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Patient factors associated with gestational age at first presentation to antenatal clinic at four facilities in the Masquassi hills sub district, North West Province, Republic of South Africa

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PATIENT FACTORS ASSOCIATED WITH GESTATIONAL AGE AT FIRST PRESENTATION TO ANTENATAL CLINIC AT FOUR FACILITIES IN THE MAQUASSI HILLS SUB DISTRICT, NORTH WEST PROVINCE, REPUBLIC OF SOUTH AFRICA.

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A research report submitted to the Faculty of Health Sciences
in partial fulfilment of the requirements for the degree
of
Master in Family Medicine
Department of Family Medicine
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Johannesburg, 2017

I. DECLARATION

I, Doctor MANWANA JEAN-PAUL KIPANGU, hereby declare that this research report is my own work except where due acknowledgement for assistance received has been made. It is being submitted for the degree of Master of Family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for another degree or examination at this or any another university.

Signed ..... (Signature of the candidate)

20TH day of OCT 2017

II DEDICATION

In memory of my father

Kipangu Baudouin Manwana

1946-2015

III ABSTRACT

Background

Research has shown that women who do not obtain adequate prenatal care significantly reduce their chances of a favourable pregnancy outcome. Despite antenatal care services being provided free of charge in South Africa, only 53.9% of women attend antenatal care before the gestational age of 20 weeks or less as recommended by the World Health Organisation (WHO) and National Department of Health (NDOH).The interventions aimed at reducing unfavourable pregnancy outcomes are most effective during prenatal care, it is crucial to identify factors that prevent pregnant mothers from presenting early.

It is believed that the findings of this study will give us an insight into the rate of early ANC attendance and will also be useful to policymakers and facility managers, especially at the Primary Health Care (PHC) level, in optimising patient care and improving healthcare services.

Aims and objectives

Therefore, the objectives of this study were:

1. To establish the gestational age at which pregnant women present to first antenatal visit in Maquassi Hills sub district.
2. To describe participants' socio-demographic profile, health status and obstetrical characteristics
3. To explore knowledge and attitudes that affect timing of first presentation.
4. To determine any association between first ANC presentation and socio-demographic, obstetric factors, knowledge and attitudes towards ANC.
5. To determine predictors for first antenatal attendance.

Method

This was a cross-sectional study conducted in four publicly funded primary health facilities in the Maquassi Hills sub district, between August and October 2015. A total of 127 participants were directly interviewed using a structured questionnaire to obtain information about their socio-economic characteristics, ANC and services rendered. Most of the information required for the study was obtained from the Maternity booklet. This included demographic data, obstetric history, medical history, and gestational age. Data analysis was done using Microsoft Excel 2014. A chi-square test was used to determine associations between time of the first presentation and each variable; and a multiple variable regression was used to determine predictors of early attendance.

Results

Most participants interviewed were: Tswana speaking (72.4%), with a mean age of 26.5 years (SD = 5.9), had a high school education (84.6%) and were mostly single (70.6%). This study showed that 68.9% of the respondents presented to their first antenatal booking within the recommended time of less than 20 weeks. The average period of presentation was 16.3 weeks (SD = 6.0). No statistically significant association was found between socio- demographic, obstetrical characteristics and the timing of the first antenatal visit.

All the participants knew that the right time to book an appointment was before 20 weeks as the best perceived time for initiation of ANC. However, there was a statistically significant difference in the best perceived time between those who booked early (2 months [1.99 months (SD =1.145)]) compared with those who booked later (3 months [2.83months (SD = 1.595)]) (p = 0.006). The multivariate analysis showed that participants who perceived three months as the best time for booking were 1.5 times more likely to book later (OR= 1.589, 95% CI 1.227-2.059) compared with those who perceived that the best time was at two months.

The most frequent reason given for booking early was to confirm pregnancy (64.0%) and (31.1%) initiated ANC because they were ill. Long waiting times and staff attitude were reported by participants (91.3%) and (5%) respectively as barriers to early ANC visit.

Conclusion

The findings of this study show that most participants booked antenatal care timely and all participants knew the right time to initiate ANC. However, there is incongruity between knowledge and practice for the 30% who presented late. This could be attributed to the long waiting time and staff attitude mentioned by some of the participants. There is a need therefore to address the demotivating factors such as long waiting time, and staff attitude in order to promote early ANC booking/attendance.

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VII LIST OF ACRONYMS AND ABBREVIATIONS

ANC:	Antenatal Care
ART:	Antiretroviral Therapy
BANC:	Basic Antenatal Care
CHC:	Community Health Centre
HCW:	Health care worker
ESMOE:	Essential Steps in the Management of Obstetric Emergencies
GA:	Gestational age
LMP:	Last Menstrual Period
MMR:	Maternal Mortality Rate
NDOH:	National Department of Health
NHI:	National Health Insurance
PHC:	Primary Health Care
RSA:	Republic of South Africa
SDG:	Sustainable Development Goals
USA:	United States of America
WHO:	World Health Organisation
WBOT:	Ward-based Outreach Team

VIII LIST OF DEFINITIONS

Antenatal Care (ANC)

Refers to the health care rendered to pregnant women for the period of time before giving birth.[1]

Early Booking

This is defined as attending the initial ANC visit at the gestational age before 20 weeks.[1]

Late Booking

Defined as attending the initial ANC visit at the gestational age of 20 weeks and above.[1]

CHAPTER 1: INTRODUCTION

1.1 Background

The important role played by early initiation of antenatal care visits (ANC) cannot be underestimated. Timely commencement of ANC provides early screening for complications, referral and treatment for ensuring a safe motherhood and childhood. It is understandable, then, that many countries are taking deliberate and purposive steps to ensure appropriate, early provision of ANC. It is one of the critical interventions that can enhance the reduction of childhood and maternal mortality as stated in the Millennium Development Goals (MDGs) 4 and 5 and Sustainable Development Goal 3.[1]

The new ANC model of the World Health Organization (WHO) states that every pregnant woman is at risk of complications and recommends an early ANC visit, of which the first should be during the first trimester.[2]In South Africa this first ANC visit is recommended as soon as possible but at least before 20 weeks.[3] The first consultation is used to categorise pregnant women into two groups; firstly, those eligible to receive routine ANC (basic component) and secondly, those who need special care. The latter on average account for 25% of all pregnant women initiating ANC based on: a previous history of pregnancy, current pregnancy state, and general medical conditions.[2]

1.2 Problem Statement

While working at various primary facilities at the Maquassi Hills sub district, the researcher observed that most women presented for their first visit between 20-24 weeks. The reasons provided were: poor access (limited clinical hours, services limited to certain days), lack of efficiency (long waiting times), staff shortages, staff negative attitude, and cultural issues.[4]

This was also supported by a study conducted in a South African city, which showed that more than half (54 %) of the women initiated their ANC care after 20 weeks of pregnancy[5]. Despite the steady improvement that has occurred each year in 2007 and 2008, almost an half (44.2%) of women attended ANC after 20 weeks in 2014 and 2015 which is still above the national average of 35%,[4] thereby missing an opportunity to have problems diagnosed early, having treatment provided and preventing further complications.[6,7]

This poor utilisation of ANC visits occurs in a context where mothers die of complications during pregnancy and childbirth that could have been prevented. The Tenth Interim report on maternal death has established the maternal mortality rate (MMR) at 146.7/100,000 live births in 2011 and 2012.[8] Sixty percent of maternal deaths were considered by assessors to be potentially avoidable while two-thirds were due to: non-pregnancy related infections, obstetric haemorrhage and complications of hypertension in pregnancy. Lack of ANC has been implicated as the main patient-related factor associated with maternal mortality. The South African Saving Babies Report also lists non-adherence and late attendance at ANC among the top five avoidable causes of perinatal deaths.[9]

Potential patient–related factors are associated with the late ANC attendance as demonstrated and these require urgent intervention.

To the researcher's knowledge, there are few published studies that have investigated primary healthcare patient factors associated with timing of first antenatal booking. Online research yielded a study conducted by Mametja.[10]This study revealed that late antenatal care attendance in South Africa was declining. A higher proportion of urban women attended antenatal care late as compared with rural women. The factors associated with late initiation of antenatal care amongst urban women included low partner education and primigravidity/nulliparity. Factors that favoured early access to antenatal care amongst urban women included high socio-economic status, a partner being employed, desire to be pregnant and having a previous history of miscarriage.[10]No recent South African studies have attempted to determine patient-related factors associated with timing of the first booking in the Maquassi Hills sub district. Therefore, the aim of the study is to gather information about patient factors that influence first antenatal presentation at ANC in the sub district so as to improve the first ANC attendance.

1.3 Rationale

This study has relevance to family medicine, as ANC allows for timely risks assessment and implementation of interventions. The researcher hopes that the findings of this study will assist the management of the Maquassi Hills sub district to implement policies that will result in increasing the rates of early ANC attendance. This information will also be useful to policymakers and facility managers nationally, especially at the PHC level, in optimising patient care and improving healthcare services. The study will also be published in a peer reviewed journal.

CHAPTER 2: LITERATURE REVIEW

A literature search of relevant literature was performed from January 1995 to December 2015.

