ASSESSMENT OF THE USE OF THE NEW MATERNITY CASE RECORD IN IMPROVING THE QUALITY OF ANTE-NATAL CARE IN ETHEKWINI DISTRICT, KWAZULU-NATAL

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Dissertation submitted in fulfilment of the requirements for the Degree of Master of Technology in Nursing in the Faculty of Health Sciences at the Durban University of Technology.

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Declaration

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

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Dedication

I dedicate this dissertation to the Almighty God for giving me the power and strength to start and finish this study, with Him everything is possible.

I would like to dedicate this study to my one and only son Melokuhle, my daughter Thembi and my dearest partner Mr Sipho P. Mposula for their support and encouragement throughout the study and being a source of my happiness.

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Abstract

Brief background to the study

The national guidelines for maternity care in South Africa recommend that a standardised maternity case record be used by all facilities at all levels of care in order to improve the quality of care for pregnant women. According to the National Department of Health, this will facilitate continuity and quality of care for women during pregnancy, labour and post-partum.

Aim of the study

The aim of the study was to assess whether the implementation of the new maternity case record has improved the quality of care for pregnant women.

Methodology

An exploratory, descriptive study using both quantitative and qualitative design was used to conduct the study. Data was collected through a retrospective record review using a checklist for the quantitative strand, and from midwives using unstructured interviews for the qualitative strand. The quantitative data set was analysed using the Statistical Package for the Social Sciences version 21.0 and the qualitative strand was analysed using the Tesch's method of data analysis.

Results

The results of the record review revealed that although the recording was done fairly well, there were a number of activities and interventions that were recorded poorly or not recorded at all in some primary health care clinic. The midwives verbalised that many mistakes and mismanagement of ante-natal care clients emanated from the structure and the design of the new maternity case record.

Recommendations

Recommendations include the following: communication of policies and protocols to the midwives should be done timeously, provision of in-service education and/or updates on new developments, strengthening of supportive supervision, the Nursing colleges be kept up-to-date with new developments in nursing practice and that a broader study involving other districts and provinces be conducted.

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Glossary of Terms

Antenatal Care (ANC)

This is the health care that is rendered to pregnant women throughout pregnancy until child birth and is aimed at detecting those problems which already exist or those that can develop in the pregnant woman and her unborn child (Pattinson 2007: 5).

ANC National HIV and Syphilis Prevalence Survey

This is the national study conducted on women who are attending ANC for the first time in their current pregnancy in selected public health clinics across South Africa, to assess the HIV and syphilis infection prevalence rate in the country (Department of Health 2010a: 3).

Gravidity

Gravidity is defined as the total number of pregnancies, regardless of duration or outcome (Goolsby and Grubbs 2011: 568)

Maternal death

Maternal death or maternal mortality, also obstetrical death, is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (Department of Health 2007a: 7).

Midwife

A midwife is a licensed health care practitioner who is registered with the South African Nursing Council. He/she has completed a recognised education and training programme to nurture, assist and treat the client, who can be a woman, a neonate or a family, in the process of promoting a healthy pregnancy, labour and post-partum period (SANC 2001).

Neonatal Death

Neonatal death is the death of the baby in the first 28 days of life, due to complication and other causes in pregnancy (Back 2006: 6).

Parity

Parity is the number of pregnancies resulting in live births together with all stillbirths (Douglas, Nicol and Robertson 2005: 212)

PMTCT

Prevention of mother to child transmission is the programme that treats and prevent baby from HIV exposure and infection, sometimes referred to as preventing vertical transmission during pregnancy, child birth and/or through breastfeeding (United Nations Children's Fund [UNICEF] 2012: 31).

Preconception care

Preconception care is the care that a woman receives before pregnancy and involves finding and taking care of any problems that might affect her and the baby later, such as diabetes or hypertension, and also involves steps that the woman can take to reduce the risk of birth defects and other problems (Department of Health 2012a: 8).

Primary Health Care

Primary Health Care (PHC) is essential health care based on practical, scientifically sound, and socially accepted methods and technology, universally accessible to all in the community through their full participation at an affordable cost, and geared toward self-reliance and self-determination (WHO and UNICEF 1978: 15).

Delivery

For the purpose of this study delivery shall mean giving birth.

List of acronyms

Acronyms	Full word/Statement
ANC	Antenatal care
ART	Antiretroviral Therapy
BANC	Basic Antenatal Care
BMI	Body mass index
EDD	Estimated date of delivery
FH	Foetal Heart
FM	Foetal Movement
HB	Haemoglobin
HCT	HIV Counselling and Testing
HIV	Human immunodeficiency virus
KZN	KwaZulu-Natal
LNMP	Last normal menstrual period
MDG	Millennium Development Goals
MCWH	Maternal Child and Women's Health
MMR	Maternal Mortality Rate
MUAC	Mid upper arm circumference
NCCMD	National Committee on confidential enquiry into causes of maternal deaths
NST	Nuchal translucency screening
PMTCT	Prevention of Mother-to-Child Prevention
POG	Period of gestation
SA	South Africa
SFH	Symphio Fundal Height
TB	Tuberculosis
UNICEF	United Nations Children's Fund
UT	Uterine Irritable
WHO	World Health Organisation

CHAPTER 1
OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

According to the World Health Organisation (WHO) (2014) almost all maternal deaths (99%) occur in developing countries with more than half of these deaths occurring in sub-Saharan Africa. According to the WHO, the maternal mortality ratio in developing countries in 2013 was 230 per 100 000 live births versus 16 per 100 000 live births in developed countries (WHO 2014). The WHO further states that most maternal deaths are preventable, as the health-care solutions to prevent or manage complications are well known, and lists the need for pregnant women to have access to antenatal care in pregnancy as one of the solutions. South Africa has adopted the recommendation by the WHO to use antenatal care (ANC) as one of the strategies to fight this problem of maternal death (Pattinson 2007: 7). The National Department of Health recommends that a standardised maternity case record be used by all PHC facilities that are providing maternity services (Department of Health 2010b: 3). The intention is to improve maternity care services during pregnancy, delivery (child birth) and postnatal care with the ultimate goal of reducing the number of maternal deaths and untoward pregnancy outcomes (Department of Health 2010b: 3).

The majority of untoward pregnancy outcomes are due in part to factors that may be identified before conception (South Australian Perinatal Practice Guidelines 2011: 64). Care of the woman should begin during the preconception period. The main goal of preconception care is to provide health promotion and to reduce risk factors which may affect future pregnancies. A multidisciplinary health team should play an active role in improving preconception heath care.

Pre-existing medical conditions have an impact on pregnancy outcome and the control and management of these conditions may limit negative effects (South

Australian Perinatal Practice Guideline 2011: 83). Genetic disorders may require counselling to consider options for antenatal diagnosis and parental genetic testing before pregnancy is advisable (South Australian Perinatal Practice Guidelines 2011: 17). The midwife plays a critical and leading role in the authoritative jurisdictions or mandates that define the structural and regulatory boundaries or demands for midwifery practice. The midwife must therefore adopt a sensible holistic nursing approach to the care of a pregnant woman (McCall Sellers 2013: 13). The style or form of midwifery practice varies greatly between healthcare systems due to contextual differences.

The detection of high-risk pregnancies through ANC has been advocated as a tool for reducing maternal and perinatal mortality rates (National Committee for Confidential Enquiry into Maternal Deaths [NCCMD] 2008: 105). Effective ANC alone will not prevent global maternal and perinatal mortality, but how the antenatal care is provided to women plays a vital role in ensuring that the outcome for mother and baby is as healthy as possible (Maternal and Neonatal Health Programme 2004: 182). All PHC facilities providing ANC therefore have a contribution to make to the maternal and perinatal death rates of the country in a positive or negative way, depending on the quality of ANC. It is recommended that all pregnant women must start attending ANC before fourteen weeks of pregnancy for early detection of risk factors (Department of Health 2007a: 4). This helps to assess and identify women who are more likely to experience complications during their pregnancies. Good antenatal care is believed to lead to better outcomes of pregnancy (Donkor and Obed 2012: 7). Lincetto, Mothebesoane-Anoh, Gomez and Munjanja (2012: 51) state that good care during pregnancy is important for the health of the mother and the development of the unborn baby. These authors highlight that good ANC links the woman and her family with the formal health system, increases the chance of using a skilled attendant at birth and contributes to good health through the life cycle.

Although a**n**tenatal care attendance is high in most parts of South Africa, the country is still faced with the problem of consistently high maternal and prenatal mortality rates. The National Department of Health's role in setting up a National Committee for Confidential Enquiry into Maternal Deaths (NCCMD) is pivotal, not only in

providing information on major causes of maternal deaths and factors related to deaths but also in giving information to society at large so that they are aware of major causes of maternal deaths and support the various initiatives to improve maternal health (National committee on Confidential Enquiry into causes of Maternal Deaths ([NCCMD] 2008: 29)). The NCCMD provides that all provinces are required to ensure that the recommendations and the action plans are implemented in accordance with the Department of Health policies, guidelines and protocols (NCCMD 2008: 29).

There is a constant rise in the number of maternal deaths despite the various strategies that are instituted in an attempt to control this problem. During 2005-2007 the maternal mortality rate increased by 20.1%, compared with previous reports by the NCCMD. Older women, from 35 years and above, have been found to be at higher risk than women under 35 years of age. Women in their first pregnancy or who had five or more pregnancies are also said to be at greater risk of maternal death (The American Congress of Obstetricians and Gynaecologists 2011:26). Teenage pregnancy appears to be a challenge that may contribute to the struggle to fulfil the objective of the MDG directly related to women's reproductive health and neonatal care (James, Rall and Strumpher 2012: 1). A total number of 3406 maternal deaths were reported in South Africa alone during the 2008-2010 trienniums (NCCMD 2011: 16). Since the first report of the NCCMD the top five conditions causing maternal deaths have been reported to be non-pregnancy related infections, hypertension, obstetric haemorrhage, pregnancy-related sepsis, and pre-existing maternal disease (NCCMD 2011: 32). Almost all these conditions can be stabilised or prevented with good ANC, thus reducing the number of deaths related to these conditions. Non-pregnancy related infections peak at 25-29 years old, leading to death due to complications of abortion and pregnancy related sepsis following a viable pregnancy (NCCMD 2008: 36).

South Africa has a persistently high maternal and perinatal mortality rate. According to the National Perinatal Morbidity and Mortality Report 2008-2010, there has been no change over the past five years (Department of Health 2011: 12). This is supported by the results of the Saving Mothers Report 2008-2010 which states that

maternal mortality rate (MMR) has increased when compared with the 2005-2007 report. During 2008-2010 a total of 4867 maternal deaths were reported (NCCMD 2011: 105). The report by the NCCMD highlights that most avoidable factors responsible for maternal deaths could have been avoided through quality antenatal care (NCCMD 2011: 32). The NCCMD highlights in the Saving Mothers report the importance of strengthening corrective measures in KwaZulu-Natal (KZN). KZN province has been identified to be amongst the provinces with the highest number of maternal deaths (NCCMD 2011: 28). EThekwini is the largest and the most densely populated district in KZN and the third-largest city in South Africa. It is therefore critical that the KZN Department of Health should comply with the appropriate guidelines if it is to succeed in its endeavours to improve the maternal and child health of its citizens.

Various strategies have been put in place to curb the problem of high maternal and perinatal mortality, amongst which is the inclusion of Maternal Child and Women's Health (MCWH) services as the priority programme in the country's strategic plan (Department of Health 2010a: 4). The department uses the PHC approach to provide early and quality ante- and postnatal services, as well as essential infant and child health services and nutritional advice. Thus it is anticipated that it may reduce the high maternal and child mortality rates in the country. The emphasis is on improving the quality of care for women at all levels, with strong emphasis on strengthening ANC services. Every woman should be given antenatal care where all investigations and antenatal services rendered are recorded. The national Department of Health introduced the new standardised maternity case record as one of the key interventions to improve the care of pregnant women. The maternity case record was developed through the realisation that different institutions use different records. It is meant to provide a comprehensive record that will be used uniformly and fill the gaps that were evident in the previously used documents. It is envisaged that the use of the case record will overcome unnecessary delays of action/intervention, thereby enabling clear problem recognition which will lead to prompt management with one case record used by all levels of care (Department of Health 2010b). The case record is given to the woman as a client-held record and

should only be retained in the delivery institution on discharge after birth, once a composite discharge summary has been written.

The card is designed in such a way that it facilitates the integration of services. The components of the card provide for implementation and recording of TB, HIV, sexually transmitted infections and cancer screening services. These are amongst the conditions that contribute to maternal and perinatal deaths in the country. HIV is one of the major challenges facing South Africa today. According to the Saving Mothers report by the NCCMD, HIV status was unknown in 63.6% of maternal deaths (NCCMD 2011). This means that these women were not tested for HIV, and it could therefore have been possible that HIV/AIDs contributed in one way or the other to their death. The Maternity Care Guidelines and Basic Antenatal Care (BANC) Principles of Good Care and Guidelines are the two guiding documents for ANC service provision, which recommend that all pregnant women should be screened for HIV and TB (Pattinson 2007: 79). This report was released more than ten years after the Department of Health introduced the prevention of mother-to-child transmission of HIV (PMTCT) programme in 2001. The 2005 national survey shows that the HIV prevalence rate increased from 29.5% in 2004 to 30.2% in 2005. KZN has been constantly leading with the highest prevalence of 39.1%, whilst the Western Cape has the lowest rate of 15.7% (Beksinska, Mullick, Kunene and Mosery 2012: 39). The ANC services form part of the critical service points where the PMTCT programme is implemented. Accurate recording on the maternity case record facilitates the implementation and monitoring of the PMTCT programme, and ensures the continuum of care for pregnant women who are enrolled into the PMTCT programme. All PMTCT services provided to pregnant women are recorded and monitored using the maternity case record. In 2012 Dr Motsoaledi, South Africa's Minister of Health, announced the award of a new antiretroviral tender worth R5.9 billion that, for the first time since the start of the ARV programme, includes a triple fixed-dose combination (FDC) tablet. The FDC contains 300mg tenefovir (TDF), 200mg emitricitabine (FTC), and 600mg efivarenz (EFV). From April 2013 all pregnant women, regardless of their CD4 cell count, are initiated on triple ARV therapy for the duration of pregnancy and breastfeeding, to enhance the prevention of mother-to-child transmission of HIV (PMTCT) programme. Switching patients to

the FDC needs to be managed carefully, particularly regarding comprehensive patient counselling (Davies 2013: 41)

1.2 IMPLEMENTATION OF THE NEW MATERNITY CASE RECORD

Several maternity case records have been used previously to record maternity care services. Some cards were used throughout pregnancy until delivery and others were used for ANC only. Some of these maternity cards were standardised national documents, while others were designed within the different provinces and therefore differ from province to province. For a long time the Eastern Cape had its own unique maternity case record. In KZN between the years 2005-2008 selected districts such as iLembe, uMgungundlovu and eThekwini each had their own unique ANC card, however one uniform card was used for intra-partum care. The provinces and districts designed their own unique maternity cards due to the gaps that existed with the standardised green maternity card. During this time a small blue card commonly referred to as the blue book, or sometimes called the BANC card, was used in the eThekwini district. The differing maternity care records created a problem when a pregnant woman moved from province to province. Therefore, the national Department of Health recommends the strict use of the standardised maternity case records. The national Department of Health emphasises that the maternity case record should not be kept at the health facility, but instead it should be kept by each pregnant women until she gives birth (KZN Department of Health 2009).

1.3 PROBLEM STATEMENT

In the national guidelines for maternity care in South Africa, the national Department of Health recommends that a standardised maternity case record be used by all facilities to record care during pregnancy, intra-partum care and post-delivery (Department of Health 2007a :6). This should be done in order to ensure that all relevant information pertaining to the woman regarding the history of problems, investigations, complications, treatment etc. is contained in one document so that it becomes readily available to all health care workers when required. This is to

ensure that quality of care and a continuum of care is provided to the pregnant woman and that unnecessary duplication and delays in initiating care are avoided. All of which are part of the strategies to reduce maternal and perinatal mortality rate in South Africa. However, despite all these efforts, the pattern of avoidable deaths was the same during 2011-2012 as the 2008-2010 report, with non-pregnancy related infections, obstetric haemorrhage and hypertension contributing to 26.0%, 23.8% and 16.5% of the avoidable deaths respectively. This is 66.3% of all avoidable deaths (Pattinson, Fawcus and Moodley 2014:3)

It has also been observed that there is a constant outcry from various PHC clinics in the eThekwini district regarding the short supply of copies of the maternity case record. The structure of the card incorporates changes of approach to ANC from the traditional approach to the BANC approach. In a study on the factors that influence successful implementation of BANC, Ngxongo (2011: 30-31) reported that >50% PHC clinics in eThekwini district have not been able to successfully implement the BANC approach to ANC. Both the maternity case record and the BANC approach are new interventions to be implemented by midwives, and this necessitates that reorientation of the midwives be done in order to ensure correct and accurate implementation of these two interventions.

1.4 RESEARCH AIM

The aim of the study was to assess the use of the maternity case record in improving the quality of the ANC in eThekwini District, KwaZulu- Natal.

1.5 RESEARCH OBJECTIVES

The objectives of the study were:

- To assess the midwives' documentation and use of the new maternity case record during ANC service provision.
- To assess the midwives' understanding of the new maternity case record during ANC service provision.
- To assess the midwives' understanding of the new maternity case record card.

1.6 SIGNIFICANCE OF THE STUDY

The successful implementation of the strategies to improve quality of care during pregnancy, labour and postnatal care remains critical for South Africa, as the country is still faced with the burden of high maternity and perinatal deaths (KZN Department of Health 2009). South Africa has included maternal health as one of the priority programmes for the country in its strategy to achieve the millennium development goals number four and five which are to reduce child deaths by 75% and improve maternal health by 50% (National Department of Health 2007b:6-7).

According to the MDGs South Africa intends to work strongly on reducing maternal and perinatal mortality rates (Department of Health 2007b: 79). The problem of constant high maternal and perinatal mortality rates is a worldwide problem, but is especially prevalent in sub-Saharan countries such as Kenya, Ghana, Malawi, and South Africa. A significant number of maternal death are preventable, therefore policy guidelines were developed with the aim of improving the provision of maternity care in clinical practice.

The implementation and correct use of the new maternity case record can assist in ensuring the continuum of care, which in turn will assist in improving the quality of care. Thus the country can achieve the goal of improving maternal health. The reasons behind the failure of health care providers to diagnose and treat problems at an early stage need to be determined. What also need to be determined are the reasons behind the delay by patients in early presentation in acute conditions so that appropriate remedial action can be implemented. This will also benefit the country in reducing perinatal deaths. The results of the study would not benefit just eThekwini municipality but the whole district of eThekwini, and also could be used by policy makers at district, provincial and national levels in order to improve and strengthen the existing antenatal care approach.

1.7 CONCLUSION

This chapter covered the introduction and background of the study, the problem statement and purpose of the study. The number of maternal deaths from 1999 up to 2011, as reported by National Committee for Confidential Enquiry into Maternal Deaths, was presented and some of the problems and complications that could be avoided through quality antenatal care were highlighted. The next chapter will present the literature review.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter outlined the background, aim and significance of the study. It also dealt with the different aspects and approaches to ANC, providing clarity on why the study was conducted. This chapter focuses on different approaches to ANC from other countries and how various strategies and approaches to ANC are implemented. Further, this chapter also looks at the accurate assessment of pregnant women which facilitates identification of risk factors, and appropriate streaming of women to the appropriate level of care.

2.2 GLOBAL CONTEXT

The maternal mortality rate differs between countries; Sweden currently has the lowest maternal mortality at 0.1/100 000 live births. The USA is 5/100,000 and the United Kingdom 12/100 000 and South Africa is estimated at 150-382/100 000 births, or about five deaths per day (McCall Sellers 2013: 9). South African midwives are facing the same challenges as midwives globally, but with their rich history they need to show leadership and innovation through education, collaboration and evidence-based research to resolve the challenges they face (McCall Sellers 2013:7).

It is important to consider maternal and perinatal mortality together, as the identification of risk factors and referring problems during the antenatal period, monitoring of foetal movements, high standards of intrapatum care, improved postnatal care and skill drills are some factors that require improvement (McCall Sellers 2013: 11). The WHO stated that in order to introduce the package into practice the clinical standards and guidelines for ANC should be updated (Lincetto

et al 2012:54). The pre- and in-service training curricula in ANC and in-service for ANC providers and their supervisors should be modified, and a thorough assessment and plan for making changes in drugs, equipment, and suppliers to implement the package should be carried out (Ngxongo 2011: 12). Several countries have different strategies in place to improve the quality of ANC.

Maternal health in Malaysia has been in relatively good standing compared with its neighbours in South East Asia. In three large States namely, Johor, Sebah and Sarawak, the maternal mortality rate was very high between 1997 and 2007. In 2007 the highest maternal ratio was experienced at Malaysia and Bumiputra where a total of 67.3 and 40.8 maternal deaths per 100,000 births respectively were reported and lowest was in China with 12.9 deaths per 100,000 births. Maternal mortality among older women (aged 40-44 years) was high compared to women in the prime child bearing age group (Kaur and Singh 2011). The implementation of more comprehensive strategies may enable a further reduction of MMR to achieve Malaysia's MDG target of 11 per 100,000 population by 2015. The WHO recommends a minimum of four visits based on a review of the effectiveness of different models of ANC (Kaur and Singh 2011). ANC visits will ensure that pregnant women receive important services and that there risk factors are identified. Treatment of illness that places a pregnant woman at high risk of maternal death due to indirect causes is therefore considered a proxy indicator for safe deliveries (Kaur and Singh 2011). In Malaysia all pregnant women are given an antenatal booklet, known as pink or red booklet, which records the pregnancy history including check-ups and follow-up visits. ANC visits occur once a month until 28 weeks of pregnancy, and then they take place every two weeks up to 36 weeks. From 37 weeks until delivery visits are on a weekly basis (Baby Centre Malaysia Medical Advisory Board 2007:1).

