

**THE EFFECT OF INVOLVING THE PRIVATE PRACTITIONERS ON THE
QUALITY OF ANTENATAL CARE OF THE INDIGENT POPULATION OF
TEMBISA.**

A Dissertation by

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DECLARATION

I declare that this dissertation, which I submit for the degree for the Masters of Science in Clinical Midwifery Nursing Science at the University of Pretoria, is my own work and has not been presented previously to any other tertiary institution for any degree.

ACKNOWLEDGEMENTS AND DEDICATION

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KEY WORDS

- **Antenatal Care**
- **Antenatal card**
- **Pregnancy Confirmation**
- **Quality care**
- **Health care Services**
- **Perinatal**
- **Maternal**
- **Problem Identification**
- **Record keeping**
- **Pregnancy outcome**



LIST OF ABBREVIATIONS

ABBREVIATION	FULL WORD
PGPG	Private General Practitioner Group
PSHCWG	Public Sector Health Care Workers Group.
MQCARS	Modified Quality Care Antenatal Records Score
SF	Symphisis Fundus
EDD	Expected date of Delivery
NDOH	National Department of Health
PGP	Private General Practitioner
PSHCW	Public Sector Health Care Worker
PSC	Public Sector Clinic
PS	Public Sector
DOH	Department of Health
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
HCW	Health Care Worker

ABSTRACT

TITLE

The effect of involving the private practitioners on the quality of antenatal care of the indigent population of Tembisa.

INTRODUCTION.

The perinatal mortality rate is of concern worldwide. In South Africa at the time of the study, 2000, it was estimated to be of the order of 40/1000 live births. However in the setting in which this study took place, namely Tembisa, (Ekurhuleni, Gauteng, South Africa) it was said to be 50/1000 live births. One of the patient- related avoidable factors that has been found to be associated with perinatal and to a lesser extent maternal mortality, is either no, or late initiation of antenatal care. It has been found in an area which, is in many respects similar to Tembisa that 50% of women go the private general practitioner (PGP) for confirmation of pregnancy but, due of lack of funds, do not continue care with the private practitioner but, initiate care in the public sector and in a proportion of these women, this is at an advanced gestational age, making it difficult to prevent or intervene if there are problems in the pregnancy. As (PGP's) are well placed in the district to render antenatal care, it was decided to perform a study looking at the effect of involving them in the antenatal care of women who presented to them for confirmation of pregnancy.

METHODS

Sixteen general practitioners agreed to be part of the study. The women who confirmed their pregnancy and who were going to deliver in Tembisa hospital were included in the study after giving written informed consent. They comprised the intervention group, the first antenatal visit was performed, the findings were recorded on the antenatal card which is used in the public sector and which was introduced to the private practitioner at 2 workshops held by the Department of Obstetrics and Gynaecology, University of Pretoria prior to the study. The woman was then to attend antenatal care with the private practitioner until delivery. The private general practitioners waived the costs normally associated with this care for the period of the study. The control group consisted of the women who confirmed their pregnancies in

the public health care sector known as the public service health care workers group (PSHCWG). Data collection took place in the postnatal ward of Tembisa hospital over the period of 3 months. By means of systematic sampling, 100 cards from the PGPG and 100 cards from the PSHCWG were obtained. The 2 groups were compared with respect to gestational age at initiation of care and a modified version of the Quality Check for Antenatal Records Score (MQCARS), an audit score which, when applied to the antenatal card, gives a measure of the effectiveness of record keeping, and whether problems in the antenatal period are detected and appropriately managed.

RESULTS.

There was a statistically significant difference between the two groups in terms of gestational age at initiation of care [PGPG mean gestational age -19.96 (5.86), PSHCW 25.96(5.98,) $p < 0.0001$]. The majority of women in the PGPG initiated care in the 2nd trimester (79%) while the majority of the women in the PSHCWG (53%) confirmed their pregnancies in the third trimester. Six per cent of PGPG confirmed their pregnancies in the first trimester compared to the PSHCWG (3%).

The two groups differ significantly with respect to the total MQCARS with the PGPG group performing better [(8.16 (1.55) vs. 16.34(2.58), $p < 0.0001$]. The associated sub- scores are statistically different [History score 5.99 (0.10) vs.7 (0.96), Examination score 9.59(1.29) vs.8.03 (1.85) Interpretation Score 2.55(0.50) vs.2.80 (0.49)].

CONCLUSION

Despite the limitations of the study it is felt that if private general practitioners in Tembisa are involved in the antenatal care of those women who confirm their pregnancies with them, there is a reduction in the gestational age at initiation of care.

There is a small difference between the two groups in record keeping, detection and management of problems.



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DEFINITIONS



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CHAPTER 1.

INTRODUCTION AND OVERVIEW.

1.1 INTRODUCTION.

This chapter deals with the background and rationale of the research problem, aims and objectives of the study, the research method which includes the study design, population, the setting in which the study took place, sampling and procedures. Data analysis is then discussed followed by study limitations, validity and reliability. Ethical procedures are also covered and finally an outline of the dissertation is given.

1.2 BACKGROUND, LITERATURE SURVEY AND RATIONALE TO THE PROBLEM.

Provision of antenatal care is considered to be the cornerstone and a major strategy for improving maternal and perinatal health care but most pregnant women do not seem to realize it. (Hogue, Hogue & Kader, 2008:66). It is suggested that if antenatal care is rendered early to women and subsequent visits are sustained, maternal and perinatal mortality tend to decrease and this leads to improved maternal health and a better pregnancy outcome. Women also get time for healthy adaptation to emotional and physical changes, which, in turn promotes successful childbirth and parenting. Maternal health and normal fetal development should be improved by monitoring and support of the women throughout the pregnancy (De Kock & Van der Walt 2004:9-2).

Cunningham and others have suggested that once the pregnancy is confirmed and the woman wants to continue with the pregnancy, antenatal care should be initiated immediately (Cunningham, McDonald, Leveno, Gant & Gilstrap, 1993:250). According to the Guidelines for Maternity Care in South Africa, when the woman thinks that she is pregnant, she should immediately confirm her pregnancy and initiate antenatal care. This can be, as soon as the woman misses her first menstrual period, as early as 4 and 5 weeks of gestation if possible, so urine pregnancy tests should be available at all health care facilities for confirmation of pregnancy (Department of Health Guidelines for Maternity Care in South Africa 2002:19).

The perinatal mortality remains a concern worldwide and it is seen as the most sensitive indicator of the quality of obstetric care. It has been noted that in developed countries, the perinatal mortality rate is below 6/1000 births calculated from 24 weeks of gestation, yet in developing countries, it still remains high at about 200/1000 births (National Department of Health 2001:4). In South Africa, the perinatal mortality rate at the time of this study (2000) estimated at 40/1000 births calculated from 28 weeks of gestation (NDOH 2001:4). Tembisa Township where this study took place is situated in Gauteng province. In Tembisa, the perinatal mortality rate was 50/1000 (Tshabalala 2000), this figure was very high, almost twice that of the secondary referral hospital for Tembisa district hospital (29/1000 deliveries) and higher than the countrywide perinatal mortality rate mentioned above (National Department of Health 2001:4). This was of great concern to the private general practitioners in this area.

Late initiation or no antenatal care and delay in seeking help during labour were identified as the patient avoidable factors associated with perinatal mortality in fact this was noted to be one of the top five contributors to the perinatal deaths (Saving Mothers 1999-2001:9).

According to the Saving Mothers report (1999-2001:9), 54% of avoidable factors were patient related and that 44% of these factors related to delayed, insufficient or no antenatal care. Of the health care provider - related avoidable factors 54% was due to the failure of the health care providers to manage patients at the appropriate level of care, lack of the identification of problems such as hypertension, diabetics, anaemia, cardiac diseases and syphilis that could be managed successfully during pregnancy. Clearly, factors such as poor initial assessment, misdiagnosis and delay in referral to a higher level of care exacerbate the problem. Failure of the health care providers to follow the set standards of care at primary and secondary levels of care may also contribute to the problems (Saving Mothers 1999-2001:14).

While there are guidelines in place and the fact that in South Africa, services for pregnant women are free, they are not always utilized. Due to lack of transport, cultural beliefs, poverty, lack of access to the services and fear of poor services, women fail to arrive early to attend the antenatal care clinics as expected. Other factors that prevent women from utilizing public health services is that there is shortage of staff which leads to long waiting hours before the women is examined (Jewkes, Abrahams & Mvo 1998: 8).

In a study done in the Atteridgeville area (Tshwane, South Africa), it was however found, that 50% of women confirmed their pregnancies at the private general practitioners (PGP's) as early as after missing the first menstrual period or when they suspected that they were pregnant. After consultation however, they were referred to initiate and continue with antenatal care at the public sector clinics (PSC's). In this study, although confirmation of the pregnancy occurred at an average gestational age of 12 weeks, initiation of antenatal care only took place at an average age of 22 weeks of gestation. This delay may lead to the failure to identify the potential problems early on in the pregnancy, mismanagement of patients and thus potentially contributing to increased perinatal mortality (Mabale, Kgoebane, Tsuari, Pattinson & Makin 1998:22).

The need for attending antenatal care early was confirmed by the study done in the same area as the above study. Here a pregnancy confirmation clinic was set up so that the women could not only confirm their pregnancies but could at the same time, initiate antenatal care. The average gestational age of attendance at this clinic was found to be 12 weeks. Even at this early gestational age, treatable conditions such as syphilis and other sexually transmitted diseases, urinary tract infections, anaemia, hypertension and diabetic mellitus which, all could have influenced the pregnancy outcome, were detected and managed. This golden opportunity to intervene early in pregnancy could have been missed if the women had come late for antenatal care. It was also shown in this study that it was possible to move the mean gestational age from 22 weeks to 12 weeks of gestation (Jeffery, Tsuari, Pistorius, Makin & Pattinson 2000:155). This is also the only record of an intervention to attempt to address the problem of late initiation of care that could be found in the literature.

Another factor, which has potential impact on perinatal mortality, is poor record keeping. It may result in non- recognition by the health care workers of potentially treatable problems in the antenatal period. In the National Department of Health (2001:8) report, failure by the health care workers to respond appropriately to the identified problems was an avoidable factor contributing to perinatal mortality. In the Saving Mothers report, 34.1% of deaths, where there were avoidable factors, could be attributed to problems with recognition and diagnosis (Saving Mothers 1999-2001:12).

The antenatal cards (Appendix F) are designed to facilitate systematic recording of all that is done thus improving record keeping. The use of a checklist ensures that all women have been

given all the attention needed for their visits. The early detection of potential problems should lead to a suitable response to the identified problems and thus potentially decrease complications. Antenatal cards act as good instruments for recording all that has been done at each visit and a good map to guide all the caregivers with the relevant information as to what is going on with a particular woman (Gauteng Department of Health Policy Document 2000:6).

Well-completed records for all pregnant women serve as a communication tool between different health care providers especially when a woman is supposed to be referred to a higher level of care. Records should be filled in at each visit and the woman should be given a well-completed antenatal card with all the pregnancy data, which she keeps during the pregnancy. Well-kept records serve to capture statistics and when audited by means of the Quality Check for Antenatal Records as developed by Voce and Philpot, can be used for an assessment of the quality of care (Pattinson, 2007:11).

In the normal care of women these antenatal cards are issued at the first antenatal visit and brought back to the clinic to be completed at every subsequent visit. The woman is requested to bring her card to the hospital when going into labour. This antenatal card is then included in the women's records as a summary of her antenatal care. Antenatal cards were only used in the PSC's and not utilized by PGP's in Tembisa before the commencement of this study.

Tembisa is situated in the greater Ekurhuleni area. It comprises approximately 20 settlements. The PGP's are evenly distributed throughout and approximately 1 to 2 of them renders health care in one settlement. The public service (PS) has eight feeder clinics including one in the hospital where antenatal care is provided. One clinic thus caters for about 5 to 6 settlements (Georgiva 2000).

As previously mentioned there was at the time (2000) concern regarding the high perinatal mortality rate in the Tembisa area. At a meeting called by the Tembisa Khalipa Private General Practitioners Association, a desire to assist in bringing down the perinatal mortality rate was expressed by the members (Tshabalala 2000). It was felt that the area where they could make a contribution was that of the women who confirm their pregnancies early with them, but because of lack of funds attend antenatal care in the PS thereafter. They indicated that the practice of confirming early was similar to that described in the study by Mabale et

al. (1998: 23). They volunteered to be involved in antenatal care of these women and this study was conceived to measure the effect of their involvement. It was felt that the effect might be on the potential reduction in the gestational age at initiation of care and so conditions likely to affect the pregnancy would be identified early and managed. This would in the long run have an impact on maternal and perinatal mortality. The other aspect that might be addressed by this involvement, was the quality of record keeping as it was thought that this might be better in the private general practitioner group (PGPG) because of the nature of private practice where there are smaller numbers of people attending the PGP, where there is potentially more time to fill in the relevant information. This would also have an influence on the identification of problems during the pregnancy and subsequent management.

If the involvement of the private general practitioners in antenatal care was found to be effective, in that, there was a reduction in the gestational age at initiation of antenatal care, identification of potential problem during pregnancy and suitable response to the identified problems and an improvement in the quality of record keeping, this could possibly pave the way to a permanent partnership in antenatal care between the private and public sector.

1.3 AIMS OF THE STUDY.

1. To establish if indigent women who visit PGP's for confirmation of pregnancy, do so early in the pregnancy and, if antenatal care is initiated at this time, will this result in a lowering of the gestational age at booking, when compared to women who attend care in the public sector in Tembisa.
2. To establish if there will be better record keeping, detection and reaction to problems in the antenatal period when compared to that in the PS, if the PGP's provide antenatal care to such women.
3. To establish if there are any differences in outcomes of the pregnancy between the 2 groups.

1.3.1 OBJECTIVES OF THE STUDY.

1. To obtain from the antenatal card, the initial gestational age in both groups.
2. To score the antenatal cards using the Modified Quality Check for Antenatal Records.

3. To obtain from the birth register, information on the outcomes of the labour and postnatal period.

1.4 RESEARCH METHOD.

1.4.1 STUDY DESIGN.

A quasi-experimental study design was used to reach the purpose of this study. There were 2 aspects to the proposed intervention:

1. Sixteen PGP's from Tembisa agreed to provide ongoing antenatal care to indigent women who came for pregnancy confirmation. Antenatal care was to start at the pregnancy confirmation visit. The normal fees for this care were waived for the period of the study so this could take place.
2. The recording of the care provided was to be done on the same antenatal card as used for this purpose by public sector healthcare workers (PSHCW's) at the primary care clinics and district hospital. Training on the use of this card was to be provided to both PGP's and PSHCW's.