The researcher conducted a systematic search of published literature on the following online databases: Up to date, Google scholar, PubMed, Cochrane Library, SUM search 2, TRIP database, Essential Evidence Plus. As a starting point for this study, the researcher developed a series of key search terms in order to outline the scope of the literature to include in the review. These terms were grouped under the broad themes: reproductive, maternal and neonatal health. The following keywords were used to find articles: 'antenatal care,' 'factors', 'first booking'. These keywords were used in combination with (any of) these keywords: 'South Africa', 'Africa,' 'Europe,' 'Asia' and 'United States of America'. The search terms were used for all fields (including title, abstract, dissertation, keywords and full text), and all result types were included. The search was limited to articles published on or after January 1st, 1995. This initial literature search identified around 200 documents for further review and analysis. However, only 26 papers were selected for this study and have relevance for the relationship between patient-related factors and timing of antenatal care. Later, the literature was organized in chapter based on topics related to socio-demographic, obstetric and health factors, knowledge and attitudes towards antenatal care.

2.1 Global epidemiology review of timing of first ANC

Studies in Asia indicate that most women do not initiate ANC in the first trimester as recommended by the WHO. The majority of Nepali women do not attend ANC early, according to the results of the National Demographic Health Survey of women aged 15–49 years.[11]Of these women, 45% had their first ANC visit three months into their pregnancy, and 28% did not receive any ANC at all. Comparative studies between rural and urban women on the utilisation of ANC services had revealed that rural women initiated ANC late. Tran *et al* compared the pattern and adequacy of ANC in rural and urban Vietnam and discovered a wide disparity between urban and rural women in terms of initiation of ANC.[12]Pregnant rural women tended to attend ANC later than their urban counterparts, with an urban/rural ratio of

1: 4 ($p<0.05$) in the first trimester. The late initiation of ANC by rural women could be from lack of awareness of the importance of attending ANC early or, since the proportion of women with two and more children was high in rural areas, perhaps they were trying to conceal the pregnancy to avoid penalties of contravening the limit set by the 'two-child policy' of the Vietnamese government. This study used two cohort surveys to follow participants, in which information was collected every three months to reduce "recall bias". Instead of using only one or two indicators, the study used a set of indicators to assess the adequacy of ANC utilization to give a more comprehensive picture about the disparities between rural and urban areas regarding ANC adequacy.

Contrary to these results, a study in Texas indicated that more than half of the women initiated ANC early. Sunil *et al* in their study in San Antonio, Texas, found that 60% of the pregnant women initiated ANC in the first trimester of their pregnancy.[13] These were women who were married, had higher income (than the women of the low-income group) and a higher level of education, and had planned their pregnancies. A limitation in this study is that the sample selected was restricted to only a few public health clinics in San Antonio. Women who use these sites might not be representative of all low-income women. It is also important to note that bias might have been introduced by lapses in recall resulting from interviewing women about barriers and initiation of antenatal care after their pregnancies

In sub-Saharan Africa, Gross *et al* reported that 71 % of participants started ANC late, especially adolescent women, resulting in them not benefiting from preventative and curative measures.[14] The participants were recruited using exit interviews, thus leading to recall biases and also no formal sample size calculation was performed limiting the scientific validity of the results.

In South Africa, a Durban tertiary hospital- based South African study by Sibeko *et al* showed that 23% of women attended antenatal care before 20 weeks of pregnancy, 47.9% of women attended after 20 weeks and 28.7% did not attend antenatal care at all.[15] The estimate of unattended women was likely to be inflated as the authors disregarded private care and categorised women as non-attenders if antenatal care was provided in the private sector. The

authors also used maternity records to determine attending status of non-attenders, whilst a questionnaire was used for late-attenders and early-attenders. These different methods of collecting data on attendance status might have resulted in differential misclassification, which was likely to inflate the proportion of women not attending for antenatal care.

Another study conducted by Mametja showed the prevalence of late attendance among rural women (26%) compared with urban women (32%).[10]The underestimated proportion of late attendance could be due to errors in recall as most of the women had their pregnancy more than two years before the study. This may have resulted from non-differential misclassification of gestational age at first ANC attendance. The high proportion of early antenatal care attendance may also be attributable to responder bias: it is possible that participants were aware of the unacceptability of late antenatal care, and might have opted to report an earlier gestation age at booking. More recently, Solarin *et al* conducted a study in the Johannesburg Inner-city which showed that more than half (54 %) of the women initiated their ANC care after 20 weeks of pregnancy.[5]This study was based on self-reports and might therefore be subject to recall bias, even though women were interviewed in the immediate post-partum period. Also, the study could only be generalized to women delivering in public labour wards in urban South Africa.

2.2 Socio-demographic factors

Many studies have documented several socio-demographic factors associated with the timing of ANC visit that include ethnicity, age, marital status, level of education and employment.

Findings on how ethnicity influences the timing of the first antenatal booking have been equivocal. Herbst *et al*, described that Hispanic (RR = 3.2; $p < 0.0001$) and African American (RR = 1.2; $p < 0.001$) women were more likely to attend antenatal care late as compared with white Americans (RR = 0.53; $p<0.0001$).[16]

However, a study on the untimely utilization of care and barriers to ANC among women from low-income groups in San Antonio, Texas found no significant difference in late initiation of antenatal care between Hispanic and non-Hispanic women (adjusted OR = 1.72; 95% CI 0.66-2.10).[13]

Age seems to play a role as well, in determining access to health care. A Nigerian study reported that women who were aged younger than 25 years were more likely to attend late as compared with those older than 25 years of age (OR =8.3; 95% CI 1.1 - 62.6).[17] The wide confidence interval means that the findings of the study are less precise, and this may be due to the small sample size used (479 participants). The authors were not explicit with the methodology and study methods, making it difficult to assess the type ad magnitude of bias associated with the study. Also, Delvaux *et al* [18] and Raaitikainen *et al* [19]reported an increased risk of late antenatal care attendance amongst young women. However, both included much younger women in their studies and defined the age limit for young women as ≤ 20 years and < 18 years, respectively. In this studies, none of the respondents were currently aged younger than 18 years, so the distribution of age at the time of previous pregnancy was similar, with few women in the lowest categories. As a result, for purposes of achieving sufficient power, a cut-off of 30 years was used to dichotomise age, which could explain the non-significant association. There was a lack of an age gradient in this study to demonstrate the effect of age in the lower age range found in the two studies.

The association between marital status and the timing of the initial antenatal care have been equivocal. A European study reported an increased odds of late initiation of antenatal care that was higher for women living without a husband or partner (OR = 2.74; 95% CI 1.81 – 4.16, *P*=0.0002).[20] This study provided good-quality evidence that women born outside the UK and those living without a husband/partner may be at particular risk of late attendance for antenatal care. However, Gross *et al*. found an insignificant association between marital status and timing of first ANC attendance (p = 0.532).[14] the study's validity was questionable as no sample size was calculated as previously mentioned.

Education of women has been frequently found to be associated with antenatal care attendance. Sunil *et al* [13] reported that women with middle school education or less, had 3.15 (95% CI 1.35 - 7.31) times the odds of late antenatal attendance as compared to women with college or beyond college education level. Raatikainen *et al* [19] reported that a high proportion of women who attended ANC adequately were more likely to be better educated than non-

attenders or irregular attenders (24.7% vs. 18.5%; p <0.05 & 24.7% vs. 16.43; p < 0.001 respectively).

A study conducted in South Africa reported statistically an insignificant association between low educational level and timing of antenatal attendance.[10] The lack of statistical significance in these studies was more likely attributable to a lack of heterogeneity in educational level amongst urban participants.

Employment determines the economic circumstances wherein a woman finds herself. A low socio-economic status has been shown by several studies to impede access to health care. Sunil *et al*. identified that women with higher incomes tend to start ANC early.[13] The authors studied a homogeneous group of women (all women were from a low income class); this non-significant association could be explained by lack of heterogeneity. Another study reported an association between the income earned by women and a late ANC attendance. Adekanle *et al* revealed that women with lower incomes booked late for ANC compared with women in higher income brackets (p < 0.01).[17]

2.3 Obstetrical history and health status

Other factors that have been found to affect a first antenatal visit relate to: obstetric history and health status of the mother such as parity, bad outcome of previous pregnancy and illness of the mother.

There are consistent findings with regard to an association between parity and the timing of antenatal attendance. Raatikainen *et al* reported an association between multiparity with late antenatal attendance.[19] They found that 1.45% multiparous vs. 0.41% nulliparous women (p < 0.01) attended ANC late. Okunlola *et al* reported that nulliparous women were more likely to book early for ANC (χ^2 = 5.5; p = 0.02).[21]The authors did not report the magnitude of the association.

Previous bad obstetric history has been described as a factor that influences early access to ANC. A British study looked at the previous obstetric history of non-attendees, late attendees and early attendees.[22] A short-inter-pregnancy interval was associated with non-attendance

for ANC. Women who had less than one year and between one and two years inter-pregnancy intervals were more likely not to attend ANC as compared with women who had two or more years interval between pregnancies (OR = 3.1; 95% CI 1.6 - 6.2 & OR = 2.2; 95% CI 1.7 - 2.8 respectively). An inter-pregnancy interval of one to two years was also associated with late antenatal attendance (OR = 1.3; 95% CI 1.1 - 1.6). A previous history of miscarriage was a contributing factor against non-attendance (OR = 0.5; 95% CI 0.3 - 0.9) and late ANC (OR = 0.5; 95% CI 0.3 - 0.6). Women who had previously undergone a Caesarean section were twice as likely to attend ANC early as compared with women who had not previously undergone a Caesarean section (OR = 1.8; 95% CI 1.1 - 2.9). Similarly, women who had previously experienced forceps deliveries or other obstetric complications were more likely to attend early for ANC (OR = 2.3; 95% CI 1.2 - 4.5 & OR = 1.7; 95% CI: 1.3 - 2.3).[22]

That cohort study of 10,500 women of pregnancy followed over two months was based on self-reports and might therefore be subject to recall bias, even though women were interviewed in the immediate post-partum period.

