinic.

Please indicate with an (x) whether the following references are available in your clinic: (Please note that more than one option can be indicated.)

	(X)
NDOH- Adult Standard Treatment Guidelines for Hospital	
NDOH- Paediatric Standard Treatment Guidelines for Hospital	
NDOH- Primary Health Care Treatment Guidelines	
Essential Drug List 2009	
A list of non-substitutable substances	
The latest edition of the Good Pharmacy Practice(GPP) Manual	
Recent edition MDR or SAMF	
A daily drug use (Tincture Press Publications)	
Other medicine related reference books	

1.21 Who is the designated person responsible for the dispensary/medicine room?

Please indicate the applicable option with an (x). Indicate more than one option if necessary.

Pharmacist's Assistant (Post-Basic)		Clinical Nurse Practitioner	
Registered Nurse		Other :	

1.22 Where in the primary health care clinic is the medication stored?

Please indicate the applicable option with (x). Indicate more than one option if necessary.

Dispensary/medicine room		Store room	
Consulting Room		Other(s) (specify):	

MEDICINE STOCK IN A PRIMARY HEALTH CARE CLINIC

1.23 Are there standard operating procedures for the ordering of medicine stock?

YES	NO

1.24 How many times per month do you order medicine stock?

_____

1.25 What are the standard operating procedures for <u>ordering</u> medicine stock at your clinic?

_____

_____

1.26 What are the standard operating procedures for <u>receiving</u> medicine stock at the primary health care clinic?

_____

_____

1.27 How many times does stock taking take place per year at your clinic?

Once a year	
Twice a year	
Three monthly	
Monthly	
Continuously	
None	

1.28 Have you had any problems in the past six months receiving medicine stock from the sub-district hospital?

Yes	No

1.29 What methods do you use to ensure that your medicine stock levels are optimal at your clinic?

_____

_____

1.30 What system is in place at your clinic to monitor medicine stock?

_____

_____

1.31 List the major reasons why your medicine stock is not kept at an optimal level. Indicate more than one option if necessary.

	X		X
Budget constraints		Deliveries not on time	
Personnel shortage		No suitable support system (e.g. computer)	
Personnel not competent		Storage space and shelving	
Over-ordering		Other: specify	

1.32 Do you use a computer in your pharmacy?

Yes	No

1.33 If the answer was yes in the above question for what purposes do you use it?

(Indicate more than one option if necessary.)

Purchasing	
Stock control	
Used to store clinic information	
Drug information	
Patient profile	
Dispensing	
Other – please specify:	

1.34 Do you have any problems with your computer system?

Yes	No

1.35 Which of the following problems do you encounter with your system?

(Indicate more than one option if necessary)

	X
Out of order due to technical faults	
Programme software problems	
Slow processing	
Capacity (e.g. memory too small)	
Poor service from the supplier	
Others – please specify:	

1.36 What information sources are being used for purposes (check all that apply)?

	X		X
Order cards/forms		Other: Specify	
Bin cards			
Computer system			

1.37 Routine warehouse or storeroom management tasks
(Please indicate with an (x) which tasks apply to your role clarification.)

				Responsible person for tasks			
TASKS	**DAILY**	**WEEKLY**	**MONTHLY**	**SUB-DISTRICT PHARMACIST**	**CLINIC MANAGER**	**PROFESSIONAL NURSE**	**OTHER**
Maintenance of physical facilities							
Sweep or scrub floors							
Remove garbage							
Clean bins, shelves, and cupboards, if needed							
Ensure that aisles are clear							
Ensure adequate ventilation and cooling							
Visually inspect fire extinguishers to ensure that pressures are maintained and extinguishers are ready for use							
Monitor store security and safety							
Inspect the storage structure for damage, including the walls, floors, roof, windows, and doors							
Check for signs of rodents, insects, or roof leaks							
Run generator to ensure the system is working correctly; check the level of fuel and add fuel, if needed							
Monitor product quality (visually inspect commodities and check expiry dates)							