1.4.2 POPULATION AND SETTING.

The study population was all the women who gave birth at Tembisa Hospital during the months of August, September and October 2002. The intervention group consisted of women who had received antenatal care from the PGP's, the comparison group consisted of women who had received antenatal care from the PSC's. The setting for the study was Tembisa Hospital in Tembisa Township. Data collection took place in the postnatal ward at Tembisa District Hospital.

1.4.3 SAMPLING PROCEDURE AND SAMPLE SIZE.

Post- delivery all antenatal cards were placed in one of two suitcases depending where the women had received antenatal care - PSC or PGP.

The researcher used a systematic sampling technique to obtain a sample of antenatal cards of women. In this research this meant taking every 13th antenatal card from each suitcase. This was calculated as follows: -

A difference in gestational age between the private and public sector group of 6 weeks was considered to be clinically significant. In order to establish a statistically significant difference between the groups with an alpha value of 0.05 and a beta value of 0.2, 100 cards would be needed in each group. As there were approximately 870 deliveries at the hospital per month, over 3 months there would thus be approximately 2600 deliveries. It was assumed that about 50% of these women, as stated in a study by (Mabale et al 1998:22) would have had their pregnancies confirmed by private general practitioners. There would thus be approximately 1300 women in each group. In order to obtain 100 cards every 13th woman's antenatal card would then be included in the sample. In order to introduce some randomness into this sampling, the numbers 1 to 13 were put into a hat and the number drawn out of the hat was to be the first card to be included in the sample.

1.4.4 PROCEDURES.

1.4.4.1 PREPARATION FOR THE STUDY.

Obstetricians from the University of Pretoria held two workshops prior to the commencement of the study, in July and August 2000. The workshops were done because the private general practitioners were not very familiar with the use of antenatal cards, as they were not using them in their practice. The other reason for the workshop was to bring the entire group of health care providers who were involved in the study up to the same level of knowledge; as well as to supply the Guidelines for Maternity care in South Africa 2000 to all who attended the workshops. The importance of starting antenatal care, on confirmation of pregnancy was stressed, to try and eliminate the possible actions of PSHCW who might confirm the pregnancy but not initiate antenatal care immediately. Health personnel who attended the workshops included the private general practitioners, involved in the trial, obstetricians working in the District hospital, doctors from the hospital feeder clinics, midwives from the hospital and from the feeder clinics and managers from the hospital and maternity department as a whole.

1.4.4.2 PROCESS FOR PGPG.

Women who confirmed their pregnancies with the private general practitioners, once it was established that they wanted to continue with the pregnancy, were informed about the study

and a written informed consent was obtained. The initial antenatal visit was performed and documented on the antenatal card and the woman given follow-up date. The women were then requested to go to the hospital to obtain a hospital number and to have routine special investigations performed as per arrangement with Tembisa Hospital. At the following visit these results were entered onto the antenatal card by the PGP. All subsequent visits to the PGP women were to be managed according to the policy guidelines (DOH Guidelines for Maternity Care 2000:19) concerned. The antenatal cards were carried by the women and brought along at each visit for the doctor to fill in what was done. During the antenatal period if any complication occurred, the women were be referred to the hospital for further management.

1.4.4.3 PROCESS FOR PSHCWG.

These women followed the standard antenatal care protocol already established at the hospital and its feeder clinics. Women confirmed their pregnancies at the PSC and antenatal care then started as per the standard routine and according to policy guideline (DOH Guidelines for Maternity Care in South Africa 2000).

1.5 DATA COLLECTION.

All the information obtained from the antenatal card including gestational age at the initial antenatal visit, the scores and outcomes of labour obtained from the birth register were entered into an Excel spreadsheet.

The antenatal cards were scored according to the Quality Check for Antenatal Records guide (NDOH 2001: 76). Appendix H.

The scoring of the cards was done by 2 independent observers (the researcher and the principal investigator). When discrepancies were found between the scores obtained, these were discussed and resolved.

1.6 DATA ANALYSIS.

The Statistical Package for the Social Sciences (SPSS Inc, Chicago, IL, USA) Version 17 was used to analyse the data. An independent epidemiologist in the Department of Obstetrics and Gynaecology, University of Pretoria did this.

Descriptive statistics was used to describe the population (in the case of continuous data this was means and standard deviations and in the case of categorical data this was frequencies and percentages).

The 2 groups PGPG and PSHCWG were compared in terms of the main outcome measures for this study namely gestational age at initiation of care, and the score obtained from the Quality Check for Antenatal records making use Student t-tests for Independent Samples. A p value of less than 0.05 was considered statistically significant.

1.7 STUDY LIMITATIONS.

1. This was not a randomised controlled trial, which was the best way to say that an intervention works.

1.8 VALIDITY AND RELIABILITY OF STUDY.

1. Where this study falls down in terms of study validity may be in the determination of gestational age at initial visit. This could have been problematic if the woman was uncertain of the dates of her last menstrual period. If an ultrasound was performed before 20 weeks (based on uterine size) it was possible to get an accurate gestational age. However routine ultrasounds are not performed in the PSC setup and not many PGP's have these facilities and the women would have to pay for this anyway. After 22 weeks symphysis fundus measurement are used to determine gestational age.

2. External validity may be compromised in this study, as Tembisa is not necessarily representative of other urban townships. There are a large number of private enthusiastic private general practitioners. Gestational age at initiation may be different in different areas.

1.9 ETHICAL PROCEDURES.

The protocol was submitted to the Faculty of Health Sciences Research Ethics Committee in 2000 and permission to conduct the study was obtained - Ethics number IPA 23-95/2000. In order for this study to be registered for M Cur purposes, an amendment was submitted and approved on 24/10/2001. (Appendix A & B).

The relevant private practitioners obtained written informed consent for the women in PGP from those women who participated in the study. (Appendix F). No consent was obtained from those women in PSHCWG as they were receiving standard care.

Permission to access the information from the antenatal cards and birth register was obtained from the Director for Maternal and Child Health Gauteng Department of Health and the Chief Executive Officer of Tembisa Hospital. (Appendix C & D).

Storage of the photocopied antenatal cards was in a locked cabinet, no one else other than the researcher had access to them. No names or hospital numbers were recorded. Once the data had been entered, the photocopied forms were shredded.

1.10 OUTLINE OF THE DISSERTATION

The dissertation comprise of five chapters which divided as follows:

Chapter one covers the background relevant literature and rationale for the study with a discussion of the aims the study design, data analysis and ethical considerations

Chapter two covers the literature reviewed.

Chapter three discusses the research methodology.

Chapter four presents the results.

Chapter five deal with a discussion of the results and how they relate to findings of work in the literature, limitation of the study, conclusions and the recommendations.

CHAPTER 2

LITERATURE REVIEW.

2.1 INTRODUCITON.

In this chapter a literature review will be presented. The literature search was done using the following key words, “infant mortality, perinatal mortality, maternal mortality, prenatal care, gestational age patient acceptance of health care, ethics,” The database searched was Ovid Medline Year 1950- April 2009. The reference lists from any articles identified in this search were then examined to identify relevant articles. The Department of Health website (<http://www.doh.gov.za/docs/>) was also searched for relevant guidelines and the Saving Mother’s reports.

The structure of this chapter will involve the description of what antenatal care is, when antenatal care should start, the use of the antenatal card, a description of the conditions that are detected by antenatal care, the gestational age at initiation of care in Sub-Saharan Africa and South Africa, the consequences of delayed care, the reasons for this, strategies to reduce the gestational age at booking and a discussion of the concept of a private-public sector cooperation. The chapter concludes with a justification for the study.

2.2 ANTENATAL CARE AND WHO SHOULD PROVIDE IT.

Pregnancy is a special journey for the mother and baby that should be considered very special by the health care providers, to give the woman an opportunity to enjoy her mixed feelings, during this period of transition and to make her feel free to make her own decisions and choices towards her pregnancy. Early antenatal care therefore ensures the best possible pregnancy outcome for the mother and the baby through the proper physical and psychological preparations before birth therefore should focus on making sure that pregnancy does not cause any harm to the mother and the foetus (Enkin & Chalmers 1982:228, Rising 1998:46, Woods 1993:2 & Viccars & Maputle 2006:237).

Antenatal care is defined as a health care service provided to a pregnant woman and her unborn baby from the start of pregnancy until the delivery of the baby. It screens pregnant

women with the aim to assess the state of the mother and of the foetus with the aim of reducing maternal and perinatal mortality and morbidity associated with pregnancy. Good antenatal care therefore should focus on making sure that pregnancy does not cause any harm to the mother and the foetus, it should include health education to the women and their families especially if health education is about the danger signs of labour and delivery and provide psychological and social support throughout the pregnancy period. For a successful pregnancy outcome, antenatal care should follow a definite plan and should be problem-orientated for immediate and appropriate action to be taken should any problem arise. This needs close supervision by the doctors and the midwives to be able to assess the women early for identification of risk factors. There should be continuous assessment for possible complications, such as anaemia, hypertension, and repeated fetal assessment to detect impaired fetal growth (Woods1993: 1, Stirrat, Mills & Draycott, 2003:6, Rising, 1998:46, World Health Organization 2003:2, Hanretty, Ramsden & Callander 2003:86, Pitkin, Peattie & Magowan 2003:5).

It is recommended that registered midwives, medical practitioners and specialists in obstetrics should provide antenatal care. Non-governmental organizations and private caregivers may render antenatal care to pregnant women but should meet the minimum standards set out in the policy document (Gauteng Department of Health Policy document 2000: 4).

2.3 IDEAL TIME FOR COMMENCEMENT OF ANTENATAL CARE.

Once a woman thinks that she is pregnant, it is recommended that she should immediately confirm her pregnancy and initiate antenatal care. This can be as soon as the woman misses her first menstrual period, and should not be later than two missed periods (DOH guidelines for maternity care in South Africa 2007:20, Cunningham, McDonald, Leveno, Gant & Gilstrap 1993:250, Woods 1993:3).

Although the Department of Health recommends that women confirm their pregnancy as early as possible, antenatal visits schedules for multiparous and nulliparous women indicate that the first visit should take place between 6 and 20 weeks (Gauteng DOH Policy Document 2000:7). This ensures that the recommended number of visits (5) can take place (Villar et al, for WHO Antenatal Care Trial Research Group 2001:1551). Indeed the number

of women attending the first antenatal care visit before 20 weeks is one of the institutional statistics that is collected with regard to antenatal care. This overlaps the upper limit of the first trimester namely 12 weeks in which it is recommended that the women initiate care but has been used in the analysis of the data from this study.

2.4 ASSESSMENT OF PREGNANT WOMEN: THE USE OF THE ANTENATAL CARD.

Any woman who presents with pregnancy should be offered or referred for a full package of antenatal care as soon as possible. The essential record-keeping tool is the antenatal card. The antenatal card (See Appendix 1) is the principal record of the pregnancy from the time of pregnancy confirmation till up to the end of delivery. According to the South African Department of Health, antenatal cards must be available to all institutions, midwives or doctors providing antenatal care (DOH Guidelines for Maternity Care in South Africa 2002:18). Antenatal cards should be handed to the woman at her first antenatal visit and as described by Abraham et al. 1985:39), it acts to: -

1. To provide the woman a record of her present pregnancy. A well-completed antenatal card is very important because even if the woman cannot read, a family member or neighbour can read the information (Telfer, Rowley & Walraven 2002:80).
2. To give health care providers, guidelines on history taking, examination, identifying problem during pregnancies, action taken, and record referrals for further management if necessary.
3. Make it possible for the health workers to manage follow-ups.
4. To have a record for all the activities and act as a guide for the health care providers.
5. To make record keeping easier and more understandable.
6. To be able to evaluate the effectiveness of the health care providers by auditing these cards (Abraham & Joseph 1985:39).

Further than this, the antenatal card acts as a means of communication between all healthcare workers involved in the care of the pregnant women.

It should be completed at each antenatal care visit and should be retained by the mother until delivery. At the initial visit the following is recorded on the antenatal card: -

History: This includes personal details, the relevant history of past and the present pregnancy, previous surgery and medical conditions relevant to the pregnancy, a family history of conditions that might affect the pregnancy, allergies, the use of any medicines, alcohol, or tobacco and important family and social circumstances.

Examination: A full examination of the woman includes a general examination, examination of the chest (lungs, heart) and abdominal palpation. The gestational age is calculated and the expected date of delivery noted.

Special investigations These include testing for HIV, anaemia, syphilis, and urine testing for protein and glucose and blood grouping.

Based on the above an assessment of the woman's risk is made and a delivery plan is noted.

Medications and vaccines given are noted.

Family planning for the following pregnancy is noted.

At subsequent visits recording of the blood pressure, urine testing, the wellbeing and growth of the fetus takes place on the antenatal card (De Kock & Van der Walt 2004:9-3, DOH Guidelines for Maternity Care in South Africa 2007:20,127, Gauteng DOH Policy Document 2000:6).

The successful outcome of pregnancy depends on healthcare workers who make good decisions based on accurate and complete recorded information (NDOH 2001:78, NDOH 2002:18). This applies to all the information collected during the pregnancy, labour and in the postnatal period. In order to assess how well an antenatal card is filled in a tool called the "Quality Check for Antenatal Records" was developed by H Philpot and A Voce (See Appendix 2). This check looks at two things -whether the data is accurate and complete and whether based on this, the correct decisions about the management of the patient were made. A full explanation of how the card is scored is also given in Appendix H (Pattinson 2007:14).

2.5 CONDITIONS THAT CAN BE SUCCESSFULLY DETECTED AND TREATED IN PREGNANCY.

The following two tables show the conditions, which can be detected by antenatal care and can be treated. They are reproduced by kind permission of Professor Robert Pattinson (Pattinson 2007:6) (See Appendix E for letter of permission).

Table 1. Conditions that can be successfully detected and treated in pregnancy.

