Psychosocial factors associated with early booking and frequency of antenatal care (ANC) visits in a rural and urban setting in South Africa.

A mini-thesis submitted in partial fulfilment of the requirements for the degree of Masters in Public Health (MPH)

School of Public Health and Family Medicine, Faculty of Health Science, University of Cape Town, South Africa

Student: Lorrein Shamiso Muhwava (MHWLOR001)

Date of submission: 17 February 2014

Supervisors: Professor Leslie London and Professor Neo Morojele

PLAGIARISM DECLARATION

I, LORREIN SHAMISO MUHWAVA Student No: MHWLOR001 declare that the work that I have submitted is my own and where the work of others has been used (whether quoted verbatim, paraphrased or referred to) it has been attributed and acknowledged**.**

Signed: L.S.Muhwava

Date: 17 February 2014

Abstract

Background: Late antenatal care (ANC) booking remains the trend in most countries in sub-Saharan Africa despite the known benefits of early booking. Infrequent, poor and no antenatal care are among the most frequent patient-related avoidable factors and missed opportunities identified for many cases of maternal death in South Africa. Whilst most country guidelines recommend that a woman initiates antenatal care (ANC) within the first 16 weeks of pregnancy and the Basic Antenatal Care (BANC) approach recommends at least 4 visits during pregnancy, this has not translated into practice amongst women in South Africa.

Literature Review: Disparities in timing of initiation of antenatal care and frequency of attendance exist between countries and between rural and urban settings within a country. Previous studies have identified demographic factors, physical access to health facilities, parity, lack of health education, relationships with health care providers and misconceptions of antenatal care (ANC) as factors influencing timing of ANC booking. Psychosocial factors have been found to also play an important role in timing and frequency of attendance to antenatal care. Strong social capital and social support were identified as protective factors against late ANC initiation and inadequate attendance whilst substance use, experiencing negative feelings about the pregnancy, misconceptions about antenatal care, poor mental health were mostly associated with poor ANC attendance. In the literature, partner characteristics and cultural and religious beliefs were associated with both early and late ANC initiation depending on the specific factors investigated. Research on the associations between psychosocial factors and antenatal care attendance is currently quite limited and

fairly new and in addition, some psychosocial factors may not be associated with timing of initiation but may have an effect on the frequency of attendance of follow-up visits.

Aim: The aim of the study was to examine the association between psychosocial factors and ANC booking to determine whether psychosocial factors (particularly substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) were associated with not only timing of initiation of antenatal care but also frequency of attendance of antenatal care visits during a previous pregnancy among women in an urban and rural location in South Africa.

Methods: The data was derived from a 2006 cross-sectional household survey looking at predictors of risk of alcohol exposed pregnancies among women in an urban area in Gauteng (N= 606) and a rural area in the Western Cape (N=412) provinces of South Africa. For the purposes of this study, only women who had ever been pregnant were eligible and therefore women who had never given birth and had never had a miscarriage were excluded. A total of 363 women from Western Cape and 466 women from Tshwane met the inclusion criteria for the current study. Data analyses were conducted in STATA v12.1 and bivariate and multivariate logistic regression analyses were used to test for associations between the independent and outcome variables.

Ethics: Written informed consent was obtained from participants during the interview process. Ethical approval for the primary study was granted by Faculty of Health Sciences Research Ethics Committees of the Universities of Pretoria (121/2005) and Cape Town (381/2005).

Results

Tshwane: Overall prevalence of early ANC booking was 46% (216/466) with 84% (393/466) of the women attending ANC visits adequately. From the multivariate analyses, desire to become pregnant increased odds of early ANC initiation among Tshwane women (OR=1.8 *p*=0.013). Women who were employed were also more likely to initiate ANC early (OR=1.6, *p*=0.024).

Western Cape: Overall prevalence of early ANC booking was 45% (165/363) with 78% (284/363) of the women attending ANC visits adequately. From the multivariate analyses, women who were single/never married were less likely to initiate ANC early (OR= 0.5, *p*=0.019) and also less likely to adequately attend ANC visits (OR=0.4, *p*=0.037). Highly religious women were less likely to initiate ANC early (OR=0.5 *p*=0.009). Having a partner with education level above Grade 9 increased odds of early ANC attendance (OR=1.9 *p*=0.008). Women desired to fall pregnant were more likely to attend ANC visits adequately (OR=4.1 *p*=0.001). Having the father of the child present in her life during the previous pregnancy also increased odds of adequate ANC attendance among Western Cape women (OR=3.0, p=0.041).

Conclusion: The findings reveal that whilst the majority of women from both sites attended ANC frequently, most women initiated ANC late with less than 50% initiating at or before 16 weeks gestational age. Interventions to reduce prevalence of late ANC booking and poor ANC attendance should engage religious leaders and address unintended pregnancy through family planning education. There is an urgent need to also involve men in reproductive health issues including family planning and maternal health care.

Acknowledgements

The 2006 survey was supported by Cooperative Agreement Number 1U01 DD00044 from the Center for Disease Control & Prevention (CDC), USA. Special thanks to Professor Leslie London (University of Cape Town) and Associate Professor Neo Morojele (Medical Research Council, Pretoria) for their valuable input, continuous guidance and support throughout the study, Mrs Natsayi Chimbindi-Bafana for assistance with data exploration and Dr Jo-Ann McLoughlin for assistance with multivariate data analysis.

Lastly, I am eternally grateful to Dr William Betserai Muhwava for being a supportive mentor throughout my academic life.

PART A: RESEARCH PROPOSAL

PART B: LITERATURE REVIEW

PART C: JOURNAL ARTICLE

PART D: Appendices

PART A: RESEARCH PROPOSAL

Title: Psychosocial factors associated with early booking and frequency of antenatal care (ANC) visits in a rural and urban setting in South Africa.

1. Summary

Antenatal care is important for monitoring the health of the mother and unborn baby during pregnancy and to ensure positive health outcomes. Despite the importance and known benefits of antenatal care, the prevalence of late antenatal care initiation remains high amongst pregnant women. Previous studies have identified demographic factors, physical access to health facilities, parity, lack of health education, relationships with health care providers and misconceptions of antenatal care (ANC) as factors influencing timing of ANC booking (Tran *et al*., 2012, Ndidi & Oseremen, 2010; Myer & Harrison, 2003). This study will examine the association between psychosocial factors and ANC booking. The study aims to determine whether psychosocial factors (substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) are associated with early booking and frequency of ANC visits in an urban and rural location in South Africa. Furthermore, the study will also assess whether the associations with early ANC booking and frequency of visits differ amongst urban and rural populations.

The current study is a sub-analysis from a larger survey on predictors of risk of alcohol exposed pregnancies among women in an urban and a rural area of South Africa. This study involved a cross-sectional household survey of 412 women in the West Coast district in the Western Cape and 606 women in the Gauteng region near Pretoria, two contrasting urban

and rural sites. Ethical approval for the primary study was granted by Faculty of Health Sciences Research Ethics Committees of the Universities of Pretoria (121/2005) and Cape Town (381/2005).

The data will be analysed in STATA v12.1 using Pearson's chi-square test for associations between categorical variables and logistic regression models for each site. Bivariate and multivariate logistic regression analyses will be used to test for associations between the outcome variables: (a) timing of ANC initiation, (early <16 weeks versus late >16 weeks gestational age) and (b) number of visits (low <4 visits and high>4 visits) against the psychosocial variables (substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) for each site. Confounders considered will include socio-demographic factors (age, parity, marital status and race).

Multiple logistic regressions will be used to model the effects of the psychosocial variables on the outcome variables (a) timing of ANC initiation and (b) frequency of ANC attendance. Socio-demographic variables which may act as potential confounders or effect modifiers will be controlled for in the analysis. To adjust for clustering at the rural site (Western Cape), the multivariate analysis will be repeated using the survey command 'svy' in STATA. The trends of association will be compared between the two sites.

2. Introduction

2.1 Background

Antenatal care refers to routine care provided by a trained health worker to a pregnant woman with the purpose of identifying, monitoring and treating health conditions and preventing health complications and death associated with pregnancy. Tran *et al* (2012) define an antenatal care (ANC) visit as "a visit to a health worker for checking and supervision of pregnancy without illness being the reason". Antenatal care has great potential to reduce maternal mortality and morbidity through careful management of health conditions by qualified health care providers. It also exposes women to maternal education and useful information about possible risks during pregnancy. Despite its known importance and associated benefits, Demographic and Health Survey (DHS) data shows that the majority of pregnant women in sub-Saharan Africa first present to health facilities for antenatal care in the third trimester with less than 30% of pregnant women achieving the WHO goal of initiating ANC in the first trimester (Pell *et al*., 2013; Ndidi & Oseremen, 2010; Myer & Harrison, 2003).

In 1994, the South African government decided to make the provision of antenatal care free of charge in all public health facilities in an effort to improve maternal health outcomes and reduce maternal mortality (Hoque et al., 2008; Myer & Harrison, 2003). This resulted in increased utilization of these services but not substantial enough to considerably reduce maternal mortality. South Africa is amongst the countries with the highest rates of maternal and perinatal mortality (Hoque et al., 2008). The South African Confidential Enquiries into Maternal Deaths for 2008-2010 found that more maternal deaths were reported; maternal mortality ratio (MMR) of 176.22/100000 live births in 2008-2010 compared to

151.77/100000 live births in 2005-2007 and these are still increasing (Saving Mothers, 2012). Infrequent, poor and no antenatal care as well as delays in accessing medical help were listed amongst the most frequent patient-related avoidable factors and missed opportunities identified for all cases in this report. This highlights a need for improved antenatal care services which are accessible to all pregnant women as antenatal care is the most important factor in determining perinatal outcomes.

2.2 Antenatal Care Guidelines

In developed countries like the United Kingdom, ANC initiation is recommended from 12 weeks of gestation with a minimum of 10 visits for primiparous women and 7 visits for multiparous women (Ndidi & Oseremen, 2010). However, this is not a feasible approach for developing countries due to limited resources and therefore, guidelines regarding ANC vary from one country to another. An ANC visit within the first 16 weeks is recommended in most country guidelines but this has not translated into practice amongst women in South Africa and late booking therefore, despite the recommended guidelines, remains the trend in most countries in sub-Saharan Africa (Pell *et al*., 2013; Gross *et al*., 2012; Myer & Harrison, 2003). The majority (between 79-86%) of pregnant women in Nigeria also present for antenatal care late (Ndidi & Oseremen, 2010). However, Nigeria has no national guidelines on antenatal care and has adopted the widely accepted commencement of ANC within the first 14 weeks of gestation as early initiation (Ndidi & Oseremen, 2010). The South African Saving Mothers (2012) report recommends educating women on the importance of early booking and initiating antenatal care within the first trimester.

2.3 Benefits of ANC

Early initiation of ANC and adequate follow-up visits facilitate early screening for HIV, syphilis, diabetes, hypertension and interventions which contribute to the prevention of unfavourable health outcomes. Screening for alcohol use routinely during pregnancy is crucial for identifying the risk of Foetal Alcohol Spectrum Disorders (FASD). During their ANC visit, pregnant women also receive folic acid and ferrous sulphate supplements. Folic acid tablets help in the neural tube development of the baby whilst ferrous sulphate tablets supplement iron intake and prevent anaemia. To prevent tetanus to the mother and baby, the tetanus toxoid immunization is administered during ANC visits. The three dose tetanus toxoid immunization is given initially at first visit, the second dose 4 weeks subsequent to the first and the third dose 6 months following the second dose (Hoque *et al*., 2008). Late booking reduces the probability of receiving the full immunization schedule thereby reducing the intended degree of protection against neonatal tetanus. In addition, early HIV testing also leads to measures to prevent transmission of the virus to the baby (PMTCT) and nutritional education (Gross *et al*., 2012). Late booking results in inadequate care and has been associated with high perinatal mortality (Menown *et al*., 1993).

