A PATIENT FLOW SYSTEM FOR ANTENATAL PRIMARY HEALTHCARE FACILITIES IN THE FRANCES BAARD DISTRICT, NORTHERN CAPE PROVINCE

By

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Submitted in fulfilment of the requirements in respect of the Magister Societatis Scientiae (Nursing) degree in the School of Nursing

Faculty of Health Sciences

University of the Free State

February 2016

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I dedicate this dissertation to my:

Heavenly Father who blessed me with knowledge, wisdom and good health to complete this study.

Dearest husband, Daniel who always supports me to grow in my career path.

Late parents who taught me to achieve above your circumstances. “Dankie pa en ma.”

ACKNOWLEDGEMENTS

This study would not have been possible without the people who crossed my path during the process. I would like to express my sincere appreciation and gratitude to the following:

- The School of Nursing for the opportunity to study with them and also for the financial assistance.

- My supervisor, Mrs. J. MacKenzie, for your guidance, support and wisdom. Your knowledge and perfectionism is outstanding qualities. Thank you for running that extra mile for me.

- My co-supervisor, Prof. A. Joubert, your knowledge, support, and guidance is highly appreciated. Your straight talks encouraged me to do my best.

- Dr. L. van Rhyn who support me throughout the study by always showing interest in the progress.

- Dr. I. Venter for support during data collection, thank you for your insight and assistance.

- Dr. M. Reid for support with study material and also giving me emotional support.

- Ds. C. Grobler for support with technology. Thank you for assistance with the referencing.

- Mr. A. Hugo for data collection and data analysis. Thank you for your insight and assistance.

- Dr. A. Grobler and Ms. L. Ziady my language editors. Thank you for your support on such short notice.

- Ms. J. Klopper, for the technical editing. Thank you for your support on such short notice.

- All the friendly personal at the Sasol library, thank you for your assistance.

- Mrs. K. Ntintelo and H. Kirsten from Frances Baard District for your support during the process.

- Antenatal PHC professional nurses for your input during data collection.

- Ms. Felicity Brekkelmans, for helping with language and information of DoH.

- Mrs. B. Adonis, for your knowledge and support towards the end. I really appreciate your late night sacrifices.

- Mr. R. Kruger for motivating and challenging me to start with the study.

- My family and friends who supported and believed in me. Your prayers carried me through it.

- Last but not the least to my children, Tanya, Tyrone and Danielle, son-in-law Elwin, grandchildren Terry-Ann, Tylinne and Juvandre. Thank you for your support and being without me for so long. I will make it up to you.

SUMMARY

Long waiting times in primary healthcare (PHC) facilities is a major challenge for the National Department of Health. The aim of the study was therefore to develop a patient flow system which would reduce long waiting times for patients in antenatal PHC facilities in the Frances Baard District, Northern Cape Province.

A quantitative, non-experimental design was used to collect data. A specifically compiled checklist was applied to audit 12 antenatal PHC facilities to identify aspects which should be included in a proposed patient flow system. Twenty-one (n=21) healthcare providers also participated in an “in-action” Delphi technique process to seek consensus with regard to the identified aspects. The consensus seeking target was ≥ 60%. Subsequently, a patient flow system was compiled, based on the “in-action” Delphi technique process.

The results of the audit checklist were discussed according to the main headings in the checklist of which the first was the need for a patient flow system. The major challenges in this regard are determined by the fact that only 50% (n=6) of PHC facility assessed had any form of patient flow system or an appointment system in place. Eight of the facilities (66.6%) regularly experience bottlenecks at reception and in waiting areas, observation and consultation rooms, and toilets and at the pharmacy. Secondly, a lack of human resources was identified. Eleven healthcare facilities (91.6%) did not have queue marshals to direct healthcare users and organize patient flow. During the study, 11 of the healthcare facilities (91.6%) experienced a shortage of professional nurses to render PHC. Only three healthcare facilities (25%) had a pharmacist assistant to dispense medication and professional nurses fulfilled this role. In the last instance, physical resources were also a problem. Ten of the healthcare facilities (83.3%) did not have computers, printers or Internet access. Nine of the facilities (75%) did not have the minimum equipment required to render proper basic antenatal care services. None of the healthcare facilities had a separate change room additional to the antenatal consultation rooms (n=12 100%).

The level of consensus with regard to the list of identified aspects to be included in patient flow system gained from the audit results was 67%. Although these respondents agreed on the required proposed aspects to be included, they were also given an opportunity to add additional aspects. The original list of aspects was extended by adding the additional aspects agreed upon. No consensus was reached in the ranking of the aspects in the proposed patient flow system (< 60%). Consensus was reached on 25 of final list of 27 aspects to be included in the patient flow system. As indicated, a final patient flow system was developed based on the research results.

The following recommendations would require further consideration as well: All healthcare facilities need dedicated, trained queue marshals to direct and organized the varied healthcare users. If this is not possible, administrative personnel, nursing staff or volunteers must be trained to execute this task. More healthcare providers need to be scheduled during clinic peak times. Healthcare users need to be booked according to appointment dates and times, to prevent overcrowded facilities and bottlenecks in the morning. A separate changing room where the next patient can undress while the present patient is being attended to would be ideal to save time. Finally, all healthcare facilities should have the necessary equipment and material resources to render proper healthcare services. It is extremely time consuming to move between consultation rooms sharing equipment, and is frustrating for both the healthcare provider and the healthcare user. Each antenatal consultation room should have a telephone to arrange referrals immediately and to swiftly obtain laboratory results on which treatment can be selected.

(***Key terms:*** Patient flow system; Antenatal primary healthcare; “In-action” Delphi technique).

OPSOMMING

Lang wagtye in primêre gesondheidsorgfasiliteite (PGS-) is ’n groot uitdaging vir die Nasionale Departement van Gesondheid. Die doel van hierdie navorsing was om ’n pasiëntvloei sisteem vir voorgeboorte PGS- fasiliteite in die Frances Baard Distrik, Noord Kaap Provinsie te skep, wat die lang wagtye sal verkort.

’n Kwantitatiewe, nie-ekperimentele ontwerp is gebruik om data te versamel. ’n Spesifieke kontroleerlys is vir die oudit van 12 voorgeboorte PGS-fasiliteite ontwerp om aspekte wat in die voorgestelde pasiëntvloei sisteem ingesluit moet word, te identifiseer. Een-en-twintig (n=21) gesondheidsorg verskaffers het ook aan ’n “in-aksie” Delphi tegniek proses deelgeneem met die doel om konsensus oor die identifiseerde aspekte te bereik. Die teiken vir konsensus bereik was op ≥ 60% gestel. ’n Pasiëntvloei sisteem, op gegrond die van die “in-aksie” Delphi tegniek resultate, is gevolglik saamgestel.

Die resultate van die ouditkontroleerlys is volgens die hoof opskrifte van die lys bespreek, waarvan die eerste die behoefte aan ’n pasiëntvloei sisteem is. Die hoof uitdagings in hierdie verband is bepaal deur die feit dat slegs 50% van die evalueerde PGS-fasiliteite oor ’n pasiëntvloei sisteem of afspraakstelsel beskik. Agt van die fasiliteite (66.6%) ervaar gereeld bottelnek probleme by ontvangs, in wagareas, waarnemings- en konsultasie kamers, die toilette en by die apteek. Tweedens is ’n tekort aan menslike hulpbronne identifiseer. Elf van die van die PGS-fasiliteite (91.6%) het nie oor “queue marshals” beskik om aanwysings aan gesondheidsorgverbruikers te gee of pasiëntvloei te beheer nie. Gedurende die navorsing het 91.6% van die fasiliteite (n=11) ’n tekort aan geregistreerde verpleegkundiges ervaar om voorgeboorte behandeling te verskaf. Slegs drie PGS-fasiliteite het apteek assistente beskikbaar en derhalwe moet geregistreerde verpleegkundiges die medikasie dispenseer. Laastens was daar ook ’n tekort aan fisieke hulpmiddels by die fasiliteite waargeneem. Tien van die PGS-fasiliteite (83.3%) het nie oor rekenaars, drukkers of Internettoegang beskik nie. Vyf-en-sewentig persent van die fasiliteite (n=9) het ook nie die minimum toerusting gehad om deeglike basiese voorgeboorte sorg te verskaf

nie. Geen van die fasiliteite het aparte pasiëntkleedkamers gehad buiten die antenatale konsultasiekamers nie (100%, n=12).

Die vlak van konsensus na die oudit met betrekking tot die lys van identifiseerde aspekte wat in die pasiëntvloei sisteem ingesluit behoort te word was 67%. Alhoewel die respondente saamgestem het oor die voorgestelde aspekte wat ingesluit moet word, is hulle ook geleentheid gegee om addisionele aspekte by te voeg. Die addisionele aspekte waaroor saam gestem is, is by die oorspronklike lys van aspekte gevoeg. Hoewel konsensus nie bereik is oor die volgorde waarin hierdie aspekte in die voorgestelde pasiëntvloei sisteem moet verskyn nie, was konsensus wel bereik by 25 van die 27 aspekte wat in die finale pasiëntvloei sisteem ingesluit is. Soos aangedui, is ’n finale pasiëntvloei sisteem gegrond op die navorsingsresultate saamgestel.

Die volgende aanbevelings verg verdere oorweging: Alle PGS-fasiliteite vereis toegewyde, opgeleide “queue marshals” om die verskeie pasiënte te begelei en te organiseer, Indien dit nie moontlik is nie, moet administratiewe personeel, verpleegpersoneel of vrywilligers opgelei word om die taak te verrig. ’n Groter aantal gesondheidsorgpersoneel moet tydens piek kliniektye skeduleer word. Pasiënte moet volgens se afsprake datums en tye geskeduleer word om toestroming van kliniekfasiliteite en bottelnek probleme soggens te voorkom. Aparte kleedkamers waar die volgende pasiënt kan ontklee terwyl die huidige pasiënt aandag geniet is ideaal om tyd te bespaar. Laastens, moet alle PGS-fasiliteite oor die nodige toerusting beskik om effektiewe gesondheidsorg te verrig. Dit is uiters tydrowend om tussen konsultasie kamers te beweeg om toerusting te deel en kan tot frustrasie by beide die gesondheidsorgverskaffer en die -verbruiker lei. Elke konsultasie kamer behoort ’n telefoon te hê waarmee verwysings onmiddellik gedoen kan word en laboratoriumverslae spoedig bekom kan word om behandelingskeuses te vergemaklik.

(***Sleutel terme***: Pasiëntvloei sisteem; Voorgeboorte primêre gesondheidsorg; “In-aksie” Delphi tegniek).

LIST OF ABBREVIATIONS

ANC	ANTENATAL CARE
CHC	COMMUNITY HEALTH CENTRE
DoH	DEPARTMENT OF HEALTH
DHS	DISTRICT HEALTH SYSTEM
HST	HEALTH SYSTEM TRUST
ICMS	IDEAL CLINIC MONITORING SYSTEM
MNCWH	MATERNAL, NEONATAL, CHILD AND WOMEN'S HEALTH
NC	NORTHERN CAPE
NCS	NATIONAL CORE STANDARDS
NDoH	NATIONAL DEPARTMENT OF HEALTH
NSDA	NEGOTIATED SERVICE DELIVERY AGREEMENT
NHI	NATIONAL HEALTH INSURANCE
PHC	PRIMARY HEALTHCARE
PFS	PATIENT FLOW SYSTEM
SANC	SOUTH AFRICAN NURSING COUNCIL
WHO	WORLD HEALTH ORGANIZATION

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CHAPTER 1
INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

Waiting times and quality patient[1] care are priories for the National Department of Health (NDoH, 2014, p. 15; DoH, 2013, pp. 3-16; NDoH, 2012a, pp. 3-5) and is evident in the National Core Standards (NCS) for Health Establishments in South Africa. To achieve these priorities, the implementation or compliance of hospitals, clinics and districts with National Department of Health set standards was described as a "critical part" to improve the quality of healthcare services. The aim was to ensure compliance and implementation of the six priority areas of the National Core Standards for health establishment, namely improving staff values and attitudes, reducing waiting times, improving cleanliness, patient safety and security, implementing infection prevention and control measures, and increasing the availability of medicines and supplies.

Fast tracking of priority areas was identified through surveys of services, the analysis of patients' complaints and media reports (DoH, 2013, pp. 3-16; NDoH, 2012a, pp. 3-5). Complaints included limited toilet facilities, inadequate waiting rooms with poor ventilation, discomfort experienced by pregnant women, and long waiting hours before being assisted, among others (Wessels, et al., 2009, pp. 195-201).

Based on the major concerns voiced by patients, the six core standards listed above were identified by the NDoH (2011b, p. 3). Amongst these the list of core standards, waiting times were again mentioned in the 2011 National Department of Health publication "Fast Tract to Quality: The Six Most Critical Areas for Patient-Centered Care" (NDoH, 2011a, p. 4).

The researcher, a primary healthcare (PHC) trained nurse practitioner assisted with a survey to determine the status of PHC facilities in the Frances Baard District in the Northern Cape, as part of her job. Waiting time was monitored at three different PHC

[1] In primary healthcare the healthcare users are referred to as clients; however, in this study they are referred to as patients.

facilities over a period of two weeks. The findings showed that waiting times varied from three to four hours per patient.

The researcher did a literature search and found that patient flow- and appointment systems seemed to be prominent concepts regarding changes in waiting times (De Silva, 2013, p. 3; Chalker, et al., 2013, p. 163; Harding, et al., 2011, p. 371). Furthermore, the researcher found that patient flow has been extensively studied in countries such as Australia, the UK, USA and Malawi, according to an evidence scan on “Improving patient flow across organisations and pathways” done by the Health Foundation (De Silva, 2013, p. 3). Different approaches to assess patient flow, for example, systematic feedback from staff, observation, and analysing routinely collected data about service usage were described in the Health Foundation’s report (De Silva, 2013, pp. 3-5).The same report also stated that there is no “one size fits all” approach to assess patient flow.

In South Africa, a Negotiated Service Delivery Agreement (NSDA) was signed in 2011 between the President and the Minister of Health Honourable Aaron Motsoaledi (NDoH, 2011a, pp. 3-5). The focus was on plans and interventions to improve health outcomes and to strengthen the effectiveness of the health system. This resulted in the development of the National Core Standards for Health Establishments in South Africa. In the document “Quality Improvement Guide: Quality Improvement – key to providing improved quality of care” detailed guidelines were provided on how managers and supervisors should go about improving healthcare services.

In 2012 a baseline audit was done by the Health Systems Trust (HST) on behalf of the Department of Health (DoH) in the Northern Cape Province. This audit focused on the six priorities in a comprehensive facility audit that included the infrastructure of PHC facilities (NDoH, 2012b, p. 11). In the same document a sample process map representing a patient care pathway, and how it should be developed, was provided (NDoH, 2012b, pp. 5-19).

Most importantly, no studies that address waiting times, appointment or patient flow systems in the Northern Cape Province could be located. Furthermore, a patient flow

system “tailor-made” for the Northern Cape could not be identified. This study therefore focused on this important gap, namely, the development of a patient flow system that is suitable for antenatal PHC facilities in the Frances Baard District, Northern Cape Province.

1.2 PROBLEM STATEMENT

At least three policy declarations influence healthcare globally, namely the 1978 Declaration of Alma-Ata as described by the World Health Organisation (WHO, 1978, p. 38) that proposed a shift in healthcare from expensive curative treatment to health promotion and basic healthcare to community healthcare; the Ouagadougou Declaration on primary healthcare and health systems in Africa (WHO, 2010, p. 3), and the Algiers Declaration that dealt with health information systems (WHO, 2010, p. 9).

The goals of South African national healthcare services are mainly to promote, and protect or to restore the health of individuals by rendering essential healthcare to all. Added to these goals, healthcare services are meant to be affordable and accessible to individuals, families and the general population on primary-, secondary- and tertiary levels of care (Van Rensburg, 2012, pp. 1-3; DoH, 2010a; Hatting, et al., 2006, pp. 59-61).

With the dispensation of the new Government in South Africa since 1994, the focus shifted from curative to a primary healthcare approach, which eventually included antenatal care in PHC facilities (Van Rensburg & Engelbrecht, 2012, pp. 121-122; DoH, 2001, p. 5). This is an approach that gives:

Everyone the right to [have] access to (a) healthcare services, including reproductive health, (b) sufficient food and water and social security, including, if they are unable to support themselves and their dependents, appropriate social assistance (Department of Justice and Constitutional Development, 2012).

Regardless of legal frameworks, namely norms and standards for PHC, as well as the Batho Pele principles, the Patients' Rights Charter, the Constitution of South Africa [Act, No. 108 of 1996, Reg. 27, Section 1(a)], the Ten Point Plan, the Millennium Goal Development and the National Core Standards being set in place, the period of PHC waiting time remained a domain and priority of concern (NDoH, 2012a, p. 6). In the National Core Standards for Health Establishment in South Africa (NDoH, 2012a, p. 6) waiting times have been listed as one of the six prioritised areas of concern, and have therefore become a focus point for research in PHC facilities (NDoH, 2012a, p. 5). In reference to this research focus, the National Healthcare Facilities Baseline Audit report has stated that primary care facilities on average scored lower than hospitals in all core priority areas described by this document (NDoH, 2012b, p. 3).

The concerns about waiting times could partially be ascribed to the implementation of "*Free Healthcare to All*" post 1994. As facilities became more and more overcrowded, waiting times increased. Furthermore, the impact of escalating patient numbers became evident in documents and research findings (Harrison, 2010, p. 14).

Results from a pilot study done by the researcher confirmed that conflict over waiting times does exist between healthcare users and healthcare providers in the Frances Baard District. During rendering of antenatal PHC services the researcher observed that healthcare users, including pregnant women, queue from as early as six o'clock in the morning hoping to be seen by a doctor. However, it is impossible for one doctor to see such large numbers of healthcare users. The long waiting times resulted in frustration and disappointment in the healthcare system amongst consumers.

Considering the challenges to improve the quality of care, the National Department of Health (NDoH, 2011a, p. 5) opted for the implementation of best practice guidelines. It was expected that: "If the efficiency of referral and queuing systems is improved, the delays in receiving treatment that can sometimes mean the difference between life and death were avoided".

To avoid the implication of queuing, the researcher considered the development of a patient flow system that is "tailor-made" for the Northern Cape antenatal PHC facilities to be of extreme importance. Therefore, the focus of this study was to address the gap

by the development of a patient flow system that is suitable for the antenatal PHC facilities.

1.3 RESEARCH QUESTIONS

The following research questions were deemed relevant to the study:

1.3.1 What are the prescribed criteria, standards, protocols and policies antenatal PHC facilities should meet in order to implement a patient flow system?
1.3.2 Do antenatal PHC facilities meet the prescribed criteria, standards, protocols and policies for a patient flow system?
1.3.3 What aspects should be included in an antenatal PHC facility patient flow system?

1.4 AIM AND OBJECTIVES

The aim of the study was to develop a patient flow system for antenatal PHC facilities in the Frances Baard District, Northern Cape Province.

The objectives were to:

1.4.1 Identify the criteria; standards, protocols and policies antenatal PHC facilities should meet to implement a patient flow system;
1.4.2 Compile a checklist, based on the prescribed criteria, standards, protocols and policies for a patient flow system;
1.4.3 Audit the existing antenatal PHC facilities in the Sol Plaatjie Municipality in the Frances Baard District, Northern Cape Province, in order to develop a patient flow system;
1.4.4 Develop and obtain staff consensus on the requirements for a patient flow system for antenatal PHC facilities in the Frances Baard District, Northern Cape Province.

1.5 DEFINITIONS OF KEY CONCEPTS

The following key and operational concepts were used in the study:

1.5.1 ANTENATAL CARE

Antenatal care is a component of the PHC package and entails healthcare services rendered specifically to pregnant women. The purpose of antenatal care is to monitor the pregnant woman and unborn baby throughout the stages of pregnancy. Health education and early detection of diseases and abnormalities can prevent complications during pregnancy, labour and the puerperium (Thembelihle, et al., 2013, p. 2; DoH, 2012/2013 - 2014/2015, p. 12).

The researcher used the concept antenatal care referring to comprehensive ANC for pregnant women in the PHC facilities.

1.5.2 PATIENT FLOW SYSTEM

A patient flow system is the management of patients in healthcare facilities as they enter, are treated and then released. Patients are directed and the flow monitored as they move through the healthcare facility. The system can also be referred to as an organizational flow (Hall, et al., 2013, p. 553). An appointment system forms an integral component of a patient flow system and is described as a booking- or time scheduling system. The system is used to manage access to healthcare facilities in case medical assistance is needed, scheduling of medical activities, and optimal use of medical resources (Cayirli, et al., 2008, pp. 338-353; Al-Haqwi & Al-Shehri, 2007, pp. 99-102; Gupta & Denton, 2007, p. 3).

In this study the concept patient flow system was used in referring to a system that addresses the flow of pregnant women visiting the antenatal PHC facilities from booking an appointment up to checking out of the clinic.

1.5.3 AUDIT

An audit is a method used to evaluate the quality of nursing by comparing the care to recognised standards (Booyens, 2012, pp. 610-611). The researcher referred to an audit as a method used to evaluate whether selected antenatal PHC facilities in the Frances Baard District, Northern Cape, met the prescribed criteria, standards, protocols and policies to implement a patient flow system. The audit was done by the researcher by means of a specially compiled checklist.

1.5.4 PRIMARY HEALTHCARE

Primary healthcare is a broad concept that describes basic healthcare rendered to communities. The emphasis is on promotive-, preventative- and curative care, and screening services in primary healthcare delivered in the Frances Baard District, Northern Cape Province. Healthcare programmes addressing specific services are implemented by different categories of healthcare providers, who received special PHC training (Thandrayen & Saloojee, 2008, pp. 1-2; Hatting, et al., 2006, p. 51; King, 2001, p. 1). The focus of these services is to ensure the delivery of efficient and effective healthcare to communities.

For this study, PHC was seen as services that are aligned with the PHC Re-Engineering approach. This approach aimed to strengthen preventative-, promotive-, curative- and rehabilitative healthcare services in primary healthcare clinics. It places an emphasis on the prevention of disease and the promotion of healthy lifestyles.

1.5.5 NORTHERN CAPE PROVINCE AND DISTRICTS

The Northern Cape Province (refer Figure 1.1) consist of five districts namely Siyanda, Pixley ka Seme, Namakwa, John Taolo Gaetsewe (JTG) and Frances Baard (refer Figure 1.2). The four municipalities in the Frances Baard District include Digatlong, Magareng, Phokwane and Sol Plaatjie Municipality.

The area's populations are sparsely distributed in small towns and villages. The Northern Cape has 15 hospitals, 25 community hospitals with community health

centres (CHC) and 135 fixed clinics. Healthcare facilities are situated within a radius of five kilometres from where people live and work. The inhabitants lives in middle class houses, shacks and backyards. Poverty and unemployment are common in the community. Kimberley, where the study was done, is situated in the Sol Plaatjie Municipality area (Department of Social Development, 2010).

Figure1.1: Northern Cape Province

Figure1.2: Districts in the Northern Cape

1.6 CONCEPTUAL FRAMEWORK

The relationships between concepts in the conceptual framework could be described as follows (refer Figure 1.3):

The Department of Health is the major role player when it comes to the provision of quality healthcare to healthcare users in South Africa (NDoH, 2011a, pp. 1-5). Good quality of care is about “technical excellence as well as about the perceptions and experience of our patients and users, and of our staff” (NDoH, 2011a, p. 4). To enhance that the quest for quality becomes a reality, a list of national criteria, standards, protocols and policies are described by the National Core Standards (NDoH, 2012a).

Primary healthcare PHC is stated to be at the “heart” of the Department of Health’s plans to transform health services in South Africa (DoH, 2001, p. 5). NDoH norms and standards are therefore made available to PHC services. Although many excellent public facilities, running successful projects and initiatives are available, the

Department is concerned about the disquieting number of “weaker facilities” that are found (DoH, 2012/2013 - 2014/2015).

Infrastructure plays an important role for flow of healthcare users through the healthcare facility. Therefore, the quality of physical infrastructure has a major impact on the functioning of services and client satisfaction with services. Healthcare facilities need to comply with the minimum structural building standards as specified in R 158 of 1980 (Port Elizabeth Technikon, 2001).

A patient or organisational flow system describes how patients enter and leave healthcare facilities. This involves patient check-in, treatment and release (De Silva, 2013, p. 1; NDoH, 2012c, pp. 3-5).

An appointment system is described as a booking- or time scheduling system. This system is used to manage access to healthcare facilities in case medical assistance is needed, scheduling of medical activities and the optimal use of medical resources (Cayirli, et al., 2008, pp. 338-353; Al-Haqwi & Al-Shehri, 2007, pp. 99-102; Gupta & Denton, 2007). In this study the concept patient flow system was used. This system includes the appointment system as described and thus refers to a system that addresses the flow of pregnant women visiting the antenatal PHC facilities from booking an appointment, being examined, any treatment(s) given, providing follow-up dates, to check-out of the facility.

Waiting times have been identified as one of the six most critical areas for patient-centred care in the Fast Tract to Quality, and the National Core Standards. (NDoH, 2012a; NDoH, 2011b). Long waiting times was also emphasized in the National Healthcare Facilities Baseline Audit report. (NDoH, 2012b).

Healthcare facilities must comply with the minimum structural standards as stated in the R158 of 1980. The quality of the infrastructure and availability of skilled and trained healthcare providers have a major impact on how services function, and patient satisfaction with service (NDoH, 2012a).