Maternal condition	Worst effect on pregnancy
Anaemia	More likely to bleed, smaller babies
Hypertension and pre-eclampsia	Convulsions, haemorrhage, maternal deaths, fetus/neonatal death
Medical diseases e.g. diabetes mellitus, epilepsy, heart disease	Maternal death; fetus/neonatal death
HIV complications	Maternal death; pre-term birth, growth impaired babies, HIV infected babies
Chronic infections e.g. tuberculosis	Maternal deaths; fetus/neonatal death
Urinary tract infections	Maternal kidney infection, pre-term labour, fetus/neonatal death
Vaginitis and other sexually transmitted infections	Pre-term labour, fetus/neonatal death
Malnutrition	Small babies
Fetal Condition	
Poor fetal growth	Fetus/neonatal death
Post-maturity	Meconium aspiration, fetus/neonatal death
Congenital infections e.g. syphilis	Fetus/neonatal death
Congenital abnormalities	Fetus/neonatal death
Twins, triplets	Pre-term labour, fetus/neonatal death
Abnormal fetal lie	Ruptured uterus, fetus/neonatal death
Rhesus isoimmunisation	Anaemic neonate, fetus/neonatal death

Table 2. Effective interventions during the antenatal period.

Problem	Prevention	Screen/diagnose	Treatment
Mother			
Anaemia	Iron and folate prophylaxis	Check haemoglobin	Iron and folate or iron injections or blood transfusion
Hypertension/pre-eclampsia	Calcium supplementation	Check blood pressure, urine	Treat hypertension
Syphilis	As for STIs	RPR, VDRL	Bicillin
Vaginitis	As for STIs	Syndromic approach	Erythromycin and metronidazole
Urinary tract infection	Personal hygiene	Urine dipsticks or urine culture	Ampicillin
HIV	As for STIs	Counselling and voluntary testing	Antiretroviral therapy for mother, PMTCT for fetus/neonate Multivitamin supplementation
Tuberculosis	TB prophylaxis where indicated	Chest X ray, sputum culture	Anti TB drugs
Malaria	Prophylaxis	Symptomatic treatment	Anti malarial drugs
Pre-existing medical conditions, Diabetes, heart disease, epilepsy		History and examination	Refer
Gestational diabetes		Family history, previous baby's birth weights, Glucosuria	Investigate, Treat as necessary or refer
Malnutrition	Balanced protein/calorie supplementation, multivitamin supplementation	History, clinical examination (Body/mass index) (Upper mid-arm circumference)	Refer social workers, Food supplementation
Fetus			
Poor fetal growth	Balanced protein/calorie supplementation, Advice on smoking	Uterine growth (serial symphysis-fundus measurements)	Timely delivery
Post-maturity	Accurate gestational age	Calculate gestational age	Induce labour at 41 weeks gestation
Multiple pregnancies	Careful assisted reproduction	Uterine growth, Sonar	Refer
Breech presentation		Uterine palpation	External cephalic version/ Caesarean section
Congenital abnormalities	Peri-conception folic acid supplementation, Advice on alcohol consumption	Maternal age, previous history, Uterine growth, Sonar abnormalities	Refer to specialists
Rhesus isoimmunisation	Anti-D prophylaxis for Rh negative women in previous pregnancy	Rapid Rh, Coombs test for Rh negative women	Refer Rhesus negative women with anti-D antibodies
Neonatal tetanus	Tetanus Toxoid immunization		

Clearly there are a number of conditions that can be treated and the earlier they are treated the greater the chance of the treatment working.

2.6 GESTATIONAL AGE AT INITIATION OF CARE.

The need for early confirmation of pregnancy and initiation of antenatal care is of utmost importance as the women and the foetus will be screened early leading to early identification of high-risk problems and an appropriate plan devised (Chamberlain & Morgan 2002:1). However, in a report by WHO and UNICEF in 2003 looking at antenatal care in developing countries, it was found that 70% of women from the Caribbean and Latin American countries presented for the first antenatal visit in the first trimester of pregnancy, 65% from the Middle East and North Africa, 50% from Asia but only 30% from Sub Saharan Africa. Here women were more likely to come in the second trimester (40%) with as much as 30% presenting in the third trimester (WHO UNICEF 2003: 13). In rural Gambia in a study looking at the experiences of mothers with antenatal care, labour and postnatal care it was found that as much as 50% of women presented in the 5th or 6th month of pregnancy (Telfer et al. 2002:74). In the south eastern district of Botswana, in a study in 2007 looking at factors affecting antenatal care initiation, it was found that 58% of women presented after 24 weeks of gestation and only 28% presented before 16 weeks (Mwenze, Mpande, Pengpid & Supa 2007:491). Similarly in a study done in Kenya on the differences between women who come to antenatal care early and those that came late, it was found that only 7.3% of women attended during the first trimester and 22% attended in the last trimester with the majority of women attending during the 2nd trimester (Ezer 2008: IV).

In South Africa in the Every Death counts report it was found that in 2007 the overall percentage of women initiating pregnancy before 20 weeks was 27% (DOH Every Death Counts 2008:6). In an audit of antenatal care in 2008 in the Empangeni health district in Kwazulu Natal, 9% of women attended the antenatal clinic in the first trimester while 66% attended in the 2nd trimester (Hogue, Hogue & Kader 2008:66). It is interesting in 1998 a study performed in Atteridgeville, Tshwane showed a similar distribution of gestational age initiation of care, 12% initiated care before 12 weeks and 28% initiated care after 28 weeks (Mabale, Tsuari & Pattinson 1998:23). This is in fact worse than the detailed in the report in 1991 regarding percentages of women attending before 12 weeks in sub-Saharan Africa. (WHO & UNICEF 2003:13). It seems that not much has changed in the 20 years from 1998 to 2008, early antenatal care remains a problem that has not been effectively dealt with and is still a problem in other African countries as well.

In a study by Jeffery et al on the effect of introducing a pregnancy confirmation clinic followed by the first antenatal visit it was found that even at 12 weeks gestation, 19% of women had conditions that, had they not been treated at that time, could have had a serious impact on the pregnancies. This just emphasizes the need for early antenatal care (Jeffery et al. 2000: 155)

2.7 PROBLEMS ASSOCIATED TO LATE OR NON-ATTENDANCE OF ANTENATAL CARE.

Table 1 show the potential worst effects of a particular condition during pregnancy and clearly if a woman develops one of these conditions and either does not attend, or comes late for antenatal care, she and her unborn infant are risk for death or severe morbidity. Provision of antenatal care is considered to be a cornerstone for maternal and perinatal health care. Yet an estimated 15% of pregnant women in developing countries still have pregnancy related complications and nearly 530,000 women worldwide die yearly from pregnancy related conditions (Hogue et al 2008:66). This statement is supported by WHO in Making Pregnancy Safer (2000:2), where it is reported that 600,000 women die due to causes related to pregnancy and child birth (WHO 2000:2).

The maternal mortality ratio in South Africa at the time of this study was estimated to be of the order 175-200/100,000 live births. (Saving Mothers 1999-2001:4). The perinatal mortality rate at that time, where this could be accurately obtained (Gauteng and Western Cape) was of the order of 32.1/1000 and 18.4/1000 live births respectively (NDOH 2001: viii). In the latest Saving Mother's report the difficulty of obtaining an accurate Maternal Mortality Ratio is discussed and different estimates vary between 150-578/ 100,000 live births (Saving Mothers 2005-2007:5). The latest Saving Babies report gives the perinatal mortality rate nationally as 38/1000 births (NDOH 2006-2007:36) these figures suggest however that not much has changed since the inception of this study and might have gotten worse.

Although there are no randomized controlled trials on the provision of antenatal care and its effect on mortality and morbidity, it is widely believed that antenatal care is an important factor in preventing morbidity and mortality of mother and fetus. This is supported in a study by Mdeni et al, where it was shown that a poor pregnancy outcome was commonly seen in pregnant women who did not attend antenatal care as compared to women who booked for

antenatal care. In this study 34% of women who experienced severe maternal morbidity never attended antenatal care (Mdeni, Mantel, Rees & Pattinson.1998: 91).

In the NDOH report of 2000, inadequate antenatal care, late initiation of antenatal care, delays in seeking care, delays in responding to decreased fetal movements, rupture of membranes, antepartum haemorrhage and non- attendance of antenatal care were the major factors that contributed to maternal and perinatal mortality (NDOH 2000:44). In the latest Saving Mothers report no attendance or late attendance is still associated with maternal mortality (Saving mothers 2005-2007:5). It was found, in maternal deaths where there was a potential to have managed the patient in the antenatal period for an example pre existing maternal disease, cardiac disease, non pregnancy related infections, AIDS and hypertension, 23% of women had not attended antenatal care. No attendance or late attendance was associated with 20.4% of fresh stillbirths and 20% of macerated stillbirths (NDOH 2006-2007:31).

Women who present late at the antenatal care pose a problem to the health care providers because there is not enough time to identify the problems and take the appropriate action to correct the problem. This is illustrated in the study by Telfer, where it was noted that late presentation did not allow sufficient time for the correction of anaemia, an indirect cause of maternal mortality in Gambia, by means of iron and folate tablets (Telfer et al. 2002:74).

Another effect of late antenatal care was suggested by Ezer in a study in Kenya - that late initiation of antenatal care might increase the costs of caring for the women because conditions that could be prevented or treated early in the antenatal period might then require a higher and more expensive level of care (Ezer 2008:3).

2.8 THE REASONS FOR DELAY IN INITIATION OF ANTENATAL CARE.

In a systematic review of 28 studies in 2009 on the uptake of antenatal care in developing countries, maternal education, partners' education, marital status, the availability and cost of services, household income, the woman's employment status, media exposure to information on antenatal care, a history of obstetric complications, cultural beliefs and a higher parity were all factors that impacted on whether and when a women initiated antenatal care (Downe, Finlayson, Walsh &Lavender 2009:518). Additional factors such as age of the women, the

partner's employment status and access to transport were factors seen to be important in studies in Gambia and Botswana (Mwenze et al. 2007:491, Telfer et al 2002:4). In Gambia, permission to attend antenatal clinic had to be sought from the husband, which could have an impact on the timing of the first antenatal visit.

Ethnographic research from Mozambique has indicated that socially and economically marginalized women may try to conceal their pregnancies and thus delay antenatal care because of the fear that they and their unborn infants may become the targets of witchcraft by jealous neighbours (Chapman 2003:356). This appears to be also the case in Zimbabwe where cultural beliefs have an influence on the time when a woman reveals she is pregnant as it is believed that the pregnant woman and the pregnancy are vulnerable to witchcraft early on in the pregnancy. Other factors mentioned in this study were, long distances to the clinics, expensive transport, consultation fees and medication, which was beyond their means. Women also mentioned that many healthcare providers were non caring, and abusive, and seeming to want to exert control over the women (Mathole, Lindmark, Majoko & Ahlberg 2003:122).

There were several studies performed in South Africa, which showed similar factors to be associated with late care to those described above (Abrahams, Jewkes & Mvo 2001:240). It must however be noted that free antenatal care for women in South Africa was introduced in May 1994 so the cost of actual care was not a factor.

In Cape Town a study in 2001 gave the reasons for delay in booking as follows: -

A number of the women did not know they were pregnant and thought the amenorrhea was due to the use of injectable contraceptive (Jewkes, Abraham & Mvo 1998:8).

Lack of time to attend the clinic.

Perceptions that starting antenatal care was only important when there were problems or when they were near to delivery.

Factors such as bad weather, an unwanted pregnancy, fears of poor and unkind care at the clinic, difficulties in arranging for others to care for the other children, lack of transport money, difficulty getting transport and the effort of getting to the transport were factors that also impacted on when a woman initiated care (Jewkes et al. 1998:8).

A study in Nkangala, Mpumalanga showed that only 50% of women knew that antenatal care should be initiated before 20 weeks. This study also showed that the following factors in a logistic regression analysis were associated with delayed attendance at antenatal care, smoking, no partner, economic factors, low education, age, attitudes of staff, health services, poor quality of care, parity, unwanted pregnancy, and multiparity (Nelson 2006:36).

A study by Mabale Tsuari and Pattinson in Atteridgeville (Tshwane) on the health seeking behaviour of pregnant women, also showed, in a subset of women who had confirmed their pregnancies before 20 weeks gestation, but who started antenatal care after 20 weeks, that there was a lack of knowledge about when was the correct time for initiating care. Of concern was the fact that a percentage of the women who had gone to the clinic after confirmation, were told by healthcare workers to come back only after 5 months (Mabale et al. 1998: 23).

As can be seen there are many and varied factors associated with a late start to care and that simply providing the women with access to free antenatal care is unlikely to have a very large impact because it does not address all the other problems.

It has been noted in two studies in South Africa that although the women may initiate care late, a number of women may actually confirm the pregnancy early. In the study mentioned above by Mabale et al, 33% of women confirmed their pregnancies in the first trimester and 36% between 13 and 20 weeks. Fifty three percent of these women confirmed their pregnancies at a private general practitioner (Mabale et al 1998: 23). The second study performed in Kwazulu Natal found that in those women who booked after 20 weeks gestation, 49% had confirmed their pregnancies in the private health sector. Of those women who never attended antenatal clinic at all, 60% had confirmed their pregnancies in the private health sector. The recommendations here were that the general practitioner should be informed about the importance of antenatal care and refer the patient after pregnancy confirmation (Sibeko & Moodley 2006:48).

2.9 STRATEGIES TO REDUCE GESTATIONAL AGE AT BOOKING.

There are a number of studies on why women initiate antenatal care late and yet there is very little literature on the solutions to these problems of late booking for antenatal care. However, a study performed in the Pretoria region by Jeffery et al, showed that it was possible to reduce

the gestational age at commencement of antenatal care. In this study a pregnancy confirmation clinic was set up, here the pregnancy was confirmed and on confirmation, if the women wished to continue with the pregnancy, antenatal care was initiated. The mean gestational age in this study was 12 weeks, which amounted to a reduction of 10 weeks. This was achieved by using the woman's behaviour of early confirmation of pregnancy as described in the study by Mabale (Jeffery et al. 2000:155, Mabale et al. 1998:23).

One solution would be involving the private general practitioners. It has been found in the literature that women go as early as after missing the first period for confirmation of pregnancy with the general practitioners as described above (Mabale et al. 1998:23, Sibeko & Moodley 2006:48).

Zander describes the difference in care provided by general practitioners and the hospital setting in Britain. Certain of these differences are applicable in our settings where the so-called "hospital setting" could be seen as public sector antenatal care. These are as follows: -

In the case of the general practitioner the surroundings tend to be familiar, situated in the community, as they tend to be, whereas the hospital surroundings tend to be unfamiliar.