2.4 Antenatal care and perinatal outcome

In South Africa, a retrospective study using data from 1990 obstetric records and aimed at determining whether there was a direct relationship between perinatal outcome and antenatal care was carried out at King Edward VIII Hospital in Durban using early booking as an indicator of effective antenatal care (Menown *et al*., 1993). The findings of this study showed that antenatal care alone could not fully explain perinatal deaths (82% of the mothers of live infants and 60% of mothers in the perinatal death group had booked for antenatal care) and highlighted the need to understand the “type” of the woman who

attends antenatal care and the interplay of various factors which already make them either low risk or at high risk of perinatal death (Menown *et al*., 1993). These factors include socioeconomic factors, understanding of health education and awareness of the importance of antenatal care.

2.5 Factors associated with timing of ANC initiation and/or frequency of ANC attendance

Studies outside South Africa have identified factors associated with early initiation of ANC and/or frequency of ANC visits and these include socio-demographic factors, health perceptions, feelings about the pregnancy (planned versus unplanned pregnancy), access to health facilities, parity and culture. (Pell *et al*., 2013; Tran *et al*., 2012; Ndidi & Oseremen, 2010; McComb Hulsey, 2001).

Socio-demographic factors such as ethnicity, age, marital status and level of education can influence timing of ANC initiation. In a study conducted in the USA, having an unintended pregnancy as well as being of black ethnicity were found to be predictors for late ANC initiation compared to women of white or 'other' ethnicity (McComb Hulsey, 2001). Regarding age, it is most likely that younger women delay ANC booking particularly in the case of unplanned pregnancies but at the same time, older women may also delay ANC booking because of 'experience' if they have had a previous uncomplicated pregnancy and perceive ANC as unnecessary. Late booking has been associated with being of young age (Gross *et al*., 2012). Women with higher levels of education are more likely to initiate ANC early and return for subsequent visits compared to women of lower levels of education. This was confirmed in a cross-sectional study of Nigerian women in which a significant association was found between level of education and early ANC booking (Ifenne & Utoo,

2012). This may be attributed to access to information and a better understanding of the importance of antenatal care.

Parity is an important factor in understanding associations with ANC booking. Parity can be both a barrier to seeking ANC early as well as an enabler of early initiation of care. Multiparous women have experienced pregnancy before and are more familiar with ANC and the follow-up visits required and would be expected to initiate ANC early. On the other hand, the same women may prefer not to seek ANC services if they have previously had uncomplicated pregnancies and delivered healthy babies without attending antenatal clinics.

Findings from a study in Vietnam showed an association between being multiparous and late initiation of ANC and lower frequency of attendance of ANC visits in rural areas (Tran et al., 2012). In another study, 12% of multiparous women compared to 11% of those who had only had one or two previous deliveries booked for ANC late although this difference was not statistically significant (McComb Hulsey, 2001). Women expressed that seeking ANC late was due to uncertainty of the pregnancy in the absence of a confirmatory test and therefore preferred to wait for up to 5 months of missed menstrual cycles before going to a health facility (Myer & Harrison, 2003). This reasoning would be expected to be more inclined towards nulliparous women who are not familiar with the symptoms of pregnancy and do not know what to expect. However, although an association between being multiparous and late ANC initiation has been observed in a number of studies, the influence of parity is in most cases however, not statistically significant (McComb Hulsey, 2001; Ifenne & Utoo, 2012).

In South Africa, lack of physical access to health facilities is still a major barrier to early initiation of ANC in rural South Africa (Myer & Harrison, 2003). A similar study in Vietnam also found a significant association between living in the rural areas and lower use of ANC services compared to living in urban areas (Tran *et al*., 2012).

2.6 Psychosocial factors associated with early initiation and/or frequency of ANC visits

2.6.1 Feelings about the pregnancy

A woman's feelings about the pregnancy may influence her decision to book early for ANC as well as the frequency of her follow-up ANC attendance. A US study of a historical cohort which used National Survey of Family Growth (NSFG) data found that women with unwanted pregnancies booked late for ANC or not at all (McComb Hulsey, 2001). This may be a result of resentment of the pregnancy or difficulty accepting and coming to terms with the unwanted pregnancy. Adolescent women in particular have been observed to initiate ANC late and not attend follow up ANC visits (Gross *et al*., 2012). This behaviour may also be in response to being mistreated by health care workers at the health facility or feelings of embarrassment and humiliation resulting from the pregnancy (Pell, 2013; James *et al*., 2012; Gross *et al.,*2012).

2.6.2 Social capital and social support

A study conducted in Brazil which investigated the relationship between social capital, social support and adequate antenatal use and found that strong social capital was associated with adequate use of antenatal services (Leal *et al*., 2011). The social networks and relationships women have with their partners as well as with their community play a role in determining their health behaviours.

2.6.3 Substance use

Findings from the primary study which was the first population-based survey of women's risk of alcohol exposed pregnancy in South Africa revealed that one in nine women in the urban area and one in five women in the rural area were current alcohol users (Morojele *et al*., 2010). The history of South Africa, living and working conditions during the apartheid era have greatly influenced the high prevalence of drinking cultures in the different communities. The 'dop' system of payment for farm workers, particularly on wine farms and the practice of home brewing beer in traditional communities have been major contributors to the drinking culture in South Africa and subsequently, the high prevalence of foetal alcohol spectrum disorders (FASD) (London, 1999).

It is important to assess the associations between different forms of substance use (alcohol, cigarette smoking) and timing of ANC initiation as these women need to be monitored and routinely screened to prevent adverse outcomes of pregnancy.

2.6.4 Cultural beliefs

Not much is known about the associations of culture and timing of ANC initiation (Gross *et al.*, 2012). Cultural beliefs play an important role in determining individual behaviour. In the African culture, it is common for a woman to not disclose her pregnancy to family and friends, particularly before the pregnancy begins to 'show', with the intention of avoiding being bewitched or some other misfortune (Gross *et al*., 2012). As a result, many women present late to antenatal care because of the strong influence of culture in shaping behaviour. In communities where traditional practices are dominant, there may be a

preference for traditional medicines and traditional forms of care during pregnancy over antenatal care from a health facility (Menown *et al*., 1993).

2.6.5 Misconceptions about antenatal care

Generally, women are knowledgeable about the overall purpose of ANC but not well informed about the purpose of early initiation of ANC and attendance of follow-up visits thereafter (Pell *et al*., 2013; Ndidi & Oseremen, 2010). A study on determinants of late initiation of ANC amongst Nigerian women found that 65.6% of the study population presented late to ANC due to misconceptions of the purpose of early initiation (Hoque et al., 2008; Ndidi & Oseremen, 2010). According to the literature, women generally consider any 'apparent' pregnancy complications within the first three months as 'normal' or mild and therefore do not see any need to visit a health facility at this stage. Some women perceive the purpose of initiating ANC and attending ANC visits simply as a means of acquiring the ANC card which is required for delivery in a health facility according to South African health regulations (Myer & Harrison, 2003).

2.6.6 Partner characteristics

Very few studies have been done on partner characteristics and their association with early initiation of antenatal care. However, in many African settings, the male holds a dominant role and is responsible for most if not all decision making (Bhatta, 2013). In some homes, women may require permission to attend ANC visits from their partners. This highlights the need for inclusion of male partners in maternal health education and the importance of antenatal care. In their study, Ifenne & Utoo (2012) found that the majority (82.7%) of the women made the decision to attend ANC together with their male partner.

These studies illustrate the complexity and multifactoral nature of reasons for timing of initiation and frequency of attendance at ANC and also highlight a need for research into psychosocial factors and their potential association with antenatal care within the South African context. The study therefore has the potential to add to the body of knowledge on the utilization of ANC services in South Africa.

2.7 Rural versus urban areas

Although antenatal care is provided free of charge in South Africa, the quality of and access to care is not uniform across urban and rural areas. Generally, rural areas are underdeveloped and rural communities tend to be medically underserved. Pregnant women in rural areas underutilize antenatal care services and either do not book for antenatal care and first present when in labour or book late, in the last trimester (Tran *et al*., 2012; Myer & Harrison, 2003). This is attributable to differences between rural and urban areas in terms of health systems, health services infrastructure as well as differences in knowledge, behaviours, attitudes and practices between women in rural areas and those in urban areas.

Following the apartheid era, the government has made tremendous effort towards democratisation and improving health service delivery to previously disadvantaged communities and particularly, to improve maternal health services in the rural areas. This has resulted in increased utilization of these services by those who are able to access them (Hoque *et al*., 2008). However, these facilities are still mostly understaffed and unequipped to meet the needs of the rural population and therefore fail to serve the antenatal population adequately.

3. Justification/Rationale

This study will examine the potential association between psychosocial factors (substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) and early initiation of ANC and frequency of subsequent ANC visits. The study aims to determine the psychosocial predictors of early booking and frequency of ANC visits amongst women of child-bearing age in an urban and rural setting of South Africa and to compare the patterns of these associations between the urban and rural location. Earlier studies have investigated and identified socio-demographic and behavioural predictors of ANC initiation whilst this study is unique in that it focuses on investigating the specific link between a set of psychosocial variables and timing of ANC initiation as well as frequency of ANC attendance. To the best of the author's knowledge no similar studies have been conducted in the South African context. Identifying these psychosocial factors would be useful for making decisions on holistic interventions and health education programmes targeted at improving health outcomes for pregnant women and the unborn child in South Africa.

4. Study Objectives

(i) To determine whether there is an association between psychosocial factors and timing of initiation (early versus late) of ANC.

(ii) To determine whether there is an association between psycho-social factors and frequency (adequate versus inadequate ANC attendance) of ANC visits.

(ii) To determine whether the associations with timing of ANC booking and frequency of visits differ amongst urban and rural populations.

5. Methodology

5.1 Study Design

This study will use secondary data from a cross-sectional household survey of two contrasting sites conducted in 2006 (Morojele *et al*., 2010). The urban site is located in Tshwane Metropolitan Municipality, Gauteng and the rural site is located in the Western Cape region, South Africa.

5.2 Study Population and Recruitment

The current study will utilize data from women who met the inclusion criteria (18-44 years) for the primary study at both sites. For the purposes of this study, only women who have ever been pregnant will be eligible and therefore women who have never given birth and have never had a miscarriage will be excluded. Women who report being currently pregnant will only be included in the study provided this is not their first pregnancy i.e.; this study will focus only on information about the pregnancy of their last born child and not their current pregnancy.

5.3 Sampling Method and Sample Size

Cluster random sampling was used at the urban site with a target sample size of 820 women. Random selection was used to identify 82 census enumeration areas (EA) and 10 households were then selected from each area using aerial photographs. One woman was selected randomly within each household, provided she met the eligibility criteria (Morojele *et al*, 2010; Ojo *et al*., 2010).

Stratified cluster random sampling was used at the rural site with a target sample size of 650 women. Farms were chosen within the boundaries of the three municipal areas. Out of 1450 farms, 150 farms were randomly selected. All eligible women on each farm were approached to participate in the study to improve recruitment as there were generally a small number of households per farm (approximately 7).

In total, 606 women were interviewed in Gauteng and 412 women were interviewed in the Western Cape corresponding to response rates of 74% and 83% respectively (Ojo *et al*., 2010). Of these, 354 women from Western Cape had given birth before and 13 were currently pregnant. From Gauteng, 460 women had previously given birth and 34 were currently pregnant.

5.4 Study Duration

Each interview took between 15-90 minutes and was conducted in the privacy of the participant's home.

5.5 Data Collection Tools

Face-to-face interviews were conducted by trained field workers using structured questionnaires. The interviews were conducted in the preferred language of the participant and questionnaires were translated into the most common languages of the study population (i.e. English, Afrikaans, isiXhosa)

5.6 Variables

Outcome variables

The outcome variables are timing of ANC (early versus late ANC initiation) and frequency of visits (adequate versus inadequate ANC attendance) during last pregnancy.