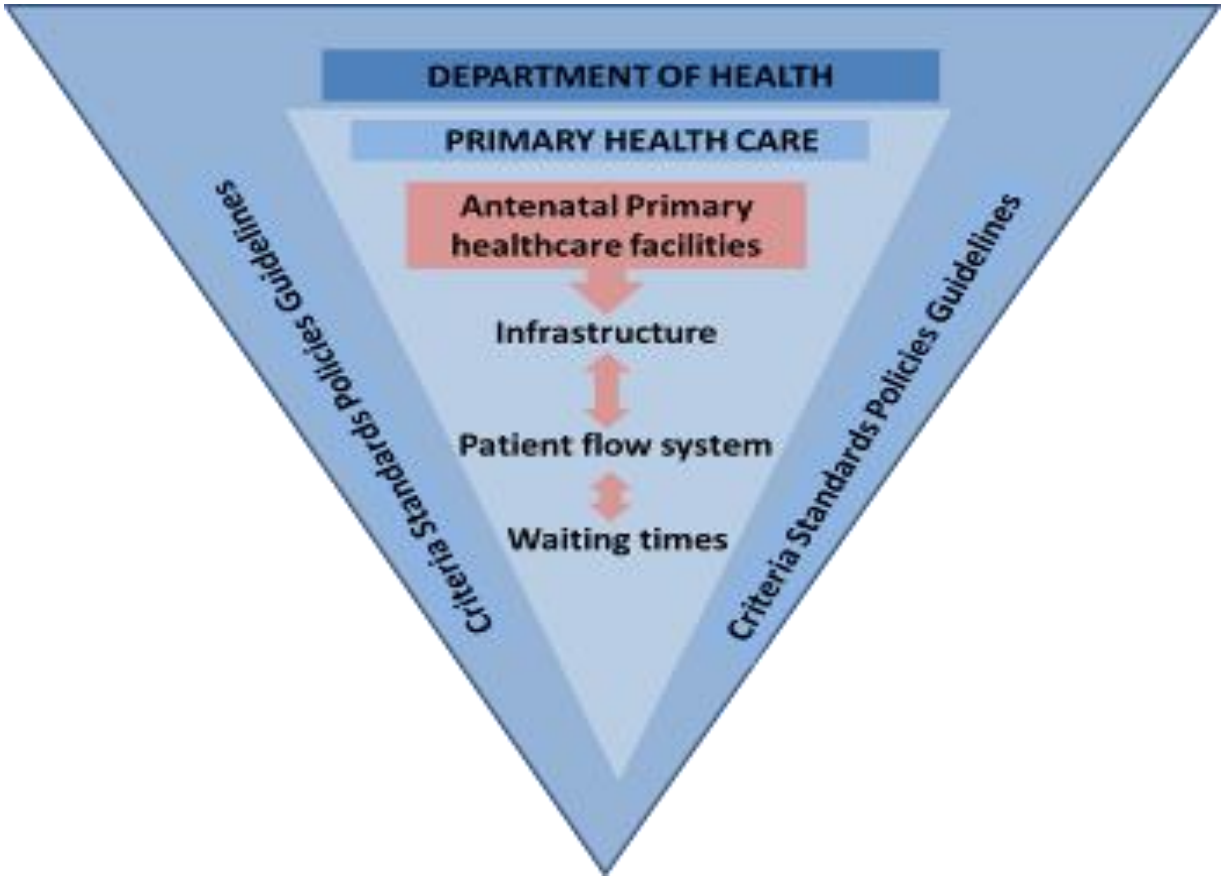

Figure 1.3: The relationship between concepts in a patient flow system in antenatal PHC facilities

1.7 RESEARCH DESIGN

A quantitative, non-experimental design (Fouché & Delport, 2011, pp. 155-156) was used to eventually compile a patient flow system for antenatal PHC facilities in the Sol Plaatjie Municipality area, Frances Baard District of Northern Cape. The quantitative, non-experimental design was implemented because the researcher made use of an audit checklist and opted to describe, explore and to explain the findings obtained in the research process.

1.8 RESEARCH PROCESS

The research process structures a study to gather and analyse information in a systematic fashion (Polit & Beck, 2012, p. 741). This study included the following stages:

Stage 1 A checklist for the audit: Research question 1.3.1, Objective 1.4.2

Stage 2 Audit the selected antenatal PHC facilities: Research question 1.3.2, Objective 1.4.3

Stage 3 Develop and obtain consensus on a patient flow system: Research question 1.3.3, Objective 1.4.4

Stage 4 Redesign of the patient flow system.

1.9 RESEARCH TECHNIQUES

In quantitative research several techniques or options for data collection are available. Options are categorised into structured observation or structured interview schedules, questionnaires, checklists, indexes and scales (Delport & Roestenburg, 2011, p. 181). It is important to consider the validity and reliability of the measurement instrument and procedures before the study is executed (Delport & Roestenburg, 2011, p. 172).

In this study an audit checklist was a tool to evaluate antenatal PHC facilities in order to use the results to develop a patient flow system. In the following step an “in-action” Delphi technique[2] was used to obtain consensus regarding the proposed patient flow system.

[2]Instead of a traditional Delphi technique where documents are mailed to respondents for feedback, an adjusted Delphi technique in which a group of participants met in order to reach consensus, was done. In this study the technique is referred to as an “in-action” Delphi.

1.9.1 CHECKLIST TO AUDIT ANTENATAL PHC FACILITIES

An audit checklist is a type of questionnaire that includes a number of items or aspects that could be used for evaluation (Delport & Roestenburg, 2011, p. 202). The compiled checklist was based on an extensive literature search related to patient flow systems and accessibility, the infrastructure of PHC facilities such as the reception and waiting areas; human, material, and medical resources; and policies, procedures and stated aspects. Items or aspects of the checklist were reviewed by both the supervisor and co-supervisor. The process to refine the checklist was repeated until consensus amongst the supervisors and researcher was reached (please refer to Addendum E).

1.9.2 DELPHI TECHNIQUE

The Delphi technique is a data-collection process to seek consensus regarding a particular topic of interest from a group of purposively selected experts. A Delphi technique is usually done through correspondence with respondents without meeting together. However, the limitations of this approach are, for example, that respondents could make “hasty, ill-considered judgements” (Grove, et al., 2013, p. 436). An “in-action” Delphi technique was applied, based on the fact that the researcher predicted that the scant and hesitant feedback from the respondents could be influenced by their current workload, limited Internet access, and the risk involved in sending the questionnaires via “snail-mail” (land mail).

Consensus was obtained by proposing aspects for a patient flow system that was individually handed to respondents who participated in the “in-action” Delphi. The revised Delphi technique was conducted in five phases: the Preparation Phase, Phase 1, Phase 2, Phase 3 and Phase 4 (Polit & Beck, 2012, p. 267; Botma, et al., 2010, p. 253). This will be further discussed in Chapter 3.

1.10 POPULATION AND SAMPLE

The target population is the specific group to who the results are applicable, and form the basis from which the sample is collected (Polit & Beck, 2012, p. 273). A sample is defined as a section or element of the accessible population identified for the study (Polit & Beck, 2012, p. 275; (Strydom, 2011b, p. 223; Botma, et al., 2010, p. 124). Two populations and two samples were used.

1.10.1 POPULATION AND SAMPLE 1: PRIMARY HEALTHCARE FACILITIES

The Frances Baard District consists of five non-fixed facilities, 31 fixed facilities, two community healthcare centres, and four district hospitals (DoH, 2012/2013 - 2014/2015). For this study the population included the 31 fixed facilities in the Frances Baard District, Northern Cape Province. Convenient sampling was done to select the 12 antenatal PHC facilities for the audit as the researcher had convenient access to these facilities.

1.10.2 POPULATION AND SAMPLE 2: HEALTHCARE PROVIDERS

This population included the 258 healthcare providers working in PHC facilities in the Frances Baard District, Northern Cape Province. A purposive sampling was done for the selection of healthcare providers who participated in the “in-action” Delphi technique to evaluate the proposed aspects to be included patient flow system. It was proposed to question 18 healthcare providers. Of these, 12 were professional nurses rendering antenatal PHC services, four were area managers, one an infection control coordinator and one quality assurance coordinator (please refer to Chapter 3).

1.11 PILOT STUDY

Two pilot studies were done. The first one, to refine the audit checklist, was held in an antenatal clinic in one of the selected 12 fixed facilities in the Frances Baard District. Afterwards some minor changes were made to the audit checklist. A pilot study on the

"in-action" Delphi technique was done to refine this part of the process as well. The changes leading from the process are discussed in Chapter 3.

1.12 DATA COLLECTION

Permission to conduct the study was obtained from the Research and Ethics Committee of the Faculty of Health Sciences (UFS). An ethics number was issued on approval of the proposal (please refer to Addendum A). Permission to pilot the audit checklist and to use a selected group of healthcare providers as part of an "in-action" Delphi technique was obtained from the Head of the Department of Health of the Northern Cape Province and the Manager of the Sol Plaatjie Municipality. Signed permission letters were distributed to the district manager, area managers and facility managers to inform them of the proposed research.

1.12.1 THE AUDIT OF THE SELECTED ANTENATAL PHC FACILITIES

The facility managers were informed of the date and time of the audit that the researcher planned to assess the 12 facilities. Confidentiality was assured by using numbers on the audit checklist instead of the names of each antenatal PHC facility. The results of the audit were used to design a patient flow system.

1.12.2 THE "IN-ACTION" DELPHI TECHNIQUE

Arrangements for the "in-action" Delphi technique process regarding to date, time and venue were made to suit all involved. The venue was ensured to be conducive, with adequate seating, comfortable temperature and noise free. All the necessary equipment needed for the "in-action" Delphi process was available.

The researcher commenced the meeting by welcoming the respondents, where after written informed consent was obtained from them to participate in the "in-action" Delphi technique process. The purpose of the meeting was explained and respondents were requested not to interact with each other. They were also requested to be honest in

their responses about the information that are about to be gathered and urged them not to respond with what they think would please the researcher.

The process of the “in-action” Delphi was as follows:

Phase 1: Audit overview and consensus on aspects

A summary of the audit results was given and explained to respondents to help them make informed judgments regarding the proposed aspects for a patient flow system.

Phase 2: Proposed patient flow system

Phase 2 comprised of two rounds, Round 1a and Round 1b. A sheet containing the proposed aspects for a patient flow system were given the respondents in Round 1a. They were instructed to indicate whether all the aspects referred to in Phase 1 should be included or excluded for the patient flow system.

In Round 1b the respondents were given an opportunity to add additional aspects for the patient flow system. These aspects were combined with the initial list of aspects.

Phase 3: Updated aspects for a patient flow system

The respondents were asked to number each of the aspects of the updated list according to the sequence in which they would have them appear in the proposed patient flow system. The feedback was captured and the percentage of consensus calculated. A new sheet containing those aspects that had achieved ≥ 60% consensus was prepared. Respondents were then asked to indicate whether each aspect should be included or excluded. The feedback was captured and the percentage of consensus was again calculated. The contribution of respondents was only required up to this point, as design of the patient flow system.

Phase 4: Design of the patient flow system

The researcher used the feedback of the respondents obtained during the “in-action” Delphi technique to develop the patient flow system.

1.13 DATA ANALYSIS

Data analysis is a process conducted to reduce, organise and give meaning to data (Grove, et al., 2013, p. 691).

Two sets of data were analysed:

1.13.1 A template of the audit checklist, prepared as a Microsoft Excel spreadsheet, was used to capture data obtained from the 12 antenatal PHC facilities. Microsoft Excel was used to calculate frequencies and percentages (please refer to Addendum F).

1.13.2 Templates prepared as a Microsoft Excel spreadsheet were utilised to calculate consensus amongst respondents during the “in-action” Delphi technique process. Data analysis and interpretation were done simultaneously and was completed during each phase described under data collection. This was the responsibility of the expert in Microsoft Excel (please refer to Table 4.2, 4.3, 4.4, and 4.5).

1.14 VALIDITY AND RELIABILITY

Validity and reliability determine how consistent the outcomes of the research study are (Botma, et al., 2010, p. 174). Validity indicates whether the conclusion of the study is justified, based on the design and interpretation of the results. Potential threats to validity that should be considered are-, for example, content-, construct-, and criterion validity (Botma, et al., 2010, p. 175). The researcher planned carefully to ensure the validity of the study (Botma, et al., 2010, p. 175; (De Vos, et al., 2011, p. 236; Polit & Beck, 2012, p. 236).

Reliability means that the outcome of a valid measurement instrument is the same every time it is used. This means that if different groups are measured under the same circumstances and by different assessors the results will be the same (Delport & Roestenburg, 2011, p. 177; Botma, et al., 2010, pp. 177-178). The researcher has to prove that a measurement instrument is reliable.

Significant measures were taken to ensure validity and reliability (Botma, et al., 2010, p. 174). The checklist for the audit of the antenatal PHC facilities was compiled based on literature reviews**.** It was piloted before it was used in the main study, and the proposed aspects for a patient flow system was refined after feedback has been was received from the supervisors.

1.15 ETHICAL CONSIDERATIONS

Ethical issues refer to ethical rules and principles drafted by professional associations or ethics committees that researchers should adhere to in order to protect human persons in a research study (Strydom, 2011a, p. 113; Botma, et al., 2010, p. 277). The basic principle of respect for people, beneficence and justice (Polit & Beck, 2012, pp. 150-167; Botma, et al., 2010, p. 277) was honoured throughout the research study.

The researcher requested permission to conduct the research in the antenatal PHC facilities from Department of Health, Northern Cape and also from the manager of the Sol Plaatjie Municipal. The respondents were informed of the nature of the study before written consent was given. Confidentiality was assured by not linking personal information or that of the facility to the findings or the outcome of the research. The respondents were assured that personal information would not appear in the dissemination of results either through reports or publication. Assurance was given that no personal or professional risks to the respondents were associated with the study. Furthermore, the respondents were free to withdraw at any time without penalty.

1.16 VALUE OF THE STUDY

The results of the audit of the 12 antenatal PHC facilities in the Sol Plaatjie Municipality in the Frances Baard District, Northern Cape Province, enabled the researcher to develop patient flow system. Feedback on the patient flow system will be communicated to the District DoH. If implemented in the district, the patient flow system could help reduce antenatal PHC waiting times, a priority that has been

identified by the National Department of Health. Client satisfaction could be increased in facilities where the system is implemented.

The publication of a research article and the dissemination of the results at a PHC conference are being examined. Furthermore, the findings of the study could be the foundation for a follow-up study to implement the approved client flow system in other services and to assess its effect in practice.

1.17 LIMITATIONS

The number of respondents selected from the services did not include service providers, for example, the pharmacist or pharmacy assistants and the receptionist, in order not to jeopardise service rendering. Furthermore, the time that respondents could be available to attend the “in-action” Delphi was limited to three hours, therefore, the number of cycles to obtain consensus had to be reduced.

1.18 CONCLUSION

In this chapter, the researcher endeavoured to align the research process with the aim and the objectives of the study. In Chapter 2 the concepts proposed in the conceptual framework has been used to guide the literature review (please refer to Table 1.1).

1.19 CHAPTER ALLOCATION

The writing of the research study is divided into five chapters (please refer to Table 1.1).

Table 1.1: Allocation of chapters in the study

CHAPTERS	DESCRIPTION
Chapter 1	Provided a general overview and background to the study, and included the reason for undertaking the research.
Chapter 2	The aims and focus of the literature review are discussed in Chapter 2. Existing literature was reviewed in terms of Government legal frameworks pertaining to the study.
Chapter 3	This chapter describes the research perspective, the reason for selecting the research approach and its application to the study. It also gives details of how rigour was maintained and how ethical issues were dealt with as the study proceeded.
Chapter 4	The findings of the study are followed by an in-depth discussion on the findings as they relate to the relevant literature.
Chapter 5	The implication on the recommendations, limitations and the suggestions for further research are discussed.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

An overview of the problem statement, research aim, objectives and research methodology was described in Chapter 1. Chapter 2 contains a literature review guided by the conceptual framework that demonstrates the relationship between concepts related to the patient flow system in Chapter 1. Therefore, the chapter will start with a description of the Department of Health, South Africa and its sub-divisions, namely the Primary Healthcare System, Antenatal Primary Healthcare, Patient Flow Systems and Waiting Times. The Department of Health's proposed strategies to ensure quality healthcare service delivery, encompass the criteria, standards, protocols and policies and guidelines as depicted in the conceptual framework (please refer to Figure 1.3).

A literature review is seen as an understanding of existing knowledge about a topic of interest. The review assists a researcher to gain an in-depth view of how researchers have investigated the research problem. The researcher also learns how the topic of interest has been theorised and conceptualised, what the findings were, what tools have been used or developed, and how the data gathering and analysis process was executed (Grove, et al., 2013, pp. 40-41; Brink, et al., 2013, pp. 54-55; Polit & Beck, 2012, p. 732; Fouché & Delport, 2011, p. 133; Creswell, 2009, pp. 23-25). The purpose of a literature review is to share the results of related studies, indicating possible gaps, and therefore assisting the researcher to determine whether a topic is worth studying. Furthermore, the literature review illustrates where the current research could possibly be linked with the existing body of knowledge in order to avoid unnecessary duplication (Grove, et al., 2013, pp. 40-41; Brink, et al., 2013, pp. 54-55; Polit & Beck, 2012, p. 732; Fouché & Delport, 2011, p. 133; Creswell, 2009, pp. 23-24).

In this study the purpose of the literature review was to develop and refine a checklist to audit the antenatal PHC facilities, and to eventually design a patient flow system for facilities in the Frances Baard District, Northern Cape Province.

2.2 DEPARTMENT OF HEALTH, SOUTH AFRICA

The Constitution, which is the law of the country, commits the state to healthcare, nutrition, water provision and social security as evident in the following: *"Everyone has the right to have access to: (a) healthcare services, including reproductive health care, (b) sufficient food and water, (c) and social security, including, if they are unable to support themselves and their dependants, appropriate social assistance*" (Constitution of the Republic of South Africa, Act No. 108 of 1996 Reg. 27, Section 1, 1996) Several departments in the South African government are responsible for the delivery of these services, of which the DoH is one (DoH, 2012/2013 - 2014/2015). The Department of Health of South Africa and its sub-departments are illustrated in Figure 2.2. In this figure of the organogram of the South African Healthcare Departments, according to Mthembu (2013, p. 37), the National, Provincial and District Departments of Health are included.

The following discussion will only focus on those departments that could be linked to the study, namely the Department of Health, South Africa; the Provincial Department of Health, Northern Cape; and the District Department of Health, Frances Baard District.

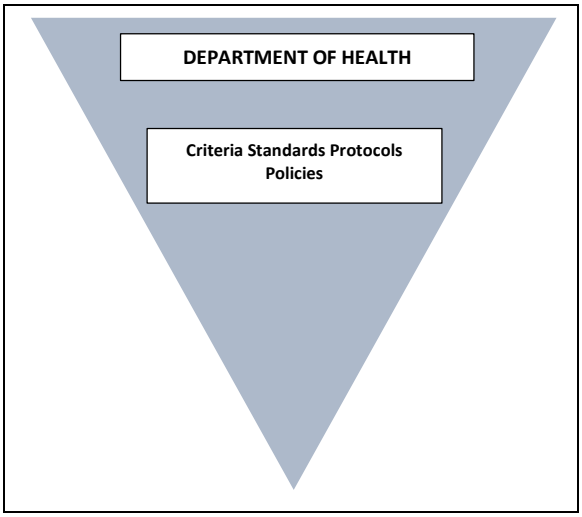

Figure 2.1: Conceptual framework: Department of Health; Criteria, Standards, Protocols and Policies (refer to Figure 1.3)

A Department of Health is the executive department assigned to healthcare matters, and is globally and nationally directed and coordinated by the World Health Organisation under the leadership of the United Nations, with the aim to fulfil its responsibilities in maintaining the health of a nation (WHO, 2015: Online). In the South African government, the vision of the DoH is to provide a long and healthy life for all South Africans. The mission is to improve health status throughout the country by the prevention of illnesses**,** promotion of healthy lifestyles and to consistently improve the healthcare delivery system by focussing on access, equity, efficiency, quality and sustainability (Mthembu, 2013, p. 13). Another feature of the comprehensive South African healthcare system is the provision of accessible and affordable healthcare to the general population (Mthembu, 2013, pp. 38-40; Van Rensburg, 2012, p. 2; Hatting, et al., 2006, pp. 59-61).

2.2.1 THE SOUTH AFRICAN HEALTHCARE SYSTEM

A health system can be defined as *"the sum of all actors, institutions and resources whose primary purpose is to improve health"* and includes the health-sector, services and care (World Bank, 2016). The healthcare system in South Africa is a comprehensive system which includes healthcare services delivered on three levels, namely the primary, secondary and tertiary level of care (Mthembu, 2013, pp. 38-40). The main goal of these different levels of healthcare is firstly to promote health,

secondly to prevent illness, and thirdly to restore health in the presence of disease for individuals, families and the community at large. Promotive and preventive healthcare operates on three further levels, namely primary prevention, secondary prevention and tertiary prevention. The different providers in the healthcare system are the National Department of Health, Provincial Department of Health, District Department of Health, and the Sub-District Healthcare services (Municipal areas), Facility Based Healthcare, Community Based Healthcare and the population for whom the healthcare is intended (Mthembu, 2013, pp. 32-40).

To achieve the necessary transformation in this comprehensive healthcare system, and to meet the overarching goal of rendering healthcare that is efficient and effective, the DoH stated criteria and developed standards, protocols and policies (legal frameworks) that were necessary to facilitate the implementation of the proposed healthcare system (WHO, 2015). Furthermore, these documents also offer service providers the opportunity to endeavour continuously for the improvement of healthcare (DoH, 2012/2013 - 2014/2015).

Importantly, any discussion of the South African healthcare system should include references to the Constitution of the Republic of South Africa (RSA), the National Health Insurance initiative, the National Core Standards, the re-engineering of Primary Healthcare, the Department of Health's 10-Point Plan, the Millennium Development Goals, the South Africa Sustainable Response to HIV and AIDS (SA SURE) project, the MomConnect, and the Ideal Clinic Monitoring System (ICMS) approach. (Van Rensburg & Engelbrecht, 2012, pp. 126-127).

Chapter 2 of the Constitution of the Republic of South Africa (Act, No. 108 of 1996), clearly lays the foundation for the fundamental right of healthcare for all. Likewise, the White Paper for the transformation for the Health System in South Africa (Notice 1459 of 1997), states as a principle that if a promised standard of service is not delivered, citizens should be offered an apology, a full explanation and a speedy effective remedy (Van Rensburg & Engelbrecht, 2012, p. 132). Lastly, the National Health Bill, namely, the Bill of Rights, which specifies the rights that should be enjoyed by all South African citizens, is considered to be the cornerstones of the Constitution of the RSA. The Bill

of Rights stipulates, among others, the right to access healthcare (DoH, 2012/2013 - 2014/2015).

The implementation of the National Health Insurance (NHI) system aims to improve quality health services; to renovate the healthcare system; to improve its management, human-resource (HR) management, planning and development; to revitalise the infrastructure in healthcare; to accelerate the implementation of the HIV and AIDS and Sexually Transmitted Infections (STI's); to review the drug policy; to improve the effectiveness of the Health Systems and to strengthen research and development (DoH, 2012/2013 - 2014/2015).

The National Core Standards for Health Establishments in South Africa focuses on plans and interventions to improve health outcomes and to strengthen the effectiveness of the Health System (NDoH, 2012c). In a document titled "Quality Improvement Guide: Quality Improvement – key to providing improved quality of care", detailed guidelines are provided on how managers and supervisors should go about improving healthcare services. Also, the National Complaints Management Protocol for the Public Health Sector of SA, emphasises that every patient has the right to complain about the healthcare they receive, and that all complaints should be investigated and report on, as enshrined in the Patients' Rights Charter. This enshrinement is enforced in Section 18 of the National Health Act and supported by requirements set out in domain one of the National Core Standards for Health Establishments in South Africa (NDoH, 2011a).

In addition, in the National Core Standards for Health Establishment in South Africa (NDoH, 2012a), the first domain is directly involved in the core business of the health system delivering quality healthcare to the patients. Domain 1 focuses on "Patients' Rights", the second pertains to "Values and attitudes" and "Waiting times". In the third "Cleanliness" is addressed. In its endeavour to achieve "free and quality healthcare to all", the Department of Health has identified waiting time as one of the priority areas of concern (DoH, 2013).

In discussion with the Minister of Health and after debate in the National Health Council, a three stream approach to the PHC re-engineering has been accepted by

the DoH. “The model contains three streams: (a) a ward based PHC outreach team for each electoral ward; (b) strengthening school health services; and (c) district based clinical specialist teams.” The roles of the ward-based outreach team include, among others, that each group to be linked to a PHC facility with a nurse in each facility, who is the team leader. Furthermore, they conduct community, household and individual health assessments and identify health needs and risk (actual and potential) and facilitate the family or an individual to seek the appropriate health service (DoH, 2011b, p. 3-10).

As part of the PHC’s re-engineering enterprise, the District Clinical Specialist teams to improve healthcare services were implemented. The aim of the teams is to ensure equitable access to appropriate and improved quality healthcare for mothers, new-borns and children. With this aim the endeavour is to reduce infant, child and maternal deaths, which are considered to be a problem in all districts. The basic function of the specialist teams includes to strengthen clinical governance at PHC level and to ensure that treatment guidelines and protocols are available and are in use; that essential equipment is available and properly used; that review maternity meetings are held and that the recommendations of these meetings are implemented. The District Clinical Specialist teams also ensure that clinicians are supported, supervised and mentored; that Health outcomes are monitored, and that door-to-door visits are done to track entire families from the same house. These teams are based in all designated Northern Cape Health Districts (DoH, 2012/2013 - 2014/2015).