The practice tends to be easily accessible whereas there may be a distance to travel to the hospital.

The woman will tend to see and get to know only a few doctors during her pregnancy in the case of the general practitioner, but may see many doctors in the hospital setting.

The relationship between doctor and patient is established at the beginning of the pregnancy and may continue beyond the pregnancy. This is not likely to be the case in the hospital setting.

The general practitioner is more likely to be aware of the social background of the women, which is not necessarily the case in a hospital setting.

Including private general practitioners in antenatal care would thus not only make use of the early confirmation of pregnancy behaviour of some women but would also address some of the other issues that are associated with late attendance at antenatal care for example distances to the clinics and the associated transport costs, long waiting queues, poor relationships with healthcare workers (Zander, 1982:249).

2.10 PRIVATE –PUBLIC PARTNERSHIP.

It has been stated by the Department of Health in transformation of health care, that the basic principles of providing health care is accessibility, affordability, safe and beneficial services that meet acceptable quality standards of health care services (DOH 1997:5). To assist in achieving this, collaboration with the private sector is needed by the government because there are specific objectives that neither the public nor private sector can achieve without working together (Reich 2000:481). According to Reich, public-private partnerships provide a joint sharing of effort and responsibilities, improving health especially for disadvantaged population. Partnerships thus involve both partners who assume core responsibilities for the joint action and whose participation is necessary for successful implementation of the outcome (Reich 2000:618).

In this case where a proportion of indigent women go to private general practitioners for confirmation of pregnancy and then carry on with care in the public sector the idea of a potential public –private partnership is appealing.

2.11 JUSTIFICATION FOR THE STUDY.

It has been established that one of the factors associated with maternal mortality and morbidity and perinatal mortality is late attendance for antenatal care. It has been shown in this literature review that a percentage of women confirm their pregnancies early in the pregnancy at private general practitioners, but then only attend antenatal care later in the pregnancy. There is thus an opportunity to intervene and start care early that is being lost. The involvement of private general practitioners thus creating a private –public partnership would have advantages in a number of ways, the initiation of care could start immediately and so potentially reducing perinatal and maternal mortality in this group of women but it would also address some of the reasons given for late attendance at antenatal care. In Tembisa and its surrounding areas, the general practitioners are evenly distributed throughout the whole township and there are usually 1-2 practitioners per block. The accessibility of the private general practitioner's care in this area could make it easier for the health care seekers, to initiate antenatal care at confirmation of pregnancy during the first visit. Private general practitioners practice individualized care, have some form of booking system thereby

avoiding the problems of waking up early to be in long queues. Some practitioners have playrooms and toys in case of mothers who bring the siblings along.

The private general practitioners in the Tembisa area are thus well placed to provide this care. Forming such a partnership would also result in improved communication between all healthcare workers involved in antenatal care of women because of the introduction of the antenatal card as record keeping method of choice both in the private and public sector.

CHAPTER 3.

RESEARCH METHODOLOGY.

3.1 INTRODUCTION.

This chapter discusses the research methodology used in this study. This includes the aims and objectives of the study, the research questions, study design, study site, study population, the sampling method and procedures involved in obtaining the sample, data collection and analysis and finally ethical considerations.

3.2 AIMS AND OBJECTIVES OF THE STUDY.

3.2 1 AIMS OF THE STUDY.

- 1.To establish if indigent women who visit private general practitioners (PGP's) for confirmation of pregnancy, do so early in the pregnancy and. if antenatal care is initiated at this time, will this result in a lowering of the gestational age at booking, when compared to women who attend care in the public sector in Tembisa.
2. To establish if the PGP's provide antenatal care to such women will there be better record keeping detection and reaction to problems in the antenatal period when compared to that in the public sector (PS).
3. To establish if there are any differences in outcomes of the pregnancy between the 2 groups.

3.2.2 OBJECTIVES OF THE STUDY.

1. To obtain from the antenatal cards the initial gestational age at bookings in both groups.
2. To score the antenatal cards using the Modified Quality Check for Antenatal Records Score (MQCARS).
3. To obtain from the birth register, information on the outcomes of the labour and postnatal period.

3.3. RESEARCH DESIGN.

Quasi-experimental study.

The intervention involves the initiation and continuation of antenatal care by the PGP. It is quasi-experimental because the women determine where they seek care not the PGP's or researchers.

3.4 THE STUDY SITE, POPULATION AND SAMPLE.

3.4.1 STUDY SITE.

The study site was the postnatal ward in the Tembisa District hospital.

3.4.2 STUDY POPULATION.

The population consisted of all women who delivered at the district hospital in Tembisa Township over the period of three months, August, September and October 2002.

3.4.3 SAMPLE SIZE AND SAMPLING PROCEDURE.

There were two groups in this study, the intervention group, that is, those women where, after confirmation of pregnancy by the PGP, antenatal care was started and carried on by the PGP. The second group was the control group, where antenatal care was initiated in the PS and carried on by the public sector health care workers (PSHCW's).

3.4.3.1 SAMPLE SIZE CALCULATION.

The outcome used in this calculation was that of gestational age at booking. A difference in gestational age between the two groups of 6 weeks was considered to be clinically significant with an alpha level set at 0.05 and a beta level set at 0.2 the sample size needed to detect a statistically significant difference was calculated to be 100 in each group.

3.4.3.2 SAMPLING METHOD.

There were approximately 870 deliveries at Tembisa hospital per month. From the study by Mabale, it was estimated that about 50% of women were likely to be seen by the PGP's (Mabale, Tsuari & Pattinson 1998:23). As the data collection period was to run for three months, a total of 2610 cards (approximately 1305 in each group) would be collected. In order to obtain 100 in each group, a systematic sampling method was used, whereby every 13th card in each group was sampled. In order to introduce a degree of randomness into the sample, the numbers 1-13 were put into a hat and the number 4 were pulled out. The forth card pulled out at the start of the study in each group, was the starting card, thereafter every 13th card was sampled. This is referred to as systematic sampling with a random start. (Polit & Beck 2008:767).

Exclusion criteria.

1. Women who have less than 2 visits either at the PGP or at the PS. This is to ensure that the Quality Check for Antenatal Records could be used effectively as part of the scoring is related to visits, subsequent to the first visit.
2. Women who did not have antenatal care provided by the PS or PGP in the Tembisa area.

3.4.4 PROCEDURES.

1. Two months prior to study two workshops were held which were attended by the health care providers in the maternity department, chief executive officer, chief professional nurses, public doctors involved and the 16 PGP's involved in the study. These workshops were run by obstetricians from the Department of Obstetrics and Gynaecology, University of Pretoria. This was to make sure that all healthcare workers likely to be involved in the care of pregnant women were knowledgeable about how to fill in the antenatal card (record keeping), what was to be done if any problems were encountered in the antenatal period and to stress the importance of starting antenatal care at confirmation of pregnancy. It was hoped in this way that even the public sector health care workers (PSHCW's) would then initiate antenatal care whenever the pregnancy was confirmed. This would eliminate late booking due to health care worker instructions (NDOH 2001:26).

2. Prior to the start of the study the researcher confirmed with all the PGP's that they were going to waive fees for the period of the study, as this was central to the study.

3. The Department of Health and the Chief Executive Officer of Tembisa Hospital agreed that the women who were to attend antenatal care with the PGP's would get their special investigations done at the hospital and would be provided with the necessary medications. The care of the women would be taken over by the hospital if the women developed complications or went into labour. This thus established the public-private cooperation.

4. The PGP's were issued with antenatal cards, which had the University of Pretoria logo on it. This was done to differentiate it from the standard antenatal card already in use by the PSHCW's. This was to aid both the researcher and the labour ward staff.

5. a. The women who visited the PGP's for confirmation of pregnancy, referred to as private general practitioner group (PGP), on confirmation of the pregnancy, were told about the study and if they wished to be part of the study, they gave written informed consent.

b. The PGP then continued with the first antenatal visit as per the antenatal card.

c. The antenatal card was given to the woman and she was told to bring it back at each antenatal care visit and to remember to bring it to the hospital once in labour (DOH Guidelines for Maternity Care in South Africa 2002:18).

d. The woman was given a return date to come back to the PGP.

e. She was referred to the hospital to obtain a hospital number, to do the routine pregnancy special investigations, to receive a tetanus toxoid injection and to be issued with iron and folate tablets.

f. The women were then told to go back to the PGP on the given appointment date to get the results of the special investigations and to continue with antenatal follow-up visits as stated in the antenatal care policy (DOH Guidelines for Maternity Care in South Africa 2000:25).

g. All information such as results of special investigations and examinations were recorded on the antenatal cards by the PGP concerned and discussed with the women at the return visit.

h. If any complications developed during antenatal care, the woman was referred to Tembisa hospital for further management.

6. a. Women who either, confirmed their pregnancies in the public sector and then started antenatal care in the public sector, or those that started care without confirming their pregnancies because it was unnecessary were referred to as the public sector health care worker group (PSHCWG).
 - b. They used the antenatal cards that were already used for recording at Tembisa Hospital and its feeder clinics.
 - c. They followed the standard antenatal care program already established (DOH Guidelines for Maternity Care in South Africa 2000:19).
 - d. They did not give written informed consent to be part of the study as it was felt that this was standard practice and an audit of cards, which is standard practice.
7. After delivery the antenatal cards were collected in the postnatal ward by the members of staff and placed in one of the two suitcases that were assigned to either PGPG or PSHCWG.
8. The researcher visited Tembisa Hospital twice a week to sample the cards as described under section 3.5, 3.ii. If there were not enough cards to allow for removal of the 13th card these were left over for the next visit.
9. Photocopies were made of the cards sampled. These cards and the rest of the cards in the suitcases were then handed back to the staff for inclusion in the patient's records.
10. Information on the outcome of labour was obtained from the birth register.

3.4.5 DATA MANAGEMENT.

2 independent observers, the researcher and the principal investigator did the scoring of the antenatal cards, using a modified version of the MQCARS. If discrepancies in scores were noted these was discussed until consensus was reached. (Saving Babies 2001:76) This scoring of the cards was done using a template that has been designed for this purpose. (See Appendix H). All the data was entered into an Excel ((Microsoft Corp., Redmond, WA) spreadsheet.

Other data needed from the antenatal cards for example gestational age at the first antenatal visit was entered directly into the Excel spreadsheet.

The data was checked for any obvious errors in Excel and then exported to (SPSS) Statistical package for the Social Sciences Version 17 (SPSS Inc, Chicago, IL, USA) for analysis.

3.4.6 DATA ANALYSIS.

An epidemiologist in the Department of Obstetrics and Gynecology University of Pretoria conducted the analysis.

The comparisons that are made between the two groups (PGPG and PSHCWG) are shown in Table 1 with the associated test used to test for statistical significance A p value of less than 0.05 was considered to be statistically significant.

Table 3 Variables in the Analysis.

Variable	Test	Comment
Age	Independent Student T test	
Parity	Mann Whitney U Tests	
Gestational age at 1st ANC (weeks)	Independent Student T test	
Gestational age < 20 weeks	Chi square test	This is one of the indicators that is collected at the institutions provided antenatal care
Gestational age categorised according to trimester First trimester 1-12 weeks Second trimester 13-28 weeks Third trimester 29 weeks-delivery	Chi square test	The earlier antenatal care is started the better- the ideal time would be in the first trimester
Modified Quality Check for Antenatal Records (MQCAR) Total score History score Examination score Interpretation Score	Independent Student T test	The score is broken down as discussed below
MQCAR \geq 80%	Chi square test	It was felt that a score of 80% or more would indicate an adequately filled in card

<p>Individual items in the score</p> <ol style="list-style-type: none"> 1. Age, parity, gravidity 2. Details of previous pregnancies 3. Previous illnesses 4. History of present pregnancy 5. LMP, EDD 6. Gestational age plot 7. Recording of maternal height and weight 8. BP 9. Examination of heart 10. Examination period of gestation +method 11. IUGR assessment 12. Fetal presentation after 35 weeks 13. Fetal heart/Fetal movements 14. Urine analysis 15. HB and Rh determination 16. Syphilis 17. Tetanus toxoid given 18. Recording of risk factors 19. Recording of action plan 20. Family planning 	<p>Independent Student T test</p>	<p>This was done to establish if there were specific items that were not done well in either group</p>
<p>Outcome of labour</p> <p>Method of delivery C/S NVD</p> <p>Perinatal death [N (%)]</p> <p>Birth weight [mean (sd)]</p> <p>Birth weight<2.5Kg [N (%)]</p> <p>APGAR</p>	<p>Chi square test</p> <p>Chi square test</p> <p>Independent Student T test</p> <p>Chi square test</p> <p>Independent Student T test</p>	<p>These tests were done to establish if there were any differences in outcomes of the pregnancy and labour, It must be noted that the sample size calculation was not done based on any of these outcomes and thus if no difference between the 2 groups was found it might be due to insufficient numbers in the sample</p>

In order to assess the relative contributions of each PGP to the PGPG frequencies and percentages were calculated. This was followed by an exploratory one-way analysis of variance to assess if there were differences between the PGP's with respect to the gestational age at booking and the MQCARS.

The following gives an explanation of the items included in the MQCARS, an explanation as to why not all the items were used in the score for this study and what items are in the different sub-scores. For a more detailed description of the actual scoring please see Appendix H.

1. Age, parity and gravidity.
2. Details of previous pregnancies, including causes of death and indications for operations.

3. Previous illnesses that might influence this pregnancy, including cardiac, renal and diabetic disease.
4. History of the present pregnancy.
5. The date of the first day of the last menstrual period and the estimated date of delivery (Correct plotting of the first entry on the graph on/after 20 weeks).

The History sub-score is made up of items 1-6 as listed above.

1. Maternal height and weight.
2. Blood pressure recorded at each visit.
3. Heart examination for cardiac disease.
4. Correct completion of the graph at follow-up visits.
5. Interpretation of graph.
6. Fetal presentation, recorded from 34 weeks onwards.
7. Fetal heart heard or fetal movements felt.
8. Urinalysis for proteinuria and glycosuria.
9. Haemoglobin and Rh group.
10. Syphilis test result recorded.
11. Has tetanus toxoid been given?

The examination sub-score is made up of items 1-11 listed above.