In India reproductive, maternal and child health services are provided by the Government sector in rural areas and the private sector in urban areas. Pregnant women are not attending antenatal care services in health institutions. However, due to ignorance, illiteracy, economic and time constraints that stand in their way of

utilising antenatal care services education and counselling is of vast importance and improves the utilisation of antenatal care services (Khan and Kalu 2011: 2259).

In Pakistan, new antenatal care handbooks are used because a variety of antenatal care record cards were available at varying levels of health facilities, which were too complicated for use at community levels as they were for secondary and tertiary level care facilities (Akhund and Avan 2011: 1-8).

Insufficient antenatal care in Latvia has been found to correlate with poor outcomes. (Lincetto, Mothebesoane-Anoh, Gomez and Munjanja. 2012:52). Another risk factor that also influences the incidence of prenatal death is the socio-economic conditions of the population. Pregnant women who do not attend antenatal care are above 35 years of age and have a history of three or more previous deliveries, with 28% being smokers and 3.2% abusing alcohol.

2.3 SUB-SAHARAN AFRICAN CONTEXT

Health promotion focuses on motivation for increased well-being and actualises health potential. Care plans are based on understanding a client's values, culture and beliefs, as well as her situations. Patients are more likely to follow the nurse's advice if the reasons are explained to them (Levasseur and Raines 2003: 83). According to Levasseur and Raines (2003: 83) maternity case records helps to pick up any abnormalities during history-taking, together with behaviours such as drug abuse, smoking, and alcohol consumption, which may all be harmful to the foetus. These may be prevented through health promotion and counselling for the pregnant mother. Good antenatal care leads to better outcomes of pregnancy. In Ghana there are maternity homes run by qualified midwives to avoid long queues in hospital (Donkor and Obed 2012: 7).

Balanced energy and protein supplementation improves foetal growth and may reduce the risk of foetal and neonatal death in nutritionally vulnerable women or those at risk of low birth-weight babies. Dietary supplementation with folic acid (400 micrograms per day) is recommended before conception up to twelve weeks of

gestation, to reduce the risk of anencephaly and spina bifida (WHO European Region 2005: 9). Differences in epidemiology of given conditions, investment priorities and cultural and social values preclude implementation of a homogeneous ANC package. In countries with scarce resources attention should primarily be focused on a limited set of essential interventions that are effective in reducing relevant adverse outcomes for mother and child (WHO European Region 2005: 15).

Poor quality and coverage of maternal health care has been identified as leading causes of high maternal mortality in developing countries such as Nigeria. Due to low rates of facility-based delivery and inability to access high-quality antenatal care and skilled professional midwives at birth resulted in adverse outcomes for mothers and infants. According to Olugbenga *et al*. (2010: 14) the WHO estimates that 45 million pregnant women in developing countries receive no antenatal care (Olugbenga *et al*. 2010: 14). The authors also state that 6 million women deliver without the assistance of midwives.

The process of record keeping involves the consideration of legal requirements, ethical standards and other external constraints, as well as the demands of the particular professional context. Records benefit both client and health providers through documentation of treatment plans, services provided and client progress (Pullen and Louden 2006: 280-286). Good records remain the most tangible evidence of the psychiatrist's practice and, in an increasingly litigious environment, the means by which it may be judged. Clinical records are also used increasingly in assessment of professional competence (Pullen and Louden 2006: 280-286).

An evaluation of quality antenatal care in the Matabeleland North Province discovered that all risk factors were identified but no action was taken. Efforts to improve the interpretation of recorded patients' information and a record-keeping system would help in this regard (Sikosana 2004:9).

In Somalia poor quality of antenatal services was associated with breaks in supplies, absence of qualified staff, short working hours and weak supervision (Sorbye 2009:56).In Sudan which is one of the countries with the highest rates of maternal

and perinatal mortality, Ali *et al*. (2010: 1) suggest that the use of antenatal care can assist to reduce maternal and perinatal mortality.

Health education and counselling of pregnant women concerning the importance of antenatal care, especially for those from unfavourable social backgrounds, should be provided more effectively (Jansone, Lindmark and Langhoff-Roos 2001: 80). Record keeping gives essential information on personal details, history, examination, investigation and pregnancy progress. It helps with continuity and continuum of care with other services. Record keeping is an integral part of nursing midwifery and specialist community public health nursing practise. Adopting a care pathway has been shown to be the best way of providing women-centred co-ordinated and clinically driven care. The pathway provides an evidence-based framework for ANC and sets a high minimum standard for the care of all women (Richley 2009: 3).

Accurate records contain observations of clinical outcomes; therefore record keeping can be a good or poor reflection of the standard of care that is given to the patient. Careful, neat, and accurate patient records are the hallmarks of a caring responsible nurse, however poorly written records can lead to doubts about the quality of a nurse's work. Who is responsible for record keeping? Anyone on the nursing team who provides care to patients can contribute to record keeping (Stevens 2010: 44-45). Record keeping is an essential underpinning of good governance. It must be demonstrated that records are crucial in ensuring transparency, accountability and good governance. These are the key issues in record management and archive administration (Tough 2007: 61).

2.4 SOUTH AFRICA

The eight MDGs, as espoused by the United Nations in 2000, have been accepted by the Ministry of Health in South Africa. The Millennium Development Goals (MDGs) numbers 4 and 5 by the United Nations Development Programme (UNDP) are to reduce maternal and child mortality rates by 2015 (United Nations Development Programme 2012: 26-30). Whilst fighting to achieve these MDGs by 2015, maternal and perinatal mortality rates remain high in South Africa. According

to the National Perinatal Morbidity and Mortality Report 2008-2010, there has been no change over the past five years (Department of Health 2011: 12). This is supported by the findings of the CCMD in their Saving Mothers Report 2008-2010, which states that the maternal mortality rate (MMR) increased during the 2008-2010 triennium when comparing it to the 2005-2007 triennium (NCCMD 2011: iii). Although South Africa is having a problem of persistently high maternal and perinatal mortality rates, a significant number of the maternal deaths occurring in the country are preventable. Every pregnant woman who continues with her pregnancy does so in the expectation of delivering a healthy baby and having the satisfaction of watching the child grow. The risk factors identified during assessment must be urgently addressed, managed and recorded (NCCMD 2005: 14).

Policy guidelines were developed with the aim of improving the provision of maternity care in clinical practice. ANC provides the first contact point for most women, thus it is the main area for preventing adverse pregnancy outcomes. What is required is access to the services and accurate assessment to detect risk factors and ensure management at an appropriate level of care (NCCMD 2005). Community participation can play a good role in improving the quality of care through health promotion. Starting ANC early in pregnancy, as early as fourteen weeks gestation, can prevent stillbirth, neonatal death and reduce maternal and perinatal mortality and morbidity (Department of Health 2007a: 12). All pregnant women must start attending antenatal care as early as before twelve weeks, and they must have five or more antenatal visits (Department of Health 2012b: 4).

The Policy and Guidelines Job Aids has been designed to provide health workers with a useful and quick reference handbook for antenatal and postnatal care work (KZN Department of Health 2010). All pregnant women must start the ANC as early as before 13 weeks in order to ensure early identification and management of risks factors. Several routine interventions such as giving prophylaxis treatment (eg. iron, folic acid and calcium supplements) to all pregnant women, together with tetanus toxoid injections, assist in reducing certain pregnancy complications such as anaemia, pregnancy haemorrhages and pre-eclampsia. High-risk clients should be referred to higher levels of care according to referral protocols (KZN Department of

Health 2010a:7). In the maternity case record guidelines for South Africa, the national Department of Health recommends that a standardised maternity case record be used by all facilities to record care during pregnancy, intra-partum care and post-delivery (KZN Department of Health 2010b:30).

Maternal health needs to be seen in a broader context than prevention of maternal mortality. Over 97% of pregnant women access the ANC and >90% deliver in a health facility. HIV prevention services and family planning are also to be prioritised, as is the need to integrate health services for women, new-borns and children. Prevention of termination of pregnancy in adolescents or teenagers is a specific focus recognising that this is the major contributor to maternal and neonatal mortality (Burton 2013: 520-521). Contraception for women with medical conditions which may become life threatening in pregnancy, also needs urgent attention. The Interim Report 2011 noted an increase in maternal deaths due to medical and surgical disorders. The MDGs have focused attention on health service delivery in terms of goal-oriented planning, strategies to achieve targets, and accountability for their income. Maternal deaths are an avoidable tragedy and their prevention an urgent priority (Burton 2013: 520-521)

2.5 COMPARISON BETWEEN THE NEW MATERNITY CASE RECORD AND PREVIOUS MATERNITY RECORDS

Table 2.1: Differences between the old and the current maternity case record.

The old maternity case record	The new maternity case record
Green card.	White Card.
Structured in line with the traditional approach to ANC as stipulated by the SANC.	Structured in line with the BANC approach to ANC as stipulated by Pattinson (2005) and MCWH guidelines (2008).
Does not incorporate the PMTCT programme.	Incorporates the PMTCT programme.
Selected provinces and districts used the card for intra-partum care only and used their own unique cards for ANC.	Used throughout pregnancy from ANC until delivery.
ANC consultation recorded in a table.	ANC consultation recorded in graph format.
Referral letters, feedback notes, and investigation requests sheets stapled onto the card.	No additional forms used; all notes, referral letters, feed-back from referral institutions are written in the cards.
POG, Palpation, SFH, Ultra Sound measurements used to monitor growth of the foetus.	Growth of foetus monitored based on POG, SFH Ultra Sound measurements.
No space provided for recording HIV test results.	Space provided for recording HIV test results.
Does not highlight period of gestation where certain procedures should be performed and assessing the presenting part and monitoring of foetal heart.	Highlights period of gestation where certain procedures should be performed and assessing the presenting part and monitoring of foetal heart.
In selected PHC clinics and hospitals the green maternity card was kept in the clinic/hospital as a clinic/hospital based record and client issued with a small carrier card during ANC.	The card is given to the pregnant woman throughout the ANC care period and is only kept in the clinic/hospital after delivery.

The two nationally standardised maternity case records that have recently been used in South Africa are the green maternity case records and the new white maternity case record. The old green maternity case record has been phased out and has been replaced by the white maternity case record. The similarity between the old and the current maternity case record is that both these maternity case records were standardised cards designed by the National Department of Health. They were intended for use throughout pregnancy from ANC until delivery, and were to be filled in by the delivery institution on discharge of the women post-delivery. Several differences are noted between these two maternity cards. Table 2.1 above highlights some of the differences between the two maternity records.

Nurses face new issues and problems each day and regularly make decisions on patient care, therefore a record of any arrangements a nurse makes for care of a patient is important from a continuity point of view. Poor record keeping results in difficulty in assessing trends. Having good quality records helps nurses to refer back when giving evidence in cases of legal advice or court cases when a client sues a hospital or health facility. Maintaining records that are of good quality have immediate and long term benefits for staff (Wood 2003: 26). All women that attend antenatal care should be issued with an antenatal card. The content of antenatal cards currently varies between provinces, but most formats are adequate for essential antenatal care. Women who present to an antenatal clinic with a card from another province should have the card completed at the clinic, rather than being issued with a new card on which information would be duplicated (Department of Health 2007a:20). Good record keeping promotes better communication as well as continuity, consistency, efficiency, and reinforces professionalism within nursing to provide a baseline record against which improvement or deterioration may be judged (Wood 2003: 26).

Relevant information about a patient's condition, needs and any arrangements the nurse has made for continuing care of the client must be recorded. Good note-taking is a vital tool of communication between members of a multi-disciplinary team in order to ensure an accurate account of treatment care planning and implementation. Record keeping must be authentic, accurate, legible and objective. The patient's record provides all involved parties with the history, assessment, specific treatment recommendations, alternatives, risks and care provided (Department of Health 2007a). Maintaining good quality records has both immediate and long-term benefits for health workers in respect of safety and protects individuals and teams from accusations of poor record keeping (Wood 2003: 26).

2.6 CONCLUSION

Chapter 2 presented literature that explores the different ways of approaching prenatal care and antenatal care, especially in record keeping from other countries, in order to assess if the quality of antenatal care is improved. Chapter 3 will focus on the methodology adopted by the study and sampling data collection and analysis.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter presented the literature review. Peer reviewed literature was used to compare and contrast the current MCWH status of South Africa with that of countries focusing on approaches to ANC services and recording systems used. Chapter 3 describes the research methodology that was adopted for the study.

3.2 RESEARCH DESIGN

Table 3.1: Presentation of research method used to achieve each of the study objectives.

Study phase	Design	Objective	Data collection Method	Participants
One	Quantitative	• Assess the midwives' documentation and use of the new maternity case record during ANC service provision. • Assess the midwives' understanding of the new maternity case record.	Record review	White maternity case records
Two	Qualitative	• Determine how the use of the new maternity case record influences the management of pregnant women.	Interview	Midwives

An exploratory, descriptive study using both quantitative and qualitative designs was used to conduct the study. The study was conducted in two phases. Quantitative design was used in phase one and qualitative design used in phase two (see Table 3.1). Polit and Beck (2012: 763) describe quantitative research as the investigation of phenomena that lend themselves to precise measurement and quantification, often involving a vigorous and controlled design. During the quantitative phase a review of maternity case records was conducted. The purpose of this phase was to assess how the midwives were using and documenting the new maternity case records during ANC service provision, which was the first objective of the study. The information gathered from the review of records also assisted the researcher to have

an idea about the midwives' understanding of the new maternity case record card, and how using the new maternity case record influences the management of pregnant women.

A descriptive qualitative design was employed during the second phase of the study. A qualitative design is described by Polit and Beck (2012: 763) as the investigation of phenomena through the collection of rich narrative materials using a flexible research design. This is typically an in-depth and holistic method. The researcher used the qualitative design to gather information from midwives regarding the use of the new maternity case record. Semi-structured interviews were conducted with midwives who were working in PHC clinics. This phase was intended to achieve the second and third objectives of the study, which were to assess the midwives' understanding of the new maternity case record and to determine how the use of the new maternity case record influences the management of pregnant women. Certain questions during the interviews were asked that informed the researcher about the midwives' understanding of the card, and how in the midwives' opinion the use of the new maternity case record has influenced the quality of care for pregnant women. Both phases of the study were guided by Donabedian's theoretical framework of structure, processes and outcome (2003:3). How the theory guided the study is described in section 3.3 below.

3.3 DONABEDIAN'S MODEL AND ITS APPLICATION TO THE STUDY

The Donabedian Model is a conceptual model that provides a framework for examining health services and evaluating quality of care. Donabedian (2003: 1) first described the three demands of the Model in his 1966 article "Evaluating the Quality of Medical Care." According to the model, information about quality of care can be drawn from three categories: 'structure', 'process' and 'outcomes'.

- *Structure* describes the context in which care is delivered, including hospital buildings, staff, financing, and equipment;
- *Process* denotes the transactions between patients and providers throughout the delivery of healthcare; and

- *Outcomes* refer to the effects of health care on the health status of patients and populations (Donabedian 2003:2).

Although Donabedian's Model is an old model dating as far back as 1966, it continues to be amongst the useful and reliable paradigms for assessing the quality of health care (Donabedian 2003:1).

Donabedian developed his quality of care framework to be flexible enough for applications in diverse health care settings and among various levels within a delivery system. The Donabedian Model can also be applied to a large health system. It can measure and align improvement of work across a hospital group practice or a large integrated health system to improve quality and outcomes for a population (Donabedian 2003:3). Whilst ANC has been practiced over the years, the implementation of the new maternity case records is one of the many strategies and interventions that are instituted to improve the quality of care. The model does not have an implicit definition of quality care, so it can be applied to problems of either a broad or narrow scope. Donabedian notes that each of the three domains has advantages and disadvantages that necessitate research to draw connections between them, in order to create a chain of causation that is conceptually useful for understanding systems as well as designing experiments and interventions. This model was used in the current study to identify the areas of focus in assessing the use of the new maternity case record (see Figure 3.1). It was also with the assistance of this model that the researcher decided on the two phases of the study, and the use of a mixed method design to gather data.

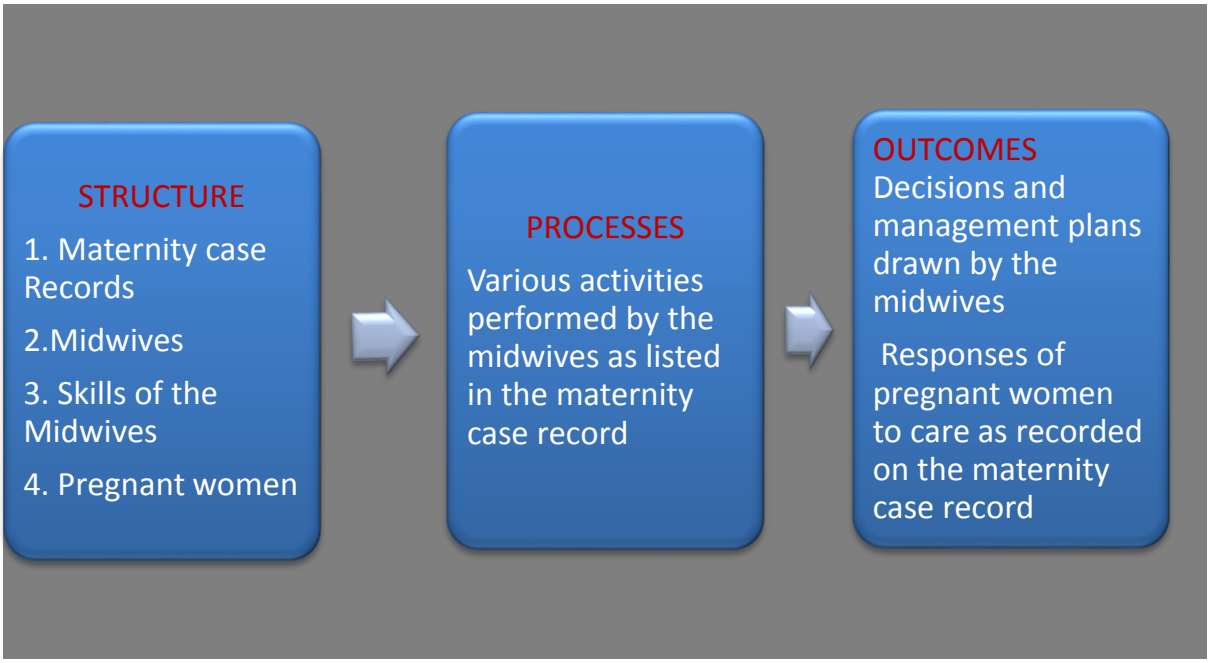


Figure 3.1 Application of Donabedian's Model to the study.

Structure describes the context in which care is delivered, including hospital building, financing and equipment. In the context of this study structure does not refer to the elements as described in the model, but instead the structure refers to the structure of the maternity case record. According to (Agency for Healthcare Research and Quality 2011:2) in order to improve coordination, or designation of a case manager the broad approaches included in the framework, structures of care such as the establishment of a health care home and the use of a health IT system. In line with this, in the current study the researcher considered the maternity case records, the midwives, and the skills of the midwives, as the structure.

Process denotes the transactions between patients and providers of care, which in this study are viewed as the midwives and the pregnant women throughout the delivery of health care. In the context of processes, the research investigated and described the various activities that are required from the midwives, as reflected in the maternity case records. In this study the processes included all the activities of care as listed in the maternity case record that were to be performed and recorded in the cards.

Outcomes refer to the effects of health care on the health status of patients and populations, including changes to health status, behaviour or knowledge, as well as a patient's satisfaction and health-related quality of life. While the final outcome of the pregnancy would be the outcome, in this study the researcher considered the decisions and interventions that were made and carried out by the midwives based on their interpretation of the recorded information. The outcomes provide that the structures of a system (whether a clinic, hospital, or integrated network) influence processes of care. How the card is structured and the skill and midwives' understanding of the maternity case record was believed by the researcher to influence how the midwives recorded information on the card, and how they interpreted and/or responded to the recorded information.

