EVALUATION OF THE QUALITY AND MANAGEMENT OF MATERNITY SERVICES IN THE NATIONAL DISTRICT HOSPITAL IN THE FREE STATE PROVINCE

Me. AGNES SEATILE SESING

Student No: 0718883E

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HEALTH SCIENCES, UNIVERSITY OF THE WITWATERSRAND, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH

JOHANNESBURG 2010

DECLARATION

I, Agnes Seatile Sesing, declare that this research report is my own work. It is being submitted for the degree of Master of Public Health (Hospital Management) at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or for any examination at this or any other university.

……

December 2010

ACKNOWLEDGEMENTS

I dedicate this work to:-

My mother, my sister, my child, my niece, my grand children, my uncle and his family for the kind understanding, support and motivation given throughout the period of my studies. I can never find words to thank you for your concern and all assistance rendered.

My supervisor for encouragement on my progress with my studies and her patience
The National District Hospital staff for their warm support and making my studies easier

Lastly my heartiest thanks to my late grandparents for making me the person that I am

ABSTRACT

INTRODUCTION: Maternity services are a priority for all health care services but in most cases there have been serious challenges experienced through service performance. The National District Hospital (NDH)'s key performance indicator is bed occupancy rate which showed an underutilization of this facility. The maternity services statistics, especially did not give a clear picture of the performance of the unit. Various studies have been conducted to identify management challenges in maternity units of district hospitals, but no formal study has been done to systematically document this problem at the National District Hospital (NDH), although there has been anecdotal evidence of problems in the performance of the unit. It was therefore important to investigate the functioning of the maternity unit of the NDH and identify problems that hinder it from functioning effectively.

AIM: To evaluate the performance of maternity services in the maternity unit at the National District Hospital.

METHODOLOGY: A cross sectional study design was used comprising of a retrospective record review. The setting of this study was the maternity unit at National District Hospital. Data was collected on various variables that are relevant to the performance of maternity services.

ANALYSIS: The data collected was analyzed and revealed that the factors contributing to the poor performance of the maternity services were:

- Poor record keeping, such as incomplete recording of partograms.
- Non adherence to guidelines and protocols, such as poor management related to HIV and AIDS care and poor management of patients in the advanced labor phase.
- Failure to make informed decision due to information mismanagement.
- Poor supervision in the unit. No adherence to objectives of peer review meetings.

RECOMMENDATION: The recommendations based on the findings are:

- Establish patient centered maternity services
- Train and retraining of health care providers in the maternity unit
- Review existing strategies to improve quality of care in the maternity unit
- Improve information management and functioning of the Maternal Morbidity Review meetings

CONCLUSION: The recommendations given can be used to improve maternity services within district hospitals as well as provincial and national maternity services.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviations	Full word
AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
BBA	Born Before Arrival
BFN	Bloemfontein
BOR	Bed Occupancy Rate
CHC	Community Health Center
C/S	Caesarean Section
DHIS	District Health Information System
FP methods	Family Planning methods
HB meter	Haemoglobin meter
HIV	Human Immunodeficiency virus
N/A	Not Applicable
NDH	National District Hospital
NVD	Normal Vertex Delivery
PHC	Primary Health Care
PMTCT	Prevention of mother to child transmission
Rh factor	Rhesus factor
SD	Standard deviation
T/F	Transfer
WHO	World Health Organization

DEFINITION OF CONCEPTS

ACTIVE PHASE: the diagnosis of the active phase of labor is made when the woman's cervix is 4cm dilated and less than 1cm long and regular uterine contractions are present (Farrell and Pattinson, 2005).

ADVERSE EVENTS: is defined as an unintended injury or complication which led to temporary permanent disability and/or increased length of stay or death which is caused by healthcare management or healthcare professionals. This will include "near misses" incidents (Farrell and Pattinson, 2005).

AUDIT: is defined as the systematic and critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources and the resulting outcome and quality of life for the patient (Crombie, Davies, Abraham and Florey, 1993).

GUIDELINES: provide the 'blue print' on what and how services should be organized and delivered (CARE/AMDD program (Columbia University Mailman School of Public Health), undated).

LATENT PHASE: the diagnosis of the latent phase of labor is made when the patient's cervix less than 4cm dilated. This will usually be a retrospective diagnosis (Farrell and Pattinson, 2005).

POLICY: is a written statement used to guide and determine present and future decisions about standards of care (CARE/AMDD program (Columbia University Mailman School of Public Health), undated).

PROTOCOLS: outline how to provide care, but are often more detailed in nature, and used together with guidelines that describe how the standards should be delivered

(CARE/AMDD program (Columbia University Mailman School of Public Health), undated).

STANDARD OF CARE: is the professionally developed detailed written statement used to guide procedures (CARE/AMDD program (Columbia University Mailman School of Public Health), undated).

CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW

1.1. INTRODUCTION

This chapter will introduce the study that was conducted, while providing a review of relevant literature and finally presenting the aims and objectives of the study.

1.2. BACKGROUND

Maternity services are essential components of the health care system at all levels of care. These services are managed according to specific policies, protocols and guidelines. Despite having the systems in place, South Africa is facing challenges with maternity services in terms of poor management of the services and systems not functioning well.

Various studies have been conducted to identify management challenges in maternity units of district hospitals, but no formal study has been done to systematically document this problem at the National District Hospital (NDH), although there has been anecdotal evidence of problems in the performance of the unit. It was therefore important to investigate the functioning of the maternity unit of the NDH and identify problems that hinder it from functioning effectively. The recommendations of this study will help to develop intervention plans to improve services in this unit.

The study provides an overview of the current situation of the maternity services at NDH. The study focused on the management of care, quality of services as well as adherence to systems and protocols that are in place.

1.3. THE NDH (NDH) AND ITS CATCHMENT AREA

1.3.1. BACKGROUND

The NDH (NDH) is one of the four district hospitals in Motheo District in the Free State Province. The NDH renders a package of services to the 500,000 population in the catchment's area, which is constantly growing. The NDH is found in Bloemfontein which is the most urban area of Motheo district. The city is the trade and administrative hub of the province and has a university, technicon, tertiary colleges, the provincial government, large military facilities and the Supreme Court of Appeal (Free State Provincial Government, 2005). This means that people who access this hospital are from the different social classes. The NDH renders 24 hours Maternity, Emergency and Radiographic services and 8 hours Theatre services.

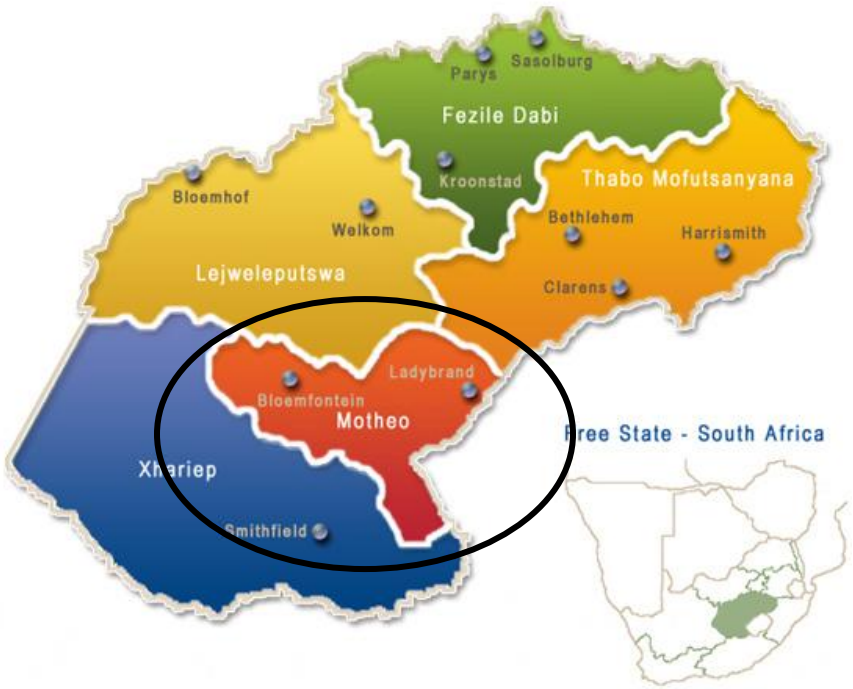

Figure 1. Districts in the Free State Province (Free State Tourism, undated).

According to a Patient Satisfaction Survey that was done in January 2009 at the NDH, 11% of patients who were consulted belonged to a medical aid scheme. Most of the patients (65%) were from Motheo district and the remaining were from other districts, provinces and even other countries. Seventy two percent were between 21 to 50 years of age. Most patients were female (63%) and from the Black population subgroup (87%). Fifty nine percent were earning less than R6500.00 per year. Most of the patients spoke Southern Sotho, Tswana, Xhosa and Afrikaans while very few spoke English. The highest level of education was between grade 8 and 12 (Breytenbach, 2009).

1.3.2. MATERNITY SERVICES AT NDH

The NDH renders 24 hour maternity services. The activities within the maternity unit of the NDH for the second half of 2008 are described in the Table 1.

Table 1. NDH maternity unit statistics from July 2008 to December 2008*

Indicators	July	Aug	Sep	Oct	Nov	Dec
Admissions	285	277	258	253	246	278
Normal deliveries	179	164	154	132	128	173
Assisted deliveries	3	3	4	5	4	5
Caesarian Sections deliveries	13	11	10	12	12	10
Bed Occupancy Rate (BOR)	67%	65%	67%	66%	64%	60%
Referrals to secondary hospital	8	9	12	10	13	7
Other patients in the unit (maternity patients not in labor)	47	90	78	94	89	83
Born Before Arrival (BBA)	35	3	69	39	43	38

* Statistics regarding the number of day patients are not kept in the unit.

Source: (NDH Information unit, 2008)

Although the NDH routinely collects information and compares it to the provincial and national performance indicators, no systematic study has been done to analyze this

information and evaluate the performance of this unit. This study would scientifically evaluate the performance of the unit and give recommendations based on its findings.

1.3.3. THE REFERRAL SYSTEM

The Free State province has a clearly defined referral system which indicates referral routes from patient's home to the nearest local clinic to the community health center to the district hospital, regional hospital and then to the tertiary hospital. These routes are also used for the Emergency Medical Services. The referral patterns in the district follow the referral system of the province (Free State Department of Health, 2006). However, these might differ somewhat, according to the population in the catchment area, facilities available and road infrastructure. The maternity unit's referral route for the NDH follows the referral system of the Motheo district. The patients admitted in this hospital are thus referred from local clinics, community health centers and "soft border towns"[1] between Motheo and Xhariep as well as Lejweleputswa districts. The referrals are done according to the Free State referral system but some of the patients opt to come to the NDH. Other patients are referred by private doctors or "walk-in" themselves.

1.4. LITERATURE REVIEW

1.4.1. OVERALL BACKGROUND OF MATERNITY SERVICES

Maternity services are one of the most important areas in the health care domain as all lives start here. The United Nations has acknowledged the importance of maternal health care and listed it among its Millennium Development Goals (United Nations, 2010). In so doing, governments across the globe are expected to act on improving maternal health services in their countries. These activities have occurred in both developed as well as developing countries.

Western Australia Health department aimed on developing, delivering and providing maternal and new born services that are safe , integrated, effective and responsive to

[1] "Soft border towns" are towns on the borders of districts within the province.

the individual needs of women in their community setting (Western Australia Department of Health, 2007). So, in the United Kingdom (UK), maternity care is available to all women although some women do not take the advantage of the services provided (The House of Commons, 2003).

The Zambian initiative to improve maternity services included providing respectful, dignified and confidential care with a family-centered approach. The approach made reference to WHO's Making Pregnancy Safer Initiative (Maimbolwa, 2004). In Mozambique the community participation approach was encouraged to make delivery places a reality and a safe place for the mother and her baby. This was done by emphasizing the need for communication, and addressing the users' needs and their viewpoints in maternity issues (Sundby and Rwamushaija, 2002).

In South Africa, Maternal Child and Women's Health Care is one of the five priorities of the government for goals to be achieved by the year 2014. The final comment of the 1999 – 2001 Saving Mothers Report states that "Every woman who becomes pregnant and continues with her pregnancy does so in the expectation of delivering a healthy child and the joy and satisfaction of watching the child grow" (National Committee on Confidential Enquiries into Maternal Deaths, 2010). This means that all maternity patients must enjoy quality care and the best management whilst admitted in the health care facilities. This is also a goal for patients at the NDH.

Failure to achieve the improvements in maternity services will result in more maternal and neonatal deaths and ultimately the Millennium Development Goals 4, 5 and 6 will not be achieved (United Nations ICT Task Force, 2003). To monitor and evaluate the performance of these services one needs to focus on maternity unit caseload, management of patients and quality of care. These are discussed further below.

1.4.2. MATERNITY UNIT CASELOAD

1.4.2.1. Bed occupancy

One of the indicators to measure hospital performance is bed occupancy. In South Africa for a hospital to show that it performs effectively and efficiently according to the quality health care standards, the bed occupancy rate should range between 80% and 90% (Olukoga, 2007).

1.4.2.2. Average length of stay

Average length of stay is also an important factor to consider when assessing a maternity unit's workload as maternity patients usually have a short length of stay. Dowswell and colleagues (1997) stated that there is very little known about the long term outcomes of women who delivered, according to their lengths of stay particularly when it was for less than 2 -3 days (Dowswell, Piercy, Hirst, Hewison and Lilford, 1997). It is further explained that there is no ideal or standard for length of stay. In the study conducted in six districts in the Yorkshire Region in 1994 it was found that the overall mean length of stay for women who had normal deliveries was 2.58 days (Dowswell et al, 1997). In contrast, it has been noted that a long average length of stay in a hospital may be a sign of inefficiency (National Department of Health, 2002). It is therefore important to have sufficient length of stay in order to use the available resources optimally (Sahni, 2000).

1.4.2.3. Profile of patients

It is important in the maternity service units to check the patients' profiles and demographics in order to know the level of risk of your patients so that you are able to categorize them correctly and plan their management. The maternity patients are classified into no risk, low risk, medium risk and high risk. Each class defines the

workload that is required to prepare that specific group for delivery and also defines the appropriate level of care required for each group (Farrell and Pattinson, 2005).

The classification of maternity patients into risk groups also takes into consideration their age group and background. The teenage age and the age above 30 years have been identified as critical ages. It has been found that a teenager who is pregnant has a 2- 5 times greater risk of dying during this period than a pregnant women of 20 – 25 years of age (Ashraf, Mustanzid and Khanom, 2007).

Based on their risk classification, pregnant women are then referred to an appropriate facility to deliver using a referral system. According to Hulton, Zoe and Stone (2000), it is important for all stakeholders to understand referral patterns and the criteria used. This will assist with giving prompt treatment to maternity patients at all levels of care including district hospitals. The referral system is one of the elements that make services easily accessible to users. This also prevents exposure to unnecessary complications which may lead to “near misses” or adverse events (Jahn, Kowalewski, and Kimatta, 1998).

1.4.3. CLINICAL MANAGEMENT OF MATERNITY SERVICE USERS

1.4.3.1. Antenatal Care

Clinical management of a pregnant woman starts when she realizes that she is pregnant and seeks health care in preparation for admission and delivery in the maternity unit. According to Bergström (2001), good quality maternal care must provide comprehensive maternity and other reproductive health services. All pregnant mothers are encouraged to start attending the antenatal care clinic prior to 14 weeks gestational period for better outcomes for the mother and the baby (Adewunmi, Rabiu and Tayo, 2009). The concern with women booking late for antenatal care is that they miss opportunities to identify and manage their problems earlier. For example, fetal anomaly

scans need to be done within a specific gestational period if action, such as an abortion, needs to occur.

In Ghana, a study investigating maternal deaths in 34 facilities recommended that the utilization of antenatal care by pregnant woman should be encouraged. This is done to ensure quality care and the best management to patients in their facilities, and to reduce maternal and neonatal deaths (Ansong-Tornui, Amar-Klenesa, Arhinful, Penhold and Hussein, 2007). The South African maternity guidelines encourages pregnant women to attend an Antenatal Care clinic by 14 weeks of their pregnancy for them to have routine investigations done, have risk factors identified and be prepared for labor and the postnatal period (National Department of Health, 2007).

In South Africa the antenatal card is used as a tool to document all important health, obstetrical and routine interventions during pregnancy to assist health care professionals to deliver quality care. Unfortunately it is found in most cases documentation is incomplete. In a study conducted at Rahima Moosa Hospital in February 2008 it was found that antenatal cards of the women who attended ANC clinic in that hospital were not completely documented (Basu and Seopela, 2010).