1. Identification and recording of risk factors, their severity and significance.
2. Record of action plan, including interventions and referral if indicated.
3. Decision taken by the mother re future family planning.

The interpretation sub-score is made up of items 1-3 listed above.

The total score is the sum of the sub-scores (history, examination and interpretation) this adds up to a total of 20.

As can be seen this score differs from that shown in Appendix H. The following items were not included.

1. HIV counseling: – This was not done at the time of the study (part of examination sub-score).
2. Discussion of labour with the mother. This was not done by the GP as all women were to be sent to Tembisa Hospital for delivery.
3. Transport arrangements.
4. Countersigning of 1st and 36-week visit. This was not relevant to the PGP.
5. Date of the next visit.

3.5. INFORMED CONSENT AND THE PROCEDURE.

The consent forms as mentioned previously were only administered to the PGP. The consent form contained detailed information, and the clients were assured of confidentiality and anonymity. They were told about the purpose of the study and that it was conducted by Medical Research Council Unit for Maternal and Infant Health Care Strategies in conjunction with Gauteng Department of Health and the Khalipa Independent Practitioner's Association. The procedure of being sent to the local public hospital for routine investigations and for a hospital registration number that was used to retrieve the results was explained.

The women were told that the procedures such as sonar were not routinely done but if the need arose they would be sent to the local public hospital. If the PGP had a sonar machine and they wished to have sonar performed at the surgery, they had to pay for the extra costs.

The women were assured that antenatal care follow-ups were to be done by their PGP's but that they would be referred to the local public hospital if complications arose. They would also be referred there for delivery. The consent form explained that, should they want to stop participation at any time they should feel free as they would not be prejudiced but that their antenatal care would continue at the local public hospital. The women were told that the antenatal cards contained all the information about what was done at each visit, and that they were to be kept safe by the women and brought along each time when coming for a follow-up visit.

They were approached in the language that they could understand and speak and they signed the consent forms once they had agreed to participate in the study.

See Appendix F for a copy of the consent form.

3.6 ETHICAL CONSIDERATIONS.

The study was approved by the Faculty of Health Sciences Ethics Committee (Number IPA - 23 95/2000). Appendix A & C.

Permission to conduct the study was given by Gauteng Provincial Administration and the Chief Executive Officer of Tembisa Hospital. See Appendix C & D.

Participation of the women was voluntary and written informed consent was obtained by the PGP. See Appendix F.

All photocopied forms were stored in a locked cabinet to which only the researcher had access.

All photocopied forms were destroyed once the data had been entered into the database. No identifying information was included in the database to which only the researcher had password-protected access.

3.7 SUMMARY OF CHAPTER.

This chapter contains a detailed description of the study design, the procedure followed, the data management and analysis, the informed consent and ethical issues.

CHAPTER 4.

DATA ANALYSIS AND INTERPRETATION.

4.1. INTRODUCTION.

In this chapter results from the comparison of data obtained from the PGPG and PSHCWG on the gestational age at 1st antenatal visit and the MQCARS will be presented. This will be followed by an in depth look at the portions of the card that presented difficulties for the 2 groups to fill in. The PGPG will be assessed in terms of the contribution of each practitioner to the sample of cards. Finally, the difference in outcomes of the labour and infant will be shown.

4.2. RESULTS.

A total of 200 cards were collected (PGPG -100, PSHCWG-100). One card in PGPG was excluded at analysis, as it was established that the woman had an ectopic pregnancy and she had had only one antenatal visit.

Table 4. Characteristics of the women obtainable from the antenatal card.

Variable	PGPG (N=99)	PSHCWG (N=100)	P value
Age [Mean (sd*)]	27.71 (5.69)	26.52(6.39)	NS ^{&}
Parity [Median (ir [@])]	1 (2)	1(2)	NS [%]

*=*standard deviation* [@]=*interquartile range* [&]= *Independent Student T test*

[%]=*Mann Whitney U Tests* N= *number*

Table 4 shows the demographic characteristics of the women obtainable from the card. There was no statistically significant difference between the 2 groups in terms of age and parity.

4.2.1 GESTATIONAL AGE AT FIRST VISIT.

Table 5 shows the gestational age at the 1st visit. There is a statistically significant difference of 6 weeks between the groups indicating that the women who saw private practitioners went

one and a half months earlier than those attending the public sector. The definition of early booking according to the National Department of Health is a gestational age of less than 20 weeks (Gauteng DOH Policy Document 2000:7). As can be seen from Table 2, 36% more women booked before this time in the PGPG.

Table 5: Gestational age at 1st antenatal visit

Variable	PGPG	PSHCWG	P value
Gestational age at 1 st ANC visit [Mean (sd)]	19.96 (5.86)	25.96(5.98)	<0.0001 ^{&}
Gestational age<20 weeks [N %]	50 (50.5)	13(13)	<0.0001 [^]
Gestational categorised according to trimester			
1. First trimester 1-12 weeks	6 (6.1%)	3(3%)	<0.0001 [^]
2. Second trimester 13-27 weeks	78(78.8%)	44(44%)	
3. Third trimester 28 weeks – delivery	15(15.2%)	53(53%)	

[&]= Independent Student T test

[^]=Chi square test

As it is recommended that women initiate care as soon as they know they are pregnant, and preferably in the 1st trimester, the gestational age was categorised into trimesters. As can be seen the majority of women in the PGPG booked in the second trimester and the majority of women in the PSHCWG booked in the third trimester. In both groups there were small numbers presenting in the 1st trimester (6.1% and 3% respectively).

4.2.2: MODIFIED QUALITY CHECK OF ANTENATAL RECORD SCORE (MQCARS)

Table 6 shows the MQCARS and the different components of the score.

Table 6: MQCARS and sub-scores

Variable	PGPG Mean (sd)	Range	PSHCWG Mean (sd)	Range	P value
Total score {T=20}	18.16 (1.55)	13-20	16.34(2.57)	6-20	<0.0001 ^{&}
History score {T=6}	5.99(0.10)	5-6	5.57(0.96)	0-6	<0.0001 ^{&}
Examination score {T=11}	9.59(1.29)	5-11	8.03(1.85)	3-11	<0.0001 ^{&}
Interpretation Score {T=3}	2.55(0.50)	2-3	2.80(0.49)	0-3	<0.0001 ^{&}

T= total of score [&]= Independent Student T test

There is a significant difference between the 2 groups with PGPG scoring higher in the total score (a difference of 1.82 points). Although, the history and examination sub-scores are higher in the PGPG the interpretation score is significantly lower than that of PSHCWG. It appears from the ranges of each score that on the whole the PGPG group is more alike in terms of their scoring than the PSHCWG, that of some the PSHCW are performing very poorly while others are performing extremely well.

If the score is categorised into 16 out of 20 (i.e. 80%) and above vs. 15 out of 20 and below the following results were obtained as shown in Table 4. A score of 80% could be considered as adequate in terms of the overall score.

Table 7: Comparison between PGPG and PSHCWG: MQCARS \geq 80%

Variable	PGPG	PSHCWG	P value
MQCARS \geq 80%	94(94.9%)	68(68.0%)	<0.0001 [^]

[^]=Chi square test

As can be seen from Table 7 there are significantly more cards (27%, $p < 0.0001$) of cards in the private practitioner group had a score of 80% or more.

In order to establish where possible differences lay between these 2 groups. Cross tabulations of each aspect of the score (20 items) were performed. These are shown in Table 8.

Table 8. Comparison between PGPG and PSHCWG. (All the items in the MQCARS)

Item	PGPG	PSHCWG	P value
Age, parity, gravidity	99(100%)	98(98%)	NS [^]
Details of previous pregnancies	99(100%)	97(97%)	NS [^]
Previous illnesses	99(100%)	95(95%)	NS [^]
History of present pregnancy	99(100%)	94(94%)	NS [^]
LMP, EDD	99(100%)	95(95%)	NS [^]
Gestational age plot	98 (99%)	78(78%)	NS [^]
Recording of maternal height and weight	98(99.0%)	59(59.0%)	<0.0001 [^]
BP	97(98%)	92(92%)	NS [^]
Examination of heart	99(100.0%)	78(78.0%)	P<0.0001 [^]
Examination period of gestation +method	98(99%)	73(73%)	P<0.0001 [^]
IUGR assessment	96(97%)	62(62.6%)	P<0.0001 [^]
Fetal presentation after 35 weeks	35(35.4%)	17(17%)	P=0.003 [^]
Fetal heart/Fetal movements	89(89.9%)	94(94%)	NS [^]
Urine analysis	92(92.9%)	96(96%)	NS [^]
HB and Rh determination	93(93.9%)	86(96%)	NS [^]
Syphilis	86(86.9%)	61(61%)	P<0.0001 [^]
Tetanus toxoid given	66(66.7%)	85(85%)	P=0.003 [^]
Recording of risk factors	99(100%)	98(98%)	NS [^]
Recording of action plan	98(98%)	98(99%)	NS [^]
Family planning	55 (55.6%)	85(85%)	P<0.0001 [^]

NS=non significant [^]=Chi square test

The highlighted areas in the above table indicate the items where there is a significant difference between the two groups or when there is an item where neither groups were performing particularly well. In the area of examination the PSHCWG fares worse in terms of maternal weight and height recording, (a difference of 40%, p<0.0001). The PSHCWG is also worse in terms of examination of the heart (a difference of 22%, p<0.0001), examination of the abdomen to determine the gestational age (a difference of 23%, p<0.0001 and then the

assessment of whether there is intrauterine growth retardation (a difference of 33%, $p < 0.0001$). Both groups fare poorly with regard to documenting of fetal presentation after 35 weeks although the PGPG is significantly better (a difference of 18%, $p = 0.003$). The recording of the syphilis result is poor in the PSHCWG and significantly worse than the PGPG (a difference of 25%, $p < 0.0001$). The PGPG did significantly worse in terms of counseling the women on future family planning (a difference of 34 % $p < 0.0001$).

4.2.3 ANTENATAL CARDS PER PGP.

As there were 16 practitioners included in the study, it was felt necessary to determine if the cards from each one of them was included in the sample and what contribution each one of them made to the mean gestational age at 1st visit and the MQCARS. Table 6 shows these results. The practitioners were assigned a number to identify them. This is represented in the first column.

As can be seen from Table 6, cards from only 14 private practitioners were collected. Practitioner No 1 filled in the largest number of cards (34%). Exploratory One-way Analysis of Variance indicates that there are significant differences between the different practitioners in terms of MQCARS but establishing this by means of post hoc tests cannot be done as 5 of the practitioners had only 1 card each in the sample. There is no significant difference between the practitioners in terms of initial gestational age.

As no data was collected on the total amount of patients that were seen by each practitioner, and thus the total number of cards filled in, one cannot say if this sample is representative.

Table 9: PGPG mean gestational age and MQCARS.

Practitioner	N (%)	Gestational age at 1 st visit (Mean (sd)) ^{&}	MQCARS (Mean (sd))
1	34(34.4%)	20.03(6.99) ^{&}	18.18(1.38) ^{&}
2	10(10.1%)	20.30(6.11) ^{&}	15.80(1.55) ^{&}
3	4(4%)	23.75(5.19) ^{&}	16.25(0.500) ^{&}
4	1(1%)	23.00.	17.00
5	9(9.1%)	20.89(3.95) ^{&}	17.67(0.50) ^{&}
6	7(7.1%)	20.29(5.62) ^{&}	19.43(1.13) ^{&}
7	3(3%)	24.67(3.22) ^{&}	17.67(0.58) ^{&}
8	5(5.1%)	20.60(7.80) ^{&}	17.80(0.84) ^{&}
9	10(10.1%)	15.90(3.07) ^{&}	19.00(0.68) ^{&}
10	9(9.1%)	20.00(4.56) ^{&}	20.00(0.000) ^{&}
11	1(1%)	29.00.	18.00
12	1(1%)	18.00.	18.00
13	3(3%)	16.33(4.51) ^{&}	19.33(0.58) ^{&}
14	2(2%)	16.00(.000) ^{&}	19.50(0.71) ^{&}
Total	99	19.96(5.86) ^{&}	18.16(1.55) ^{&}

[&]= Independent

Student T test

4.2.4 LABOUR AND NEONATAL OUTCOMES.

Table 10 shows the outcomes of the mother's labour and the neonatal outcome

Table 10: Outcome of labour and neonatal outcome

Outcome	PGPG	PSHCWG	P value
Method of delivery			
C/S	14(14.1%)	5 (5%)	0.028 [^]
NVD	85(85.9%)	95(95%)	
Perinatal death [N (%)]	3(3%)	3(3%)	NS [^]
Birth weight [mean (sd)]	3.03(0.521)	2.92(0.478)	NS ^{&}
Birth weight<2.5Kg [N (%)]	13(13.3%)	14(14.1%)	NS [^]
APGAR	9.4 (1.75)	9.5(1.74)	NS ^{&}

[&]= Independent Student T test

[^]=Chi square test

C/S=caesarian section

NVD=normal vaginal delivery

There are no statistically significant differences between the two groups in terms number of perinatal deaths, birth weight and numbers of low birth weight infants and Apgar score at birth. There is however a difference in numbers of C/S performed where there are 9% more (p=0.028) in the PGPG.

4.3 CONCLUSION.

1. The gestational age at 1st visit is significantly lower in the PGPG.
2. The MQCARS is significantly better in the PGPG.
3. In terms of the labour and neonatal outcomes there are significantly more C/S's in the PGPG.

CHAPTER 5

DISCUSSION, LIMITATIONS, RECOMMENDATIONS AND CONCLUSIONS.

5.1 INTRODUCTION.

This chapter starts with a summary and a discussion of the possible reasons for the results obtained and how the study accords with what has been found in the literature. From unpublished data there is a short description of perceptions of some of the PGP's of the problems encountered in the study. This is followed by a short discussion on the perceptions of women regarding the care provided by the two groups. This was the subject of a MCur thesis by a second researcher. The limitations and recommendations are then discussed.

5.2 DISCUSSION OF THE RESULTS.

This study was performed to determine:

- If women who visit PGP's for confirmation of pregnancy, do so at an earlier gestational than those who do attend antenatal care in the public sector and thus, if initiation and continuance of care by the PGP's takes place, will this result in a lowering of the gestational age at the initiation.
- If because of the nature of the PGP practice that record keeping and detection and management of problems during this period would be better in the PGP group as reflected by differences in the QCAR score.
- If there is a difference in labour and neonatal outcomes between the 2 groups although differences might not be detected because there may be not enough numbers in each group to be find those differences.