				Responsible person for tasks			
TASKS	**DAILY**	**WEEKLY**	**MONTHLY**	**SUB-DISTRICT PHARMACIST**	**CLINIC MANAGER**	**PROFESSIONAL NURSE**	**OTHER**
Storage conditions							
Monitor storage conditions							
Clean receiving, storage, packing, and areas							
Ensure that products are protected from direct sunlight							
Ensure that products are stacked correctly							
Store products using correct procedures; rearrange commodities to facilitate the first-to-expire, first-out (FEFO) policy.							
Stock management							
Use established procedures to dispose of expired or damaged products							
Monitor stock levels, stock quantities							
Submit emergency order (as needed, using local guidelines)							
Conduct physical inventory or cycle count, and update stock keeping records							
Assess stock situation							
Update back-up file for computerised inventory control records							
Complete and submit requisition form (indent or “pull” systems)							
Determine issue quantity and issue products (“push” systems).							
Monitor product quality (visually inspect commodities and check expiry dates)							
Receive products							
Update bin cards							
Update stock records and maintain files							
Ensure that products are stacked correctly							
Separate expired stocks and move to secure area							
Complete required reporting and documentation							
Reassess maximum/minimum stock levels, and adjust if needed							

1.38 Who is responsible for managing Standard operating procedures?

(Please indicate appropriate block with an (x). Indicate more than one option if necessary.)

Sub-district pharmacist		Clinic manager	
Professional nurse		Other:	

1.39 What measures are implemented against theft <u>at the clinic</u>:

(Please indicate appropriate block with an (x). Indicate more than one option if necessary.)

Precautionary measures	**Yes**	**No**
Limit access to only designated staff		
Lock the storeroom/cupboards		
Secure all locks and doors		
Have inventory control cards for each product		
Set maximum dispensing quantities		
Have dispensers record individual prescriptions and maintain prescription or dispensing registers		
Limit dispensing to authorised staff members only		

APPENDIX B

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

MUSA

(Completed by the sub-district pharmacists)

SURVEY

MEDICINE LOGISTICS IN PRIMARY HEALTH CARE CLINICS IN THE DR KENNETH KAUNDA DISTRICT

RESEARCH ENTITY: MEDICINE USAGE IN SOUTH AFRICA

FACULTY OF HEALTH SCIENCES

NORTH-WEST UNIVERSITY: POTCHEFSTROOM CAMPUS

(SECTION B)

Co workers:

Prof. M.S. Lubbe

Mrs. H.E. Bekker

Mr. W.D. Basson

Mrs. A v.d. Westhuizen

Mrs. R van Reenen

Mrs. M Vorster

Mrs. E Du Plessis

Mrs. C Swanepoel

Mrs A van Vuuren

Dear Colleague

MEDICINE LOGISTICS AT PRIMARY HEALTH CARE CLINICS

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of the 36 primary health care clinics or the nurse who is in charge of medicine logistics, who will be requested to complete section A of the survey. Section C will be an observational study done by the researcher. Each colleague will be contacted to arrange an appropriate date, time and place to complete the survey form. The survey form will be taken to the clinics by the sub-district pharmacist a week before the researcher's observation study will be made, thus giving the professional nurse and sub-district-pharmacist the opportunity to ask questions if some aspects are unclear in the survey form.

Your contribution towards the study is appreciated.

Anje van der Westhuizen

(M.Pharm student at the North-West University, Research entity: Medicine Usage in South Africa, School of Pharmacy)

SECTION B: Sub-district pharmacist

MEDICINE LOGISTIC DOCUMENTATION PROJECT

Date of personal interview:

D	D	/	M	M	/	Y	Y	Y	Y

Language preference for interview:

English	Afrikaans

1.1 Classification of institution

Classification:	Primary health care clinic (static)	
	Health centre (static)	
	Primary health care clinic (mobile)	
	Settlement clinic (VSD)	

1.2 Health region where primary health care clinic is situated

Maquassi Hills sub-district (A)	
Matlosana sub-district (B)	
Potchefstroom sub-district (C)	
Ventersdorp sub-district (D)	

1.3 What role does the Sub-district pharmacists play in the primary health care setting?

_____

1.4 What role do they play in medicine logistics in the primary health care clinics?

_____

1.5 What is the job description of a Sub-district pharmacist?

_____

1.6 What are Sub-district pharmacists' roles in conducting an annual clinic budget?

_____

1.7 Please describe how the annual clinic budget is performed?

_____

APPENDIX C

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

MUSA

(Observations done by the researcher)