The Department of Health’s 10-Point Plan emphasises the provision of strategic leadership and the creation of a social contract for better health outcomes.

The Millennium Development Goals have been implemented in South Africa. The fifth goal required that countries improve maternal health and reduce their Maternal Mortality Ratio by 77% by 2015. Women tend to have a higher burden of disease than men and therefore need more services (Redelinghuys, 2012, pp. 245-246).

Through the South Africa Sustainable Response to HIV and AIDS (SA SURE) project, Health System Trust (HST) mentor and coach healthcare providers were developed at district, sub-district and facility level to strengthen the health system’s effectiveness

and to improve health outcomes in the 12 districts supported by the project. The approach is focused on sustainable capacity development at the lowest level within the district health system, in order to integrate national health priority actions such as Primary Healthcare Re-Engineering, National Health Insurance, the National Core Standards and the Ideal Clinics (ICSM) initiative, but also to focus in improving quality of care at the same time. This plan concentrates on integrated clinical services management (ICSM), and reads as follows: "… *is a model that provides for integrated prevention, treatment and care of chronic patients at primary healthcare level, to ensure a seamless transition to 'assisted' self-management within the community by taking a patient-centric view that encompasses the full value of the continuum of care and support"* (DoH, 2012/2013 - 2014/2015).

The MomConnect, a new cell phone based application made available to all pregnant women in the country, uses a Short Message Service (SMS) to provide information and advice on pregnancy. The application is also used as a channel to notify the Department of Health about poor service. The MomConnect application is used to support the aim of the DoH to reduce waiting times by informing pregnant women periodically about the progression of pregnancy, possible complications, and offer advice on what to do. The expectation is that healthcare providers will have to spend less time answering questions from pregnant women during their scheduled consultation visits. Subsequently, more healthcare users will be attended to in a shorter period of time.

All the listed structures were implemented to address the rights of healthcare users to access healthcare services in South Africa.

2.2.2 THE NATIONAL DEPARTMENT OF HEALTH

The NDoH, (2011a, p. 13) is committed to provide quality healthcare to healthcare users in order to meet their expectations and needs, and to improve service delivery. This commitment is aligned with guidelines stipulated in the National Health Plan. According to these guidelines, the aim of the NDoH is to reconstruct healthcare services in an effort to improve healthcare. To further support the NDoH's commitment to quality healthcare, the Negotiated Service Delivery Agreement (NSDA) was signed

September, 2010 by the Minister of Health (DoH, 2011a). The focus of this agreement was on plans and interventions to: improve health outcomes; strengthen the effectiveness of the health system and improve the quality of healthcare. (Van Rensburg & Engelbrecht, 2012, p. 133; DoH, 2010a, p. 3).

2.2.3 PROVINCIAL DEPARTMENT OF HEALTH

Each DoH of the nine provinces in South Africa is managed by its provincial offices in Gauteng, Mpumalanga, Limpopo, Free State, Northern Cape, Western Cape, Eastern Cape, North West and KwaZulu-Natal, which function independently and thus manages its own budget.

2.2.4 DISTRICT DEPARTMENT HEALTH

The District Department of Health of the Northern Cape oversees five districts, namely Siyanda, Pixey ka Seme, Namakwa, John Taolo Gaetsewe and Frances Baard. The legal and policy framework for the rendering of PHC services is the responsibility of the District Health services (DHS) and the local Municipalities in each district. The DHS is also responsible for the structures that affect the health of the people, such as the provision of clean water, sanitation and housing.

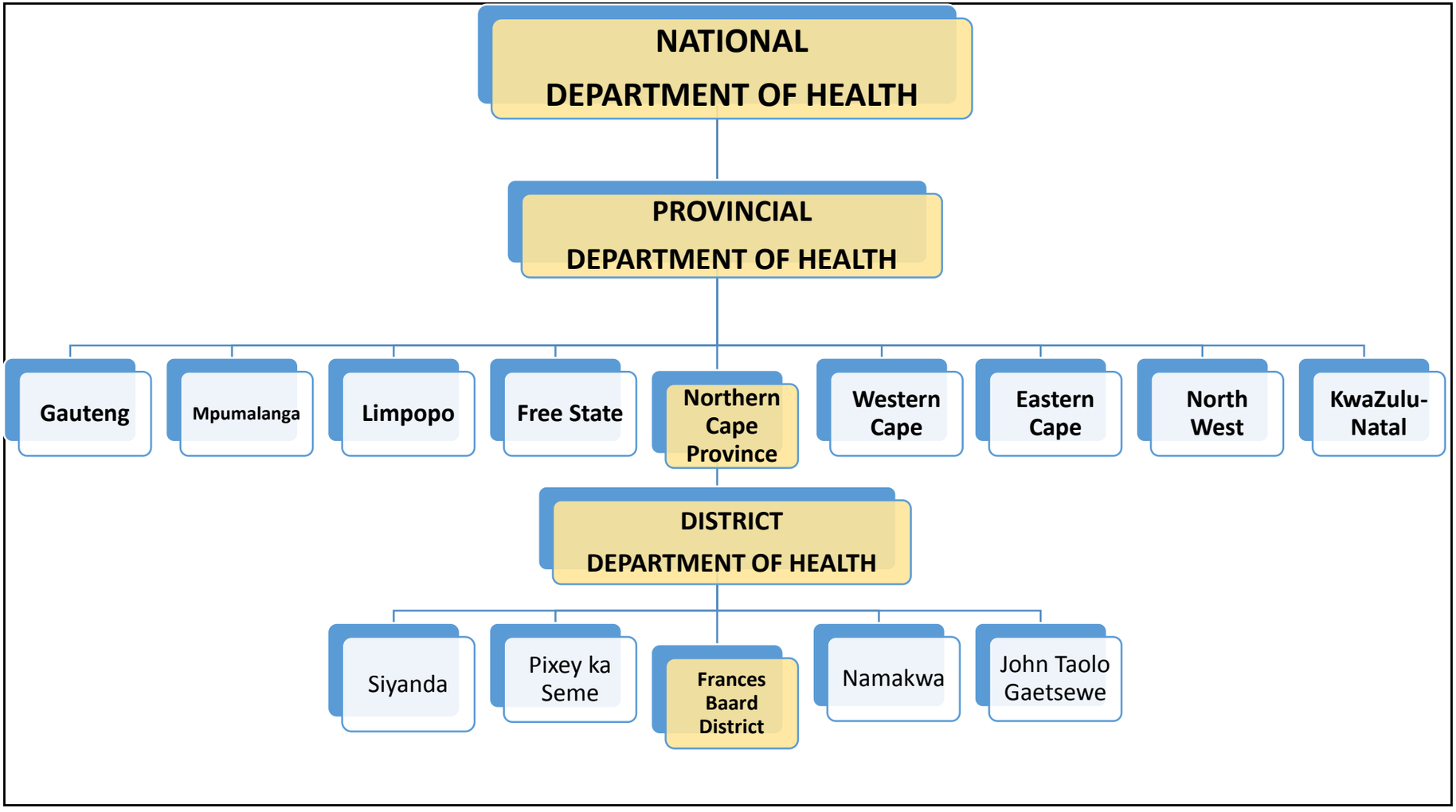

Figure 2.2: The organogram of the Department of Health, adapted from Mthembu (2013:37)

2.2.5 THE HEALTHCARE SYSTEM IN THE NORTHERN CAPE PROVINCE

The healthcare system in the Northern Cape Province embraces the following vision, mission and values:

Vision

"Health Service Excellence for All".

> *"We are committed to achieving our vision through a decentralised, accountable, accessible and constantly improving healthcare system, within available resources. Our caring, multi-skilled, effective personnel will use evidence-based, informative healthcare and maturing partnerships for the benefit of our clients and patients"* (DoH - Northern Cape, 2015).

Mission

> *"Working together, we are committed to provide quality healthcare services. We will promote a healthy society in which we care for one another and take responsibility for our health. Our caring multi-skilled professionals will integrate comprehensive services, using evidence-based care strategies and partnerships, to maximise efficiency for the benefit of all."*

Values

- Respect (towards colleagues, rule of law and cultural diversity)
- Honesty (discipline, integrity and ethics)
- Excellence (effectiveness, efficiency and quality healthcare)
- Humanity (caring institution, facility and community)
- Empowering our people (DoH, 2010b).

The Northern Cape is not exempted from globalisation, the economic recession or the rising costs of medical care. Therefore, the challenge of the Northern Cape Department of Health is to reform the healthcare system to best use the limited resources available to improve the health status of the population of the Northern Cape (DoH - Northern Cape, 2015).

Since 1994, when National transformation took place in South Africa, the Northern Cape Province has become the largest and most sparsely populated area of all the provinces. As previously stated, the Northern Cape Province (referring to Figure 1.1) consists of five districts namely Siyanda, Pixley ka Seme, Namakwa; John Taolo Gaetsewe (JTG) and Frances Baard (refer Figure 1.2).

The four Municipalities in the Frances Baard District are Digatlong, Magareng, Phokwane and Sol Plaatjie Municipality (DoH - Northern Cape, 2015; Department of Social Development, 2010). Sol Plaatjie Municipality is the most densely populated Municipal area (sub-district) in the Frances Baard District, and comprises a large urban node in the form of Kimberley. It is surrounded by Ritchie, Platfontein, small villages and farms.

Kimberley, from where the 12 healthcare facilities selected for the study are managed, is the administrative centre of both the Municipality and the seat of the Provincial Administration. Ten healthcare facilities are situated in Kimberley and two are approximately 40 km outside Kimberley. Six of the 12 healthcare facilities are still managed by the Sol Plaatjie Municipality, whereas the remaining six are managed by the District DoH. All the mentioned healthcare facilities operate for eight hours per day.

The growing population has a major impact on the delivery of services by the Department of Health on Provincial, Municipal and local levels. It has major financial implications, which impact on crucial service delivery such as staffing, planning, managing, training and development.

In essence the problems that the Department of Health face include:

- Shortage of staff and poor staff retention;
- Inadequate planning;
- Lack of management skills;
- Failure of health service delivery models to address the health needs of the population;
- Lack of researched, evidence-based practice;

- Insufficient and poor output by all categories of nurses, but especially by registered nurses with the appropriate skills and qualifications;
- Lack of continuous nursing education to maintain high standards of professional clinical practice, which in actual fact, is non-existent;
- Outdated and insufficient resources and infrastructure (DoH - Northern Cape, 2015).

All the above mentioned problems contribute to long waiting times and a lack of access to quality healthcare services, which is contrary to the Patient's Bill of Rights, the Batho Pele and Ubuntu principles, and the Northern Cape vision of "Health Service Excellence to All". Health Services are further being impacted on by the disease profile; the poverty rate; as well as the socio-economic and geographic factors affecting the population of the Northern Cape (DoH - Northern Cape, 2015; Department of Social Development, 2010, pp. 10-12).

Challenges with regard to the Northern Cape Healthcare system have been voiced by various stakeholders on numerous occasions, as well as in research that addresses the cause and effect of such challenges. Some long-term challenges in the current service delivery system include long patient queues in the healthcare facilities; the shortage of medication; poor and outdated equipment and, most prominently, the severe shortage of nursing staff – specifically registered nurses - in most of the PHC facilities, but most profoundly in the rural health facilities (DoH - Northern Cape, 2015).

Unfortunately, when the service delivery package was compiled and given to the clinics to deliver, it was not supported by an increase in staffing; adequate, relevant and continuous training; improved budgets to deal with the increased cost of medication and related costs associated with the new variety of services to be offered. The result of the declining staffing ratio is that the quality of healthcare that is rendered to the patients and community at large has become debatable (DoH - Northern Cape, 2015).

The ability of the Province to address the challenges mentioned requires strategies that are appropriate for each of the challenges being faced. This includes dealing with

the challenges posed by the increasing burden of disease, and the high rate of unemployment and poverty (DoH - Northern Cape, 2015). It is therefore important to turn back to the basics to build and develop healthcare delivery in the Provincial Department of Health in the Northern Cape. It is furthermore essential that the Department of Health supplement this by providing a discussion platform to allow the eventual improvement in quality healthcare.

An immediate task of the Directorate of Nursing is to initiate relevant research, and to develop an appropriate or ideal service delivery model for the Northern Cape Province. The researcher identified long waiting times as one of the challenges that needed specific attention, and proposed to address this gap by developing a patient flow system for antenatal care in PHC facilities.

2.3 PRIMARY HEALTHCARE

Primary healthcare is a broad concept, where basic healthcare is provided to the community at large, which is defined by various authors as the “heart” of the Department of Health - based on practical, scientifically, socially acceptable, justified and technologically sound methods of healthcare delivery. Furthermore, it is defined as universally accessible, essential and affordable to individuals, families and the community (DoH - Northern Cape, 2015; Mthembu, 2013, pp. 28-49; WHO, 1978). Primary healthcare is an essential part of a comprehensive health service.

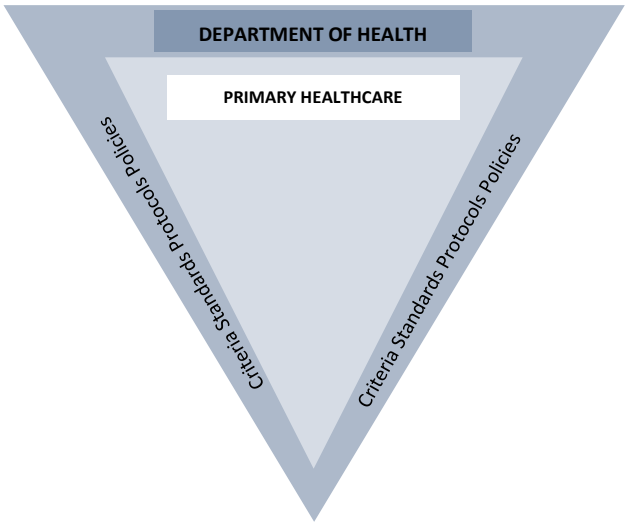

Figure 2.3: Conceptual framework: Primary healthcare (please refer to Figure 1.3)

Prior to 1994, South Africa had major disparities and inequalities regarding healthcare services. Public healthcare services had been burdened with a heavy concentration of resources to hospitals, while primary healthcare services were under-resourced. Existing healthcare services emphasised medical care opposed to total healthcare. Importantly, primary healthcare services were fragmented and delivered in a manner that was ineffective and inefficient (Van Rensburg, 2012, pp. 30, 81,483, 499). Not much research has been done on national level in South Africa regarding quality of services rendered in PHC facilities prior to 1994 (Schneider, 1999, p. 3). Therefore; the Department of Health has set the stage for improvement by introducing norms and standards to reshape healthcare delivery. A comprehensive primary healthcare approach for the delivery of healthcare within the 3-tiered system of care (National, Provincial and District) has also been adopted.

Post 1994, with the dispensation of the new Government in South Africa, the focus shifted from curative to the primary healthcare approach that is rendered by PHC Services (Van Rensburg, 2012, p. 121). Also, three declarations, including the Declaration of Alma-Ata in 1978 (WHO, 1978, p. 38) proposed a shift in healthcare from expensive curative treatment to health promotion, and a move from basic healthcare to community healthcare (Van Rensburg, 2012, pp. 31-32; World Health Organization, 1978). Secondly the Ouagadougou Declaration on Primary Healthcare and Health Systems in Africa addressed nine major priority areas, namely leadership and governance for health; health services delivery; human resources for health; health financing; health information systems; health technologies; community ownership and participation; partnership for health development and research for health, while the Algiers Declaration dealt with health information systems influencing decisions regarding healthcare globally (WHO, 2010, pp. 3-9).

Systems that were put into place in an attempt to render proper healthcare services post 1994 included a comprehensive and integrated package that was made available to the community to provide holistic care to all. This package included antenatal, postnatal, maternity and reproductive healthcare.

Furthermore, the Batho Pele principles that prescribe consultation service standards, access, courtesy, information, openness and transparency, redress and value for money have been initiated in the public service, as well as the Patients' Rights Charter which includes all patients' right to a healthy and safe environment; access to healthcare; confidentiality; privacy; informed consent; access to a second opinion or to exercise a choice in healthcare; the right to continuity of care, refusal of care or to participate in any decision-making that affects his / her health; to be treated by a named healthcare provider; to have knowledge of their health insurance and medical aid scheme policies; and finally to file complaints about the quality of the healthcare service they received (DoH, 2010a, pp. 10-14).

In addition, the Minister of Health, Dr Aaron Motsoaledi, announced the following to strengthen healthcare services, namely that the National Health Insurance Policy will be implemented shortly to ensure that all South African citizens have appropriate, efficient and quality healthcare services, regardless of their socio-economic status (DoH, 2011e).

2.4 ANTENATAL PRIMARY HEALTHCARE

Antenatal PHC will be discussed under two headings, namely antenatal care and antenatal healthcare facilities / infrastructure.

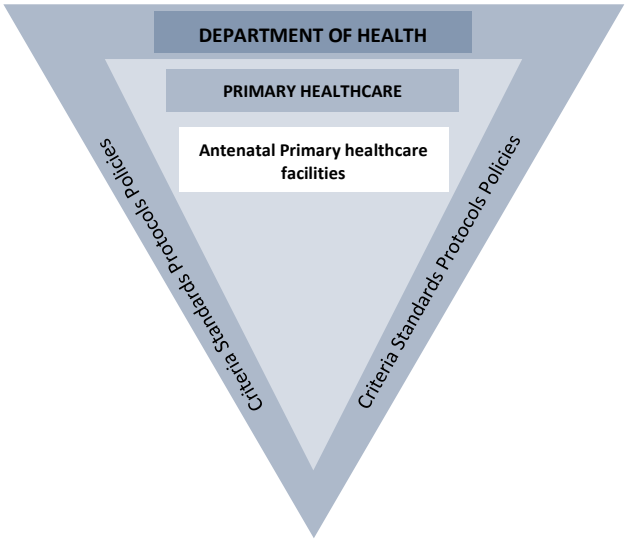

Figure 2.4: Conceptual framework: Antenatal primary healthcare facilities (please refer to Figure 1.3)

2.4.1 ANTENATAL CARE

Antenatal care (ANC) is a healthcare service rendered by healthcare providers to pregnant mothers to promote early detection of risk factors, for early diagnosis of pregnancy complications and to refer, and ensure appropriate health management, including health education. In addition, ANC is also considered as a section of routine Maternal, Neonatal, Child and Women's Health (MNCWH) services, implemented to reduce perinatal mortality and maternal death. The focus of antenatal care is to keep the woman and baby under frequent observation, as well as to maintain or improve her physical, psychological and spiritual health throughout pregnancy, labour and the puerperium (Thembelihle, et al., 2013, p. 2; DoH, 2012 - 2016).

2.4.2 ANTENATAL HEALTHCARE FACILITIES / INFRASTRUCTURE

During audits done by HST (Health System Trust) at healthcare facilities the following problems about the infrastructures were observed: Facilities were overcrowded; lack of space which compromises healthcare users' right to privacy; too small facilities and small waiting areas that could not cope with healthcare users' demands. The right to efficient healthcare services is a fundamental requirement that is dependent on resources to deliver adequate healthcare services and the infrastructure has to be appropriate as well. The quality of infrastructure and availability of healthcare providers has a major impact on how services function, and influences patient satisfaction with service. Facilities must comply with the minimum standards as stated in Building Guidelines, R158 of 1980 (DoH, 2011d).

The infrastructure to improve the flow of patients through a healthcare facility should include signage outside the facility starting from the main road, to direct patients to the facility. The name of the facility, including the operational hours, should be displayed on the outside. Signage to the reception area, the help desk, waiting area, toilets or bath rooms, observation room, consultation room for antenatal patients and also to the pharmacy should be clear (please refer to Audit Checklist).

The quality of physical infrastructure has a major impact on the functioning of services and patients' satisfaction with care. A proper and sufficiently ventilated reception-, and

waiting area, consultation- and observation room, and toilet facilities with running water are essential. The building and grounds are to be kept clean and hygienic to maximise safety and comfort (NDoH, 2012a).

2.5 PATIENT FLOW SYSTEM

In literature, both patient flow and appointment systems have been described. Patient flow systems represent the ability of the healthcare system to serve patients quickly and efficiently as they move through the stages of care (Hall, et al., 2013, pp. 4-12; Hall, 2006, p. 6). It entails the admission of patients to the healthcare system; their medical treatment, discharge information and rescheduling for follow-up visits (DoH, 2012/2013 - 2014/2015; Backer, 2006).

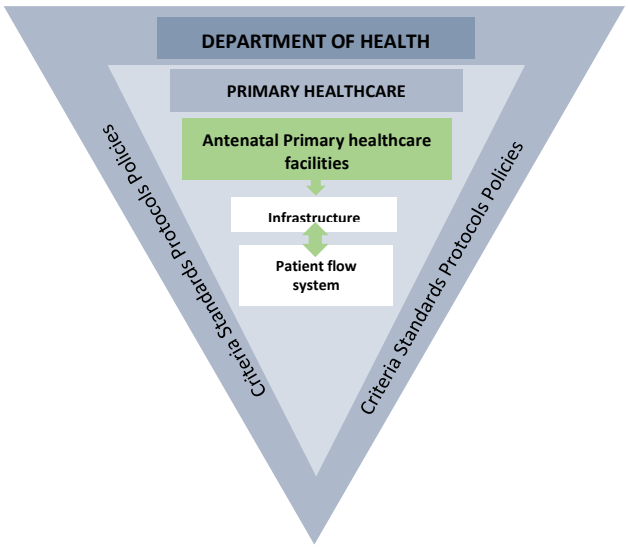

Figure 2.5: Conceptual framework: Infrastructure and patient flow system (please refer to Figure 1.3)

Patient flow systems in the antenatal PHC facilities are challenged by the DoH's adoption of the Alma-Ata Declaration, the implementation of Constitutional Rights, the Batho Pele Principles and the Patients' Rights Charter that promote free access to healthcare for South Africans (DoH, 2012/2013 - 2014/2015). Furthermore, according to Hall (2013, pp. 4-12), a multitude of factors are responsible for overcrowding including high patient acuity, prolonged procedures, severe nursing shortages and problems with access to on-call specialists. In addition, long waiting times are influenced by poor triage management; slow retrieval of patient files at reception;

insufficient waiting areas; polypharmacy; poorly trained healthcare providers; the bad attitude of healthcare providers; lack of medical resources; inappropriate infrastructures and poor, or no signage (DoH, 2012/2013 - 2014/2015).

The implementation of the declarations, together with the vertical referral of anti-retroviral treatment (ART) to PHC services, have contributed to the sudden influx of patients that is so evident in the primary healthcare sector (Topp, et al., 2010, p. 1). Unfortunately, the infrastructure and human resources of the facilities were never on par with the extent of the changes. The influx of patients has led to long queues and extended waiting times, which have caused patients to be dissatisfied with the healthcare services, and contributes to missed appointments and non-compliance in regard to appointments (Sokhella, et al., 2013, p. 1).

According to Backer (2006, pp. 45-46) the key to improved patient flow is to understand the patient flow process in the facility; to identify problem areas; to develop a concept of the ideal system; and then to implement small changes. Emphasis is also put on charting the flow of patients through the facility, and to make use of flow mapping and cycle time measurement. In a study done by Sokhella et al. (2013, pp. 2-8), the Fast Queue Strategy was implemented to improve healthcare delivery, and to enhance healthcare users' satisfaction with services delivery. Queue marshals were appointed to direct healthcare users to respective queues in an effort to reduce waiting time and to keep users satisfied.

Acknowledging the above demands, the researcher considers a patient flow system that is designed to reduce waiting times for antenatal patients, to be a necessity.

In this study, the researcher decided to include appointment systems as a part of patient flow systems. An appointment system is described as a booking- or time scheduling system that can be done manually, and is handwritten, electronic or computerised. The system is used to manage access to healthcare facilities for several services, such as medical assistance, scheduling of medical activities and optimal use of medical resources. Different time slots are given according the healthcare users' needs, such as scheduling of primary and specific visits to attend healthcare facilities. In addition, provision should be made for walk-ins and emergency cases.

Appointments per day should be given with caution to prevent scheduling more patients than can be managed per day which could increase waiting times.

A well designed patient flow system (appointment system included) depends on the combination of efficient organizational skills and timely access to healthcare services. The purpose of timely access is important for good medical outcomes and to assure healthcare users' satisfaction (Hall, et al., 2013, pp. 4-12; Cayirli, et al., 2008, pp. 338-353; Al-Haqwi & Al-Shehri, 2007, 2007, p. 1; Gupta & Denton, 2007, pp. 800-801). An example of such a system is one that was developed by Wang and Gupta (2011, p. 373) that emphasises the preferences of healthcare users. Patients indicate the time they want to see a healthcare provider, when they want urgent appointments, and may also choose specific healthcare providers. To manage this setup, open time slots for each day are required. Various ways of communication such as landline telephone calls, Internet booking, SMS (short message service), and kiosks are used to facilitate the above options (Wang & Gupta, 2011, p. 373).