In contrast, the differences reported by Raatikainen *et al* in the frequency of previous miscarriage, prior foetal death, previous induced abortion, hypertension and diabetes compared with poor attenders, non- ANC attenders and good ANC attenders were insignificant.[19] However, this study was conducted in a tertiary hospital and it is possible that women who attend there generally have high risk pregnancy therefore a more homogenous distribution of risk factors. Okunlola *et al* reported similar non-significant findings: previous history of Caesarean section or previous obstetric complications had no influence on gestational age at first ANC attendance (p = 0.91 & p = 0.79 respectively).[21]The authors attributed these insignificant findings to lack of counselling in women who had Caesarean and obstetric complications.

In one study on health issues, illness in the index pregnancy has been reported to promote early access to antenatal care. For instance, Okunlola *et al* reported that illness in the index pregnancy favours early ANC attendance (p = 0.03).[21]The authors did not report the magnitude of the associations and confidence intervals.

2.4 Knowledge and attitudes towards antenatal care.

Several studies have examined the influence of culture and beliefs on ANC attendance. Delvaux *et al* found that women with inadequate ANC were more likely to experience cultural barriers as compared with women with adequate ANC.[18] Barriers cited were: language problems, examination by male medics and prohibition by husband to access antenatal care. In this study, a higher proportion of unresponsiveness to certain questions was recorded among cases than among controls. Participants whose records were excluded in the calculation of the Odds Ratios (i.e., with missing values) were more likely to be higher amongst foreign nationals. These excluded records may have resulted in an underestimation of the effect of these characteristics in the results, because they are positively associated with inadequate prenatal care. In addition, the same excluded records may have resulted in an underestimation of the impact of perceived financial difficulty, as this barrier was more commonly reported by foreign nationals.

Also, Skinner *et al* found that in some African cultures, it was inappropriate for a mother-in-law to be informed of the pregnancy until it could be seen.[23] However, no causative inferences were made.

Ill-founded perceptions, such as: absence of benefits from antenatal attendance, knowing what to do during pregnancy, ignorance of pregnancy and efforts to conceal pregnancy have been found to influence the timing of first antenatal care attendance.

For a woman to actually book an appointment to attend an antenatal clinic, she needs to see the benefit of doing so. She must be made aware that the available services will improve the outcome of the pregnancy for her and her unborn baby. Therefore, the perception that attending the local clinic holds no benefit is a barrier to antenatal service.

In South Africa, Abrahams N. *et al* [24]reported that Xhosa women believed that booking for antenatal care secures them a bed for delivery in hospital. In contrast, they perceived labour and delivery as the time for biomedical intervention. This paradox in which health care is important in childhood but not during pregnancy is embodied in most women as the primary reason for seeking ANC in this setting: to receive an antenatal attendance card as a requirement to deliver at the facility.[25]

Some of the other cited reasons for late attendance reported by Delvaux *et al* include ignorance of pregnancy (26% of late attenders) and efforts to conceal pregnancy (9% of late attenders).[18]

When a woman realizes that she is pregnant, she has to internalize the concept before moving on. This process of acceptance may be affected by whether it is a planned pregnancy. However, in the event that the pregnancy was unplanned overcoming the initial shock may further delay her booking an appointment at a clinic. Delvaux *et al* found that women who had an unplanned pregnancy had four times the likelihood of initiating antenatal care late (OR = 4; 95% CI 3.3 - 4.7).[18] These findings were similar to a study conducted by Abrahams N. *et al* where women reported unwanted pregnancy as reason for late attendance.[24]

2.5 Summary of literature review

The above literature review has shown that timely ANC attendance remains a challenge in developing countries, including South Africa. In developed countries up to 60 % of women attend ANC early, in South Africa and developing countries 23% to 73% of women attend ANC early. Patient factors associated with timing of antenatal care include: socio-demographic profile, past obstetric and medical history, cultural factors.

Socio-demographic characteristics that were found to be associated with timing of antenatal care attendance included ethnicity, age, marital status, level of education and employment.

Past bad obstetric history such as previous miscarriage, has been reported to promote early access to antenatal care. Multiparous women with previous uneventful pregnancy are more likely to attend antenatal care late as they believe that they know what to expect.

Cultural barriers such as language, discomfort with male doctors, and being a foreigner have been associated with late antenatal care attendance.

2.6 Aim and Objectives

The aim of this study was to describe patient factors associated with the timing of first antenatal booking.

The objectives are:

1. To establish the gestational age at which these women present to first antenatal visit in Maquassi Hills sub district
2. To describe participants' socio-demographic profile, health status and obstetrical characteristics
3. To explore knowledge and attitudes that affect timing of first presentation.
4. To determine any association between first ANC presentation and socio-demographic, obstetric factors, knowledge and attitudes towards ANC.
5. To determine predictors for first antenatal attendance.

CHAPTER 3: METHODOLOGY

3.1 Study Design

The study design was a prospective cross-sectional study.

3.2 Site of the Study

The study was conducted in four publicly funded primary health facilities in the Maquassi Hills sub district, between August and October 2015. The Maquassi Hills sub district is one of the four sub districts located in Dr Kenneth Kaunda district in the North West Province, South Africa. According to the 2011 National Census, Maquassi Hills is a designated mainly rural region with an unemployment rate of 33.4% and an estimated population of 77 794, the majority of whom are Black (88.7 %). The rest of the population (11.3%) is comprised of other races: Coloured, White and Indian. The most commonly spoken language is Setswana (71.7 %,), followed by Afrikaans (10.6%) and the rest of the population (16%) speaks a mixture of other indigenous languages.[26] The sub district has one district hospital, two community health centres (CHCs) and six primary healthcare facilities (PHCs). Two of the targeted facilities (Segametsi and Tswelelang clinics) are located in the Black townships while the other two (Wolmaranstad and Makwassi clinics) are located in small towns. The majority of the pregnant women who attend these facilities are Black Africans and they are representative of people in a typical black township set-up. The researcher chose to focus on the four sites where he works.

On a daily basis, all four clinics offer ANC in addition to other comprehensive primary care services such as immunisation, acute illnesses and chronic disease care. Health education is planned in each health facility; morning talks delivered by health workers cover a variety of topics. The district hospital serves as a referral centre for complicated cases or other investigations such as ultrasound scans and it was not included in the study.

The targeted clinics are run on average by two professional nurses, three enrolled nursing assistants and two lay counsellors. The clinics are supported by one medical officer, two

family medicine registrars and four General Practitioners who visit the clinics on scheduled days.

The doctors are required to see all antenatal patients at least once during the current pregnancy. To this end, patients were booked on scheduled days to be seen by the doctor for review of their ANC.

3.3 Study population

The study population was composed of all pregnant women from 18 years of age attending ANC.

3.4 Sampling and sample size

3.4.1 Sample size

According to the audit of the first antenatal booking from June to August 2014 (a similar period during which this study was planned to be conducted in 2015) in the targeted clinics, a total of 234 women were registered in the Antenatal visit register - 96 from Wolmaranstad Town Clinic, 51 from Tswelelang Clinic, 45 from Segametsi Clinic and 42 from Makwassi Clinic.

The sample size was determined by the Raosoft online sample size calculator. With an estimated population of 234 women over two months, a confidence interval of 95 %, a margin of error of 5 % and an estimated prevalence of 56 % attending ANC before 20 weeks[5], the recommended sample size was 145 participants. Proportional sampling was used to determine the number of women who were studied in each clinic. The researcher expected to get the following participants: 59 from Wolmaranstad Town Clinic, 32 from Tswelelang Clinic, 28 from Segametsi Clinic and 26 from Makwassi Clinic.

3.4.2 Selection of participants

The recruitment of participants took place in four targeted primary health clinics over three months on the scheduled days for the doctor. The researcher visited four facilities every week to offer antenatal services. The team consisting of the researcher and four trained assistants

carried out the study on scheduled days for the doctor's appointments by taking consecutive patients until the number required in each facility was reached.

The researcher liaised with the sister-in-charge of each clinic to ascertain whether there were any patients booked for him on a particular day to prevent unnecessary visits to clinics when there were no patients booked.

3.4.3 Inclusion criteria

Eligible patients were composed of all pregnant women aged 18 of years residing in the area and consenting to participate.

3.4.4 Measuring tool

Permission to use a validated questionnaire was sought from Isaac Banda who had conducted a study on factors associated with late Antenatal Care Attendance in Selected Rural and Urban Communities of the Copper belt Province, Zambia.[27]This tool was also used in another study.[28] Ten out of twenty-four questions (42%) that were irrelevant to my study were excluded (Appendix 4).

Most of the information required for the study was obtained from the National Department of Health's Maternity booklet, and used to record information about antenatal patients.[2]This included demographic data such as age, obstetric history, medical history, gestational age, and the last menstrual period.

Socio-economic data such as level of education and employment status were obtained from the participants.

Questions on ANC and the services rendered were included. The questionnaire contained six questions; four open-ended questions and two closed questions. From the six questions, three were proposed by assessors.

An accredited translator at the Department of Linguistics, University of the Witwatersrand translated the questionnaire from English to Setswana (since it is the predominant language spoken by residents in the area).The questionnaire was translated back into English in order to ascertain that what was translated was an authentic translation.