SURVEY

MEDICINE LOGISTICS IN PRIMARY HEALTH CARE CLINICS IN THE DR KENNETH KAUNDA DISTRICT

RESEARCH ENTITY: MEDICINE USAGE IN SOUTH AFRICA

FACULTY OF HEALTH SCIENCES

NORTH-WEST UNIVERSITY: POTCHEFSTROOM CAMPUS

(SECTION C)

Co workers:

Prof. M.S. Lubbe

Mrs. H.E. Bekker

Mr. W.D. Basson

Mrs. A v.d. Westhuizen

Mrs. R van Reenen

Mrs. M Vorster

Mrs. E Du Plessis

Mrs. C Swanepoel

Mrs A van Vuuren

SECTION C: Observations during clinic visits

MEDICINE LOGISTIC DOCUMENTATION PROJECT

Date of personal interview:

D	D	/	M	M	/	Y	Y	Y	Y

Language preference for interview:

English	Afrikaans

1.1. Classification of institution

Classification:	Primary health care clinic (static)	
	Health centre (static)	
	Primary health care clinic (mobile)	
	Settlement clinic (VSD)	

1.2 Health region where primary health care clinic is situated

Maquassi Hills sub-district (A)	
Matlosana sub-district (B)	
Potchefstroom sub-district (C)	
Ventersdorp sub-district (D)	

SECTION C: Observations during clinic visits

10 Drugs have been selected and their stock cards will be evaluated and compared to the GPP guidelines and the WHO guidelines.

Code	Item	Type	Available	Comment
0004	Amoxicillin 125mg/5ml suspension (Tracer drug)	Antibiotic		
3954	Rifam 300mg INH 150mg tablets 40's (Tracer drug)	Antibiotic		
0136	Medroxyprogesterone injection 150mg/ml (Tracer drug)	FP		
3975	Ibuprofen tablets 15's (Tracer drug)	Caps/Tabs		
3270	Flucloxacillin capsules 250mg 20's (Tracer drug)	Caps/Tabs		
0383	Paracetamol syrup 50ml (Tracer drug)	Liquids		
5408	Co-Trimoxazole tablets 56's (Tracer drug)			
3195	Paracetamol 500mg tablets 10's (Tracer drug)	Caps/Tabs		
0122	Salbutamol M.D.I. Complete 100msg 200 dose (Tracer drug)	Drops/Inh		
2668	Nifedipine 30mg XL tablets 28's (Tracer drug)	Caps/Tabs		

1.3 What is the percentage of available tracer drugs at the primary health care clinic?

% Tracer drug availability =_____

1.4 Premises and layout of primary health care clinics

	N/A	Does not comply	Complies
Dispensary or medicine room			
Temperature in the dispensary or medicine room is below 25°C			
Temperature in the dispensary or medicine room is controlled 24 hours a day as demonstrated by a maximum/minimum thermometer			
There is an air conditioner in the dispensary or medicine room and it is in good working condition			
Only the pharmacist's assistant (post-basic) or licensed dispenser at all times has keys to the dispensary or medicine room where schedules 1-5 items are kept			
There is sufficient security to prevent unauthorised access to medicines			
The storage area is large enough to allow for orderly arrangement of stock and proper stock location			
Dispensary or medicine room is situated so that products are protected from potentially harmful influences			
All goods are stored off the floor			
Supplies are stored neatly on shelves or in boxes			
Thermo liable medicine			
Only medicine is stored in the refrigerator			
Is the refrigerator in a good working condition?			
Is the refrigerator fitted with a warning system to indicate that refrigeration has failed or temperatures are above or below 2°C and 8°C			
Is the temperature of the refrigerator controlled 24 hours a day as demonstrated by a WHO approved dial thermometer or alcohol mercury thermometer			
Are other vaccines packed away from the freezer plate?			
Are there any vaccines packed in the door of the fridge?			
Are there stock cards available for all the vaccines in the fridge?			
Is there a designated person responsible for maintaining the cold chain?			