Some routine activities that are conducted during antenatal care are the management of sexually transmitted infections like syphilis and HIV and AIDS. In Botswana one factor that indicated that there was a positive impact in their antenatal care clinics was the number of syphilis cases declining because more women were attending the antenatal care clinic (Creek, Thuku, Kolou, Rahman and Kilmarx, 2005). HIV management is important in South Africa as it was discovered that 43.7% of the maternal deaths were caused by non pregnancy related infections, which were caused mainly by AIDS, and it was rated as one of the three top causes of maternal deaths (National Committee on Confidential Enquiries into Maternal Deaths, 2010; Burnett, 2009). Adequate management of HIV in pregnancy also includes good enrollment and successful completion of the PMTCT programme (Hoque, Hoque and Kader, 2008).

Finally from the antenatal care clinic the mother and her support system are prepared for admission in the maternity unit.

1.4.3.1. Care of patients during their stay in the maternity unit

The best management and good quality care which starts in the antenatal clinic is meant to continue in the maternity unit where the woman goes to deliver her baby. In South Africa, 42% of deliveries are conducted at district hospitals. In these hospitals maternity care is one of priority services rendered for 24 hours and can be accessed to improve outcomes (Gaunt, 2010).

In hospitals, patients are admitted from different societies, races and communities with their own identities. These patients share cultural values and have common perceptions of what constitute conceptions, pregnancy, labor, birth and the postpartum period (Maimbolwa, 2004). It is important to give these mothers (patients and their support system) a clear understanding of their health status, expectations and any complications at any stage of their condition, and to assist them with birth preparedness and complication readiness (UNICEF Regional office for South Asia, 2004). The health education cannot be seen as additional and unnecessary workload that can be skipped to manage the numbers of patients to be attended to either in a clinic or in a hospital unit.

During this period most women become emotional and their concern during this phase is the need for support and companionship which started during the antenatal care period. Some need their mothers, sisters, cousins and/or their husbands. The best practice standards for the maternity unit patients includes allowing for companionship and this has been found to be the most sensitive and humane means of providing care (Smith, Brown, Hofmeyr, Dickson-Tetteh, Garner, Rees, 2001). Companionship providing continuous support to the women during labor may also reduce or stop dissatisfaction reports received in the maternity units as these women have been found to have better outcomes (Brown, Hofmeyr, Nikodem, Smith and Garner, 2007).

Women being admitted in the maternity ward should all be assessed to confirm labor or make a correct diagnosis, identify their risk status and be managed according to maternity/obstetric policies, guidelines, protocols and doctor's instructions. With the onset of labor, the following observations should be done according to set protocols: abdominal palpations, vaginal examination, checking vital signs (blood pressure levels, pulse rate and temperature (on a 4 hourly basis), before any doctor's instructions are to be followed (Farrell and Pattinson, 2005). The effective management of the latent and active phases of labor can significantly reduce the probability of poor maternal and fetal outcomes.

The partogram is used as a tool to manage the progress of labor through its phases. The use of partogram increases the quality and regularity of important observations during the progress of labor and allows for the early detection of problems (Kenya Ministry of Health and UNFPA Kenya, 2004). However, a study done in Homa Bay District Hospital reported that midwives were more comfortable completing case notes than completing the partogram (Kenya Ministry of Health and UNFPA Kenya, 2004). The midwives in this facility failed to adhere to the use of most important tool during labor.

Poor implementation of the partogram can lead to poor fetal and maternal outcomes, resulting in the need for emergency care such as neonatal resuscitation. A study which was conducted in Charlotte Maxeke Johannesburg Academic Hospital reported that there was poor implementation of the partogram and assumed that was one of the factors contributing to maternal mortality and morbidity at this hospital (Basu, Hoosain, Leballo, Leistner, Masango, Mercer, Mohapi, Petkar and Tshiovhe, 2009).

The World Health Organization (1997) states that each health care institution that provides delivery care needs to have a clear policy and standard of care, to care for newborn babies who need resuscitation.

1.4.4. QUALITY OF CARE IN THE MATERNITY UNIT

1.4.4.1 Adverse events or 'Near- misses' incidents

In a study done by Williams, Olsen, Crichton, Witte, Flin, Ingram, Campbell, Watson, Hopf and Cuthbertson (2008) in the medical, surgical and obstetrical units of a large teaching hospital in Scotland, 8% of patients admitted to hospitals had experienced adverse events. Chaulagai, Moyo, Koot, Moyo, Sambakunsi, Khunga and Naphini (2005) stated that "Maternal mortality rates are pushed up by poor access to essential obstetric services and the poor quality of these services." (Chaulagai et al, 2005).

1.4.4.2 Monitoring and evaluation strategies for assessing the unit's performance

In Australia it was found that indicators can assist unit managers/supervisors to make informed decisions and plan better to provide safe and quality care with appropriate processes for risk assessment and management (Queensland Health Department, 2003). It can also reduce preventable/avoidable complications and make services more acceptable.

In South Africa the National Health Care Management Information System was developed to monitor the implementation and success of health programmes and to report data at all levels of care timeously, accurately and completely including reporting of maternity services (Khotu, 1977). Of most concern is the poor reporting of maternal deaths universally. There is underreporting of maternal deaths globally including in countries with good vital registration and record keeping systems (Shay and Say, 2007).

1.5. STATEMENT OF THE PROBLEM

The hospital management of the NDH has ensured that the systems and resources are in place as well as having guidelines, norms and standards of maternity services, management plans and other reproductive health policies available and implemented.

Despite the abovementioned, the hospital performance continues to show an underutilization of maternity beds. In the NDH, the bed occupancy rate of the maternity unit ranges between 60% and 69%, but there are unconfirmed reports of a high number of maternity day patients. This does not then give a clear indication of the performance in the unit. There has thus been a concern from management about the actual utilization of maternity beds. The low bed occupancy is a reflection of inefficiencies in the system because the resources planned for 80% to 90% may not be fully utilized meaning that the hospital becomes expensive to manage. The unit's health care professionals argue that the day patients increase the workload but this is not captured on the maternity statistics; but they insist to have a high turnover due to high number of day patients. Therefore it is important to check also the impact of the unconfirmed numbers of day patients when discussing caseload/workload of the NDH.

In addition, the length of stay also needs to be considered. The NDH has 22 beds which are used for the admission of patients for antenatal, intrapartum and postnatal care, but most of the time these are not enough for the maternity unit demands. For the maternity staff, the length of stay is not then considered when they discharge a patient who had a normal delivery, as they concentrate on the patient's condition, i.e. is the mother bleeding moderately or less and has the baby passed urine, stools and can feed.

Furthermore, although there was only one maternal death reported in ten years of service delivery, there have been one or two adverse events or "near miss" incidents reported per month. Reports from the Adverse Events Committee indicate that patients were mismanaged and that the unit is not performing up to the set standards and protocols that are in place.

In addition there have been reports of dissatisfaction noted from the patients and staff satisfaction surveys completed from the maternity section of the hospital. The patient satisfaction surveys, done in January 2009, showed that most of the patients were dissatisfied with the fact that the doctors and nurses did not provide them with enough information. The staff satisfaction surveys revealed that the health care professionals and workers were experiencing problems about resource distribution and utilization, especially in relation to the number of people and equipment allocated per unit. Furthermore the hospital patient complaint records also showed that most of the complaints reported were related to the Maternity and Casualty units.

For this study the focus will be on investigating the main causes of these problems or factors contributing to the following problems:

- Low bed occupancy rate.
- Reported mismanagement of inpatients during their stay in the maternity unit.
- Lack of monitoring and evaluation reports from this unit.

1.6. RESEARCH PURPOSE

1.6.1. AIM

To evaluate the functioning of maternity services rendered at the NDH's maternity unit, in the Free State Province, during the study period (2006 – 2008).

1.6.2. SPECIFIC OBJECTIVES

1. To describe the caseload of patients in the maternity unit of the National District Hospital during the study period.
2. To describe the clinical management of inpatients during their stay in the maternity unit of the National District Hospital during the study period.

3. To describe adverse events and near-misses incidents reports related to the maternity unit of the National District Hospital.
4. To describe the monthly monitoring and evaluation reports completed by the unit manager of the maternity unit of the National District Hospital, for decision making and planning the unit activities during the study period.

CHAPTER TWO: METHODOLOGY AND PROCEDURES

2.1 INTRODUCTION

This chapter will discuss the methodology for this study. The methodology was selected on the basis of its aims and objectives. In this chapter, the following are discussed: setting, scope, study design and research tools.

2.2 STUDY DESIGN

A retrospective cross sectional study design was used for this study. The study design consisted of four components:

- Component 1: A random month was selected (April). The Admission and Birth registers for 2006, 2007 and 2008 were reviewed to calculate the maternity unit's caseload for the selected month.
- Component 2: Systematic sampling was used to select thirty patient files/records which were reviewed to assess the quality of care provided.
- Component 3: All adverse events incidents that were reported in the Adverse Events Register for the maternity unit from 2006 – 2008 were assessed.
- Component 4: The monthly monitoring and evaluation reports for the maternity unit were assessed for the period of 2006 – 2008.

2.3 STUDY PERIOD

The study included the 2006, 2007 and 2008 calendar years.

2.4 STUDY SETTING

The setting of this study was the maternity unit of NDH in the Motheo district in the Free State Province. The hospital has 24 hours maternity unit and 8 hours theatre services. The maternity unit has 22 beds for admission of patients, an antenatal unit for high risk

patients or patients waiting to deliver, first stage of labor, labor wards and a post natal unit for patients who have delivered.

2.5 STUDY POPULATION

All patients admitted in the maternity unit at the NDH for the selected month were included for Component 1.

All women who were admitted in the maternity unit for the selected month formed part of the sample for Component 2, where patient files were reviewed. Therefore all patients admitted in the maternity unit at the NDH in the month April of 2006, 2007 and 2008 were included.

Inclusion Criteria

- Pregnant patients admitted whether sick, not in labor and those in labor.
- All patients who have delivered and were admitted for post natal care.

Exclusion criteria

- Patients who did not appear in the admission registers were excluded from the study.
- Patients who were referred out to other facilities as the files accompany patients to the referral facility.
- Patients who were redirected to other facilities as the files accompany patients to the referral facility.
- For the selection process, the entrants which were not complete in the admission register were excluded for sampling.

For component 3, all entries in the adverse event register of 2006, 2007 and 2008 were reviewed.

For component 4, all the monthly supervisory unit reports of 2006, 2007 and 2008 were reviewed.

2.6 STUDY SAMPLING

Component 1: No sampling was done. All patients entered into the admission registers for the selected month of 2006, 2007 and 2008 were included in the study.

Component 2: Thirty patient clinical files/records from the selected month for 2006, 2007 and 2008 were systematically sampled. The data collected in component 1 formed the sampling framework. Patients who were referred out were excluded as files were sent with patient to the referral facility. This was divided by thirty to obtain the systematic number. If a patient's file was not found, the next patient's file was selected as a replacement.

At the initial stage, all files of the patients were given case numbers. In 2006, 309 patients were registered, in 2007, 270 patients were registered, and in 2008, 299 patients were registered. All files which were available were checked against admission register and those which were not entered in the admission register for the month of April, those that were transferred out and redirected were excluded. During the second round, the remaining files were given new case numbers to correspond with new numbers. The sampling is explained graphically in Figure 2 below.

In 2006, 259 patients were registered. For the sampling, the total was divided by 30 and, the researcher had to draw every ninth file. The researcher decided to draw the seventh file giving allowance for those which might be missing.
In 2007, 140 patients were registered. For the sampling, the total was divided by 30 and, the researcher had to draw every fifth file. The researcher decided to draw the fourth file giving allowance for those which might be missing.
In 2008, 150 patients were registered. For the sampling, the total was divided by 30 and, the researcher had to draw every fifth file. The researcher decided to draw the fourth file giving allowance for those which might be missing.

	2006	2007	2008
Total number of admissions in the month of April	309	270	299
Exclude patients who were not entered into the admission register, or those that that were transferred out or redirected			
Total number of admissions remaining	259	140	150
Divide by 30			
Systematic number obtained	9	5	5
Systematic number used	7	4	4

Figure 2. Sampling for Component 2 of the study

Component 3: No sampling was done. All patients entered into the Adverse Events Register for 2006, 2007 and 2008 were included in the study.

Component 4: No sampling was done. All monitoring and evaluation reports completed for the maternity unit's performance for 2006, 2007 and 2008 were included in the study.

2.7 MEASUREMENT AND DATA SOURCE

2.7.1. STUDY INSTRUMENT

Data collection tools were developed for each of the components of the study. Table 2 describes the data collected, the data source, and the data collection tool used.

Table 2. List of data collection tools developed for the study

Component of study	Variables	Data Source	Data collection tool
Component 1	Bed Occupancy Average length of stay Patients' profile	Admission Register Birth Register	Appendix A
Component 2	**Demographic characteristics** Age Race Catchment area **ANC clinic** Booked Diagnosis Referrals Preparations for delivery **Maternity Unit inpatients** Admission in the unit Assessment on admission Following routine protocols Doctor's orders Routine interventions **Intrapartum care** Observations	Patients' files and records	Appendix B

	Clinical assessment Use of Partogram Second stage of labor Delivery phase Third stage of labor **Postnatal care** Assessment of mother's condition Assessment of newborn baby's condition Resuscitation details Discharge notes		
Component 3	**Quality of care received by patients** Adverse events reports	Adverse Events register	Appendix C
Component 4	**Supervisor's unit performance report** Statistics MMR meetings	Monthly statistics Monthly performance reports MMR meeting minutes	Appendix D

2.7.2. PILOT STUDY

The data collection tools for Component 3 and 4 were piloted in the medical wards of the NDH. The data collection tools for Component 1 and 2 were piloted using a different month from the one that was selected. Only five patient records were reviewed for Component 2. The pilot study was done to assess the applicability of the data collection tools and to ensure that the researcher familiarizes herself with the tools being used. Changes were made to the tools (Appendices A and B) after the pilot study was done. The researcher started to give variables codes to make the tools user friendly.

2.7.3. DATA COLLECTION

2.7.3.1. Preparation for data collection

Data for this study were found on the patients' and nursing records used routinely when the patients are admitted in this unit. Data from various sources of the hospital information management unit were also extracted. No primary data was collected specifically for this study. All of the data collection was conducted by the researcher and no field workers were used.

2.7.3.2. Actual data collection

Actual collection of data was started in January 2010. The researcher started with the admission registers and checked with the birth registers to confirm the entrants. The entrants were used for component 1 and they were used as the framework to do sampling for component 2. The information was captured in Excel spreadsheets with code numbers for component 1 and 2.

All of the information from the maternity unit adverse events registers was entered for component 3.

All of the maternity unit's monthly supervisory unit reports were entered for component 4.

2.7.4. DATA CLEANING AND ANALYSIS

Information from the data collection tools were captured onto separate MS Excel spreadsheets for each component of the study. These were checked for obvious errors and cleaned. The spreadsheets were then imported into EPI-Info software version 3.5.1. for analysis.

The first round of analysis was done, after which the following was found:

- Incomplete information
- A mistake in numbering with sequence (e.g. for date: year, month and day)
- Some numbers duplicated or omitted
- Some of the wordings were written in full while others were abbreviated
- Some names of places were misspelled and gave wrong readings
- Some information was not included under the correct columns

The data was cleaned up several times until the analyses were done as given in Chapter 3. Descriptive statistics were conducted and reported. This included the mean, median, range and standard deviation for continuous variables. Frequencies and proportions were calculated for categorical variables.

To test for differences across the years, test for associations were done. The t-test was done for continuous variables. Chi-square or Fischer Exact tests were appropriate, were done for categorical variables to test for changes across the years. A p-value of 0.05 was considered to be significant.

2.8 ETHICAL CONSIDERATIONS

Permission for conducting research and accessing documents was sought from the Head of the Department of the Free State Provincial Department of Health (Appendix E). A submission was made to the Wits Human Research Ethics Committee to obtain approval before the study was commenced (Appendix F). This study was based on reviewing the existing information. No primary data was collected specifically for this study. No intervention was done as a part of this study.

Confidentiality and anonymity was maintained at all times during the collection, capturing, and reporting of information. No names and addresses of patients were used. The files were given case numbers to identify the files, and the actual file numbers were not recorded.

CHAPTER THREE: FINDINGS

3.1. INTRODUCTION

The aim of this chapter is to condense and organize the data for interpretation through the process of analyses as described in the Methodology section.