An antenatal care visit is defined as a visit to a health facility for the purpose of assessing the health of the pregnancy. Timing of ANC initiation is defined as timing of first ANC attendance (early <16 weeks versus late >16 weeks gestational age). Early attendance refers to the first ANC visit at or earlier than 16 weeks during the last pregnancy as recommended in literature guidelines. In the original questionnaire, women were asked their gestational age when they first initiated antenatal care during their last pregnancy. This data was collected as number of months pregnant at time of first ANC attendance, which was easier for the women to recall, and then converted to weeks for analysis.

Adequate number of ANC visits is defined as at least four visits during the last pregnancy. This is according to recommendations by the World Health Organization (WHO) in the focused ANC model for developing countries which is in also line with the Guidelines for Maternity Care in South Africa which recommend return visits scheduled for 20, 26, 32, and 38 weeks, and 41 if still pregnant (Villar & Bergsjo, 2003). Participants responded to the question “How many times did you go for antenatal appointments during this pregnancy?” referring to the last pregnancy. The response was then coded as either adequate (0) or inadequate (1).

Independent variables

The independent variables are the psycho-social factors (substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics).

Psycho-social factors

Self-esteem: Scores on a 10 item Rosenburg (1965) self-esteem scale were summed and dichotomised across the 75th percentile to represent low (score = 1) versus high self-esteem (score = 0).

Cultural influences: A single item scale was used to determine participants' extent of agreement that culture entitles males to have as many children as they wish to. A score of "1" was assigned for the response strongly or moderately agree and all other responses were given a score of "0".

A single-item scale was used to assess participants' beliefs that culture prescribed child bearing obligation to women. A score of "1" was assigned to those who agreed and those who did not agree were given a score of "0".

Social capital: Scores on a 6 item social capital scale (Martin *et al*., 2004) were summed and dichotomised across the 75th percentile into weak social capital (0) versus strong social capital (1).

Social support: A 14-item scale from the Ran Medical Outcomes (MOS) Social Support Survey Scale (Sherbourne & Stewart, 1991) was used to measure social support (excluding Tangible support scale). Questions relating to emotional support (8 questions); affectional support (3 questions) and positive social interaction (3 questions) were measured and given a score from 'All the time' given a score of "0" to 'None of the time' given a score of "6". The scores were summed and dichotomised as weak (assigned "1") and strong (assigned "0").

Desire to become pregnant: Participants had a choice of 4 possible responses to a question on their actual desire to become pregnant at the time they became pregnant ranging from 'A great deal' to 'Not at all'.

Health perceptions: A 4 item health perception scale was used together with a 5 item mental health scale adopted from the Short-Form-20 Health Survey (Stewart *et al*., 1988). Participants were asked about their general health by choosing a number that best described their health ranging from 'Definitely true' given a score of "1" to 'Definitely false' given a score of "5". A cut-off score of 70 or lower denoted poor health perceptions.

Mental health: Mental health was assessed by asking participants a series of 5 questions about the way they had been feeling during the past month with responses ranging from 'All the time' given a score of "0" to 'None of the time' given a score of "6" (Stewart *et al*., 1988). The scores were summed and whilst a score of 100 indicated best possible functioning, a cut-off score of 67 or lower indicated low mental functioning (assigned "1") and all others assigned "0".

Substance use

Current smokers: Current smokers were defined as those who had smoked cigarettes during the past 30 days

Alcohol use (CAGE): Participants responded Yes (1) or No (0) to four question on alcohol use (Mayfield *et al*., 1974). A cut-off score of >1 was defined as likely to have an alcohol problem.

Partner characteristics

The variable ‘older partner’ was used for participants with a partner aged 30 years or older (score = 1) versus partner younger than 30 years (score = 0).

In the analysis, socio-demographic variables, which may act as potential confounders or effect modifiers will be controlled for. These include: age; educational status; socioeconomic status; marital status; race and parity.

6. Analysis Plan

All data will be analysed using the statistical software package STATA v12.1. Independent variables were measured on scales in the questionnaires and the scores were summed and dichotomized. Associations between each primary explanatory variable (psychosocial variable) and each outcome variable will be analysed using both simple and multiple logistic regressions for each site (rural and urban).

Variables which may act as potential confounders or effect modifiers will be controlled for in the analysis. Confounding variables may account partially or fully for the apparent association between psychosocial variables and the outcomes whilst effect modifiers will interact with the independent (psychosocial) variables and will modify the effect of the psychosocial variables on the outcomes. These include: age; educational status; socioeconomic status; marital status; race and parity.

Logistic regressions will be used to model the effects of one or more of the psychosocial variables on the outcome variables. All relevant potential confounding variables i.e. socio-demographic variables (socioeconomic status, age, educational status etc.) will be added one at a time to form a baseline model with all confounders. Psychosocial variables will then be added one at a time to this baseline model and their significance will be assessed by

looking at the reduction in the deviance. Interactions between the independent variables and confounders will be assessed for any change in the effect on the outcome variable.

The models will be compared using deviance or likelihood ratio chi-square statistics and the model with the lowest Aikakes Information criterion (AIC) will be selected as the best model. Pearson's residuals and Deviance residuals will be used in model checking for identification of influential points and outlying observations. The adequacy of the link function (logit transformation) will not need to be checked as the outcome variables are binary responses (early initiation/ late initiation) and (adequate ANC/inadequate ANC). To adjust for clustering at the rural site (Western Cape), the multivariate analysis will be repeated using the survey command 'svy' in STATA. The trends of association will be compared between the two sites.

Reliability and Validity

The questionnaire attempted to cover as much as possible, all the questionnaire measures which have been used in similar populations in South Africa and which would adequately address the research question.

7. Limitations

The use of a pre-existing data set will limit the study to the questionnaire design which was used in the data collection. Recall bias may have affected the responses given in the questionnaire as women had to remember when they went for their first ANC visit and the frequency of attendance of ANC visits during their last pregnancy and this may subsequently affect the study findings. Also, the participants were not required to present their ANC cards during the interviews to confirm their booking and ANC attendance. Maternal pregnancy

risk would prompt more clinic visits than a low risk pregnancy and this may confound the results when examining the potential association between psychosocial variables and frequency of antenatal care attendance. The data to be used in this study comes from a cross-sectional survey which gives a 'snapshot' of the situation without implying causality or temporality. The data cannot be used to infer cause and effect relationships but non-directional associations between the psychosocial factors and outcomes (timing of ANC initiation and frequency of ANC attendance).

8. Ethical Considerations

Ethical clearance was obtained from the Faculty of Health Sciences Research Ethics Committees of the Universities of Pretoria (121/2005) and Cape Town (381/2005). Written informed consent was obtained from participants during the interview process.

Benefits to participants

Participants received fact sheets with information about alcohol-exposed pregnancies together with contact details of places to access family planning services and receive alcohol counselling and treatment.

9. Dissemination

This study will be completed in fulfilment of the requirements of completion of a Masters in Public Health qualification. The findings of this study may be published in a relevant journal with assistance of the supervisors, Professor Leslie London (University of Cape Town, School of Public Health and Family Medicine) and Professor Neo Morojele (Medical Research Council, Pretoria).

10. Logistics

10.1 Timeline

The study will take its course over 6 months including the data analysis process and write-up of the findings.

10.2 Budget

No major financial costs are anticipated for this study as secondary data will be used.

11. References

Gross, K., Alba, S., Glass, T. R., Armstrong Schellenberg, J. & Obrist, B. 2012. Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania. *BMC* Pregnancy and Childbirth, 12:1-12.

Harris, B., Goudge, J., Ataguba, J. E., McIntyre, D., Jikwana, S & Chersich, M. 2011. Inequities in access to health care in South Africa. *Journal of Public Health Policy*, 32: S102–S123.

Hoque. M., Hoque. E. & Kader, S. B. 2008. Audit of antenatal care in a rural district of KZN, South Africa. *SA Fam Pract*, 50:66a-66d.

Idehen, E. E. 2001. The development and evaluation of a religiosity scale. *IFE PsychologIA*, 9:58–69.

Ifenne, D. I. & Utoo, B. T. 2012. Gestational age at booking for antenatal care in a tertiary health facility in north-central Nigeria. *Niger Med J*, 53: 236-239.

London, L. 1999. The 'dop' system, alcohol abuse and social control amongst farm workers in South Africa: a public health challenge. *Soc Sci Med*, 48: 1407-1414.

Martin, K. S., Rogers, B. L., Cook, J. T., & Joseph, H. M. 2004. Social capital is associated with decreased risk of hunger. *Social Science & Medicine*, 58: 2645–2654.

McComb Hulsey, T. 2001. Association between Early Prenatal Care and Mother's Intention of and Desire for the Pregnancy. *JOGNN*, 30: 275-282.

Menown, I. B. A., Archbold, J. A. L. & Wills, C. 1993. Perinatal outcome and antenatal care in a black South African population. *The Ulster Medical Journal*, 62: 37- 43.

Morojele, N. K., London, L., Olorunju, S. A.,Matjila, M. J., Davids, A. D. & Rendall-Mkosi, K. M. 2010. Predictors of risk of alcohol-exposed pregnancies among women in an urban and a rural area of South Africa. *Social Science & Medicine*, 70: 534–542.

Myer, L & Harrison, A. 2003. Why do women seek Antenatal Care late? Perspectives from rural South Africa. *Journal of Midwifery and Women's Health*, 48: 268-272.

Ndidi, E. P & Oseremen, I. G. 2010. Reasons given by pregnant women for late initiation of antenatal care in the Niger Delta, Nigeria. *Ghana Medical Journal*, 44: 47-51.

Ojo, O. A., Louwagie, G., Morojele, N., Rendall-Mkosi, K., London, L., Olorunju, S. & Davids, A. 2010. Factors associated with female high-risk drinking in a rural and urban South African site. *SAMJ*, 100: 180-182.

Pell, C., Mencana, A., Were, F., Afrah, N. A., Chatio, S., Manda-Taylor, L., Hamel, M. J., Hodgson, A., Tagbor, H., Kalilani, L., Ouma, P. & Pool, R. 2013. Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi. *PLoS ONE*, 8: 1-11.

Rosenberg, M. 1965. Society and the adolescent self-image. Princeton, NJ: Prince University Press.

Saving Mothers 2008-2010: The Fifth Report on Confidential Enquiries into Maternal Deaths in South Africa. Pretoria: Government Printer, 2012.

Stewart, A. L., Hays, R. D., & Ware, Jr. J. E. 1988. The MOS Short-Form General Health Survey: reliability and validity in a patient population. *Medical Care*, 26: 724–735.

Villar, J & Bergsjo, P. 2003. WHO Antenatal Care Randomized Trial: Manual for the implementation of the New Model. WHO/RHR/01.30. WHO: Geneva.

Tran, T.K., Gottval, K., Nguyen, H. D., Ascher, H. & Petzold, M. 2012. Factors associated with antenatal care adequacy in rural and urban contexts-results from two health and demographic surveillance sites in Vietnam. *BMC Health Services Research*, 12: 1-10.

Part B: Literature Review

1. Introduction

1.1 Background

Antenatal care has great potential to reduce maternal mortality and morbidity through careful management of women's health conditions by qualified health care providers. It also exposes women to maternal education and useful information about possible risks during pregnancy. The World Health Organization (WHO) recommends four goal-oriented visits, known as the focused ANC package as adequate and effective for the provision of essential interventions for women with no underlying health conditions, with the first visit occurring in the first trimester (Villar & Bergsjo, 2002; Bamford, 2013). In resource limited settings, increasing the number of antenatal care visits to more than four has not been found to necessarily improve health outcomes (Low *et al*., 2005). In low and middle income countries (LMIC), attendance of less than four visits has been associated with an increased risk of perinatal mortality, particularly, stillbirth (Finlayson & Downe, 2013).