1.4 Premises and layout of primary health care clinics (continued)

	N/A	Does not comply	Complies
Stock control			
Is there a computerised programme used for dispensing?			
Is there a book/permanent record for S1-S5 medicines kept as required in Regulation 11 (1) of the Medicine and Related Substance Act (101 of 1965)?			
Are S5 medicines locked away and the key under control of an authorised person in terms of the Medicine and Related Substance Act (101 of 1965)?			
Stock cards			
Product generic name			
Strength			
Dosage form			
Code			
Minimum stock level			
Maximum stock level			
Date			
Ordered from/issued to			
Stock received			
Stock issued			
Stock balance			

APPENDIX D: APPOINTMENT CARD FOR PATIENTS (front)

PERSONAL/ HEALTH / MEDICATION APPOINTMENT CARD
PERSOONLIKE GESONDHEID / MEDIKASIE / AFSPRAAK KAART

COMMUNITY SERVICES GEMEENSKAPSDIENSTE (DOMICILIARY VISITS BY/ HUISBESOEKE DEUR)			APPOINTMENTS / AFSPRAKE		
			DATE DATUM	TIME TYD	DAY HOSPITAL/ DAG HOSPITAAL OR/OF DEPARTMENT/DEPARTEMENT
DATE DATUM	SERVICE DIENS	SIGNATURE HANDTEKENING			

PERSONAL HEALTH/MEDICATION/
PERSOONLIKE GESONHEID/MEDIKASIE/
APPOINTMENT CARD
AFSPRAAK KAART

Name:
Naam:
Address:
Adres:

Date of Birth:
Geboortedatum:
Identity No.
Identiteitsnommer:
Clinic No.
Kliniek Nr:

HOSPITAL OR DAY HOSPITAL HOSPITAAL OF DAG HOSPITAAL	HOSPITAL OR DAY HOSPITAL HOSPITAAL OF DAG HOSPITAAL NUMBER / NOMMER

PHARMACISTS
APTEKER:

1.
2.
3.
OTHER:
ANDER;

APPENDIX D (CONTINUED): APPOINTMENT CARD FOR PATIENTS (back)

DATE DATUM	DIAGNOSIS DIAGNOSE	TREATMENT / BEHANDELING			SIGNATURE HANDTEKENING	HEATH CLASSIFICATION GESONHEIDS KLASSIFIKLASIE	
		DRUG ARTSENYMIDDEL	DOSE DOSIS	FREQUENCY HERHALING		A B or/of C	1 2 or/of 3

A = HEALTY / GESOND
B = ACUTELY ILL / AKUUT SIEK
C = CHRONICALLY ILL / KRONIES SIEK

1 = INDEPENDENT / ONAFHANKLIK
2 = SEMI-INDEPENDENT / SEMI ONAFHANKLIK
3 = HELPLESS / HULPELOOS

APPENDIX E: STOCK CARDS USED IN CLINIC

NORTH WEST DEPARTMENT OF HEALTH

STOCK CARD

Product generic name:						Min:			
Strength and dosage form:					Code:		Max:		
Date	Ordered from/ Issued to	Stock received	Stock issued	Stock balance	Date	Ordered from/ Issued to	Stock received	Stock issued	Stock balance

POTCHEFSTROOM SUB-DISTRICT (EVALUATION OF STOCK CARDS)