3.2. CASELOAD AND PATIENTS PROFILE IN THE MATERNITY UNIT

3.2.1. CASELOAD IN THE MATERNITY UNIT

Table 3 presents the caseload as captured in the unit registers. The data captured in the DHIS did not match the figures that the researcher found in the maternity unit during data collection. There was no data for day patients in the unit. This was only reflected in the DHIS report. The patients who had babies Born Before Arrival at the hospital (BBAs) were not captured in the admission register or the birth register except for those who stayed for a day. Other BBAs were captured in the separate register.

The researcher found that there were some patients in the unit that were not captured in the admission or birth register. These patients had files opened for them but were not captured in the admission register but some were captured in the birth register when they delivered their babies.

Table 3. Comparison of data from the DHIS and maternity unit registers for the month of April

	Data from DHIS			Data obtained from registers		
Date	**2006**	**2007**	**2008**	**2006**	**2007**	**2008**
*NVD	185	154	199	164	148	158
Assisted delivery	4	5	4	3	5	4
*C/S	16	10	14	17	7	9
*T/F out	40	24	15	48	6	15
Day patients	92	79	77	59	38	77
*BBA	40	39	33	1	0	1
Patients in the ward but not in the registers	No info	No info	No info	12	8	6
Patients who were unable to be classified as files were incomplete	No info	No info	No info	5	58	29
Total admissions as calculated	***377***	***311***	***342***	***309***	***270***	***299***
Admission (on DHIS)	***308***	***269***	***300***	***N/A***	***N/A***	***N/A***
Gap between DHIS and total admissions as calculated	***69***	***42***	***42***	***1***	***1***	***-1***

*NVD: Normal vertex delivery

*C/S: Caesarean Section delivery

*T/F out: Transferred out

*BBA: Babies born before arrival to the health facility

The graph below (Figure 3) displays the comparison of data from the DHIS for the maternity unit and the data from research tools. This showed that data from DHIS system was not adding up with the data obtained from registers used for the study purpose and the numbers which were reflected on the DHIS for the unit during the selected month. The red lines on the graph reflects the total number of admissions on the DHIS system.

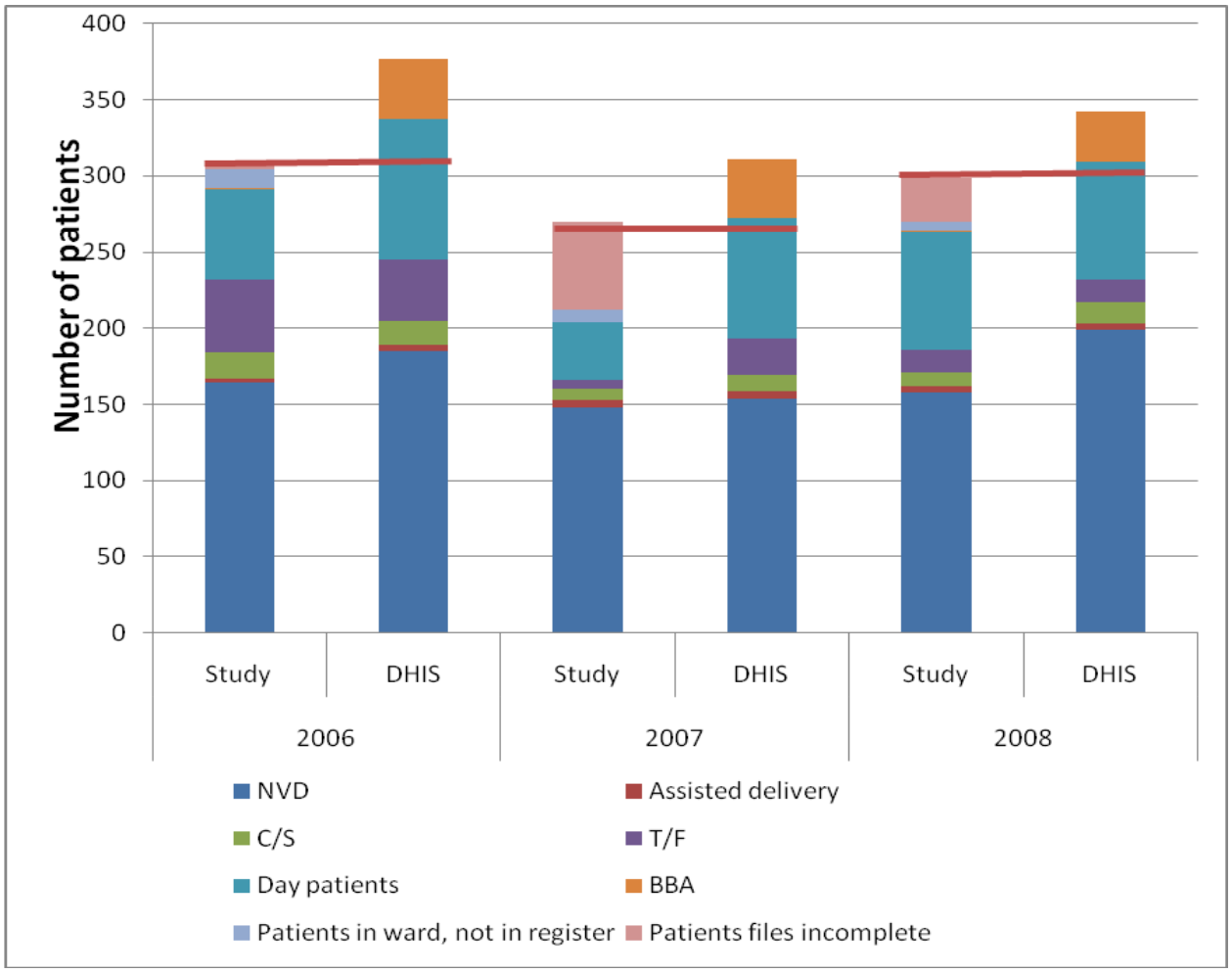

Figure 3. Comparison of data from DHIS and research sources

3.2.2. PATIENTS PROFILE IN THE MATERNITY UNIT

Table 4 shows the profile of patients that accessed the NDH maternity services during the study period. Most of the patients were between the ages of 24 and 25 years. There were changes in the profile of the patients who were admitted in the unit with a significant increase of married patients and White patients in 2008. Most of the patients were from the catchment area served by the hospital but there were also patients from other catchment areas as far as the Western Cape Province and Vereeniging in Gauteng province.

Table 4. Profile of patients admitted in the maternity unit of the NDH

	Total	2006	2007	2008	p value
	Mean (SD) for continuous variable **n (%) for categorical variable**				
Age	*24.48 (5.87)*	23.95 (6.27)	24.61 (5.39)	24.86 (5.75)	0.1941
Marital status					
(N = 634)	*3 (0.5%)*	2 (1.0%)	1(0.5%)	0 (0.0%)	0.0001
Engaged	*153 (24.1%)*	30 (14.9%)	44 (21.5%)	79 (34.6%)	
Married	*477 (75.2%)*	168 (83.6%)	160 (78.0%)	149 (65.4%)	
Single	*1 (0.2%)*	1(0.5%)	0 (0.0%)	0 (0.0%)	
Widow					
Race (N = 829)					
Black	*626 (75.5%)*	211 (79.9%)	214 (80.5%)	201(67.2%)	0.0000
Coloured	*75 (9.0%)*	26 (9.8%)	27 (10.2%)	22 (7.4%)	
Chinese	*4 (0.5%)*	0 (0.0%)	1 (0.4%)	3 (1.0%)	
Indian	*9 (1.1%)*	2 (0.8%)	3 (1.1%)	4 (1.3%)	
White	*115 (13.9%)*	25 (9.5%)	21 (7.9%)	69 (23.1%)	
Area of origin					
(N = 855)					0.0373
Motheo BFN	*615 (71.8%)*	215 (74.9%)	175 (64.7%)	225 (75.3%)	
Other Motheo	*17 (2.0%)*	9 (3.1%)	4 (1.5%)	4 (1.3%)	
Naledi	*64 (7.5%)*	13 (4.5%)	32(12.0%)	19 (6.4%)	
Xhariep	*59 (6.9%)*	20 (7.0%)	19 (7.1%)	20 (6.7%)	
Lejweleputswa	*91 (10.7%)*	27 (9.4%)	36 (13.5%)	28 (9.4%)	
Thabo Mofutsanyane	*1 (0.1%)*	1(0.3%)	0 (0.0%)	0 (0.0%)	
Other places	*8 (0.9%)*	2(0.7%)	3 (1.1%)	3 (1.0%)	

Table 5 shows the type of patients that were managed at the NDH maternity unit. Most of the patients (87.9%) had attended ANC clinic and were booked patients. Patients who were referred or who referred themselves to this hospital were diagnosed in five main categories on admission. About two thirds were admitted being in the latent or active phases of labor.

Table 5. Types of patients referred to be managed at NDH maternity unit

Type of patients	***Total***	**2006**	**2007**	**2008**	**p value**
	n (%)				
Booked (N = 572)					
No	*65 (11.4%)*	15 (10.3%)	23 (11.8%)	27 (11.7%)	0.5025
Yes	*502 (87.8%)*	128 (87.7%)	171 (87.7%)	203 (87.9%)	
Yes/Private	*5 (0.9%)*	3 (2.1%)	1 (0.5%)	1 (0.4%)	
Diagnosis (N = 750)					
Active phase	*560 (74.7%)*	198 (73.1%)	185 (86.0%)	177 (74.7%)	0.0009
Latent/false phase	*159 (21.2%)*	60 (22.1%)	25 (11.6%)	74 (28.0%)	
Sick patients	*26 (3.5%)*	10 (3.7%)	4 (1.9%)	12 (4.5%)	
Post labor care	*3 (0.4%)*	2 (0.7%)	1 (0.5%)	0 (0.0%)	
BBA	*2 (0.3%)*	1 (0.4%)	0 (0.0%)	1 (0.4%)	

The outcomes (reason for admission/diagnosis) of the inpatients managed at the NDH maternity unit are reported in Table 6. Most of patients had normal vaginal delivery (61.5%) followed by patients who had a short stay for less than a day (27.8%) then those who were transferred out (9%) either to higher or lower institutions and then those who had Caesarean Section deliveries (4.3%)

Table 6. Diagnosis Outcome data in maternity unit

Outcome (N = 774)	*Total*	2006	2007	2008	p value
	n (%)				
*NVD	*470 (61.5%)*	164 (56.4%)	148 (71.2%)	158 (59.6%)	0.0000
*C/S	*33 (4.3%)*	17 (5.8%)	7 (3.4%)	9 (3.4%)	
Abnormal presentations	*6 (0.8%)*	0 (0.0%)	4 (1.9%)	2 (0.8%)	
Assisted delivery	*22 (1.6%)*	3 (1.0%)	5 (2.4%)	14 (1.5%)	
Day patients	*174 (27.8%)*	59 (20.3%)	38 (18.3%)	77 (29.1%)	
*T/F out	*69 (9.0%)*	48 (16.5%)	6 (2.9%)	15 (5.7%)	

*NVD: Normal vertex delivery

*C/S: Caesarean Section delivery

*T/F out: Transferred out

Table 7 presents data on the average length of stay for patients to achieve their outcome (delivery/action taken after making the diagnosis) and the average length of stay up to the discharge of the patient. The time spent by the patients in this unit indicates that even some of the patients who were in labor stayed for less than two days. The majority achieved their outcome in less than four hours and was discharged after a day.

Table 7. Time spent by the patients at the NDH Maternity unit

Times patients spent (N = 898)	*Total*	2006	2007	2008	p value
Outcome in days (mean)	*0.39*	0.48	0.31	0.37	0.0422
Median	*0.00*	0.00	0.00	0.00	
Standard deviation	*0.74*	0.91	0.60	0.61	
Range	*0 - 7*	0 - 7	0 - 4	0 - 4	
Discharge in days (mean)	*1.52*	1.09	1.34	2.16	0.486
Median	*1.00*	1.00	1.00	1.00	
Standard deviation	*1.05*	0.97	1.27	0.92	
Range	*0 - 12*	0 - 6	0 - 12	0 – 6	

3.3. MANAGEMENT OF PATIENTS

3.3.1. QUALITY OF CARE RECEIVED WHILE PATIENTS RECEIVED ANTENATAL CARE

For this observation, 90 files were selected from the total number of patients admitted from 2006 to 2008. For each year 30 files were selected.

As these patients were a sample of the patients from Component 1 of the study, the demographics are similar to the data presented above of the patients' profile. Most the patients were between the ages of 19 – 30 years (63.4%), from the Black population (71.1%) and unemployed with 10% being students. More than fifty percent were primigravidas (54.4%) (Data not shown).

Most of the patients (73.3%) were from the catchment area; but it is noted that even patients who were not supposed to have been served by this hospital did access the services of this hospital as far as from Western Cape as well as Vereeniging. Most of the patients were accompanied by family, relative members or friends and only 1% was not accompanied during antenatal care clinic attendance and on admission to the maternity unit.

Table 8 shows the management of patients and quality of care received by the patients when they attended the antenatal clinic. All of the patients who attended the clinic (73.3%) were attended to by midwives during their first contact in the clinic. Their current medical history and obstetric history were taken mostly by midwives (68.9%) and 4.4% by students without a midwife's supervision.

Table 8. Quality of history obtained in antenatal clinic

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Current medical history taken (N = 90)					
Yes (Taken)	*66 (73.3%)*	22 (73.3%)	20 (66.7%)	24 (80.0%)	0.0161
*No (Not taken)	*1 (1.1%)*	0 (0.0%)	1 (3.3%)	0 (0.0%)	
+Not recorded	*9 (10.0%)*	1 (3.3%)	5 (16.7%)	3 (10.0%)	
Card missing	*8 (8.9%*	1 (3.3%)	4 (13.3%)	3 (10.0%)	
#N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Current obstetric history taken (N = 90)					
Yes (Taken)	*66 (73.3%)*	22 (73.3%)	20 (66.7%)	24 (80.0%)	0.0161
No (Not taken)	*1 (1.1%)*	0 (0.0%)	1 (3.3%)	0 (0.0%)	
Not recorded	*9 (10.0%)*	1 (3.3%)	5 (16.7%)	3 (10.0%)	
Card missing	*8 (8.9%*	1 (3.3%)	4 (13.3%)	3 (10.0%)	
N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Examination done by (N = 90)					
Midwife	*62 (68.9%)*	20 (66.7%)	20 (66.7%)	22 (73.3%)	0.0173
Doctor	*13 (14.4%)*	3 (10.0%)	5 (16.7%)	5 (16.7%)	
Student midwife	*9 (10.0%)*	1 (3.3%)	5 (16.7%)	3 (10.0%)	
Card missing	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	

*No: Where information written and indicated that the history was not taken

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who did not attend the antenatal clinic.

Investigations conducted during the provision of antenatal care are reported in Table 9, 10 and 11. Rhesus (Rh) testing was done for 74.4% of patients who attended the clinic and 72.2% tested Rh negative and only 1.1% tested Rh positive (Table 9). Most of the patients (72.2%) were tested for syphilis and tested negative (68.9%) (Table 10). The HIV records, however, showed that significant number of the documents for pre and post counseling, testing and results were not recorded as about 40% of documents reviewed had blank space in this area (Table 11).

Table 9. Rhesus (Rh) investigation and results during antenatal care

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Testing (N = 90)					
Yes (test done)	*67 (74.4%)*	23 (76.7%)	21 (70.0%)	23 (76.7%)	0.0050
+Not recorded	*9 (10.0%)*	0 (0.0%)	5 (16.7%)	4 (13.3%)	
Card missing	*8 (8.9%)*	1 (3.3%)	4 (13.3%)	3 (10.0%)	
#N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Status (N = 90)					
Positive	*65 (72.2%)*	22 (73.3%)	20 (66.7%)	23 (76.7%)	0.0039
Negative	*1 (1.1%)*	0 (0.0%)	1 (3.3%)	0 (0.0%)	
+Not recorded	*9 (10.0%)*	0 (0.0%)	5 (16.7%)	4 (13.3%)	
Card missing	*8 (8.9%)*	1 (3.3%)	4 (13.3%)	3 (10.0%)	
#N/A	*7 (7.8%)*	7 (23.3%)	0 (0.0%)	0 (0.0%)	

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who did not attend the antenatal clinic.