The focused ANC model also clearly outlines what is assessed at each visit from the first visit (8-12 weeks), second visit (24-26 weeks), third visit (32 weeks) and the fourth visit (36-38 weeks) and introduces a holistic approach to ANC. Activities on the schedule include pregnancy confirmation at first vist, screening, prevention measures, treatment, monitoring of identified conditions and counselling throughout the pregnancy and the development of a birth plan and emergency plan which can be modified accordingly (Lincetto *et al*., 2006; Villar & Bergsjo, 2002).

One of the key actions required to bring countries closer to achieving Millennium Development Goals 5 is that pregnant women should be 'informed, screened and appropriately managed for diseases such as HIV, tuberculosis, STIs and pneumonia (Millennium Development Goals Report, 2013). Delayed initiation and inadequate attendance of antenatal care reduces opportunities for early interventions aimed at improving pregnancy outcomes. Evidence shows that comprehensive antenatal care is associated with increased birth weight in children born of low-income mothers (Benediktsson *et al.*, 2013).

Existing literature from both local and international studies was reviewed to inform the current research and identify gaps in literature in order to contribute to the body of knowledge. Evidence from research aimed at identifying factors associated with late attendance to antenatal care has increased over the years looking at socio-demographic factors (including ethnicity, age, marital status, income, level of education etc) and access to health facilities and whether these factors are associated with antenatal care attendance (Pell *et al*., 2013; Gross *et al*., 2012; Tran *et al*., 2012; Ndidi & Oseremen, 2010; Myer & Harrison, 2003; McComb Hulsey, 2001; McCaw-Binns *et al*., 1995).

However, research on the associations between psychosocial factors and antenatal care attendance is currently quite limited and fairly new (Benediktsson *et al*, 2013; Finlayson & Downe, 2013; Leal *et al*., 2011). The aim of the study was to examine the association between psychosocial factors and ANC booking to determine whether psychosocial factors (particularly substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) were associated with not only timing of initiation of antenatal care but also frequency of attendance of

antenatal care services during the previous pregnancy (pregnancy of their last born child) among women in an urban and rural location in South Africa. Furthermore, this study is unique in that it also assessed whether the associations with timing of antenatal care initiation and frequency of visits during a previous pregnancy differed amongst urban and rural populations.

1.2 Maternal Mortality in Africa

South Africa is amongst the countries with the highest rates of maternal and perinatal mortality globally (Hoque *et al*., 2008). According to the World Health Organization (2010), the rate of decline of maternal mortality rates (MMR) in sub-Saharan Africa has been less than 1% per year and in fact, the rates of maternal mortality have increased in countries such as South Africa, Nigeria, Mozambique and Swaziland. Infrequent, poor and no antenatal care as well as delays in accessing medical help were listed in The South African Confidential Enquiries into Maternal Deaths for 2008-2010 report (Saving Mothers Report, 2012) as amongst the most frequent patient-related avoidable factors and missed opportunities identified for all cases of maternal death. According to the WHO Countdown to 2015 report for 2012, a total of 9 out of 75, which is 12%, of the countries with the highest MMR are on target to meeting the Millennium Development Goal 5; reducing maternal mortality by 75% by 2015 and South Africa is listed among countries that have made no progress towards MDG 5 (Building a Future for Women and Children, The 2012 Report).

1.3 Trends in antenatal care attendance across Africa

Despite the known importance of antenatal care and its associated benefits, data from the Demographic and Health Survey (DHS) shows that less than 20% of pregnant women in Ethiopia and Nigeria initiate ANC in the first trimester and slightly higher percentages for Congo-Brazzaville (47%) and Ghana (55%) (Pell *et al*., 2013; Ndidi & Oseremen, 2010). The general trend in sub-Saharan Africa, including South Africa, is that pregnant women first present to health facilities for antenatal care in the third trimester with less than 30% of pregnant women achieving the WHO goal of initiating ANC in the first trimester (Myer & Harrison, 2003). Prevalence rates of late booking as high as 85% have been reported in other African countries (e.g. Nigeria and Ethiopia) with initiation of antenatal care in the third trimester of pregnancy resulting in poor outcomes (Ngomane & Mulaudzi, 2012; Ndidi & Oseremen, 2010).

A cross-sectional survey with women attending urban and rural antenatal clinics in The Gambia found that whilst 90% of the women attended the ANC clinic more than once and 52% had attended at least 4 times during their pregnancy, the time spent with the health provider was very limited. Approximately 71% of the interviewed women reported spending at most, only 3 minutes with the antenatal care provider (Anya *et al*., 2008). Antenatal clinics need to have skilled nursing staff and midwives who are properly trained to have high levels of communication and interpersonal skills to achieve effective antenatal care (Finlayson & Downe, 2013). Health providers also need to have knowledge and understanding around the cultural and religious beliefs and practices which influence antenatal care attendance to enable them to provide health services to all pregnant women

without ignorantly judging them for following cultural and religious practices (Ngomane & Mulaudzi, 2012).

1.4 Trends in antenatal care attendance in South Africa

A meta-synthesis of 21 qualitative studies, 4 from South Africa explored the views, beliefs, and experiences of women from LMIC who attended antenatal care inadequately with the aim of creating hypotheses about women's use of antenatal care services in LMIC to inform policy development for antenatal care programmes (Finlayson & Downe, 2013). Two main hypotheses emerge from this study (i) that inconsistencies between theory around antenatal care programmes based on the WHO model for antenatal care and the local context (ie: belief systems, actions and experiences of users of these services) could explain lack of or poor initial attendance and (ii) the misalignment between assumptions underlying the provision of antenatal care and the experiences of women who utilize them could be responsible for poor attendance of follow-up visits (Finlayson & Downe, 2013). Risk management in pregnancy is likely to be more successful if the perceptions and beliefs of the women it targets are well understood and acknowledged in the design of health interventions and programmes to promote positive antenatal and perinatal outcomes.

An ANC visit within the first 16 weeks is recommended in most country guidelines but this has not translated into practice amongst women in South Africa and late booking therefore, despite the recommended guidelines remains the trend in most countries in sub-Saharan Africa (Pell *et al*., 2013; Gross *et al*., 2012; Myer & Harrison, 2003). According to the Saving Mothers Report (2005-2007) and the Millennium Development Goals 2009 Report; whilst over 90% of South African women have access to antenatal care services, 63.2% of pregnant women in South Africa attend antenatal services at all. District level maternal health data in

Bohlabelo, Limpopo confirmed the under-utilization of antenatal care services with only 2.9% of women initiating antenatal care before 20 weeks of gestational age (Ngomane & Mulaudzi, 2012).

1.5 Rural versus urban areas

Although antenatal care is provided free of charge in South Africa, the quality of and access to care is not uniform across urban and rural areas. Generally, rural areas are underdeveloped and rural communities tend to be medically underserved. Pregnant women in rural areas underutilize antenatal care services and either do not book for antenatal care and first present when in labour or book late, in the last trimester (Tran *et al*., 2012; Myer & Harrison, 2003). This is attributable to differences between rural and urban areas in terms of health systems, health services infrastructure as well as differences in knowledge, behaviours, attitudes and practices between women in rural areas and those in urban areas.

Following the apartheid era, the government has made tremendous effort towards democratisation and improving health service delivery to previously disadvantaged communities and particularly, to improve maternal health services in the rural areas. This has resulted in increased utilization of these services by those who are able to access them (Hoque *et al*., 2008). However, these facilities are still mostly understaffed and unequipped to meet the needs of the rural population and therefore fail to serve the antenatal population adequately.

2. Factors associated with antenatal care attendance

Research outside South Africa has identified socio-demographic factors, health perceptions, feelings about the pregnancy (planned versus unplanned pregnancy), access to health

facilities, parity and culture to be associated with timing of initiation of antenatal care and frequency of follow-up visits (Pell *et al*., 2013; Tran *et al*., 2012; Ndidi & Oseremen, 2010; McComb Hulsey, 2001).

Early attendance to antenatal care may also be influenced by poor health or health complications and therefore it is necessary to adjust for maternal risk when examining factors associated with antenatal attendance (McCaw-Binns *et al*., 1995). Existing health conditions or prior events of violence or abuse present an opportunity for contact and association with health services and may therefore facilitate early initiation of care during pregnancy (Pagnini & Reichman, 2000).

2.1 Socio-demographic factors

Socio-demographic factors such as ethnicity, age, marital status and level of education can influence timing of ANC initiation. In a study conducted in the USA, having an unintended pregnancy as well as being of black ethnicity were found to be predictors of late ANC initiation compared to women of white or 'other' ethnicity (McComb Hulsey, 2001). Younger women have been found to delay ANC booking particularly in the case of unplanned pregnancies. Older women may also delay ANC booking because of 'experience' if they have had a previous uncomplicated pregnancy and therefore perceive ANC as unnecessary. Women with higher levels of education are more likely to initiate ANC early and return for subsequent visits compared to women of lower levels of education. A cross-sectional study of Nigerian women found a significant association between level of education and early ANC booking (Ifenne & Utoo, 2012). This may be attributed to access to information and a better understanding of the importance of antenatal care.

2.2. Psychosocial factors and antenatal care

Although booking systems in health facilities; strict quotas, as well as the attitudes of health care providers are recognised barriers to access (Abrahams *et al*., 2001) psychosocial factors have been found to also play an important role in timing and frequency of attendance to antenatal care. Timing of initiation of antenatal care in previous pregnancies may influence timing of initiation in subsequent pregnancies (Pagnini & Reichman, 2000).

Although the focus of the relationship between psychosocial factors and timing of initiation of antenatal care has mainly been on three factors; overall stress level and coping strategies, risk-taking behaviour and feelings about the pregnancy (Pagnini & Reichman, 2000), having a husband with low levels of education has also been identified as a barrier to access to antenatal care services (Finlayson & Downe, 2013). Other psychosocial factors associated with late initiation of antenatal care and fewer follow-up visits include abortion contemplation and delayed diagnosis of the pregnancy (Low *et al*., 2005). Social support from partners, family and community members has been associated with adherence to antenatal care and healthy behaviours during pregnancy such as quitting smoking and alcohol intake and eating healthy food (Leal *et al*., 2011).

Research in South Africa has found that late attendance to ANC has been associated with psychosocial factors such as unstable relationships with the unborn baby's father, feelings about the pregnancy (i.e. unwanted or unintended) and lack of social support (Abrahams *et al*., 2001). Ngomane and Mulaudzi (2012) also argue that cultural beliefs passed on from generation to generation hold great value and influence health-seeking behaviours. Studies in South Africa and Zimbabwe have revealed that cultural and religious beliefs influence antenatal care attendance (Ngomane & Mulaudzi, 2012; Mathole *et al*., 2004).

Disparities in timing of initiation of antenatal care and frequency of attendance exist between countries and between rural and urban settings within a country (Finlayson & Downe, 2013). In addition, some psychosocial factors may not be associated with timing of initiation but may have an effect on the frequency of attendance of follow-up visits.

2.2.1 Substance use

Behavioural factors such as smoking, substance use and alcohol consumption have been observed to be correlated with poor pregnancy outcomes (Ojo *et al*., 2010; Pagnini & Reichman, 2000). Studies have shown that babies born of women with substance addictions are of poorer health compared to those born of women who are not substance users and some known obstetrical complications associated with substance use include low birth weight, spontaneous abortions and preterm labour and delivery (Jansson *et al*., 1996). Substance use during pregnancy is a major public health concern and can have negative consequences for the development of the unborn child (Ojo *et al*., 2010). Early ANC initiation and frequent ANC visits present opportunities for screening to identify high risk pregnancies and early interventions to prevent or reduce negative pregnancy outcomes. Screening for alcohol use routinely during pregnancy is crucial for identifying the risk of Foetal Alcohol Spectrum Disorders (FASD). A situational gap analysis on FASD conducted in 2008 highlighted that prevalence data on FASD showed that some areas within South Africa had the highest prevalence of FASD in the world (Rendall-Mkosi *et al*., 2008). Prevention of maternal drinking and subsequently prevention of FASD requires improving screening practices for alcohol exposed pregnancies (AEP) and early interventions which are facilitated by early initiation of ANC and frequent ANC visits.