3.4.5 Data collection

Booked participants were approached while in the waiting room. One person in the team introduced the study to the pregnant women and asked them whether they were willing to spare some time after their consultation to answer a few questions concerning antenatal services at the clinic. Prior to the commencement of a consultation, a consent form was obtained for those willing to participate to the study.

For participants who met the inclusion criteria, the researchers extracted information from the NDH maternity booklet onto the data extraction sheet and the assistant asked questions on antenatal services of those patients who did not speak English. For those participants who preferred English, the researchers asked all the questions.

The researcher collected data from three of the clinics while a colleague who had been previously briefed on the study collected data from the fourth clinic (Wolmaransstad) where all participants were interviewed in English as their preferred language. To ensure reliability between data collected by the researcher and the assistants, regular meetings were held in order to improve the quality of data collected.

3.4.6 Pilot study

At one of the facilities a pilot study was conducted, prior to the research, by the researcher and a trained research assistant to test the questionnaire and process of the study. Five pregnant women attending ANC were interviewed using each version of the Setswana and English questionnaires. This sample was excluded from the data analysis. There were no major adjustments necessary in the study questionnaire. Minor changes were made to the numbering of questions to simplify data capturing and analysis. All data were stored in a secure place after the interview.

3.5 Determination of Gestational Age (GA)

The booking date recorded in the maternity book or maternity register by professional nurses was regarded as the date of first presentation. The estimation of gestational age was determined by using women's Last Menstrual Period (LMP) with ultrasound confirmation. Where there was disparity between LMP and ultrasound, the ultrasound scan was used. The ultrasound result was adjusted to the first date of presentation.

3.6 Data Capturing and Analysis

3.6.1 Data capturing

Data capturing was done by an accredited statistician from the Department of Statistics, North West University, Potchefstroom Campus and cleaning was done by the researcher using (Microsoft) Excel 2014 software.

3.6.2 Data analysis

Data analysis was done using (Microsoft) Excel software. The mean and standard deviation of gestational age were calculated for the first visit. Furthermore, gestational age at first visit was analysed in two groups: < 20 weeks and ≥ 20 weeks to determine the commonest gestation age at which mothers present according to the guideline.

Socio-demographic information, obstetrical data, knowledge and attitudes towards ANC was presented using frequency tables and bar graphs. Concerning socio-economic status, scores developed by Mametjawereused.[10] Scores on eight items and the possession of specified assets and amenities (electricity, a radio, a television, a telephone, a fridge, a computer, a washing machine and a cellular phone) was summarised to compute a socio-economic status (SES) score. The scores obtained are dichotomised in two categories; five or more household assets was assigned a high SES score, whereas less than five assets was designed as a low SES score.[10]

A chi-square test was used to determine associations between the time of the first presentation and socio-demographic, obstetric factors and knowledge, attitudes towards

antenatal care. Logistic regression was used to find out which variables are predictors for early and late ANC attendances.

3.7 Ethics

The research was approved by the Health Research and Ethics Committee, University of the Witwatersrand, Johannesburg. Additional approval was obtained from the North West Province Research Committee to carry out the study at the facilities.

Informed consent was obtained from all participants before administering the questionnaire. It was clarified that confidentiality would be respected and that they were welcome to terminate the interview at any time without any detrimental or unfavourable consequences.

The information collected was treated as confidential. No names were used. However, the questionnaires were captured as serial numbers for the purpose of data entry.

3.8 Budget

The study was funded by the researcher.

Item	Cost in Rand (R)
1. Stationery (paper, printer ink)	1,500
2. Photocopying (R 1.00 per copy)	2,700
3. Language editing	5,000
4. Other (gift, cold drink etc.,)	5,000
Total:	**14,200**

Figure 3.8.1: List of items and estimated cost

CHAPTER 4: RESULTS

In this chapter the results of the study are presented. A total of 127 participants were interviewed: 50 from Wolmaranstad Town Clinic, 30 from Tswelelang Clinic, 21 from Segametsi Clinic and 26 from Makwassi Clinic, giving a response rate of 87.5%. Some women were unwilling to wait for the interview. However, because of missing data due to the assistant's poor handwriting or some unanswered questions, the total number of participants will vary. The first section will present**:** gestational age (GA)at which women present to first ANC, socio-demographic data, health status and obstetrical characteristics of participants, participants' attitudes towards ANC, association of socio-demographic, obstetrical and other factors with the time of first ANC and the predictors for early and late ANC attendances.

4.1. Gestational age at which women present to first ANC

The earliest gestational age at booking was four weeks and latest was 30 weeks. Eighty four participants (68.9%) booked before 20 weeks of gestation which is considered to be early (Figure 4.1).

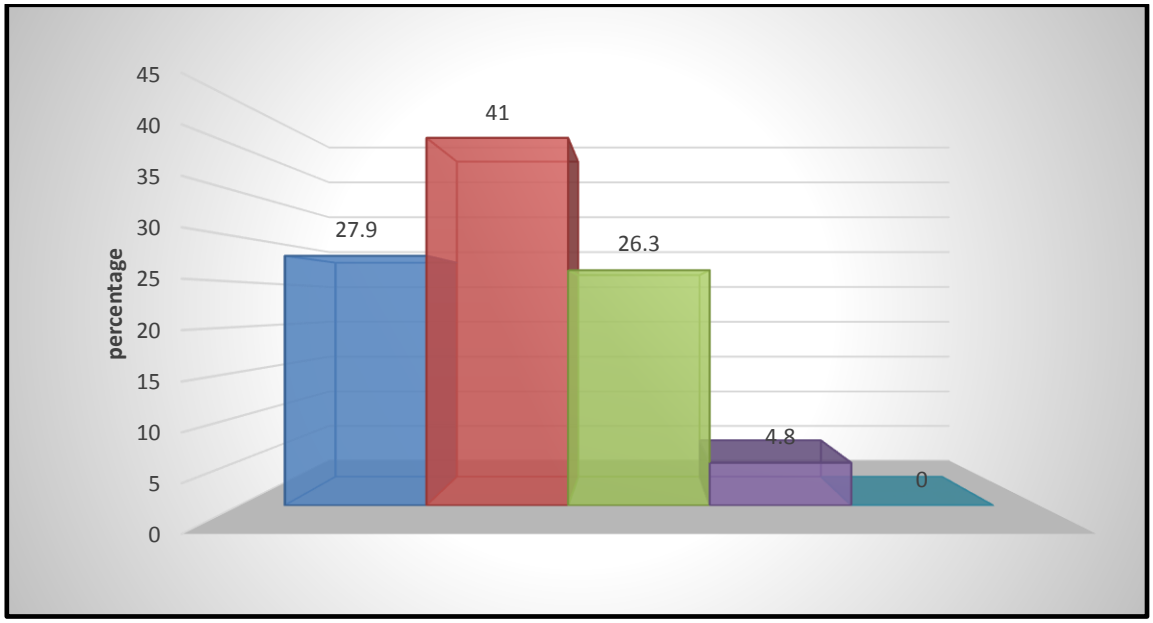

Figure 4.1: Percentage of participants by category of gestational age at first ANC

4.2 Socio-demographic profile, health status and obstetrical characteristics of participants

The socio-demographic profile of the participants are shown in Table 4.1. The majority of the respondents were Tswana speaking (72.4%), single (70.6%), unemployed (81.3%) and had a high school education (84.6%). Their ages ranged from 18 to 40 years with a mean age of the respondents was 26.5 years (SD = 5.9). Most of the participants (74.8%) were multiparous and had delivered their last children vaginally (90.1%). Most of those deliveries were term babies (86.2%). Most participants did not mention any complication during their last pregnancy and generally (66.4%) their current pregnancy had been unplanned (Table 4.2).

Table 4.1: Socio-demographic characteristics of participants

Variables	Number (percentage %)
Maternal age in years (N=120)	
<20	20(16.7)
20-35	89(74.1)
>35	11(9.2)
Marital status (N=126)	
Single	89 (70.6)
Married	16 (12.7)
Stable relationship	21 (16.7)
Level of education (N=123)	
No formal education	1 (0.8)
Primary	15 (12.2)
Secondary/ high school	104 (84.6)
Tertiary (University, Technikon, diploma etc.)	3 (2.4)
Socio-economic status (N= 123)	
Low SES score	67 (54.5)
High SES score	56 (45.5)
Occupation (N= 123)	
Employed	23 (18.7)
Unemployed	100 (81.3)
Language spoken at home (N=127)	
SeTswana	92 (72.4)
Other*	35 (27.6)
*Afrikaans, Xhosa, Amahric, English, Portuguese, SeSotho, Shona	

Table 4.2: Obstetrical characteristics and health status of participants

Variables	Number (percentage %)
Gravidity (N=123)	
1	31 (25.2)
2 or more	92 (74.8)
Miscarriages (N=83)	
0	73 (88)
1 or more	10 (12)
Outcome of last pregnancy (N=94)	
Full term	81 (86.2)
Preterm	5 (5.3)
Stillborn	3 (3.2)
Miscarriage	5 (5.3)
Mode of delivery of the last child (N=91)	
Normal vaginal delivery	82 (90.1)
Caesarean section	9 (9.9)
Assisted delivery (forceps, vacuum)	0 (0)
Birth interval in years (N= 84)	
<2	4 (4.8)
2-5	37 (44)
>5	43 (51.2)
Complications during the last pregnancy (N=86)	
No	81 (94.2)
Yes	5 (5.8)
Pre-existing medical condition (N=116)	
None	73 (62.9)
Hypertension	8 (7)
Diabetes	1 (0.8)
HIV	33 (28.4)
Epilepsy	1 (0.8)
Planned pregnancy (N= 125)	
No	83 (66.4)
Yes	42 (33.6)

4.3 Participants' knowledge and attitudes towards ANC

4.3.1 Primary reasons for starting ANC at a stated gestational age.

A total of 122 participants reported several reasons for initiating ANC at health institutions. Missing their menstrual periods seemed to be the main motivator for booking early (50% of participants) (Table 4.3).