Other patient flow / appointment models or designs that are available on the market include the Health Transformation Program, the Centralised Hospital Appointment System (HAS), and the AA (Advance Access) model, among many others (Gupta & Denton, 2007, pp. 800-801). In a study done by Hu, (2010, p. 20) the AA model was rated as the best primary healthcare management model in terms of providing timely services to healthcare users, although the implementation of the model demonstrated many challenges. One of the challenges was the shift of appointment decisions from healthcare providers to healthcare users' demands (Fournier, et al., 2012, pp. 1-5; Ahluwalia & Offredy, 2005, pp. 3-5). The effort to manage the demand and supply of services led to complex changes, not only regarding accessibility and no-show rates, but also in continuity of care and healthcare provider overload (Dixon, et al., 2015).

Patient flow / appointment systems hold advantages and disadvantages for both the healthcare users and the healthcare providers. The system must make provision for walk-ins and emergencies to address the needs of the healthcare users, but at the same time the healthcare providers might be fully booked and would have to prioritise between cold cases (non-emergency) or emergency cases' needs. This process can be time consuming and can put the appointment system behind schedule.

Appointment plans are likely to be disrupted due to the arrival of a critical patient, who demands urgent attention. Also a healthcare user's condition can change during waiting from a non-emergency to emergency status (Hall, et al., 2013, p. 12).

2.6 WAITING TIMES

Waiting time has become a focus point of much research done with regard to primary healthcare facilities (Ajai, 2002, pp. 121-123). Numerous complaints received from patients about bad services in health care facilities has made research necessary (Fournier, et al., 2012, pp. 1-5; Fossum, et al., 1998, pp. 59-65). Primary healthcare is the first contact that many healthcare users have with healthcare providers (Ramkilwan, 2013, p. 51). However, complaints regarding long waiting times have become more frequent as a result of overcrowded facilities with less consultation time, due to the post 1994 policy "*Free health care to all*" (Thandrayen & Saloojee, 2008).

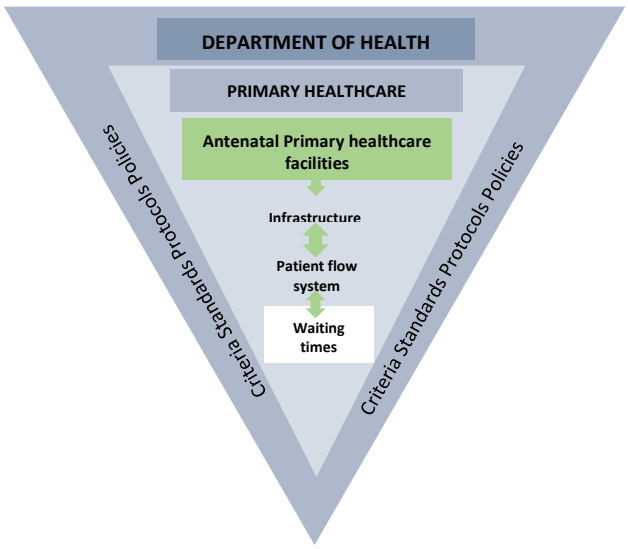

Figure 2.6: Conceptual framework: Waiting times (please refer to Figure 1.3)

Research shows (DoH, 2011c) that several surveys have been conducted to investigate the complaints about waiting times. According to the outcome of these surveys, waiting times vary from approximately three to six hours due to inadequate infrastructure; lack of effective filing systems; no triage systems being in place; too many clients with too few healthcare providers; incompetent healthcare providers; a

lack of appointment systems; long queues waiting to see a nurse, doctor or pharmacist; and chronic shortages of medicine, which lead to patients having to come back the following day to collect medication (DoH, 2011c).

Policy, such as acceptance of the Constitution "*Healthcare to all'* program*;* the Batho Pele principles that include service standards, access, courtesy and redress; and the Patients' Rights Charter addressing a healthy and safe environment, access to healthcare, and standards and protocols, has been implemented to address the mentioned problems (DoH, 2010b, pp. 11-13). Recently, the DoH implemented more legal frameworks, such as the National Core Standards, MomConnect, and the Ideal Clinic Service Management (ICSM) to quickly assess and serve the primary healthcare users (DoH, 2012 - 2016; NDoH, 2011b).

The National Department of Health then funded a consortium of partners to audit every health facility in the public sector. The audit assessed infrastructure, compliance to priority areas, human resources access and a further range of services offers. Data collected were captured into the database of the National Core Standards. Results of the audit revealed that the Northern Cape scored low (40%) in all areas. The physical infrastructure in this province and the availability of functional and essential medical technological equipment in maternity wards required priority attention, especially considering the high maternal mortality rate in the country. Additionally, the compliance score in the six priority areas in the audit revealed a 17% score for positive and caring attitude, 23% for improved patient safety and security, 37% for cleanliness, 42% for availability of medicine supplies, 42% for infection prevention and control, and 42% for waiting times (NDoH, 2012b).

Although waiting times were identified as one of the six most critical areas for patient-centred care in the *Fast Tract to Quality,* and the National Core Standards (NDoH, 2012a; DoH, 2011a), PHC facilities on average scored lower than hospitals in priority areas such as patient safety and security, and the length of waiting times, as reported in the National Healthcare Facilities Baseline Audit: National Summary Report (NDoH, 2012b).

As mentioned in the introduction, a pilot study done by the researcher during 2011 as part of her job description revealed that waiting times in antenatal PHC facilities at that time varied from 3-4 hours. Annual waiting time surveys that are routinely done by the DoH, Frances Baard District in the Northern Cape report results at the same levels.

No matter how good the clinical care and clinical decision-making are, when patients have long waits in overcrowded facilities, both the patients and the healthcare providers become dissatisfied with the services (Bamidele, et al., 2011, pp. 174-175). Based on all these findings, it is vital to design strategies that specifically address waiting times. Therefore, the initiative of the researcher was to compile a patient flow system which could reduce waiting times for pregnant women in antenatal PHC facilities in the Frances Baard District, Northern Cape Province.

2.7 CONCLUSION

In this chapter the literature review done was based on the conceptual framework of a patient flow system for pregnant women visiting antenatal PHC facilities. The legal framework of the NDoH, namely the standards, protocols, policies and guidelines used to compile the audit checklist and to develop a patient flow system have also been discussed.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter provided an in-depth literature review on topics related to the patient flow system for Northern Cape antenatal PHC facilities. The focus of this chapter is to describe the research design and methodology relating to the research questions, aims and objectives.

3.2 RESEARCH QUESTIONS, AIM AND OBJECTIVES

Three research questions were formulated to guide the study. These questions firstly addressed issues such as the legally prescribed criteria, standards, protocols and policies antenatal PHC facilities should meet in order to implement a patient flow system. Secondly, the questions probed the extent to which antenatal PHC facilities meet the prescribed requirements and what such a facility would require to implement a patient flow system.

Accordingly, the aim and objectives of the study were determined. The aim of the study was to develop a patient flow system for antenatal PHC facilities in the Frances Baard District in the Northern Cape Province, based on the results of the facility audits and the “in-action” Delphi technique.

To obtain the aim several objectives were formulated and considered by the researcher throughout the study (please refer to Chapter 1).

3.3 RESEARCH DESIGN

A research design can be described as an overarching plan executed to address the research question as stated by the researcher. Furthermore, it could either be described as the backbone of the proposed research (Botma et al., 2010, p.108), or

as a list of specifications to improve the final results of a study (Polit & Beck, 2012, p.741). A research design involves a clear description of the form of data collection, data analysis and interpretation of findings proposed by researchers in order to conduct their studies (Creswell, 2009, p. 3). A research design is selected according to the purpose, the research question and the proposed population (Botma et al., 2010, p.108). Importantly, the research design should show strong evidence that the research question can be answered (Botma et al., 2010, p.108).

The quantitative research designs mentioned by Grove et al. (2013, pp. 34-43) and Botma et al. (2010, pp. 108-110) are mainly descriptive, correlational, time-dimensional, case-study, cross-sectional survey, experimental, or quasi-experimental in nature. These designs include a combination of sub-designs. A descriptive design is a non-experimental design that could be selected in case the researcher wants to describe an area of interest in its natural state. Correlation designs describe relationships between variables, whereas time-dimensional designs are used to investigate an occurrence of interest over a period of time.

Opposed to the time-dimensional design, cross-sectional designs measure variables of interest at one point in time. In experimental research, the researcher actively introduces an intervention or treatment. In quasi-experimental research the researcher collects data without introducing treatment or making changes, therefore being a bystander (Brink, et al., 2013, p. 102; Polit & Beck, 2012, pp. 202-203; Fouché, et al., 2011, pp. 144-149).

A quantitative, non-experimental design with the objective to explore and describe was selected to develop a patient flow system for antenatal PHC clinics from the Frances Baard District, Northern Cape Province (Fouché & Delport, 2011, pp. 155-156).

3.3.1 QUANTITATIVE RESEARCH

Quantitative research is described as an important approach to obtain new knowledge in the field of nursing, to test theories, or to investigate a selected phenomenon (Polit & Beck, 2012, p. 739; Botma, et al., 2010, p. 82; Creswell, 2009, p. 4). Quantitative

research is also characterised by the role of the researcher which is more distant, as opposed to qualitative research where the researcher becomes part of the data collection process; the amount of control exerted during implementation of the research; the type of design and use of structured instruments; as well as the use of strong statistical measures to refine data (Botma et al., 2010, p.83).

A quantitative research approach was used to generate more knowledge regarding the topic of interest, namely the proposed characteristics of a patient flow system for antenatal PHC facilities.

The researcher adhered to the following underlying principles of quantitative research:

3.3.2 NON-EXPERIMENTAL DESIGN

Non-experimental design can be distinguished from experimental and quasi-experimental designs based on three criteria, namely that independent variables are not manipulated, no intervention is implemented, and no control of the setting is done (Brink, et al., 2013, p. 112). The main purpose of non-experimental designs is to describe, to explore and to explain (Brink, et al., 2013, p. 112). In this study data was collected without any experimental intervention or a control group (Brink, et al., 2013, p. 112; Polit & Beck, 2012, p. 735; Fouché & Delport, 2011, p. 155).

3.3.3 EXPLORATION AND DESCRIPTION

Exploration and description can form part of the objectives and were for this study implicitly described as such in Chapter 1 in 1.4 and Chapter 3 in 3.4 (Fouché & De Vos, 2011, p. 94).

3.4 RESEARCH PROCESS

A research process is followed when learning has to take place and knowledge has to be acquired. A systematic process of scientific enquiry or a number of steps is used

to improve our understanding of a phenomenon or the world around us (De Vos, et al., 2011, p. 61).

The research process that was followed by the researcher is described below:

Stage 1 Develop a checklist: Research question 1.3.1, objective 1.4.1 and 1.4.2

- A checklist to audit the antenatal PHC facilities was developed based on an extensive literature review of criteria, standards, protocols and policies stated for patient flow systems in other healthcare facilities.

Stage 2 Audit the selected antenatal PHC facilities: Research question 1.3.2, objective 1.4.2 and 1.4.3

- Antenatal primary healthcare facilities in the Sol Plaatjie Municipality were audited to evaluate whether they meet the legal criteria, standards, protocols and policies needed to implement a patient flow system.

Stage 3 Develop and obtain consensus on aspects to be included in a patient flow system: Research question 1.3.3, objective 1.4.4

- Professional nurses will evaluate the aspects the patient flow system using an “in-action” Delphi technique.

Stage 4 Design of the patient flow system

- A patient flow system for the Northern Cape Provincial antenatal PHC facilities will be developed, based on the audit results. Results of a previous facility audit done by the Health Systems Trust (DoH, 2012, p. 11) will also be considered in the development of the patient flow system.

3.5 RESEARCH TECHNIQUE

Researchers usually select a research technique from a variety of data-collection methods. In case of a quantitative approach, structured interviews or observation schedules, questionnaires, checklists, indexes and scales are available. Each of the mentioned techniques or methods has their own characteristics (De Vos, et al., 2011,

p. 181). A checklist was selected for the purpose of the study due to the fact that it is considered to be a highly structured tool, suitable for the collection of quantitative data (De Vos, et al., 2011, p. 181).

The audit checklist and “in-action” Delphi techniques were selected and implemented as follows:

3.5.1 CHECKLIST TO AUDIT ANTENATAL PHC FACILITIES IN THE NORTHERN CAPE PROVINCE

The checklist to audit antenatal PHC facilities was compiled based on an extensive literature review. It included the South African national policies and legal requirements for antenatal primary healthcare and the infrastructure of PHC facilities. Literature regarding appointment systems, patient flow systems, waiting times, human resource and medical resource requirements, as well as guidelines of accessibility were included. In order to design a patient flow system, the key is to better understand the patient flow process in a facility, identify problem areas, then develop a concept of the ideal system, and lastly make small changes if required (Backer, 2006, p. 1).

The audit checklist consisted of 12 headings (please refer to Table 3.1). At the top of the audit checklist a space was provided where the clinic that was audited could be numerically identified as C1 to C12. The headings included in the audit checklist were firstly based on literature as well as according to the National Department of Health’s quality service guidelines. Secondly, the headings were also based on aspects stipulated by the researcher for a proposed patient-flow system. Information regarding individual facilities allows for analysis and reflection on how the country’s health services inputs meet the population’s needs in terms of the type, quantity and quality of services. The information is essential to identify health system strengths and gaps, to assess current and future needs and for planning investments and future services, such as proposed in the National Health Insurance policy. In addition, the aim of an audit is to improve quality of the care provided to healthcare users (HST, 2014, pp. 3-5; DoH, 2012, pp. 3-6).

Three columns were inserted next to the questions where a tick mark [✓] could be made in the yes or no category, and comments could be entered in the third column (please refer to Table 3.1 and Addendum E).

Table 3.1: Structure of audit checklist

HEADING	DESCRIPTION	NUMBER OF QUESTIONS
1	PATIENT FLOW SYSTEM	8
2	ACCESSIBILITY	8
3	RECEPTION	9
4	WAITING AREA	6
5	ROOMS	15
6	HUMAN RESOURCES	7
7	MATERIAL RESOURCES	9
8	MEDICAL EQUIPMENT	12
9	LINEN	4
10	SCHEDULING	3
11	OTHER	1
12	CRITERA, STANDARDS, PROTOCOLS AND POLICIES	1

The audit checklist was evaluated and refined by the researcher's supervisor, co-supervisor and members of the School of Nursing's proposal evaluation committee, all experts in the field of quantitative research (Refer to Table 3.2).

Table 3.2 Example of the audit checklist

UNIVERSITY OF THE FREE STATE

SCHOOL OF NURSING

AUDIT CHECKLIST TO AUDITS ANTENATAL PHC FACILITIES

Facility number		

Please indicate whether the following aspects are met or not met by the antenatal PHC facility by marking either **YES = [✓] or NO = [X]** in the applicable column. Comments could be added in the third column if required.

		YES	NO	COMMENTS
1.	PATIENT FLOW SYSTEM			
1.1	Is there a patient flow system in place?			
1.2	Are most of the patients that arrive at the clinic scheduled for an appointment?			
1.3	Do specific time slots exist for the following:			
1.3.1	Follow-up visits?			
1.3.2	First ANC visits?			
1.4	Is there a triage system in place?			
1.5	Is there a bottleneck with regard to the patient flow system?			

3.5.2 DELPHI TECHNIQUE

The Delphi technique is a data-collection process to seek consensus regarding a particular topic of interest from a group of purposively selected experts. Consensus methods are regularly used to seek opinions from experts who are busy and therefore saves time and cost. Three types of Delphi techniques are identified, namely the classic or consensus, dialectic and decision Delphi (Grove, et al., 2013, pp. 435-436; Polit & Beck, 2012, pp. 267-268; Botma, et al., 2010, p. 253).

The main focus in the classic Delphi technique is to reach consensus and is therefore often refer to as a consensus Delphi technique. In the dialectic Delphi, the focus is to identify and understand different viewpoints and differences. In the consensus Delphi the participating panel consists of persons in decision making positions with the aim to come to a decision. It comprises of a panel of expertise that have to answer several rounds of questions regarding a topic they have a broad knowledge about. The questions are usually sent by land mail or e-mail. Each round of questions is analysed by the researcher, summarised and returned to the experts with new or adapted questions (Grove, et al., 2013, pp. 435-436; Botma, et al., 2010, p. 253; Polit & Beck, 2012, pp. 267-268). There is no face-to-face contact with each other, meaning that although geographical at a distance from each other, respondents may agree and share the same knowledge about a topic of interest. In other words, a Delphi technique is usually done via correspondence with respondents, without meeting. Data analysis methods used in the Delphi technique are usually both qualitative and quantitative (Grove, et al., 2013, pp. 435-436; Polit & Beck, 2012, pp. 267-268; Botma, et al., 2010, p. 253).

The benefits of the Delphi technique include an increase in access to experts, a high response rate, simplicity and flexibility in design and use. It is easily understood and implemented by a researcher who selects this technique. Respondents are anonymous and therefore views can be expressed freely without direction persuasion (Vernon, 2009 as cited by Grove et al., 2013, p. 436). Limitations or disadvantages might include that some respondents delay in returning their responses on time and therefore retard the process. Furthermore, respondents could make “hasty, ill-considered judgements” (Polit & Beck, 2012, pp. 267-268; Botma, et al., 2010, p. 253).

The Delphi technique is conducted in five phases, namely the preparation phase, phases one, two, three and four.

Preparation phase

The problems are recognized and the research questions are compiled. Based on the research question a sample will be collected. A purposive sample is usually indicated. The selection of experts on the topic is chosen globally (Polit & Beck, 2012, pp.267-68; Botma et al., 2010, p.253).

Phase 1

The researcher compiles an open-ended questionnaire. With this the respondents can give their input indisputably and without the influence of other experts. The questionnaire will then be sent back to the researcher who analyses the data and compiles a new set of question(s) (Polit & Beck, 2012, pp.267-68; Botma et al., 2010, pp.253-54).

Phase 2

The data collected from the first question round is provided to the respondents. One of the strengths of the Delphi technique is giving feedback to respondents. Hereby, respondents learn from each other's opinion. Although respondents are not known to each other, they can review their input and still learn from each other's opinion. The respondents also have the opportunity to review their own opinions. The second questionnaire is compiled and sent to the respondents, from which their input data will then be analysed again (Polit & Beck, 2012, pp.267-68; Botma et al., 2010, pp.253-54).

Phase 3

Data from the questionnaire are analysed and feedback is given to respondents. A new questionnaire is compiled, based on the statements drawn from analysis of the Phase 2 questionnaire. Questionnaire 3 is compiled. This questionnaire differs from the previous two questionnaires, because it is ranked according to priority. The researcher can see where opinions differ in the panel, and can add her own opinion, should it differ from that of the panel or not (Polit & Beck, 2012, pp.267-68; Botma et al., 2010, pp.253-54).

Phase 4

The ranked opinions and those ones that differ, and are not integrated, are sent to respondents. The researcher then checks the ranking of the statements to ensure that consensus in the panel is reached. The process is repeated until consensus is reached among the panel members (Polit & Beck, 2012, pp.267-68; Botma et al., 2010, pp.253-54).

An “in-action” Delphi technique was used for this study, based on the fact that the researcher felt that speedy feedback from the respondents could be influenced by their current heavy workload (described in Chapter 2 in 2.2.5), limited Internet access, and the risk involved of sending the questionnaires via the unreliable land mail system.

For the benefit of this study, consensus for a proposed patient flow system was considered if agreement between respondents was ≥ 60%, opposed to the 51-71% that is suggested by Polit and Beck (2012, p. 268). Please refer to the heading “Pilot study and data collection” for a detailed description of the process.

3.6 POPULATION AND SAMPLE

The population or the target population is the population on whom the results are applicable, and the population from which the sample was collected (Polit & Beck, 2012, p. 273). A sample is defined as a section or element of the accessible population identified for the study (Polit & Beck, 2012, p. 275; Strydom, 2011, p. 223; Botma, et al., 2010, p. 124).

There are two fundamental methods to sampling, namely probability and non-probability sampling. A probability method refers to the fact that every member of the population has a probability of higher than a zero chance of being selected. Probability sampling can also be referred to as random sampling.

Non-probability sampling refers to the fact that the researcher cannot estimate the chance that every member would be selected. The reasons for this include time and

cost constraints, or if access to the population is limited (Polit & Beck, 2012, pp. 358-365; Botma, et al., 2010, pp. 125-126).

Non-probability sampling methods are commonly used in nursing research and include convenient, purposive, quota, and network or snowball sampling. In a purposive sampling method only respondents with the most typical characteristics according to the study's inclusive criteria can be added to the sample. Inclusion criteria are chosen according to the judgement of the researcher. A disadvantage of this sampling method is that the judgement of the researcher is focal in determining what may be considered typical, but may be mistaken or not inclusive enough (Grove, et al., 2013, p. 365).

The researcher made used of a purposive sampling method. Therefore, respondents were selected who are experienced in ANC PHC service delivery and who could provide extensive information about the topic being studied (Polit & Beck, 2012, pp. 279-280; Botma, et al., 2010, pp. 125-126).

3.6.1 POPULATION AND SAMPLE 1: HEALTHCARE FACILITIES

The Northern Cape Province (please refer to Figure 1.1) consists of five districts, namely Siyanda, Pixley ka Seme, Namakwa; John Taolo Gaetsewe (JTG) and Frances Baard (please refer to Figure 1.2). The four municipalities in the Frances Baard District are Digatlong, Magareng, Phokwane and Sol Plaatjie Municipality (DoH, 2011d; Department of Social Development, 2010). The Frances Baard District further consists of five non-fixed (mobile clinics) healthcare facilities, 31 fixed facilities, two community health centres, and four district hospitals (DoH, 2012/2013 - 2014/2015).

Sol Plaatje Municipality is the most densely populated municipality in the District and includes the largest populated urban area in Kimberley. It is surrounded by Ritchie, Platfontein, smaller villages and farms. Kimberley is the administrative centre of both the municipality and the seat of the provincial administration. The centre's economic activities consist of several retailers, as well as industrial, mining and farming. The escalation of population has a major impact on the delivery of healthcare and other services of the Department of Health on Provincial, Municipal and Local levels. It mainly affects the financial aspects that are crucial to service delivery such as staffing,

planning, managing, training and development (DoH, 2011d; DoH - Northern Cape, 2015).

There are 12 fixed facilities, of which six are still managed by the Sol Plaatjie Municipality. The other six are provincial managed facilities of which two are situated in the rural area. The two rural facilities are approximately 15 km and 40 km away from Kimberley. All 12 facilities are operational for 8 hours per day (DoH, 2011d; DoH - Northern Cape, 2015).

For this study, the research population included the nursing staff of the 31 fixed facilities in the Frances Baard District, Northern Cape Province. Convenience sampling was done to select the 12 antenatal PHC facilities for the audit due to the fact that the researcher had access to these facilities.

3.6.2 POPULATION AND SAMPLE 2: PROFESSIONAL NURSES

The population for the study included the 258 professional nurses working in the 31 fixed facilities in the Frances Baard District, Northern Cape Province, at the time when the research was done.

An important step was to select respondents who could provide the best answers to the research questions. Respondents chosen by the researcher met the inclusion criteria for the study as they were all professional nurses from the targeted facilities and involved in antenatal primary healthcare.

Those respondents who finally participated in the “in-action” Delphi technique included five health area managers, five operational managers and 11 professional nurses who render services in antenatal primary healthcare facilities in the Frances Baard District, Northern Cape.

3.7 PILOT STUDY

Strydom (2011c, p. 237) describes a pilot study as a process whereby researchers "test the various aspects of their project on a small scale, not yet intending to generalize their findings". In addition to this Brink et al. (2013, p. 57) emphasise that a pilot study focusses on re-examining the practicality of the study and the evaluation of its measuring tool. The researcher utilised the pilot study to determine the feasibility of the study, and to refine both the audit checklist and the process for the "in-action" Delphi technique.

3.7.1 PILOTING OF THE AUDIT CHECKLIST

One facility out of the 12 PHC facilities that had been selected in the Frances Baard District was conveniently nominated to conduct the pilot study of the audit checklist.

An appointment was made with the operational manager of the specific facility prior to the date of the pilot study to make the arrangements. The facility audit was done by the researcher herself.

Thereafter some minor changes were made to the checklist, under the following headings:

Headings 1, 1.1, and 1.5: Appointment system was change to patient flow system.

Heading 12.1: Names of the guidelines were added: Guidelines for Maternity Care in South Africa, 2007, and Saving Mothers 2008-2010.

Based on the fact that the minor changes to the checklist did not affect the result, a decision was made to include the data as part of the results (please refer to Addendum: E).

3.7.2 PILOTING THE "IN-ACTION" DELPHI TECHNIQUE PROCESS

A pilot study to test the planned "in-action" Delphi technique process was also completed. Permission to pilot the "in-action" Delphi technique using a selected group of healthcare providers was obtained from the Head of the Department of Health of the Northern Cape Province, and the Manager of the Sol Plaatjie Municipality. The permission letters that were signed by the above authorities were given to the district manager, area managers and facility managers to inform them that the pilot study would be done.

Table 3.3 Example of the checklist for the "in-action" Delphi technique process:

"IN-ACTION" DELPHI TECHNIQUE PROCESS: CHECKLIST

The following is a checklist to evaluate the "in-action" Delphi technique process as followed by the researcher during an assessment of a proposed Patient Flow System for antenatal PHC clinics.