The overall aim of this study was for the researcher to establish how the use of the new maternity case records influences the quality of care for the pregnant women. The researcher assessed the management plans drawn up by the midwives, the implementation of the plans, and the referral and communication with the referral institutions, which all have an impact on the quality of care for the pregnant women. Outcomes are sometimes seen as the most important indicators of quality because improving a patient's health status is the primary goal of health care. Although it is widely recognised and applied in many health care related fields, Donabedian's Model was developed to assess the quality of care in clinical practice. Assessment, examination, diagnoses, management, treatment and documentation of patient care promotes quality of care and good communication amongst health care providers. This is the crux of ANC and the maternity case record is the evidence of all that has been done and implemented

3.4 AREA OF THE STUDY

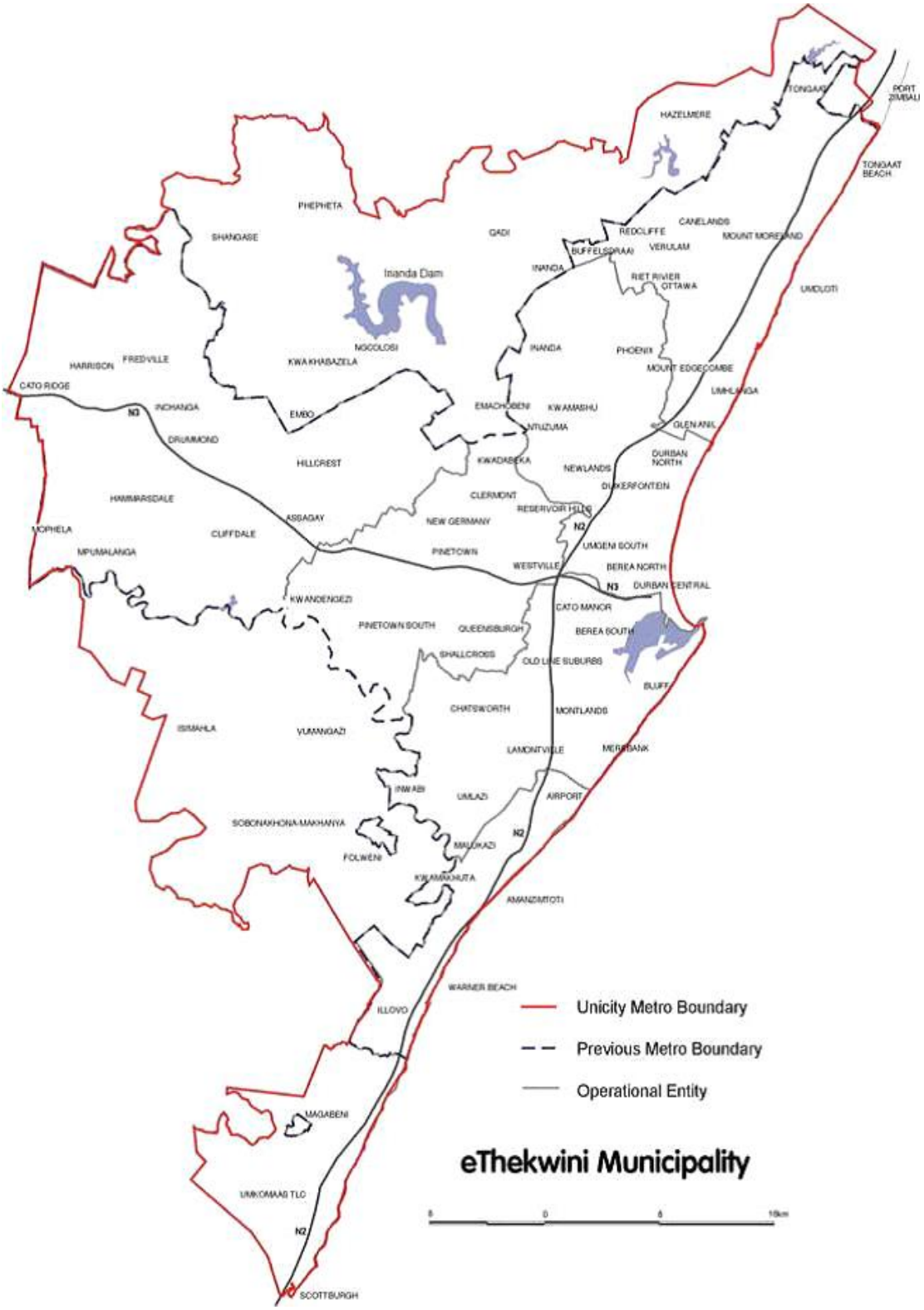


Figure 3.2: Map showing the eThekwini Municipality Sub Districts (KZN Department of Health 2009).

The study was conducted in the eThekwini District (see Figure 3.2). EThekwini is one of the eleven districts of the KZN province in South Africa. The eThekwini metropolitan municipality was created in 2000 and includes the city of Durban, surrounding towns and some tribal authorities. EThekwini is surrounded by iLembe District Municipality and the Indian Ocean in the East, uGu District Municipality (DC21) in South and uMgungundlovu District Municipality (DC22) in the West. The district has an estimated population of 51.94% (n=605 080) females and 48.06% (n=485 046) Males. The ethnic distribution consists of 30% (n=2 110 594) Black African, 19.90% (n=614 829) Asian and Whites 8.98% (n=277 429) (KZN Department of Health 2009). The district is sub-divided into three sub-districts: the South, the West and the North. Data was collected in all three of the sub-districts.

The ANC services for the general public in eThekwini are provided mainly in the PHC facilities. The PHC facilities in the eThekwini district are situated across the three sub-districts to ensure access and equitable distribution of the service to all people of the eThekwini district. The map in Figure 3.2 above shows the distribution of PHC clinics in the eThekwini Municipality Sub Districts. There are 45 PHC clinics in the South, 28 in the West, and 29 in the North sub-districts. The health care services in the eThekwini District are jointly provided by the KZN Provincial Health Authority (KZNPA) and the eThekwini Municipality. Therefore, some PHC facilities are under the control of the KZNPA and others are under the control of the eThekwini Municipality health authorities. Only the municipality PHCs were included in this study.

3.5 IDENTIFICATION OF THE STUDY POPULATION

The study population consisted of the PHC clinics providing ANC services and maternity case records, and the midwives who were providing ANC services in the PHC facilities. All the study participants were selected using a purposive sampling method which is a non-probability sampling method in which the researcher selects participants based on personal judgment about which one will be most informative (Polit and Beck 2012: 763). Purposive sampling involves the conscious selection of

certain participants for inclusion in the study, which might be according to age, illness or qualifications (Burns and Grove 2009: 355). The PHC clinics that were included in the study were only those that were under the authority of the eThekwini municipality and providing ANC services. The maternity records included were the new maternity case records (the white card), and the midwives were those who were providing ANC services.

3.6 SAMPLING PROCESS

A three-phased sampling method was used, which included identification of the PHC facilities, sampling of clinic records which consisted of the maternity case records, and sampling of the midwives. All the study participants were sampled using purposive sampling method. Burns and Grove (2009:716), describe purposive sampling as judgemental or selective sampling method that involves conscious selection by the researcher of certain participants or elements to include in a study.

3.6.1 Phase 1: Identification of the PHC facilities

The study was conducted in PHC clinics within the eThekwini Municipal area. A total of 59% (n=60) PHC facilities in the eThekwini district are under the authority of the Municipality and 40% (n=41) are controlled by the KZNPA. The Municipal PHC clinics are distributed in the three sub-districts as follows: there are 31 in the South, eleven in the West and eighteen PHC clinics in the North sub-districts. A total of 59 Municipal PHC clinics are providing ANC services. One PHC clinic that is located in the South sub-district is dedicated to communicable disease services and therefore does not provide ANC services.

The ANC client case load per month differs from clinic to clinic. Many factors could be responsible for this, ranging from the distribution of the PHC clinics, the catchment population for each PHC clinic, and the accessibility and the quality of the services in each PHC clinic. The average case load of ANC attendance in PHC clinics ranges between four and 988 pregnant women per clinic per month. The average case load for each clinic was calculated over one year from June 2012 to

May 2013. A total of 15 PHC clinics have an average of less than 50 clients per month, the other 44 PHC clinics have an average of equal to or more than 50 ANC clients per month. Only the PHC clinics with an ANC client case load of equal to or more than 50 per month were included in the study. The PHC clinics included in the study were homogenous in that they were all controlled by the municipality with the ANC services conducted by qualified midwives, thus the findings can be generalised for other municipal PHC facilities but not for the KZNPA PHC facilities.

3.6.1.1 Inclusion criteria

The PHC clinics that were included in the study were:

- The PHC clinics under the Municipal authority;
- Those clinics providing ANC services; and
- Clinics with an average case load of 50 or more ANC clients per month.

3.6.1.2 Exclusion criteria

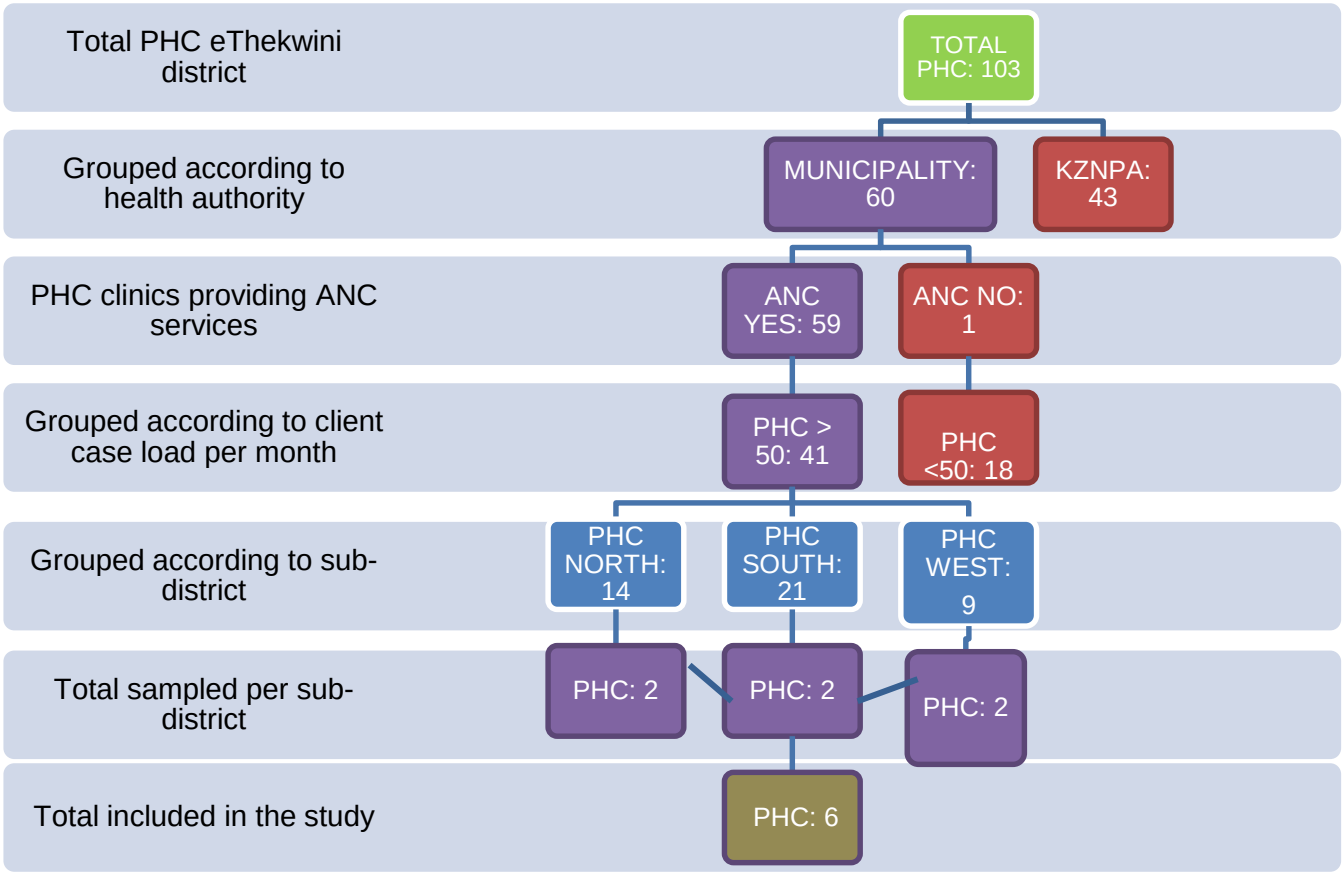
All PHC clinics that were not:

- Under the municipal authority;
- Providing ANC services;
- Implementing the use of the new white maternity case record; and
- All PHC clinics with the case load of less than 50 ANC care clients per month.

3.6.1.3 Sample size and sampling process

A total of 15% (n=6) PHC clinics were included in the study, with a total of two PHC clinics included from each sub-district. The initial sample size was identified as the PHC clinics that were under the authority of the municipality health authority. All the PHC clinics that were not providing ANC services were excluded. The PHC clinics that were providing ANC services were grouped according to the ANC client case load per month. There were 69% (n=41) PHC clinics with a case load of >50 and 39% (n=18) PHC clinics with the case load of <50 ANC clients per month. This information was gathered from the eThekwini Municipality information office.

Monthly statistics for a period of one year (from June 2012 to May 2013) were used. The 31% (n=18) PHC clinics with a total of less than 50 monthly ANC client caseloads were excluded from the study, as per study inclusion and exclusion criteria. The sample was gathered from the 69% (n=41) PHC clinics with a monthly ANC client case load of 50 or more clients per month. These clinics were grouped according to the three sub-districts as follows: there were 21 PHC clinics in the South, fourteen in the North, and nine in the West sub-district. A total of two PHC clinics were selected from each group to give a total of 15% (n=6) of PHC clinics that were included in the study. Figure 3.2 shows the schematic representation of steps in the identification of the PHC clinics.



Key:
Total number of PHC clinics in eThekwini District.
Included in the sampling frame.
Not included in the sampling frame.
Total number of clinics in the sub-districts.

Figure 3.3: Schematic representation of steps in identification of the PHC clinics.

3.6.2 Phase 2: Sampling of clinic records

This phase included selecting the records to be reviewed. Purposive sampling of the new maternity case records (the white cards) for the pregnant women who had already had two or more ANC visits was done. Reviewing the maternity case record after the midwives have documented more than one consultation record afforded the researcher a better picture of how the maternity case record was used. The records were only for the pregnant women who were attending ANC clinic at the time of the study, and only the white maternity case records were sampled. It would have been ideal to access the maternity case records for mothers who had already given birth as their maternity case record would have given the researcher more complete information. This was not possible however, because some pregnant women attended ANC in the Municipality PHC but gave birth in the KZNPA hospitals. This was because the PHC clinics under the municipality control were not rendering delivery services. If the maternity case records were accessed and analysed in the delivery institution it would not be possible to link the ANC care with the municipality PHC clinics. Yet, the researcher was interested in assessing the use of the new maternity case record in improving the quality of antenatal care in eThekwini District within the municipality PHC clinics.

3.6.2.1 Inclusion criteria

- The new maternity case records (the white cards); and
- Records for the pregnant women who had a minimum of two ANC visits recorded on the card.

3.6.2.2 Exclusion criteria

- Any other clinic records used to record ANC consultation; and
- All the records for pregnant women who had less than two visits recorded on the card.

3.6.2.3 Sample Size

A total of 50 maternity case records were selected in each PHC clinic to give a total of 300 maternity case records for the entire study.

3.6.3 Phase three: Sampling of the midwives

This phase involved sampling of the midwives to be included in the study. Purposive sampling of the midwives who were involved in provision of ANC services was done.

3.6.3.1 Inclusion criteria

- All midwives working within ANC with experience of two years and above.

3.6.3.2 Exclusion criteria

- All newly employed midwives working within ANC with less than two years' experience;
- All midwives who were not working in ANC clinics; and
- All registered nurses without a midwifery qualification.

3.6.3.3 Sample size

The principle of data saturation was adopted during the study. Sample size in qualitative research is determined by data saturation with no specific rules for sample size (Polit and Beck 2012: 357).

3.7 DATA COLLECTION PROCESS

Data collection was conducted in two phases, namely Phase 1: Retrospective record review; and Phase 2: Interviews with the midwives.

3.7.1 Phase 1: Retrospective record review

A retrospective review of maternity case records of women attending ANC at the time of study for a period of three months was conducted. The purpose was to assess the use and documentation of the records. A checklist adapted from a BANC audit tool was used to do a retrospective record review. Checklists are techniques used to establish whether a behaviour occurred (Burns and Grove 2009: 402). The checklist was developed by Pattinson (2007:14) and is intended to be used for auditing the ANC services (Appendix 8).

3.7.2 Phase 2: Interviews with the midwives

Data was collected from the midwives who were working at ANC clinics at the time of the study. The purpose was to assess their understanding of, and to gain their views on, the new maternity case record. Semi-structured interviews were conducted. The interviews were conducted by the researcher in a private room at the PHC clinic where the midwives were working during the time that was convenient to the midwives. The minimum time taken for the interview was 20 minutes and the maximum was 30 minutes. The researcher used an interview guide with a number of predetermined/guided questions to keep the interview focused, and to ensure that the researcher was able to gather all the relevant information that she intended to collect (Appendix 9). The predetermined questions were supported by probing from time to time where necessary during the interview, to get more information or clarity from the responses of the participants(Burns and Grove 2009:405). An audio recorder was used to record the interview.

3.8 PILOT STUDY

A pilot study was conducted in one PHC facility. A pilot study is a small scale version or trial run designed to test the methods to be used in a larger or more vigorous study (Polit and Beck 2012:213). It is used to test the possibility of developing a larger and stronger investigation on the same topic. All midwives who were working in ANC in the pilot facility and who agreed to take part in the pilot study

were included in the pilot study. A total of five midwives were interviewed. Ten maternity case records were reviewed. The results of the pilot study revealed that the checklist was appropriate to gather the required information and all the participants had a clear understanding of questions. There were no changes made to data collection tools. The pilot site, participants, and all pilot findings were not included in the main study.

3.9 DATA ANALYSIS

Data analysis was done in two phases. The first phase included analysis of data from the record review, and the second phase included analysis of data from the interviews with midwives.

3.9.1 Phase 1: Quantitative data analysis

The data was reduced and analysed with the assistance of a statistician, using the statistical software SPSS version 21.0. Data was analysed using descriptive statistics in the form of averages and percentages. Data was described and summarised and presented in the form of tables and graphs. Quantitative data analysis will be discussed in detail in Chapter 4.

3.9.2 Phase 2: Qualitative data analysis

Analysis of data from the interviews with midwives was done concurrently with data collection in order to monitor and guide against data saturation. At the end of each interview the researcher listened to the recorded responses from the midwives several times, in order to gain a clear understanding of the data collected. The researcher also read and re-read the recorded notes, comparing these with the recorded information. Tesch's method of data analysis was used to analyse the qualitative data. Tesch's method involves the researcher listening to audiotapes and reading and re-reading all the transcriptions to get a sense of the full data, jotting down ideas as they emerge (Tesch 1992:141). One transcript of the interview must

be picked up at a time and re-read; the underlying meaning of the data must be sorted out and jotted down. Data is analysed and systematically explored to generate meanings and existing data is recorded. In this study, data was organised into categories which were further arranged into themes and sub-themes. The information on the checklist was also organised into themes.

3.9.3 Data interpretation and triangulation

The information from the interviews was triangulated with the data from the interviews to highlight the similarities and differences in information from the two data sources inorder to draw conclusions about the use of the maternity case record. Polit and Beck (2012:196) describe triangulation as the use of multiple sources of data to draw conclusion about what constitutes the truth. The researcher discussed the identified themes and supported or verified them with relevant literature. Data interpretation and triangulation was used to guide the researcher towards making recommendations from the study. Direct quotes from the participants were used to support discussion of the study results. Chapter 4 presents the results of the data analysis and interpretation. Recommendations from the study are also included in the next chapter.

3.10 ETHICAL CONSIDERATIONS

The study commenced only after the study design and procedures were approved by the Durban University of Technology Faculty Research Committee and ethical clearance certificate issued (Appendix 1). Permission was sought from the Head of the Health Unit for eThekwini Municipality (Appendix 4a). Data collection commenced only after the eThekwini Municipality Health Research Unit had given approval for the study to be conducted in their PHC facilities (Appendix 4b). The participants signed a written informed consent form before agreeing to participate in the study (Appendix 6). Pregnant women gave informed consent for their records to be reviewed during the study. The information letters were available in English and

IsiZulu, which are the two main official languages used by the community in the eThekwini district (Appendices 7a and 7b).

The study participants were informed during the information session, and again reminded before the interview, that the discussions during the interview were going to be recorded and the researcher was also going to take some notes. The data collection tools were identified by numbers so that there was no link between the PHC clinics and the participants' identity, and the information that was gathered (Appendices 9 and 8). All paper-based data is kept under lock and key and will be stored for a minimum of fifteen years, and will then be destroyed by shredding. All electronic data will be stored on a computer and secured with a personal private password only known to the researcher; the data will be deleted from the computer after fifteen years.

3.11 TRUSTWORTHINESS AND RESEARCH RIGOUR

Trustworthiness was ensured throughout the study following the five criteria as described by Lincon and Guba (1985). The criteria included credibility, dependability, generalisability, confirmability, transferability and authenticity.

3.11.1 Credibility

According to Lincon and Guba (1985) credibility refers to the confidence in the truth of the data and interpretation of them. The researcher ensured credibility of data by recording all interviews with the study participants and using direct quotations and narratives by the study participants during data reporting.

3.11.2 Dependability

Lincon and Guba (1985) describe dependability as the stability of data over time and over conditions. This was ensured by using data from the record review as is, and

by the researcher remaining as neutral as possible during the interviews so as to ensure that she did not influence the responses of the participants.

3.11.3 Confirmability

Lincon and Guba (1985) refer to confirmability as the potential for congruence between two or more independent people about the accuracy of data, relevance and meaning. The researcher used direct quotes and narratives from the participants.

3.11.4 Generalisability

Data collected will be stored as evidence for a maximum period of five years to ensure an audit trial. Lincon and Guba (1985) referred to transferability as generalisability of data, which is the extent to which the findings can be transferred to have applicability in other settings or groups.

3.11.5 Transferability

The researcher ensured transferability of the findings of this study by providing sufficient descriptive data in the research report, so that whosoever wishes to use the study can evaluate the applicability of the data other contexts.

3.11.6 Authenticity

Authenticity refers to the extent to which the researchers fairly and faithfully show a range of different realities (Lincon and Guba 1985). The researcher strived to ensure authenticity by using direct narratives from the study participants. This ensured that the feeling and tone of the study participants was conveyed as it was lived.

3.12 CONCLUSION

This chapter outlined all the phases undertaken during data collection and data analysis. The next chapter will focus on presenting the results of the study.

CHAPTER 4
PRESENTATION OF RESULTS

4.1 INTRODUCTION

The previous chapter outlined the methodology adopted in conducting the study. As described in the previous chapter, a mixed methods approach was used to conduct the study where a retrospective record review was used to collect quantitative data, and semi-structured interviews were conducted with the midwives to collect the qualitative data. This chapter presents the findings that were gathered from the data analysis of both phases of the study. The presentation of results is based on Donabedian's theoretical framework of structure, processes and outcome, as this is the framework that was used to guide the study.