Table 4.3: Distribution of respondents' primary reasons for starting ANC

Reasons	Entry to ANC	
	Gestational age <20 weeks	Gestational age ≥ 20 weeks
	Number (%)	Number (%)
Missed period (N=78)	61 (50)	17 (14)
Illness (N=38)	22 (18.0)	16 (13.1)
Knowledge of symptoms (N= 6)	1 (0.8)	2 (1.6)
Feeling foetal movements (N=2)	1 (0.8)	1 (0.8)
Checking for HIV status (N=1)	0 (0.0)	1 (0.8)

4.3.2 Knowledge of the best time to start Antenatal Care (ANC)

This section was designed to assess patients' knowledge on the recommended time to initiate ANC. All the women knew that they should present themselves before five months.

4.3.3 Reasons for Antenatal Care during the perceived best time

One hundred and eighteen participants responded to the question about reasons for perceived best time for ANC. Also, 47.4% of respondents who booked early came to verify underlying diseases (Table 4.4).

Surprisingly, a non-negligible proportion (14.4%) of participants who booked timely did not provide any reason for their early attendance.

Table 4.4: Reasons for Antenatal Care during the perceived best time

Reasons	Entry to ANC				p-value
	Gestational age <20 weeks	Gestational age ≥ 20 weeks	Gestational age <20 weeks	Gestational age ≥ 20 weeks	
	Number (%)	Number (%)	Frequency (%)	Frequency (%)	
To detect diseases	56 (47.4)	13 (11.0)	0.6667	0.3421	0.0008
Did not know	17 (14.4)	2 (1.7)	0.2024	0.0526	0.1730
To assess foetal well-being	7 (6.0)	3 (2.5)	0.0833	0.0789	0.9346
To get medical care	7 (6.0)	2 (1.7)	0.0833	0.0526	0.5479
To minimize visits	3 (6.0)	1 (3.3)	0.0357	0.0263	0.7871
To wait for pregnancy to show up	1 (3.3)	2 (1.7)	0.0119	0.0526	0.1788
For taking ARVs	2 (1.7)	0 (0.0)	0.0238	0.0000	0.3376
To open a file	1 (0.05)	0 (0.0)	0.0119	0.0000	0.4995
Fear of disclosure	0 (0.00)	1 (0.05)	0.0000	0.0263	0.1356

4.3.4 Persons who motivated the participants for ANC initiation

From 127 participants, 63 (49.6%) were motivated to attend ANC by their mothers, and 31.5% by their husbands or partners.

Table 4.5: Persons who motivated participants for ANC initiation

Motivators	Number (percentage)
Mothers	63 (49.6 %)
Husbands or partners	40 (31.5 %)
Friends	12 (9.45 %)
Heath care professionals	12 (9.45%)

4.3.5 Reasons for late ANC attendance

From the 80 respondents, 91.3% (n=73) perceived the long waiting time at the clinic as a drawback and 5% (n=4) perceived staff members' judgemental attitude as daunting (Table 4.6). Only 3 (3.8%) respondents suggested that misconceptions of ANC could have explained late attendance.

Table 4.6: Reasons for late attendance

Reasons for late attendance	Number (percentage)
Long waiting time	73 (91.3%)
Staff judgemental attitude	4 (5 %)
ANC misconception	3 (3.8 %)

4.3.6 Perceived measures to encourage timely utilization of ANC

From 123 respondents, the findings suggested that more than half of the respondents (Table 4.7) were unable to answer the question on whether they booked early or late (40.7 % versus 17.1%).

Table 4.7: Perceived measures to encourage timely utilization of ANC

Measures	Entry to ANC				p-value
	Gestational age <20 weeks	Gestational age <20 weeks	Gestational age ≥ 20 weeks	Gestational age ≥ 20 weeks	
	Number (%)	Frequency (%)	Number (%)	Frequency (%)	
Did not know (N=71)	50 (40.7)	0.5952	21 (17.1)	0.5526	0.6587
Health education (N=33)	18 (14.6)	0.2143	15 (12.2)	0.3947	0.0378
To improve staff attitude (N=11)	10(8.1)	0.2630	1 (0.8)	0.0263	0.1356
To isolate ANC from other services (N=6)	4 (3.25)	0.0714	2 (1.6)	0.0263	0.3211
To reduce waiting time (N=2)	2 (1.6)	0.0426	0 (0.0)	0.0000	0.0978

4.4 Association of socio-demographic, obstetrical and other associated factors with time of first presentation to antenatal care

4.4.1 Socio-demographic factors associated with timing of first ANC attendance.

Tables 4.8 and 4.9 did not show any associations between socio-demographic factors with timing of first ANC attendance.

4.4.2 Obstetrical factors associated with timing of first ANC attendance.

No associations were found between obstetrical factors and timing of first antenatal visit (Tables 4.8 and 4.9).

4.4.3 Knowledge and attitudes associated with timing of first ANC attendance.

There was a statistically significant difference in the best perceived time between those who booked early (2 months [1.99 months (SD =1.145)]) compared with those who booked later (3 months [2.83months (SD = 1.595)])(p = 0.006). (Table 4.9)

Table 4.8: Association of selected socio-demographic, obstetrical and other associated factors with time of first presentation to ANC.

Variables	Entry to ANC		χ2	p-value
	Gestational age <20 weeks	Gestational age ≥ 20 weeks		
	Number (%)	Number (%)		
Marital status (N=126)				
Single	58 (65.1)	31 (34.8)		
Married	12 (75)	4 (25)		
Stable relationship	14 (66.7)	7 (33.3)	0.068	0.757
Outcome of last pregnancy (N=94)				
Full term	59(72.8)	22 (27.2)		
Other *	9 (69.2)	4 (30.8)	0.014	0.894
Mode of delivery of the last child (N= 91)				
Normal vaginal delivery	59 (72)	23 (28)		
Caesarean section	7 (77.8)	2 (22.20)	-0.052	0.633
Complications during last delivery (N=86)				
No	59 (72.8)	22 (27.2)		
Yes	3 (60)	2 (40)	0.159	0.152
Pre-existing medical conditions (N= 116)				
No	53 (72.6)	20 (27.3)		
Yes	31 (72)	12 (28)	-0.148	0.103
Level of education (N=119)				
Primary	10 (66.7)	5 (33.3)		
Secondary/High school	76 (73)	28 (27)	-0.040	0.670
Employment (N=123)				
No	73 (73)	27 (27)		
Yes	15 (65.2)	8 (34.8)	0.070	0.445
Socio-economic status (N=123)				
High score	43(76.7)	13 (23.2)		
Low score	45 (67.1)	22 (32.8)	0.091	0.325
Language spoken at home (N=127)				
Setswana	62 (67.3)	30 (33.7)		
Other	22 (63.5)	13 (36.5)	0.041	0.560
Planned pregnancy (N=125)				
No	59 (71.08)	24 (29)		
Yes	31 (73.8)	11 (26.2)	-0.051	0.576
* Preterm, stillborn, miscarriage				

Table 4.9: Association of selected socio-demographic, obstetrical and other associated factors with time of first presentation to ANC.

Variables	Gestational age	Number	Mean	SD**	Cohen's d-value*	p-value
Age	<20 weeks	83	26.65	6.013	0.17	0.366
	≥ 20 weeks	37	25.62	5.524		
Gravidity	<20 weeks	85	2.39	1.061	0.04	0.811
	≥ 20 weeks	38	1.30	1.350		
Parity	<20 weeks	80	1.48	1.023	0.02	0.902
	≥ 20 weeks	38	1.41	1.322		
Miscarriages	<20 weeks	58	0.11	0.366	0.25	0.240
	≥ 20 weeks	25	0.32	0.852		
Birth interval	<20 weeks	60	5.40	2.813	0.28	0.245
	≥ 20 weeks	24	4.50	3.244		
Perceived best time for ANC initiation (in months)	<20 weeks	78	1.99	1.145	0.53	0.006
	≥ 20 weeks	36	2.83	1.595		

*Cohen's d is an appropriate effect size for the comparison between two means.
≈ 0.2 Small, No practically significant difference
≈ 0.5 Medium, Practically visible difference
≈ 0.8 Large, Practically significant difference
****** Standard deviation

4.5 Predicators of early and late ANC attendance

A multivariate analysis involving all associated variables was performed to identify independent predictors of early and late ANC attendances.

4.5.1 Obstetrical predictors of early and late ANC Attendances

The association between early ANC attendance and obstetrical variables such as number of miscarriages, birth interval and absence of pre-existing medical condition during the current pregnancy was insignificant (Table 4.10).

4.5.2 Knowledge and attitudes predictors of early and late ANC Attendances

There was a significant statistical association between knowledge as predictors of late ANC attendance amongst women.

Participants who knew that the right time to book was at 2.8 months (SD = 1.595) of pregnancy were almost twice more likely to book late (OR= 1.589, 95 % CI 1.227-2.059)

compared with those who knew that the best time was at 1.99 months (SD = 1.145) (p = 0.003) (Table 4.10).