PHASE	No	STEPS	YES	NO	COMMENTS
AUDIT RESULTS					
1	**1.1**	A sheet containing the audit results was handed to each respondent			
	1.2	A summary of the audit results were displayed on a screen			
	1.3	The results of the audit was explained to the group			
	1.4	A paper on which questions could be written was handed to each respondent			
	1.5	The researcher requested the respondents to write down any questions they had regarding the audit			
	1.6	The questions were collected			
	1.7	The questions were addressed			

PHASE	No	STEPS	YES	NO	COMMENTS
SHEET WITH ASPECTS FOR THE PFS: ROUND 1A					
2.1	2.1.1	A sheet containing the list aspects for a PFS including the **[YES] or [NO]** response was handed out			
	2.1.2	A paper on which questions could be written was handed to each respondent			
	2.1.3	The researcher instructed the respondents to read through the proposed list of aspects for the PFS and to indicate: - **[YES]** if they thought that all the aspects had been included; - **[NO]** if they thought all the aspects for the PFS had not been included			

The data collection during the pilot study was done as follows:

A plan to execute the process of both the pilot study and the main “in-action” Delphi technique was developed (please refer to Table 3.3 and Addendum: G). Written informed consent (please refer to Addendum: D) was obtained from 10 available healthcare providers who are or were involved in antenatal PHC services on the day of the pilot study. These 10 respondents did not participate in the main “in-action” Delphi technique.

The 10 participants included six healthcare providers rendering antenatal PHC services, one operational manager working in PHC facilities, one Perinatal Health and Genetics manager, one Integrated School Health programme assistant manager, and one nurse educator from the Henrietta Stockdale Nursing College;

Eight of the ten healthcare providers were female and two were male. All were healthcare providers with experience of antenatal PHC facilities;

Arrangements were made to suit all involved and that all the necessary equipment needed for the “in-action” Delphi, such as a data projector, files containing paper and pens, and a laptop and printer, was available. The venue was checked to ensure that it was conducive to the process, with adequate seating, noise free and well ventilated;

The researcher and the moderator welcomed the respondents. The purpose of the meeting was explained, consent to participate in the study was signed by respondents and co-signed by the researcher. They were requested not to interact with each other during the process. The respondents were also requested to be honest in their responses and not respond in order to please the researcher;

The “in-action” Delphi process was facilitated by the researcher and monitored by the moderator, who is an expert in conducting the Delphi technique, the supervisor and co-supervisor, as well as a Microsoft Excel computer expert. The fact that the moderator and an independent data-capturer was part of the Delphi process helped obtain and capture data immediately and accurately;

The process started with an overview of the results as obtained from the audits of the healthcare facilities.

3.7.2.1 Phase 1: Audit overview and consensus on aspects

A summary of the audit results was given to the respondents to help them make informed judgments on aspects that need to be included in the patient flow system (please refer to Table: 3.2 and Addendum: E).

3.7.2.2 Phase 2: Proposed aspects for a patient flow system

A sheet containing the list of aspects for a patient flow system was made available to all respondents (please refer to Table 4.1). In the first Delphi round the respondents were asked to read through the aspects and indicate “yes” if they thought all the proposed aspects for a patient flow system should be included or “no” if they disagreed. Respondents were also given the opportunity to pose written questions to clarify the assignment. The written questions were used to prevent that questions could be linked to specific respondents.

The feedbacks were then captured and the percentage consensus of those who voted "yes" *versus* those who indicated "no" was calculated. The consensus for the stated aspects was above 60%, and the researcher proceeded with the second round of the "in-action" Delphi technique. Although the consensus was 60%, the respondents were given five minutes to write down additional features that they thought should be added to the existing list of aspects.

A list containing the additional aspects was then prepared, printed and handed back to the respondents. The respondents were asked to read through the new list and indicate whether each aspect should be "included" or "excluded". The feedback was again captured and the percentage of consensus calculated. Only aspects with a 60% consensus were then added to the initial list of aspects for the patient flow system. Please refer to Table 3.5 for the updated list of aspects.

Table 3.4 Example of the list of updated aspects for the "in-action Delphi" technique

PLEASE SELECT ASPECTS FOR INCLUSION IN THE PATIENT FLOW SYSTEM		Include	Exclude
1	A trained staff member / clerk manages the patient flow system		
2	The nurse practitioner retrieves the files of all follow-up visits according to bookings for the next day, or allocates the task to the clerk at the reception counter		
3	The queue marshal/s: Directs the patients to the nurse practitioner on arrival at the clinic		
4	The enrolled nurse does observations and side room tests according to requirements for antenatal patients and completes the necessary documents		
5	The nurse practitioner performs the physical assessments of patients		
6	The nurse practitioner prescribes treatment, and also dispenses medication		
7	The queue marshal/s: First visit - Directs patients to the reception counter to open files		
8	The queue marshal directs patient to the observation room when the file is available		
9	Patients who are not visiting on scheduled dates or times, will be seen by the nurse practitioner in between the patients scheduled for follow-up visits, for example after every third patient		
10	The queue marshal/s: Manage "no shows" and late arrivals by referring to professional nurse to be managed or re-booked		
11	The queue marshal/s: Monitor the flow of patients to prevent bottlenecks		
12	Handouts in local languages, containing relevant topics regarding pregnancy and postpartum care will be given to all patients at each visit		
13	For patients that are unable to read handouts, a video containing information regarding ANC topics can be shown in the waiting area		
14	Urine specimen containers will be given to all new ANC patients and patients advised on how to collect urine at home		
15	PFS aspects should be flexible and allow for individualised facilities		
16	An identifying dress code should be prescribed for queue marshals		
17	Patients should comply with follow-up booking dates or else they will only be attended to after other patients are done		
18	A lay counsellor may fill the role of queue marshal		
19	Health talks will be done during group sessions		
20	Timeslots for first and follow-up bookings will be set		
21	Compulsory change rooms will be available in all facilities		
22	Two professional nurses should be available for ANC		
23	Patient bookings must be done in catchment area		
24	Specific urine bottles for ANC patients will be provided		
25	Information on importance of early bookings will be provided		
26	Home-based caregivers will track defaulters		
27	Size of catchment population to dictate daily staff allocation		

3.7.2.3 Phase 3: Updated aspects for a patient flow system

The respondents were asked to number (rank) the aspects according to the sequence in which they should appear on the proposed patient flow system. The feedback was captured and the consensus percentage was calculated.

A new sheet with the updated aspects was prepared. Respondents were asked to indicate whether each of these aspects should be included or excluded. The feedback was again captured and the consensus percentage calculated. The inputs from the respondents were only required up to this point.

3.7.2.4 Phase 4: Design of the patient flow system

The results obtained during the “in-action” Delphi technique pilot study were not used to design a patient flow system, as the purpose of the pilot was to test the process of the research technique.

3.8 DATA COLLECTION

Data collection must be accurate and include the systematic gathering of information which is relevant to the research purpose, specific objectives, questions and hypothesis of a study (Grove, et al., 2013, p. 691). The actual steps of collecting the data are specific to each study and depend on the research design and measurement methods. Data may be collected on subjects by observing, testing, measuring, questioning, recording, or a combination of these methods. The researcher is actively involved in this process either by collecting data or by supervising data collectors (Brink, et al., 2013, pp. 147-149; Grove, et al., 2013, pp. 394-397; Botma, et al., 2010, pp. 276-277).

Permission to conduct the study was obtained from the Research and Ethics Committee of the Faculty of Health Sciences (UFS). Please refer to Addendum: A. An ethics number was obtained on this approval. Permission to pilot the audit checklist and to use a selected group of healthcare providers as part of an “in-action” Delphi

technique was obtained from the Head of the Department of Health of the Northern Cape Province and the Manager of the Sol Plaatjie Municipality (please refer to Addendum: B and C). Signed permission letters were distributed to the district manager, area managers and facility managers to inform them of the research. The data collection was done as follows:

3.8.1 THE AUDIT OF THE SELECTED 12 ANTENATAL PHC FACILITIES

The checklist was designed after an extensive literature study of the criteria, standards, protocols and policies of antenatal PHC facilities was done (please refer to Chapter 2). The facility managers were then informed of the date and time that the researcher planned to audit the 12 facilities. The researcher pre-visited all healthcare facilities to explain the reason for auditing the facilities and also to familiarise herself with the distance between individual healthcare facilities and their unique environments.

Confidentiality was assured by using numbers instead of the names on the checklist of each antenatal PHC facility. The researcher did the visits to collect data according to a scheduled plan. Each facility manager was contacted telephonically the day before the main audit to confirm the appointment.

The day of the audit the researcher introduced herself to the healthcare staff and explained to them how the audit would be done. In most facilities, the facility manager escorted her throughout the facility, but in some facilities she had to do this on her own. After completion of the audit checklist, the researcher thanked the staff and left the facility.

3.8.2 THE “IN-ACTION” DELPHI TECHNIQUE

Based on the findings obtained during the “in-action” Delphi technique pilot study the following adjustments were made to the process to be followed.

3.8.2.1 Phase 1: Audit overview and consensus on aspects

After refection, the researcher improved the summary of the audit results used in the pilot study:

More content was added to the summary that was finally given to the respondents;

The findings of the audit were further explained to the respondents by means of a Microsoft PowerPoint presentation on the day of the Delphi technique;

A hard copy of the most important findings was also handed out to each respondent;

- The feedback on the summary of the audit was given by the moderator and not the researcher, as had been done in the pilot study.

3.8.2.2 Phase 2: Proposed aspects for a patient flow system

As stated in Chapter 1, the decision had been taken to proceed to the next round of data gathering if consensus of 60% and above was reached in any round. However, on the day of the procedure, the respondents were given five minutes to write down additional aspects that they thought should be added to the existing list of aspects. This was done due to the fact that the respondents were experienced and experts in antenatal care services and could therefore add possible additional aspects.

3.8.2.3 Phase 3: Updated aspects for a patient flow system

In both the pilot and the main study the respondents were asked to number (rank) the updated aspects according to the sequence in which they should appear in the patient flow system. During the pilot study consensus was reached on this point during this round (please refer to Table: 4.3).

However, in the main study the list containing updated aspects including more statements than had been the case in the pilot study, and the consensus calculation ranged between 9-45% for each of the aspects. Due to time constraints, the moderator, researcher and data-capturer decided to proceed to the next round, and to

determine whether an option to “include” or “exclude” each of the aspects would provide better results from the respondents (please refer to Addendum: M).

3.8.2.4 Phase 4: Design of the patient flow system

The researcher used the feedback of the respondents during the “in-action” Delphi to design the patient flow system. Please refer to Diagram 4.1 to view the flow chart of the patient flow system.

3.9 DATA ANALYSIS

Two sources of data were analysed. The first source of data was the audit checklist, prepared as a Microsoft Excel spread sheet. The audit checklist captured data from the 12 antenatal PHC facilities. [Yes] and [No] responses were captured and the percentage frequencies calculated in Microsoft Excel. The researcher and supervisor checked the correctness of the calculations afterwards. Results from the audit were used to list aspects to be included in the patient flow system and these were then explored in the “in-action” Delphi technique.

The second source of data was obtained from the “in-action” Delphi technique process in which 21 respondents participated. Individual responses on the aspects in the proposed patient flow system were copied from individual investigation sheets to frequency tables in Microsoft Excel. From the frequency tables, consensus was calculated as a percentage of consensus on each of the aspects in the different “in-action” Delphi technique phases.

Table 3.5: Example of the data capturing and analysis: Audit checklist

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SCHOOL OF NURSING

DATA ANALYSIS OF AUDITS DONE IN ANTENATAL PHC FACILITIES

Facility number		

Please indicate whether the following aspects are met or not met by an antenatal PHC facility by marking either **YES = [✓] or NO = [X]** in the applicable column. Comments could be added to the third column if required.

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
1.	PATIENT FLOW SYSTEM																												
1.1	Is there a patient flow system in place?		X	X			X	X			X	X		X		X		X		X		X			X	8	66.6%	4	33.3%
1.2	Is the largest percentage of the patients that arrive at the clinic scheduled for an appointment?		X	X		X		X		X			X	X		X		X		X		X		X		10	83.3%	2	16.6%

3.10 RELIABILITY AND VALIDITY

In quantitative research, the quality of a study can be ensured and assessed by means of the concepts reliability and validity.

According to, Brink et al. (2013, pp. 163-165), Salkind (2003: 179-180) cited by (Delport & Roestenburg, 2011, p. 177) and Neuman and Kreuger (2003: 179-180) cited by (Delport & Roestenburg, 2011, pp. 177-180), there is no point in using an instrument that is not valid and reliable.

In this study the researcher endeavoured to ensure rigor by strictly executing the research process as stipulated in the research proposal. The steps prescribed for the process of the "in-action" Delphi consensus technique ensured that control was attained during data gathering. An audit checklist was compiled and used to identify the criteria, standards, protocols and policies of the healthcare facilities that would be required to develop a patient flow system. Possible bias during the "in-action" Delphi technique was addressed by using a moderator for data gathering, and a Microsoft Excel expert to capture and analyse data after each phase in the process. Furthermore, healthcare providers (experts) evaluated the list of proposed aspects to be included in the patient flow system and add additional aspects for the design of the PFS system during the "in-action" Delphi technique.

3.10.1 RELIABILITY

Reliability refers to the consistent outcome of findings a valid measurement instrument every time it is applied. This means that if different groups are measured under the same circumstances by different assessors, the results should be similar (Delport & Roestenburg, 2011, p. 177; Botma, et al., 2010, p. 177). For this study two aspects of reliability were adhered to, namely stability and internal consistency.

Stability of a research instrument refers to its consistency when used over a period time. Therefore, the stability of this study's instrument was enhanced by using the same audit checklist for the audit of each clinic, as well as ensuring that the researcher

was the only person who did the data collection. Reliability was further improved by using an expert in the Delphi technique to assist the researcher. Lastly, two co-coders monitored the “in-action” Delphi technique, while the Microsoft Excel specialist captured and analysed the data in real time during the process (Brink, et al., 2013, pp. 169-170) Internal consistency refers to the extent to which all items on the instrument measure the same variable (Brink, et al., 2013, pp. 169-170). Internal consistency, also known as “homogeneity”, was applied throughout the study by utilising the same items on the audit checklist to measure variables and secondly, by asking the same research question to all respondents during the single “in-action” Delphi technique process that was held.

3.10.2 VALIDITY

Validity is used to enhance rigour in quantitative research. Validity refers to whether the outcome of a study is acceptable, based on the research design and interpretation of the results (Polit & Beck, 2012, p. 745). In addition, Botma et al. (2010, p.174) define validity as: “… *the approximate truth of interference*”, meaning the degree that an instrument represents a true value. The validity of the research design is measured on the basis of internal and external validity.

3.10.2.1 Internal validity

Internal validity as a concept broadly deals with whether an instrument measures what it is supposed to measure, in order to give truthful and factual findings (Polit & Beck, 2012, p. 236). The identified threats to internal validity include history, maturation, testing, instrumentation, mortality, demoralisation and selection bias (Botma et al., 2010, p.100). Furthermore, the authors elaborate that there are different types of instrument validity such as content validity, face validity, criterion-related validity and construct validity.

For the purpose of this study only content and face validity need be discussed.

3.10.2.2 Content validity

According to Brink et al. (2013, p. 166) content validity is concerned with how well an instrument represents all the components of the variable to be measured. In addition, Polit and Beck (2012, p. 723) advise novice researchers to rather use an existing instrument than develop a new one which can be complex. Content validity is also a judgement process by experts in the field to assess the content for comprehensiveness and appropriateness. This validity has been spelled out clearly by Delport and Roestenburg (2011, p. 173) that: "... *a valid measure would provide an adequate, or representative sample of all content, or elements, or instances of the phenomenon being used".*

For this study, the researcher did an extensive national and international literature review by using electronic sources, books and journals as well as existing legal frameworks, including South African legal criteria, standards, protocols and policies provided by the Department of Health to develop and formulate questions for the audit checklist. The audit checklist was reviewed by the research supervisors, five expert members of the Research Evaluation Committee, as well as the Research and Ethics Committee of the Faculty of Health Sciences (UFS). The checklist was also piloted in one of the 12 designated healthcare facilities and thereafter refined. Only minor modification was required (please refer to point 3.7.1).

The questions in the audit checklist were based on a summary of the reviewed literature. Thus the content validity was enhanced by three sources, namely literature, the input of the content experts, and the representation of the relevant population.

3.10.2.3 Face validity

Face validity means that an instrument has the appearance of measuring the construct that it was supposed to measure. Although it is no longer considered the only acceptable evidence for validity, face validity is still determined by the willingness of the respondents to answer the questions asked by the. Face validity can also be described as the simplest and weakest, but most understandable kind of validity. It also refers to the extent to which a measuring tool measures what it is supposed to

measure. Therefore, it is based on the intuitive judgement of experts in the field. Face validity does not always have strong proof, but it is helpful to convince people to participate in the study. A researcher often finds the process useful in the instrument development process with regard to readability and clarity of the content, but should not be considered as an alternative for other types of validity (Brink, et al., 2013, p. 166; Polit & Beck, 2012, p. 366; Botma, et al., 2010, p. 177).

In this study, the supervisors agreed that both the audit checklist and the “in-action” Delphi technique questions appeared logic, clear and understandable, and therefore valid.

3.11 ETHICAL CONSIDERATIONS

Ethical issues arise at all stages in the research process (Brink, et al., 2013, pp. 34-35; Botma, et al., 2010, p. 177). Nursing research is bounded by ethical principles that guide the judgements of professionals within their health practices.

The ethical considerations that were adhered to throughout the research process for this study are summarised below:

- Document ECUFS NR: 67/2014 was allocated to indicate that permission to conduct the research was given by the Research and Ethics Committee of the Faculty of Health Sciences (UFS).
- The researcher requested permission to conduct the research in antenatal PHC facilities from the Head of the Department of Health, Northern Cape and also from the manager of the Sol Plaatjie Municipality.
- The basic principles of respect for people, beneficence and justice were honoured throughout the research study (Polit & Beck, 2012, pp. 150-167; Botma, et al., 2010, p. 3).
- The respondents were informed of the nature of the study before written consent was given:
    - Confidentiality was assured by not linking personal information or the name of the facility to the findings or the outcome of the research. Facilities was

numbered and not named. The respondents were assured that personal information would not appear in the dissemination of results either through reports or publication;

- Assurance was given that no risks were associated with the study, as it is a non-experimental analysis;
- In addition, respondents were informed that there were no cost implications in taking part in the research and that no remuneration was offered during the study;
- The respondents were assured that they could withdraw at any time, without penalty from the researcher.

- The principle of beneficence was adhered to by treating all the respondents with respect, fairness and constantly providing a conducive environment (Brink, et al., 2013, p. 36).
- The principle of justice was adhered to by selecting the respondents according to their expertise and not only their availability. In order to refine the patient flow system, the respondents had to be knowledgeable about the organisation and PHC facilities:
  - The respondents had the right to expect that the information collected would be treated as confidential. Anonymity could not be assured due to the fact that “in-action” Delphi technique was used, with all the respondents present at one time. However, no recorded responses could be traced to a specific respondent. Opportunities to pose questions regarding the given tasks during the “in-action” Delphi process were done in writing. Although the researcher was familiar with the identities of the respondents, each respondent’s feedback was protected by a numerical code;
  - The researcher kept to the date and time arranged for the “in-action” Delphi technique as communicated to respondents, and no unexpected changes were required during the process.

The researcher acknowledged the key persons that supported and guided her with the research process, namely the research supervisor, co-supervisor, moderator, the Microsoft Excel expert and the librarian involved with the research (please refer to the heading “Acknowledgements”).

3.12 CONCLUSION

In this chapter a detailed description of the research methodology was given. The study design, pilot study, population, sampling method, data collection, and the validity, reliability and ethical considerations of it was discussed. This has been done to demonstrate that the researcher carefully planned the data collection process; and was able to collect applicable data from 12 antenatal PHC facilities, using a specifically compiled audit checklist. Further data was collected during the “in-action” Delphi technique process, run with 21 knowledgeable professional nurses as respondents. The researcher was then able to collate and analyse the data.

In Chapter 4 a detailed discussion of the process of data analysis and findings will follow.

CHAPTER 4
DATA ANALYSIS

4.1 INTRODUCTION

The research design and methodology relating to the research questions, aims and objectives, the data collection processes and other important issues such as data analysis and ethical considerations followed during the execution of the study were discussed in Chapter 3. In Chapter 4 the results of the checklist to audit the antenatal PHC facilities and the data collected through the "in-action" Delphi technique will be described.

Data analysis can be defined as "*The systematic organization and synthesis of research data and, in quantitative studies, the testing of hypotheses by using those data"* (Polit & Beck, 2012, p. 725). Furthermore, the same authors state that statistical procedures and percentages are normally utilised in order to interpret and communicate quantitative results. In this study the researcher used descriptive statistics to organise the data in meaningful ways, and employed percentage distributions to present the study data of both the audit checklist, and the "in-action" Delphi technique.

Tables and pie charts were used to communicate the results and to depict the interpretations of percentage distributions. Different colours were used in the tables and pie charts to clarify the results for the reader. The final patient flow system designed by the researcher, based on the results, is presented as a diagram (please refer to Diagram 4.1).

4.2 AIM AND OBJECTIVES OF THE STUDY

The aim of the study was to develop a patient flow system for antenatal PHC facilities in the Frances Baard District, Northern Cape Province. According to the researcher, the results obtained through the different processes mentioned in the study finally supported the aim of the research. The objectives that had been stated were to identify

the legal frameworks (criteria, standards, protocols and policies) of the NDoH for antenatal PHC facilities, to compile an audit checklist, to audit the facilities and, finally, to reach consensus on a patient flow system proposed by the researcher.

4.3 ANALYSIS AND PRESENTATION OF RESULTS

Two sources of data were analysed in the study. The first source of data was an audit checklist prepared as a Microsoft Excel spreadsheet. The audit checklist was used to capture data from the 12 antenatal PHC facilities. “Yes”, and “No” responses were used to indicate the answers to the questions on the checklist. These responses were then automatically converted to frequencies and percentage using Microsoft Excel. The results of the audit were applied to design a list of aspects to be included in the patient flow system. These aspects were then further explored by the “in-action” Delphi technique.

The second source of data was data obtained through the “in-action” Delphi technique. Twenty-two respondents participated in the “in-action” Delphi technique. Individual responses on the aspects that presented the proposed patient flow system were copied from individual data sheets to frequency tables in Microsoft Excel. The frequency tables were then used to calculate consensus among the respondents as percentages. Consensus on how the aspects for the patient flow system were obtained has been described in Chapter 3.

4.4 DISCUSSION OF RESULTS

The results of the audits performed in the 12 antenatal PHC facilities and the data collected during the “in-action” Delphi technique process will now be discussed, as indicated.

4.4.1 RESULTS OF THE AUDITS

The results of the audits are discussed under the 12 main headings, as listed in the audit checklist: Patient flow system, Accessibility, Reception area, Waiting rooms, Human resources, Material resources, Medical equipment, Linen, Scheduling, Other,

and Criteria, standards, protocols and policies (Please refer to Table 3.1 and Addendum F).

4.4.1.1 Patient flow system

The researcher noted that five (41.6%) of the healthcare facilities did not have a patient flow system in place and that bottlenecks were experienced in five (41.6%) of the facilities. All the healthcare facilities (n=12) do not schedule healthcare users for visits according to specific timeslots. It is noted that eight (66.6%) of PHC facilities do not have a triage system in place.

4.4.1.2 Accessibility: Signage and transport

Signage indicating access routes outside and inside the facilities was in place in nine (n=9: 75%) of the PHC facilities. The fact that routes were indicated enabled both healthcare users and healthcare providers to locate health service delivery points quickly and easily, and therefore comply with National Core Standards (NCS) infrastructure requirements. However, 25% (n=3) did not comply. Only six (n=6: 50%) of the facilities do not have strategies in place to handle patient "no shows[3]", and late arrival of patients.

When scheduling healthcare users for follow-up visits, a high percentage of 83.3%, (n=10) of PHC facilities did not take into account the mode of transport of patients. This might lead to late arrivals and "no shows", and subsequently lead to overcrowded healthcare facilities, with defaulters ending up with complications during their pregnancy. Although the study did not measure the distance that healthcare users had to walk to the PHC facilities, it could be considered as a factor that possibly could have an impact on patients' non-compliance to the scheduled dates.

[3] "No shows" refer to antenatal patients booked for follow-up visits but did not turn up for the appointment.

4.4.1.3 Reception: Signage, staff and files

Five of the healthcare facilities (75%) experienced bottlenecks in the flow of patients at the following areas: Reception, waiting room, observation room, consultation room and the pharmacy.

Nine clinics (75%) met three aspects related to the reception area, namely the presence of visible signage, sufficient numbers of staff to manage reception, and the availability of the patients' files on their arrival. The minority (n=3: 25%) did not comply. It could therefore be concluded that although certain clinics do need to improve the quality of service in this regard, the majority of clinics effectively manage those activities related to the reception area.

4.4.1.4 Waiting area: Signage and seats

In this study 58.3% (n=7) of signage was observed at the waiting areas. More than half (n=7: 58.3%) do not have enough seats in the waiting areas to accommodate all the patients, which inevitably led to a bottleneck (n=8: 66.6%). Prolonged standing is not ideal for pregnant women, as to hypotension and hypoglycaemia can develop due to physical and hormonal changes in their bodies (Murray, 1999, pp. 172-175).

4.4.1.5 Rooms: Consultation and change rooms

Although all the antenatal PHC facilities (n=12: 100%) had one separate room for antenatal consultations, none of them had a separate change room where antenatal patients can undress, put on a gown, and re-dress again after the consultation. The fact that change rooms are not available could cause a delay or bottleneck, which might increase time spent in the consultation room, as this is the only dressing space available for patients.