4.2 PRESENTATION OF PHASE ONE DATA: QUANTITATIVE DATA

The review of records was conducted during the quantitative phase. This phase was intended to achieve the first two objectives of the study which were to: 1) assess the midwives' documentation and use of the new maternity case record during ANC service provision; and 2) assess the midwives' understanding of the new maternity case record card. A total of 50 maternity case records were reviewed in each PHC facility included in the study, with a total of 300 maternity records reviewed for the whole study. The checklist adapted from the BANC audit tool by Pattinson was used (See Appendix 3). The checklist consisted of the following main elements: gestational age at booking; history findings; plotting of gestation at first visit; examination findings, interpretation and decisions.

In her framework Donabedian describes the three dimensions of structure, process and outcome as essential in order to achieve quality of care. The tool that was used to conduct the record review was structured in line with all these processes. During the process of record review, the first assessment was to assess the availability of

correct recording systems being used, which is part of the structure. This was followed by assessing the documentation on the records, which is part of the processes. Lastly, assessing interpretation and decisions made by the midwives as recorded on the maternity case record, as the outcome of proper history and examination are the vehicles towards the ultimate outcome of care, which is the quality of ANC.

The statistical analysis used during this phase included:

- Descriptive statistics including means and standard deviations, frequencies which are represented in tables and for selected elements presented in graphs; and
- Chi-square goodness-of-fit-test which is a univariate test, used on a categorical variable to test whether any of the response options are selected significantly more/less often that the others. Under the null hypothesis, it is assumed that all responses are equally selected.

4.2.1 Gestational age at booking

Table 4.1: Record of Gestational age at booking.

Element	Yes/No	Frequency	Percent
Gestational age at booking.	Yes	300	100.0

As can be seen from Table 4.1, all records 100% (n=300) reflected that gestational age at booking was recorded.

4.2.2 Recording of history taking at first visit

Table 4.2: Record of summary of findings on history.

Element	Yes/No	Frequency	Percent
Age, Parity, Gravida.	Yes	300	100.0
History of previous pregnancy.	Yes	300	100.0
Previous illness.	Yes	300	100.0
History present pregnancy.	Yes	298	99.3
LNMP EDD	Yes	300	100.0

Table 4.2 shows that several elements regarding the recording of history taking on the maternity case record were reviewed. These included age, parity, gravida, history of previous pregnancy, previous illness, history of present pregnancy, expected date of delivery according to the last normal menstrual period (LNMP EDD), and plotting of gestation at first visit. The results of this study revealed that in 100% (n=300) maternity case records, all these elements were recorded except for history of present pregnancy. This was recorded, however, in the majority of maternity case records 98.3% (n=298).

4.2.3 Plotting of gestation at first visit

Table 4.3: Plotting of gestation at first visit.

Element	Yes/No	Frequency	Percent
Gestational age at booking.	Yes	245	81.7

As can be seen from Table 4.3, the study finding was that out of a total of 300 maternity case records that were reviewed, in 81.7% (n=2450) gestational age at first booking was plotted onto a graph that was included in the maternity case record. The graph was not plotted in 18.3% (n=55) of maternity case records. Figure 4.1 is a graphical representation of these findings.

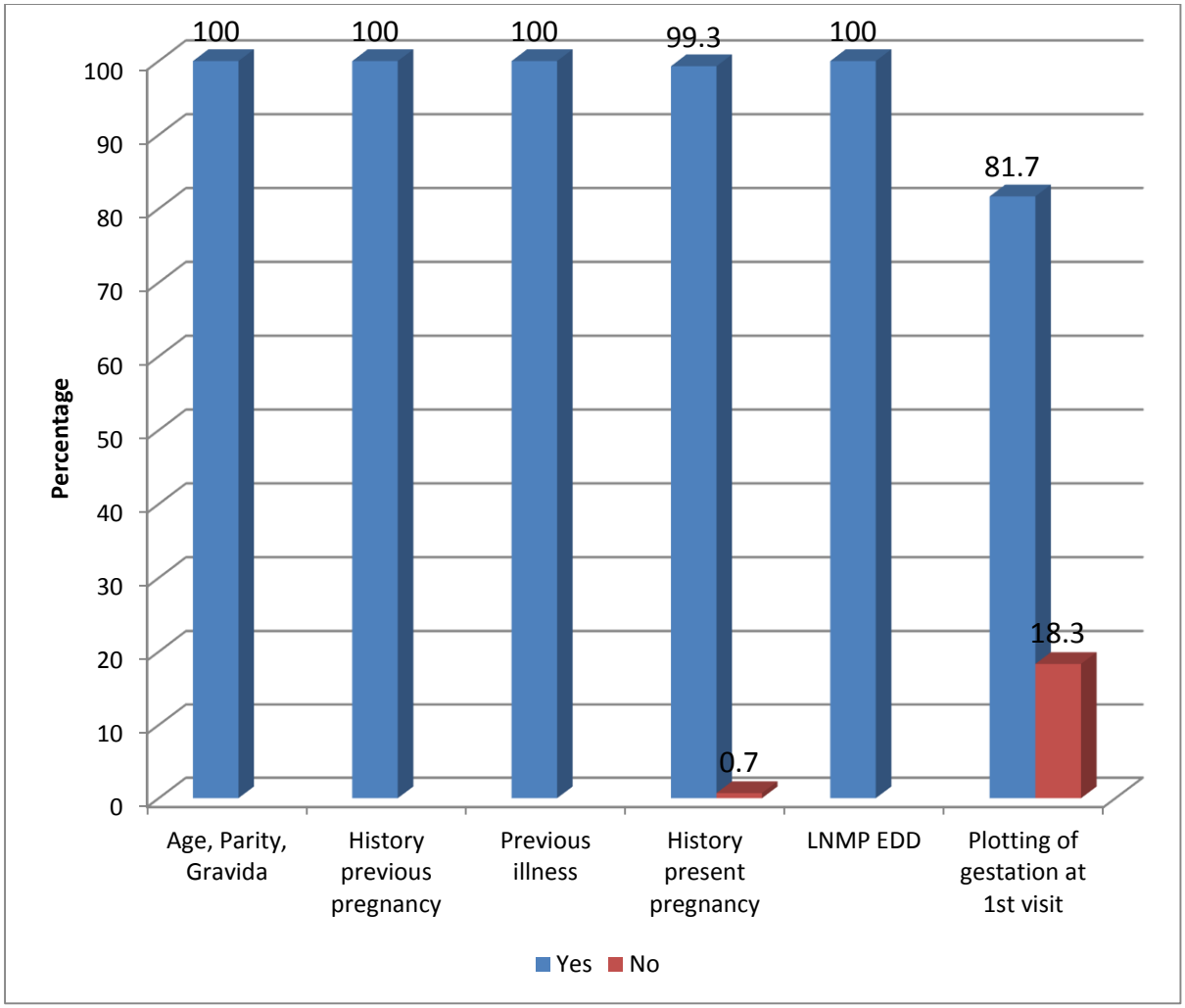


Figure 4.1: Graph presenting findings on history and plotting of gestational age at booking.

4.2.4 Examination

Table 4.4: Record of examination findings.

Element	Yes/No	Frequency	Percent
Maternal height.	Yes	245	81.7
Weight.	Yes	300	100.0
MUAC.	Yes	172	57.3
BMI.	Yes	196	65.3
BP(each visit).	Yes	299	99.7
Heart examination.	Yes	297	99.0
Correct plotting of SFH.	Yes	277	92.3
Presence of IUGR detected.	Yes	299	99.7
Fetal presentation(from 34 weeks).	Yes	287	95.7
Fetal heart and movements.	Yes	296	98.7
Urinalysis.	Yes	300	100.0
Hb, Rh.	Yes	293	97.7
Syphilis test results.	Yes	277	92.3
HIV counselled.	Yes	300	100.0
Tetanus Toxoid given.	Yes	284	94.7

Various elements regarding the recording of examination findings were assessed. These elements together with the findings on record review are presented in Table 4.4. The study findings reflected between a range of 57.3-100% (n=172-300) for these elements with the MUAC being the lowest recorded in only 57.3% (n=172) of the maternity case records. Figure 4.2 represents these findings in a graph form.

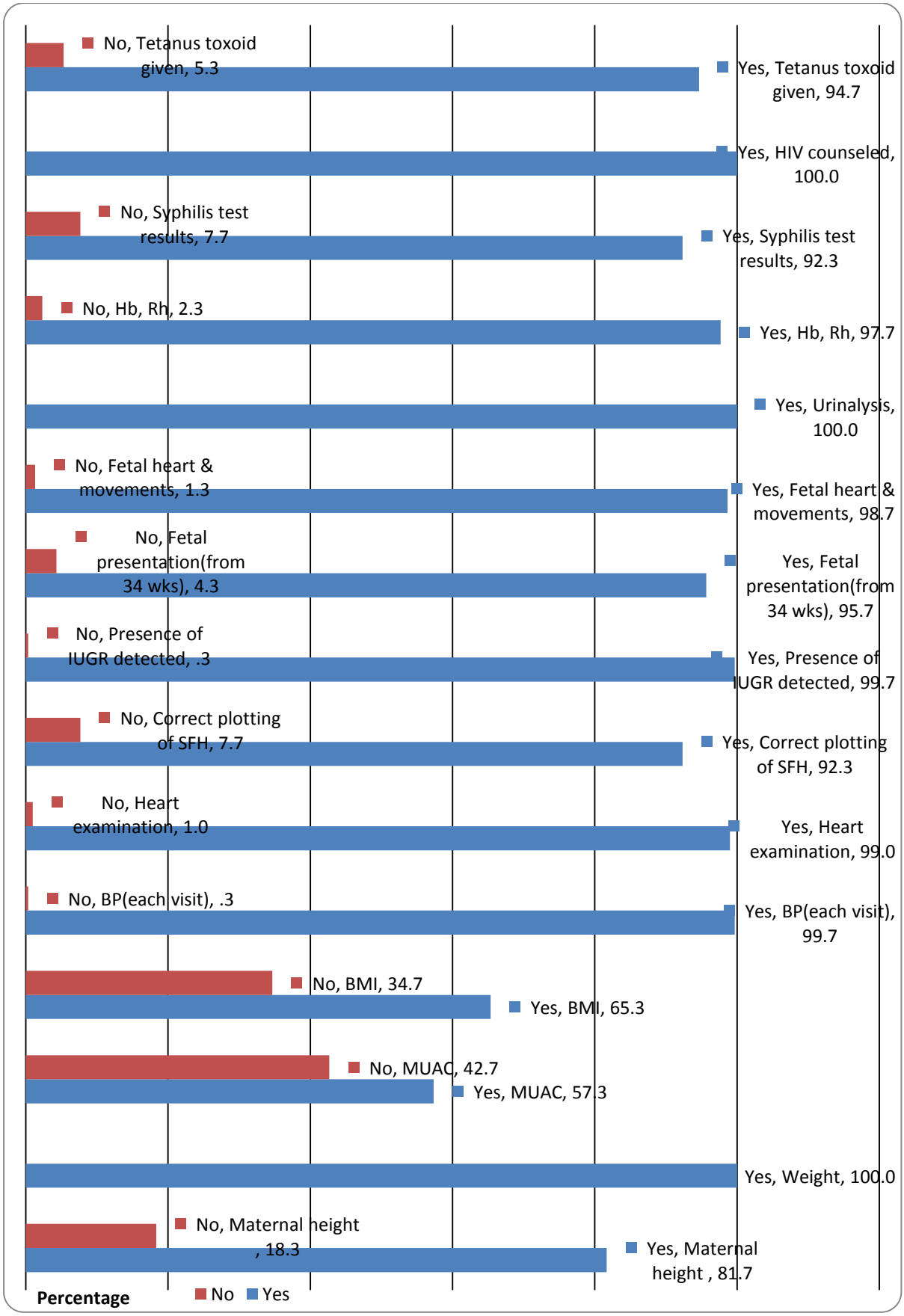


Figure 4.2: Graphical presentations record of findings on examination.

4.2.5 Further Test statistics

Table 4.5: Test statistics for the p-value and a chi-square goodness-of-fit test

Element	Expected	Observed	Residual	Chi-square test	df	Asymp Sig	P value
History present pregnancy	150.0	298	148.0	292.053[a]	1	.000	p<0005
Plotting of gestation at 1st visit	150.0	245	95.0	120.333[a]	1	.000	p<0005
Maternal height	150.0	245	95.0	120.333[a]	1	.000	p<0005
Maternal height	150.0	300	.0	Not significant			
MUAC	150.0	172	22.0	6.453[a]	1	.011	p<0015
BMI	150.0	196	46.0	28.213[a]	1	.001	p<0005
BP (each visit)	150.0	299	149.0	296.013[a]	1	.000	p<0005
Heart examination	150.0	297	147.0	288.120[a]	1	.000	p<0005
Correct plotting of SFH	150.0	277	127.0	215.053[a]	1	.000	p<0005
Presence of IUGR	150.0	299	149.0	296.013[a]	1	.000	p<0005
Fetal presentation (from 34 weeks)	150.0	287	137.0	250.253a	1	.000	p<0005
Fetal heart and movements	150.0	296	146.0	284.213a	1	.000	p<0005
Urinalysis	300.0	300	.0	Not significant			
Hb, Rh	150.0	293	143.0	284.213a	1	.000	p<0005
Syphillis test results	150.0	277	127.0	215.053a	1	.000	p<0005
HIV counselled	150.0	300	.0	Not significant			
Tetanus toxoid given	150.0	284	134.0	239.413a	1	.000	p<0005

On further analysis, the p-value and a chi-square goodness-of-fit test were conducted for findings on history and plotting of graph at first visit and examination. The analysis reflected a p-value of <.05 for most elements assessed. The results from a chi-square goodness-of-fit test showed that significantly more respondents recorded the majority of the elements assessed. Example: more respondents recorded the history of the present pregnancy ($\chi^2(1,N=300)=292.053$, p<.0005) and plotted the gestation at the first visit ($\chi^2(1,N=300)=120.333$, p<.0005). Zero cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency

is 150.0. All elements except MUAC and BMI results showed a p value of p<.05. The highlighted rows on Table 4.5 showing results for MUAC and BMI are to be noted. No further tests were needed on maternal weight, urinalysis, and HIV-counselled, as 100% (N=300) of the respondents answered 'yes' for all these elements

4.2.6 Interpretation and decisions

Table 4.6: Findings on Interpretation and decisions.

Element	Yes/No	Frequency	Percent
Identification/recording of risks.	Yes	300	100.0
Action plan and interventions.	Yes	300	100.0
Tetanus toxoid given.	Yes	284	94.7
Action plan and interventions.	Yes	300	100.0
Discussion of labour with mother.	Yes	249	83.0
Transport arrangements.	Yes	266	88.7
Family planning.	Yes	298	99.3
1st and 32nd week visits countersigned.	Yes	300	100.0
Referral.	Yes	153	51.0
Feedback.	Yes	101	33.7
Diagnostic tests and procedures.	Yes	300	100.0
Management plan.	Yes	300	100.0
Date of next visit.	Yes	300	100.0

The following elements were assessed under the section on interpretation and decision: identification/recording of risks; action plan and interventions; tetanus toxoid given; discussion of labour with mother; transport arrangements; family planning, first and 32nd week visits countersigned; referral; feedback; diagnostic tests and procedures; management plan; and date of next visit. Table 4.6 represents the findings on how the midwives recorded various interpretation and decisions they made during assessments and management of the pregnant women. The highlighted rows on the table indicate the two lowest recorded elements. The study findings reflect that all the elements assessed were recorded in 33.7%-100% (n=101-300) of the maternity case records. The lowest recorded amongst these

elements was feedback which was 33.7% (n=101,) followed by referral which was 51% (n=153). Figure 4.3 below is a graphical presentation of the findings.

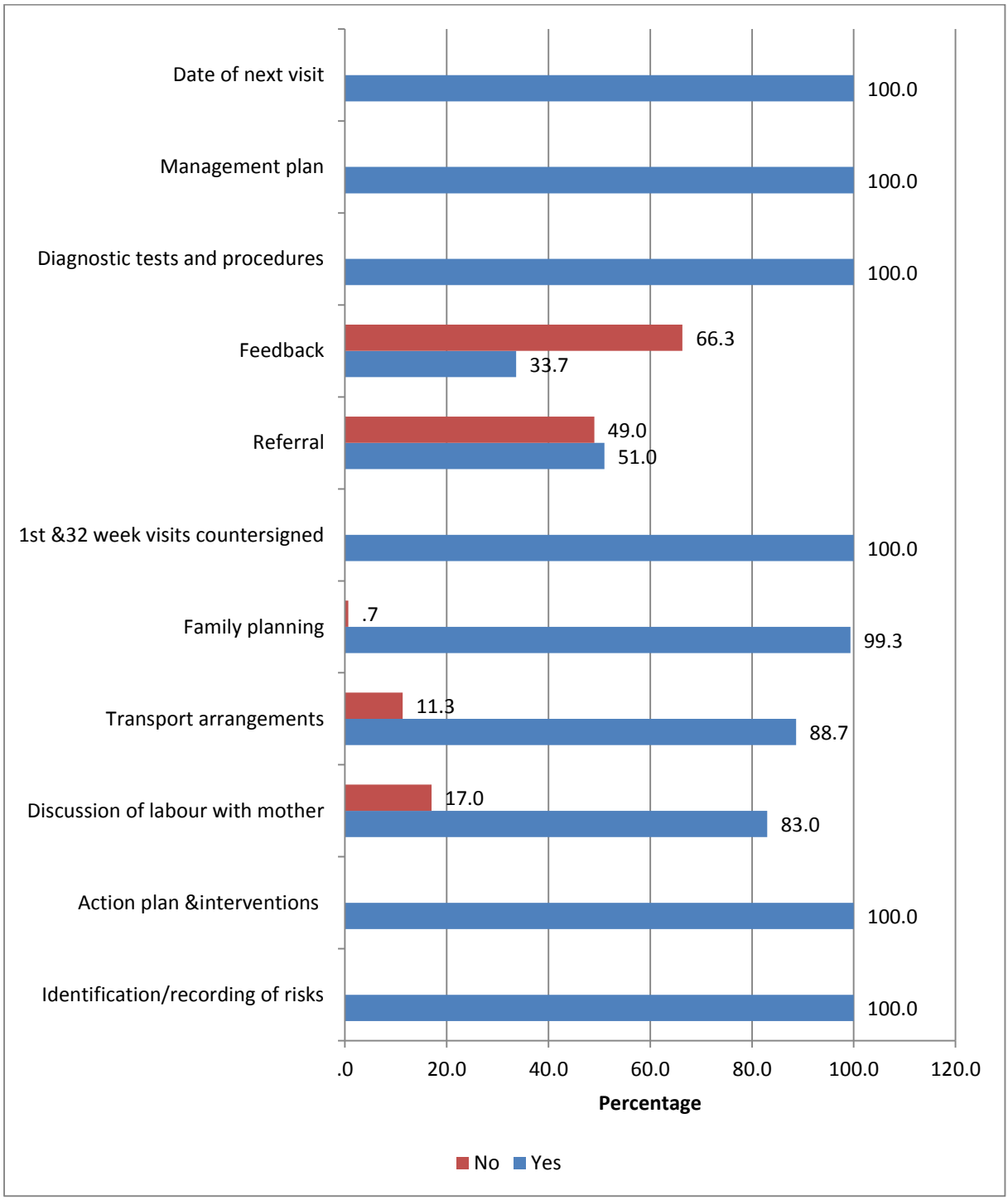


Figure 4.3: Graphical presentations of findings on interpretation and decisions.

4.2.7 Further test statistics

Table 4.7: Test statistics for the p-value and a chi-square goodness-of-fit test.

Element	Expected	Observed	Residual	Chi-square goodness of fit test	df	Asymp Sig	P value
Identification/recording of risks.	300	300	.0	Not significant			
Action plan and interventions.	300	300	.0	Not significant			
Discussion of labour with mother.	300	249	99.0	130.680[a]	1	.000	P<500
Transport arrangements.	150	266	116.0	179.413[a]	1	000	p<0005
Family planning.	150	298	148.0	292.053[a]	1	000	p<0005
First and 32nd week visits countersigned.	300	300	.0	Not significant			
Referral.	150	153	3.0	.120[a]	1	.729	P=729
Feedback.	150	101	-49.0	32.013[a]	1	000	P<0005
Diagnostic tests and procedures.	300	300	.0	Not significant			
Management plan.	300	300.0	.0	Not significant			
Date of next visit.	300	300.0	.0	Not significant			

Further analysis was done where the p-value and a chi-square goodness-of-fit test was conducted for findings on interpretation and decisions. Zero cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 150.0. The results of these further statistical tests are shown in Table 4.7. Discussion of labour with the mother, transport arrangement family planning and referral results showed a p value of p<.05. No further test was done on all the elements where 100% (N=300) respondents answered “yes”. These included the following elements: Identification of risk factors, action plan and interventions, first and 32 week visit countersigned diagnostic tests and procedures, management plan and date of next visit.

4.2.8 Bivariate analysis

Further analysis was undertaken by doing a bivariate analysis to see if practices with regard to record keeping were significantly different at different facilities. A chi-square test of independence was also applied. The findings of the bivariate analysis are presented below.

4.2.8.1 Recording of each element by the facilities

Table 4.8 Total number of records with elements being assessed recorded.

Element Assessed	Facility number					
	1	2	3	4	5	6
Maternal height.	50	50	0	50	50	45
MUAC.	45	36	0	36	29	26
BMI.	45	36	0	44	37	34
SFH.	44	46	43	50	49	45
Facility by foetal presentation (from 34 weeks).	49	50	44	50	48	46
Tetanus Toxoid given.	50	50	35	50	49	50
Discussion of labour.	44	48	32	42	42	41
Transport arrangement.	48	46	30	48	48	46
Feedback.	9	25	15	18	15	19

The study findings revealed that all elements that were being assessed, except for feedback, recorded more than 50% of the records in the five PHC facilities that were included in the study. All 50 records from the sixth PHC facility had no record of maternal height, MUAC and BMI. Similar to the other five PHC facilities included in the study, the other elements namely: SFH, foetal presentation (from 34 weeks), tetanus toxoid given, discussion of labour and transport arrangements were recorded in more than 50% of the records from this PHC facility. Feedback was the least recorded element in all six PHC facilities, with just 18% (n=9) being the lowest number of recordings per PHC facility and 50% (25) records being the highest number of records per facility. The findings of the analysis of recording of various elements are presented in Table 4.8.