Table 4.10: Obstetrical and other factors predictors of early ANC attendance (unadjusted)

Variables	N	%	mean	SD	OR* (95% CI)	p-value
Number of miscarriages						
Gestational age < 20 weeks	58	0.11	0.366	1		
Gestational age ≥ 20 weeks	25	0.32	0.82	1.916	(0.884-4.150)	0.167
Birth interval						
Gestational age < 20 weeks	60	2.813	0.379	1		
Gestational age ≥ 20 weeks	24	3.244	0.662	0.890	(0.762-1.040)	0.218
Pre- existing medical condition						
Gestational age < 20 weeks	53	72.6		1		0.105
Gestational age ≥ 20 weeks	20	27.3		1.900	(0.991-3.643)	
Perceived best time to Initiate ANC						
Gestational age < 20 weeks	78	1.99	1.145	1		
Gestational age ≥ 20 weeks	36	2.83	1.595	1.589	s(1.227-2.059)	0.003

4.6 Summary of study results

Main findings from the study are as follows: more than 2/3 of participants (68.9%) booked before 20 weeks. One of the more frequently cited reasons for earlier attendance was to establish pregnancy (64% of attendants of whom 50 % booked timely). Barriers to early booking were mainly attributed to the long waiting time (91.3%) and staff judgemental attitude (5%). Results failed to show a statistically significant association between socio-demographic, obstetrical variables and the timing of the first ANC attendance. Although all participants knew that the best time to book was before 20 weeks but those who knew that the right time to book was at 2.8 months (SD = 1.595) of pregnancy were almost twice more likely to book late (OR= 1.589, 95 % CI 1.227-2.059) compared to those who knew that the best time was at 1.99 months (SD = 1.145) (p = 0.003). Findings are discussed in the following chapter.

CHAPTER 5 DISCUSSION

5.1 Discussion

This chapter examines the key findings of the study.

The study shows that most of the women (68.9%) in the Maquassi Hills sub district, North West Province present for ANC before 20 weeks and a good number before 12 weeks (27.8%) which is above the provincial average of 54.3%.This is above the National target of 65%[5]contrary to previous studies conducted in South Africa where only 40% of mothers made their first booking before 20 weeks of pregnancy.[5,6,7]

This could be explained by the fact that in the last three to four years, there has been a concerted effort by the National Department of Health to put programmes in place to reduce mother and child deaths and to improve their health. All provinces and district health departments were to implement these programmes. In addition the Dr Kenneth Kaunda district is one of the pilot districts for the National Health Insurance (NHI) that aims to improve access to health care of the community and thereby improve their health. Among these services the introduction of the re-engineering of primary health care (PHC) which was implemented in 2012. These included the expansion of health care in the communities by the utilisation of community workers (CHW) visiting households. Moreover, the introduction of district clinical specialist teams whose sole responsibility for ensuring that Maternal and child services were adequately implemented could have contributed to mothers booking early.

During the same period, the pregnancy screening tool which is routinely performed on women attending family planning was extended to Ward-based Outreach Teams **(WBOTS)** for use in the community they visited, women of child bearing age, and this could have contributed to an increase in bookings before <20 weeks.

Participants cited several reasons for their timely attendance. One of the more frequently cited reasons and prompts to earlier attendance was to establish pregnancy. Half of the participants who attended early said they did so because they had missed their periods.

Patients knew they should come early but did not perceive antenatal care as enabling prompt access to care and they did not value it for the role it plays in ensuring a safe delivery which is in line with other studies.[5,24,25, 29,30] In a study conducted by Solarin *et al* in the Johannesburg inner-city, almost a third of women who attended ANC said they did so in order to obtain an antenatal card with a view to expedite their access to care when they went into labour, and a fifth said they would have attended earlier had they felt unwell.[5] Other studies have shown that participants may view early attendance as unnecessary if there are no medical concerns, in other words, more as curative than preventative.[24,25,29,30]

Long waiting time is a barrier to initiating ANC early. Currently there is no proper appointment and booking system, and the reason reported for the patient registration process taking so long is due to a shortage of staff. Other SA studies have shown that a long waiting time remains a challenge for early ANC booking[23,31]

Since large numbers of pregnant women attend public antenatal facilities, women arrive very early even before the facility opens in order to book their space for antenatal care that commenced later, during normal office hours. This long waiting time is generally intolerable to pregnant women during their pregnancy which is why some women opted to report late. However, less than 2% of them mentioned this as a point of improvement to earlier antenatal care. These findings suggest that women expect or even accept this as a norm and further investigation into understanding this is warranted.

In the study by Rashmi *et al*[32], it was cited that a waiting period of at least 30 minutes was acceptable. Most women were satisfied with the time they had spent with either a doctor or a midwife during consultation. It is for this reason that the National Department of Health in South Africa has identified 'waiting times to receive care' as being part of the six most critical areas for patient-centred care in the country.

Negative staff attitude did not feature highly as reason for late antenatal care at the selected facilities. Concerns with the quality and delivery of clinics services have been expressed in the public domain with considerable frequency. District meetings and workshops have highlighted the need to address key challenges in the areas such as staffing and quality of care. Taking the above aforementioned into account, the National DOH has initiated a

process of assessing performance against a set of core standards. Having established this baseline, health facility improvement plans were developed for those facilities where performance has been unsatisfactory. That could explain the reason for staff attitude as improving towards patients.

The initial booking pattern was found to be uninfluenced by any of the socio-demographic or obstetrical factors.

Many studies conducted across the world have reported an association between age and ANC first attendance.[17,18,19] It was reported that the young maternal age was associated with late antenatal care attendance. This is in not line with a study done in Bangladesh where it was observed that there was no effect of maternal age on ANC utilization[33]. Despite the lack of statistically significant association, this study established that there was a tendency of initiating ANC early amongst women who were aged 26.5 years (SD = 6.01) compared with those who were younger than 25.62 years (SD = 5.52). The reason might be that although most of the women have information about the importance of early antenatal care booking in this study area, older women tend to be more concerned about their pregnancy, and therefore pursued the required institutional care.

A few studies on marital status have reported that living with a partner is protective for late antenatal care attendance. Rowe *et al* found that single women were most likely to attend ANC late.[20]These findings are not in line with those of this study, which shows no statistically significant difference between marital status and timing of first ANC attendance (χ^2 = 0.068, p-value = 0.75). This can be explained by the fact that married participants were too few. Most of the participants were single and the family structure played a key role as 49.6 % of participants were encouraged by their mothers to initiate ANC timely while 34.5 % were encouraged by their partners.

Sunil *et al* reported that women with middle-school education or lower were more likely to book late as compared with women who had a college or post-college education level.[13] The above findings are not in line with a South African study conducted by Mametja who

reported that statistically there was an insignificant association between a low education level and late antenatal care attendance.[10]

As in the abovementioned study, no statistically significant association was found between women's educational status and timing of ANC booking. This could be explained by the fact that the majority of participants had a secondary level of education. However, despite the insignificant association, the majority of women booked timely. A possible explanation could be that all the participants had at least a secondary level of education and they were likely to appreciate the importance of early booking. Receiving a formal education at school or other educational institution, also allows interaction with one's peer group. Both peer engagement and exposure to didactic teaching offer an opportunity for one to learn about sexuality and what to do in the event of pregnancy. Therefore, the lack of formal education may negatively influence the understanding for access to ANC. The reasons why some women still schedule late despite being well informed needs to be investigated.

It has been shown in various studies that low income and poor socio-economic conditions are associated with late ANC first attendance.[13,17] This is not in line with our study where no association was found between participants socio-economic status and timing of ANC attendance. This could be explained by the fact that the study was conducted in a predominantly lower socio-economic population.

There are consistent findings with regard to an association between multiparity and late attendance.[19, 21] In the later study, no association was found between parity and timing of ANC attendance. This is due to the fact that the majority of participants in our study were multiparous. Despite the lack of statistically significant association, this study established that there was a tendency of initiating ANC early amongst women of high parity and gravidity. This could be as result of positive perceptions resulting from previous pregnancy experiences. It is also possible that multiparous women feel more confident with the health care system and are more aware of risks and complications related to their condition.

Also, it could be again due to health education and influence of the CHWs programme and DCST, PHC re- engineering programmes in the past four years and the CARMA initiative launched in 2012 which had improved access to skilled birth attendants and strengthened human resources for Maternal and Child Health by providing training on Essential Steps in Management of Obstetric Emergencies (ESMOE) to doctors and midwives.

In our study, pre-existing medical conditions in current pregnancy did not show any association with the timing of ANC booking as reported by Okunlola *et al*.[21] The explanation could be found by the fact a minority of participants had a medical condition.

Regarding their knowledge of ANC, many studies revealed that women with adequate knowledge were likely to initiate ANC early. The current study revealed that mothers who knew that the right/correct time to book during pregnancy was at 2.8 months (SD = 1.595) were almost twice more likely to book late than their counterparts. Moreover, all women/participants knew the right time frame for booking but almost one-third (31.1 %) of them scheduled late. A possible explanation could be that recognising pregnancy after missing one or two (menstrual) cycles is common and thereafter mothers might be reluctant to start ANC soon.