Table F 1(a): Evaluation of stock cards in the Potchefstroom sub-district

Code	Item	Type	Clinic1	Comment	Stock Card	Clinic2	Comment	Stock Card	Clinic 3	Comment	Stock Cards	Clinic 4	Comment	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Antibiotic	Available	50 Bottles	250 Bottles	Not available	No Stock	0 Bottles	Available	6 Bottles	77 Bottles	Available	10 Bottles	10 Bottles
3954	Rifam 300mg INH 150mg tab 40's (Tracer drug)	Antibiotic	Available	37 Boxes	36 Boxes	Not available	No Stock	0 Boxes	Available	20 Boxes	37 Boxes	Available	3 Boxes	18 Boxes
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	FP	Available	200 Vials	100 Vials	Not available	No Stock	0 Stock	Available	200 Vials	200 Vials	Available	100 Vials	100 Vials
3975	Ibuprofen tab 15's (Tracer drug)	Caps/Tabs	Available	225 Packs	230 Packs	Available	20 Packs	20 Packs	Available	450 Packs	715 Packs	Available	170 Packs	200 Packs
3270	Flucloxacillin caps 250mg 20's (Tracer drug)	Caps/Tabs	Available	66 Packs	57 Packs	Available	60 Packs	70 Packs	Available	220 Packs	275 Packs	Available	55 Bottles	55 Bottles
383	Paracetamol syr 50ml (Tracer drug)	Liquids	Available	27 Bottles	87 Bottles	Not available	No Stock	35 Bottles	Available	28 Bottles	81 Bottles	Not Available	No Stock	0 Bottles
5408	Co-Trimoxazole tab 56's (Tracer drug)	Tabs	Available	4 Packs	No Stock Card	Available	20 Packs	336 Packs	Available	235 Packs	No Stock Card	Available	No 56's only 20 's	No 56's only 20 's
3195	Paracetamol 500mg tab 10's (Tracer drug)	Caps/Tabs	Available	70 Boxes	130 Boxes	Available	140 Boxes	280 Boxes	Available	180 Boxes	380 Boxes	Available	150 Boxes	190 Boxes
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Drops/Inh	Available	127 Inhalers	No Stock Card	Available	12 Inhalers	13 Inhalers	Available	100 Inhalers	17 Inhalers	Available	48 Inhalers	40 Inhalers
2668	Nifedipine 30mg XL 28's (Tracer drug)	Caps/Tabs	Available	8 Boxes	190 Boxes	Available	40 Boxes	590 Boxes	Available	160 Boxes	630 Boxes	Available	14 Boxes	15 Boxes

POTCHEFSTROOM SUB-DISTRICT (EVALUATION OF STOCK CARDS) continued

Table F 1(b): Evaluation of stock cards in the Potchefstroom sub-district

Code	Item	Clinic 5	Comment	Stock Cards	Clinic 6	Comment	Stock Cards	Clinic 7	Comment	Stock Cards	Clinic 8	Comment	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Available	10 Bottles	10 Bottles	Available	10 Bottles	5 Bottles	Available	40 Bottles	153 Bottles	Available	11 Bottles	14 Bottles
3954	Rifam 300mg INH 150mg tab 40's (Tracer drug)	Available	31 Boxes	13 Boxes	Not Available	No Stock	0 Boxes	Available	101 Boxes	79 Boxes	Not available	No Stock & Stock Card	0 Boxes
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	Available	100 Vials	100 Vials	Available	200 Vials	200 Vials	Available	100 Vials	150 Vials	Available	100 Vials	200 Vials
3975	Ibuprofen tab 15's (Tracer drug)	Not available	No Stock	0 Packs	Available	110 Packs	110 Packs	Not available	No Stock	70 Packs	Not available	No Stock	0 Packs
3270	Flucloxacillin caps 250mg 20's (Tracer drug)	Not available	No Stock	0 Bottles	Available	90 Bottles	100 Bottles	Available	47 Bottles	95 Bottles	Available	54 Bottles	54 Bottles
383	Paracetamol syr 50ml (Tracer drug)	Available	100 Bottles	100 Bottles	Available	122 Bottles	122 Bottles	Available	20 Bottles	35 Bottles	Available	7 Bottles	240 Bottles
5408	Co-Trimoxazole tab 56's (Tracer drug)	Available	79 Packs	40 Packs	Available	20 Packs	20 Packs	Available	2 Packs	502 Packs	Not available	No Stock	200 Packs
3195	Paracetamol 500mg tab 10's (Tracer drug)	Available	150 Boxes	150 Boxes	Available	310 Boxes	310 Boxes	Available	89 Boxes	380 Boxes	Not available	No Stock	0 Boxes
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Available	40 Inhalers	40 Inhalers	Available	41 Inhalers	41 Inhalers	Available	2 Inhalers	0 Inhalers	Available	40 Inhalers	40 Inhalers
2668	Nifedipine 30mg XL 28's (Tracer drug)	Available	180 Boxes	180 Boxes	Available	50 Boxes	37 Boxes	Available	70 Boxes	105 Boxes	Available	20 Boxes	120 Boxes

VENTERSDORP SUB-DISTRICT (EVALUATION OF STOCK CARDS)