4.4.1.6 Human resources

Human resources included the presence of professional nurses, queue marshals, pharmacists or pharmacy assistants, enrolled nurses, general assistants (cleaners) and administration clerks in the facilities.

A major concern with regard to human resources was that 11 of the PHC facilities (91.6%) experienced a shortage of PHC trained professional nurses. Only four facilities (33.3%) had nursing assistants available. Furthermore, the audits also showed that 11 (91.6%) of the 12 facilities did not have a queue marshal to organize queues and direct patients to the appropriate areas of healthcare. Another observation was that three (n=3: 25%) of the healthcare facilities did not have administrative clerks to help with patient records. In these cases, the professional nurses rendering antenatal care first to open first visit files for ANC patients. It was further noted that half the number of facilities (n=6: 50%) did not have general assistants to do cleaning. In addition, only five of PHC facilities (41.6%) had staff trained to implement the NDoH triage coding correctly. It is therefore most likely that healthcare users with complications are not being attended to in time, and that they can get lost in the patient flow, and ultimately increase waiting times (SATS, 2012).

4.4.1.7 Material resources: Computers, printers, Internet access and telephones

It was established that a high percentage (n=10: 83.3%) of the PHC facilities did not have access to computers, printers, Internet, fax lines and telephones. This result is quite concerning as the limited availability of technology may signify poor management of all facets of patient recording (Mahmud, et al., 2013, p. 7).

Another finding was that none of the clinics had a telephone in the ANC consultation room. It definitely poses a threat to direct communication with other healthcare providers in case of emergencies (Mahmud, et al., 2013, p. 7). Another observation was that some facilities (n=8: 75%) did not have a central point or reception area where all patient records are kept.

4.4.1.8 Medical equipment: Instruments and disposables

All the PHC facilities did not have sufficient medical equipment to render proper healthcare services, including thermometers (n=6: 50%); Glucometers (n=9: 75%); scales, adult (n=5: 416%); Baumanometers (n=2: 16.6%); foetus scopes (n=1: 8.3%); emergency trolleys n=2: 16.6%) and emergency drugs (n=1: 8.3%). All the facilities (n=12: 100%) were in possession of urine test sticks, stethoscopes, syringes and needles, however.

Further findings were that, according the audit checklist results six (n=6: 50%) of the antenatal PHC facilities did not have sterile packs available for emergency deliveries. This poses a dire threat to both patient and new-born, including a high risk of infection and poor asepsis. According to the NDoH guidelines for maternity care, all pregnant women are entitled to be treated in a clean and safe environment. Therefore all healthcare providers should have knowledge, skills and equipment to perform clean and safe delivery (DoH, 2012 - 2016; DoH, 2007, p. 7).

4.4.1.9 Linen: Gowns

The audit done revealed that seven (n=7: 58.3%) of the antenatal PHC facilities had gowns for patients to wear during the physical examination, although in five (n=5: 41.6%) patients were exposed to improper clothing during examination, which can compromise their privacy. Patients have the right to be treated with respect and dignity (DoH, 2008).

4.4.1.10 Scheduling: Staff allocation

All PHC facilities (100%) indicated that they experienced peak times on specific days and during specific times of the day. Only two of the facilities (16.6%) allocated staff according to their peak times. Legally staff should be allocated according to the patient-nurse ratio 1-35 (DoH, 2001).

4.4.1.11 Other

All PHC facilities had reliable patient transport services available for emergency transfers to hospital.

4.4.1.12 Legal frameworks: Criteria, standards, protocols and policies

All the facilities (n=12: 100%) were compliant with the requirements of the NDoH legal framework, namely that the documents “Guidelines for Maternity Care in South Africa, 2007” and “Saving Mothers 2008-2010” were available to staff in order to render the required quality antenatal care (DoH, 2012 - 2016; DoH, 2007, p. 2).

4.4.2 “IN ACTION” DELPHI TECHNIQUE

A three-part discussion of the results of the “in-action” Delphi technique will follow next. The first part includes the demographic profile of the respondents, followed by the results of data sheets that contain the aspects for the patient flow system, and the final patient flow system.

4.4.2.1 Demographic information of respondents

The demographic information of the respondents (n=21) is discussed under gender, age, ethnic group, home language, professional qualifications and areas of employment.

4.4.2.1.1 Gender

All the respondents (n=21: 100%) were female. Although the number of male nurses in the PHC had increase over the past years, female nurses are still in the majority. In the nursing profession it is still common that females dominate the field (Vere-Jones, 2008).

4.4.2.1.2 Age

The ages of the respondents in the “in-action” Delphi technique process are depicted in Figure 4.1.

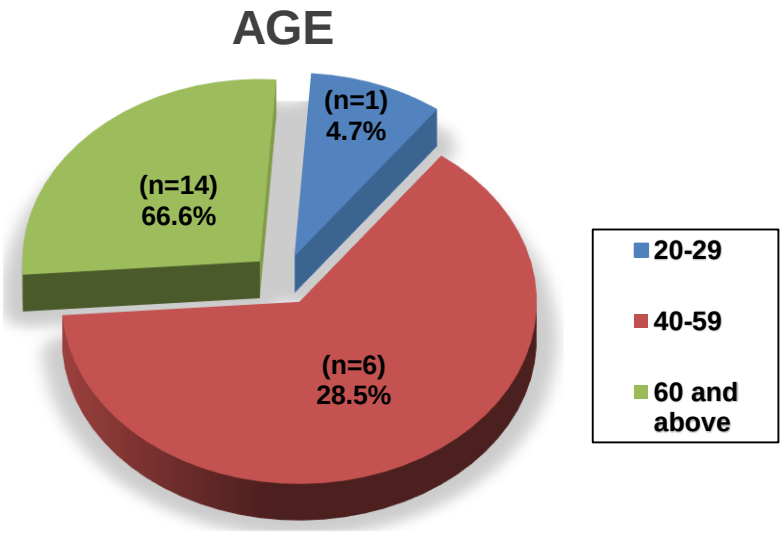

Figure 4.1: Age distribution of respondents in the “in-action” Delphi technique

The lowest number of respondents (n=1: 4.7%) was in the age category between 20-29 years, whereas the majority of the respondents (n=14: 66.6%) were between ages 40-59 years, and six (n=6: 28.5%) were 60 years and older. Median age results correlated with SANC statistics which indicate that the majority of practising professional nurses are between 40-59 years of age (South African Nursing Council - Under the provisions of the Nursing Act, 2005, 2014).

4.4.2.1.3 Ethnic groups

The ethnic group distribution of the respondents in the “in-action” Delphi technique are reflected in Figure 4.2.

The majority of the respondents (n=10: 47.6%) represent the black ethnic group, with the coloured ethnic group (n=7: 33.3%) as the second highest and the white ethnic group as the lowest number (n=4: 19%).

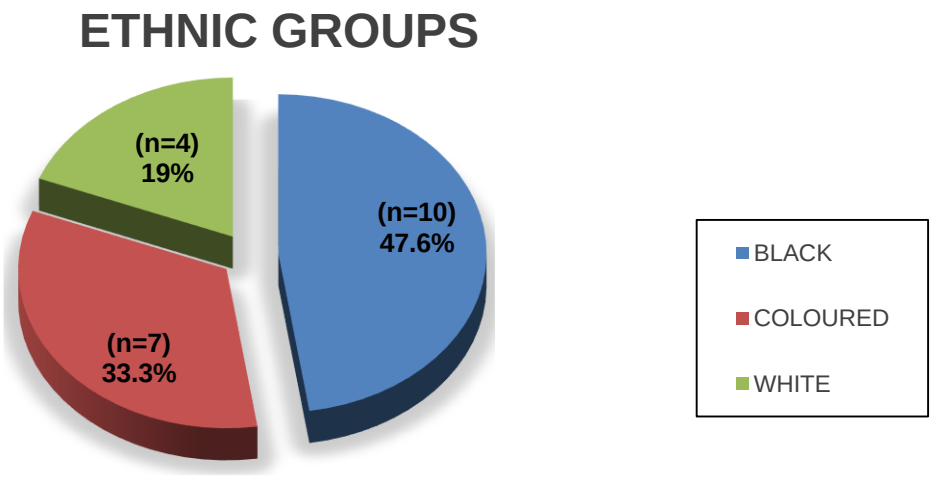

Figure 4.2: Ethnic groups of the respondents

According to the mid-year report of SA Statistics, the black ethnic group represents 80.2% of the population proportion in the Northern Cape (South Africa Statistics, 2014, p. 7). Legally the requirement is that employees should represent the proportion of the population and therefore black employees are in the majority (Employment Equity Act, 1998).

4.4.2.1.4 Home Language

Although Setswana and Afrikaans are mostly spoken by the population in the Northern Cape, English is the language of business, even so in the healthcare services (DoH, 2014).

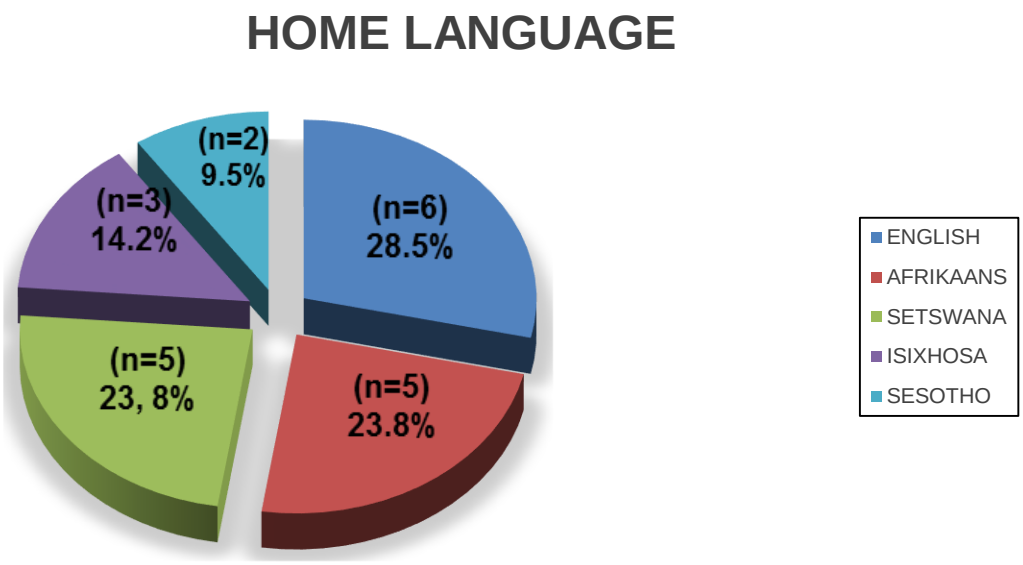

Figure 4.3: Home language of the respondents

In Figure 4.3, 28.5% (n=6) of the respondents selected English as language of preference, 23.8% (n=5) Afrikaans, 23.8% (n=5) Setswana, 14.2% (n=3) IsiXhosa and 9.5% (n=2) Sesotho. All the respondents were selected to participate in the "in-action" Delphi based on the fact that they were able to speak and write English.

4.4.2.1.5 Professional qualifications

The respondents either had a diploma or a degree in nursing as indicated in Figure 4.4.

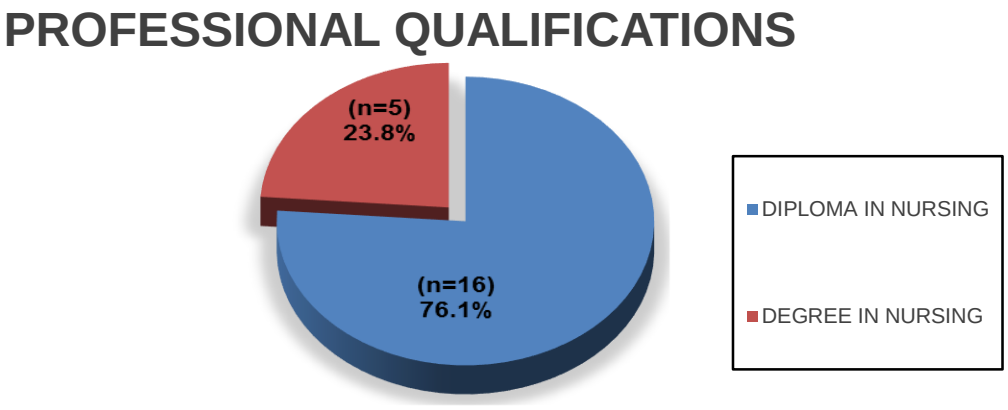

Figure 4.4: The professional qualifications of the respondents

The majority of respondents (76%: n=16) indicated that they had a diploma in nursing science. Only 24% (n=5) indicated that they held a degree in nursing science.

4.4.2.1.6 Nursing positions filled by the respondents

Respondents filled different positions in the healthcare setting, as depicted in Figure 4.5.

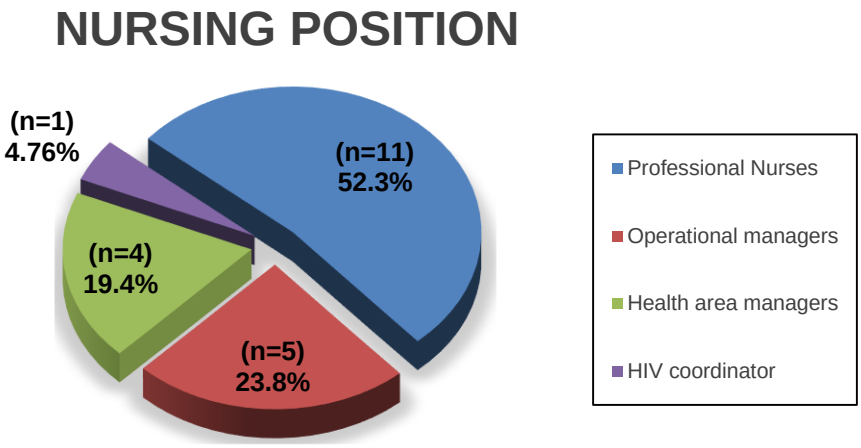

Figure 4.5: Nursing positions filled by the respondents

Figure 4.5 illustrates that all respondents were appointed as professional nurses (100%: n=12), but that they filled different positions, as follows: 52.38% (n=11) were professional nurses rendering antenatal care; 23.8% (n=5) were operational managers; 19.4% (n=4) were health area managers, and only one was a HIV coordinator (n=1: 4.76%).

4.4.2.1.7 Area of employment

The respondents were from different areas such as urban or rural settings, while some had worked in both urban and rural areas, as indicated in Figure 4.6.

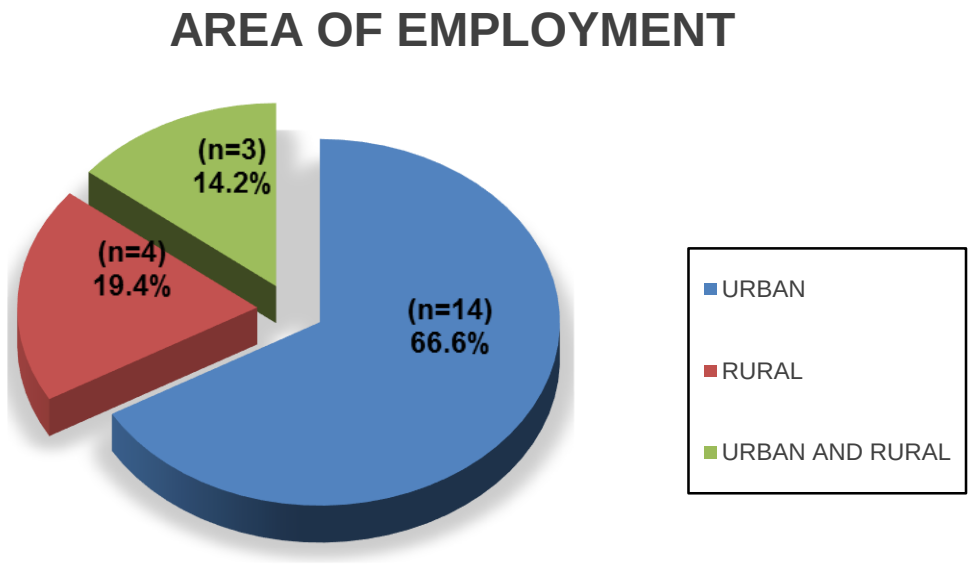

Figure 4.6: Working area of employment of the respondents

The majority of respondents (n=14: 66.6%) were employed in healthcare facilities in the Frances Baard urban area. Nineteen percent (n=4: 19%) were employed in the rural area, while 14.3% (n=3) were employed in both urban and rural areas. Included among the respondents who had worked in both areas were three of the health area managers, who travel between the urban and rural facilities that were allocated to them.

To follow for discussion are the results of the data sheets that were compiled during the “in-action” Delphi technique process.

4.4.2.2 The results of data sheets that contain the aspects for the patient flow system

The data analysis of the “in-action” Delphi technique process was done in three different phases, with each phase represented in a table. The consensus seeking target was set at 60% and above. The process was managed by the researcher, a facilitator and Microsoft Excel expert, who calculated the data percentages of consensus.

Although 21 respondents signed consent to participate in the “in-action” Delphi technique process, it was only realized at the end of the data capturing and analysis that an extra respondent had participated. It could have happened that, during the time slot in the sub-district meeting allocated to the “in-action” Delphi technique, an additional member of the committee had joined and participated unnoticed. This was not noticed earlier due to the large number of respondents. The process could not be repeated due to time constraints and the fact than the same group was required later, as this would have influenced the data.

The researcher had explained the rules for “in-action” Delphi technique process to the group of respondents, such as that no verbal communication was allowed. However, a blank sheet of paper was given to them to write down their questions after each instruction given throughout the process. The questions were finally collected, read aloud and then addressed.

The technique phases are described under the following headings:

4.4.2.2.1 Phase 1

A hard copy summary of the results of the audits that had been done was given to each respondent. The researcher explained the results, as given to the respondents. They were then allowed an opportunity to ask written questions about the results, to prevent possible bias through linking questions to specific respondents. The questions were again collected and addressed.

4.4.2.2.2 Phase 2: Round 1a

In this phase each respondent (n=21) was given a data sheet containing a list of 14 proposed aspects for the PFS (please refer to Table 4.1). They were asked to indicate only whether the list was complete or not (please refer to Chapter 3, Phase 1). The sheets with their responses were collected and the Microsoft Excel expert calculated the percentages. The consensus results were as indicated at the bottom of Table 4.1.

Table 4.1 Responses on the list of proposed aspects for a patient flow system

ANALYSIS OF ***YES / NO*** IF RESPONDENTS AGREE / DISAGREE THAT THE LIST OF ASPECTS DERIVED FROM AUDITS IS COMPLETE FOR THE PFS	
1	Trained staff/clerk to manage patient flow system
2	Nurse practitioner retrieves files of all follow-up visits according to bookings for the next day or allocates task to the clerk at reception counter
3	Queue marshal/s: - Direct clients to nurse practitioner on arrival at the clinic
4	Nurse practitioner does observations and side room tests according to requirements for antenatal clients and documents to be completed
5	Nurse practitioner does physical assessment
6	Nurse practitioner prescribes treatment and also dispenses medication
7	Queue marshal\s: - First visit- Direct clients to the reception counter to open files
8	Direct clients to observation room, when file is available
9	Clients that are not visiting according to scheduled date or time, are seen by nurse practitioner in between clients scheduled for follow-up visits, for example after every third client
10	Queue marshal\s: - Manage “no shows” and late arrivals by referring to professional nurse, to be managed or re-booked
11	Monitor flow of clients to prevent bottlenecks
12	Hand-out of relevant flyers with topics regarding pregnancy and post-partum care to be given at each visit to the ANC client, in the local languages
13	For clients who cannot read, a video with information regarding ANC topics can be played in the waiting area
14	Urine specimen containers are to be given to all new ANC clients, and they must be advised on how to collect urine at home

		Consensus ≥ 60%	
Counted and calculated responses:	YES	14	66.6%
	NO	7	33.3%

Fourteen respondents (n=14: 66.6%) agreed that the proposed list of aspects was a complete list, versus seven (n=7: 33.3%) who disagreed. The consensus was above 60% and therefore the decision to include the list in the final PFS was taken.

4.4.2.2.3 Phase 2: Round 1b

Although consensus was reached on the proposed list of aspects for the patient flow system in Phase 2 Round 1a, respondents were given the opportunity to write down additional aspects they felt needed to be added. Fifteen additional aspects were suggested. A sheet with the list of additional aspects was given to each respondent (n=22) to indicate whether the additional aspects should be included or excluded. The percentage thereof was calculated and is depicted in Table 4.2.

Table 4.2 Additional aspects for the patient flow system

ANALYSIS OF THE **INCLUDE / EXCLUDE** OF ADDITIONAL ASPECTS FOR THE PATIENT FLOW SYSTEM		Include	Exclude	Include %	Exclude %
1	Individualised or flexible PFS criteria for individual clinics	20	2	91%	9%
2	Standardised PFS criteria in all clinics	13	9	59%	41%
3	Dress code for queue marshals	20	2	91%	9%
4	Patients must comply with dates, otherwise they will only be seen after all other patients have been done?	17	5	77%	23%
5	Lay counsellor may fill role of queue marshal	15	7	68%	32%
6	Group session health talks	21	1	95%	5%
7	Timeslots for first and follow-up bookings	17	5	77%	23%
8	Compulsory change rooms in all facilities	20	2	91%	9%
9	Two professional nurses for ANC	20	2	91%	9%
10	Patient bookings in catchment area	17	5	77%	23%
11	Specific urine bottles for ANC patients	17	5	77%	23%
12	Issuing of information on the importance of early booking	22	0	100%	0%
13	Home based caregivers to track defaulters	21	1	95%	5%
14	Extended hours for ANC services	3	19	14%	86%
15	Catchment population to influence size of staff allocation	19	3	86%	14%

Although the respondents suggested 15 additional aspects, consensus was reached on only 13 of them. Percentages of aspects that are highlighted in green represent the aspect that was agreed upon to be included in the PFS. The [following] two aspects that are highlighted in orange scored < 60% and were excluded:

Standardised PFS criteria in all clinics (59%)

Extended hours for ANC services (14%)

The scoring of the aspects for the patient flow system is discussed from the highest score to the lowest. Issuing of information on the importance of early bookings scored 100%. Whereby both group sessions health talks, as well as home-based caregivers to track defaulters scored 95%. Further, individualised or flexible PFS criteria for individual clinics, dress code for queue marshals, compulsory change rooms in all facilities and two professional nurses for ANC scored 91%. Furthermore, the catchment population to influence size of staff allocation, scored 86%. The following aspects namely, patients must comply with dates otherwise they will only be seen after all patients have been done, timeslots for first and follow-up bookings, patient bookings in catchment area and specific urine bottles for ANC patients scored 77%. Lastly, lay counsellor may fill role of queue marshals scored 68%.

The 13 additional aspects on which consensus was reached was combined with the 14 original proposed aspects. A sheet with the updated list of 27 aspects was then compiled and explored in Phase 3 of the study.

4.4.2.2.4 Phase 3

During this phase, the ranking of the 27 aspects and the selection of the aspects to be included in the final PFS was executed.

Ranking of aspects

A sheet with the 27 aspects was given to each respondent. The researcher instructed the respondents to rank the aspects according to the sequence in which they think they should appear in the PFS. After the respondents ranked the aspects in the

sequence of their choice, the Microsoft Excel expert calculated the frequencies for each aspect. The percentage per aspect was then calculated by taking the highest frequency, divided by the number of respondents and multiplied by percentage, for example: 8÷22×%=36% (please refer to Table 4.3).