5.2.1 GESTATIONAL AGE AT INITIATION OF CARE.

There is a difference between the two groups in terms of gestational age at the start of care. This does tend to confirm that there is a group of women who do confirm their pregnancies earlier at a general practitioner. This is similar to what was found by Mabale et al (1998:23), but it seems that this is taking place only in the second trimester with only 6% confirming

their pregnancies in the first trimester. In Mabale et al (1998:23) it was found that 33% confirmed their pregnancies in the first trimester and that 50% of them confirmed their pregnancies with a PGP (Mabale et al.1998: 23). This, of course is a study done in a different area. It is of concern that only small numbers of women are confirming their pregnancies in the first trimester in both groups and it suggests that knowledge about the importance of early booking is lacking as confirmed in other studies (Nelson 2006:36, Mabale et al. 1998:23). It is also of concern that the majority of women in the PSHCWG and 15% of those on the PGPG were starting care in the third trimester thus not allowing time for the management and prevention of conditions that could have an impact on the pregnancy as illustrated in the article by Telfer (Telfer et al. 2002:74).

It is important to note that while the results show there is a difference between the two groups, one does not know whether there were not some of the women receiving antenatal care in the PS, who started antenatal care late, but who had actually confirmed their pregnancies early either at PGP's, who were not involved in the study, or who confirmed their pregnancies early in the PS, and were then told by the healthcare worker initiate care late as found in the study by Mabale (1998:23), where it was found that 3% of women were told to come for antenatal care after 20 weeks.. Clearly if there were a large number of these women and they had also started care at confirmation there would not have been such a big difference between the two groups.

5.2.2 MQCARS

With regard to the mean MQCARS there is a significant difference between the two groups but this is small. Both groups had reasonably high mean scores. A greater percentage in the PGPG obtained more than 80%. As mentioned in the discussion when looking at the ranges of the scores in the two groups it appears that the PGPG have more similar scores whereas the PSHCWG scores having larger ranges suggesting that some PSHCW's are performing well while others are performing very poorly.

It must be noted that in this score we are looking at the score which, is shows of how well both groups of healthcare workers perform and with the gestational age one is really looking at the way women behave that is when they initiate care, if one looks at the individual items

of the score one can potentially explain why the PCHCWG or PGPG is performing worse in some areas.

In the recording of the height and weight- this may be that many clinics do not have functional scales and height measuring devices.

Correct completion of the antenatal card graph followed by correct interpretation, it is the experience of the researcher that there has to be fairly intensive training on how to fill in the graph and then how to interpret it. Despite the workshops done on basic antenatal care, this might still have been difficult for HCW in the PS whereas many of the PGP's in the study may have been exposed during their undergraduate training.

Fetal presentation at 35 weeks – It is difficult to say why this was the case.

Recording of syphilis results- this may have related to the fact that these are sent away to the laboratory and it was noted by some of the PGP's in an informal discussion, that obtaining results was sometimes difficult (Tshabalala 2002).

Family planning – it is difficult to give a reason for why the discussion of family planning was poorer in the PGPG. It is possible that the PGP's did not see this as being important, as it was unlikely that they would be seeing the women after the pregnancy.

5.2.2.1 PGP GROUP.

Not all the PGP's participated in the study (there is no data available on the numbers that did not participate), of those that did agree to be part of the study (16) only 14 had cards that were included in the PGPG sample. There are a number of PGP's who appeared to contribute a lot more than others to the sample. There was no data recorded on the number of women that would have qualified to be part of the study and the antenatal cards that were issued by each practitioner. There was also no attempt made to establish from the cards collected in the postnatal ward what percentage each practitioner contributed to the whole PGPG. As there is none of this information available, it is not possible to say whether the sample was representative of those PGP's involved in the study. This could have had an effect on the

mean gestational age and MQCARS especially if the average gestational age or score of those PGP's with the largest numbers of cards in the sample was either very high or very low.

5.2.3 LABOUR AND NEONATAL OUTCOMES.

Although there appears to be a significant difference with regard to the number of caesarean sections performed, this is possibly just a chance occurrence as all the women all went to the hospital for delivery and decisions as to mode of delivery were made there. The caesarean section rate in a hospital such as Tembisa is of the order of 14% so the rate in the PSHCWG is very low and likely a chance occurrence. As mentioned previously the numbers needed to detect any difference in the outcomes such as perinatal mortality would be a lot higher than those calculated for difference in gestational age so it is unlikely that a difference would have been detected.

5.3 PROBLEMS EXPERIENCED BY THE PGPS DURING THE TIME OF THE STUDY.

A series of informal focus groups and interviews where relevant were held in 2006 with the PGP's involved in the study that were still practicing in the Tembisa area at the time in order to get an idea of how the study had worked from their point of view. The findings from these groups are included here because they possibly can give more insight on the results that were obtained (Unpublished data). It must be noted however, that only a small proportion of the original PGP's were available and that this was 4 years after the study was completed.

At the start of the study there were several misconceptions regarding the study purpose e.g. it was thought that the study's purpose was to make money for the private general practitioners without providing women with adequate care or medications. One clinic thought private general practitioners were to examine women in the clinics rather than their own consulting rooms.

The attitude of the HCW's at Tembisa Hospital posed a problem for those women from the PGPG who went to have the special investigations performed. They were required to wait for a long time before these were performed, as in many cases, these women were viewed as private patients, so they were forced to wait until the hospital clients were seen first. Some of

the women were told that the study had not yet started so that the special investigations were not performed. Some of these women had their antenatal cards removed so they did not return for a follow-up visit to the PGP. Apparently these matters were dealt with and matters improved.

Another problem was the transmission of laboratory results to the private general practitioners. Once again this matter was eventually resolved.

There were also difficulties in patients obtaining haematinics, and other medications due to long queues, lack of supplies, and poor communication.

It seems that poor communication was at the bottom of all of these problems.

5.3.1 PERCEPTIONS OF WOMEN INVOLVED IN THE STUDY

A sub-study making use of 30 patients from the 2 groups found that in 93% of women in the PGP were satisfied with the care provided compared to 23% of women in the PSHCWG, Only 7% of the PGP indicated that they had long waiting times vs. 77% of the PSHCWG. (Digamela 2003:56). Clearly the strength of this study was the fact that it made use of the women's behavior. It did not seek to impose an intervention upon the women and, in so doing, addressed other factors associated with late booking. (Nelson 2006:36, Jewkes et al. 1998:8)

5.4 LIMITATIONS OF THE STUDY.

1. As mentioned previously one cannot be certain that the difference between the groups in terms of gestational age was linked to the women's behaviour and not related to the behaviour of the other HCW's who if the women confirmed early either in the PS or with other PGP's not involved in the study then told the women to come back for antenatal care later on (DOH guidelines for Maternity Care 2007:9). This then raises the issue of internal validity of the study because the difference between the 2 groups might not have been as large as indicated by the results.

2 There are a number of statistics that may have helped to determine if this sampling was representative of the PGP's. These were detailed previously. If we cannot say that we have a representative sample we cannot say that the study is both internally and externally valid.

3. Not all the PGP's in Tembisa took part in the study, so saying the results could apply to a larger group is not possible as those who did not take part might be different to those who did. This affects the external validity of the study.

4. While we have looked very closely at the PGP's we have not looked at the PS in the same kind of detail. We do not know what HCW were responsible for the filling in of the cards that were sampled. We need to know this so we can have an idea about whether the sample was representative. The clinic where the HCW comes from could have had an impact on both the gestational age at booking and on the scores. If there were a large number of cards from a clinic where the scores were poor or very good or where women who confirmed early were started in antenatal or told to come back later, this could have affected the final results.

5. The effect of involving PGP's was not assessed in terms of the outcomes of importance such as maternal and perinatal mortality. As these events are relatively rare large numbers would be needed to detect a difference. It was assumed that if there was a group of women who came early for confirmation of pregnancy and initiation of care took place that in the long run this would have an impact. It was also assumed that if the PGP's were better in terms of record keeping and identifying problems and managing them this would have an impact. The problem is the fact that we do not know the size of the group of women who confirm with the PGP's because not all PGP's were involved in the study and there was no record kept of the numbers of women who did see the PGP's in the study. We thus do not know the size of the group of women who confirm their pregnancies early. All that one can say is that the gestational age can potentially be lowered if PGP's are included because they are seeing a group of women early and that it appears that they are slightly better record keepers and if this was a substantial number of women that this might have an effect

5.5 RECOMMENDATIONS.

While the results from this study may not be necessarily valid it is clear that there are women going to PGP's for confirmation of pregnancy. For this reason it would be a good idea if all

PGP's are informed about the importance of referring women to the PS once the pregnancy is confirmed as is also suggested by Sibeko (Sibeko & Moodley 2006:48). In order for this to happen, it is recommended that all PGP's be issued with antenatal cards and that the examination and history be performed by the GP and any problems noted (NDOH 2002:17). The woman would then be referred to the PS where the special investigations would be performed and any concerns of the PGP dealt with. The rest of the woman's care could carry on in the PS. While it would be ideal to keep PGP's involved in antenatal care it is unlikely, in the opinion of the researcher, that at this stage that there would be a mechanism for keeping private practitioners involved in the care of these women unless, there was some way to reimburse them for this care and somehow keep the number of women attending the PGP manageable. All of these practical problems however, might be resolved with the proposed introduction of national health insurance (National Health Insurance 2010).

It must be stressed to PSHCW that women must initiate care as soon as they confirm their pregnancy. This should not pose a problem given the governmental policy in place currently, which states that primary health clinics should provide a one-stop service (Gauteng DOH 2000:7).

There needs to be some form of education given to the women regarding the benefits of early confirmation of pregnancy in the first trimester, followed by initiation of antenatal care. This should possibly start at school level.

All the other factors mentioned as potentially contributing to late booking should be taken into account when trying to develop an effective intervention. It is of little use to change the health system if it does not take into account the needs and concerns of the mother herself for an example,

Antenatal care clinic hours should be made flexible to accommodate working mothers so as to promote utilization of services even after hours (Gauteng DOH 2000:5).

Introduction of antenatal mobile services to all the Provinces especially the rural areas in order to reach out to pregnant women who live far away. Participation of the community in this matter will be important, as they know the area better than the health personnel. This will help them assume responsibility for the services provided to the community.

5.6 CONCLUSION.

Given the limitations listed the findings do possibly suggest that it is feasible to use a public-private sector co-operation to improve the accessibility of antenatal care to the indigent women of Tembisa community. This will potentially lead to the initiation of antenatal care at an earlier gestational age in this group of women, resulting in improved pregnancy outcomes. Although there is not a very large difference between the two groups in terms of MQCARS, it does suggest that the PGPG will possibly provide care as safe as or slightly better than that of the PS.

DEFINITION OF TERMS.

Aim: The specific accomplishment the researcher hopes to achieve by conducting a study. (Polit & Becker 2008:81).

Alpha level: The probability of a type 1 error, a false positive (Polit & Beck 2008:602).

Alpha Value: The probability of rejecting a null hypothesis when the null hypothesis is actually true (type 1 error), it is designated by the symbol (α). The alpha value is also called the level of significance and is selected based on the importance of the Test, a value of 0.05 would be common (Netherwood 2010 Available from: http://www.micquality.com/six_sigma_glossary/alpha_value.htm. Accessed 15 November 2010)

Beta Level: The probability of a type 11 errors or a false negative (Polit & Beck 2008:602).

Chi square test A statistical test used to assess differences in proportions by testing the hypothesis that one group could be better than the other, the hypothesis might be the intervention group will do better than the control group (Polit & Beck 2008:600).

Control group: Subjects in an intervention study that does not receive the experimental treatment and acts as a baseline against which the effect of the treatment can be measured (Polit & Beck 2008:751).

External Validity: The degree to which study results can be generalized to other populations or settings other than the one studied (Polit & Beck 2008:753).

Internal Validity: The degree to which it can be inferred that the experimental intervention, rather than other, caused observed effects (Polit & Beck 2008:756).

Intervention Group: In experimental research, researchers actively introduce an intervention or treatment (Polit & Beck 2008: 63).

Interquartile range Distance between the 75th percentile and the 25th percentile, it is the range of the middle 50% of the data, it is not affected by extreme values (Simon, S. 2008).

Mann-Whitney U test A nonparametric test used to test the difference between two groups, based on rank scores (Polit & Beck 2008:757).

Maternal mortality: Death of a woman while pregnant from conception onwards until 6 weeks (42 days) after delivery (Pattinson 2001: 7).

Maternal mortality Ratio: The number of maternal deaths per 100,000 live births measures the risk of maternal death among pregnant or recently pregnant women (cl-t077-040cl.privatedns.com/mothers/terms.htm).

Mean: A measure of central tendency, obtained by summing all values and dividing by the number of the subjects (Polit & Beck 2008:758).

One-way Analysis for variance Procedure for testing differences between means of three or more groups (Polit & Beck 2008:596).

Perinatal mortality: The number of perinatal deaths in an area per total number of perinatal deliveries for that area, for a specified time period and is expressed per 1000 deliveries. It is calculated as follows:

Total number of perinatal deaths X 1000

Total number of deliveries (Pattinson 2001:9).

Perinatal period: The perinatal period begins when the foetus is considered viable (28 weeks gestation or 1000g) and extends to the 7th day after birth. A perinatal death is one that happens during this time (Pattinson 2001:9).

Post hoc test: A test for comparing all possible pairs of groups following a significant test of overall group differences (Polit & Beck 2008:762).

P value: The probability that the obtained results are due to chance alone (Polit & Beck 2008:760).

Population: is the group of cases about which the researcher would like to generalize (Polit & Beck 2008:338).

Quasi- experiment design: A design for an intervention study in which subjects are not randomly assigned to different groups (Polit & Beck 2008:763).

Random: Random means that every subject has an equal chance of being in any group. (Polit & Beck 2008:253)

Randomized Control Trial: An experimental trial of an intervention, with random assignment to groups (Polit & Beck 2008: 764).

Random start: In selecting a systematic sample at interval of n from an ordered population, it is sometimes desirable to select the first sample unit by a random drawing from the first n units of that population. The sample is then said to have a random start (Mariot. 2002).

Reliability: The degree of repeatability with which an instrument measures an attribute (Polit & Beck 2008:764).