The primary study from which the data for this study is derived, which was the first population-based survey of women's risk of alcohol-exposed pregnancy in South Africa revealed that one in nine women in the urban area and one in five women in the rural area were current alcohol users (identified by a positive response to the question 'Do you still take a drink with alcohol sometimes?' (Morojele *et al*., 2010). The 'dop' system of payment for farm workers, particularly on wine farms and the practice of home brewing beer in traditional communities have been major contributors to the drinking culture in South Africa and subsequently, the high prevalence of foetal alcohol spectrum disorders (FASD) (London, 1999). Although the practice has since been abolished, the practice of home brewing beer in traditional communities has continued and the consequences of the practice of "dop system" are still evident and have encouraged a tradition of alcohol consumption amongst women in areas in which it was practised including during pregnancy (Croxford & Viljoen, 1999).

It is important to assess the associations between different forms of substance use (alcohol, cigarette smoking) and timing of ANC initiation as women who use substances need to be monitored and routinely screened to prevent adverse outcomes of pregnancy. Substance use in itself may act as a barrier to ANC attendance due to fear of the repercussions of being identified as a drug user or alcohol abuse. Early ANC initiation presents an opportunity for counselling and motivating for positive lifestyle changes to ensure healthy outcomes of pregnancy. In a study with Jamaican women, drug use and smoking were associated with increased risk of non-attendance (McCaw-Binns *et al*., 1995). Antenatal care allows pregnant women an opportunity to make choices about their lifestyles to yield positive

pregnancy outcomes (Anya *et al*., 2008). Assessing alcohol use amongst pregnant woman is critical to inform planning of prevention measures (Croxford & Viljoen, 1999).

2.2.2 Social capital and Social Support

Over the years, research has begun to look at the interpersonal relationships formed between people with common goals and how these interactions influence health-seeking behaviours (Leal *et al*., 2011). Interactions with other community members, colleagues, family and friends can influence health-seeking behaviour. The social networks formed through these interactions provide a strong support system for women during pregnancy and facilitate antenatal care attendance and return for follow-up visits. In contrast, Beeckman *et al*. (2012) refer to 'closed networks' which restrain and limit interactions with those outside the network. Such networks could potentially prevent access to information and therefore pose as a barrier to antenatal care attendance.

Social capital can be defined as 'the set of norms and networks that enable people to act collectively' (Woolcock & Narayan, 2000). Social capital has an impact on health through sharing of information, adoption of positive healthy practices, improved health-seeking behaviours and access to services, raising awareness around health issues and promoting self-esteem (Leal *et al*., 2011). Traditional antenatal care is approached from a communal angle in the Pacific Islands as in many African countries including South Africa. Immediate and extended family members and community members are involved in playing a role in tending to the pregnant woman and encouraging healthy habits (Low *et al*., 2005).

A study in Brazil examined the relationship between social capital and social support with antenatal care use in two cities with different socioeconomic conditions and levels of health

services (Leal *et al*., 2011). Women who initiated early antenatal care lived with their partners and belonged to more social networks. In contrast, poor social conditions and therefore lower social capital reinforced health inequalities and contributed to late initiation of antenatal care.

In another study, a cohort of Jamaican mothers was interviewed by midwives at delivery to examine socio-environmental and obstetric history factors and the relationship of these factors with initiation of antenatal care (McCaw-Binns *et al*., 1995). Women who felt they lacked support from family and friends during pregnancy were twice as likely to not attend antenatal care.

In recognition of the role of social support in improving outcomes of pregnancy, a new model of group antenatal care, CenteringPregnancy® is emerging in Canada and other countries. CenteringPregnancy® is aimed at improving social support within the group of participants and better psychosocial health by providing both medical care and education (Benediktsson *et al.*, 2013).

2.2.3 Feelings about the pregnancy

For some women, the discovery that they are pregnant may come with different emotions and evoke different feelings ranging from excitement and anticipation particularly for women who desired or planned to become pregnant, to confusion, ambivalence and even depression. Women's feelings about their pregnancy are often associated with their timing of ANC care (McCaw-Binns *et al*., 1995; Pagnini & Reichman, 2000). For example, in a local study, women expressed that seeking ANC late was due to their uncertainty of their pregnancy in the absence of a confirmatory test and therefore they preferred to wait for up

to 5 months of missed menstrual cycles before going to a health facility (Myer & Harrison, 2003). Ambivalence about the pregnancy leads to delayed decision-making and subsequently late initiation of antenatal care (Low *et al*., 2005; Pagnini & Reichman, 2000; McCaw-Binns *et al*., 1995).

In their study, desirability of pregnancy was an important factor in determining timing of initiation of ANC and women who had not desired to conceive were more likely to not attend (OR = 2.8) or to initiate antenatal care late (OR= 2.2) (McCaw-Binns *et al*., 1995). A New Zealand study found that women whose pregnancies were unplanned or who were not initially happy about their pregnancy initiated antenatal care late and attended fewer follow-up visits (Low *et al*., 2005; Pagnini & Reichman, 2000).

Women who felt sad during the pregnancy were also less likely to initiate antenatal care early (McCaw-Binns *et al*., 1995). This may be a result of initial resentment of the pregnancy or difficulty accepting and coming to terms with the unwanted pregnancy. Adolescent women in particular have been observed to initiate ANC late and not attend follow up ANC visits (Gross *et al*., 2012).

2.2.4 Cultural and traditional beliefs

Understanding cultural beliefs and practices and acknowledging their role in pregnancy and childbirth can facilitate interventions to motivate pregnant women to attend antenatal care services and ensure positive health outcomes (Ngomane & Mulaudzi, 2012).

A South African qualitative study to describe the influence of indigenous beliefs and practices in delaying antenatal care attendance was carried out with twelve pregnant women in the Bohlabelo district of Limpopo (Ngomane & Mulaudzi, 2012). One of the

emerging themes was that of pregnancy preservation (physical preservation, spiritual preservation and herbal protection). Protection derived from concoctions made from herbs, performing rituals to 'inform the ancestors' about the pregnancy, secrecy and other beliefs and practices all form part of these women's cultural belief systems in which initiating antenatal care within the first trimester is not the preferred option.

In a qualitative study of women's perspectives of antenatal care in the rural Gutu District of Zimbabwe, women who were interviewed also expressed trust in their cultural and religious practices in ensuring a healthy pregnancy experience and positive health outcomes over presenting to a health facility to initiate antenatal care in the first trimester (Mathole *et al*., 2004). Religion has a similar influence as culture during pregnancy and certain practices and rituals are followed as a way to ward off harm, preserve the pregnancy and ensure positive health outcomes (Ngomane & Mulaudzi, 2012).

In some African cultures, it is common for a woman to not disclose her pregnancy to family and friends, particularly before the pregnancy begins to 'show', with the intention of avoiding being bewitched or some other misfortune (Gross *et al*., 2012). In separate studies, women also expressed the view that a pregnancy should be kept secret in the first trimester to protect the unborn child from witchcraft and evil spirits and thus presenting at a health facility for antenatal care amongst other pregnant women would reveal their secret prematurely and 'endanger' the pregnancy (Ngomane & Mulaudzi, 2012; Mathole *et al*., 2004).

In a study with mothers who had given birth approximately 6 weeks earlier conducted in the Pacific Islands, women were interviewed about antenatal care attendance to examine the maternal and socio-demographic factors associated with late attendance (Low *et al*., 2005).

No association was found between the use of traditional healers (11.2% of the mothers had used traditional medicine) and antenatal attendance.

Another study with rural Ugandan women found that cultural practices and beliefs were so innate and deeply rooted, that seeking antenatal care services was perceived to be less favourable compared to following traditional practices of care during pregnancy under the supervision of grandmothers, mothers-in-law and traditional healers (Kyomuhendo, 2003). The traditional medicines used vary at each stage of the pregnancy and are administered orally, smeared on skin or inserted into the vagina.

These findings highlight the need for more culturally appropriate antenatal care services administered by sensitized health care workers. The clinical aspects of pregnancy are often the focus of health interventions to ensure positive pregnancy outcomes and very little attention has been given to the influence of cultural traits, beliefs and practices in seeking health-care services during pregnancy (Ngomane & Mulaudzi, 2012; Kyomuhendo, 2003). From both a medical and traditional or cultural perspective, there is agreement that the first few months of the pregnancy are a critical period but as explained in Mathole *et al* (2004), the responses or actions during this period to ensure positive health outcomes are quite conflicting.

2.2.5 Misconceptions about antenatal care

The purpose and goals of antenatal care during pregnancy are not always clear or well understood by women and this often leads to misconceptions about antenatal care which could possibly influence timing of initiation and attendance follow-up visits. In addition, lack

of information about antenatal care, coupled with limited time with the health care provider during the antenatal care visit in resource limited facilities only worsen the situation.

A study on determinants of late initiation of ANC amongst Nigerian women found that 65.6% of the study population presented late to ANC due to misconceptions of the purpose of early initiation (Hoque *et al*., 2008; Ndidi & Oseremen, 2010). According to the literature, women generally consider any apparent pregnancy complications within the first three months as 'normal' or mild and therefore do not see any need to visit a health facility at this stage (Pell *et al*., 2013; Gross *et al*., 2012). Some women perceive the purpose of initiating ANC and attending ANC visits simply as a means of acquiring the ANC card which is required for delivery in a health facility according to South African health regulations (Myer & Harrison, 2003).

Another South African study found that women did not understand the importance of adequate attendance after the initial ANC visit and perceived follow-up visits to be of less importance compared to the first visit and women interviewed in this study booked between 3 and 8 months into the pregnancy (Abrahams *et al*., 2001). Data from the Jamaican Perinatal Morbidity and Mortality Survey conducted in the 1980s suggests that because women do not view pregnancy as a pathological condition, they initiated antenatal care late and attended fewer visits unless they were ill (McCaw-Binns *et al*., 1995).

Multiparous women whose previous pregnancies were uncomplicated and those women with a history of Caesarian section tend to initiate antenatal care late. This is based on the view that they are familiar with experiences of being pregnant and therefore do not need to sit through antenatal sessions all over again (McCaw-Binns *et al*., 1995). Older women have been reported to view antenatal care as unnecessary as they felt they had enough

experience to manage their pregnancy without seeking antenatal care services (Mathole *et al*., 2004). Messaging about the benefits of antenatal care to safeguard the health of infants and reduce maternal mortality rates needs to target all women, including those who have experienced pregnancy and childbirth (Low *et al*., 2005).

2.2.6 Mental Health

Maternal mental health during pregnancy affects the infant's birth status (Benediktsson *et al*, 2013). Women with a history of depression may also be at higher risk of antenatal depression and antenatal depression is known to negatively impact ANC uptake. For example, in a US study, women who had clinical depression or other forms of mental illness or had experienced violence or abuse fell in the category of early attenders (Pagnini & Reichman, 2000). A study in rural Hlabisa, South Africa found a high prevalence of antenatal depression in this community, twice as high as the estimated rate for Africa (4-17%)(Rochat *et al*., 2011).