Table 10. Syphilis investigation and results during antenatal care

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Testing (N = 90)					
Yes (testing done)	*65 (72.2%)*	23 (76.7%)	19 (63.3%)	23 (76.7%)	0.0065
*No (testing not done)	*2 (2.2%)*	0 (0.0%)	1 (3.3%)	1 (3.3%)	
+Not recorded	*9 (10.0%)*	0 (0.0%)	6 (20.0%)	3 (10.0%)	
Card missing	*8 (8.9%)*	1 (3.3%)	4 (13.3%)	3 (10.0%)	
#N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Results status (N = 90)					
Positive	*2 (2.2%)*	2 (6.7%)	0 (0.0%)	0 (0.0%)	0.0006
Negative	*62 (68.9%)*	21 (70.0%)	18 (60.0%)	23 (76.7%)	
Not recorded	*11 (12.2%)*	0 (0.0%)	8 (26.7%)	3 (10.0%)	
Card missing	*9 (10.0%)*	1 (3.3%)	4 (13.3%)	4 (13.3%)	
N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Treatment (N = 90)					
Yes (Treatment given)	*2 (2.2%)*	2 (2.2%)	0 (0.0%)	0 (0.0%)	0.0400
Not recorded	*10 (11.1%)*	0 (0.0%)	7 (23.3%)	3 (10.0%)	
Card missing	*9 (10.0%)*	2 (2.2%)	4 (13.3%)	3 (10.0%)	
N/A	*69 (76.7%)*	26 (86.7%)	19 (63.3%)	24 (80.0%)	

*No: Where information written and indicated that the investigation activity was not done

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who did not attend the antenatal clinic.

Table 11. HIV investigations and results during antenatal care

	Total	2006	2007	2008	p value
	n (%)				
Pre counseling (N = 90)					
Yes (Counseling done)	42 (46.7%)	14 (46.7%)	11 (36.7%)	17 (56.7%)	0.0048
*No (Counseling not done)	9 (10.0%)	3 (10.0%)	6 (20.0%)	0 (0.0%)	
+Not recorded	25 (27.8%)	6 (20.0%)	9 (30.0%)	10 (40.0%)	
Card missing	8 (8.9%)	1 (3.3%)	4 (13.3%)	3 (10.0%)	
#N/A	6 (6.7%)	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Testing (N = 90)					
Yes (testing done)	35 (38.9%)	16 (53.3%)	10 (33.3%)	9 (30.0%)	0.0018
No (testing not done)	10 (11.1%)	3 (10.0%)	5 (16.7%)	2 (6.7%)	
Not recorded	31 (34.4%)	4 (13.3%)	11 (36.7%)	16 (53.3%)	
Card missing	8 (8.9%)	1 (3.3%)	4 (13.3%)	3 (10.0%)	
N/A	6 (6.7%)	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Results status (N = 90)					
Positive	9 (10.0%)	4 (13.3%)	1 (3.3%)	4 (13.3%)	0.0003
Negative	30 (33.3%)	15 (50.0%)	10 (33.3%)	5 (16.7%)	
Not recorded	37 (41.1%)	4 (13.3%)	15 (50.0%)	18 (60.0%)	
Card missing	8 (8.9%)	1 (3.3%)	4 (13.3%)	3 (10.0%)	
N/A	6 (6.7%)	6 (20.0%)	0 (0.0%)	0 (0.0%)	
Post counseling (N = 90)					
Yes (Counseling done)	37 (41.1%)	14 (46.7%)	10 (33.3%)	13 (43.3%)	0.0014
No (Counseling not done)	10 (11.1%)	3 (10.0%)	7 (23.3%)	0 (0.0%)	
Not recorded	29 (32.2%)	6 (20.0%)	9 (30.0%)	14 (46.7%)	
Card missing	8 (8.9%)	1 (3.3%)	4 (13.3%)	3 (10.0%)	
N/A	6 (6.7%)	6 (20.0%)	0 (0.0%)	0 (0.0%)	

PMTCT Program (N = 90)					
On program	6 (6.7%)	4 (13.3%)	0 (0.0%)	2 (6.7%)	0.0050
Not on program	1 (1.1%)	1 (3.3%)	0 (0.0%)	0 (0.0%)	
Not recorded	37 (41.1%)	4 (13.3%)	12 (40.0%)	21 (70.0%)	
Card missing	9 (10.0%)	2 (6.7%)	4 (13.3%)	3 (10.0%)	
N/A	37 (41.1%)	19 (63.3%)	14 (46.7%)	4 (13.3%)	

*No: Where information written and indicated that the investigation activity was not done

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who did not attend the antenatal clinic.

Table 12 shows that most of the patients were at no risk (51.1%) or at low risk (25.6%) only 2.2% was considered to be high risk pregnancies. Eighty three percent of the patients were referred to deliver at a hospital of which 66.7% were referred to deliver at the district hospital and 16.7% at the secondary hospital. Seventeen percent of patients chose to deliver at a secondary hospital because it was the nearest hospital from where they live and those midwives referred them to the secondary hospital as the NDH was doing more Caesarean Section deliveries during working hours and there were limited theatre services available after hours.

Advice was given to pregnant mothers on baby feeding and most mothers chose breastfeeding (57.8%) and (7.8%) opted for formula feeding. These were patients who were on the PMTCT program. Some of the patients did not make a choice at the clinic especially unbooked mothers. They made a choice on admission at the hospital.

Table 12. Patients' preparation for delivery before admission to the NDH maternity unit

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Risk status (N = 90)					
No risk	*46 (51.1%)*	11 (36.7%)	17 (56.7%)	18 (60.0%)	0.0670
Low risk	*23 (25.6%)*	11 (36.7%)	8 (26.7%)	4 (13.3%)	
Medium risk	*17 (18.9%)*	4 (13.3%)	5 (16.7%)	8 (26.7%)	
High risk	*2 (2.2%)*	2 (6.7%)	0 (0.0%)	0 (0.0%)	
Card missing	*2 (2.2%)*	2 (6.7%)	0 (0.0%)	0 (0.0%)	
Planned place of delivery (N = 90)					
CHC	*8 (8.9%)*	3 (10.0%)	2 (6.7%)	3 (10.0%)	0.0111
District hospital	*60 (66.7%)*	17 (56.7%)	21 (70.0%)	22 (73.3%)	
Secondary hospital	*15 (16.7%)*	3 (10.0%)	7 (23.3%)	5 (16.7%)	
N/A	*7 (7.8%)*	7 (23.3%)	0 (0.0%)	0 (0.0%)	
Baby's nutrition (N = 90)					
Formula feeding	*7 (7.8%)*	0 (0.0%)	3 (10.0%)	4 (13.3%)	0.0310
Breast feeding	*52 (57.8%)*	17 (56.7%)	17 (56.7%)	18 (60.0%)	
+Not recorded	*16 (17.8%)*	4 (13.3%)	6 (20.0%)	6 (20.0%)	
Card missing	*9 (10.0%)*	3 (10.0%)	4 (13.3%)	2 (6.7%)	
#N/A	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who did not attend the antenatal clinic.

3.3.2. MANAGEMENT OF PATIENTS DURING ADMISSION IN THE MATERNITY UNIT

The tables 13, 14, 15 and 16 presents data on the management of patients in the maternity unit. Of note, it was found that all of the patients' files were opened by

midwives. No significant changes were noticed on assessment done on admission across the years except that fewer patients were given treatment on admission in 2008. Significant change was seen in observations. Improvement in recordings was noted in 2008 as more patients' observations (58 – 60%) were recorded in that year.

The use of the partogram showed that most of the documents were completed on the fetal condition, labor progress and maternal condition only. A significant number of the files were not completed on the risk factor (51.1%) and progress management plan (47.8%).

Table 13. Admission records of patients in the maternity unit

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
File opening by midwife (N = 90)	*90 (100.0%)*	30 (100.0%)	30 (100.0%)	30 (100.0%)	-
Reason for admission (N = 90)					
In labor	*77 (85.6%)*	24 (80.0%)	25 (83.3%)	28 (93.3%)	0.3107
Sick patients	*13 (14.4%)*	6 (20.0%*)*	5 (16.7%)	2 (6.7%)	
Initial examination by (N = 90)					
Midwife	*75 (83.3%)*	22 (73.3%)	26 (86.7%)	27 (90.0%)	0.3762
Doctor	*6 (6.7%)*	3 (10.0%)	1 (3.3%)	2 (6.7%)	
Both (midwife & doctor)	*9 (10.0%)*	5 (16.7%)	3 (10.0%)	1(3.3%)	

Table 14. Assessment on admission

	Total	2006	2007	2008	p value
	n (%)				
Assessment recorded (N = 90)					
Yes	*87 (96.7%)*	30 (100.0%)	28 (93.3%)	29 (96.7%)	0.3554
No	*3 (3.3%)*	0 (0.0%)	2 (6.7%)	1 (3.3%)	
Treatment given noted (N = 90)					
Yes	*27 (30.0%)*	15 (50.0%)	6 (20.0%)	6 (20.0%)	0.0138
No	*63 (70.0%)*	15 (50.0%)	24 (80.0%)	24 (80.0%)	
Doctor's orders carried out (N = 90)					
Yes	*34 (37.8%)*	14 (46.7%)	12 (40.0%)	8 (26.7%)	0.2662
No	*56 (62.2%)*	16 (53.3%)	18 (60.0%)	22 (73.3%)	
Protocol on admission (N = 90)					
Yes	*89 (98.9%)*	29 (96.7)	30 (100.0%)	30 (100.0%)	0.3638
No	*1 (1.1%)*	1 (3.3%)	0 (0.0%)	0 (0.0%)	
+Interventions on admission (N = 90)					
Yes	*89 (98.9%)*	30 (100.0%)	30 (100.0%)	29 (96.7%)	0.3638
No	*1 (1.1%)*	0 (0.0%)	0 (0.0%)	1 (3.3%)	

+The maternity interventions done either routinely or as prescribed by the doctor.

Table 15. Observations recorded on patients at the NDH maternity unit on admission

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Contractions (N = 90)					
Yes (Observed)	*52 (57.8%)*	13 (43.3%)	18 (60.0%)	21 (70.0%)	0.1073
No (Not observed)	*38 (42.2%)*	17 (56.7%)	12 (40.0%)	9 (30.0%)	
Liquor (N = 90)					
Yes (Observed)	*54 (60.0%)*	12 (40.0%)	20 (37.0%)	22 (73.3%)	0.0205
No (Not observed)	*36 (40.0%)*	18 (60.0%)	10 (33.3%)	8 (26.7%)	
Fetal heart (N = 90)					
Yes (Observed)	*53 (58.9%)*	12 (40.0%)	19 (63.3%)	22 (73.3%)	0.0266
No (Not observed)	*37 (41.1%)*	18 (60.0%)	11 (36.7%)	8 (26.7%)	
Maternal condition (N = 90)					
Yes (Observed)	*53 (58.9%)*	12 (40.0%)	19 (63.3%)	22 (73.3%)	0.0266
No (Not observed)	*37 (41.1%)*	18 (60.0%)	11 (36.7%)	8 (26.7%)	
Urine testing (N = 90)					
Yes (Observed)	*52 (57.8%)*	11 (36.7%)	18 (60.0%)	23 (76.7%)	0.0070
No (Not observed)	*38 (42.2%)*	19 (63.3%)	12 (40.0%)	7 (23.3%)	
Vaginal examination (N = 90)					
Yes (Observed)	*51 (56.7%)*	11 (36.7%)	19 (63.3%)	21 (70.0%)	0.0342
No (Not observed)	*38 (42.2%)*	19 (63.3%)	11 (36.7%)	8 (26.7%)	
N/A	*1 (1.1%)*	0 (0.0%)	0 (0.0%)	1 (3.3%)	

Drugs given recorded (N = 90)					
Yes (Observed)	*42 (46.7%)*	4 (13.3%)	18 (60.0%)	20 (70.0%)	0.0001
No (Not observed)	*47 (52.2%)*	26 (86.7%)	12 (40.0%)	9 (30.0%)	
N/A	*1 (1.1%)*	0 (0.0%)	0 (0.0%)	1 (3.3%)	

#N/A: Patients who were not in labor or who had delivered their babies.

Figure 4 below graphically presents the significant improvement in record keeping on admission in 2008.

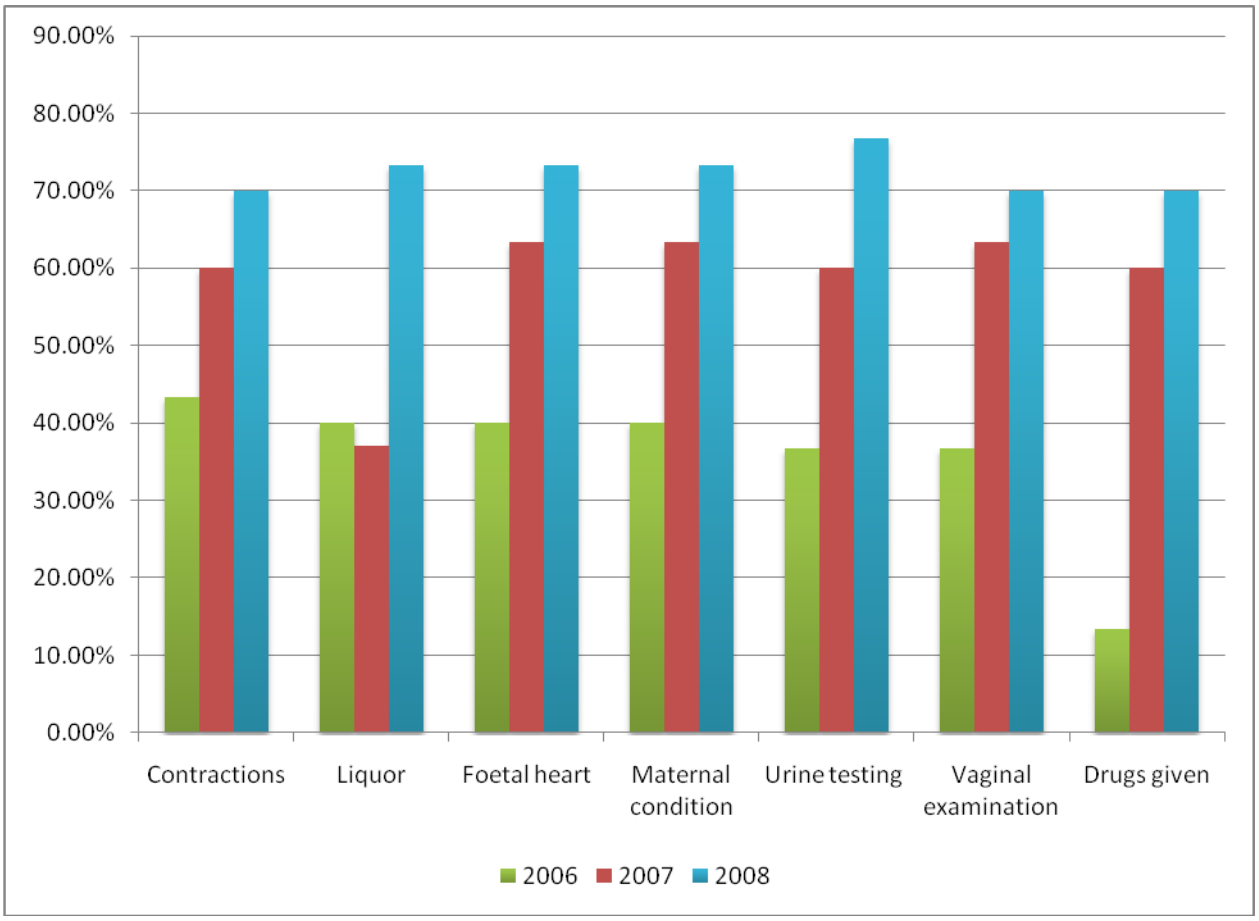

Figure 4. Observations recorded on admission of patients at NDH maternity unit

Table 16. Partogram observations for patients who were in latent and active labor phases

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Risk status noted (N = 90)					
Yes	*23 (25.6%)*	11 (36.7%)	8 (26.7%)	4 (13.3%)	0.2034
*No	*46 (51.1%)*	11 (36.7%)	17 (56.7%)	18 (60.0%)	
#N/A	*21 (23.3%)*	8 (26.7)	5 (16.7%)	8 (26.7%)	
Fetal condition noted (N = 90)					
Yes	*61 (67.8%)*	21 (70.0%)	22 (73.3%)	18 (60.0%)	0.8073
No	*11 (12.2%)*	4 (13.3%)	3 (10.0%)	4 (13.3%)	
N/A	*18 (20.0%)*	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Labor progress (N = 90)					
Yes	*64 (71.1%)*	23 (76.7%)	23 (76.7%)	18 (60.0%)	0.5951
No	*8 (8.9%)*	2 (6.7%)	2 (6.7%)	4 (13.3%)	
N/A	*18 (20.0%)*	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Maternal condition noted (N = 90)					
Yes	*61 (67.8%)*	23 (76.7%)	21 (70.0%)	17 (56.7%)	0.5264
No	*11 (12.2%)*	2 (6.7%)	4 (13.3%)	5 (16.7%)	
N/A	*18 (20.0%)*	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Progress management plan (N = 90)					
Yes	*28 (31.1%)*	9 (30.0%)	12 (40.0%)	7 (23.3%)	0.6844
No	*43 (47.8%)*	15 (50.0%)	13 (43.3%)	15 (50.0%)	
N/A	*19 (21.1%)*	6 (20.0%)	5 (16.7%)	8 (26.7%)	

Notes by (N = 90)					
Midwife	*57 (63.3%)*	16 (53.3%)	19 (63.3%)	22 (73.3%)	0.2003
Doctor	*19 (21.1%)*	6 (20.0%)	6 (20.0%)	7 (23.3%)	
Both	*12 (13.3%*	7 (23.3%)	5 (16.7%)	0 (0.0%)	
+Not recorded	*2 (2.2%))*	1 (3.3%)	0 (0.0%)	1 (3.3%)	

*No: Where information written and indicated that the activity was not done

+Not recorded: Space/column in the file left blank without information.