Women's participation in the decision making process is central and helps mothers to utilise maternal health services which directly and indirectly decreases maternal morbidity and mortality. As observed in this study, mothers who did not choose to attend ANC by themselves were encouraged by partners or family members to start ANC. Taking part in the decision making process could assist the mother to gain support from partner or family members; that in turn, increases the utilization of maternal health service as observed in a study conducted in Tanzania[14].Many other studies have similar outcomes. In Zambia, Banda's findings were similar to those studies of Tariku and others where women who were well informed about ANC were more likely to book for ANC within the recommended time frame[27]. Furthermore, their studies suggest that pregnant women who perceived that there were no benefits to be derived from starting early, tended to start ANC late.

Desirability of pregnancy is an important factor in determining the timing of ANC.[18,34] Many studies have reported that women who planned their pregnancy were more likely to attend ANC early.[12,18] However, the finding of this study did not show any statistically significant association between unplanned pregnancies with first ANC attendance. This finding is similar with studies done in Kenya, Egypt as well as Ethiopia.[35,36]The lack of statistical significance could be due to the fact that a small proportion of participants planned their pregnancy.

5.2 Limitations of the Study

- The recruitment of participants and conducting the interviews before patients received their care might have increased the potential for cohesion and social desirability bias.
- Some of the data were collected by direct answers to open ended questions, which could influence patients' answers to please researchers.
- The results of the study cannot be generalized to the entire District because of the way the study sample was sampled.
- Effect of small sample size (127 participants instead of 145) might have reduced the power of the study and increases the margin of error, which could have negatively affected the likelihood that a nominally statistically significant finding actually reflects a true effect.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The findings of this study showed that most women book antenatal care timely and all know the right time to initiate ANC. However, there is incongruity between knowledge and practice for the 30% who present late. This could be attributed to the long waiting time and staff attitude mentioned by some of the women. There is a need, therefore, to address the demotivating factors such as long waiting time, and staff attitude in order to increase early ANC booking.

6.2 Recommendations

Despite the average ANC attendance above national target, the following suggestions are made by the researcher to help in improving access to services:

- Continue and consolidate current programmes, mentoring and coaching of health care workers (HCWs), education and information of the community.
- The DOH should promote facilities to conduct self-assessments on the National Core Standards so that they are able to identify gaps and decide on strategies for improvement i.e. waiting times and quality of care as these standards will assist facilities to improve on the barriers identified in this study.
- Introduction of appointments and ANC clinics daily (on week days [Monday to Friday]) and maybe on weekends and holidays if possible the provision of adequate staffing necessary if patients could be seen on those particular days.

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APPENDICES

APPENDIX 1

DATA EXTRACTION SHEET

CLINIC:

DATE: **(YY/MM/DD)**

INTERVIEWER:

DATA EXTRACTION SHEET NUMBER:

SECTION 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1.1. Age in years …

1.2. Marital status (According to Antenatal Card- DOH)

Single	1
Married	2
Stable relationship	3

SECTION 2: OBSTETRICAL CHARACTERISTICS

2.1. Gestational age at first presentation based on ultrasound scan (……. weeks)

2.2. Last Menstrual period……

2.3. Gravidity….

2.4. Parity….

2.5. Number of miscarriages ….

2.6. Outcome of the last pregnancy

Full term	1
Pre term	2
Still born	3
Voluntary terminated pregnancy	4
Miscarriage	5

2.7. Mode of delivery of the last child

Normal vaginal delivery	1
Caesarean section	2

2.8. Age of the last child ……

2.9. Complications during the last delivery

No	0
Yes (Specify…… ……...)	1

2.10. Pre-existing medical conditions.

None	1
Hypertension	2
Diabetes	3
HIV	4
Other (Specify……)	5

APPENDIX 2

QUESTIONNAIRE

NAME OF THE STUDY:"PATIENT FACTORS ASSOCIATED WITH GESTATIONAL AGE AT FIRST PRESENTATION TO ANTENATAL CLINIC AT FOUR FACILITIES IN THE MAQUASSI HILLS SUB DISTRICT, NORTH WEST PROVINCE, REPUBLIC OF SOUTH AFRICA."

CLINIC:

DATE: **(YY/MM/DD)**

INTERVIEWER:

QUESTIONNAIRE NUMBER:

GENERAL INSTRUCTIONS (to be read to the patient)

The purpose of this interview is to help us find out some of the reasons why you chose to book at a particular time for your first visit during this current pregnancy. Your answer will remain confidential. Speak freely and ask questions whenever you need clarity.

SECTION 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1.1. What is the highest level of schooling that you have achieved?

No formal education	1
Primary	2
Secondary/high school	3
Tertiary (University, technikon, diploma etc)	4

1.2. Are you employed?

No	0
Yes	1

1.3. If you answered, *Yes*, what work do you do? …….

1.4. Does your house have electricity?

No	0
Yes	1

1.5. Do you own any of the following items in your house?

		Yes	No
A	A radio	1	0
B	A television	1	0
C	A telephone	1	0
D	A fridge	1	0
E	A computer	1	0
F	A washing machine	1	0
G	A cell phone (anyone) (any brand?)(or, anyone in your household with a cell phone?)	1	0

1.6. What language do you speak at home?

……

SECTION 2: OBSTETRIC CHARACTERISTICS

2.1. Did you plan the current pregnancy?

No	0
Yes	1

SECTION 3: ATTITUDES TOWARDS ANTENATAL CARE

3.1. Please recall the reason for your initial first visit to the clinic. What made you decide to attend?

……

……

1.2. Besides that, was there anyone else that influenced you?

A	Husband/spouse/partner	1
B	Friend	2
C	Health provider	3
D	Other (Specify……)	4

3.3. When do you think is the best time to begin antenatal care? ……..months

3.4. What makes you think that it is the best time?

……

……

……

3.5. We know many women who present to the Antenatal clinic late in their pregnancies. What reasons do you think make it difficult for women to present earlier in their pregnancies?

Misconception of antenatal care	1
Cultural beliefs	2
Other	3

If you have chosen *Other* (Specify): …….

…….

……

3.6. What can we do to make it better for women to schedule earlier?

……

……

……

APPENDIX 3

INFORMED CONSENT FORM

NAME OF THE STUDY:"PATIENT FACTORS ASSOCIATED WITH GESTATIONAL AGE AT FIRST PRESENTATION TO ANTENATAL CLINIC AT FOUR FACILITIES IN THE MAQUASSI HILLS SUB DISTRICT, NORTH WEST PROVINCE, REPUBLIC OF SOUTH AFRICA."

This informed consent form is for pregnant women who are attending antenatal care services at four publicly funded facilities in the Maquassi Hills sub district, North West Province.

Main investigator: Dr Jean-Paul Kipangu Manwana

PART I. INFORMED CONSENT

Good day,

My name is Dr Jean-Paul Manwana (student number 698969).Currently, I am a registrar at the Department of Family Medicine, University of the Witwatersrand, Johannesburg. The purpose of this letter is to request your permission to participate in the above mentioned study. The study is a prerequisite of my studies towards a MMed (Fam) degree.

This study was approved by the Health Research and Ethics Committee, University of the Witwatersrand, Johannesburg (Clearance certificate M150540).

Most South African women start antenatal care after 20 weeks of gestation. The purpose of this study is to understand why women attend ANC after 20 weeks so as to improve ANC services at the clinics in the Maquassi Hills sub district.

We would be most grateful if you would consider participating in a study to understand this.

The interview will take approximately 15 minutes. I am going to ask you questions about yourself. All information will be treated as confidential and will not contain any information that can identify you or link you to the study. The questionnaire is anonymous. We are going to complete the questionnaire together; if you agree to participate. In addition; antenatal care will be provided following the interview.

Are there direct benefits* to participants? No

Are there foreseeable risks? No

Is there any compensation? No

May you withdraw from the study? Certainly, you may do this at any time without providing a reason. Remember that the study is completely voluntary and not participating in it, or withdrawing from it, carries no penalty of any sort.

The members of the Health Research and Ethics Committee (HREC), University of the Witwatersrand, Johannesburg) my supervisor and I will have access to the records of this study.

What will I do with the information that you provide? Once all the participants are interviewed, all the information received will be gathered and analysed. If this study and those that follow yield obvious results, these findings will be utilized for scientific purposes in order to provide a basis for addressing late first antenatal bookings and strategies to achieve early antenatal booking. It will be beneficial*for you to participate in this study because; the results of this study also belong to you and you will need to learn more about what was discovered at a later stage. The results of this study will be shared with you so that you may have a better understanding of antenatal care issues - not only from your own perspective and experience, but also from the perspective and experience of other pregnant women participating in the study.

If you have any further queries relating to this study in the future, ourcontacts details are as follows:

Dr Jean-Paul MANWANA

Cellular phone: 079 451 7636

Home telephone: 018 596 2844

Prof Peter Cleaton-Jones

Chairperson of HREC

Telephone: 011-717-2301

Email: Peter.Cleaton-Jones@wits.ac.za

Mr Langutani Masingi

Secretariat HREC

Telephone: 011 717-1234/2656

Email: langutani.masingi@wits.ac.za

Ms Zanele Ndlovu

Secretariat HREC

Telephone: 011 717-1252

Email: zanele.ndlovu@wits.ac.za

PART II. CONSENT FORM TO BE SIGNED BY PARTICIPANTS.

NAME OF THE STUDY: "PATIENT FACTORS ASSOCIATED WITH GESTATIONAL AGE AT FIRST PRESENTATION TO ANTENATAL CLINIC AT FOUR FACILITIES IN THE MAQUASSI HILLS SUB DISTRICT, NORTH WEST PROVINCE, REPUBLIC OF SOUTH AFRICA."