Early ANC initiation facilitates early identification and treatment of antenatal depression whilst frequent ANC attendance enables routine screening to reduce negative foetal and obstetric outcomes. Antenatal care providers should be trained and equipped to assess the mental health status of the women who present at ANC clinics and establish whether the woman has resources (financial, social support) to cope with the symptoms identified (Evans & Bullock, 2012). Each visit presents a unique opportunity to assess these psychosocial factors and encourage frequent attendance. Positive health outcomes can be enhanced through the provision of support and counselling during the antenatal period (Patel *et al*., 2004).

2.2.7 Self-esteem

Studies on the relationship of self-esteem in relation to antenatal care have increased over the years providing evidence that low self-esteem affects antenatal care (Evans & Bullock, 2012; Jomeen & Martin, 2005). Self-esteem refers to an individual's sense of self-worth and has potential to influence behaviour. Low self-esteem has been found to be associated with early antenatal depression and some women resort to detrimental coping strategies such as disengagement and 'giving up' (Evans & Bullock, 2012). Other coping strategies can include risk taking behaviour and substance use. Such coping strategies create a barrier which prevents the pregnant woman from initiating ANC early if at all and may also be an obstacle to frequent ANC attendance. Because low self-esteem can be used as a predictor of potential psychological disturbances, health care providers need to be trained to identify low self-esteem in clinical dialogue during the ANC visit in order to closely monitor frequency of ANC attendance among these women and implement early interventions to improve self-esteem and prevent antenatal depression and anxiety (Jomeen & Martin, 2005).

2.2.8 Partner characteristics

In developing countries, men are usually the household heads with decision-making power in relationships and control over their partners and families (Bhatta, 2013). In some homes, women may require permission to attend ANC visits from their partners. This highlights the need for inclusion of male partners in maternal health education and the importance of antenatal care. Because men tend to control their spouse's timing and utilization of health services, male involvement in maternal health enables them to support their partners to book early for antenatal care and attend follow-up visits regularly (Bhatta, 2013).

On the other hand, maternal health in other countries including South Africa is still viewed as a woman's issue due to socially constructed gender roles and men are generally not actively involved in reproductive health issues (Sonke Gender Justice Network, 2008). A study on men's involvement in reproductive health was conducted with married men in the Kathmandu district (which is the central part of Nepal) and found that factors such as the male partner's age, education, income and employment were associated with males' involvement in the antenatal visits (Bhatta, 2013). Having a poor relationship with the baby's father may negatively influence antenatal care attendance (Pagnini & Reichman, 2000).

In the developing world, men can play an important role in enhancing positive birth outcomes through reduction of the three phases of delay (i) delay in the decision to seek care, (ii) delay in reaching care and (iii) delay in receiving care (Bhatta, 2013). Partner characteristics could be a barrier to accessing antenatal care. Male partners interviewed in the Zimbabwean qualitative study on perspectives on antenatal care mentioned earlier, expressed the view that pregnant women were vulnerable targets for witchcraft and objects of community gossip hence that it was crucial to keep the pregnancy a secret (Mathole *et al*., 2004).

3. References

Abrahams, N., Jewkes, R & Mvo, Z. 2001. Health Care–Seeking Practices of Pregnant Women and the Role of the Midwife in Cape Town, South Africa. 2001. *Journal of Midwifery & Women's Health* 46, 240-247.

Anya, S. E., Hydara, A & Jaiteh, L. E. S. 2008. Antenatal care in The Gambia: Missed Opportunity for Information, Education and Communication *BMC Pregnancy and Childbirth* 8:9.

Bamford, L. Maternal, Newborn and Child Health. In: Padarath, A., English, R.,editors. South African Health Review 2012/13. Durban: Health Systems Trust; 2013. URL: http//www.hst.org.za/publications/south-african-health-review-2012/13.

Beeckman, K., Louckx, F & Putman, K. 2012. Content and Timing of Antenatal Care: Predisposing, Enabling and Pregnancy-Related Determinants of Antenatal Care Trajectories. *European Journal of Public Health*, 1–7.

Benediktsson, I., McDonald, S. W., Vekved, M., McNeil, D. A., Dolan, S. M & Tough, S. C. 2013. Comparing CenteringPregnancy® to Standard Prenatal Care Plus Prenatal Education. *BMC Pregnancy and Childbirth* 13(Suppl 1):S5.

Bhatta, D. N. 2013. Involvement of Males in Antenatal Care, Birth Preparedness, Exclusive Breast feeding and Immunizations for Children in Kathmandu, Nepal. *BMC Pregnancy and Childbirth* 13:14.

Croxford, J & Viljoen, D. 1999. Alcohol Consumption by Pregnant Women in the Western Cape. *South Africa Medical Journal* 89, 962-965.

Evans, C & Bullock, L. F. C. 2012. Optimism and Other Psychosocial Influences on

Antenatal Depression: A systematic review. *Nursing and Health Sciences* 14, 352–361.

Finlayson, K & Downe, S. 2013. Why Do Women Not Use Antenatal Services in Low- and Middle-Income Countries? A Meta-Synthesis of Qualitative Studies. *PLoS Med* 10(1):

Gross, K., Alba, S., Glass, T. R., Armstrong Schellenberg, J. & Obrist, B. 2012. Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania. *BMC* Pregnancy and Childbirth, 12:1-12.

Harris, B., Goudge, J., Ataguba, J. E., McIntyre, D., Jikwana, S & Chersich, M. 2011. Inequities in access to health care in South Africa. *Journal of Public Health Policy*, 32: S102–S123.

Hoque. M., Hoque. E. & Kader, S. B. 2008. Audit of antenatal care in a rural district of KZN, South Africa. *SA Fam Pract*, 50:66a-66d.

Ifenne, D. I. & Utoo, B. T. 2012. Gestational age at booking for antenatal care in a tertiary health facility in north-central Nigeria. *Niger Med J*, 53: 236-239.

Jansson, L. M., Dace., S., Lee, J., Paluzzi, P., Rutigliano, P & Hackerman, F. 1996. Pregnancy And Addiction A Comprehensive Care Model. *Journal of Substance Abuse Treatment* 13, 321-329.

Jomeen, J., Martin, C.R. 2005. Self-Esteem and Mental Health During Early Pregnancy. Clinical Effectiveness in Nursing 9, 92–95.

Kyomuhendo, G. B. 2003. Low Use of Rural Maternity Services in Uganda: Impact of Women's Status, Traditional Beliefs and Limited Resources. *Reproductive Health Matters* 11, 16-26.

Leal, M. C, Pereira, A. P. E., Lamarca, G. A & Vettore, M. V. 2011. The Relationship between Social Capital, Social Support and the Adequate Use of Prenatal Care. *Cad. Saúde Pública, Rio de Janeiro*, 27 Sup 2:S237-S253.

Lincetto, O., Mothebesoane-Anoh, S., Gomez, P & Munjanja, S. Antenatal Care, in: Lawn J and Kerber K, eds., Opportunities for Africa's Newborns: Practical data, policy and programmatic support for newborn care in Africa, Cape Town, South Africa: WHO, 2006, pp. 51–62.

London, L. 1999. The 'dop' system, alcohol abuse and social control amongst farm workers in South Africa: a public health challenge. *Soc Sci Med*, 48: 1407-1414.

Low, P., Paterson, J., Wouldes, T., Carter, S., Williams, M & Percival, T. 2005. Factors affecting Antenatal Care Attendance by Mothers of Pacific Infants living in New Zealand. *New Zealand Medical Journal* 1216, 1-10.

Mathole, T., Lindmark, G., Majoko, F & Ahlberg, B. M. A Qualitative Study of Women's Perspectives of Antenatal Care in a Rural Area of Zimbabwe. *Midwifery* 20, 122–132.

McCaw-Binns, A., Grenade, J & Ashley, D. 1995. Under-users of Antenatal Care: A Comparison of Non-attenders and Late Attenders for Antenatal Care, with Early Attenders *Soc. Sci. Med* 7, 1003-1012.

McComb Hulsey, T. 2001. Association between Early Prenatal Care and Mother's Intention of and Desire for the Pregnancy. *JOGNN*, 30: 275-282.

Morojele, N. K., London, L., Olorunju, S. A.,Matjila, M. J., Davids, A. D. & Rendall-Mkosi, K. M. 2010. Predictors of risk of alcohol-exposed pregnancies among women in an urban and a rural area of South Africa. *Social Science & Medicine*, 70: 534–542.

Myer, L & Harrison, A. 2003. Why do women seek Antenatal Care late? Perspectives from rural South Africa. *Journal of Midwifery and Women's Health*, 48: 268-272.

Ndidi, E. P & Oseremen, I. G. 2010. Reasons given by pregnant women for late initiation of antenatal care in the Niger Delta, Nigeria. *Ghana Medical Journal*, 44: 47-51.

Ngomane, S & Mulaudzi, F. M. 2012. Indigenous Beliefs and Practices that Influence the Delayed Attendance of Antenatal Clinics by Women in the Bohlabelo district in Limpopo, South Africa. *Midwifery* 28, 30–38.

Ojo, O. A., Louwagie, G., Morojele, N., Rendall-Mkosi, K., London, L., Olorunju, S. & Davids, A. 2010. Factors associated with female high-risk drinking in a rural and urban South African site. *SAMJ*, 100: 180-182.

Pagnini, D. L & Reichman, N. E. 2000. Psychosocial Factors and the Timing of Prenatal Care Among Women in New Jersey's HealthStart Program. *Family Planning Perspectives* 32, 56–64.

Patel, V., Rahman, A., Jacob, K. S & Hughes, M. 2004. Effect of maternal mental health on infant growth in low income countries: new evidence from South Asia. *British Medical Journal* 328, 3.

Pell, C., Mencana, A., Were, F., Afrah, N. A., Chatio, S., Manda-Taylor, L., Hamel, M. J., Hodgson, A., Tagbor, H., Kalilani, L., Ouma, P. & Pool, R. 2013. Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi. *PLoS ONE*, 8: 1-11.

Rendall-Mkosi, K., London, L., & Adnams, C., Morojele, N., McLoughlin, J &and Goldstone, C. 2008. Fetal Alcohol Spectrum Disorder in South Africa: Situational and Gap Analysis, 1-78.

Rochat, T.J., Tomlison, M., Bärnighausen, T., Newell, M.L & Stein, A. 2011. The prevalence and clinical presentation of antenatal depression in rural South Africa. *Journal of Affective Disorders* 135, 362–373.

Saving Mothers 2008-2010: The Fifth Report on Confidential Enquiries into Maternal Deaths in South Africa. Pretoria: Government Printer, 2012.

Sonke Gender Justice Network. 2008. Literature Review on Men, Gender, Health and HIV and AIDS in South Africa.

Tran, T.K., Gottval, K., Nguyen, H. D., Ascher, H. & Petzold, M. 2012. Factors associated with antenatal care adequacy in rural and urban contexts-results from two health and demographic surveillance sites in Vietnam. *BMC Health Services Research*, 12: 1-10.

United Nations, *The Millennium Development Goals Report 2013*, 1 July 2013, ISBN 978-92-1-101284-2, available at: http://www.refworld.org/docid/51f8fff34.html [accessed 27 February 2014]

Villar, J & Bergsjo, P. 2002. WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model. Geneva: WHO.

Woolcock, M & Narayan, D. 2000. Social capital: Implications for Development Theory, Research and Policy. *The World Bank Research Observer* 15, 225-249.

World Health Organization, United Nations Children's Fund (2012) Countdown to 2015: building a future for women and children—the 2012 report.

World Health Organization, United Nations Children's Fund, United Nations Population Fund, The World Bank (2010) Trends in maternal mortality: 1990–2008. Geneva: World Health Organization.

PART C: JOURNAL ARTICLE

Abstract

Background

Late antenatal care (ANC) booking remains the trend in most countries in sub-Saharan Africa despite the known benefits of early booking. Infrequent, poor and no antenatal care are among the most frequent patient-related avoidable factors and missed opportunities identified for many cases of maternal death in South Africa. The aim of the study was to examine the association between psychosocial factors and ANC booking to determine whether psychosocial factors were associated with not only timing of initiation of antenatal care but also frequency of attendance of antenatal care visits during a previous pregnancy among women in an urban and rural location in South Africa.