Research/ study design: A plan for collecting and utilizing data so that desired information can be obtained with sufficient precision or so that a hypothesis can be tested properly.

Available from <http://www.hsl.unc.edu/Services/Tutorials/ATA/researchdesign.htm>

Accessed: 15 November 2010.

Significance level: Probability that results obtained from a study could be due to chance If this level is set at 05 then this suggests that the results of the study would be found by chance only 5 times out of 100 (Polit & Beck 2008: 766).

Standard deviation: A measure of how much of variability there is in a sample (Polit & Beck 2008:766).

Statistically significant: If the p value is set at 0.05 level and the value obtained from the study falls below this level then the result is considered statistically significant. This means that only 5 times out of 100 ($5/100 = 0.05$) would the result be incorrect (Polit & Beck 2008:73).

Student t-test Statistical test used to test the difference in means of two groups (Polit & Beck 2008:593)

Study setting: The physical location which data collection takes place during the study (Polit & Beck 2008:766).

Systematic Sampling: Systematic sampling involves the selection of sample participant such that every “kth” person in a sampling frame is chosen (Polit & Beck 2008:767).

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APPENDIX A

**LETTER OF PERMISSION FROM ETHICS COMMITTEE, FACULTY OF
HEALTH SCIENCE, UNIVERSITY OF PRETORIA**





DEPARTMENT
OF
HEALTH

DEPARTEMENT
VAN
GESONDHEID

Tel: (012) 354 1560
Fax/Faks: (012) 354 1831
Ref/Verw: Ethics Committee
Enquiries/Navrae: Dr R Sommers
Ward 4 Room 19
Date : 18/08/2000

Number : IPA - 23 - 95/2000

Title : The effect of involving private practitioners on the quality of antenatal care of the indigent population of Tembisa

Investigator : Prof R C Pattinson; Department of Obstetrics and Gynaecology; Kalafong Hospital and Pretoria Academic Hospital; Pretoria.

This Protocol has been considered by the Ethics Committee, Faculty of Medicine, Univ. of Pretoria and Pretoria Academic Hospital on 16/08/2000 and found to be acceptable.

Dr J. E. Davel (female) MBChB: Hospital Superintendent
Prof A. P. du Toit BA; DiplTheo; BA (Hons); MA; DPhil: Philosopher
Prof C. I. Falkson (female) MBChB; M. Med(Int); MD; Med. Oncologist
Prof G. Falkson CHAIRPERSON; MBChB; M. Med(Int); MD; OSG: Medical Oncologist
Prof S. V. Grey (female) BSc(Hons); MSc; DSc : Deputy Dean
Prof J. Jooste (female) Dip. Pharm; M Pharm; Pharmacist.
Prof M. L. Karusseit MBChB; MFGP(SA); M. Med(Chir); FCS (SA): Surgeon
Prof S. Khan (female) MB.BCh.; Med. Adviser (Gauteng Dept. of Health).
Prof B. C. F. Magardie (female) BCur: Matron/Senior Nursing-Sister
Prof B. Mullins (female) BSc(Hons); Teachers Diploma;
Prof Z. Njongwe (female) MBChB ; D.P.H.; DTMtH; DOH ; F.F.C.H(CM)
S.A. Chief Med. Super of Pretoria Academic Hospital.
Prof J. Phatoli (female) BCur(Et. A1) Senior Nursing-Sister
Prof W. Pretorius MBChB; M. Med (Psych) MD: Psychiatrist
Prof P. Rheeder MBChB; MMed(Int); LKI(SA); MSc (KLIN.EPI): Specialist Physician
Prof M. M. S. Smuts (female) BVSc; DVSc
Prof R. Snyman MBChB, M. Pharm. Med: MD: Pharmacologist
Prof K. Sommers BChB; HDD; MBChB; MD: Pharmacologist
Prof Sommers SECRETARIAT (female) MBChB; M. med (Int); MPhar. Med;
Prof F. W. van Oosten BA; LLB ; LLD ; LLD ; Head of Department of Public Law and Prof in Criminal Law and Medical Law

Student Ethics Sub-Committee

Prof Ahrens (female) B. Cur;
Prof S. V. Grey (female) BSc(Hons); MSc ; DSc : Deputy Dean
Prof P. Rheeder MBChB; MMed(Int); LKI(SA); MSc (KLIN.EPI): Specialist Physician
Prof Sommers SECRETARIAT (female) MBChB; M. med (Int); MPharMed;
Prof van der Westhuizen (female) D. Cur; M. Ed.

PROF G FALKSON;

MBChB; M. Med(Int); MD; OSG: Medical Oncologist
CHAIRPERSON of the Ethics Committee at Pretoria Academic Hospital;



APPENDIX B

**LETTER OF APPLICATION FOR APPROVAL OF AMENDMENT
FROM MEDICAL RESEARCH UNIT FOR MATERNAL AND
INFANT HEALTH CARE STRATEGIES AT KALAFONG HOSPITAL**





Research Unit for Maternal and Infant Health Care Strategies

Director: Prof R C Pattinson

Departments of Obstetrics and Gynaecology, and Paediatrics, Kalafong Hospital, Private Bag X396 Pretoria 0001, South Africa
Tel: (012) 373 0825 • Fax (012) 373 0825 • E-mail: matinfu@global.co.za or rcpattin@kalafong.up.ac.za

APPLICATION FOR APPROVAL OF AMENDMENT

Date: 2001-08-28

Prof J.R. Snyman
Chair: University of Pretoria Faculty of
Health Sciences Research Ethics Committee
University of Pretoria and Pretoria Academic Hospitals Complex
PRETORIA
0002

Dear Prof Snyman

PROTOCOL NO: IPA - 23 95/2000

PROTOCOL NAME: VISION OF PRIVATE-PUBLIC SECTOR CO-
OPERATION IN COMMUNITY OBSTETRICS: THE EFFECT OF
INVOLVING PRIVATE PRACTITIONERS ON THE QUALITY OF
ANTENATAL CARE OF THE INDIGENT POPULATION OF
TEMBISA.

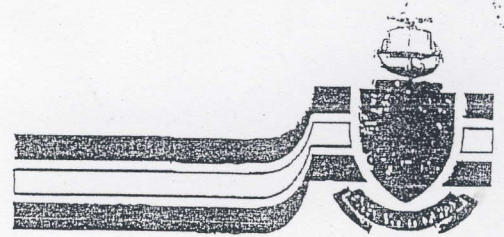
Nature of amendment:

The primary investigator of the study is SR. Rachel Mokhondo. She will be doing this study for MCur purposes. ←

- Protocol: Vision Of Private-Public Sector Co-Operation In Community Obstetrics: The Effect Of Involving Private Practitioners On The Quality Of Antenatal Care Of The Indigent Population Of Tembisa.
- The approval of protocol 95/2000.
- The approval of the Department of Health.

Prof RC Pattinson
Director





University of Pretoria

Pretoria 0002 Republic of South Africa Tel (012) 354-1000
Fax (012) 329-1327 <http://www.up.ac.za>

Faculty of Health Sciences Research Ethics Committee
University of Pretoria
Sculpsansberg Road - MRC-Building - Level 2
Tel: (012) 339 8612 Fax: (012) 339 8587
E Mail: mande@med.up.ac.za
Private Bag x 385
Pretoria
0001
Date: 29/10/2001

Number : Amendment to Protocol for MCur purposes - 95/2000
Title : The effect of involving private practitioners on the quality of antenatal care of the indigent population of Tembisa
Investigator : Prof R C Pattinson; Department of Obstetrics and Gynaecology; Kalafong Hospital and Sr Rachel Mokondo - for MCur purposes Pretoria Academic Hospital; Pretoria.
Sponsor : Unit fund A 0397

This Amendment for MCur purposes has been considered by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 24/10/2001 and found to be acceptable.

Prof P Carstens	BLC LLB LLD (Pret) Faculty of Law
Dr J.E.Dafe	(female) MBChB: Hospital Superintendent
Prof A.P.du Toit	BA; DiplTheo; BA (Hons); MA; DPhil: Philosopher
Prof S.V. Grey	(female) BSc (Hons); MSc; DSc: Deputy Dean
*Mrs R Jooste	(female) Dip. Pharm; M Pharm; Pharmacist.
Dr V.O.L. Karusseit	MBChB; MFGP (SA); M.Med (Chir); FCS (SA): Surgeon
Dr S.Khan	(female) MB.BCh.; Med. Adviser (Gauteng Dept.of Health)
*Miss B Mullins	(female) BscHons; Teachers Diploma;
*Snr Sr J. Phatoli	(female) BCur (Et.AI) Senior Nursing-Sister
*Prof H.W. Pretorius	MBChB; M.Med (Psych) MD: Psychiatrist
Prof P. Rheeder	MBChB; M.Med (Int); LKI (SA); MSc (CLIN.EPI): Specialist Physician
*Dr C F Slabber	BSc (Med)MB BCh, FCP (SA) Acting Head; Dept Medical Oncology
*Prof J.R. Snyman	MBChB, M.Pharm.Med: MD: Pharmacologist
*Prof De K. Sommers	BChB; HDD; MBChB; MD: Pharmacologist
Dr R Sommers	(female) MBChB; M.Med (Int); MPhar.Med;
*Dr TJP Swart	BChD, MSc (Odont), MChD (Oral Path) Senior Specialist; Oral Pathology

PROF J R SNYMAN MBChB, M.Pharm.Med: MD: MD: Pharmacologist
CHAIRPERSON of the Faculty of Health Sciences Research Ethics Committee
University of Pretoria

* = Members attended the meeting on 24/10/2001.



APPENDIX C

**LETTER OF PERMISSION TO GAUTENG DEPARTMENT OF HEALTH
FROM TEMBISA HOSPITAL**





DEPARTMENT OF HEALTH

TEMBISA HOSPITAL/HOSPITAAL

ENQUIRIES : MS MPELA/aj
NAVRAE :

REF. NO. : (011)923-2325
VERW. NO. :

31 January 2001

Ms Rachel Mokhondo
P O Box 7
Atteridgeville
0008

Dear Madam,

RE: APPLICATION FOR PERMISSION TO DO RESEARCH

In response to your request in a letter dated 18 January 2001 to do research in the lying in ward post deliveries, for women who attended antenatal care in our hospital and the surrounding clinics including women who received antenatal care from the general practitioners where auditing of the antenatal cards will be done to compare the services rendered by the public antenatal care clinics and the general practitioners. Management has agreed to grant you permission to do research on conditions that you consider all ethical implication.

Sincerely yours

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CHIEF EXECUTIVE OFFICER

ALL CORRESPONDENCE TO BE ADDRESSED TO THE C.E.O.
GAUTENG DEPARTMENT OF HEALTH, TEL: (011) 926-0814
TEL: (011) 923-2000 / FAX: (011) 920-1195
PRIVATE BAG X7, OLIFANTSFONTEIN, 1665



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

APPENDIX D

LETTER OF PERMISSION FROM TEMBISA HOSPITAL





MRC

DEPARTMENT OF HEALTH

TEMBISA HOSPITAL/HOSPITAAL

ENQUIRIES : DR MFENYANA Mm
NAVRAE :

REF. NO. : (011) 926 2722
VERW. NO. :

25 AUGUST 2000

**ATTENTION: DR M. MODISE
DIRECTOR - MCH**

Gauteng Department of Health
Private Bag X085
MARSHALLTOWN
2107

Dear doctor Modise

**RE: ANC - PPP PROJECT WITH GENERAL PRACTITIONERS IN
TEMBISA**

This is to confirm that the preparations, investigations and planning for above-mentioned project have been finalized successfully and that the pilot can now start. Hospital Management happily approved the project.

Thanking you in advance.

Yours faithfully

**CHIEF EXECUTIVE OFFICER
DR S. MFENYANA**

cc.: Doctor Georgieva - Head of Department Obstet & Gynae

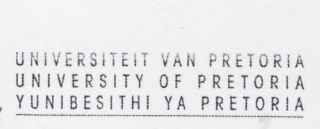
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APPENDIX E

**LETTER OF PERMISSION TO REPRODUCE TABLES AN QUALITY
CHECK FOR ANTENATAL RECORDS SCORE**





Research Unit for Maternal and Infant Health Care Strategies

Tel: 012-373 1002
Fax: 012-373 1045

Director
Professor RC Pattinson
Email Robert.pattinson@up.ac.za

Klinikala Building
PO Box 667
Pretoria, 0001

19th November 2010

To whom it may concern

I hereby give permission for Ms KR Mokhondo to reproduce the following tables from the Basic Antenatal Care Handbook: in her MCur dissertation:-

Table 1 . Conditions that can be successfully detected and treated during pregnancy – Page 6

Table 2. Effective interventions in the antenatal period-Page 9

She may also include the following from the BANC Antenatal Care Audit Workbook the appendices of her dissertation

Quality of Antenatal Care Guide for Scoring - Pages 5-14

Yours faithfully

Professor RC Pattinson
Head of Obstetrics & Gynaecology Kalafong Hospital and Clinical Head
Department of Obstetrics and Gynaecology, Faculty of Health Sciences University of Pretoria



APPENDIX F

**PRIVATE GENERAL PRACTITIONER'S PATIENT INFORMED CONSENT
FORM**



The effect of involving private practitioners on the quality of antenatal care of the indigent population of Tembisa.

Patient Consent Form

I, Willingly agree to participate in this study which has been explained to me by Dr This research study is being conducted by the MRC Maternal and Infant Health Care Strategies Research Unit, in conjunction with the Gauteng Department of Health and the Khyalami Independent Practitioners Association.

The purpose of this study is to measure the effect of involving private practitioners on the quality of antenatal care of the poor people of Tembisa. You have been invited to participate in this study.

Your doctor has confirmed you are pregnant and that you want to continue with the pregnancy. He will examine you and fill in a motherhood card. You will take this card to Tembisa Hospital where the routine antenatal bloods will be taken. Your doctor will ensure he gets the results and you are to follow-up with him at his/her surgery. Your doctor will follow the Gauteng antenatal care policy and will ensure the prescribed tests are performed. However, he will not do tests that are not prescribed by the policy in the context of the trial. For example, he will not routinely perform a sonar test on your baby, but if indicated he will refer you to Tembisa Hospital for one. However, if he/she has a sonar machine, and you want a sonar test your doctor will charge you for that test. If there are any problems he will refer you to Tembisa Hospital for further care.