4.2.8.2 Chi-square test of independence

Table 4.9: Presentation of the results of chi-square test of independence.

Element Assessed	Pearson Chi-Square	Likelihood Ratio	Linear-by-Linear Association	No of Valid Cases	Minimum expected count	P value
Maternal height.	.000	.000	.276	300	9.17	<.0005
MUAC.	.000	.000	.006	300	21.33	<.0005
BMI.	000	000	.777	300	17.33	<.0005
SFH.	.055	.019.	.206	300	3.83.	=.024
Foetal Presentation.	.017	.011	.249	300	2.17	=.011
Tetanus Toxoid given.	000	000	.412	300	2.67.	<.0005
Discussion of labour with mother.	.001	.001	.301	300	8.50	=.001
Transport arrangements.	000	000	.456	300	5.67	<.0005
Facility by Feedback.	.027	.024	.411	300	16.83	=.027

A chi-square test of independence was also applied to see if practices with regard to record keeping were significantly different at different facilities. The results of the analysis for each element in the six PHC facilities were as follows (see Table 4.9):

- **Maternal height:** significantly more than expected respondents from facility 3 did not record maternal height ($\chi^2(5,N=300)=269.944$, $p<.0005$).
- **MUAC:** significantly more than expected respondents from facility 3 did not record MUAC ($\chi^2(5,N=300)=93.383$, $p<.0005$.
- **BMI:** significantly more than expected respondents from facility 3 did not record BMI ($\chi^2(5,N=300)=121.801$, $p<.0005$).
- **SFH**: significantly more than expected respondents from facility 3 did not plot SFH correctly (Fisher's (N=300)=12.060, p=.024).
- **Foetal presentation (from 34 weeks**): significantly more than expected respondents from facility 3 did not record foetal presentation (from 34 weeks) (Fisher's (N=300)=11.722, p=.011).

- **Tetanus toxoid given**: significantly more than expected respondents from facility 3 did not record Tetanus Toxoid given (Fisher's (N=300)=43.627, p<.0005).
- **Discussion of labour**: significantly more than expected respondents from facility 3 did not record discussion of labour with mother (χ^2 (5, N=300)=19.773, p=.001).
- **Transport arrangement**: significantly more than expected respondents from facility 3 did not record transport arrangements (χ^2 (5, N=300)=50.022, p<.0005).
- **Feedback**: significantly more than expected respondents from facility 1 and facility 2 did record feedback (χ^2 (5, N=300)=12.613, p=.027).

4.2.9 Summary of the quantitative phase

Whilst the overall findings of the record review revealed that most of the elements assessed were recorded in most maternity case records in each PHC facility, there were several elements that were discovered to be poorly recorded. These included the following:

- Under the section of history the plotting of gestational age on the graph was poorly done, where it was only recorded in 18.5% (n=55) maternity case records.
- Under the section of examination and findings the recording of MUAC and BMI were poorly done, with MUAC recorded in 57.3 %(n=172) and BMI in 65.3% (n=196) of the maternity case record.
- In the section on interpretation and decision making, referral and feedback were the two poorly recorded elements, where referral was not recorded in 49% (n=153) and feedback in 33% (n=101) of the maternity case records. In this section, record of transport arrangement and discussion of labour with the mother were also not well recorded. Transport arrangement was recorded in 88.7% (n=266) and discussion of labour with the mother recorded in 83% (n=249) of the maternity case records.

4.3 PRESENTATION OF PHASE TWO DATA: QUALITATIVE DATA

The second phase of the study was conducted using a qualitative research design. Data in phase two was collected from the midwives who were working in sampled PHC facilities and were involved in the provision of ANC. This study phase was intended to determine how the use of the new maternity case record influenced the management of pregnant women. Data was gathered from the midwives using one-on-one interviews. A total of two to five midwives were interviewed in each PHC facility included in the study. The number of interviews in each PHC facility was guided by data saturation. A total of seventeen interviews were conducted. Table 4.10 presents the number of interviews conducted in each PHC facility. The results of the data obtained from in-depth individual interviews with the midwives are presented in this section. Similar to the quantitative phase, Donabedian's framework was again used to guide the presentation and analysis of the qualitative data. Various themes and sub-themes emerged from the data analysis.

Table 4.10: The number of interviews conducted in each PHC clinic (n=17).

Sub-district	PHC clinic	Number of interviews
South	1	5
	4	3
North	2	3
	3	2
West	5	2
	6	2
Total number of interviews		17

4.4 THEMES THAT EMERGED FROM THE INTERVIEW DISCUSSIONS

The three major themes that emerged from the interviews with the midwives were:

1. Accessibility of the maternity case record for use in the PHC facilities;
2. How the maternity case record is structured; and
3. The consequences of the current design/structure of the maternity case record.

According to Donabedian's framework the first two themes are part of the structure, whilst the third theme covers both the processes and the outcome. Several sub-themes emerged from the second and third main theme. The sub-themes are presented in Table 4.11.

Table 4.11: Themes and sub-themes.

Themes	Sub-themes
1. Accessibility of the maternity case record for use in the PHC facilities.	• Supplies of the maternity case record card in the PHC clinics. • Process of ordering card. • Alternative means of making card available in the PHC clinics.
2. Structure of the card.	• Card size. • Card design. • Writing space. • Repetition. • Limited questions.
3. The consequences of the current design/structure of the maternity case record.	• Communication. • Referral system. • Poor recording.

4.4.1 THEME 1: ACCESSIBILITY OF THE MATERNITY CASE RECORD

The midwives stated that they had some problems accessing the maternity case records. The problems included inadequate supplies of the card, a malfunctioning ordering system, and problems with alternative means of accessing the card.

4.4.1.1 Supplies of the maternity case record card in the PHC clinics

The majority of the midwives reported that there was always a shortage of the cards in the PHC facilities. This interfered with provision of ANC services when there was no proper document available to use to make a record.

"…Well, I think for the whole of this year 2013, I have not seen an original copy of this new maternity case record. We are only using photocopies and they tear easily" (W3 Facility 6 participant 1).

4.4.1.2 Process of ordering the card

The midwives verbalised their concern about the ordering system, stating that the system was not working well most of the time. They complained that although they always ensured that appropriate quantities were ordered, the stores department usually cut down the supplies and issued insufficient quantities which were not enough for the number of clients that they had in the ANC clinics. The midwives also stated that there were usually delays in delivering the orders from the stores department to the PHC clinics. Thus, most of the time original copies of the maternity case record card was usually out of stock.

"…We experience a lot of problem ordering the card, the hospital from which we order the card takes time to deliver the card even when you have indicated that you need it urgently" (S4 facility 4 participant 1).

"…The stores department cut down our orders as they please without considering the number of clients that we have, it is so frustrating because this reflect as though it is us that do not do correct ordering" (S4 facility 1 participant 1).

4.4.1.3 Alternative means of making the card available in the PHC clinics

In the absence of the original copies of the maternity case record, photocopies were made in the clinic. The midwives reported that the photocopied maternity case records were of sub-standard quality compared to the original copies. They are less durable due to the quality of photocopying paper used, and sometimes there is very faint and skewed writing depending on the quality of the photocopying.

"…We usually do photocopying of the cards which is easily torn. I think the supplier of the card itself does not have enough, if they can make a plan on that" (N1 facility 2 participant 3).

"…That is why you find this card torn because there is always shortage of stock and we always do photocopies" (W4 facility 5 participant 1).

4.4.2 THEME 2: STRUCTURE OF THE CARD

The midwives verbalised their concern about the structure of the card. They stated that it interferes with the use, documentation of, and the understanding of the maternity case record. Several sub-themes emerged from this theme. These included: the size, design of the card, writing space, and information provided in the maternity case record.

4.4.2.1 Card size

The national Department of Health provided for the card to be given to the clients as a client-held record, in order to facilitate the continuum of care in cases where the client moves from one clinic to another. The card is too big to fit into the client's handbag, and as a result they are more prone to lose it because they carry it separately. When carried outside the bag the card becomes dirty, or else it gets torn from constantly being folded as the client tries to fit it into the handbag. All this interferes with the quality and the safe keeping of the card.

"…I would really wish to see the improvement. I would suggest that they must come up with the better one that would be easy to use, friendly to carry because people that use this card are living in modernised way they carry small hand bags" (W4 facility 5 participant 2).

"…This card is too big, clients fold it in half because it does not fit in their bags and when they come back to us it is dirty. I feel the card is not properly designed" (S 4 facility 1 participant 3).

"…Clients often complain about the size of the card, stating it does not fit in their bags and also in the event of rain it gets wet, though there are some who really look well after their cards, either putting it in a plastic sleeve or covering it with a book cover but even these do complain that it is too big" (N1 facility2 participant 1).

*"…Clients say it's too big, it does not fit in their small bags because they have to be classy and presentable in public but now the size of this card forces them to carry big bags when they are pregnant, it does not look smart" (*N1 facility 2 participant 3).

4.4.2.2 Card design

The midwives reported that the new maternity case record has a beautiful appearance but is not designed properly. They stated that the design of the maternity case record is very confusing with most of the information mixed up, therefore making it difficult to understand. They stated that the card is not user-friendly and does not provide spaces for recording relevant elements for BANC and PMTCT. Space for recording consent for HIV Counselling and Testing (HCT) is situated separately from the page with full HCT information; it is on the other page hiding below 'risk factors' or 'problem list' space. This results in midwives missing out on recording other relevant elements for BANC and also forgetting to get the clients to sign the consent for HCT. The midwives stated that questions on one condition are scattered all over the page e.g. obstetric history is supposed to be together with LNMP, EDD, ultrasound antenatal care plan, infant feeding, family planning and lifestyle counselling, but it is separated by medical and general history, physical examination and investigations.

"…The new maternity case record is not user friendly, some of the elements which are important in basic management of antenatal care have been left out, e.g. girth and oedema so you end up not knowing where to record these elements" (W4 facility 5 participant 2).

"…The design is very, very poor because the information is all over the book; for an example gynaecological history is with the general information. It is not properly organised, it is mixed up. Also the graph is not designed properly because blocks do not correspond with dates and SFH, space provided for clinical note too little so most of the time we have to add continuation pages" (S4 facility 1 participant 3).

*"…As for the design its looks so beautiful but the content information is mixed up. The card is designed such that obstetric history is to be recorded in two or three different places. There is no logic in order in it, history, assessment or investigation should be together cos they fall under obstetric history and other must be together cos they fall under medical history" (*N1 facility 2 participant 3).

4.4.2.3 Writing space

The midwives stated that they required enough space to record observations, assessment, examination and their findings, instead of the small boxes and few pages that are provided. They stated that the limited space for writing causes midwives to document scanty information about their findings and client progress, which has an adverse effect on client care. They used abbreviations or make ticks and cross even where it would have been more appropriate to make detailed clinical notes, or record the whole information; this is not practical with this maternity case record. The ticks and crosses may not be understood by the next midwife, thereby creating confusion and mismanagement. The maternity case record has only three pages for clinical notes, which is not enough for writing clients' information as they start attending the ANC as early as before twelve weeks. This limits midwives' recording as they need to add more sheets for writing notes or may simply shorten what they record. This becomes worse when the client has been reviewed by the doctor, or the client is admitted, where the whole space is used up in one single consultation or admission. These concerns were expressed as follows:

"…*Space available for writing is not enough, basically you have to squeeze few sentences in one line which is not practical and the patient is not able to give full information that you were trying to obtain" (*N1 facility 2 participant 3).

"…The space is limited since we tell them to start the clinic early, you find that by the time of delivery the space is short or too little, I don't know whether to add progress notes now and again, they are coming now and then so the space is short" (N1 facility 2 participant 1).

"…On the first page there is not enough space for writing we got to turn over the page and write notes on the other side whereas it is better for the information to appear on one page where we can do observation and everything in one page" (S4 facility 4 participant 2).

4.4.2.4 Repetition

The midwives stated that the new maternity case record was not user-friendly. The maternity case record consisted of several parts where there was duplication of information. They stated that the repeated recording of similar information wasted time which could be spent on offering care to the clients.

"…*There is a repetition from the first page and second page tends to provide the same information that requires clients' particulars"* (W4 facility 5 participant 2).

"…Firstly there is lot of repetition in terms of clients' particulars we write on the cover, first page and on the second page instead of it being in one page" (S4 facility 4 participant 2).

"…There is nothing new we still make mistakes, still there are problems when it comes to recording the introduction of this new maternity case record is influencing the services in terms of the work load because there is a lot to write and there is a repetition of clients' information" (S4 facility 1 participant 5).

"…The way the card was designed I think there is a repetition of the information in the card regarding the details of the patient on the first and second page which is the waste of time for health workers" (S4 facility 1 participant 4).

4.4.2.5 Limited Questions

The midwives commented that in the section for history taking questions were limited and incomplete, and important questions were omitted such as mental state, liver failure, jaundice and kidney failure. These investigations are very important in case the client needs to be started on anti-retroviral treatment. As questions are incomplete, midwives ask their own questions in order to make sure they do not miss out on risk factors. Most participants stated that they depended on the BANC guidelines for complete questioning.

"…Okay, under medical history questions are limited e.g. liver failure, kidney failure, and mental history is not there, under obstetric history, the format is not properly done, questions that are there but are not enough" (S 4 facility 1 participant 5).

"…It is not easy to identify risk factors because without full history you end up missing important information and you find that at times you question the patient on

your own or when doing examination so it is not easy at all because things are missing" (W 4 facility 5 participant 2).

"…*With the help of BANC and use of checklist as with some other things and questions which are not there for instance, obstetric history there are other things which are not listed like birth weight e.g. below 2.5 kg, above 4 kg, teenage pregnancy below 17 years, above 35 years, so we know that we can refer those cases"* (N 2 facility 3 participant 1).

"…The questions or history taking on the first visit that requires to be filled in by midwives, guide them to identify whether the client is high risk or not, together with assessment and examination are very limited and serious conditions are left out" (N 1 facility 2 participant 1).

*"…The place where you are supposed to write the risk factors is so hidden if you are rushing, you miss so much and if you are not familiar with the ANC service. It is written in small feint words in a small corner as it was not important and limited space with five short lines where there actually put these risk factors and that is the backbone of the management risk factors, it is not easy to identify risk factors. Most of the nurses leave that space not filled up" (*W3 facility 6 participant 2).

"…I cannot say it is easy at all because you find the risk factors on clients' first visit when taking history but if the first midwife missed the risk factors the second one won't be able to see if it was not highlighted so really and it is not a user friendly card that I can recommend" (W4 facility 5 participant 1).

"…I think with the old card we had a better identification with an old card that you could pick up risk factors when with this one you have to turn pages for risk factors, there was a page in the old card called record of antenatal attendances where there is a space for all the patients observation and examination all appears in one page it was very easy to pick up information so that what we miss from the old card" (S4 facility 4 participant 2).

4.4.3 THEME 3: CONSEQUENCES OF THE CURRENT DESIGN

4.4.3.1 Communication

Participants' comments about communication amongst midwives were divided. The majority of participants stated that the new maternity case record does influence communication between them negatively because of scanty, abbreviated or no recording at all; others say it does not. Participants expressed their mixed views as follows:

"…What I can say is; the new card is very good because as I've said before we are all using this card as a means of communication so that if I refer the patient to the doctor I write all the information that I wish to communicate to the doctor on the card, and in return the doctor will write whatever management that he did. Even if you refer patients to ultrasound there is no need for a separate report because the patient has got this card you just document everything on the card so communication is easy" (N1 facility 2 participant 2).

"…It hasn't influenced communication, it is still the same there is no change, because when you refer the patient to hospital there is no feedback you get the doctors notes only which are unclear and scribbled and the follow up dates but no feedback for what action was taken" (S4 facility 1 participant 3).

"…I would not say its good or it is bad, it is average because the card has some gaps. Staff members completing the card do not record all the information and like before we are still required to phone the institutions to verify some information. Otherwise, if the card is correctly and completely filled, it assists with communication between health institutions" (N 2 facility 3 participant 2).

4.4.3.2 Referral system

The midwives stated that the new maternity case record has greatly improved the referral process. This is one positive comment that the midwives verbalise about the use of the new maternity case record.

"…*The referral system is affected still with this card you get clients that comes back with no feedback from the mother hospital after further investigations and management has been done and if there is no feedback it is difficult to continue with the management of the patient sometimes you are forced to refer the client back or for the feedback from the mother hospital and this causes a lot of inconvenience for the client and delays the initiation of care"* (S4 facility 1 participant 1).

"…*For us as a clinical team in level one it has improved our service, made it easier to refer the patient because everything is documented on the chart so the client is always carrying one booklet from clinic to clinic to hospital and back to the service and there is more improvement*" (N1 facility 2 participant 2).

"…Basically with us communication on the nurses' side is excellent if there is a problem with a client we record and we refer when it is necessary, it doesn't work two ways because when we refer the patient to the hospital, patient comes back with nothing written on the card but when you ask the patient if she did go to hospital, client says yes I've been to hospital seen by the doctor but nothing written on the file, that is a beautiful card which improves the quality of care and service" (S4 facility 4 participant 3).

4.4.3.3 Poor recording

Participants raised their concern about the introduction of the new maternity case record. They believe many mistakes and mismanagement of ANC clients emanate from the structure and the design of the new maternity case record. The midwives blame the poor recording on the structure of the card. The midwives complained that the card is complex with too many small boxes to be filled in, which creates a lot of confusion and also results in inaccurate and incomplete documentation. The midwives stated that other midwives fail to document all the information required for the client, often spaces are left blank. Most of the time the following information is not recorded: height, MUAC, BMI, whether SFH measurement correlation with dates ANC graph not plotted.

Their views are expressed in the following excerpts:

"…Recording, I think certainly not 100% as I said if you look at this card the aspects that are there to be covered, are not detailed and they are not put in order that the person who uses the card feels that the card is user friendly. You've got to jerk around with the card getting information here and there to put together that information trying to make sense of it" (W3 facility 6 participant 2).

"…New maternity case record is still the same but there is little bit of changes like SFH graph changes as it is not designed properly that leads to poor recording as other health workers fail to do correct plotting of SFH graph" (S4 facility 1 participant 3).

"…Communication level amongst the health providers is very poor in case of patients that are received from other provinces, information which is recorded in the maternity case record is very scanty, it is time consuming for particular services to go and phone to find out about patients results" (S4 facility 1 participant 1).

4.5 SUMMARY FOR THE QUALITATIVE PHASE

The findings for the qualitative phase reflect the general dissatisfaction with the card. In almost all three major themes and the sub-themes that emerged the midwives were verbalising their dissatisfaction with accessibility and the structure of the card They mention how these influence the ANC services where they talk about consequences of the current card design. It is only under the sub-theme on communication where the midwives present that the new maternity case record has improved communication. Other midwives still dispute this and state that the card has not assisted them to improve communication, and argue that this would only be possible if the card was better designed for them to be able to completely and accurately complete all sections of the card.

4.6 CONCLUSION

In this chapter the results of the data analysis for the two data sets were presented. In the beginning of the chapter, the results from the quantitative phase of the study were presented. This was followed by the results of the qualitative phases of the study. The results of the quantitative phase portrayed a generally good use of and documentation on the card with a few selected aspects where some elements were poorly recorded. In contrast to these findings the results of the qualitative phase shows a great dissatisfaction amongst the midwives with the new maternity case records. These contrasting findings will be dealt with in the next chapter, where the results will be presented and supported with relevant literature in order to identify the gaps in the use of the new maternity case record. Relevant recommendations that will assist in the improvement of the quality of care for pregnant women will be presented. The information from the two phases of the study will be triangulated in order to support and verify how the maternity case record is being used, as well as how the implementation of this new record card has improved the quality of care for pregnant women.

CHAPTER 5
DISCUSSION OF THE RESULTS

5.1 INTRODUCTION

The previous chapter focused on the presentation of the study results. Chapter 5 will focus on discussion of the study findings and relevant peer reviewed literature will be used to support and argue the findings. The discussion will be guided by Donabedian's structure, process and outcome model. The discussion will also aim to portray whether the three objectives of the study were achieved. These were: to assess the midwives' documentation and use of the new maternity case record during ANC service provision; to assess the midwives' understanding of the new maternity case record; and to determine how the use of the new maternity case record influenced the management of care of pregnant women.

5.2 DISCUSSION OF THE RESULTS

5.2.1 Structure

In the current study the structure pertained mainly to the maternity case record card, which was a standardised recording system in PHC clinics to document ANC services provided for pregnant women. Patients' records are among the most basic of clinical tools and are involved in almost every consultation (Pullen and Louden 2006: 280). It was noted during the study that although all PHC clinics were using the white maternity case record card, not all PHC clinics were using the original document: some PHC clinics were using the photocopied maternity case record card. The midwives verbalised various concerns during the interviews about the accessibility of the maternity case record card and the challenges that arose from the use of a photocopied maternity case record card.

A maternity case record is a legal requirement by the SANC. According to the SANC nurses should keep accurate records and the health records should be stored for a minimum of five years (South African Nursing Council 2001). The Health Professions Council of South Africa (HPCSA), which is another regulatory body for health professionals, provides guidelines for record keeping in which they state that the health records should be stored for a period of not less than six years as from the date they became dormant (Health Professions Council of South Africa 2008: 5). The HPCSA prescribed that where paper-based records are used the recording document should be made of a durable material and be legible. It must be written using durable ink in order to ensure that the record would last for the five/six year period as stipulated by the controlling bodies. During the interviews the midwives verbalised that photocopied cards were made from poor quality paper which often tear easily, and that during the process of photocopying some of the information became skewed and distorted, all of which interfered with proper recording.