Table G 2: Evaluation of stock cards in the Ventersdorp sub-district

Code	Item	Type	Clinic1	Comment	Clinic2	Comment	Stock Cards	Clinic 3	Comment	Stock Cards	Clinic 4	Comment	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Antibiotic	Available	No photocopies	Not Available	No Stock	0 Bottles	Available	71 Bottles	74 Bottles	Available	76 Bottles	108 Bottles
3954	Rifam 300mg INH 150mg tab 40's (Tracer drug)	Antibiotic	Available	No photocopies	Not Available	No Stock	0 Boxes	Available	7 Boxes	10 Boxes	Not Available	No Stock	0 Boxes
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	FP	Available	No photocopies	Not Available	No Stock	0 Vials	Not Available	No Stock	0 Vials	Not Available	No Stock	0 Vials
3975	Ibuprofen tab 15's (Tracer drug)	Caps/Tabs	Available	No photocopies	Not Available	No Stock	0 Packs	Available	132 Packs	165 Packs	Available	158 Packs	No Stock Card
3270	Flucloxacillin caps 250mg 20's (Tracer drug)	Caps/Tabs	Available	No photocopies	Available	50 Bottles	70 Bottles	Available	59 Bottles	58 Bottles	Available	65 Packs	66 Packs
383	Paracetamol syr 50ml (Tracer drug)	Liquids	Available	No photocopies	Not Available	No Stock	0 Bottles	Available	115 Bottles	123 Bottles	Available	107 Bottles	137 Bottles
5408	Co-Trimoxazole tab 56's (Tracer drug)	Tabs	Available	No photocopies	Available	89 Packs	90 Packs	Available	13 Packs	0 Packs	Available	100 Packs	140 Packs
3195	Paracetamol 500mg tab 10's (Tracer drug)	Caps/Tabs	Available	No photocopies	Not Available	No Stock	0 Boxes	Available	35 Boxes	280 Boxes	Available	309 Packs	210 Boxes
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Drops/Inh	Available	No photocopies	Available	187 Inhalers	150 Inhalers	Available	164 Inhalers	133 Inhalers	Available	120 Inhalers	122 Inhalers
2668	Nifedipine 30mg XL 28's (Tracer drug)	Caps/Tabs	Available	No photocopies	Available	154 Packs	144 Packs	Available	160 Boxes	183 Boxes	Available	120 Packs	No Stock Card

MAQUASSI HILLS SUB-DISTRICT (EVALUATION OF STOCK CARDS)

Table H 3: Evaluation of stock cards in the Maquassi Hills sub-district

Code	Item	Type	Clinic1	Stock Cards	Clinic2	Stock Cards	Clinic 3	Stock Cards	Clinic 4	Stock Cards	Clinic 5	Stock Cards	Clinic 6	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Antibiotic	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	No Stock	No photo-copies	Available	No pho-tocopies
3954	Rifam 300mg INH 150mg tab 40's (Tracer	Antibiotic	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	FP	Available	No photo-copies	Available	No photo-copies	Out of stock	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
3975	Ibuprofen tab 15's (Tracer drug)	Caps/Tabs	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	No Stock	No photo-copies	Available	No pho-tocopies
3270	Flucloxacillin caps 250mg 20's (Tracer	Caps/Tabs	Available	No photo-copies	Available	No photo-copies	Out of stock	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
383	Paracetamol syr 50ml (Tracer drug)	Liquids	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	No Stock	No photo-copies	Available	No pho-tocopies
5408	Co-Trimoxazole tab 56's (Tracer drug)	Tabs	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
3195	Paracetamol 500mg tab 10's (Tracer drug)	Caps/Tabs	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Drops/Inh	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies
2668	Nifedipine 30mg XL 28's (Tracer drug)	Caps/Tabs	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No photo-copies	Available	No pho-tocopies

MATLOSANA SUB-DISTRICT (EVALUATION OF STOCK CARDS)