Table 4.3: **Ranking results of the updated list of aspects for the PFS**

PLEASE **NUMBER** THE ASPECTS ACCORDING TO THE SEQUENCE YOU THINK THEY SHOULD APPEAR IN THE PATIENT FLOW SYSTEM		Number	%
1	Trained staff / clerk to manage patient flow system	8	36%
2	Nurse practitioner retrieves files of all follow-up visits according to bookings for the next day or allocates task to the clerk at reception counter	6	27%
3	Queue marshal/s: - Direct clients to nurse practitioner on arrival at the clinic	7	32%
4	Nurse practitioner does observations and side room tests according to requirements for antenatal clients and documents to be completed	8	36%
5	Nurse practitioner does physical assessment	10	45%
6	Nurse practitioner prescribes treatment and dispenses medication	8	36%
7	Queue marshal\s: First visit - Direct clients to the reception counter to open files	6	27%
8	Direct clients to the observation room when file is available	5	23%
9	Clients that are not visiting on a scheduled date or time, will be seen by the nurse practitioner in between clients scheduled for follow-up visits (for example after every third client)	3	14%
10	Queue marshal\s: Manage “no shows” and late arrivals by referring to the professional nurse, to be managed or re-booked	4	18%
11	Monitor flow of clients to prevent bottlenecks	6	27%
12	Hand-out of relevant flyers with topics regarding pregnancy and postpartum care to be given to each ANC client in local languages during every visit	3	14%
13	For clients who cannot read, videos with information regarding ANC topics can played in waiting area	4	18%
14	Urine specimen containers will be given to all new ANC clients and they will be advised on how to collect urine at home	4	18%
15	Individualised or flexible PFS criteria must be developed for clinics	3	14%
16	Identifying dress code prescribed for queue marshals	3	14%
17	Patients must be urged to comply with follow-up booking dates, or else the patient is only helped after all other patients are done	3	14%
18	Lay counsellor may fill the role of the queue marshal	4	18%
19	Group session health talks will be given	4	18%
20	Timeslots for first and follow-up bookings will be set	5	23%
21	Change rooms will be available in all facilities	4	18%
22	Two professional nurses will be available for ANC	4	18%
23	Patient bookings must be done in catchment area	3	14%
24	Specific urine bottles will be provided for ANC patients	3	14%
25	Information on importance of early bookings will be stressed	4	18%
26	Home based caregivers will track defaulters	4	18%
27	Catchment population size to influence staff allocation	2	9%

The highest percentage score was 45% and the lowest 9%. The aspect that score the highest (45%) was that of: Nurse practitioner does the physical assessment, followed by 36% for: Trained staff/clerk to manage PFS; Nurse practitioner retrieves files of all follow-up visits according to bookings for the next day or allocates task to the clerk at reception counter; Nurse practitioner prescribes treatment and dispenses medication. Queue marshal/s: - Direct clients to nurse practitioner on arrival at the clinic, scored 32%. Nurse practitioner retrieves files of all follow-up visits according to bookings for the next day or allocates task to the clerk at reception counter; Queue marshal/s: First visit - Direct clients to the reception counter to open files, and Monitor flow of clients to prevent bottlenecks scored 27%. Queue marshal\s: Direct clients to the observation room when file is available scored 23%. The following aspects scored 18%: Queue marshal\s: Manage “no shows” and late arrivals by referring to the professional nurse, to be managed or re-booked; For clients who cannot read, videos with information regarding ANC topics can played in waiting area; Urine specimen containers will be given to all new ANC clients and they will be advised on how to collect urine at home; Lay counsellor may fill the role of the queue marshal; Group session health talks will be given; Change rooms will be available in all facilities; Two professional nurses will be available for ANC; Information on importance of early bookings will be stressed, and Home based caregivers will track defaulters. The following aspects score 14%: Individualised or flexible PFS criteria must be developed for clinics; Hand-out of relevant flyers with topics regarding pregnancy and postpartum care to be given to each ANC client in local languages during every visit; Individualised or flexible PFS criteria must be developed for clinics; Identifying dress code prescribed for queue marshals; Lay counsellor may fill the role of the queue marshal; Patient bookings must be done in catchment area, and Specific urine bottles will be provided for ANC patients. Lastly: Catchment population size to influence staff allocation scored 9%.

All aspects scored < 60% and therefore agreement was not reached on the sequence in which each of the aspects should appear in the PFS. Possible reasons why consensus was not reached could include the time constraint and effort to keep within the three-hour timeslot as agreed upon; too many aspects that had to be ranked; and the larger group of respondents that increased the time data capturing and calculations took. In addition, the different points of views of the respondents could also be a

reason, based on individual challenges at their facilities such as infrastructure, human resource shortages, and lack of medical and material resources.

Selection of aspects for inclusion

A sheet with the updated aspects was next given to each respondent. This time they were instructed to indicate whether each aspect should be included or excluded from the final PFS. Respondents' feedback was captured and the percentage for each aspect was calculated (please refer to Table 4.4).

Consensus was reached on all the aspects, except the following two that averaged at< 60%.

Lay counsellors may fill the role of a queue marshal
Specific urine bottles be available for ANC patients.

The remaining 25 aspects were taken in consideration for the final PFS.

Table 4.4 Analysis of aspects selected for final Patient Flow System

PLEASE SELECT ASPECTS FOR INCLUSION INTO THE PFS		Include	Exclude	Include %	Exclude %
1	A trained staff member / clerk manages the patient flow system	21	1	95%	5%
2	The nurse practitioner retrieves the files of all follow-up visits according to bookings for the next day, or allocates the task to the clerk at the reception counter	20	2	91%	9%
3	The queue marshal/s: Directs the patients to the nurse practitioner on arrival at the clinic	20	2	91%	9%
4	The enrolled nurse does observations and side room tests according to requirements for antenatal patients and completes the necessary documents	19	3	86%	14%
5	The nurse practitioner performs the physical assessments of patients	22		100%	0%
6	The nurse practitioner prescribes treatment, and also dispenses medication	21	1	95%	5%
7	The queue marshal/s: First visit - Directs patients to the reception counter to open files	22		100%	0%
8	The queue marshal directs patient to the observation room when the file is available	22		100%	0%
9	Patients who are not visiting on scheduled dates or times, will be seen by the nurse practitioner in between the patients scheduled for follow-up visits, for example after every third patient	18	4	82%	18%
10	The queue marshal/s: Manage “no shows” and late arrivals by referring to professional nurse to be managed or re-booked	18	4	82%	18%
11	The queue marshal/s: Monitor the flow of patients to prevent bottlenecks	22		100%	0%
12	Handouts in local languages, containing relevant topics regarding pregnancy and postpartum care will be given to all patients at each visit	20	2	91%	9%
13	For patients that are unable to read handouts, a video containing information regarding ANC topics can be shown in the waiting area	20	2	91%	9%
14	Urine specimen containers will be given to all new ANC patients and patients advised on how to collect urine at home	15	7	68%	32%
15	PFS aspects should be flexible and allow for individualised facilities	22		100%	0%
16	An identifying dress code should be prescribed for queue marshals	20	2	91%	9%
17	Patients should comply with follow-up booking dates or else they will only be attended to after other patients are done	14	8	64%	36%
18	A lay counsellor may fill the role of queue marshal	12	10	55%	45%
19	Health talks will be done during group sessions	19	3	86%	14%
20	Timeslots for first and follow-up bookings will be set	18	4	82%	18%
21	Compulsory change rooms will be available in all facilities	16	6	73%	27%
22	Two professional nurses should be available for ANC	20	2	91%	9%
23	Patient bookings must be done in catchment area	14	8	64%	36%
24	Specific urine bottles for ANC patients will be provided	13	9	59%	41%
25	Information on importance of early bookings will be provided	19	3	86%	14%
26	Home-based caregivers will track defaulters	21	1	95%	5%
27	Size of catchment population to dictate daily staff allocation	19	3	86%	14%

The 25 aspects to be included in the final PFS were grouped under the headings "Patient flow system", "Queue marshal", "Nursing staff" and "Patient information" in Table 4.5. The grouped aspects will be discussed in detail next.

Table 4.5 Grouping of aspects for the final PFS

GROUPS	ASPECTS AGREED ON
Patient flow system	• PFS aspects should be flexible and allow for individualisation in facilities • A trained staff member / clerk manages the patient flow system • Patients who are not visiting on scheduled dates or times will be seen by the nurse practitioner in between the patients scheduled for follow-up visits (for example after every third patient) • Patients should comply with follow-up booking dates or else they will only be attended to after the other patients are done • Patient bookings must be done in catchment area • Timeslots for first and follow-up bookings • Change rooms are available in all facilities • Home-based caregivers will track defaulters
Queue marshals	• The queue marshal directs the patients to the reception and the nurse practitioner on arrival at the clinic • The queue marshal directs patients scheduled for their first visit to the reception counter to complete / open files • The queue marshal directs patients to the observation room when the file is available • The queue marshal manages late arrivals according to guidelines or refers them to professional nurse to be managed or re-booked • The queue marshal monitors the flow of patients to prevent bottlenecks • An identifying dress code should be prescribed for queue marshals
Nursing staff	• The nurse practitioner retrieves the files of all follow-up visits according to bookings for the next day, or allocates the task to the clerk at the reception counter • The nurse practitioner performs the physical assessments of patients • The nurse practitioner prescribes treatment, and also dispenses medication • The size of the catchment population influences daily staff allocation • Two professional nurses should be available for ANC • Urine specimen containers will be given to all new ANC patients and patients advised on how to collect urine at home • The enrolled nurse does observations and side room tests according to requirements for antenatal patients and completes the necessary documents
Patient information	• Health talks to be held during group sessions • Handouts in local languages, containing relevant topics regarding pregnancy and postpartum care, will be given to all patients during each visit • For patients who are unable to read handouts, a video containing information regarding ANC topics can be shown in the waiting area • Information on importance of early bookings (bookings before 20 weeks of pregnancy) will be provided to patients at the earliest opportunity

4.4.2.2.4.1 Grouped aspects for the final PFS

- *Patient flow system*

Patient flow systems should be flexible and allow for individualised clinic requirements. This suggestion is supported by Sokhela et al. (2013, pp. 1-8). These authors emphasize that a PFS is not a “one size fits all” approach. Nursing staff or a clerk should therefore be trained on how to manage the flow of patients in a specific healthcare facility.

Regarding follow-up bookings, patients should comply with scheduled dates and times for visits. If not, they should only be attended to after other patient consultations are completed. Timeslots for first and follow-up bookings should be set as this influences staff allocation. This suggestion is supported by the government’s ICMS approach that patients should be booked according to time and not only by date. An additional suggestion in this regard was that patients who did not arrive on their scheduled dates or times, should be seen by the professional nurse in between scheduled follow-up patients’ visits, for example after every third patient. Although facilities apply individual management protocols for late arrivals or “no shows”, patients should not be sent back home without being attended (DoH - Northern Cape, 2015). The recommendation that home-based caregivers should trace defaulters is a valid contribution, in line with the ward-based outreach teams which are community based services link with fixed PHC services to increase health outcomes. This suggestion refers to one of their core functions in tracing defaulters (DoH, 2011b, pp. 3-5).

The suggestion that patient bookings should only be made from the facility’s catchment area is somewhat opposed by the Batho Pele principles (Vasuthevan & Mthembu, 2013, pp. 33-34) and the Patients’ Rights Charter (Vasuthevan & Mthembu, 2013, pp. 34-35, pp. 34-35; DoH, 2008), that patients have equal access to any healthcare facility(s) of their choice.

Availability of change rooms in all facilities for antenatal patients was highly recommended by the respondents (73%). This aspect is supported by the Constitution of South Africa, which states that every citizen has the right to privacy and to be treated with respect and dignity (DoH, 2008; DoH, 1996).

- *Queue marshals*

Seven of the 25 aspects in the PFS refer to queue marshals and their purpose in assisting with the flow of patient throughout the PHC facility to prevent bottlenecks.

Their role should include directing first visit patients to the reception counter to open files, and follow-up patients to collect their files, move to the observation room when the file is available, and then on to the nurse practitioner for assessment / treatment. They further should refer late arrivals to the professional nurse to be managed or re-booked. In the absence of a queue marshal, the clerk should manage the flow of patients (DoH - Northern Cape, 2015).

A dress code for queue marshals was recommended to enhance identification. The professional or qualified healthcare providers already have a specified dress code in order to be identified as a healthcare provider, the queue marshals should also be easily identifiable as part of the support team (NDoH, 2012a, p. 19).

- *Nursing staff*

First of all, the suggestions that two professional nurses should be available to render antenatal care and that daily staff allocation should be in line with size of the facility's catchment population is important to the work flow in the clinic.

The antenatal professional nurse or the reception clerk should retrieve the files of all follow-up visits according to bookings for the next day. The tasks of the professional nurse should in actual fact rather be directed at performing the physical assessments, prescribing treatment, and dispensing medication to patients. These tasks are in line with the prescriptions of the Guidelines for Maternity care (DoH, 2007 p.13).

Suggested tasks to be allocated to enrolled nurses include that they should do the observation of vital signs and side room tests according to requirements for antenatal patients and complete the necessary documents. This suggestion is in line with their job description to work under supervision and report to a professional nurse (South African Nursing Council - Under the provisions of the Nursing Act, 2005, 2014).

- *Patient information*

Information on the importance of early bookings (bookings before 20 weeks of pregnancy) should be provided timeously to all patients for the early detection and referral of abnormalities, as required by the Maternity Guidelines (DoH, 2007 p.13).

Urine testing for pregnant women is a prerequisite for each clinic visit, as it screens among others for the presence of protein, leukocytes and nitrates (DoH, 2007, p. 26). Protein in the urine together with hypertension indicates the possibility of pre-eclampsia and the patient must be treated and refer. The presence of leukocytes indicates a potential sexual transmitted or bladder infection whereas nitrates is indicative of a urinary tract infection. (Hynes, 1999, pp. 602-605). Although it was suggested that all new antenatal patients should be provided with a urine specimen container and be advised to collect urine at home for follow-up visits, this practice is scientifically incorrect. The composition of the urine changes when a urine specimen ages (is collected longer than two hours before testing) and this will influence the urine test results (Mulder, 1999, p. 255).

Health talks should be done during group sessions during each visit. Handouts containing relevant topics regarding pregnancy and postpartum care in all the local languages should also be available to antenatal patients. Patients have the right to be addressed in their preferred language, as stipulated in the Constitution of South Africa (DoH, 1996, p. 4). Furthermore, patients are entitled to receive information regarding their health, according to the Patients' Rights Charter (DoH, 2008). In addition, the information should be communicated by video in the waiting area for those patients who are unable to read.

Finally, the results of the audits and the “in-action” Delphi technique were taken into consideration in designing the patient flow system for antenatal PHC facilities in the Frances Baard District, Northern Cape Province, which was the aim of the study.

4.5 PATIENT FLOW SYSTEM

A brief discussion of the patient flow system is as follows (please refer to Diagram 4.1). The patient enters the facility and is directed by a queue marshal to the help desk or triage area, where a colour coded number card is allocated (for example, a green card for all antenatal PHC patients). The queue marshal then directs the patient to the reception area, in order to open a file (for a new patient) or to retrieve the file (for a follow-up patient). After receiving the file, the patient will be directed to the observation room where the enrolled nurse will assess the vital signs, test the urine, provide health talks and antenatal exercises. The patient is next directed to the consultation room where the professional nurse will do the physical examination, draw of blood samples, discuss blood results, give health education, schedule a follow-up date and time booking, or refer the patient for further management, if needed. At some facilities the professional nurse will dispense medication at this point or refer the patient to the pharmacy.

Diagram 4.1 with the compiled patient flow system is spread over two pages. The first page is a flow chart and the second page provides the key to the colour coding of the red, green and purple oval shapes. On this page the red oval shapes numbered 1 - 6 indicate document references related to the specific step in the flow diagram

4.6 CONCLUSION

Chapter 4 has been discussed in two parts. The first part addressed the results of the audits done in the PHC facilities in order to design a patient flow system, while the second part dealt with the “in-action” Delphi technique, to reach consensus for the contents of the patient flow system. The first data included the audit of the existing PHC facilities, with regard to any patient flow system(s), human resources and physical resources. The second data addressed the three components of the “in-action” Delphi technique process, namely the demographic profile of the respondents, the anticipated results of a proposed patient flow system and the results of the “in-action” Delphi technique. Based on the outcomes of these results, a patient flow system was then developed.

CHAPTER 5
RECOMMENDATIONS

5.1 INTRODUCTION

Chapter 4 provided an overview of the results of the audit checklist and the “in-action” Delphi technique. Chapter 5 will address recommendations as identified from the results as presented in Chapter 4.

5.2 RECOMMENDATIONS: AUDIT CHECKLIST

In this study, most of the aspects addressed in the audit checklist was considered in the development of the patient flow system. The rest of the aspects are included in the following recommendations:

5.2.1 RECEPTION

A sufficient number of staff should be appointed to manage the reception area. They should also be well trained in order to facilitate the flow of patients through the different clinical areas. To ease the financial burden of appointing clerical staff or queue marshals, volunteer workers could be considered.

5.2.2 WAITING AREA

Although areas provided for waiting patients does not address waiting time as such, it is recommended that provision is made for all patients to be comfortably seated in the waiting area as this may reduce the frustration of waiting. Therefore, sufficient seats should be available to improve patients’ comfort during their waiting period.

5.2.3 CLINICAL ROOMS

In future, the design of antenatal consultation areas should include three separate rooms to enhance patient flow:

- One observation room where antenatal patients could be monitored regarding their weight and blood pressure measurements, and side-room tests would be done in accord with protocols related to antenatal patients, such as haemoglobin (Hb) and PMTCT follow-up;
- A second or changing room where the antenatal patients could undress and put on gowns, and re-dress again after their consultation. This measure could save unproductive clinical time spent in the antenatal consulting room;
- A third or consultation / treatment room where antenatal patients could be treated by the professional nurse.

Furthermore, it should be ensured that a sufficient number of toilets are available for patients in order to prevent bottlenecks. This is especially necessary for antenatal patients who are required to provide a fresh urine specimen to be tested on their first and follow-up visits for early detection of signs of urine tract infection and pre-eclampsia (Das, 1999, pp. 217-219).

5.2.4 HUMAN RESOURCES

The results of the audit checklist indicated a general shortage of professional nurses, nursing assistants, doctors, pharmacists or pharmacy assistants, and cleaners at the time of the assessment. Appointment of additional healthcare and supporting care providers according to the need at each facility should be revisited in order to improve the patient flow in individual clinics.

An important issue that was also identified was that all professional nurses have to dispense medication. According to Section 22A trained, professional nurses are given authority to prescribe and dispense certain medication as stated in the essential drug list (EDL) for PHC. Therefore, it is suggested that medications specific to antenatal patients be readily available in consultation rooms to ease the burden on the pharmacy, and be managed according to the Pharmacy Act (South Africa Pharmacy Act 101, 1965). Among others, one of the requirements is that medicine should be kept in a single or double lockable cupboard or locked room at all times.

Furthermore, it is recommended that all categories of nursing staff be trained to implement the triage coding correctly, so that patients can be directed correctly from the moment they step into the clinic.

5.2.5 MATERIAL RESOURCES

It is highly recommended that it be budgeted and motivated that material resources such as computers, printers, internet access, fax lines / machines, telephones (for antenatal consultation rooms) be procured for all PHC facilities. This will save time and effort as patients can be referred immediately, laboratory results speedily drawn and prescriptions from consultants or doctors be obtained or sent without time delay.

Technical support and regular training regarding the above-mentioned equipment should be made available. Training should be done on an ongoing basis and evidence of all training be kept on staff files.

5.2.6 MEDICAL EQUIPMENT

It is also recommended that medical equipment required in antenatal consulting rooms such as glucometers, Hb-meters, adult scales and thermometers, be procured. An inventory and maintenance register of all equipment should be compiled and checked every week. Equipment should be engraved with the name of the specific facility as part of an equipment audit trail. Professional nurses should be held responsible for equipment allocated to their work areas.

Commercial sterile emergency packs for delivery should be available at all times at each clinic. The stock of packs and their expiry dates should be checked weekly, and replacements ordered as the packs are used.

5.2.7 LINEN

Enough sheets, pillow slips, blankets and examination gowns should be procured and available at all times. Availability of gowns has an influence on waiting times if patients have to wait for gowns from the laundry.

5.2.8 SCHEDULING

It is recommended that staff be scheduled according to the demand created by the patient load during peak times, as well as to cover the requirements of the patient appointment system.

Although governmental documents “Guidelines for Maternity Care in South Africa 2007”, and “Saving Mothers 2008-2010” were available in each of the antenatal PHC clinics during the audits, it should be required of staff to prove that they are informed about the guidelines’ contents, for example by showing that they have read and signed acknowledgement, and in the application of the guidelines.

Lastly, it is recommended that the latest applicable documents of the Department of Health, such as the Ideal Clinic Monitoring System and the National Core Standards addressing patient flow should be made available and implemented in each clinic.

5.3 RECOMMENDATIONS: “IN-ACTION” DELPHI TECHNIQUE

The following recommendations are grounded in the “in-action” Delphi technique. The process itself had a good outcome in this study, and has shown that it can be used very fruitfully in nursing research, which is what this part of the study recommendation is about.

5.3.1 “IN-ACTION” DELPHI TECHNIQUE PROCESS

In this study, application of the “in-action” Delphi technique process was well planned and a written document was made available to the researcher, the moderator, and the

data-capturer. This expedited the execution of the research technique process and kept the mentioned people on par. Therefore, it is recommended that this strategy be followed by researchers who opt to use this technique in future.

5.3.2 WRITTEN QUESTIONS ON INSTRUCTIONS

As part of the “in-action” Delphi technique, respondents were given the option to pose written questions after they had been given a written instruction of what was required of them during each step of the Delphi process. However, instead of addressing their concerns about each task only, respondents also wrote questions about problems they experiencing in service delivery. Some of these questions could not be answered by the moderator or the researcher and those attempted to answer were time consuming and encouraged discussions the group. Therefore, the option to pose written questions should be carefully managed in future use of the “in-action” Delphi technique, in order to save time.

5.3.3 OCCUPYING RESPONDENTS

During the time used for electronic data-capturing and analysis in the application of the “in-action” Delphi technique process, respondents should be kept busy constructively with activities such as watching appropriate nursing videos or reading material. This strategy is necessary to prevent respondents from communicating with each other and losing interest when they are not constantly occupied.

5.4 LIMITATIONS

The respondents for the main “in-action” Delphi technique were all female professional nurses involved in services to antenatal patients in the PHC of the Northern Cape Province. Due to time limits and the availability of the respondents, the traditional process of the “in-action” Delphi technique was shortened with regard to the prioritising of data. Consensus was not reached during the first part of Phase 3 (ranking of updated aspects) of the “in-action” Delphi technique. The percentage for each aspect ranged from 9 to 45%. A possible rationale for these results could be that the final list

of aspects was too long (27 aspects). The respondents should therefore rather been instructed to rank only the 10 most important aspects from 1 to 10 with 1 as the most important in a descending order to 10.

5.5 SUGGESTIONS FOR FURTHER RESEARCH

There is no doubt that more research is needed to establish what type of patient flow system would be suitable for all antenatal PHC facilities, taking the infrastructure (or lack thereof) in each clinic into consideration.

It is suggested that the patient flow system in Chapter 4 be considered for implementation and evaluation in future studies.

5.6 REFLECTION BY THE RESEARCHER

Doing research in the PHC facilities and using respondents from different facilities and occupational positions made the data collection process complex. The well planned written methodology and process followed assisted the researcher to remain focused in achieving the research objectives.

As a novice post-graduate student the researcher became aware of the challenges that have to be faced during a study being a distance researcher. Due to the fact that the researcher was full time employed study leave was not easily granted to have face-to-face contact with the study supervisors. Insufficient computer skill was another hurdle to overcome. However, the researcher became skilled in compiling electronic referencing, Internet searching and developed academic writing skills. These skills will be an advantage for the researcher's career path as a primary healthcare practitioner.

5.7 CONCLUSION

Although the legal frameworks are available the researcher realised that they are not always applied to in rendering of services due to challenges regarding technology, infrastructure, medical resources, and staff shortages. The patient flow system for

antenatal PHC can become a reality with the support of Government and the commitment of the district management team, and the staff in the PHC facilities.

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ADDENDUM A

Approval letter from the Research and Ethics Committee of Faculty of Health Sciences (UFS)

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS UV

Research Division
Internal Post Box G40
☎(051) 4052812
Fax (051) 4444359

E-mail address: StraussHS@ufs.ac.za

Ms H Strauss/jdpls

2014-07-30

REC Reference nr 230408-011
IRB nr 00006240

MS A VALLA
C/o MS J MACKENZIE
SCHOOL OF NURSING
UFS

Dear Ms Valla

ECUFS NR 67/2014
PROJECT TITLE: A PATIENT FLOW SYSTEM FOR ANTENATAL PRIMARY HEALTHCARE FACILITIES IN THE FRANCES BAARD DISTRICT, NORTHERN CAPE PROVINCE.

1. You are hereby kindly informed that at the meeting held 22 July 2014 the Ethics Committee approved the study after all conditions have been met when the following signed permission letters were submitted:

   - ***The Sol Plaatjie Municipality***
   - ***The Northern Cape Dept of Health***

2. Committee guidance documents: Declaration of Helsinki, ICH, GCP and MRC Guidelines on Bio Medical Research. Clinical Trial Guidelines 2000 Department of Health RSA; Ethics in Health Research: Principles Structure and Processes Department of Health RSA 2004; Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa, Second Edition (2006); the Constitution of the Ethics Committee of the Faculty of Health Sciences and the Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines.

3. Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

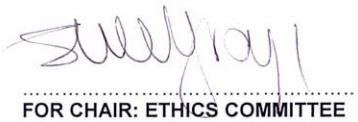
4. The Committee must be informed of any serious adverse event and/or termination of the study.

5. All relevant documents e.g. signed permission letters from the authorities, institutions, changes to the protocol, questionnaires etc. have to be submitted to the Ethics Committee before the study may be conducted (if applicable).

6. A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.

7. Kindly refer to the ETOVS/ECUFS reference number in correspondence to the Ethics Committee secretariat.

Yours faithfully



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FOR CHAIR: ETHICS COMMITTEE

Cc Ms J Mackenzie

ADDENDUM B

Approval letter from Department of Health: Kimberley

DEPARTMENT OF HEALTH
LEFAPHA LA BOITEKANELO
ISEBE LEZEMPILO
DEPARTEMENT VAN GESONDHEID

Department of Health
Private Bag X5049
KIMBERLEY
8301

Enquiries : Dipatlisiso : Imibuzo : Navrae :
Dr. E. Worku

Reference : Tshupelo : Isalathiso : Verwysings :

Tel: 053 830 2134
Fax: 053 830 0655

Date : Letlha : Umhla : Datum :
11 July 2014

Mrs. Anna Valla
18 Constance Street
Northview
Kimberley
8301

Dear Mrs. Anna Valla

PROJECT TITLE: A PATIENT FLOW SYSTEM FOR ANTENATAL PRIMARY HEALTH CARE FACILITIES IN THE FRANCES BAARD DISTRICT, NORTHERN CAPE PROVINCE.

NC PHREC Reference Number: NC 2014/009

The application to conduct the study was received and has been reviewed by the Northern Cape Provincial Health Research and Ethics Committee.

Approval is hereby granted to conduct the above-mentioned study in the Northern Cape Province.