According to Abdelrahman and Abdelmageed (2014: 1), medical records are a fundamental part of providing patient care and form a permanent account of a patient's illness. The authors further state that the clarity and accuracy of records is paramount for effective communication between healthcare professionals and patients. The maternity case record card assists midwives to communicate with doctors, with other relevant healthcare professionals, and amongst themselves. It is therefore essential to ensure that the assessed needs of the pregnant women are met comprehensively and in good time (Pullen and Louden 2006: 280). It is of importance, therefore, that midwives have a clear understanding of the maternity case record and its contents so that a standardised format is followed when recording the information onto the maternity case record card. The HPCSA advises that appropriate keeping of patient records should ensure that the standardised format is used where notes should contain, in order, the history; physical findings; investigations; diagnosis; treatment and outcome (Health Professions Council of South Africa 2008: 5).

In the current study although the results of the record review demonstrated that the midwives had a good understanding of the maternity cases record, findings revealed

that some midwives did not have a clear understanding of the information that they are required to document onto the maternity case record card. During the interviews, the majority of midwives expressed their concerns about the structure of the maternity case record. These concerns included that the arrangement of information on the recording card was not user-friendly; the organisation of information was not sequential; the space provided for them to write on was too small; and there was duplication of certain information. All of these concerns were legitimate and needed to be addressed, by making some adjustments to the structure and layout of the card.

A few participants reported that they did not have information on the current advances in maternity care, all of which interfered with their understanding for the maternity case record card. These concerns included the following: that the space for recording the foetal heart rate was only provided for after 27 weeks; the space for recording the presenting part only provided for after 34 weeks; there is no space provided for abdominal girth and the size of the foetus by palpation; and there is no table to record examination findings, only a graph is provided. All these concerns highlighted that the midwives did not have updated information about maternity services and did not have a clear understanding about the maternity case record card and its contents.

5.2.2 Process

In this study, the process aspect of the research model included the process of making the maternity case record card available in PHC clinics, which was raised as a concern by midwives during the interviews. The participants expressed general dissatisfaction regarding the process of ordering and photocopying of the maternity case records. They mention how this interfered with ANC service provision.

With regard to the process of ordering the maternity case record card, the participants outlined their concerns about the ordering system, stating that the system was generally not working well. They complained that although they always ensured that appropriate quantities of the maternity case record cards were ordered,

the stores department usually reduced the supplies and issued them insufficient quantities which were not enough for the number of pregnant women that they had in ANC clinics. The midwives also stated that there were usually delays in delivery of the maternity case record cards orders from the stores department to the PHC clinics. Thus, most of the time the original copies of the maternity case records were not in stock. It is essential that an organisation assembles resources to support the effective operation of the processes that hopefully will deliver the strategy to ensure that the resources are managed (Oakland 2008: 72). In the absence of the original copies of the maternity case record card, photocopies were made in the PHC clinics.

Regarding this alternative means of making the cards available in the PHC clinics, the midwives contended that the photocopied maternity case record cards were of a sub-standard quality compared to the original copies. The photocopies were less durable than the original maternity case record card due to the quality of photocopying paper that was being used. This was not the same type of paper used for the original document. Another concern that they raised was that sometimes the photocopied maternity case records had very faint and skewed writing, which made documenting and making sense of the documented information very difficult. It is important that appropriate recording systems be used in health institutions because all health institution records are legal documents that can be used in a court of law.

As far as the recording of gestational age at booking, all records that were reviewed reflected that gestational age at booking was recorded. The estimation of pregnancy dates is important for the mother, who wants to know when to expect the birth of her baby, as well as for the health care providers so they may choose the times at which to perform various screening tests and assessments (Mongelli 2012).

With regard to history findings, the results of the study revealed that all the elements that were meant to be recorded under the section of history taking were recorded, except for ‘history of present pregnancy’ which was recorded in 98.3% (n=298) of maternity case records. While 1.7% (n=2) appears to be a very small percentage of the clinics where the history of present pregnancy was not accurately recorded, it becomes very important in that it is not just one woman that will be affected by this

but many of those attending for ANC in the two PHC clinics where this occurred. It is important that a comprehensive and accurate history is completed during health assessment. Viljoen and Sibiya (2009: vi) state that the acquisition and interpretation of data is the first stage in the process of assessing the patient. They further state that thorough planning of effective patient care depends on accurate and complete collection of data for analysis and decision-making in order to plan care. The history of present pregnancy allows the midwives to have an understanding as to how far the woman is in pregnancy, and whether there are any existing risk factors that may adversely affect the woman. This knowledge assists midwives to draw up relevant plans of management.

The study finding revealed that out of a total of 300 maternity case records that were reviewed, gestational age at first booking was plotted onto a graph in 81.7% (n=245) of cases. The graph was not plotted in 18.3% (n=55) of the maternity case records. According to Bamfo and Odibo (2011: 1) foetal growth restriction remains a leading contributing cause to perinatal mortality and morbidity and metabolic syndrome in later life. The authors state that abnormal foetal growth can be detected with the clinical suspicion of a subnormal uterine size, and confirmed by abdominal palpation and direct measurement of the symphysis-fundal height. The symphysis-fundal height measurement is best interpreted if recorded as a graph, as this allows for the interpretation of the growth curve and comparison of the plot with the percentile lines.

The symphysis-fundal distance has a sensitivity of 27-86% and specificity of 80-93% for detecting ‘small for gestational age’ (Bamfo and Odibo 2011: 3). The first plotting that is done at the booking visit offers the midwives a baseline for comparison of subsequent findings. It is therefore essential that all PHC clinics providing ANC services should plot the gestational age onto the graph.

Furthermore, an assessment of how various examination findings were recorded was done during the study. The BANC handbook provides a list of the processes, screening tests and examinations that should be carried out during ANC in order to ensure quality of ANC service (Pattinson 2007: 9). The study findings reflected that

the elements that were assessed were recorded in 57.3%-100% (n=172-300) of the maternity case records. These findings reflected that there were PHC clinics where, in almost 50% of the maternity case record cards, some of the examination results and interventions were not recorded. The results of the record review revealed that some of these interventions such as weight, urinalysis and HIV counselling, were recorded in 100% of the maternity case records. All the other elements were recorded in some of the maternity case record cards and not recorded in the others. All the interventions required by the maternity case record have good evidence to support their use. Only interventions that are effective during the antenatal period are included and those that are not are excluded (Pattinson 2007: ii). Results from this study show that some of the interventions, including maternal height, BP (each visit), heart examination, correct plotting of SFH, presence of IUGR detected, feotal presentation (from 34 weeks), foetal heart and movements, Hb, Rh, Syphilis test results and Tetanus Toxoid administered, were not recorded in all the maternity case records, although between 81.7and 99.7% records cards showed that these interventions were recorded. This is a good reflection that midwives were able to use the card, meaning they had a good understanding of what to records were.

The result of a chi-square goodness-of-fit-test indicates that the respondents recorded BP very well in all the maternity case records. Although many pregnant women with high BP have healthy babies without serious problems, high BP can be dangerous for both the mother and the foetus. It is important to monitor blood pressure in pregnant women because hypertension is the most common medical complication in pregnancy and occurs in up to 12% of this population (Krucik 2013: 1-9). The author highlights that accurate monitoring of blood pressure during pregnancy is an important aspect of good quality prenatal care. Cardiac disease is a subset of pre-existing medical disease, and it is therefore very important to do a heart examination during pregnancy to rule out cardiac disease. Women should also be advised to avoid smoking, drinking alcohol and using drugs during pregnancy, as all these habits can harm the health, growth and development of the baby (Department of Health 2012a: 7).

It is important that with any pregnancy, whether it results in a live birth, miscarriage, stillbirth, or abortion, blood typing is a universal precaution against blood compatibility disease. The results of the record review in the current study showed that 97.7% (n=293) out of 300 maternity case records had RH results recorded. Rhesus disease does not harm the mother but has an impact on the baby and can result in premature births, stillbirth or neonatal deaths. Complications such as the baby becoming anaemic and developing neonatal jaundice can occur, which if not treated can lead to brain damage, learning difficulties, deafness and blindness (McCall Sellers 2013: 11). Rhesus disease is a common condition where antibodies in a pregnant woman's blood destroy her baby's blood cells. If an RH negative woman who has the circulating IgG anti-D antibody which was formed during a previous RH incompatible pregnancy, then becomes pregnant with an RH positive infant and by any chance the IgG anti-D passes into the foetal circulation, this can destroy the foetal red cells. As a result, the infant can become anaemic and jaundiced (Okeke 2011: 36).

A haemoglobin test is one of the routine tests that is conducted on all pregnant women in PHC facilities, to exclude anaemia. The results of the record review showed that 97.7% (n=293) out of 300 maternity case records had Hb results recorded. Anaemia is when the blood does not have enough red blood cells to carry oxygen to the pregnant woman's body tissues and to the baby. Over and above the normal physiological change where there is increased production of high volumes of plasma during pregnancy, several factors may increase the risk of anaemia during pregnancy (Akhtar and Hassan 2012: 1). Such factors include an increasing demand on the body for folic acid iron during pregnancy, infection, and vitamin B12 deficiency. Anaemia during pregnancy is common and has both maternal consequences where. If left untreated, it can cause serious complications such as cardiovascular symptoms, reduced physical and mental performances, reduced immune function and fatigue, and foetal consequences including growth retardation, prematurity, intrauterine death, amnion rupture, neural tube defects, and low birth weight (Akhtar and Hassan 2012: 3).

Regarding the recording of syphilis testing, this was recorded in the majority of the maternity case records with a total of 92.3% (n=277) having the test results recorded. According to Mabey and Peeling (2011: 655) syphilis is estimated to be responsible for almost 500 000 perinatal deaths per year in sub-Saharan Africa alone. The authors further state that if all pregnant women were screened, and those who tested positive were treated with one dose of Benzathine Penicillin before 28 weeks of gestation, no stillbirths or neonatal deaths would be due to syphilis. Included in the Centre for Disease Control and Prevention's sexually transmitted infection screening recommendations is that all pregnant women should be screened for Syphilis, HIV, chlamydia, and hepatitis B. Syphilis still affects large numbers of pregnant women worldwide, causing serious health problems and even death to their babies, yet this infection could be prevented by early testing and treatment. The routine screening tests, such as Rapid Plasma Reagent test, is done on the pregnant woman during the first visit to exclude syphilis, and is repeated at 32 weeks. If there is a positive result, the mother must be treated before delivery of the baby. All routine screening tests should be performed on site so that the results are available to the pregnant woman before she completes the first visit (Department of Health 2007a: 26). In line with this, a rapid screening test for Rapid Plasma Reagent that can be done on site was introduced for use in PHC clinics to ensure that the test results are available on the first ANC visit. This facilitates the initiation of treatment for pregnant women who are infected.

This study revealed that 81.7% (n=245) maternity case records did not record maternal height. The recommendation of the national Department of Health is that all women should have their height measured in the first ANC visit (Department of Health 2007a: 20). According to the WHO (2011: 6) maternal short stature and iron deficiency anaemia, which can increase the risk of death of the mother at delivery, contribute to at least 18% of maternal deaths in low- and middle-income countries. Whilst the best pelvimetry is the head of the foetus, short maternal stature is always associated with cephalo-pelvic disproportion (CPD) (Gauteng Department of Health 2010: 13). It also states that CPD is more frequent in African than in European women, and complicates between 1.4 and 8.5% of pregnancies. Short stature in women is known to be associated with difficulties in labour. Maternal height provides

a clue to midwives regarding the safety of allowing the woman to have a vaginal delivery. There was one PHC clinic in particular where maternal height was not recorded in all maternity case record cards that were reviewed.

In many settings SFH measurement has replaced clinical assessment of foetal size by abdominal palpitation as the latter has been reported to perform poorly (Nelson 2007: 1). In the current study 92.3% (n=277) of the maternity case record cards had SFH measurement results recorded. The SFH measurement is the basic strategy that is used to assess foetal growth *in utero* in the absence of sophisticated medical technology, as it requires just a tape measure and the skill of the midwife. It is a very simple skill that can be performed even by a junior midwife. Midwives are able to make sense of the growth of the foetus by comparing the distance in centimetres between the highest border of the symphysis pubis and the highest point of the fundus of the uterus. This is compared with the period of gestation calculated using either the date of the first day of the last normal menstruation period, or early ultra sound findings. The results are best interpreted if recorded on the ANC foetal growth chart.

The results of the study revealed that out of the 300 maternity case record cards that were reviewed, 95.7% (n=287) had foetal presentation recorded. Checking of foetal presentation makes it possible for midwives to identify the lie, attitude and position of the foetus, and helps them to identify risk factors that might interfere with the normal descent of the presenting part during labour. According to McLeod (2008:212) there are variations of the foetal presentation, each of which can affect the labour experience in different ways, which is largely determined by the shape of the mother's pelvis. The most common and preferable presentation is when the baby enters the birth canal head first. This is commonly called a cephalic foetal presentation. Some women have abnormal presentation, where the foetus presents with any other part of the body other than the head. For example, the presentation may be a breech where the foetus presents with the buttocks. When the buttocks of the foetus enter the pelvis before the head, this is considered to be abnormal and serious complications that need emergency care may occur. According to Simm (2007: 283-284), a breech presentation is a marker for poor perinatal outcome and

there have been suggestions that this poorer long-term outcome may be antenatal in origin, as it has been shown that breech babies exhibit intrauterine behavioural differences when compared to their cephalic counterparts.

During the interviews, midwives raised their concerns that provision was not made in the new maternity case record for recording of the presenting period before 34 weeks gestation. According to the ANC policy for routine care for the healthy pregnant woman, routine assessment of presentation by abdominal palpation should not be offered before 36 weeks because it is not always accurate (Agency for Health care Research and Quality 2012: 37). It is further stated in the policy that the foetal presentation should be assessed by abdominal palpation at 36 weeks or later, when presentation is likely to influence plans for the birth (Agency for Health care Research and Quality 2012: 37). This is one of the new developments in midwifery practice. Although a specific period was not mentioned as to when the presenting part was to be assessed in the previous maternity care guidelines for South Africa, the ANC graph that was used at the time allowed for the recording of the presenting part from 30 weeks gestation (KZN Department of Health 2002: 21).

Tetanus is a life-threatening bacterial disease which is caused by the toxin of a bacterium called *clostridium tetani*. It affects the nervous system and can be fatal if not treated. Tetanus toxoid is given during pregnancy to protect the baby during delivery should it happen that the woman gives birth in an unsafe environment. It is therefore very important that midwives encourage all pregnant women to be vaccinated during pregnancy and to complete at least the minimal recommended doses of tetanus vaccinations (which is three doses during pregnancy) (Department of Health 2007a: 26). The Advisory Committee on Immunisation Practices recommends that tetanus toxoid reduces the incidence of tetanus infection(ACIP) (2006: 55) and states that studies have shown that tetanus toxoid containing vaccine administered during pregnancy has not shown to be teratogenic (ACIP 2006: 55).

Results show that MUAC was recorded in a total of 57.3% (n=172) maternity case records, and BMI in 65.3%. In nursing, what is not recorded is considered to be ‘not done’, which means that all the information that was not recorded on the maternity

case record was not done by the midwives during ANC service provision. MUAC is a useful and simple tool for screening adults for poor nutritional status and has shown to be accurate in reflecting adult nutritional status (Chakraborty, Bose and Koziel 2011: 9). The national Department of Health emphasises the importance of integration of MNCWH and Nutrition services, thus a strategic plan which includes maternal and child services and nutritional services has been developed (NCCMD 2008). This strategic plan highlights that the nutritional status of the mother should be assessed, corrected and monitored during pregnancy for safe pregnancy and breastfeeding. MUAC measurement and BMI calculations are an important criterion for assessing the nutritional status for both adults and children. MUAC is an appropriate indicator for the assessment of the nutritional status of both adult and children. The indicator is useful for screening acute under-nutrition and for estimating the prevalence of under-nutrition at a population level. The National and Provincial Department of Health provide guidelines which outline routine ANC for pregnant women (KZN Department of Health 2010: 30-71; Department of Health 2007a: 19-31).

In all its forms malnutrition is closely linked, either directly or indirectly, to major causes of death and disability worldwide (WHO 2013: 1). Maternal under-nutrition also increases the probability of a low birth weight, which in turn increases the probability of neonatal deaths due to infections and asphyxia (WHO 2011: 3). Being overweight has been observed to cause problems for the pregnant woman. The WHO indicates that in 2008, 35% of adults aged twenty years and older were overweight, with a BMI of equal to or greater than 25 kg/m2. According to the WHO (2011: 3) the worldwide prevalence of obesity nearly doubled between 1980 and 2008, and in 2008 14% of women in the world were obese with a BMI ≥30kg/m^2 compared with 8% in 1980.

During the interviews midwives stated their concerns that there was no space provided in the maternity case record for them to record the findings on abdominal girth measurement. Bloemenkamp (2005: 296) suggests that clinical palpation and fundal height and girth measurements have a large range of error when predicting foetal weight. The measurement of maternal abdominal girth to assess foetal growth

has been discredited as far back as 1985. The study on fundal height and abdominal girth measurements during pregnancy, which was published in 1985, already discredited the use of maternal girth measurement to assess foetal growth. The study stated that compared to abdominal girth measurements, fundal height measurements were more valid predictors of the gestational weeks and foetal size (Bloemenkamp 2005:296).

5.2.3 Outcome

Outcomes in this study were measured based on the interpretation of decisions made by midwives, based on recorded information on history and examination and the management plans that were drawn up by the midwives. Several assessment strategies were employed to assess the outcome. The review included an analysis of how midwives recorded information on the card and also how they interpreted and responded to the recorded information. The review included checking on whether the management plans and other actions taken by the midwives were in line with the service delivery guidelines by the national Department of Health. This also assisted in determining how the use of the new maternity case record influenced the management of pregnant women. During the qualitative phase the views of the midwives regarding the use of the new maternity case records were gathered. Their responses to various questions during the interviews gave the researcher an impression of their understanding of the new maternity case record.

Some of the results of the record review are not in line with those of the interviews with the midwives. Whist the results of the record review revealed that the midwives had an understanding of the maternity case record, on occasion the concerns that were raised by the midwives during the interviews about the maternity case record and its use were the complete opposite

The findings of the study further revealed that the section on interpretation and decision making, referral and feedback were two poorly recorded elements, where referral was not recorded in 49% (n=153) and feedback in 33% (n=101) of the maternity case records. In this section, records of transport arrangements and

discussions on labour with the mother were not very well recorded. Transport arrangements were recorded in 88.7% (n=266) and discussion of labour with the mother recorded in 83% (n=249) of maternity case records. These findings give the impression that although the midwives had learnt during the course of their work to record relevant information in relevant areas of the card, their understanding of the card was not up to the required standard because they were not able to interpret and make decisions based on the recorded information. According to Smith, Higgs and Ellis (2006: 98) quality decision making is an essential component of good clinical practice. In order to understand, critique and improve clinical decision making, it is imperative that in addition to understanding the elements of the immediate clinical problem, contextual factors are taken into account when making decisions be explicitly made (Smith, Higgs and Ellis 2006: 98).

Record keeping is for future use and continuation of clients' management and treatment, and promotes good communication amongst midwives within the clinic and other facilities (Wood 2003). If midwives do not document complete information on the maternity case record card, this leads to poor communication. Although according to BANC guidelines, pregnant women should ideally be attended to by the same midwife during each and every consultation visit in order to ensure continuity of care, this is usually not possible in the current health system of South Africa (Pattinson 2007: 9). In the absence of the midwife who attended to the pregnant woman during the previous ANC visit, the attending midwife or health care provider will not be in a position to know what procedures and investigations were conducted and what interventions took place unless these were accurately documented on the maternity case record card. This makes it difficult to continue with the care of the pregnant woman and to link the new findings of tests and examinations to the previous findings. The midwives had different views about how the new maternity case record card influenced communication. The majority of midwives stated that the new maternity case record interfered with communication between midwives and with other relevant health care providers because of scanty, abbreviated, or no recording at all. Other midwives opposed this view, stating that the maternity case record was a good communication tool between health care providers for pregnant women.

The midwives stated that the new maternity case record has greatly improved the referral process. This is one positive comment that almost all midwives expressed regarding usage of the new maternity case record. It is important that the referral process be understood and be agreed upon by all parties involved. In most cases this includes the staff from the PCH clinic, the referring hospital and the emergency medical response service department (EMRS). Policies and guidelines should be available to ensure a smooth running referral process. Institutional protocols are developed from the guidelines provided to incorporate as much evidence-based medicines relating to providing effective ANC as feasible, given the relatively limited health care resources of South Africa (Pattinson 2007:16).

Records are used to give a clear and accurate picture of the care and treatment of patients and to assist in making sure they receive the best possible clinical care (Pullen and Louden. 2006: 280). The following elements were assessed under the section on interpretation and decisions: identification/recording of risks; an action plan and interventions; discussion of labour with the pregnant woman; transport arrangements; family planning; first and 32 week visits countersigned; referral, feedback, diagnostic tests and procedures; management plan; and date of next visit. The lowest recorded amongst these elements was feedback, which was recorded in 33.7% (n=101) of maternity case record cards, followed by referral which was recorded in 51% (n=153) of maternity case record cards.

Identification and recording of risk factors was done in 100% (n300) of maternity case record cards that were reviewed. According to the maternity care guidelines, it is important that all risk factors be identified and should be recorded in red in order of importance in the space provided on the maternity case record card (Department of Health 2007a: 22-24). This is to ensure that risk factors are not missed. The risk factors are used to group the pregnant women and to decide on the level of care where they should receive within ANC services. All pregnant women within the high risk category should be referred for higher levels of care, which includes level one, two or three hospital depending on the severity of the risk factors identified.