Will you please keep your motherhood card in a safe place and take it with you whenever you see your doctor or go to Tembisa Hospital. This serves as your referral letter and all the information concerning your pregnancy is on it.

You are free to stop the participating in the trial at any time. If you do so please keep the motherhood card and take it to where you want to go for your antenatal care, or where



you want to have your baby. The card contains all the information concerning your pregnancy and will be very useful to the doctors who will treat you.

If you do not want to participate in the trial, your antenatal care will be performed at Tembisa Hospital as is normally the case.

Your delivery will take place at Tembisa Hospital, as would normally be the case. Once you have had your baby, your motherhood card will be collected and valuable data will be taken from it. The information will be kept confidential. Once the data has been entered, no one will be able to identify you.

I have read all of the above, had time to ask questions, received answers concerning areas I did not understand and I willingly give my consent to participate in the study.

(Patient Signature)

(Date)

(Witness 1 Signature)

(Date)

(Witness 2 Signature)

(Date)

(Doctor Signature)

(Date)



APPENDIX G

ANTENATAL CARD



APPENDIX H

QUALITY CHECK FOR ANTENATAL RECORDS SCORE



Quality of Antenatal Care: Guide for Scoring

The audit tool has 25 criteria listed from the antenatal card reflecting the quality of care the pregnant patient received during her visits to the clinic. The criteria are divided into three main categories:

- History
- Examination
- Interpretation and decisions.

History

This section has six criteria dealing with the history of previous pregnancies, the current pregnancy and medical history.

1. Age, parity and gravidity

Score:

Age = $\frac{1}{2}$

Grav and Para = $\frac{1}{2}$

Very young women (<18) has an increased risk for complications; Older women (>35) should be given the opportunity for genetic counselling, either by a specially trained midwife or at a high risk clinic.

Gravidity and Parity:

A primigravid woman is at risk as she has not proven that she can give birth, a multigravida might be at risk depending on the outcome of the previous pregnancy eg. Previous C-section or ENND.

2. Details of previous pregnancy, including causes of death and indicating complications or operations

Score:

The table for previous pregnancy should be completed indicating complications if present, of the pregnancy and delivery and the outcome with causes of SB or ENND. = 1.

Incomplete or incorrect data = 0.

3. Previous illnesses that may influence this pregnancy, including cardiac, renal and diabetic disease.

Score:

Evidence of all diseases asked, proven by individual recording of each corresponding block = 1. Evidence doubtful, or incomplete = 0.

The antenatal card lists the major illnesses that may impact on the health of the woman during pregnancy for example cardiac disease. (An important cause of maternal death in the category chronic diseases.)



Often 'none' or 'nil' is written below the blocks, but in this case it is then not clear if all diseases were addressed. Evidence should be clear that the history of a particular disease was asked and recorded.

4. History of present pregnancy:

Score:

Sufficient evidence to form a general impression on the well-being of the woman and the fetus, and the progress of the pregnancy = 1;

No deduction can be made from the notes on the well-being of the woman and the fetus, or notes page contains only repeated vital signs or test results = 0.

The history of the present pregnancy should reflect a narrative of the events during the current pregnancy; the main purpose is to establish the well-being of the pregnant woman and the well-being of the fetus.

5. Last menstrual period and expected date of delivery:

Score:

EDD established correctly or an attempt is made to estimate where dates are not known; EDD must be recorded and the method used to obtain the date indicated = 1

No EDD recorded or EDD established incorrectly, (even if the LMP recorded) = 0

Time and effort need to be spent during the first visit to determine the EDD as close to the correct date as possible. (+/-3 days) This can be achieved using the dates, SF measurement, ultrasound scan or a combination of the above.

Two major causes for unexplained SB are identified as IUGR and post-maturity. The importance of the correct EDD to assist in the identification of these cannot be over-emphasized. Accurate EDD calculation allows the SF growth chart to be started correctly and fetal growth monitored appropriately.

It is advised that clinic staff have a gestational calendar available to make this calculation easy and correct.

The EDD should be noted in the block or table designed specifically for it, with the indication of how it was calculated.

6. Correct plotting of the first entry on the graph on/after 20 weeks to illustrate the growth of the fetus.

Score:

Graph started correctly = 1

Lack of evidence that graph was started correctly, or started incorrectly = 0.

The first entry on the graph may be before 20 weeks gestation if the first antenatal visit is completed with the confirmation of pregnancy. The graph



may then only be started at the second visit, although some data may be recorded in the appropriate blocks eg. Weight, BP, etc. In this case the second visit needs to be assessed.

Two options are available to start the graph:

- *Where dates are sure (LMP known and correct or sonar):* Here the graph is started on the axis where the gestational age is indicated in weeks. The plotting of the SF measurement follows the recording of the current date and would most likely not fall on the 50th centile line.
- *Where dates are not known:* The assumption is made that this woman has an 'average' pregnancy with a fetus of average weight and therefore SF measurement is plotted on the 50th centile, followed by recording the date of the visit on the axis representing the gestational age. This would then give some indication of the gestational age and the EDD can then be estimated.

Examination:

This section deals with the examination of the woman and her baby. It includes sections of the physical examination and measurement or investigations that would provide more information to determine the well-being or health of the woman and the progress of the pregnancy.

7. Maternal height and weight:

Score:

Height and weight = 1

Either height or weight = 1/2

No height or weight = 0

With the advent of HIV and AIDS the nutrition status of the pregnant woman has become a very important measure. The BMI (Weight(kg)/Height(m)²) indicates the nutritional status of the pregnant woman. Supportive programmes are available, but unless the problem is identified no support or referral can be initiated.

8. BP at each visit:

Score:

BP checked at each visit = 1

BP not checked at all visits = 0

The BP has to be checked at each visit. GPH contributes to both maternal and neonatal deaths

9. Heart examined

Score:

Evidence that the heart sounds was checked/recorded = 1

Nothing recorded = 0



Cardiac disease contributes to maternal deaths.

10. Correct completion of the graph for follow-up visits

Score:

Evidence that the graph is completed correctly that is the time axis remains constant and in accordance with duration of pregnancy. (3 day variance acceptable) = 1

Incorrect completion of the graph that is the time axis is not constant and 1 week or more variance on the duration of the pregnancy = 0.

This step needs to be checked carefully. A gestational calendar is used and set on the EDD. The dates of the antenatal visits are then used to check if the gestational age was correctly calculated and plotted. This step is critical to allow interpretation of the graph, in particular to identify IUGR or post-maturity.

11. Interpretation of the graph:

Score:

If the deduction can be made on the well being or otherwise of the fetus = 1
(Normal growth, IUGR or fetus large for dates)

If no interpretation of the graph can be made = 0.

Therefore if criteria 10 scores nil, criteria 11 must also score nil.

12. Fetal presentation from 34 weeks

Score:

Any fetal presentation recorded from 34 weeks on = 1

No fetal presentation recorded after 34 weeks = 0

13. Fetal heart and fetal movements noted

Score:

Fetal heart OR fetal movements noted = 1

No record of fetal heart or movements = 0

14. Urinalysis:

Score:

Urinalysis at each visit = 1

Urinalysis omitted at some visits = 0

Urinalysis assists in the diagnosis of eclampsia, UTI, etc.

15. Hb and Rh:

Score:

Rh done and recorded and Hb done early in pregnancy and again in third trimester = 1

Rh only = $\frac{1}{2}$

Hb x2 only = $\frac{1}{2}$

No Rh and Hbx1 or no Hb = 0

Anaemia may increase bleeding and chance of a smaller baby.

16. Syphilis test result recorded

Score:

Result noted = 1

No result noted even if blood taken and sent to laboratory = 0

Syphilis may result in fetal or neonatal death.

17. HIV counselled:

Score:

Evidence of patient counselled, with or without evidence of being tested = 1

No evidence of patient being counselled = 0

Evidence may be in the format of for example VCT or the code used to record the test result followed by the mothers name for the PMCTC programme.

AIDS is currently the major cause of maternal death and all patients should be encouraged to be tested and to know their status. (Opt out) Support programmes available can only be initiated once status is known.

18. Tet Tox given:

Score:

Evidence of appropriate doses given = 1

No record of booster given = 0

Interpretation and Decisions:

All the above could have been completed correctly, but without action taken where risk factors are identified, antenatal care will be of little or no benefit to the pregnant women and her unborn baby.

19. Identification and recording risk factors in the space indicated for problems

Score:



All risk factors noted and recorded under the problem list OR no risk factor present = 1

Some risk factors (but not all present factors) noted under problem list = ½

Risk factors present but not noted under the problem list = 0

One of the main objectives of antenatal care is to identify the woman with risk factors present, and to treat or refer appropriately. Should investigations reveal risk factors, which are then ignored by health care workers, it results in a poor quality of care, which in turn may result in mortality and morbidity.

20. Record of action plan including intervention & referral if indicated

Score:

Evidence of action taken for all problems present OR no problem present = 1

Some problems addressed but for some no action noted = ½

Problems present but no action noted = 0

21. Discussion of labour with mother:

Score:

Evidence that the woman has been informed of the place of labour; and/or discussion of risk factors = 1

No evidence that the woman has been informed of place of labour or high risk factors = 0

The labour plan may need adaptation as the pregnancy progresses. Evidence of appropriate information to the woman is required.

22. Transport arrangements

Score:

Evidence that transport arrangements was discussed with the mother = 1

No evidence = 0

Women need to be encouraged to have a plan to reach the health service should labour start, for example to have emergency taxi fare. This is not the function of the emergency rescue services.

23. Future family planning:

Score:

Evidence that future contraceptive method was discussed = 1

No evidence = 0

Evidence suggests that unwanted pregnancies are experienced negatively by women, leading to no or poor attendance of antenatal care.



24. 1st & 36 week visit countersigned

Score:

Two signatures at these visits = 1

Absence of two signature = 0

Peer review should be encouraged to verify findings and ensure quality of records.

25. Date of the next visit:

Score:

Evidence of the TCB (To come back) date =1

No evidence = 0



Quality Check for Antenatal Records - Criteria

1. **Age, parity & gravidity**
 0 = *not completed*
 ½ = *either age or parity/gravidity completed*
 1 = *all completed*
2. **Details of previous pregnancies, including causes of death & indications for operations**
 0 = *absent/incomplete information*
 1 = *all details recorded*
3. **Previous illnesses**
 0 = *no evidence that each section addressed*
 1 = *each section marked or evidence that all addressed (eg "none of the above")*
4. **History of present pregnancy**
 0 = *no/inadequate notes about the pregnancy*
 1 = *notes about the well-being of the woman and the progress of the pregnancy*
5. **LNMP & EDD**
 0 = *no information in table or wrong method used to calculate EDD (eg sonar after 24wks)*
 1 = *EDD accurate +/- 3 days*
6. **Estimated gestation plotted on graph at 1st visit**
 0 = *inappropriate method (50th percentile v gestation) or incorrect calculation*
 1 = *correct plotting*
7. **Maternal height & weight**
 0 = *neither completed*
 ½ = *one completed*
 1 = *both completed*
8. **BP at each visit**
 0 = *BP not recorded on one or more occasion*
 1 = *BP recorded at all visits*
9. **Heart examination**
 0 = *no evidence of heart examination*
 1 = *heart examined*
10. **SFH correctly plotted on graph**
 0 = *SFH plotted incorrectly or not at each visit*
 1 = *SFH plotted correctly at each visit*
11. **Estimation of IUGR**
 0 = *not able to be estimated (ie if #10=0) or if IUGR evident but not acted upon*
 1 = *appropriate action taken*
12. **Fetal presentation from 34wks**
 0 = *no fetal presentation recorded from 34wks*
 1 = *fetal presentation at any visit from 34wks*
 *if no visit from 34wks, leave blank and calculate score out of total of 24
13. **Fetal heart or fetal movements**
 0 = *no record*
 1 = *any record of FHR or fetal movements*
14. **Urinalysis for proteinuria & glycosuria**
 0 = *urinalysis not done on 1+ occasion*
 1 = *urinalysis at all visits*
15. **Hb & Rh**
 0 = *<1 Hb and Rh*
 ½ = *1 Hb + Rh or 2 Hb*
 1 = *2 Hb + Rh*
16. **Syphilis test result recorded**
 0 = *no RPR result*
 1 = *RPR result recorded*
17. **HIV counselling**
 0 = *no record of counselling*
 1 = *any record of counselling (VCT or code)*
18. **Tetanus toxoid**
 0 = *no tetanus toxoid given*
 1 = *tetanus toxoid given (booster/full course)*
19. **Identification & recording of risk factors in problem list table**
 0 = *risks present but not recorded*
 ½ = *some risks recorded on problem list*
 1 = *all risks recorded /no risks present*
20. **Record of action plan including intervention & referral if indicated**
 0 = *problems identified but no action taken*
 ½ = *some problems addressed*
 1 = *action for all probs/no probs present*
21. **Delivery discussed with mother**
 0 = *location of ANC & delivery not indicated*
 1 = *location of ANC & delivery recorded*
22. **Transport arrangements for labour**
 0 = *no notes about transport*
 1 = *evidence of discussion of transport*
23. **Decision re future family planning**
 0 = *no discussion of family planning*
 1 = *evidence of discussion of family planning*
24. **Countersigning of 1st visit & 32 wk visit**
 0 = *no sign of quality check*
 ½ = *double-checking of card at 1 visit*
 1 = *double-checking of card at both visits*
25. **Date of next visit recorded**
 0 = *no record of future visit*
 1 = *future visit recorded at any stage (TCB)*



Score sheet

Criteria	Date:																									Total	%			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25					
Gestational age at booking (wks)																														
History																														
Age, Parity, Gravida																														
History prev preg																														
Prev illness																														
History present preg																														
LNMP, EDD																														
Plotting of gestation @ 1st visit																														
Examination																														
Maternal height & weight																														
BP (each visit)																														
Heart examination																														
Correct plotting of SFH																														
Presence of IUGR detected																														
Fetal presentation (from 34 wks)																														
Fetal heart & movements																														
Urinalysis																														
Hb, Rh																														
Syphilis test results recorded																														
HIV counselled																														
Tetanus toxoid given																														
Interpretation & decisions																														
Identification/recording of risks																														
Action plan & interventions																														
Discussion of labour with mother																														
Transport arrangements																														
Family planning																														
1st & 32wk visits countersigned																														
Date of next visit																														
Total																														
%																														