The following conditions have to be noted:

1. The research project shall be conducted at no cost to the Northern Cape Department of Health.
2. The approval is limited to the research proposal as submitted in the application.
3. Variation or modification on the research must be notified formally to the PHREC for further consideration.

ADDENDUM C

Approval letter from the manager: Sol Plaatjie Municipality, Kimberley

Directorate: Community & Social Development Services

Direktoraat: Gemeenskap- en Sosiale Ontwikkelingsdienste

Bokaedi: Nonofisho ya Ditirelo tsa Puso Selegae

Privaatsak X5030
Private Bag
KIMBERLEY
8300

Tel: 053 830-6911
Fax: 053 833-1005

VERW./REF. NO.:

NAVRAE/ENQUIRIES: Setlogelo/as (Tel : 053 - 8306690)

17 July 2014

Ms Anna Valla
18 Constance Street
Northview
Kimberley
8301

Madam

PERMISSION TO CONDUCT RESEARCH : A PATIENT FLOW SYSTEM FOR ANTENATAL PRIMARY HEALTH CARE FACILITIES

Your letter in the above regard, has reference.

Permission is hereby granted to conduct your research at the primary health care facilities in the Sol Plaatje Municipal area. We also understand that you don't have pre-set dates for this research but wish to state this must not infringe on the service delivery at the primary health care facilities. In the light of good governance principles, you are requested to share any suggestions that may arise from your research.

Kindly note that this is an express condition of this permission that the Sol Plaatje Municipality accepts no liability for any loss, damage or injury to persons or property which may arise directly or indirectly from this.

Sol Plaatje Municipality retains the right to withdraw this permission should any objections be received.

For any further assistance, Sr L G Kgakane, Acting Manager : Personal Health Services can be contacted at 053 - 8306600.

Yours faithfully

S SETLOGELO
ACTING EXECUTIVE DIRECTOR :
COMMUNITY AND SOCIAL DEVELOPMENT SERVICES

The City that Sparkles

ADDENDUM D

Participant information leaflet and consent for the "in-action" Delphi technique process:

Population Two: Healthcare providers

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS UV

School of Nursing
Skool vir Vepleegkunde
Nelson Mandela Avenue/Rylaan|
P.O. Box / Posbus 339 |
Bloemfontein, | 9300 | RSA
Tel: +27 (0)51 401 9111
www.ufs.ac.za

INFORMED CONSENT FORM FOR RESPONDENT IN THE "IN-ACTION" DELPHI TECHNIQUE

RESEARCHER: Mrs. A VALLA, CELLULAR NO: 0729393001

The following information is provided to enable you to decide whether you are willing to participate in a study to develop of a patient flow system in antenatal PHC facilities, Sol Plaatjie Municipality, Frances Baard District, Northern Cape Province.

Data will be collected through an "in-action" Delphi technique, which is a consensus seeking data collection technique. You will be part of a group of professional nurses from different ANC PHC facilities. The data will be collected during a 3-hour session scheduled according to the availability of respondents. The information regarding the date is as follows:

Date: 29 May 2015,

Time: 08:00

Venue: St Joseph Church, Gemdene, Kimberley.

To ensure confidentiality, your personal information or that of the ANC PHC facility that you are associated with, will not be linked to any feedback, findings or the outcome of the research. Personal information will not appear in the dissemination of results either through reports or publications. The raw data will be retained in safekeeping.

You will not be compensated for your participation. Although there may be no direct benefits for participation in the data collection session, the results may assist the

researcher to propose a patient flow system for ANC PHC facilities. There are no known risks associated with this study. You may withdraw your consent at any time without penalty by the researcher.

Permission to proceed with the research study has been obtained from the manager, Frances Baard District and the manager of the Sol Plaatjie Municipality.

Before signing the consent form, you are invited to clarify any uncertainties with the researcher.

I, _____ (Full name and surname) am willing to participate in the “in-action” Delphi data collection technique.

SIGNATURE RESPONDENT: _____

DATE: _____

SIGNATURE RESEARCHER: _____

DATE: _____

ADDENDUM E

Audit Checklist

AUDIT CHECKLIST TO AUDIT ANTENATAL PHC FACILITIES

SCHOOL OF NURSING

UNIVERSITY OF THE FREE STATE

Facility number		

Please indicate whether the following criteria is met or not met by an ANC PHC facility by marking either **YES** = **[✓] or NO = [X]** in the applicable column. Comments could be added to the third column if required.

		YES	NO	COMMENTS
1.	PATIENT FLOW SYSTEM			
1.1	Is there a patient flow system in place?			
1.2	Is the largest percentage of the patients that arrives at the clinic scheduled for an appointment?			
1.3	Do specific time slots exist for the following:			
1.3.1	Follow-up visits?			
1.3.2	First ANC visits?			

		YES	NO	COMMENTS
1.4	Is there a triage system in place?			
1.5	Is there a bottleneck with regard to the patient flow system?			
2.	ACCESSIBILITY			
2.1	Is the necessary signage in place in front of the clinic?			
2.2	Do most of the patients access the clinic by means of:			
2.2.1	Public transport?			
2.2.2	Private transport?			
2.2.3	Walking?			
2.3	Does the appointment system consider the above when scheduling a visit?			
2.4	Is there a strategy in place to manage the following:			

		YES	NO	COMMENTS
2.4.1	No shows?			
2.4.2	Late arrivals?			
3.	RECEPTION			
3.1	Is the necessary signage to the reception area in place?			
3.2	Is a sufficient number of staff appointed to manage the reception area?			
3.2.1	Is the staffs sufficiently trained to manage the administration?			
3.3	If the patient is scheduled for a follow-up visit, is the file immediately available at the reception?			
3.3.1	Is there a filing system for ANC patients?			
3.4	If it is a new patient is the necessary administrative staff available to open a new file?			

		YES	NO	COMMENTS
3.5	Is a number allocated in the order that patient will be called for consultation?			
3.6	Does the number indicate that the patient is scheduled for an ANC visit (e.g. ANC 01)?			
3.7	Is there a bottleneck with regard to the reception area?			
4.	WAITING AREA			
4.1	Is the necessary signage to the waiting area in place?			
4.2	Are there enough seats in the waiting area to accommodate the number of patients?			
4.3	Is there a queue marshal?			
4.4	Does the queue marshal triage the patients?			
4.5	Does the queue marshal ensure patient flow to the different healthcare service?			

		YES	NO	COMMENTS
4.6	Is there a bottleneck with regard to the waiting area?			
5.	ROOMS			
5.1	Are the following available for ANC services:			
5.1.1	A separate room for observations, weighing and other side-room tests for ANC patients?			
5.1.2	ANC consulting room(s)?			
5.1.2.1	Is the number of ANC rooms sufficient in terms of patient demand?			
5.2	Change room?			
5.3	Are the toilet facilities sufficient in terms so patient demand?			
5.4	Is there clear signage to the following rooms:			
5.4.1	Observation room?			
5.4.2	ANC consultation room(s)?			

		YES	NO	COMMENTS
5.4.3	Restroom (toilets)?			
5.4.4.	Pharmacy?			
5.5	Do the following have running water?			
5.5.1	Hand basin in consulting room?			
5.5.2	Toilets?			
5.5.3	Pharmacy?			
5.6	Are there a sufficient number of toilets for the number of patients visiting the facility daily?			
5.7	Are the restroom following neat and tidy?			
5.8	Is the change room separate from the consultation room?			

		YES	NO	COMMENTS
6.	HUMAN RESOURCES			
6.1	Is there sufficient numbers of the following categories:			
6.2	Professional nurses/PHC practitioners?			
6.3	Nursing assistants?			
6.4	General assistants (cleaners)?			
6.5	Pharmacist or pharmacist assistant?			
6.5.1	Is it required of the Professional nurses/PHC practitioners to dispense medication?			
6.5.1	Does the professional nurse(s) attending to ANC patients also give health education to them?			
6.6	Are all categories of staff trained to implement the triage coding correctly?			

		YES	NO	COMMENTS
7.	MATERIAL RESOURCES			
7.1	Is there a computer at the facility?			
7.2	Is there a printer at the facility?			
7.3	Does the facility have internet access?			
7.4	Is there a fax line/ machine?			
7.5	Is there a telephone(s) in the facility?			
7.6	Is there a telephone in the ANC consulting room?			
7.7	Is there a need for a telephone in the ANC consulting room?			
7.8	Are there lockable cabinets available for the ANC facility for storage of medication?			
7.9	Does the facility have stationary?			

		YES	NO	COMMENTS
8.	MEDICAL EQUIPMENT			
8.1	Does each consulting room have the following equipment:			
8.1.1	Thermometer			
8.1.2	Glucometer			
8.1.3	Scale adult			
8.1.4	Hb meter			
8.1.5	Baumanometer			
8.1.6	Stethoscope			
8.1.7	Fetoscope			
8.1.8	Measuring tape			
8.1.9	Urine test sticks			

		YES	NO	COMMENTS
8.14	Sterile delivery packs for emergency deliveries			
8.9	Emergency trolley (equipped according to inventory)			
8.13	Emergency drugs			
8.14	Are all needed consumables (e.g. needles and syringes etc.) available to function optimally?			
9.	LINEN			
9.1	Are the following available:			
9.1.1	Gowns for the ANC patient to undress			
9.1.2	Linen savers			
9.1.3	Sheets and pillowcases			
9.1.4	Blankets			

		YES	NO	COMMENTS
10.	SCHEDULING			
10.1	Are there peak times with regard to patient visits on:			
10.1.1	Specific days?			
10.1.2	Specific times during the day?			
10.2	Are staffs scheduled according to the demand during peak times?			
11.	OTHER			
11.1	Are reliable transport services available for emergency transfer to hospital?			
12.	CRITERIA, STANDARDS, PROTOCOLS AND POLICIES			
12.1	Are there written criteria, standards, protocols and policies available in the facility, e.g. Guidelines for			

	Maternity Care in South Africa, 2007, and Savings Mothers 2008-2010?			

ADDENDUM F

Results of the audits done in the antenatal PHC facilities

UNIVERSITY OF THE FREE STATE
SCHOOL OF NURSING

DATA ANALYSIS OF AUDITS DONE IN ANTENATAL PHC FACILITIES

Facility number:		

Please indicate whether each of the following aspects are met or not met by the antenatal PHC facility by marking either **YES = [✓] or NO = [X]** in the applicable column.

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
1.	PATIENT FLOW SYSTEM																												
1.1	Is there an appointment system in place?		X	X			X	X			X	X		X		X		X		X		X			X	8	66.6%	4	33.3%
1.2	Is the largest percentage of the patients that arrives at the clinic scheduled for an appointment?		X	X		X		X		X			X	X		X		X		X		X		X		10	83.3%	2	16.6%
1.3	Do specific time slots exist for the following:																												

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
1.3.1	Follow-up visits?		X		X		X		X		X		X		X		X		X		X		X		X	0	0%	12	100%
1.3.2	First ANC visits?		X		X		X		X		X		X		X		X		X		X		X		X	0	0%	12	100%
1.4	Is there a triage system in place?		X		X		X		X		X	X			X		X	X			X	X		X		4	33.3%	8	66.6%
1.5	Is there a bottleneck with regard to the patient flow system?		X	X			X	X			X		X	X			X	X		X			X		X	5	41.6%	7	58.3%
2.	ACCESSIBILITY																												
2.1	Is the necessary signage in place in front of the clinic?	X		X		X			X	X		X		X			X	X			X	X		X		9	75%	3	25%
2.2	Do most of the patients access the clinic by means of:																												
2.2.1	Public transport?	X		X		X		X			X	X		X			X		X		X		X		X	6	50%	6	50%
2.2.2	Private transport?	X		X		X		X			X	X			X		X		X		X		X		X	5	41.6%	7	58.3%
2.2.3	Walking?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
2.3	Does the appointment system consider the above when scheduling a visit?		X		X		X		X		X		X	X			X		X		X		X	X		2	16.6%	10	83.3%
2.4	Is there a strategy in place to manage the following:																												
2.4.1	No shows?	X		X			X	X			X	X		X			X		X	X			X		X	6	50%	6	50%
2.4.2	Late arrivals?		X	X			X	X		X		X		X		X			X	X			X	X		8	66.6%	4	33.3%
3.	RECEPTION																												
3.1	Is the necessary signage to the reception area in place?	X		X			X		X	X		X		X			X	X		X		X		X		9	75%	3	25%
3.2	Is a sufficient number of staff appointed to manage the reception area?		X	X		X		X		X		X			X	X		X		X			X	X		9	75%	3	25%
3.2.1	Is the staffs sufficiently trained to manage the administration?		X		X		X		X	X		X		X		X		X		X		X		X		8	66.6%	4	33.3%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
3.3	If the patient is scheduled for a follow-up visit, is the file immediately available at the reception?	X			X	X		X			X	X		X		X		X			X	X		X		9	75%	3	25%
3.3.1	Is there a filing system for ANC patients?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
3.4	If it is a new patient is the necessary administrative staff available to open a new file?	X		X		X		X			X	X		X		X		X		X		X		X		11	91.6%	1	8.3%
3.5	Is a number allocated in the order that patient will be called for consultation?		X	X			X		X	X			X	X			X		X		X		X	X		4	33.3%	8	66.6%
3.6	Does the number indicate that the patient is scheduled for an ANC visit (e.g. ANC 01)?		X		X		X		X		X		X	X			X		X		X		X	X		2	16.6%	10	83.3

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
3.7	Is there a bottleneck with regard to the reception area?	X		X		X		X		X		X			X	X		X		X		X			X	10	83.3	2	16.6%
4.	WAITING AREA																												
4.1	Is the necessary signage to the waiting area in place?		X	X			X		X	X		X		X			X	X			X	X		X		7	58.6%	5	41.6%
4.2	Are there enough seats in the waiting area to accommodate the number of patients?		X		X	X		X		X			X	X			X	X			X		X		X	5	41.6%	7	58.6%
4.3	Is there a queue marshal?		X		X		X		X	X	X		X		X		X		X		X		X		X	1	8.3%	11	91.6%
4.4	Does the queue marshal triage the patients?		X		X		X		X	X	X		X		X		X		X		X		X		X	1	8.3%	11	91.6%
4.5	Does the queue marshal ensure patient flow to the different healthcare service?		X		X		X		X	X	X		X		X		X		X		X		X		X	1	8.3%	11	91.6%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
4.6	Is there a bottleneck with regard to the waiting area?	X		X			X	X		X		X			X		X	X		X			X	X		7	66.6%	5	33.3%
5.	ROOMS																												
5.1	Are the following available for ANC services:																												
5.1.1	A separate room for observations, weighing and other side-room tests for ANC patients?	X		X			X		X		X		X	X			X		X		X	X			X	4	33.3%	8	66.6%
5.1.2	ANC consulting room(s)?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
5.1.2.1	Is the number of ANC rooms sufficient in terms of patient demand?		X	X		X		X			X	X		X			X	X			X		X	X		7	58.3%	5	41.6%
5.2	Change room?		X		X		X		X		X		X		X		X		X		X		X		X	0	0%	12	100%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
5.3	Are the toilet facilities sufficient in terms of patient demand?		X		X	X		X		X		X			X		X	X			X		X		X	5	41.6%	7	58.3%
5.4	Is there clear signage to the following rooms:																												
5.4.1	Observation room?	X			X		X		X		X		X	X			X		X		X	X		X		4	33.3%	8	66.6%
5.4.2	ANC consultation room(s)?	X		X			X		X	X			X	X			X		X		X	X		X		6	50%	6	50%
5.4.3	Restroom (toilets)?	X		X			X		X	X		X		X			X	X			X	X		X		8	66.6%	4	33.3%
5.4.4	Pharmacy?	X		X		X			X	X		X		X		X		X		X		X		X		11	91.6%	1	8.3%
5.5	Do the following have running water?																												
5.5.1	Hand basin in consulting room?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
5.5.2	Toilets?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
5.5.3	Pharmacy?	X		X			X		X	X			X	X		X			X	X		X		X		8	66.6%	4	33.3%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
5.6	Are there a sufficient number of toilets for the number of patients visiting the facility daily?		X		X	X		X		X		X			X	X			X		X		X		X	6	50%	6	50%
5.7	Is the restroom neat and tidy?	X		X		X			X	X		X		X			X	X		X		X		X		10	83.3%	2	16.6%
5.8	Is the change room separate from the consultation room?		X		X		X		X		X		X		X		X		X		X		X		X	0	0%	12	100%
6.	HUMAN RESOURCES																												
6.1	Is there sufficient numbers of the following categories:																												
6.1.1	Professional nurses/PHC practitioners?		X		X		X		X		X	X			X		X		X		X		X		x	1	8.3%	11	91.6%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
6.1.2	Nursing assistants?		X		X		X	X			X	X			X	X			X		X	X			X	4	33.3%	8	66.6%
6.1.3	General assistants (cleaners)?		X	X		X		X		X			X		X	X			X		X		X		X	6	50	6	50
6.1.4	Pharmacist or pharmacist assistant?		X		X		X	X			X		X		X	X			X		X		X	X		3	25	9	75
6.2	Is it required of the Professional nurses / PHC practitioners to dispense medication?	X		X		X		X		X		X		X		X		X		X		X		X		12	100	0	0
6.3	Does the professional nurse(s) attending to ANC patients also give health education to them?	X		X		X		X		X		X		X		X		X		X		X		X		12	100	0	0
6.4	Are all categories of staff trained to implement the triage coding correctly?		X		X		X		X		X	X		X			X	X			X	X		X		5	41.6	7	58.3

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
7.	MATERIAL RESOURCES																												
7.1	Is there a computer at the facility?		X		X		X	X			X	X			X		X		X		X	X		X		4	33.3%	8	66.6%
7.2	Is there a printer at the facility?		X		X		X		X		X	X			X		X		X		X		X		X	1	8.3	11	91.6
7.3	Does the facility have internet access?		X		X		X		X		X		X		X		X		X		X		X		X	0	0	12	100
7.4	Is there a fax line/ machine?		X		X		X		X		X		X		X		X		X		X		X		X	0	0	12	100
7.5	Is there a telephone(s) in the facility?	X		X		X		X		X		X		X		X		X		X		X			X	11	91.6	1	8.3
7.6	Is there a telephone in the ANC consulting room?	X		X		X		X		X		X		X			X		X		X	X			X	7	58.3	5	41.6

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
7.7	Is there a need for a telephone in the ANC consulting room?	X		X		X		X		X		X		X		X		X		X		X		X		12	100	0	0
7.8	Are there lockable cabinets available for the ANC facility for storage of medication?	X			X	X		X		X		X		X			X		X		X	X			X	7	58.3	5	41.6
7.9	Does the facility have stationary?	X		X		X		X		X		X		X		X		X		X		X		X		12	100	0	0
8.	MEDICAL EQUIPMENT																												
8.1	Does each consulting room have the following equipment:																												
8.1.1	Thermometer		X		X	X		X		X		X		X			X		X		X	X			X	6	50	6	50
8.1.2	Glucometer		X		X	X			X		X	X			X		X		X		X	X			X	3	25	9	75
8.1.3	Scale adult		X	X		X			X	X		X		X	X		X	X		X		X			X	7	58.3%	5	41.6%
8.1.4	Hb-meter	X			X	X			X	X			X		X		X	X			X		X		X	4	33.3%	8	66.6%
8.1.5	Baumanometer				X	X		X			X	X			X	X		X		X		X		X		10	83.3%	2	16.6%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
8.1.6	Stethoscope	X			X	X			X	X		X		X		X		X		X		X		X		12	100%	0	0%
8.1.7	Fetoscope				X	X		X		X		X		X		X			X	X		X		X		11	91.6%	1	8.3%
8.1.8	Measuring tape	X			X			X		X		X		X		X			X	X		X		X		11	91.6%	1	8.3%
8.1.9	Urine test sticks	X		X		X		X		X		X		X		x	X			X		X		X		12	100%	0	0%
8.1.10	Sterile delivery packs for emergency deliveries		X		X	X			X		X	X		X		X			X	X			X	X		6	50%	6	505
8.1.11	Emergency trolley (equipped according to inventory)	X		X			X		X	X		X			X	X		X		X		X		X		10	83.3%	2	16.6%
8.1.12	Emergency drugs	X		X			X	X		X		X		X		X		X		X		X		X		11	91.6%	1	8.3%
8.1.13	Are all needed consumables (e.g. needles and syringes etc.) available to function optimally?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
9.	LINEN																												
9.1	Are the following available:																												
9.1.1	Gowns for the ANC patient to undress	X		X		X			X		X	X		X		X		X			X		X		X	7	58.3%	5	41.6%
9.1.2	Linen savers	X		X		X		X		X		X	X	X			X	X		X		X		X		10	83.3%	2	16.6%
9.1.3	Sheets and pillowcases	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
9.1.4	Blankets		X	X		X		X			X	X		X		X			X		X		X		X	7	58.3%	5	41.6%
10.	SCHEDULING																												
10.1	Are there peak times with regard to patient visits on:																												
10.1.1	Specific days?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
10.1.2	Specific times during the day?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	
10.2	Are staffs scheduled according to the demand during peak times?		X		X	X			X		X		X		X	X			X		X		X		X	2		10	

		C1		C2		C3		C4		C5		C6		C7		C8		C9		C10		C11		C12		F	%	F	%
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N
11.	OTHER																												
11.1	Are reliable transport services available for emergency transfer to hospital?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%
12.	CRITERIA, STANDARDS, PROTOCOLS AND POLICIES																												
12.1	Are there written criteria, standards, protocols and policies available in the facility: Guidelines for Maternity Care in South Africa, 2007, and Saving Mothers 2008-2010?	X		X		X		X		X		X		X		X		X		X		X		X		12	100%	0	0%

ADDENDUM G

"In-action" Delphi technique process

CHECKLIST: FINAL DELPHI PROCESS

The following is a checklist to assess the “in-action” Delphi process followed by the researcher during an assessment of a proposed Patient Flow System for an ANC PHC clinic

PHASE	No	ASPECTS	YES	NO	COMMENTS
AUDIT RESULTS					
1	**1.1**	A sheet containing the audit results was handed to each respondent			
	1.2	A summary of the audit results were displayed on a screen			
	1.3	The results of the audit is explained to the group			
	1.4	A paper on which questions could be written is handed to each respondent			
	1.5	The researcher requests the respondents to write down any questions they have regarding the audit			
	1.6	The questions are collected			
	1.7	The questions are addressed			

PHASE	No	ASPECTS	YES	NO	COMMENTS
SHEET WITH PFS ASPECTS ROUND 1a					
2.1	2.1.1	A sheet containing the aspects for a proposed PFS including the **[YES] or [NO]** response is handed out			
	2.1.2	A paper on which questions could be written is handed to each respondent			

	2.1.3	The researcher instructs the respondents to read through the proposed list for the PFS and to indicate: - **[YES]** if they think all the aspects have been included; - **[NO]** IF they think all the aspects for the PFS were not included			
	2.1.4	The researcher requests the respondents to write down any questions they have regarding their task			
	2.1.5	The questions are collected			
	2.1.6	The questions are addressed			
	2.1.7	The sheet with aspects and **[YES]** or **[NO]** answer is collected			
	2.1.8	Consensus <60% and >60% is calculated and the researcher proceeded with round 1b			

PHASE	**No**	**ASPECTS**	**YES**	**NO**	**COMMENTS**
SHEET WITH PFS ASPECTS ROUND 1b					
2.2	2.2.1	The researcher instructs the respondents that they have **5 minutes to write down additional aspects** that should be added to the sheet			
	2.2.2	A paper on which questions could be written is handed to each respondent			

	2.2.3	The researcher requests the respondents to write down any questions they have regarding their task			
	2.2.4	The questions are collected			
	2.2.5	The questions are addressed			
	2.2.6	The list containing the additional aspects for the PFS is collected			
	2.2.7	**A new list containing ONLY the additional aspects for the PFS** is prepared, printed and handed to each respondent			
	2.2.8	A paper on which questions could be written is handed to each respondent			
	2.2.9	The researcher instructs the respondents to read through the new list and indicate next to each new criterion if it should be **[INCLUDED]** or **[EXCLUDED]**			
	2.2.10	The researcher requests the respondents to write down any questions they have regarding their task			
	2.2.11	The questions are collected			
	2.2.12	The questions are addressed			
	2.2.13	Feedback on new list is collected			
	2.2.14	Consensus is calculated. Only aspects with > 60% consensus is added to the existing aspects			

PHASE	No	ASPECTS	YES	NO	COMMENTS
UPDATED ASPECTS FOR A PFS Round 2					
3	3.1	The updated aspects (**complete list**) for the PFS is handed to each respondent			

	3.2	A paper on which questions could be written is handed to each respondent			
	3.3	The researcher instructs the respondents to **number** the aspects according to the sequence in which they think it should appear on the proposed PFS			
	3.4	The researcher requests the respondents to write down any questions they have regarding their task			
	3.5	The questions are collected			
	3.6	The questions are addressed			
	3.7	Feedback on list containing the sequence of aspects is collected			
	3.8	Consensus on the feedback is calculated			
	3.9	A new sheet containing aspects with <60% consensus is prepared, printed and handed out			
	3.10	A paper on which questions could be written is handed to each respondent			
	3.11	The researcher instructs the respondents to indicated whether a aspects should be [included] or [excluded]			
	3.12	The researcher requests the respondents to write down any questions they have regarding their task			
	3.13	The questions are collected			
	3.14	The questions are addressed			

	3.15	The list containing the feedback on **[INCLUSION]** or **[EXCLUSION]** of aspects is collected			
	3.14	Consensus is again calculated **Input from respondents only required up to this point**			