According to BANC guidelines only pregnant women within the low risk category can receive ANC at PHC level (Pattinson 2005: 7-14).

With regards to the action plans and interventions that were prepared and carried out by the midwives in response to clinical assessment findings, all maternity case records had this information documented. Action plans and interventions form an important part of the management of pregnant women during ANC. Recording of this information ensures that everyone who is involved in the care of pregnant women is aware of what has been planned and done for the pregnant women, and what is still to be done. It also ensures that all interventions are carried out in due time as specified in the guidelines or as required by the condition of the pregnant woman. The plan should specify what and when specific tests and procedures are to be performed, what treatment is to be given when and how and when pregnant women should be referred to the next level of care. Also for inclusion is the expected date and mode of delivery and at what level of care the woman is expected to give birth.

Significantly more than the expected number of respondents from facility 3 did not record 'discussion of labour with mother' (χ^2 (5, N=300)=19.773, p=.001). It is important for all midwives to discuss signs of labour, complications and danger signs during pregnancy, so that the women can recognise these when they do happen. Women should be cautioned about these and advised on what to do when complications and danger signs arise. This will ensure that they know when it becomes necessary for them to report to a health institution. The discussion of labour with a pregnant woman is one component of care that should not be missed if midwives want to ensure that quality of care is provided to pregnant women (NCCMD 2008: 28).

Family planning is an important component of MNCWH services. The service facilitates the provision of information, guidance and contraceptive methods to women so as to facilitate spacing of children and to ensure that no pregnancy is unplanned or unwanted (Department of Health 2012a: 2). Mothers need enough time between pregnancies to recover from the stresses of the previous pregnancy

and to take care of the new-born babies. In the current study the findings of the record review reflect that in 99.3% (n=298) of maternity case record cards it was recorded that future family planning was discussed with the pregnant women and a choice of contraceptive method indicated. The discussion of family planning during pregnancy allows the women enough time to think and decide on what contraceptive method they intend to use. It also allows the health care providers correct timing in issuing the chosen contraceptive method to the woman. The contraceptive guidelines provides that women should be counselled about contraception and/or supplied with a suitable method of their choice at every opportunity, for example during ANC visits after delivery, at the six-week post-partum visit and subsequent visits for infant immunisation (Department of Health 2012b: 10).

According to BANC guidelines, the maternity case record should be double-checked and countersigned by a senior and experienced midwife, at the end of the first and 32 week visit consultation. The midwife should preferably be an experienced advanced care practitioner. This is to safeguard pregnant women against mismanagement and omissions and to give supportive supervision to the younger, less experienced midwives. In the current study this was one of the activities that was very poorly recorded. It is worth noting that none of the maternity case record cards that were reviewed for this study had this recorded. According to the BANC handbook, after the initial visit that is recommended to be before the end of the first trimester, the next ANC visit is at twenty weeks. Thereafter the subsequent routine follow up visits are scheduled six weeks apart (Pattinson 2007: 10). In the PHC clinics where the maternity case record cards are not double-checked and countersigned, any omission or mismanagement can go unnoticed for a long time until it adversely affects the pregnant woman and/or her unborn child.

It was evident from the study results that transport arrangements were not discussed with the women. In only 88.7% (n=266) of the maternity case records were transport arrangement recorded. Midwives stated during the interviews that the new maternity case record allowed them to document what transport arrangements are available for the woman to use in cases of emergency. They stated that it was very important to discuss transport arrangements with clients because failure to find transport in

time may result in delays in reaching and initiating care. This may lead to various adverse outcomes, such as home birth and fresh stillbirth. According to the Saving Mothers Report, the delay in seeking help is the most common patient-related avoidable factor which accounted for 26.8% of maternal deaths (NCCMD 2008: 10). The delay in seeking help is mostly due to the lack of transport between the client's residence and a health care facility, especially at night, or between health institutions. During the 2002-2004 triennium transport problems from the home of the women to the health institutions accounted for 3.0%, and transport problems between institutions accounted for 9.7% of maternal deaths (NCCMD 2008: 10).

Significantly more than the expected number of respondents from facility 1 and facility 2 recorded feedback (χ^2 (5, N=300=12.613, p=.027). Transport arrangements were recorded in 88.7% (n=266) and discussion of labour with the mother recorded in 83% (n=249) of maternity case records. Midwives stated that it is difficult to manage clients without any report back from the referral hospital. The midwives were concerned that when pregnant women return to the PHC clinics after having been referred to hospital for a doctor's assessment, most doctors do not document information about what was done to the pregnant woman. This interferes with the continuum of care and sometimes causes an unnecessary inconvenience to the pregnant woman when she has to be sent back to the hospital for the report. In some instances, it causes a delay in the initiation of care, and in results in mismanagement of the pregnant woman.

Specific diagnostic tests and procedures to be performed during pregnancy are detailed in the service guidelines. These include essential routine screening investigations, screening tests that are not offered routinely but indicated in special circumstances, medications and vaccines (Department of Health 2007b: 26). The record review assessed whether these tests and procedures were recorded and found that all maternity case record cards 100% (n=300) that were reviewed had these recorded.

Pattinson (2007: 9) advises that a management plan be drawn in conjunction with the pregnant woman at the end of each consultation. The same is also specified in

the guidelines for maternity care in South Africa where specific reference is made to the instruction that at the end of the first visit, all pregnant women should be given a provisional delivery plan (Department of Health 2007a: 27). The management plans were documented in a total of 100% (n=300) maternity case record cards.

It is mandatory that at the end of each consultation, before the pregnant woman is allowed to leave the consulting room a date of next visit be discussed and agreed upon between the pregnant woman and the midwife. The date should be recorded on the maternity case record card. This is done in order to ensure that the woman remembers and does not miss her future follow-up dates. In the current study a total of 100% (n=300) maternity case records had the date of the next visit recorded. The pregnant woman and the midwife have a dual responsibility of ensuring that there is continuity of care for the woman. It is therefore mandatory that whilst these dates are scheduled to suit the structure of the ANC services at the clinic, the convenience of the woman should also be taken into consideration. Although both the BANC and maternity care guidelines specify a structure of scheduling subsequent ANC visits, the timing of the next visit should be informed by and based on the management plan that is drawn up for each woman.

5.3 SUMMARY OF THE STUDY FINDINGS

The results of the record review revealed that although the recording was done fairly well, there were a number of activities and interventions that were recorded poorly or not recorded at all in some PHC clinics. It is therefore evident from these findings that there is a need to implement strategies to improve recording. Emanating from the interviews with the midwives was the view that the majority of midwives were not in favour of the new maternity case record card. The midwives raised their concern about the introduction of the new maternity case record. They stated that many mistakes and mismanagement of ANC clients emanated from the structure and the design of the new maternity case record. The midwives blame the poor recording on the structure of the card. They commented that the maternity case record card was complex with too many small boxes to be filled in, which had created confusion and resulted in inaccurate and incomplete documentation of information. Midwives

stated that many of their colleague midwives failed to document all the information required for the client, leaving spaces blank.

In summary, the findings of the study revealed the following with regards to the three objectives of the study:

Objective one: To assess the midwives documentation and use of the new maternity case record during ANC service provision. The overall study finding was that whilst there were some interventions, activities and examinations that were recorded well, there were a number of these that were poorly documented. Accurate recording means documenting all information precisely and accurately. Considering that what is not recorded is considered not done the implication is that there were several intervention, activities, test and examinations that were not performed by participant midwives for the pregnant women during ANC. The new maternity case record card was intended to improve the quality of care by improving recording, however it is evident from the result of this study that this has not yet been achieved

Objective 2: To assess midwives' understanding of the new maternity case record. The most concern regarding the new maternity case record arose from the interviews with the midwives. The majority of midwives were not happy with the card. It was noted that a number of issues that they complained about were things that had been omitted or added onto the card because of advances in maternity care. The question that arises from this is why; is it because the midwives were not updated about the new developments or was it out of ignorance? The conclusion was that although midwives knew what to record and where, they did not have an up-to-date understanding of the information that was contained on the card and its relevance to the care of pregnant women.

Objective 3: To determine how the use of the new maternity case record influenced the management of pregnant women. In an attempt to achieve this objective the researcher assessed various activities and interventions that were recorded in the maternity case record. This informed the researcher as to whether or not those activities and interventions had been carried out. The results of the

study reflected that the use of the new maternity case record card has had some influence on the management of pregnant women as some of the activities were documented well in the maternity case record cards. There were some activities and interventions, however, which were poorly recorded. In some selected clinics the percentage of maternity case records that reflected a particular recording was zero. The use of a graph, and timings of repeat tests and investigations, were all done and recorded. However, certain critical things specified in the service guidelines were omitted, such as the discussion of labour with the women, preparing a delivery plan, and screening and assessing for nutrition by means of MUAC and BMI.

5.4 CONCLUSION

The findings of the study show negative factors regarding the new maternity case record, and it is clear that it is not user-friendly. The negative perceptions of midwives about the understanding of the new maternity case record were identified. About 99% of the midwives believe many mistakes and mismanagement of ANC clients emanate from the structure and the design of the new maternity case record. The midwives blame the poor recording on the structure of the card. The midwives complained that the card is complex with too many small boxes to be filled in, which creates a lot of confusion and also results in inaccurate and incomplete documentation. The midwives stated that other midwives fail to document all the information required for the client, and spaces are often left blank. Most of the time the following information is not recorded: height, MUAC, BMI, whether SFH measurement correlates with dates, and the ANC graph not plotted. There are still more gaps to be filled in, as communication between managers, supervisors, doctors and midwives needs to be free and open to avoid confusion and to improve the quality of care. The responsibility for changes to the new maternity case record design falls under the Department of Health, if the Minister of Health has accepted the recommendations.

5.5 LIMITATIONS OF THE STUDY

Although the study area included the three sub-districts in the eThekwini district, the limitation was that only PHC clinics that were under the control of the Municipality were included; those that were under KZNPA were not included in the sample. Whilst the researcher observed all the ethical principles regarding how she presented herself during the interview, some of the participants that she was interviewing did not take the interviews very seriously in the beginning as they were her work colleagues. This was in relation to the manner that they were responding to the interview questions, and they had to be requested to take the interviews seriously.

5.6 RECOMMENDATIONS

The following recommendations were made, with special reference to policy development and implementation, institutional management and practice, nursing education and further research.

5.6.1 Policy development and implementation

It is critical that relevant policies and protocols that inform and guide midwives regarding the provision of ANC services be communicated to the midwives timeously, and where there is a need for in-service education and/or updates that these be provided to them as well. Policies and guidelines give direction to the staff in an organisation and ensure standardisation of performance.

5.6.2 Institutional management and practice

Supportive supervision should be strengthened to ensure that midwives gain adequate support and guidance, especially during the times when new developments in service provision are being implemented. Supervision ensures that staff members are compliant with the provisions of the guidelines and that they follow instructions. Supervision also ensures that guidance, support and encouragement

are given to the staff until they gain confidence in carrying out the new procedures. It is important that material resources should be reviewed for adequacy, especially when a new type of resource is being introduced in the system. The managers should assist staff by ensuring that the card ordering system is working well. All logistics required to ensure adequate and sustainable supplies of new resources should be put in place before the new resource is implemented. Team work involving all relevant stake holders should be encouraged so as to ensure that there is co-operation amongst all stakeholders. Managers should arrange regular meetings with stakeholders to discuss challenges in working relationships. Input should be invited during the design phase of a new recording system. Managers should obtain feedback from the implementers of the newly introduced recording system so as to evaluate whether the system is working well, and to identify challenges that are faced by the implementers and devise strategies to deal with these challenges.

5.6.3 Nursing Education

Nursing colleges should be kept up-to-date with new developments in nursing practice, so as to adjust and/or incorporate the changes into the curriculum. This will ensure that teaching and learning is in line with advances and new developments in the profession.

5.6.4 Further research

The maternity case record is the standardised recording system that is used throughout the country. It is evident from the results of the study that there are various concerns regarding the structure and design of the maternity case record card. A broader study involving other districts and provinces is recommended in order to check if similar concerns exist in other parts of the country, so that the maternity case record card could be improved as required.

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Appendix 1: DUT Ethics Clearance

DURBAN UNIVERSITY of TECHNOLOGY

INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREC)

24 April 2013

IREC Reference Number: **REC 13/13**

Ms R J Cele
15 Endel Place
Seaview
4094

Dear Ms Cele

Assessment of the use of the new maternity case record in improving the quality of ante natal care in eThekwini district, KwaZulu-Natal

I am pleased to inform you that Full Approval has been granted to your proposal REC 13/13.

The Proposal has been allocated the following Ethical Clearance number IREC 029/13. Please use this number in all communication with this office.

Approval has been granted for a period of one year, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's. In addition, you will be responsible to ensure gatekeeper permission.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Please note that you may continue with validity testing and piloting of the questionnaire. Research on the proposed project may not proceed until IREC reviews and approves the final questionnaire.

Yours Sincerely

[redacted]

Dr D F Naude
Chairperson: IREC

Appendix 2: Acknowledgement of pilot study

DURBAN UNIVERSITY of TECHNOLOGY

INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREC)

30 July 2013

IREC Reference Number: **REC 13/13**

Ms R J Cele
15 Endel Place
Seaview
4094

Dear Ms Cele

Assessment of the use of the new maternity case record in improving the quality of ante natal care in eThekwini district, KwaZulu-Natal

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tools.

Please note that you may now proceed with research on the proposed project.

Yours Sincerely,

[redacted]

Prof J K Adam
Chairperson: IREC

Appendix 3: Support letter from the statistician

Gill Hendry B.Sc. (Hons), M.Sc. (Wits)
Mathematical and Statistical Services

Cell: 083 300 9896
email : hendryfam@telkomsa.net

22 October 2012

To whom it may concern

Please be advised that Reginah Jabulisile Cele (student number 21242579) who is presently studying for a Master of Technology: Nursing has consulted me regarding the sampling strategy she will use for her study. I have also advised her on the development of the questionnaire.

Yours sincerely

Gill Hendry (Mrs)

Appendix 4a

15 Endel Place
Seaview
4094

The Head of Health Unit
EThekwini Municipality
09 Archie Gumede Place
Durban
4000
Dear Sir/Madam

REQUEST FOR A PERMISSION TO CONDUCT A STUDY IN MUNICIPALITY PHC CLINICS

I hereby request your permission to conduct a research project at your institution. The research project is for my studies towards Masters of Technology Degree. I am currently registered at the Durban University of Technology in faculty of Health Science, Nursing Department. The title of my research project is: **Assessment of the use of the new maternity case record in improving the quality of antenatal care in eThekwini District Kwa-Zulu-Natal**. I am attaching the research proposal for your perusal.

The aim of the study is to assess how the implementation the New Maternity Case Record has influenced the quality of Antenatal Care for the pregnant women. A non-experimental qualitative descriptive research design will be used. The study will be conducted in the fixed Primary Health Care facilities. Data will be collected in two phases. The first phase will involve retrospective record review. In the second phase data will be collected from the midwives who are working in ANC clinics. The researcher will ensure that no disruption to clinic services occur during data collection

Your support and permission to conduct the study in your facility will be appreciated.

Yours sincerely

Ms. R. J. Cele (Masters Student) Signature……..

Dr M. N. Sibiya (Supervisor) Signature……..

Mrs. T.S.P. Ngxongo (Co-supervisor) Signature……..

Appendix 4b Approval letter from the eThekwini Municipality

HEALTH, SOCIAL SERVICES
Health Unit

9 Archie Gumede Place
P O Box 2443, Durban, 4000
Durban, 4001
Tel: 031 311 3523, Fax: 031 311 3530
www.durban.gov.za

15 May 2013

Dear Ms R. J. Cele

Permission to undertake research study: Assessment of the use of maternity case record in improving the quality of antenatal care in eThekwini District Kwa-Zulu natal.

Approval for **pilot** is granted in any of the following sites: Mpola, Marianridge, Lovu, Bayview and Red hill and final approval of the study project will await final ethics approval of questionnaire from IREC after the pilot.

Recommendations: Due consideration to be given to the subjectivity of the questionnaire and consider reconstructing the questionnaire in a manner that it will provide the health unit with more useful information. Concern is that no comparison is made to the previous maternity record.

The following to be noted:

- Submission of the indemnity form obtainable from the EThekwini Municipality Health Unit before commencement of the pilot study.
- Prior arrangements to be made with the facility and an assurance that all services will not be disrupted.
- No staff member should be used for collecting data for the researchers.
- Withdrawal of permission to conduct research will be left to the discretion of the eThekwini Municipality Health Unit.

Yours faithfully,

Dr. [redacted] Date: 16.05.2013

Deputy Head of Health: EThekwini Municipality.

Appendix 5: Indemnity for the eThekwini Municipality

No. M.1/1/2

Researcher- Name: JABULISILE R. Cele
Institution- Name: Durban University of Technology
Institution- Address: P.O.Box 1334
Durban.
4000
Research Subject: The Use of the New Maternity Case Record.

Director : Health
Box 2443
DURBAN
4000

Dear Sir/Madam

RESEARCH SITE : ETHEKWINI MUNICIPALITY HEALTH DEPARTMENT

I, the undersigned, hereby wish to apply for permission to attend the eThekwini Health Department to undertake research on Council property.

I understand that any permission granted to me will be subject to:
(a) there being no additional cost to the Council; and
(b) the exigencies of the eThekwini Health Department, and provided that no interference with its programme will ensue.

In consideration of the facilities given and to be given to me by the eThekwini City Council, as aforesaid, I hereby indemnify the said Council and its officers and hold it and them harmless against and hereby waive, renounce and abandon any claim for damages or compensation arising from injury or loss which I may sustain whilst on Council property or transport or on the way to or from any Council property or place of research or which I may sustain in any way whatsoever whilst conducting research.

I further indemnify the eThekwini Council and its officers against any claim whatsoever which may in any way result from the facilities afforded to me and be brought against the said Council or its officers.

[redacted]
Researcher's Signature

Date: 2013-06-07

Witness: [redacted]

JABULISILE R. CELE
Researchers Name (in capital letters)

Permanent Address:
15 ENTER PLACE
DURBAN 4091

Period From: 10 June 2013 to 30 June 2013

Appendix 6: Letter of information and consent for the midwives

Dear Participant

Welcome to my research study. Thank you for taking time to consider participating in my study.

Title of the Study: Assessment of the use of the new maternity case record in improving the quality of antenatal care in eThekwini District Kwa-Zulu-Natal

Principal Investigator/s: Ms R. J. Cele (Masters Student)

Supervisor: Dr MN Sibiya, D Tech: Nursing (Supervisor) and Ms TSP Ngxongo, M Tech: Nursing (Co-supervisor)

Briefly Introduction and Purpose of the Study

The high rate of maternal deaths has been an ongoing problem for most developing countries including South Africa. This resulted in the National Department of Health introducing the new maternity case record in year 2010 in order to improve the quality of care for pregnant women by ensuring that one universal /standardized record is used by all health professionals. The researcher intends to undertake a study to assess how the use of the new maternity case record is improving the quality of antenatal care.

Research design: You are requested to participate in an interview in order to assess your understanding of the new maternity case record. Interviews will last approximately 30-45 minutes.

Risks or Discomforts to the Subject: None

Benefits: Research findings will provide you with information to identify the gaps with the use of the new maternity case records which will assist in facilitating a better understanding of how to use the new maternity case record more effectively.

Reason why the Subject May Be Withdrawn from the Study: Participation is voluntary and by consent only. You may withdraw at any time and will not be penalized should you choose to withdraw.

Remuneration: None

Costs of the Study: None

Confidentiality: All data collected will be kept confidential and will only be used for the purpose of the study only. All data collection tools will be identified with numbers so that there will be link between the information and the subject's identity. Paper based data will be kept under lock and key and electronic data secured with private pass word for a maximum period of 15 years. All paper based records will thereafter be destroyed with shredding and electronic data wiped off.

Research-related Injury: The study does not pose any risk of injury.

Persons to Contact in the Event of Any Problems or Queries:

Researcher:	Ms RJ Cele	Lancers Road Clinic	Tel: 031-307 7023
Supervisor:	Dr MN Sibiya	Durban University of Technology	Tel: 031-373 2606
Co-supervisor:	Ms TSP Ngxongo	Durban University of Technology	Tel: 031-373 2609

Institutional Research Ethics administrator on Tel: 031-373 2900.

Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031-373 2382 or dvctip@dut.ac.za.

Statement of agreement to participate in the research study

(I,……subject's full name……..…, ID number……., have read this document in its entirety and understand its contents. Where I have had any questions or queries, these have been explained to me by ……..to my satisfaction. Furthermore, I fully understand that I may withdraw from this study at any stage without any adverse consequences and my future health care will not be compromised. I, therefore, voluntarily agree to participate in this study.

Subject's name (print) ……..…

Subject's signature:…….…….. Date:……..…

Researcher's name (print) signature: ……..……...

Researcher's signature:……..……..Date:.....

Witness name (print) signature: ……...

Witness signature: …….....Date:…….….

Appendix 7a: Letter of information and consent for pregnant women (English)

Dear Owner of the clinic card

Welcome to my research study. Thank you for taking time to consider agreeing that your clinic card be used in the study.

Title of the Study: Assessment of the use of the new maternity case record in improving the quality of antenatal care in eThekwini District Kwa-Zulu-Natal

Principal Investigator/s: Ms R. J. Cele (Masters Student)

Supervisor: Dr MN Sibiya, D Tech: Nursing (Supervisor) and Ms TSP Ngxongo, M Tech: Nursing (Co-supervisor)

Briefly Introduction and Purpose of the Study

The white card that is being used to record the care that you are receiving at the clinic is new. It was introduced in 2010 by the national Department of Health in an attempt to improve the quality of care for the pregnant women. I intend to undertake a study to assess how the use of this new card is improving the quality of the care for the pregnant women.