Methods

The data was derived from a 2006 cross-sectional household survey looking at predictors of risk of alcohol exposed pregnancies among women in an urban area in Gauteng (N= 606) and a rural area in the Western Cape (N=412) provinces of South Africa. From the primary study, 363 women from Western Cape and 466 women from Tshwane met the inclusion criteria for this study. Data analyses were conducted in STATA v12.1 and bivariate and multivariate logistic regression analyses were used to test for associations between the independent and outcome variables.

Results

Tshwane: Overall prevalence of early ANC booking was 46% (216/466) with 84% (393/466) of the women attending ANC visits adequately. From the multivariate analyses, desire to become pregnant increased odds of early ANC initiation among Tshwane women (OR=1.8 *p*=0.013). Women who were employed were also more likely to initiate ANC early (OR=1.6, *p*=0.024).

Western Cape: Overall prevalence of early ANC booking was 45% (165/363) with 78% (284/363) of the women attending ANC visits adequately. From the multivariate analyses, women who were single/never married were less likely to initiate ANC early (OR= 0.5, *p*=0.019) and also less likely to adequately attend ANC visits (OR=0.4, *p*=0.037). Highly religious women were less likely to initiate ANC early (OR=0.5 *p*=0.009). Having a partner with education level above Grade 9 increased odds of early ANC attendance (OR=1.9 *p*=0.008). Women desired to fall pregnant were more likely to attend ANC visits adequately (OR=4.1 *p*=0.001). Having the father of the child present in her life during the previous pregnancy also increased odds of adequate ANC attendance among Western Cape women (OR=3.0, p=0.041).

Conclusion

The findings reveal that whilst the majority of women from both sites attended ANC frequently, most women initiated ANC late with less than 50% initiating at or before 16 weeks gestational age. Interventions to reduce prevalence of late ANC booking and poor ANC attendance should engage religious leaders and address unintended pregnancy

through family planning education. There is an urgent need to also involve men in reproductive health issues including family planning and maternal health care.

Keywords

Maternal Mortality, Antenatal care, Psychosocial factors, Rural, Urban, South Africa

Background

South Africa is amongst the countries with the highest rates of maternal and perinatal mortality globally [1]. The South African Confidential Enquiries into Maternal Deaths for 2008-2010 found that more maternal deaths were reported; there was a maternal mortality ratio (MMR) of 176.22/100000 live births in 2008-2010 compared to 151.77/100000 live births in 2005-2007 and these are still increasing [2]. According to the World Health Organization (WHO) [3], the rate of decline of maternal mortality rates (MMR) in sub-Saharan Africa has been less than 1% per year and in fact, the rates of maternal mortality have increased in countries such as South Africa, Nigeria, Mozambique and Swaziland. Infrequent, poor and no antenatal care as well as delays in accessing medical help were listed in The South African Confidential Enquiries into Maternal Deaths for 2008-2010 [2] as amongst the most frequent patient-related avoidable factors and missed opportunities identified for all cases of maternal death.

The WHO recommends four goal-oriented visits, known as the focused ANC package as adequate and effective for the provision of essential interventions for pregnant women with no underlying health conditions, with the first visit occurring in the first trimester [4, 5]. In resource limited settings, increasing the number of antenatal care visits to more than four has not been found to necessarily improve health outcomes [6]. In low and middle income

countries (LMIC), attendance of less than four visits has been associated with an increased risk of perinatal mortality, particularly, stillbirth [7].

Although an ANC visit within the first 16 weeks is recommended in most country guidelines, this has not translated into practice amongst women in South Africa and late booking, despite the recommended guidelines remains the trend in most countries in sub-Saharan Africa [8-10]. According to the Saving Mothers Report (2005-2007) [2]and the Millennium Development Goals 2009 Report [11], whilst over 90% of South African women have access to antenatal care services, 63.2% of pregnant women in South Africa attend antenatal services at all. District Health Information System (DHIS) data for 2011 showed that only 34.4 % and 55.6% of pregnant women in Gauteng and Western Cape respectively, initiated ANC before 20 weeks and at national level, 40% of pregnant women in South Africa initiated ANC before 20 weeks despite 100% ANC coverage.

Previous studies have identified demographic factors, physical access to health facilities, parity, lack of health education, relationships with health care providers and misconceptions of antenatal care (ANC) as factors influencing timing of ANC booking [12,13,10]. However, research on the associations between psychosocial factors and antenatal care attendance is currently quite limited and fairly new [13,7,14]. The aim of the study was to examine the association between psychosocial factors and ANC booking to determine whether psychosocial factors (particularly substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics including age and level of education) were associated with not only timing of initiation of antenatal care but also frequency of attendance of antenatal care visits during a previous pregnancy among women in an urban and rural location in South Africa. Identifying

these psychosocial factors would be useful for making decisions on holistic interventions and health education programmes targeted at improving health outcomes for pregnant women and the unborn child in South Africa.

Methods

Sampling Method and Sample Size

The data was derived from a 2006 cross-sectional household survey which assessed and compared the predictors of risk of alcohol exposed pregnancies among women (18-44 years old) from a rural and urban setting in South Africa [15]. Participants were recruited from an urban area (N=606) located in the Tshwane Metropolitan Municipality in the Gauteng region and a rural area (N=412) in the West Coast district of the Western Cape. Cluster random sampling was used at the urban site with a target sample size of 820 women. Random selection was used to identify 82 census enumeration areas (EA) and 10 households were then selected from each area using aerial photographs. One woman was selected randomly within each household, provided she met the eligibility criteria. Stratified cluster random sampling was used at the rural site with a target sample size of 650 women. Farms were chosen within the boundaries of the three municipal areas. Out of 1450 farms, 150 farms were randomly selected. All eligible women on each farm were approached to participate in the study to improve recruitment as there were generally a small number of households per farm (approximately 7).

Trained field workers conducted face-to-face interviews using structured questionnaires in the participant's preferred language from a choice of five common languages among the study population. Each interview took between 15-90 minutes and was conducted in the

privacy of the participant's home. In total, 606 women were interviewed in Gauteng and 412 women were interviewed in the Western Cape corresponding to response rates of 74% and 83% respectively [15]. Written informed consent was obtained from participants during the interview process. Ethical approval for the primary study was granted by the Faculty of Health Sciences Research Ethics Committees of the Universities of Pretoria (121/2005) and Cape Town (381/2005).

For the purposes of this study, only women who had ever been pregnant were eligible and therefore women who had never given birth and had never had a miscarriage were excluded. Women who reported being currently pregnant were only included in the study provided this was not their first pregnancy i.e.; this study focused only on information about the pregnancy of their last born child and not their current pregnancy. A total of 363 women (13 of whom were also currently pregnant) from the Western Cape sample and 466 women (14 of whom were also currently pregnant) from the Tshwane sample met the inclusion criteria for the current study.

Dependent variables

We examined two dependent variables (a) timing of ANC (early versus late ANC initiation) and (b) frequency of ANC attendance (adequate versus inadequate ANC attendance) during last pregnancy.

Early attendance refers to the first ANC visit at or earlier than 16 weeks during the last pregnancy as recommended in literature guidelines and adequate number of ANC visits is defined as at least four visits during the last pregnancy. This is according to recommendations by the WHO in the focused ANC model for developing countries which is

also in line with the recommendations of the basic antenatal care (BANC) approach [5] and also described in the Guidelines for Maternity Care in South Africa which recommend return visits scheduled for 20, 26, 32, and 38 weeks, and 41 if still pregnant.

The original questionnaire included questions on antenatal care relating to the pregnancy with the last born child. Women were asked their gestational age when they first initiated antenatal care during their last pregnancy. This data was collected as number of months pregnant at time of first ANC attendance, which was easier for the women to recall, and then converted to weeks for analysis. The responses were then coded as either early ANC initiation (1) for those who attended at or before 16 weeks gestational age or late ANC initiation (0) for those who attended after 16 weeks gestational age. Participants also responded to the question, "How many times did you go for antenatal appointments during this pregnancy?" The responses were then coded as either Adequate ANC attendance(1) for those who attended at least 4 ANC visits during the pregnancy or Inadequate ANC attendance (0) for those who attended less than 4 ANC visits during the previous pregnancy.

Independent Variables: Psycho-social factors

Self-esteem: Participants responded to questions about their general feelings about themselves. Scores on a 10 item self-esteem scale were summed and dichotomised across the 75th percentile to represent low (0) versus high self-esteem (1) [16].

Cultural influences: Four one- item scales were used to assess the extent of the participants' agreement to questions on fertility norms; having children was culturally considered a male entitlement, cultural prescriptions on child bearing obligation to women, whether it was wrong for a woman to choose not to have children if she did not want to and whether

having children indicated male/female worth. A score of "1" was assigned for the response strongly or moderately agree and all other responses were given a score of "0".

Religiosity: A 6-item scale was used to ask questions on religious orientation. Responses were summed and dichotomised as highly religious (1) and low religiosity (0) split at the 75th percentile.

*Social capital***:** Scores on a 6 item social capital scale [17] were summed and dichotomised across the 75th percentile into weak social capital (0) versus strong social capital (1).

Social support: A 14-item scale from the Ran Medical Outcomes (MOS) Social Support Survey Scale [18] was used to measure social support (excluding Tangible support scale). Questions relating to emotional support (8 questions); affectional support (3 questions) and positive social interaction (3 questions) were measured and scored. The scores were summed and dichotomised as weak (0) and strong (1) across the 75th percentile.

Desire to become pregnant: Participants were categorised into two groups based on their responses to a question on their actual desire to become pregnant at the time they became pregnant as either 'A little to a great deal' (1) or 'Not at all' (0).

Partner characteristics: Questions relating to characteristics of the male partner who was present during the last pregnancy included male partner's age, level of education, employment status and whether the male partner present who was in her life during the previous pregnancy was the father of the child she was carrying.

Mental health: Mental health was assessed by asking participants a series of 5 questions about the way they had been feeling during the past month with responses ranging from 'All the time' given a score of "0" to 'None of the time' given a score of "6" [19]. The scores

were summed and whilst a score of 100 indicated best possible functioning, a cut-off score of 67 or lower indicated low mental functioning (0) and all others above 67 assigned (1).

Substance use: For substance use, lifetime smoking was coded (1) for women who had ever smoked in their lifetime and (0) for those who had never smoked. Similarly, lifetime alcohol use was coded (1) for women who had had a drink containing alcohol in their lifetime and (0) for those who had not. The Alcohol Use Disorders Identification Test (AUDIT) was used to identify high-risk drinkers with a score of 8 or more indicating high-risk drinking (1) whilst a score of less than 8 indicated low-risk drinking (0).

Data analysis

The data was analysed in STATA v12.1 using Pearson's chi-square test to describe associations between categorical variables for each site. Bivariate and multivariate logistic regression analyses were used to test for associations between the outcome variables: (i) timing of ANC initiation; before 16 weeks (early) versus after 16 weeks (late) gestational age and (ii) frequency of attendance; less than 4 visits (inadequate) and at least 4 visits (adequate) against the psychosocial variables (substance use, feelings about pregnancy, social capital, social support, cultural beliefs, mental health perceptions, self-esteem and partner characteristics) for each site.