Table I 4a: Evaluation of stock cards in the Matlosana sub-district

Code	Item	Type	Clinic1	Comment	Stock Cards	Clinic2	Comment	Stock Cards	Clinic 3	Comment	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Antibiotic	Available	7 Bottles	10 Bottles	Available	34 Bottles	16 Bottles	Available	40 Bottles	5 Bottles
3954	Rifam 300mg INH 150mg tab 40's (Tracer drug)	Antibiotic	Available	22 Boxes	24 Boxes	Available	6 Boxes	No Stock Card	Available	44 Boxes	No Stock Card
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	FP	Available	100 Vials	100 Vials	Available	300 Vials	200 Vials	Available	100 Vials	300 Vials
3975	Ibuprofen tab 15's (Tracer drug)	Caps/Tabs	Not Available	No Stock	0 Packs	Available	98 Packs	210 Packs	Not available	0 Packs	115 Packs
3270	Flucloxacillin caps 250mg 20's (Tracer drug)	Caps/Tabs	Available	5 Bottles	5 Bottles	Available	10 Bottles	30 Bottles	Available	73 Bottles	110 Bottles
383	Paracetamol syr 50ml (Tracer drug)	Liquids	Available	10 Bottles	10 Bottles	Available	113 Bottles	85 Bottles	Available	55 Bottles	139 Bottles
5408	Co-Trimoxazole tab 56's (Tracer drug)	Tabs	Available	11 Packs	10 Packs	Available	30 Packs	93 Packs	Not available	0 Packs	No Stock Card
3195	Paracetamol 500mg tab 10's (Tracer drug)	Caps/Tabs	Available	47 Packs	50 Packs	Not available	0 Packs	30 Packs	Available	40 Boxes	57 Boxes
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Drops/Inh	Not Available	No Stock	0 Inhalers	Available	40 Inhalers	44 Inhalers	Available	60 Inhalers	140 Inhalers
2668	Nifedipine 30mg XL 28's (Tracer drug)	Caps/Tabs	Not Available	No Stock	10 Boxes	Available	140 Boxes	30 Boxes	Available	20 Boxes	415 Boxes

MATLOSANA SUB-DISTRICT (EVALUATION OF STOCK CARDS) continued

Table I 4b: Evaluation of stock cards in the Matlosana sub-district

Code	Item	Clinic 4	Comment	Stock Cards	Clinic 5	Comment	Stock Cards	Clinic 6	Comment	Stock Cards	Clinic 7	Comment	Stock Cards
4	Amoxicillin 125mg/5ml suspension (Tracer drug)	Available	64 Bottles	67 Bottles	Available	77 Bottles	0 Bottles	Available	20 Bottles	50 Bottles	Available	178 Bottles	84 Bottles
3954	Rifam 300mg INH 150mg tab 40's (Tracer drug)	Available	20 Boxes	38 Boxes	Available	49 Boxes	11 Boxes	Available	12 Boxes	55 Boxes	Available	106 Boxes	0 Boxes
136	Medroxyprogesterone inj 150mg/ml (Tracer drug)	Available	200 Vials	200 Vials	Available	200 Vials	100 Vials	Available	800 Vials	100 Vials	Available	200 Vials	200 Vials
3975	Ibuprofen tab 15's (Tracer drug)	Available	270 Packs	270 Packs	Not available	0 Pack	No Stock Card	Available	138 Packs	1150 Packs	Available	79 Packs	120 Packs
3270	Flucloxacillin caps 250mg 20's (Tracer drug)	Available	30 Bottles	30 Bottles	Available	58 Bottles	0 Bottles	Available	68 Bottles	8 Bottles	Available	27 Bottles	30 Bottles
383	Paracetamol syr 50ml (Tracer drug)	Available	139 Bottles	65 Bottles	Available	79 Bottles	0 Bottles	Available	34 Bottles	185 Bottles	Available	326 Bottles	455 Bottles
5408	Co-Trimoxazole tab 56's (Tracer drug)	Available	23 Packs	280 Packs	Not available	0 Packs	No Stock Card	Available	25 Packs	28 Packs	Not available	No Stock	0 Packs
3195	Paracetamol 500mg tab 10's (Tracer drug)	Available	120 Boxes	120 Boxes	Available	210 Boxes	140 Boxes	Available	40 Boxes	1250 Boxes	Available	109 Boxes	140 Boxes
122	Salbutamol M.D.I. Complete 300msg 200 dose (Tracer drug)	Available	100 Inhalers	108 Inhalers	Available	40 Inhalers	0 Inhalers	Available	44 Inhalers	25 Inhalers	Available	66 Inhalers	90 Inhalers
2668	Nifedipine 30mg XL 28's (Tracer drug)	Available	90 Boxes	120 Boxes	Available	80 Boxes	310 Boxes	Available	10 Boxes	30 Boxes	Available	40 Boxes	No Stock