#N/A: Patients who were not in labor (those who were sick or already delivered).

Unlike the recording of admission notes, record keeping while in labor actually declined over the years, although the trend was not found to be significant (Figure 5). Figure 5 was generated with the patients, who were not applicable, excluded.

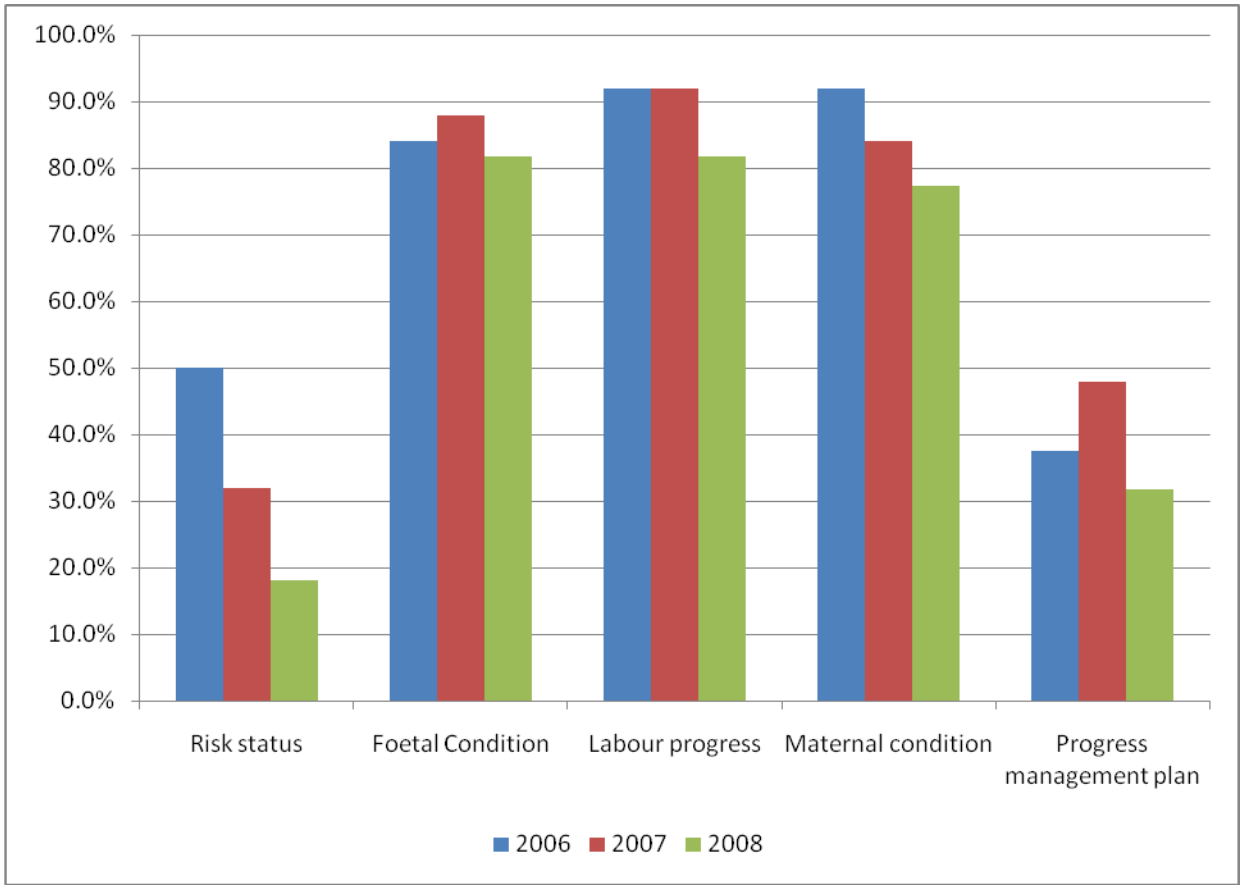

Figure 5. completion of partogram observations

The outcome of the patients who were in labor is presented in Table 17, 18 and 19. Most of the data was statistically insignificant and most of the patients had normal vertex deliveries (67.8%) followed by other types of abnormal presentations (20.0%). All cases of assisted labor deliveries and caesarian section deliveries were well recorded.

The management of patients in an active labor, from the beginning to the end of the birth processes is presented in Table 20. Approximately two thirds of the patients had notes on the active stage of their labor recorded.

Table 17. Different types of delivery results

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Types (N = 90)					
NVD	*61 (67.8%)*	21 (70.0%)	19 (63.3%)	21 (70.0%)	0.4436
Forceps delivery	*2 (2.2%)*	0 (0.0%)	2 (6.7%)	0 (0.0%)	
Vacuum extraction	*2 (2.2%)*	1 (3.3%)	1 (3.3%)	0 (0.0%)	
Elective C/S	*3 (3.3%)*	1 (3.3%)	1 (3.3%)	1 (3.3%)	
Emergency C/S	*4 (4.4%)*	1 (3.3%)	3 (10.0%)	0 (0.0%)	
Abnormal presentations	*18 (20.0%)*	6 (20.0%)	4 (13.3%)	8 (26.7%)	
Indication of assisted delivery[*] (N = 90)					
Previous C/S	*1 (1.1%)*	0 (0.0%)	1 (3.3%)	0 (0.0%)	0.2602
Fetal distress	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	
Maternal condition	*6 (6.7%)*	1 (3.3%)	4 (13.3%)	1 (3.3%)	
[#]N/A	*79 (87.8%)*	27 (90.0%)	23 (76.7%)	29 (96.7)	

[*] Assisted deliveries included caesarean section, vacuum, and forceps deliveries.

[#]N/A means patients who did not deliver by assisted delivery

Table 18. Management of patients who had vacuum and forceps deliveries

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Condition before delivery (N = 90)					
Yes (Noted)	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.3512
*N/A	*86 (95.6%)*	28 (93.3%)	28 (90.0%)	30 (100.0%)	
Vaginal examination (N = 90)					
Yes (Noted)	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.3512
*N/A	*86 (95.6%)*	28 (93.3%)	28 (93.3%)	30 (100.0%)	
Anesthesia given (N = 90)					
Yes (Noted)	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.3512
*N/A	*86 (95.6%)*	28 (93.3%)	28 (93.3%)	30 (100.0%)	
Reason for assisted delivery (N = 90)					
Yes (Noted)	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.3512
*N/A	*86 (95.6%)*	28 (93.3%)	28 (93.3%)	30 (100.0%)	
Outcome of assisted delivery (N = 90)					
Yes (Noted)	*4 (4.4%)*	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.3512
*N/A	*86 (95.6%)*	28 (93.3%)	28 (93.3%)	30 (100.0%)	

Remarks (N = 90)					
Yes (Noted)	*2 (2.2%)*	1 (3.3%)	1 (3.3%)	0 (0.0%)	0.7187
No (Not noted)	*2 (2.2%)*	1 (3.3%)	1 (3.3%)	0 (0.0%)	
*N/A	*86 (95.6%)*	28 (93.3%)	28 (93.3%)	30 (100.0%)	

*N/A means patients who did not deliver by Vacuum or Forceps deliveries

Table 19. Management of patients who had Caesarean Section deliveries

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Elective C/S (N = 90)					
Yes (Noted)	3 (3.3%)	1 (3.3%)	1 (3.3%)	1 (3.3%)	1.0000
^N/A (To Elective C/S)	87 (96.7%)	29 (96.7%)	29 (96.7%)	29 (96.7%)	
Emergency C/S (N = 90)					
Yes (Noted)	4 (4.4%)	1 (3.3%)	3 (13.3%)	0 (0.0%)	0.1602
<N/A (To Elective C/S)	86 (95.6%)	29 (96.7%)	27 (90.0%)	30 (100.0%)	
Pre operative preparation (N = 90)					
Yes (Noted)	7 (7.8%)	2 (6.7%)	4 (13.3%)	1 (3.3%)	0.3381
*N/A (To both Elective & Emergency C/S)	83 (92.2%)	28 (93.3%)	26 (86.7)	29 (96.7%)	
Operative notes (N = 90)					0.3381
Yes (Noted)	7 (7.8%)	2 (6.7%)	4 (13.3%)	1 (3.3%)	
*N/A (To both Elective & Emergency C/S)	83 (92.2%)	28 (93.3%)	26 (86.7)	29 (96.7%)	
Post operative notes (N = 90)					0.3381
Yes (Noted)	7 (7.8%)	2 (6.7%)	4 (13.3%)	1 (3.3%)	
N/A (To both Elective & Emergency C/S)	83 (92.2%)	28 (93.3%)	26 (86.7)	29 (96.7%)	

^N/A means patients who did not deliver by Elective C/S

<N/A means patients who did not deliver by Emergency C/S

*N/A means patients who did not deliver by Elective and Emergency C/S

Table 20. Management of patients in an active labor (beginning to the end of birth processes)

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Second stage (N = 90)					
Recorded	71 (73.3%)	25 (83.3%)	24 (80.0%)	22 (73.3%)	0.6269
Not recorded	19 (26.7%)	5 (16.7%)	6 (20.0%)	8 (26.7%)	
Neonatal details (N = 90)					
Recorded	72 (80.0%)	25 (83.3%)	25 (83.3%)	22 (73.3%)	0.5353
N/A	18 (20.0%)	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Apgar score (N = 90)					
Recorded	72 (80.0%)	25 (83.3%)	25 (83.3%)	22 (73.3%)	0.5353
N/A	18 (20.0%)	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Anesthesia (N = 90)					
Recorded	4 (4.4%)	2 (6.7%)	2 (6.7%)	0 (0.0%)	0.1559
Not recorded	86 (95.6%)	28 (93.3%)	28 (93.3%)	30 (100.0%)	
N/A					
Third stage (N = 90)	72 (73.3%)	25 (83.3%)	25 (83.3%)	22 (73.3%)	0.5353
Recorded	18 (26.7%)	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Not recorded					
Labor summary (N = 90)	71 (78.9)	24 (80.0%)	25 (83.3%)	22 (73.3%)	0.5254
Recorded	19(21.1%)	6 (20.0%)	5 (16.7%)	8 (26.7%)	
Not recorded					

The management of the mother and baby immediately after delivery until the mother and the baby were transferred to the postnatal unit from the labor ward is presented in table 21.

Table 21. Mother and baby health status immediately after delivery

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Mother's health status details (N = 90)					
Yes	*22 (24.4%)*	5 (16.7%)	9 (30.0%)	8 (26.7%)	0.5086
No	*50 (55.6%)*	20 (66.7%)	16 (53.3%)	14 (46.7%)	
N/A	*18 (20.0%)*	5 (16.7%)	5 (16.7%)	8 (26.7%)	
Placenta checks (N = 90)					
Yes	*73 (81.1%)*	24 (80.0%)	25 (83.3%)	24 (80.0%)	0.7078
No	*1 (1.1%)*	1 (3.3%)	0 (0.0%)	0 (0.0%)	
N/A	*16 (7.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Vital sign taken (N = 90)					
Yes	*37 (41.1%)*	8 (26.7%)	14 (46.7%)	15 (50.0%)	0.2616
No	*37 (41.1%)*	17 (56.7%)	11 (36.7%)	9 (30.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Uterus checks (N = 90)					
Yes	*73 (81.1%)*	24 (80.0%)	25 (83.3%)	24 (80.0%)	0.7078
No	*1 (1.1%)*	1 (3.3%)	0 (0.0%)	0 (0.0%)	
N/A	*16 (7.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	

Cervical checks (N = 90)					
Yes	*68 (75.6%)*	19 (63.3%)	25 (83.3%)	24 (80.0%)	0.0111
No	*6 (6.7%)*	6 (20.0%)	0 (0.0%)	0 (0.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Perineum checks (N = 90)					
Yes	*68 (75.6%)*	21 (70.0%)	24 (80.0%)	23 (76.7%)	0.5041
No	*6 (6.7%)*	4 (13.3%)	1 (3.3%)	1 (3.3%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Blood loss (N = 90)					
Yes	*66 (73.3%)*	21 (70.0%)	24 (80.0%)	21 (70.7%)	
No	*8 (8.9%)*	4 (13.3%)	1 (3.3%)	3 (10.0%)	0.7086
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Breastfeeding (N = 90)					
Yes	*69 (76.7%)*	23 (76.7%)	24 (80.0%)	22 (73.3%)	
No	*5 (5.6%)*	2 (6.7%)	1 (3.3%)	2 (6.7%)	0.9617
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Transfers to PNU (N = 90)					
Yes	*12 (13.3%)*	0 (0.0%)	5 (16.7%)	7 (23.3%)	0.0843
No	*62 (68.9%)*	25 (83.3%)	20 (66.7%)	17 (56.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	16 (20.0%)	

Post delivery maternal condition (N = 90)					
Yes	*74 (82.2%)*	25 (83.3%)	25 (83.3%)	24 (80.0%)	0.9268
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Newborn condition (N = 90)					
Yes	*74 (82.2%)*	25 (83.3%)	25 (83.3%)	24 (80.0%)	0.9268
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	

Table 22 shows significant changes in the resuscitation sequence and resuscitation problems, because more files were recorded completely in this area over the years (Table 22).

Table 23 displays information about the mothers' health conditions and management activities carried out. Most of patients' vital signs were done but other observations were not done as found in more than 50% of files.