Research design: I am requesting your permission to review your clinic card in order to establish how the nurses at the clinic are recording on the card and also to check whether they are recording appropriately. I will review your card during one of the days when you are attending your scheduled antenatal care visit and will return the card back to you on the same day.

Risks or Discomforts to the Subject: None

Benefits: Research findings will provide the nurses at your clinic with information to identify the gaps with the use of the new maternity case records which will assist in facilitating a better understanding of how to use the new maternity case record more effectively. This will assist in improving your care at the clinic.

Reason why the Subject May Be Withdrawn from the Study: Participation is voluntary and by consent only. You may refuse to give permission for your card to be reviewed or stop the researcher to continue reviewing your card at any point.

Remuneration: None

Costs of the Study: None

Confidentiality: All the information gathered from your card will be kept confidential and will only be used for the purpose of the study only. All paper sheets that will be used to record the information from

your card will be identified with numbers so that there will be link between the information and the owners of the cards. All the paper sheets that contain the information from the study will be kept under lock and key and electronic information generated from the study will be secured with private pass word for a maximum period of 15 years. All paper based records will thereafter be destroyed with shredding and electronic information wiped off.

Research-related Injury: The study does not pose any risk of injury.

Persons to Contact in the Event of Any Problems or Queries:

Researcher: Ms RJ Cele	Lancers Road Clinic	Tel: 031-307 7023
Supervisor: Dr MN Sibiya	Durban University of Technology	Tel: 031-373 2606
Co-supervisor: Ms TSP Ngxongo	Durban University of Technology	Tel: 031-373 2609
Institutional Research Ethics administrator on		Tel: 031-373 2900

Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031-373 2382 or dvctip@dut.ac.za.

Statement of agreement to participate in the research study

I ,…… (*Owner of the card's full name)*……..…. (*ID number*), have read this document in its entirety and understand its contents. Where I have had any questions or queries, these have been explained to me by ……..to my satisfaction. Furthermore, I fully understand that I may withdraw from this study at any stage without any adverse consequences and my future health care will not be compromised. I, therefore, voluntarily agree to participate in this study.

Owner of the card's name (print)
……..…….

Owner of the card's signature: ……. Date: ……..…

Researcher's name (print):
……..…….

Researcher's signature: ……..……. Date :.....

Witness name (print):
…….

Witness signature: ……..... Date: ……..…

Appendix 7b: Letter of information and Consent for pregnant women (Isizulu)

Incwadi yolwazi nemvume yokucwaningwa kwekhad likamama okhulelwe

Mnikazi Wekhadi othandekayo

Ngiyakwamukela kulolucwaningo lwami. . Ngiyabonga ngokuthatha kwakho ithuba lokubhekelela ukunikeza imvume yokuthi ikhadi lakho licutshungulwe kulolucwaningo

Isihloko socwaningo: Ukucubungulwa kokusetshenziswa kwekhadi elisha ekuthuthukuseni izinga lokunakelelwa komama abakhulelwe eThekwini esifundazweni sakwa -Zulu-Natal

Umcwaningi Omkhulu: Nkosazana R. J. Cele (Umfundi weMastazi)

Abambhekile: Udokotela MN Sibiya, D Tech: Nursing (*Umeluleki*) kanye noNkosikazi TSP Ngxongo, M Tech: Nursing (*Umlekeleli kameluleki*)

Isingeniso esifishane kanye nenhloso yocwaningo

Ikhadi elimhlophe elisetshenziswa ukushicilela ukunakekelwa okutholwa abesivazane abakhulelwe emtholampilo lisha. Laqalwiswa umnyango wezempilo ka zwelonke ngonyaka ka-2010 ngenhloso yokuthuthukisa izinga lokunakekelwa komama abakhulelwe emtholampilo. Nginesifiso sokwenza ucwaningo ukubheka ukuthi ukusetshenziswa kwalelikhadi elisha lilithuthukisa kanjani izinga lokunakekelwa komama abakhulelwe

Uhlobo Locwaningo: Ngicela imvume yakho ukuthi ngicubungule ikhadi lakho ngenhloso yokuthola ukuthi abahlengikazi basemtholampilo wakho babhala kanjani ekhadini lakho nokuthi babhala ngendlela efanele yini. Ikhadi lakho ngiyolicubungula ngosuku oluluhlelelwe oyobe uvakashele ngalo emtholampilo futhi ngiyolibuyisela kuwe ngalo lolosuku

Ubungozi nokuhlukumezeka kwabangenele ucwaningo: Abukho

Inzuzo: Imiphumela yocwaningo iyonikeza abahlengikazi emtholampilo wakho ulwazi lokuthola izikhala ekusebenzisweni kwalelikhadi elisha lokhu okuyosiza ekuthuthukiseni ulwazi oluncono lokuthi bangalisebenzisa kanjani lelikhadi elisha ngendlela enempumelelo. Loku kuyothuthukisa izinga lempatho oyitthola emtholampilo.

Isizathu esengenza ungenele ucwaningo ahoxe: Ukusetshenzinswa kwekhadi ngesikhathi socwaningo kuyokuba ngemvume nangokuzinikela kongumnikazi wekhadi kuphela. Ungakwazu ukunqaba ukunikeza imvume yokuthi ikhadi lakho licutshungulwe noma ukumisa ukuthi umcwaningi aqhubeke nokucubungula ikhadi lakho kunoma iliphi izinga locwaningo.

Inkokhelo: Ayikho

Ukubiza kocwaningo: Akukho

Imfihlo: Yonke imininingwane ngokucubungula kwekhadi lakho iyogcinwa ngendlela eyimfihlo futhi iyosetshenziselwa ngenhloso yalolucwaningo ukuphela. Wonke amaphepha ayobe esetshenziswe ukubhala imininingwane ephume kwikhadi lakho ayohlukaniswa ngezinombolo ukuze kungabi khona ukuxhumana phakathi kweminingwne equkethwe kulamaphepha kanye nawe njengomnikazi wekhadi. Wonke amaphepha aqukethe imininigwane ayogcinwa endaweni ekhiyiwe kuthi imininingwane eqokelelwe kwisiqoqemazwi (khompuyutha) igcinwe ngekhodi eyimfihlo.isikhathi esingeqile eminyakeni eyishumini nesihlanu. Wonke amapheshana aqukethe imininigwane ayoshabalaliswa ngokuqotswa bese kuthi imininingwane equkethwe kwisiqoqelamazwi (khompuyutha) acishwe

Ukulimala okuphathelene nocwaningo: Ucwaningo alukubeki engozini yokulimala njengomnikazi wekhadi.

Abantu okungaxhunyanwa nabo uma kunenkinga kumbe imibuzo:

Umcwaningi: Nkosazana RJ Cele Emtholampilo waseLancers Road Ucingo: 031-307 7023

Umbhekeleli: Udokotela MN Sibiya Durban University of Technology Ucingo: 031-373 2606

Osizana nombhekeleli: Nkosikazi TSP Ngxongo Durban University of Technology Ucingo : 031-373 2609

Isikhungo sokuphathwa nokuhlelwa kocwaningo Ucingo: 031-373 2900.

Izikhalazo zingathulwa kwi DVC: TIP, Prof F. Otieno kulenombolo 031-373 2382 noma dvctip@dut.ac.za.

Umusho wesivumelwano sokucubungulwa kwekhadi lasemtholampilo

Mina……*igama longunikazi wekhadi*, *Inombolo kamazisi*……,ngifundile futhi ngaqondisisa konke okuqukethwe ileliphephabhuku lapho benginemibuzo nokungaqondisisi khona , konke lokhu ngichazelwe kona ngunkosazana **R.J. Cele** ngendlela enganelisayo Futhi, ngiyaqonda ngokugcwele ukuthi ngingakwazi ukummisa umcwaningi ukuba aqhubeke nokusebenzisa ikhadi lami kunoma iliphi izinga locwaningo ngaphandle kokuhlukumezeka futhi nangaphandle koku thikamezeka kwekusasa lempilo yami. Ngalokhoke, mina, ngokwami ngiyavuma ukuthi ikhadi lami licutshungulwe kulolucwaningo .

Igama lomnikazi wekhadi: …… …… *(bhala ngokuhlukanisa)*

Isishicilelo somnikazi wekhadi :……..Usuku :……..…

Igama lomcwaningi…… *(bhala ngokuhlukanisa*)

Isishicilelo somcwaningi :……..Usuku: .....

Igama likafakazi…… *(bhala ngokuhlukanisa)*

Isishicilelo sikafakazi: …….....Usuku :……..

Appendix 8: Checklist for the record review

Facility-No: ---------- **Date----------**

	CARD NUMBERS																				
CRITERIA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Total**
Gestational age at booking(wks)																					
History																					
Age, Parity, Gravida																					
History previous pregnancy																					
Previous illness																					
History present pregnancy																					
LNMP EDD																					
Plotting of gestation at 1st visit																					
Examination																					
Maternal height and weight																					
BP(each visit)																					
Heart examination																					
Correct plotting of SFH																					
Presence of IUGR detected																					
Fetal presentation(from 34 wks)																					
Fetal heart and movements																					
Urinalysis																					
Hb, Rh																					
Syphilis test results																					
HIV counseled																					
Interpretation and decisions																					
Identification/recording of risks																					

Action plan and interventions																					
Tetanus Toxoid given																					
Discussion of labour with mother																					
Transport arrangements																					
Family planning																					
1st and 32 week visits countersigned																					
Referral																					
Feedback																					
Diagnostic tests and procedures																					
Management plan																					
Date of next visit																					

Appendix 9: Interview guide for the midwives

Date---------- Facility no: Participant no:

Demographic data

Age ---------- Gender----------

Race ---------- Work experience--------

---

1. Grand tour question

In your opinion how has the introduction of the new maternity case record influenced ANC services?

2. Guided Tour Questions

2.1 How has the new maternity case record influenced referral of antenatal clients to and from other health services?

2.2 In your opinion, how has the maternity case record influenced communication between health care providers?

2.3 In your opinion, state the improvement of antenatal care with use of then new maternity case record?

2.4 How does the new maternity case record influence identification of risk factors for pregnant women?

2.5 What is your opinion regarding the use of the new maternity record as a maternity case record as a recording document f? Comment on design and space available for writing

2.6 What challenges have are you experiencing with the use of the maternity case record?

NB The questions will be supported and guided by probing whenever necessary

Appendix 10: Report of the statistical analysis

Gestational age at booking(wks)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

History

Age, Parity, Gravida					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

History previous pregnancy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Previous illness					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

History present pregnancy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	298	99.3	99.3	99.3
	no	2	.7	.7	100.0
	Total	300	100.0	100.0	

LNMP EDD					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Plotting of gestation at 1st visit					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	245	81.7	81.7	81.7
	no	55	18.3	18.3	100.0
	Total	300	100.0	100.0	

History present pregnancy			
	Observed N	Expected N	Residual
yes	298	150.0	148.0
no	2	150.0	-148.0
Total	300		

Plotting of gestation at 1st visit			
	Observed N	Expected N	Residual
yes	245	150.0	95.0
no	55	150.0	-95.0
Total	300		

Test Statistics		
	History present pregnancy	Plotting of gestation at 1st visit
Chi-Square	292.053[a]	120.333[a]
df	1	1
Asymp. Sig.	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 150.0.

Examination

Maternal height					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	245	81.7	81.7	81.7
	no	55	18.3	18.3	100.0
	Total	300	100.0	100.0	

Weight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

MUAC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	172	57.3	57.3	57.3
	no	128	42.7	42.7	100.0
	Total	300	100.0	100.0	

BMI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	196	65.3	65.3	65.3
	no	104	34.7	34.7	100.0
	Total	300	100.0	100.0	

BP(each visit)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	299	99.7	99.7	99.7
	no	1	.3	.3	100.0
	Total	300	100.0	100.0	

Heart examination

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	297	99.0	99.0	99.0
	no	3	1.0	1.0	100.0
	Total	300	100.0	100.0	

Correct plotting of SFH

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	277	92.3	92.3	92.3
	no	23	7.7	7.7	100.0
	Total	300	100.0	100.0	

Presence of IUGR detected					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	299	99.7	99.7	99.7
	no	1	.3	.3	100.0
	Total	300	100.0	100.0	

Fetal presentation(from 34 wks)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	287	95.7	95.7	95.7
	no	13	4.3	4.3	100.0
	Total	300	100.0	100.0	

Fetal heart and movements					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	296	98.7	98.7	98.7
	no	4	1.3	1.3	100.0
	Total	300	100.0	100.0	

Urinalysis					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Hb, Rh					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	293	97.7	97.7	97.7
	no	7	2.3	2.3	100.0
	Total	300	100.0	100.0	

Syphilis test results					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	277	92.3	92.3	92.3
	no	23	7.7	7.7	100.0
	Total	300	100.0	100.0	

HIV counseled					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Tetanus toxoid given					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	284	94.7	94.7	94.7
	no	16	5.3	5.3	100.0
	Total	300	100.0	100.0	

Chi-square goodness of fit test results

Maternal height			
	Observed N	Expected N	Residual
yes	245	150.0	95.0
no	55	150.0	-95.0
Total	300		

Weight			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

MUAC			
	Observed N	Expected N	Residual
yes	172	150.0	22.0
no	128	150.0	-22.0
Total	300		

BMI			
	Observed N	Expected N	Residual
yes	196	150.0	46.0
no	104	150.0	-46.0
Total	300		

BP (each visit)			
	Observed N	Expected N	Residual
yes	299	150.0	149.0
no	1	150.0	-149.0
Total	300		

Heart examination			
	Observed N	Expected N	Residual
yes	297	150.0	147.0
no	3	150.0	-147.0
Total	300		

Correct plotting of SFH			
	Observed N	Expected N	Residual
yes	277	150.0	127.0
no	23	150.0	-127.0
Total	300		

Presence of IUGR detected			
	Observed N	Expected N	Residual
yes	299	150.0	149.0
no	1	150.0	-149.0
Total	300		

Test Statistics							
	Maternal height	MUAC	BMI	BP(each visit)	Heart examination	Correct plotting of SFH	Presence of IUGR detected
Chi-Square	120.333[a]	6.453[a]	28.213[a]	296.013[a]	288.120[a]	215.053[a]	296.013[a]
df	1	1	1	1	1	1	1
Asymp. Sig.	.000	.011	.000	.000	.000	.000	.000
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 150.0.							

Fetal presentation(from 34 wks)			
	Observed N	Expected N	Residual
yes	287	150.0	137.0
no	13	150.0	-137.0
Total	300		

Fetal heart and movements			
	Observed N	Expected N	Residual
yes	296	150.0	146.0
no	4	150.0	-146.0
Total	300		

Urinalysis			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Hb, Rh			
	Observed N	Expected N	Residual
yes	293	150.0	143.0
no	7	150.0	-143.0
Total	300		

Syphilis test results			
	Observed N	Expected N	Residual
yes	277	150.0	127.0
no	23	150.0	-127.0
Total	300		

HIV counseled			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Tetanus toxoid given			
	Observed N	Expected N	Residual
yes	284	150.0	134.0
no	16	150.0	-134.0
Total	300		

Test Statistics					
	Fetal presentation(from 34 wks)	Fetal heart and movements	Hb, Rh	Syphilis test results	Tetanus toxoid given
Chi-Square	250.253[a]	284.213[a]	272.653[a]	215.053[a]	239.413[a]
df	1	1	1	1	1
Asymp. Sig.	.000	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 150.0.

Interpretation and Decisions

Identification/recording of risks					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Action plan andinterventions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Discussion of labour with mother					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	249	83.0	83.0	83.0
	no	51	17.0	17.0	100.0
	Total	300	100.0	100.0	

Transport arrangements					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	266	88.7	88.7	88.7
	no	34	11.3	11.3	100.0
	Total	300	100.0	100.0	

Family planning					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	298	99.3	99.3	99.3
	no	2	.7	.7	100.0
	Total	300	100.0	100.0	

1st and32 week visits countersigned					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Referral					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	153	51.0	51.0	51.0
	no	147	49.0	49.0	100.0
	Total	300	100.0	100.0	

Feedback					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	101	33.7	33.7	33.7
	no	199	66.3	66.3	100.0
	Total	300	100.0	100.0	

Diagnostic tests and procedures					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Management plan					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Date of next visit					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	300	100.0	100.0	100.0

Chi-square goodness of fit results

Identification/recording of risks			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Action plan andinterventions			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Discussion of labour with mother			
	Observed N	Expected N	Residual
yes	249	150.0	99.0
no	51	150.0	-99.0
Total	300		

Transport arrangements			
	Observed N	Expected N	Residual
yes	266	150.0	116.0
no	34	150.0	-116.0
Total	300		

Family planning			
	Observed N	Expected N	Residual
yes	298	150.0	148.0
no	2	150.0	-148.0
Total	300		

1st and32 week visits countersigned			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Referral			
	Observed N	Expected N	Residual
yes	153	150.0	3.0
no	147	150.0	-3.0
Total	300		

Feedback			
	Observed N	Expected N	Residual
yes	101	150.0	-49.0
no	199	150.0	49.0
Total	300		

Diagnostic tests and procedures			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Management plan			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Date of next visit			
	Observed N	Expected N	Residual
yes	300	300.0	.0
Total	300[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Test Statistics					
	Discussion of labour with mother	Transport arrangements	Family planning	Referral	Feedback
Chi-Square	130.680[a]	179.413[a]	292.053[a]	.120[a]	32.013[a]
df	1	1	1	1	1
Asymp. Sig.	.000	.000	.000	.729	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 150.0.

Bivariate analysis

Facility by Maternal height

Crosstab				
Count				
		Maternal height		
		yes	no	Total
facility number	1	50	0	50
	2	50	0	50
	3	0	50	50
	4	50	0	50
	5	50	0	50
	6	45	5	50
Total		245	55	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	269.944[a]	5	.000
Likelihood Ratio	253.338	5	.000
Linear-by-Linear Association	1.189	1	.276
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.17.

Facility by MUAC

Crosstab				
Count				
		MUAC		
		yes	no	Total
facility number	1	45	5	50
	2	36	14	50
	3	0	50	50
	4	36	14	50
	5	29	21	50
	6	26	24	50
Total		172	128	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	98.383[a]	5	.000
Likelihood Ratio	121.049	5	.000
Linear-by-Linear Association	7.450	1	.006
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.33.

Facility by BMI

Crosstab				
Count				
		BMI		
		yes	no	Total
facility number	1	45	5	50
	2	36	14	50
	3	0	50	50
	4	44	6	50
	5	37	13	50
	6	34	16	50
Total		196	104	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	121.801[a]	5	.000
Likelihood Ratio	138.726	5	.000
Linear-by-Linear Association	.080	1	.777
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.33.

Facility by correct plotting of SFH

Crosstab				
Count				
		Correct plotting of SFH		
		yes	no	Total
facility number	1	44	6	50
	2	46	4	50
	3	43	7	50
	4	50	0	50
	5	49	1	50
	6	45	5	50
Total		277	23	300

Chi-Square Tests						
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	10.972[a]	5	.052	.055		
Likelihood Ratio	14.953	5	.011	.019		
Fisher's Exact Test	12.060			.024		
Linear-by-Linear Association	1.774[b]	1	.183	.206	.103	.021
N of Valid Cases	300					
a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 3.83.						
b. The standardized statistic is -1.332.						

Facility by Foetal presentation (from 34 weeks)

Crosstab				
Count				
		Fetal presentation(from 34 wks)		
		yes	no	Total
facility number	1	49	1	50
	2	50	0	50
	3	44	6	50
	4	50	0	50
	5	48	2	50
	6	46	4	50
Total		287	13	300

Chi-Square Tests						
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	13.910[a]	5	.016	.017		
Likelihood Ratio	15.870	5	.007	.011		
Fisher's Exact Test	11.722			.011		
Linear-by-Linear Association	1.546[b]	1	.214	.249	.124	.031
N of Valid Cases	300					
a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 2.17.						
b. The standardized statistic is 1.243.						

Facility by Tetanus toxoid given

Crosstab				
Count				
		Tetanus toxoid given		
		yes	no	Total
facility number	1	50	0	50
	2	50	0	50
	3	35	15	50
	4	50	0	50
	5	49	1	50
	6	50	0	50
Total		284	16	300

Chi-Square Tests						
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	72.623[a]	5	.000	.000		
Likelihood Ratio	54.039	5	.000	.000		
Fisher's Exact Test	43.627			.000		
Linear-by-Linear Association	.812[b]	1	.367	.412	.206	.040
N of Valid Cases	300					
a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 2.67.						
b. The standardized statistic is -.901.						

Facility by discussion of labour with mother

Crosstab				
Count				
		Discussion of labour with mother		
		yes	no	Total
facility number	1	44	6	50
	2	48	2	50
	3	32	18	50
	4	42	8	50
	5	42	8	50
	6	41	9	50
Total		249	51	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.773[a]	5	.001
Likelihood Ratio	19.630	5	.001
Linear-by-Linear Association	1.068	1	.301
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.50.

Facility by Transport arrangements

Crosstab				
Count				
		Transport arrangements		
		yes	no	Total
facility number	1	48	2	50
	2	46	4	50
	3	30	20	50
	4	48	2	50
	5	48	2	50
	6	46	4	50
Total		266	34	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.022[a]	5	.000
Likelihood Ratio	38.619	5	.000
Linear-by-Linear Association	.555	1	.456
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.67.

Facility by Feedback

Crosstab				
Count				
		Feedback		
		yes	no	Total
facility number	1	9	41	50
	2	25	25	50
	3	15	35	50
	4	18	32	50
	5	15	35	50
	6	19	31	50
Total		101	199	300

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.613[a]	5	.027
Likelihood Ratio	12.905	5	.024
Linear-by-Linear Association	.675	1	.411
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.83.