I have read the information on the aims and objectives of the proposed study and was provided with an opportunity to ask questions and given adequate time to rethink the issue.

The aim and objectives of the study are sufficiently clear to me. I have not been pressurized to participate in any way.

I understand that participation in this Study is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have not any influence on the regular treatment that holds for my condition or will it influence the care that I receive from my regular doctor. I know that this Study has been approved by the Health Research and Ethics Committee, University of the Witwatersrand, Johannesburg and North West Province, Department of Health. I am fully aware that the results of this study will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

I hereby give consent to participate in this Study.

Signed at on the day of 2015

APPENDIX 4

INTERVIEW FOR PREGNANT WOMEN ATTENDING ANC IN MPONGWE AND NDOLA DISTRICTS

SECTION A

SOCIO-DEMOGRAPHIC DATA

1. Age (Last birthday) ❑ ……..

2. Marital status

   1.❑Married 2. ❑Single 3.❑Divorced 4.❑Widowed

3. Occupation

   1. ❑Employed 2. ❑Unemployed

4. What type of employment? (Specify)…….

5. Religion

   1.❑ Christian 2. ❑Muslim 3.❑Hindu

   4. ❑Other (Specify)……...

6. Level of education

   1. ❑Never attended school 2. ❑Primary 3.❑Secondary

   4. ❑College/university

SECTION B:

OBSTETRIC INFORMATION

7. Parity: ……

8. Gravidity: ……..

9. Age of the last child ……..

10. How far was your pregnancy when you made your first ANC visit?

(Age of pregnancy in weeks) …….

11. What family planning method did you use before you fell pregnant?

1. ❑Pills 2. ❑Injections 3.❑IUCD 4.❑Implants

5. ❑Condoms 6. ❑Breastfeeding 7.❑Nothing

12. What were the reasons for discontinuing family planning methods?

(Specify) …….

……..….

SECTION C

Individual level

13. List thefactors that influenced you to book for antenatal

……

……

14. What hindered you from booking ANC earlier?

(Before 20thweek of pregnancy)

1. ❑Pregnancy was unintended 2. ❑No knowledge about ANC

3. ❑Dissatisfied with service 4. ❑No benefits of starting early

5. ❑Others (Specify) …….…….

15. Would being tested for HIV prevent you from attending ANC?

1. ❑Yes 2. ❑No

Interpersonal level

16. Who motivated you to book for ANC?

1. ❑Husband/spouse 2. ❑Friend 3.❑Media 4.❑Health provider

5. ❑TBA 6. ❑Others (Specify) ……..……..

17. What was/is your husband's attitude towards ANC?

1. ❑Supportive 2. ❑Not supportive 3. ❑Don't know

If supportive, how were you supported?

……..

……

18. Do you think it a good idea for husbands to accompany pregnant women to ANC?

1. ❑Yes 2. ❑No

Give reasons for your answer to question 18

……....

……

Institutional level

19. Which of the following factors do you think could prevent you from attending ANC early?

1. ❑Distance to ANC services 2. ❑Long waiting time

3. ❑Negative attitude of health providers 4. ❑Lack of privacy

Community level

20. What community influence could stop you attending ANC?

1. ❑Misconceptions of ANC 2. ❑Value attached to ANC (Community norm)

3. ❑Cultural beliefs

Public policy

21. Could the high cost of accessing ANC prevent you from booking early?

1. ❑Yes 2. ❑No

22. Could traveling time hinder you from accessing ANC on time?

1. ❑Yes 2. ❑No

23. Could inadequate health facilities prevent you from accessing ANC on time?

1. ❑Yes 2. ❑No

Section D

24. What strategies could be put in place to enhance ANC attendance?

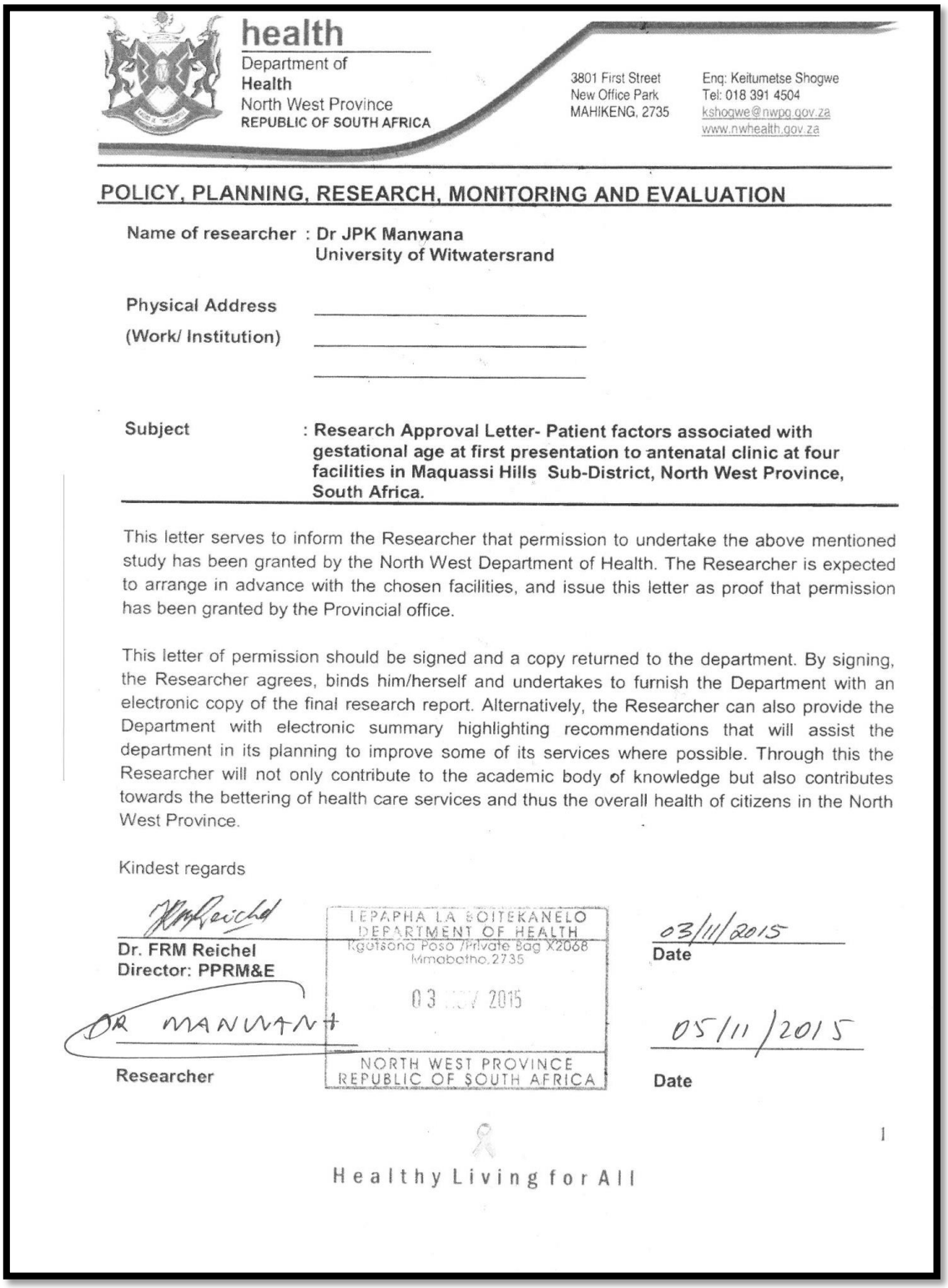
……..……

……..……

……..

APPENDIX 5

AUTHORISATION LETTER



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POLICY, PLANNING, RESEARCH, MONITORING AND EVALUATION

Name of researcher : Dr JPK Manwana
University of Witwatersrand

Physical Address _____
(Work/ Institution) _____
_____

Subject : Research Approval Letter- Patient factors associated with gestational age at first presentation to antenatal clinic at four facilities in Maquassi Hills Sub-District, North West Province, South Africa.

This letter serves to inform the Researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The Researcher is expected to arrange in advance with the chosen facilities, and issue this letter as proof that permission has been granted by the Provincial office.

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with electronic summary highlighting recommendations that will assist the department in its planning to improve some of its services where possible. Through this the Researcher will not only contribute to the academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Kindest regards

Dr. FRM Reichel
Director: PPRM&E

03/11/2015
Date

IEPAPHA LA BOITEKANELO
DEPARTMENT OF HEALTH
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Mmabatho, 2735
03 NOV 2015
NORTH WEST PROVINCE
REPUBLIC OF SOUTH AFRICA

DR MANWANA
Researcher

05/11/2015
Date

1

Healthy Living for All

APPENDIX 6

CLEARANCE CERTIFICATE

R14/49 Dr. Jean-Paul Kipangu Manwana

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M150540

NAME: (Principal Investigator)	Dr. Jean-Paul Kipangu Manwana
DEPARTMENT:	Family Medicine Segametsi, Tswelelang, Wolmaranstaad and Makwassie Primary Healthcare Clinics
PROJECT TITLE:	Patient Factors Associated with Gestational Age at First Presentation to Antenatal Clinic at four Facilities in Maqwasi Hills Sub-District, North West Province, South Africa
DATE CONSIDERED:	29 May 2015
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr. Edrone Rwakaikara
APPROVED BY:	Professor P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	03/08/2015

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.**

DR MANWANA — 01/09/2015

Principal Investigator Signature — Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 7

PLAGIARISM REPORT CERTIFICATE