Table 22. Newborn baby resuscitation and physical assessment

	Total	2006	2007	2008	p value
	n (%)				
Resuscitation details noted (N = 90)					
Yes	*72 (80.0%)*	24 (80.0%)	25 (83.3%)	23 (76.7%)	0.8767
No	*2 (2.2%)*	1 (3.3%)	0 (0.0%)	1 (3.3%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Resuscitation sequence noted (N = 90)					
Yes	*41 (45.6%)*	4 (13.3%)	18 (60.0%)	19 (63.3%)	0.0001
No	*33 (36.7%)*	21 (70.0%)	7 (23.3%)	5 (16.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Resuscitation problems noted (N = 90)					
Yes	*38 (42.2%)*	3 (10.0%)	17 (56.7%)	18 (60.0%)	0.0001
No	*36 (40.0%)*	22 (73.3%)	8 (26.7%)	6 (20.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Initial physical assessment (N = 90)					
Yes	*73 (81.1%)*	25 (83.3%)	25 (83.3%)	23 (76.7%)	0.6927
No	*1 (1.1%)*	0 (0.0%)	0 (0.0%)	1 (3.3%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	

Table 23. Management of the new mother during the postnatal care

	Total	2006	2007	2008	p value
	n (%)				
Post vital signs (N = 90)					
Yes	*69 (76.7%)*	21 (70.0%)	24 (32.9%)	24 (80.0%)	0.2323
No	*5 (5.6%)*	4 (13.3%)	1 (3.3%)	0 (0.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Fundal height checking (N = 90)					
Yes	*17 (18.9%)*	4 (13.3%)	7 (23.3%)	6 (20.0%)	0.8674
No	*57 (63.3%)*	21 (70.0%)	18 (60.0%)	18 (60.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
HB meter noted (N = 90)					
Yes	*6 (6.7%)*	2 (6.7%)	2 (6.7%)	18 (60.0%)	0.9972
No	*68 (75.6%)*	23(76.7%)	23(76.7%)	6 (20.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Breast checking (N = 90)					
Yes	*24 (26.7%)*	7 (23.3%)	10 (33.3%)	22 (73.3%)	0.8855
No	*50 (55.6%)*	18 (60.0%)	15 (50.0%)	2 (6.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Post uterus checking (N = 90)					
Yes	*22 (24.4%)*	6 (20.0%)	9 (30.0%)	7 (23.3%)	0.9051
No	*52 (57.8%)*	19 (63.3%)	16 (53.3%)	17 (56.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	

Perineum checking (N = 90)					
Yes	*22 (24.4%)*	6 (20.0%)	9 (30.0%)	7 (23.3%)	0.9051
No	*52 (57.8%)*	19 (63.3%)	16 (53.3%)	17 (56.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Lochia checking (N = 90)					
Yes	*22 (24.4%)*	6 (20.0%)	9 (30.0%)	7 (23.3%)	0.9051
No	*52 (57.8%)*	19 (63.3%)	16 (53.3%)	17 (56.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Puerperium urine testing (N = 90)					
Yes	*22 (24.4%)*	6 (20.0%)	9 (30.0%)	7 (23.3%)	0.9051
No	*52 (57.8%)*	19 (63.3%)	16 (53.3%)	17 (56.7%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Bowel action noted (N = 90)	*24 (26.7%)*	6 (20.0%)	9 (30.0%)	7 (23.3%)	0.8451
Yes	*52 (55.6%)*	19 (63.3%)	16 (53.3%)	17 (56.7%)	
No	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	
N/A					
Legs checking (N = 90)					
Yes	*27 (30.0%)*	8 (26.7%)	10 (33.3%)	9 (30.0%)	0.9718
No	*47 (52.2%)*	17 (56.7%)	15 (50.0%)	15 (50.0%)	
N/A	*16 (17.8%)*	5 (16.7%)	5 (16.7%)	6 (20.0%)	

N/A: Patients who did not deliver at the hospital

Finally, the mother and baby were prepared after delivery, but before discharge, and given a copy to show that this activity was done. Table 24 shows that this was well done although there were gaps; some patients were skipped and about 8% were not given copies of their discharge summaries to take home as their copies were still in their files.

Table 24. Preparation of mother and baby to be discharged

	Total	**2006**	**2007**	**2008**	**p value**
	n (%)				
Mother notes (N = 90)					
Yes	72 (80.0%)	25 (83.3%)	24 (80.0%)	23 (76.7%)	0.8767
No	2 (2.2%)	0 (0.0%)	1 (3.3%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Exam on discharge notes (N = 90)					
Yes	73 (81.1%)	25 (83.3%)	25 (83.3%)	23 (76.7%)	0.6927
No	1 (1.1%)	0 (0.0%)	0 (0.0%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	
FP methods given noted (N = 90)					
Yes	73 (81.1%)	25 (83.3%)	25 (83.3%)	23 (76.7%)	0.6927
No	1 (1.1%)	0 (0.0%)	0 (0.0%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Post natal advice given noted(N = 90)					
Yes	73 (81.1%)	25 (83.3%)	25 (83.3%)	23 (76.7%)	0.6927
No	1 (1.1%)	0 (0.0%)	0 (0.0%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	

Baby discharge notes (N = 90)					
Yes	73 (81.1%)	25 (83.3%)	25(83.3%)	23 (76.7%)	0.6927
No	1 (1.1%)	0 (0.0%)	0(0.0%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5(16.7%)	6 (20.0%)	
Completed by midwives (N = 90)					
Yes	72 (80.0%)	25 (83.3%)	24 (80.0%)	23 (76.7%)	0.8767
No	2 (2.2%)	0 (0.0%)	1 (3.3%)	1 (3.3%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	
Copy to mother (N = 90)					
Yes	66 (73.3%)	24 (80.0%)	23 (76.7%)	19 (63.3%)	0.4045
No	8 (8.9%)	1 (3.3%)	2 (6.7%)	5 (16.7%)	
N/A	16 (17.8%)	5 (16.7%)	5 (16.7%)	6 (20.0%)	

FP: Family planning

N/A: Not applicable to the patients who did not go through delivery/birth processes.

3.4. ADVERSE EVENTS AND NEAR MISSES REPORTS

The adverse event incidents reported were complaints from patients, their family members and incidents reports from the staff. The reports indicate that most of the incidents could have been avoided (Table 25).

Table 25. Adverse events and near misses that occurred in the NDH maternity unit

Year	Incidents	Cause	Report by	Impact	Closure
2006	Patient delivered the baby unattended in the bathroom	Mismanagement by nursing staff	Patient's husband	Staff allocation	Referred to district committee
	Patient delayed to be transferred to the next level of care	Delayed EMS transport	Attending doctor	Resource allocation	Referred to district committee
	Patient delivered the baby unattended in the bathroom	Miscommunication between the private doctor and hospital staff	Attending midwife	Referral system /procedure	Resolved
	Patient had unwanted pregnancy	Failed sterilization procedure	Expectant couple	Procedural impact	Resolved
2007	Midwife failed to record medication given to the patient	Negligence	Attending doctor	Ethical impact	Resolved
	Private doctor inserted 200mg cytotec to the patient without proper referral to the hospital	Lack of communication between two systems	Attending midwife	Ethical impact	Resolved
	Uncomfortable vaginal	Failed to explain		Ethical impact	Resolved

	examination performed to the patient	procedure to the patient and obtain consent	Patient		
2008	The newborn baby failed to survive after resuscitation The newborn baby failed to survive after 10 minutes resuscitation Patient delayed to be transferred to the next level of care by 4 hours	Unknown Unknown Delayed EMS transport	The father Attending midwife Attending midwife	Ethical impact Ethical impact Resource allocation	Referred to district committee Referred to district committee Referred to district committee
Summary					
	2006: 4 *2007: 3* *2008: 3*			*Ethical impact: 5* *Resource allocation: 2* *Staff allocation: 1* *Procedural impact: 1* *Referral system /procedure: 1*	*Referred to district committee: 5* *Resolved: 5*

3.5. NATIONAL DISTRICT HOSPITAL MATERNITY UNIT'S MONITORING AND EVALUATION REPORTS FROM 2006 TO 2008

The data reflected below were the unit performance reports from 2006 to 2008 which indicates that the unit is busy based on the average statistics given (Table 26). There were over 3000 admissions annually, but this had dropped over the years from 3710 in 2006, to 3537 in 2007, and there were finally 3312 admissions in 2008. The neonatal mortality rate changed quite significantly, especially after 2006 (Figure 6).

Table 26. Supervisory monthly reports completed for the maternity unit

2006	BOR	Admissions	Births	C/S	C/S Rate	Assisted delivery	Low birth weight	Maternal deaths	Neonatal death	BBA	MMR meeting held
Jan	N/R	324	173	10	5.78%	13	7	0	2	46	YES
Feb	N/R	281	150	17	11.3%	5	8	0	2	48	NO
Mar	N/R	348	206	9	4.4%	5	11	0	1	42	YES
Apr	N/R	308	185	16	8.65%	4	3	0	3	40	YES
May	N/R	325	197	9	4.57%	8	7	0	7	41	YES
Jun	N/R	308	189	13	6.88%	12	5	0	5	35	YES
Jul	69%	322	213	20	9.39%	5	5	0	5	39	NO
Aug	69%	310	201	12	5.97%	8	3	0	3	42	YES
Sep	60%	385	207	13	6.28%	8	5	0	5	31	YES
Oct	54.6%	293	188	10	5.32%	6	7	0	7	31	YES
Nov	53%	277	144	11	7.64%	3	5	0	5	33	YES
Dec	54.8%	229	125	8	6.40%	3	3	0	6	35	NO
Total		***3710***	***2178***	***148***		***80***	***69***	***0***	***51***	***463***	***9/12***
Ave/ month	***60%***	***309***	***182***	***12***	***6.88%***	***7***	***6***	***0***	***4***	***39***	

BOR: Bed Occupancy Rate, C/S: Caesarian section, BBA: Born before arrival, MMR: Maternal morbidity and mortality review

2007	BOR	Admissions	Births	C/S	C/S Rate	Assisted delivery	Low birth weight	Maternal deaths	Neonatal death	BBA	MMR meeting held
Jan	53.1%	384	180	13	7.22%	3	5	0	1	28	YES
Feb	N/R	267	157	11	7.00%	3	2	0	1	41	YES
Mar	N/R	317	209	17	8.13%	5	1	0	2	54	YES
Apr	57%	269	154	10	6.49%	5	0	0	3	39	NO
May	60%	276	160	10	6.25%	5	0	0	3	30	YES
Jun	53.3%	300	162	19	11.72%	1	0	0	1	40	YES
Jul	53%	281	168	20	11.90%	1	0	0	2	42	YES
Aug	63.9%	310	176	22	12.50%	3	1	0	1	35	YES
Sep	43.5%	282	177	10	5.64%	5	0	0	2	37	YES
Oct	65.6%	310	186	15	8.00%	4	0	0	2	41	YES
Nov	53.9%	260	146	19	13.01%	4	0	0	3	42	YES
Dec	60.7%	281	179	18	10.05%	7	0	0	1	43	YES
Total		***3537***	***2054***	***184***		***46***	***9***	***0***	***22***	***472***	***11/12***
Ave/ month	***56.4%***	***295***	***171***	***15***	***8.9%***	***4***	***1***	***0***	***1.8***	***39***	

BOR: Bed Occupancy Rate, C/S: Caesarian section, BBA: Born before arrival, MMR: Maternal morbidity and mortality review

2008	**BOR**	**Admissions**	**Births**	**C/S**	**C/S Rate**	**Assisted delivery**	**Low birth weight**	**Maternal deaths**	**Neonatal death**	**BBA**	**MMR meeting held**
Jan	62.8%	283	170	18	10.58%	6	0	0	1	40	YES
Feb	52.7%	280	168	11	6.54%	3	0	0	1	38	YES
Mar	66%	318	205	6	2.92%	4	0	0	2	31	YES
Apr	59%	300	199	14	7.03%	4	1	0	3	33	YES
May	69%	236	159	18	11.32%	6	1	0	3	38	YES
Jun	62.2%	298	196	10	5.10%	5	2	0	1	33	YES
Jul	69%	285	195	13	6.66%	3	3	0	2	43	NO
Aug	60%	277	178	10	5.61%	3	3	0	1	43	YES
Sep	54.6%	258	167	10	5.98%	4	1	0	2	39	NO
Oct	67%	253	149	12	8.05%	4	2	0	2	44	YES
Nov	65%	246	166	12	7.22%	4	1	0	3	47	NO
Dec	67%	278	188	10	5.31%	5	2	0	1	46	YES
Total		***3312***	***2140***	***144***		***51***	***16***	***0***	***22***	***475***	***9/12***
Ave/ month	***62.9%***	***276***	***178***	***12***	***6.86%***	***4***	***1***	***0***	***2***	***46***	

BOR: Bed Occupancy Rate, C/S: Caesarian section, BBA: Born before arrival, MMR: Maternal morbidity and mortality review

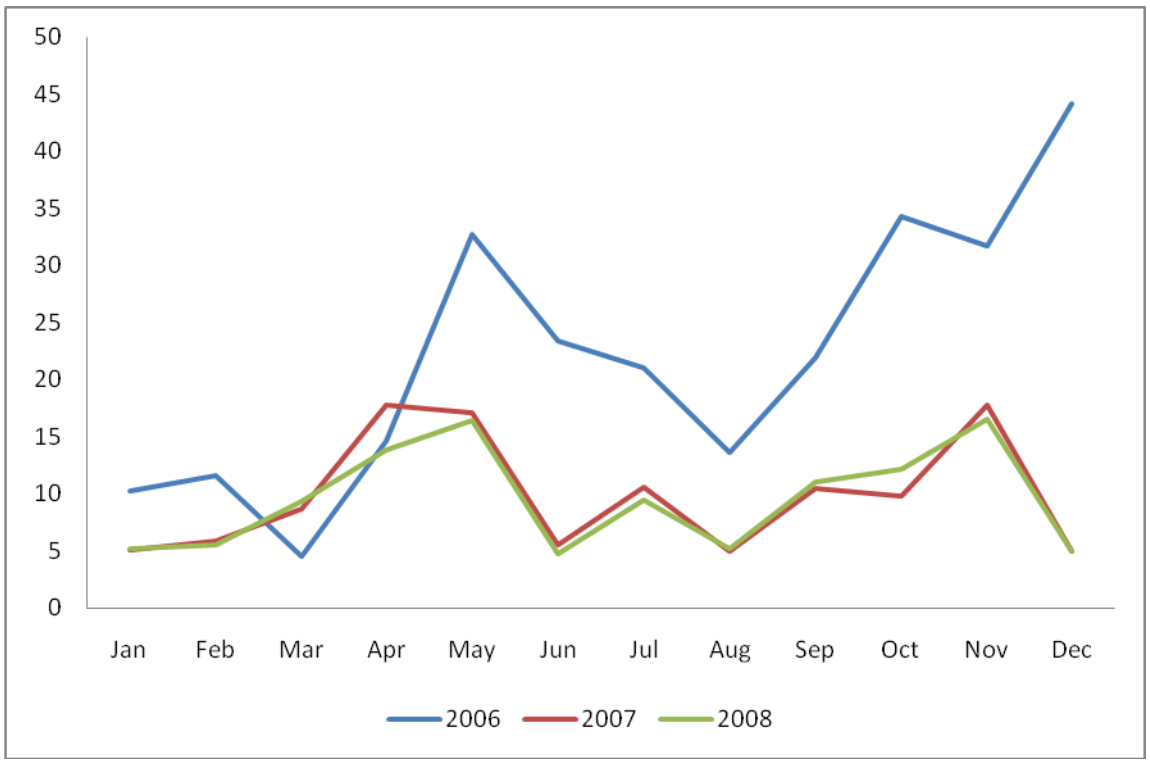

Figure 6. Neonatal mortality rate for NDH from 2006 to 2008

The abovementioned figure displayed the trend of neonatal mortality rate in this hospital from the year 2006 to the year 2008 as calculated using data from the supervisory reports. As can be seen, there was a significant drop in the mortality rate from 2007.

CHAPTER FOUR: DISCUSSION OF FINDINGS

4.1. INTRODUCTION

This chapter constitutes the discussion of findings obtained and presented in Chapter three of the report.

4.2. INTRODUCTION OF DISCUSSION

This was the first scientific study conducted to evaluate the quality and management of maternity services in the NDH's maternity unit in the Free State province. The hospital is rendering services to both urban and rural populations. The importance of this chapter is to discuss the findings of this study.

Based on the information from the data outlined in the previous chapter the following findings were made:

4.3. CASELOAD

The bed occupancy is an indicator that reflects the hospital performance. The low bed occupancy may indicate the inefficiency of the hospital performance meaning that the resources may not be used optimally thus making the hospital expensive to manage (Boulle, Belcher and Burn, 2000).

The NDH study revealed that the bed occupancy was lower than expected but there were an additional number of patients who were not admitted in the admission register and this did not reflect the whole picture to quantify if the hospital was performing as expected. It also means that the hospital performance was better than what is reflected in the DHIS.

There were also a high number of BBAs (460 – 470 per year) and they were not counted under admissions, as they had their own registers. The study did not review their files as they were not in admission registers used for the study purposes.

Other indicators which were considered in this study were the average length of stay and the profile of the patients. The length of stay was not as clear as the bed occupancy. It did not reveal a great impact on the caseload/workload.

It was not possible to assess all patients' postnatal outcomes, particularly for those who stayed in the ward for 4 hours or less. Patients are expected to stay in the postnatal unit for at least 6 hours post delivery (Dowswell, Piercy, Hirst, Hewison and Lilford, 1997).

Looking at the patients' profiles it was shown that people were utilizing the hospital but it is not clear whether people in the catchment area were accessing the services as expected. In the literature it is noted that accessing health care facilities timeously maybe a problem due to various factors, including transport from home (Gaunt, 2010), poor quality of services, or health care provider attitudes.

4.4. MANAGEMENT OF PATIENTS WHILE RECEIVING ANTENATAL CARE

Farrell and Pattinson (2005) explained that it is important to classify women during antenatal care according to risk categories (no risk, low risk, medium risk and high risk) in preparation for labor and referral to the appropriate level of care. The NDH study revealed that this was done and well documented by surrounding clinics. This showed that the patients were well managed in this regard. Most the patients who were admitted were in a category of "no risk" and "low risk" during antenatal care and few were in the medium and high risk category.

There are protocols and guidelines that need to be followed and adhered to when preparing women during antenatal care and labor to ensure the correct management of maternity service patients. In terms of HIV care, the management of patients during this period is a priority for reducing the transmissions of the infection from mother to child and in so doing achieving the Millennium Development Goal number 6 (United Nations, 2010). However in the NDH, most of patients' records indicated that HIV and AIDS investigations were not well managed. Most of the patients' files showed that they were either not recorded or incompletely recorded. This made it difficult to know whether all patients who were eligible for the PMTCT programme were included in the programme according to the protocol.

A study done in Empangeni sub district in South Africa confirmed that if HIV management was not followed as expected there is a chance of missing patients who were supposed to be enrolled in the PMTCT programme (Hoque, Hoque and Kader, 2008). The NDH study revealed that the HIV and AIDS management was not up to the required standards as more than 50% of patients' HIV status were not captured in their files. There was therefore a potential for mismanaging patients on the PMTCT programme.

Another study done in Rahima Moosa Hospital indicated that poor documentation in the ANC card may result in the women missing out the benefits of ANC care which may include other reproductive health related issues and common medical conditions outside pregnancy (Basu and Seopela, 2010).

4.5. QUALITY OF CARE FOR INPATIENTS AT THE MATERNITY UNIT OF NDH

There were varying degrees of care provided to inpatients, with good care being provided and recorded in some instances, but substandard or no care being provided in others. For example, observations on admission and prior to the

delivery were done and an improvement was shown from 2006 to 2008. The adherence to and follow up of protocols and policies was good although there were gaps identified which needed to be addressed. Similarly, patients were prepared well for discharge. They were given all of the necessary documents and discharge advice. However, it was not the same with recording of the partograms as they were completed selectively or not recorded at all. In some instances, the most important or critical areas were left blank. This means that the patients were not well managed and that the partogram did not meet its intended purpose of managing the progress of labor (Kenya Ministry of Health and UNFPA Kenya, 2004). This was also confirmed by the study conducted at Charlotte Maxeke Johannesburg Academic Hospital in Gauteng province, South Africa, as one of the outcomes of the study was that the partogram was poorly used as a monitoring tool in the maternity unit of this hospital (Basu, Hoosain, Leballo, Leistner, Masango, Mercer, Mohapi, Petkar and Tshiovhe, 2009).

Companionship was another important aspect in improving maternity services for patients admitted in the maternity unit, which was not optimally utilized. Most the women who were admitted at the NDH's maternity unit were accompanied by their mothers, husbands, friends or neighbors but they were not involved during the care or management of patients as there was no evidence of this in their files. The Free State province adopted a Companionship practice (Smith, Brown, Hofmeyr, Dickson-Tetteh, Garner and Rees, 2001) for their hospitals which could have been implemented for the patients in the NDH, as most had normal deliveries and very few had either assisted deliveries or deliveries by Caesarean Section, and most had a support system during ANC and when admitted. The staff in this hospital failed to adhere to this critical practice for quality care and humaneness (Brown, Hofmeyr, Nikodem, Smith and Garner, 2007).

The study showed that both the mothers and the newborn babies were assessed and observed according to the policies whilst in the labor ward but after that in the postnatal unit the mothers' observations were not well documented. The files

were completed selectively. The concern is that the postnatal care was not well managed especially for those patients who had normal deliveries and stayed for less than 6 hours as they need a lot of health education. Most of the patients were single mothers who had their first babies. As with the study conducted in the United Kingdom (Dowswell et al, 1997), little was known about the postnatal outcome of these patients since they had short stay post delivery.

In addition to the findings from the review of patient records, some patients who experienced substandard care also reported their cases to the patients' complaints office. Other adverse events were reported by staff members. As reported, a study in Scotland reported that 8% of patients admitted to hospitals experience adverse events (Williams et al, 2008). In this study, there were approximately 0.1% adverse events reported out of the total number of admissions recorded on the supervisory reports. This is significantly lower in comparison to the literature, and raises the question of whether all cases of adverse events are identified and reported at the NDH.

Discharging mothers and babies after postnatal short stay (less than 48 hours) is safe for those uncomplicated cases (normal vaginal deliveries) and where proper follow up is provided. Despite this arrangement there is evidence that women and newborns are being discharged early without much follow up to pick up health problems and address them before they complicate or to determine if there were any maternal or neonatal deaths (United States. General Accounting Office, 1996). According to WHO (2005) in Sub Sahara deaths outside health care facilities are generally excluded from health service data (Rogo, Oucho and Mwalali, 2006)

The NDH study found that there were no maternal deaths reported during the period from 2006 to 2008. Although there were no maternal deaths in the hospital, the study did not investigate what happened to the discharged patients

within 42 days post delivery. Most of the patients in the maternity unit of the NDH were discharged after a day or two.

The management of mothers and newborn babies need to be improved to close the gaps identified according to maternity guidelines and protocols. These are in place to prevent and avoid any complications that can happen in future to the patients in the hospital or at home within 42 days.

4.6. QUALITY OF RECORD KEEPING IN THE MATERNITY UNIT OF THE NDH

There was no consistency in the completion of files and registers. Policies on handling the patients' records were not observed on admission and during the patient's stay in the maternity unit. This was similar to a study that was conducted in Tanzania where it was found that registers and clients records were not always well maintained. There were many different registers and several separate forms that needed to be completed for the unit (CARE/AMDD program (Columbia University Mailman School of Public Health), undated).

The problems of missing records, duplication, incompleteness and inaccuracies in record keeping were identified during the study at NDH. This can be a problem if the patient's file is to be used for references at a later stage for purposes of research or litigation. There is a system of tracking files but this was not applied in the maternity unit.

4.7. OVERALL PERFORMANCE OF MATERNITY UNIT

4.7.1. INFORMATION MANAGEMENT

The information management system is the managerial tool used by unit supervisors in assisting them with implementation plans, allocation of financial

resources and prioritization of activities for supervision. In many developing countries health information systems are inadequate, inaccurate and staff members are not equipped with the skills necessary to interpret data and local staff is often unaware of essential planning and monitoring tools (Loevinsohn, 1993).

In a study that implemented interventions to improve maternal health care in a district in Gauteng, it was found that the Health Information Systems intervention were not easy to implement as the supervisor's role was not defined. Supervisors also lacked relevant skills even if it was expected that they use data for planning services and conduct meetings where data was interpreted for use (Thomas, Jina, Tint and Fonn, 2007).

The NDH study showed that the supervisor of the maternity unit completed performance reports monthly but not all months were covered in the year. The data in the reports were not interpreted for the unit planning and addressing gaps in service delivery. Although the report was completed by the supervisor, some other staff members were not involved in writing or reviewing the figures. When the researcher was looking for these reports some of the unit staff had no clue about such reports showing that they were not involved.

Overall, there appears to be a lack of interrogation of routine data that is collected. Errors were identified in both the DHIS data and reports from the maternity unit supervisor, but this was never picked up and corrected prior to the study being conducted. There was also no clear assessment of trends so that improvements or deteriorations in services could be identified and managed. In addition, the NDH study did not provide sufficient evidence that the unit performance indicators were discussed thoroughly and interpreted. It was also not used for planning and managing the unit and allocating resources.

4.7.2. MATERNAL MORTALITY PEER REVIEW MEETINGS

Maternal and perinatal review meetings are supposed to be held monthly and usually discussions are about the statistics, obstetric clinical topics, maternity performances, outcomes and preventive or preemptive factors (Gaunt, 2010). The meetings should be attended by doctors, midwives, laboratory staff and administrators. The unit's audit should also be discussed with the aim of judging elements below standard, exploring these further and then making recommendations to address substandard care so that it does not reoccur (Filippi, Brugha, Browne, Gohou, Bacci, De Brouwere, Sahet, Goufodji, Alihonou and Ronsmans, 2004).

4.8. LIMITATIONS OF THE STUDY

The study has a number of limitations. Firstly the study depended heavily on completeness of available records. However, there were files that were found with incomplete contents and these were excluded for sampling for Component 2. Patients' files which were excluded from the study may have had valuable information for the study as the hospital is doing few Caesarean Sections and assisted deliveries. Patients that were referred out were excluded in Component 2. This may result in a bias as the most complicated cases may be referred out.

Seasonality is a major concern as only one month of data was used for Components 1 and 2. The findings of the study may have been different if another month was selected but it is assumed that these differences would not significantly change the direction of the findings, as the same health care providers deliver maternity services throughout the year.

Using only one method of collecting data i.e. reviewing records limited the researcher. If the study had included interviews with staff and patients more information could have been obtained which was lacking from records, or clarity

about information could have been achieved as the researcher was not always informed and had to make assumptions based on the available literature.

The study did not investigate resource allocation and utilization. The investigation of available resources was not included as it would have made the study too big and not manageable, but this needs to be followed up as it has an impact on the workload and performance of the unit.

In relation to adverse events, only reported cases were reviewed. No further investigation was done to identify unreported events. This may have resulted in a bias, as only patients and families that felt empowered to report cases would do so. Similarly, cases reported by staff depended on the honesty of staff to report such incidents. Finally, it is possible that only cases that were considered to be serious in nature may have been reported.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. INTRODUCTION

In this chapter, the conclusions are drawn and discussed. Appropriate recommendations are made within the context of the findings of the study. Finally, suggestions for further research are presented.

5.2. CONCLUSION

The researcher, after conducting this study, found that there were gaps in the management of the patients and the quality of care rendered in the maternity unit which indicated poor management and substandard quality care. The researcher found that the gaps identified from caseload, patients' management and quality of care issues were due to system failure/s, staff and/or patients' challenges caused either by ignorance, overwork, irresponsibility or just laziness (negligence), as the best work was identified in some areas.

The caseload data indicates that the unit's performance was based on data that was not a true reflection as collection of data did not include all patients in the unit. The problem was identified through the collection of raw data and interpretation of statistics. This had an impact on the management of patients, allocation of resources and quality of care delivered.

The unit staff did not adhere to the guidelines, protocols and policies in place. The recordings in the patients' files and professionals' notes were not compliant with the quality service norms and standards. Any service rendered, if not recorded, is interpreted as if it was not done; as there is no evidence that it was done. This gave an impression of poor patient management and substandard quality of care being delivered.

5.3. RECOMMENDATIONS

5.3.1. RECOMMENDATIONS ON HOSPITAL ISSUES

For the hospital to improve the maternity unit's services the following is needed:

- The hospital management and unit staff need to benchmark good and best practices with other institutions in the district, province or other provinces.
- There is a need to improve the patients' registry in the unit.
- Health professionals need to be trained and retrained on the maternity guidelines and especially the use of the partogram.
- There is a need to review the attitude, commitment and skills level of unit staff.
- The importance of information management should be emphasised and the system be used effectively and efficiently.
- The service delivery approach should be converted into a family centred approach, where patient support systems are involved.

5.3.2. RECOMMENDATIONS ON PROVINCIAL ISSUES

At the provincial level, the following recommendations should be considered:

- The provincial office needs to strengthen monitoring and evaluation strategies to ensure that the service is implemented according to norms and standards for managing patients and improving quality of care
- There is a need to strengthen the implementation of the maternity guidelines.
- The Provincial Department of Health should assist in the retraining of health professionals on the use of the partogram and improve the implementation of the PMTCT programme.

5.4. FUTURE RESEARCH

This was a cross-sectional descriptive study and, therefore, it looked at rather broad issues pertaining to the management and quality of maternity services. More qualitative studies need to be conducted which will entail interviews and observations in the maternity unit. This may either support or contradict the findings of this study.

Other potential research studies that could be done in the future using either qualitative or quantitative methods include studies investigating:

- Resource allocation and utilization.
- Unit staffing.
- Companionship projects in the maternity units and postnatal follow ups.
- Theatre utilization.
- Utilization of maternity services in the district.
- Doing a population–based study in Mangaung catchment area to interview women on which facility would they attend and why.
- Looking at long term outcomes of women who delivered at NDH.

REFERENCES

Adewunmi A. Rabiu K. Tayo A. 2009. Gestational Age at Antenatal Booking in Lagos. South-West Nigeria. The Internet Journal of Gynecology and Obstetrics, 12.

Ansong-Tornui J. Armar-Klenesa M. Arhinful D. Penfold S. and Hussein J. 2007. Hospital Based Maternity Care in Ghana - Findings of a Confidential Enquiry into Material Deaths. Ghana Medical Journal, 41, 125 – 132.

Ashraf F. Mustanzid SM and Khanom M. 2007. Maternal Mortality in a District hospital of Bangladesh An In-Depth Search of the underlying Causes. The Journal of Teachers Association, 20, 99 - 106.

Basu JK, Hoosain S, Leballo G, Leistner E, Masango D, Mercer M, Mohapi M, Petkar S and Tshiovhe NA. 2009. The partogram: A missed opportunity. South African Medical Journal, 99, 578.

Basu J and Seopela L. 2010. Accurate and consistent record-keeping using the antenatal card. African Journal of Midwifery and Women's health, 4, 171 – 174.

Bergström S. Quality and Audit of Maternity Care. In: Lawson JB, Harrison KA, Bergström S (Ed). 2001. Maternity Care in Developing Countries. London: RCOG Press.

Boulle A. Belcher M. and Burn A. 2000. Hospital Restructuring. In: South African Health Review 2000. Durban: Health Systems Trust.

Breytenbach HJ. 2009. National District Hospital Clients Satisfaction Survey 2009. The Survey Workshop Quality Quantitative Qualitative Research. Bloemfontein: National District Hospital.

Brown H, Hofmeyr J, Nikodem VC, Smith H and Garner P. 2007. Promoting Childbirth Companions in South Africa: A randomized pilot study. BMC Medicine, 5, 7.

Burnett P. 2009. South Africa: Redouble Efforts to Reduce Maternal Mortality. Retrieved 22 June 2010, from http://ipsnews.net/news.asp?idnews=48393.

CARE/AMDD program (Columbia University Mailman School of Public Health). (Undated). Emergency Obstetric Care (EmOC): A Core Strategy for Safe Motherhood Care. New York. CARE/AMDD program (Columbia University Mailman School of Public Health).

Chaulagai CN, Moyo CM, Koot J, Moyo HBM, Sambakunsi TC, Khunga M and Naphini PD. 2005. Design and Implementation of a health management information system in Malawi: Issues, innovations and results. Health Policy and Planning, 375 - 384.

Creek T, Thuku H, Kolou B, Rahman M, and Kilmarx P. 2005. Declining syphilis Prevalence among Pregnant Women in Northern Botswana: An Encouraging sign for the HIV Epidemic? Sexually Transmitted Infections, 81, 453 - 455.

Crombie IK, Davies HTO, Abraham SCS, Florey CduV (Eds). 1993. The audit handbook: improving health care through clinical audit. Chicester: WileyBlackwell

Dowswell T, Piercy J, Hirst J, Hewison J and Lilford R. 1997. For debate short postnatal hospital stay: Implications for women and service providers. Journal of Public Health Medicine, 19, 132 - 136.

Farrell E and Pattinson B. 2005. Intrapartum care in South Africa: Review and Guidelines. Pretoria: MRC Maternal and Infant Health Care Strategies Research

Filippi V, Brugha R, Browne E, Gohou V, Bacci A, De Brouwere V, Sahel A, Goufodji S, Alihonou E and Ronsmans C. 2004. Obstetric Audit in Resource poor settings: lesson from a multicounty project auditing near miss' obstetrical emergencies. Health Policy and Planning, 19, 57 – 66.

Free State Department of Health. 2006. Free State Department of Health Strategic Plan 2006/2007 to 2010/2011. Bloemfontein: Free State Department of Health.

Free State Provincial Government. 2005. Provincial growth and development strategy (PGDS): (2005 – 2014). Bloemfontein: Free State Provincial Government.

Free State Tourism. Undated. Welcome to the Free State - South Africa. Retrieved June 23, 2010, from http://www.freestatetourism.org/.

Gaunt CB. 2010. Are we winning? Improving perinatal outcomes at a deeply rural district hospital in South Africa. South African Medical Journal, 100, 101 - 104.

Hoque M, Hoque E and Kader SB. 2008. Audit of Antenatal Care in a Rural District of KZN. South Africa. South African Family Practice, 50, 66 – 66d.

Hulton L, Zoe M and Stone RW. 2000. A Framework for the Evaluation of Quality of Care in Maternity Services. Southampton: University of Southampton.

Jahn A, Kowalewski M and Kimatta SS. 1998. Obstetric Care in Southern Tanzania. Does it reach those in need? Tropical Medicine and International Health, 3, 926 - 932.

Kenya Ministry of Health and UNFPA (Kenya). 2004. Needs Assessment of Obstetric Fistula in Kenya. Nairobi: Kenya Ministry of Health and UNFPA Kenya.

Khotu SH. 1977. National Health Care Management Information System of South Africa NHC/MIS. Pretoria: National Health Information System Department of Health.

Loevinsohn B. 1993. Data Utilization and Analytical skills among Mid – Level Health Programme Managers in a Developing Country. International Journal of Epidemiology, 23, 1.

Maimbolwa MC. 2004. Maternity Care in Zambia with special reference to social support (PhD dissertation). Stockholm: Karolinska Institutet.

National Committee on Confidential Enquiries into Maternal Deaths. 2010. Saving Mothers. Fourth Report on Confidential Enquiries into Maternal Deaths in South Africa 2005 – 2007. Pretoria: National Department of Health.

National Department of Health. 2002. Estimating the Cost of District Hospital Services. Pretoria: Department of Health.

National Department of Health. 2007. Guidelines for Maternity Care in South Africa: A Manual for Clinics, Community Health Centers and District Hospitals. Pretoria: Department of Health.

Olukoga A. 2007. Unit costs of inpatient days in district hospitals in South Africa. Singapore Medical Journal, 48, 143 – 147

Queensland Health Department. 2003. Maternity Service Review – Banana HSD and Central Highlands. [HSD: Health Service District]. Queensland: Queensland Health Department.

Rogo KO, Oucho J and Mwalali P. 2006. Maternal Mortality: Disease and Mortality in Sub Sahara Africa.Washington (DC): The World Bank.

Sahni AA. 2000. Study of Medical Services Infrastructure and Utilization in Gujarat. Health Administrator: The official journal of the Indian Society of Health Administrators, 1 & 2, 96 – 108.

Shah IH and Say L. 2007. Maternal Mortality and Maternity Care from 1990 to 2005: Uneven but Important Gains. Reproductive Health Matters, 15, 17 - 27.

Smith H, Brown H, Hofmeyr J, Dickson-Tetteh K, Garner P and Rees H. 2001. Better Birth Initiative. Making Childbirth Better. A Workbook for Labor ward staff. Johannesburg: Reproductive Health Research Unit (Chris Hani Baragwanath Hospital).

Sundby J and Rwamushaija E. 2002. Investing in Safe Motherhood – An operations research project in Maputo Mozambique. Bangkok: CICRED.

The House of Commons. 2003. Inequalities in Access to Maternity Services. London: The Stationery Office Limited.

Thomas LS, Jina R, Tint KS and Fonn S. 2007. Making Systems Work: The Hard Part of Improving Maternal Health Services in South Africa, Reproductive Health Matters, 15, 38 - 49.

UNICEF Regional office for South Asia. 2004. Surviving Childbirth and Pregnancy in South Asia. Kathmandu: The United Nations Children's Fund.

United Nations. 2010. The Millennium Development Goals Report: 2010. New York: United Nations.

United Nations ICT Task Force. 2003. Tools for Development Using Information and Communications Technology to Achieve the Millennium Development Goals. New York: United Nations.

United States. General Accounting Office. 1996. Maternity care: appropriate follow-up services critical with short hospital stays: report to the honorable Ron Wyden, U.S. Senate / United States General Accounting Office. Washington (DC): United States. General Accounting Office.

Western Australia Department of Health Maternal and Child Health Unit. Improving Maternity Services. 2007. Working Together Across Western Australia. A Policy Framework: Delivering a Health WA. Health Policy and Clinical Reform Department of Health.

Williams DJ, Olsen S, Crichton W, Witte K, Flin R, Ingram J, Campbell MK, Watson M, Hopf Y and Cuthbertson BH. 2008. Detection of adverse events in a Scottish hospital using a consensus based methodology. Scottish Medical Journal, 53, 26 -30.

World Health Organization. 1997. Safe Motherhood: Basic Newborn Resuscitation: A practical guide. Brazzaville: WHO.

World Health Organization. 2005. Reducing Maternal Deaths: The Challenge of the New Challenge of the New Millennium in the African Region. Geneva: WHO.

Appendix A: Review of Maternity unit Admission Register

No	Patient file No.	Date of admission	Age	Race	Booked	Area	Marital Status	Diagnosis	Outcome	Outcome date	Discharge	Discharge date
1.				B W I C Other	Yes No		Single Married Widowed Divorced Living with a partner		False labor Normal delivery Referred out Complicate _____ Other: ____			
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												

Appendix B: Review of Patients records

A.PRE ADMISSION CARE	
1. Demographical data	
1.1. Age	18 years 1 19 - 25 2 26 – 30 3 31 - 35 4 > 36 5
1.2. Medical Aid	Yes 1 No 0 Not recorded 2
1.3. Occupational status	Employed 1 Unemployed 2 Student 3 Not recorded 4
1.4. Race	Black 1 White 2 Coloured 3 Indian 4 Others 5 Not recorded 6
1.5. Address	Motheo Bfn 1 Other Mother Catchment area 2 Naledi district 3 Xhariep district 4 Lejweleputswa district 5 Fezile Dabi district 6 Thabo Mofutsanyane district 7 Others 8 Not recorded 9
1.6. Accompanying	Mother 1 Father 2 Husband 3 Partner 4 Sister 5 Friend 6 Others 7 Not recorded 8 None 9
1.7. Attended Antenatal Clinic	Yes 1 No 0

2. Antenatal clinic care	
2.1. Parity	
2.2. Gravidity	
2.3. Previous and current medical history noted	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.4. Previous and current obstetrical history noted	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.5. Examination done by	Midwife 1 Doctors 2 Student midwife 3 Card missing 4
2.6. Rhesus (Rh) testing	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.7. Rhesus (Rh)status	Positive 1 Negative 0 Not recorded 2 Card missing 3 N/A 4
2.8. Syphilis testing	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.9. Syphilis result status	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.10. Syphilis treatment	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4

2.11. HIV pre counseling	Positive 1 Negative 0 Not recorded 2 Card missing 3 N/A 4
2.12. HIV testing	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.13. HIV result status	Yes 1 No 0 Not recorded 2 Card missing 3 N/A 4
2.14. HIV post counseling	Positive 1 Negative 0 Not recorded 2 Card missing 3 N/A 4
2.15. On PMTCT programme	Yes 1 No 0 Not recoded 2 Card missing 3 N/A 4
3. Planning for delivery	
3.1. Risk Status	No risk 0 Low risk 1 Medium risk 2 High risk 3 Not recorded 4 Card missing 5
3.2. Antenatal Planning for place delivery	Community Health Centre 1 District hospital 2 Secondary hospital 3 Not recorded 4 Card missing 5
3.3. Nutritional plan for the baby	Formula Feeding 1 Breast Feeding 0 Not recorded 2 Card missing 3 N/A 4

B. ADMISSION IN THE MATERNITY UNIT		
1. Admission register		
1.1 Opening a file	By admission clerk By midwife	1 2
1.2. Reason for admission	In labor Sick during pregnancy	1 2
1.3.Initial examination by:	Midwife Doctor Both (midwife & doctor)	1 2 3
2. Antenatal unit care		
2.1. On admission		
2.1.1. Assessments recorded	Yes No	1 0
2.1.2.Treatment given noted	Yes No	1 0
2.1.3.Doctors' orders carried out	Yes No	1 0
2.1.4.Protocols followed on admission	Yes No	1 0
2.1.5.Interventions carried out on admission	Yes No	1 0
2.2. Observations		
2.2.1.Contractions observations noted	Yes No	1 0
2.2.2.Liquor observed	Yes No	1 0
2.2.3.Fetal heart beat checked	Yes No	1 0
2.2.4.Maternal condition observed	Yes No	1 0
2.2.5.Urine testing	Yes No	1 0
2.2.6.Vaginal examinations recorded	Yes No	1 0
2.2.7.Drugs given recorded	Yes No	1 0
2.3. Labor – initial assessment		
2.3.1.Clinical History recorded	Yes No N/A	1 0 2
2.3.2.General Examination	Yes No N/A	1 0 2
2.3.3.Abdominal Examination	Yes No N/A	1 0 2

2.3.4.Vaginal Examination	Yes	1
	No	0
	N/A	2
2.3.5.Risk factors noted	Yes	1
	No	0
	N/A	2
2.3.6.Summary / Diagnosis / Management recorded	Yes	1
	No	0
	N/A	2
2.3.7.Decision on place of delivery	Yes	1
	No	0
	N/A	2
2.4. Partogram (complete this section if patient is in labor)		
2.4.1.Risk status noted	Yes	1
	No	0
	N/A	2
2.4.2.Foetal Condition noted	Yes	1
	No	0
	N/A	2
2.4.3.Progress of labor recorded	Yes	1
	No	0
	N/A	2
2.4.4.Maternal Condition noted	Yes	1
	No	0
	N/A	2
2.4.5.Management for progress of labor and delivery noted	Yes	1
	No	0
	N/A	2
2.5. Progress clinical notes	By midwife	1
	By doctor	2
	Both (midwife & doctor)	3
	Not recorded	0
3. LABOUR/DELIVERY CARE		
3.1. Type of delivery	Normal Vaginal delivery	1
	Forceps delivery	2
	Vacuum extraction	3
	Elective C/S	4
	Emergency C/S	5
	Abnormal presentations	6
3.2. Indication for assisted delivery & Caesarian Section	Previous C/S	1
	Fetal distress	2
	Maternal Condition	3
	N/A	4
3.3 Assisted delivery performed		
3.3.1. Condition before assisted delivery noted	Yes	1
	No	0

	N/A	2
3.3.2. Vaginal examination done during assisted delivery	Yes No N/A	1 0 2
3.3.3. Anesthesia given during assisted delivery	Yes No N/A	1 0 2
3.3.4. Reason for assisted delivery noted	Yes No N/A	1 0 2
3.3.5. Outcome of delivery noted	Yes No N/A	1 0 2
3.3.6.Remarks and post procedural notes recorded	Yes No N/A	1 0 2
3.4. Caesarian section performed		
3.4.1.Elective C/S planned	Yes No N/A	1 0 2
3.4.2.Emergency C/S decided	Yes No N/A	1 0 2
3.4.3.Preoperative details noted	Yes No N/A	1 0 2
3.4.4. Operative procedure notes.	Yes No N/A	1 0 2
3.4.5.Post operative care management notes	Yes No N/A	1 0 2
3.5. Management of patients in an active labor		
3.5.1.Second Stage details noted	Yes No N/A	1 0 2
3.5.2.Neonatal details noted	Yes No N/A	1 0 2
3.5.3.Apgar assessment	Yes No N/A	1 0 2
3.5.4.Anaesthesia given noted	Yes No N/A	1 0 2
3.5.5.Third stage	Yes	1

3.5.6.Summary of duration of labor noted	No N/A Yes No N/A	0 2 1 0 2
4. Mother and baby health status immediately after delivery		
4.1 Mother's health status details	Yes No N/A	1 0 2
4.2 Placenta checked notes recorded	Yes No N/A	1 0 2
4.3 Vital signs taken	Yes No N/A	1 0 2
4.4 Uterus contracted	Yes No N/A	1 0 2
4.5 Cervical tears noted	Yes No N/A	1 0 2
4.6.Perineum tears noted	Yes No N/A	1 0 2
4.7 Bloodloss measured and management noted	Yes No N/A	1 0 2
4.8 .Breastfeeding details noted	Yes No N/A	1 0 2
5. Transference details noted		
5.1.Transfer to postnatal unit	Yes No N/A	1 0 2
5.2.Maternal condition noted post delivery	Yes No N/A	1 0 2
5.3.Newborn condition noted	Yes No N/A	1 0 2

C. PUERPERIUM CARE NOTES		
1. Assessment of newborn		
1.1 Resuscitation details	Yes	1
	No	0
	N/A	2
1.2 Resuscitation sequence and summary	Yes	1
	No	0
	N/A	2
1.3 Problems with resuscitation	Yes	1
	No	0
	N/A	2
2. Initial Physical Assessment of newborn	Yes	1
	No	0
	N/A	2
3. Management of the new mother during the postnatal care		
3.1. Vital signs taken	Yes	1
	No	0
	N/A	2
3.2. Fundal height noted	Yes	1
	No	0
	N/A	2
3.3. Haemoglobin completed	Yes	1
	No	0
	N/A	2
3.4. Breast checked	Yes	1
	No	0
	N/A	2
3.5. Uterus checked	Yes	1
	No	0
	N/A	2
3.6. Perineum checked	Yes	1
	No	0
	N/A	2
3.7. Lochia checked	Yes	1
	No	0
	N/A	2
3.8. Urine tested	Yes	1
	No	0
	N/A	2
3.9. Bowel action noted	Yes	1
	No	0
	N/A	2
3.10. Legs checked	Yes	1
	No	0
	N/A	2

4. DISCHARGE SUMMARY		
4.1 Mothers notes	Yes	1
	No	0
	N/A	2
4.2 Examination on discharge notes	Yes	1
	No	0
	N/A	2
4.3 FP method given noted	Yes	1
	No	0
	N/A	2
4.4 Postnatal advice given	Yes	1
	No	0
	N/A	2
4.5 Baby physical discharge examination done	Yes	1
	No	0
	N/A	2
4.6 .Completed by midwives	Yes	1
	No	0
	N/A	2
4.7 Copy given to the mother	Yes	1
	No	0
	N/A	2

FP: Family Planning
N/A: Not Applicable to the patients who did not go through delivery/birth processes

THE END

Appendix C: Adverse events/near misses incidents register for maternity unit

Year	Incidents	Cause of the incident	Report by	Impact	Closure

Appendix D: Maternity unit monthly monitoring and evaluation reports

Date	BOR	Adm	Birth	C/S	C/S rate	A/ delivery	Low b/weight	Mat/ death	Neo/ death	BBA	MMR
Year											
Jan											
Feb											
Mar											
Apr											
May											
June											
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											
Average											

Appendix E: Permission from the Free State Department of Health

health
Department of Health
FREE STATE PROVINCE

28 December 2009

Me. A.S. Sesing
198 Koedoe Road
Fauna
BLOEMFONTEIN
9301

Dear Me Sesing

Subject: PERMISSION TO CONDUCT RESEARCH AT MATERNITY UNIT AT THE NATIONAL DISTRICT HOSPITAL

The above mentioned correspondence bears reference.

Permission is hereby granted for the above – mentioned research on the following conditions:

- Research results shared with the Department as well as all reports made available to the Free State Department of Health.
- Research does not impact negatively on service delivery.
- No patients or health care providers will be interviewed for the above study.
- A presentation is done to the Clinical Health Services cluster
- Confidentiality of information will be ensured and no names will be used.

Trust you find the above in order.

REV M M MUSAPELO
2009 -12- 28
GEO/GENERAL MANAGER
AHSC

Kind Regards,

Rev M Musapelo
Acting Executive Manager:
Clinical Health Services
Date: _____

Head : Health
PO Box 227, Bloemfotein, 9300
4th Floor, Executive Suite, Bophelo House, cnr Maitland and, Harvey Road, Bloemfotein
Tel: (051) 408 1107/8 Fax: (051) 408 1055, e-mail: hodpa&fshealth.gov.za@fshealth.gov.za

national hospital

Department of Health
National District Hospital
FREE STATE PROVINCE

31 December 2009

Me. AS Sesing
198 Koedoe Road
Fauna
Bloemfontein
9300

Dear Me. AS Sesing

PERMISSION TO CONDUCT RESEARCH AT MATERNITY UNIT AT THE NATIONAL DISTRICT HOSPITAL

The above mentioned correspondence bears reference.

- The National District Hospital Ethical Committee does not have objection to carry out research at the maternity unit.
- Research results shared with Department as well as all reports made available to the Free State Department of Health.
- Research does not impact negatively on service delivery.
- No patient or health care providers will be interviewed for the above study.
- A presentation is done to the Clinical Health Service cluster.
- Confidentiality of information will be ensured and no names will be used.

Kind regards

.....
Dr. TD Ledibane
Chairperson: Adverse Events & Ethics Committee

Chief Medical Officer: Dr. TD Ledibane
National District Hospital, Roth Avenue, Willows, 9300
Tel: (051) 403 9628 Fax: (051) 403 9907
E-mail Address: tdledibane@fshealth.gov.za

Appendix F: Ethics approval certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Miss Agnes S Sesing

CLEARANCE CERTIFICATE	**M091155**
PROJECT	Evaluation of the Quality and Management of Maternity Services in the National District Hospital in the Free State Province
INVESTIGATORS	Miss Agnes S Sesing.
DEPARTMENT	School of Public Health
DATE CONSIDERED	2009/11/27
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 2009/11/30 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr R Jina

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...