Multiple logistic regressions were used to model the effects of one or more of the psychosocial variables on the outcome variables. A predictive modelling strategy was used where variables potentially associated with ANC attendance (excluding psychosocial variables) which included demographic factors (age, level of education, marital status, employment status and race) parity and having had a miscarriage were added one at a time

to a model with the outcome variable to form a baseline model with all 'confounders'. Psychosocial variables were then added one at a time to the baseline model and their significance was assessed by looking at the reduction in the deviance. Interactions between the independent variables and confounders were assessed for any change in the effect on the outcome variable. The models were then compared using likelihood ratio chi-square statistics and the model with the lowest Aikakes Information criterion (AIC) was selected as the best model. To adjust for clustering at the rural site (Western Cape), the multivariate analysis was repeated using the survey command 'svy' in STATA. Two final models were therefore selected per site, for (i) timing of ANC initiation and (ii) frequency of ANC attendance for Tshwane and Western Cape.

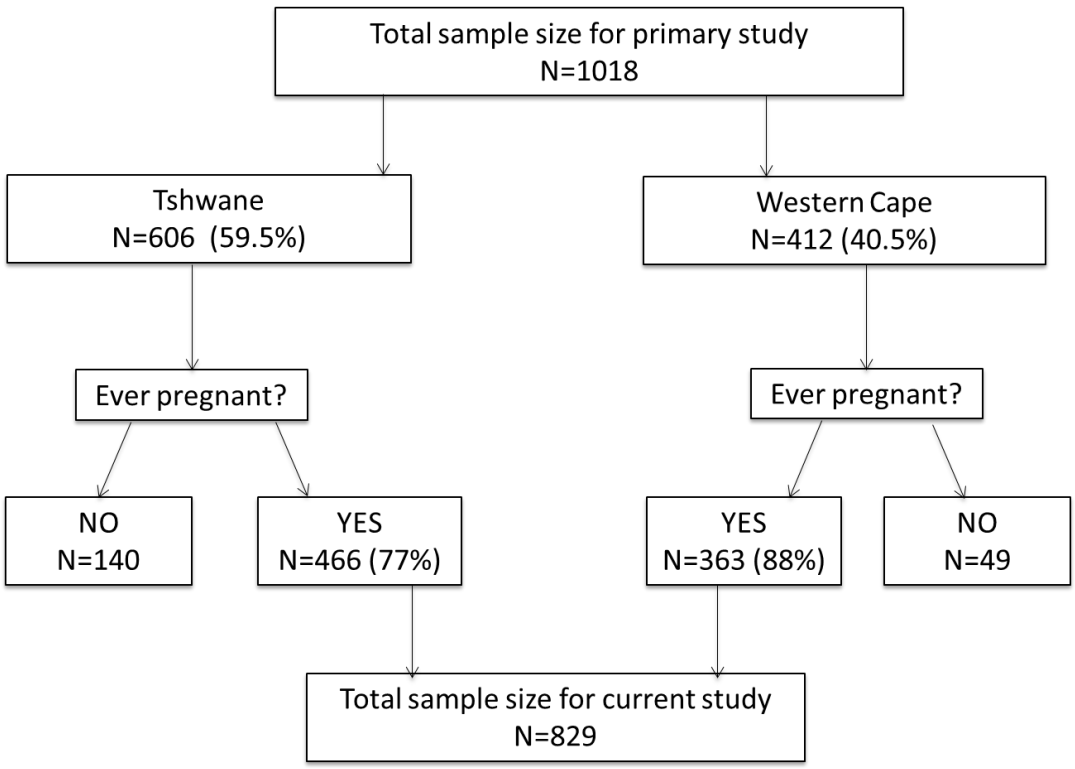

Figure 1: Sample size selection of women who had ever been pregnant from participants in the 2006 cross-sectional household survey.

Validity

The questionnaire attempted to cover as much as possible, all the questionnaire measures which have been used in similar populations in South Africa and which would adequately address the research question. The AUDIT tool, developed by the WHO has been validated and used internationally to assess hazardous drinking including in studies in South Africa [20,21,22]. Studies on the use of instrument adapted from [17] to measure social capital are lacking within the South African context. For measurement of social support in this study, the tangible support scale was omitted due to duplication with the Social Capital Scale, and the desire to shorten the questionnaire. The Ran Medical Outcomes (MOS) Social Support Survey Scale is a globally validated tool and has been used successfully in studies among South African populations [23,24]. The Rosenburg self-esteem scale is the most widely used scale internationally and has been used in studies in South Africa [16,25,26]. The MOS Short-Form-General Health Survey is an accepted standardized tool used to measure mental health status and has been used in several studies in South Africa which demonstrated its validity [23,27].

Results

Descriptive Statistics

For Tshwane, overall prevalence of early ANC booking was 46% (216/466) with 84% (393/466) of the women attending ANC visits adequately. For Western Cape, overall prevalence of early ANC booking was 45% (165/363) with 78% (284/363) of the women attending ANC visits adequately. The Tshwane sample was made up of 87% (378/466) black women and 13% (56/466) coloured women, 9% (40/466) had completed at least Grade 9

Table 1: Bivariate analyses of associations between individual demographic and psychosocial factors with early booking among women aged 18-44 years who reported ever being pregnant (N=829): comparison for early booking.

Variable	Bivariate Analyses			
	Tshwane(urban) N (% Early booking)	(OR) *p*-value	W. Cape (rural) N (% Early booking)	(OR) *p*-value
Marital Status				
Married	69 (58)	-	64 (54)	-
Living with a partner	26 (45)	-	56 (44)	-
Never married/single	16 (48)	(0.7)0.357	37 (37)	(0.5)0.016*
Divorced/separated/widowed	92 (39)	(0.5)0.001*	8 (47)	(0.8)0.604
Employed				
Yes	113 (54)	(1.7)0.005*	131 (44)	(0.8)0.404
No	103 (40)		34 (50)	
Desire				
Yes	161 (50)	(1.7)0.015*	142 (49)	(2.1)0.008*
No	55 (38)		23 (32)	
Religious Orientation				
High religiosity	69 (53)	(1.4)0.092	41 (37)	(0.58)0.021*
Low religiosity	146 (44)		123 (50)	
Partner Characteristics				
Age				
Older than 29yrs	202 (48)	(2.2)0.018*	87 (48)	(1.2)0.368
Younger than 29yrs	14 (30)		78 (43)	
Employed				
Yes	165 (52)	(2.0)0.001*	143 (47)	(1.4)0.209
No	51 (35)		22 (38)	
Education				
Below Grade 9	44 (48)	(0.9)0.660	91 (41)	(1.5)0.026*
Grade 9 and above	157 (46)		56 (54)	
Social Support				
Positive social interaction				
Strong	95 (50)	(1.3)0.190	72 (52)	(1.5)0.056
Weak	121 (44)		93 (42)	
Emotional support				
Strong	51 (46)	(1.0)0.922	46 (55)	(1.6)0.052
Weak	165 (46)		119 (43)	

*p<0.05. Demographic and Psychosocial factors associated with early booking

Table 2: Bivariate analyses of associations between individual demographic and psychosocial factors with adequate ANC attendance among women aged 18-44 years who reported ever being pregnant (N=829): comparison for adequate attendance.

Variable	Bivariate Analyses			
	Tshwane(urban) N (% Adequate attendance)	(OR) *p*-value	Western Cape (rural) N (% Adequate attendance)	(OR) *p*-value
Marital Status				
Married	107 (89)	-	101 (85)	-
Living with a partner	47 (81)	-	102 (80)	-
Never married/single	28 (85)	(0.7)0.497	70(71)	(0.4)0.013*
Divorced/separated/widowed	193 (82)	(0.6)0.086	11 (65)	(0.3)0.049*
Miscarriage				
Never	304 (84)	(1.2)0.513	228 (81)	(0.6)0.039*
At least 1 miscarriage	89 (86)		55 (70)	
Desire				
Yes	264 (82)	(0.6)0.067	241 (83)	(3.4)<0.001*
No	129 (89)		43 (59)	
Cultural Influences				
Male Worth				
Agree	252 (85)	(1.1)0.792	228 (76)	(0.5)0.052
Disagree	141 (84)		56 (88)	
Partner Characteristics				
Employed				
Yes	275 (85)	(1.5)0.103	251 (82)	(3.5)<0.001*
No	118 (80)		33 (57)	
Father of the child present				
Yes	354 (85)	(1.3)0.536	264 (81)	(3.4)0.001*
No	39 (81)		20 (56)	

*p<0.05 Demographic and Psychosocial factors associated with adequate attendance.

-level and 46% (211/466) reported having some form of employment. The Western Cape sample was made up of 92% (329/363) coloured women and 8% (30/363) black women, 28% (109/363) had completed at least Grade 9 level and 81% (295/363) reported having some form of employment. In Tshwane, 47% (216/466) and 45% (165/363) in the Western Cape initiated early during the last pregnancy. The majority of women in Tshwane 84% (393/466) and 78% (284/363) in Western Cape attended at least four ANC visits during the last pregnancy.

Table 1 and Table 2 report results of Pearson's chi-square tests showing variables that were both significant and marginally significant with either early booking or adequate ANC attendance, respectively. Appendix 2 shows results of Pearson's chi-square tests including all variables examined.

Bivariate analyses

Psychosocial factors associated with early ANC initiation across both sites were religiosity, having had the father of the child present during the pregnancy, desire to fall pregnant and partner characteristics (age and employment status). Demographic factors associated with early booking across both sites were employment status and marital status. Psychosocial factors associated with adequate ANC attendance across both sites were desire to fall pregnant and having had the father of the child present during the pregnancy and partner characteristics (age and employment status). Demographic factors associated with adequate ANC attendance across both sites were history of miscarriage and marital status.

Women in the Tshwane sample who had a partner older than 29yrs during their previous pregnancy were more likely to initiate ANC early compared to those who had a partner younger than 29 years (OR=2.2, *p*=0.018). Women who had a partner who was working during their previous pregnancy were more likely to initiate ANC early compared to those who had a partner who was not working during their previous pregnancy (OR=2.0, *p*=0.001). Women who had desired to be pregnant were more likely to initiate ANC early compared to those who had no desire at all (OR=1.7, *p*=0.015). Marital status and employment status were associated with timing of ANC. Women who were divorced, separated or widowed were less likely to book early compared to married women (OR=0.5, *p*=0.001). Being employed was associated with early ANC initiation (OR=1.7, p=0.005).

In the Western Cape sample, women who had a male partner with education level above Grade 9 were more likely to initiate ANC early compared to women whose partner had education below Grade 9 (OR=1.7, *p*=0.026). Single women were less likely to book early for ANC compared to married women (OR=0.5, *p*=0.016). Women who had desired to be pregnant were more likely to initiate ANC early compared to those who had no desire at all (OR=2.1, *p*=0.008). Women who were highly religious were less likely to initiate ANC early compared to women who were not highly religious (OR=0.6, *p*=0.021). Women who had strong social support in the form of positive social interaction (OR=1.5, *p*=0.056) and emotional support (1.6, *p*=0.052) were more likely to book early although the associations were marginally significant (Table 2).

Table 3: Multivariate analyses of factors associated with timing of ANC initiation among women aged 18-44 years who reported ever being pregnant (N=829)

Variables	**Western Cape (*N=363*)**		**Tshwane (*N=466*)**	
	Odds Ratio† (95% CI)	*p*-value	Odds Ratio† (95% CI)	*p*-value
Living with partner	0.6 (0.3-1.1)	0.109	0.6 (0.3-1.3)	0.197
Never married/single	0.5 (0.3-0.9)	0.019*	0.8 (0.4-2.0)	0.696
Divorced/separated/widowed	0.5 (0.1-1.5)	0.181	0.7 (0.4-1.1)	0.136
Previous miscarriage	1.2 (0.7-2.3)	0.514	1.4 (0.8-2.2)	0.226
Employed	-	-	1.6 (1.1-2.4)	0.024*
More than one child	-	-	1.0 (0.7-1.6)	0.854
Pregnancy Desired	-	-	1.8 (1.1-2.8)	0.013*
High Religiosity	0.5 (0.3-0.8)	0.009*	1.3 (0.8-2.0)	0.326
Higher Partner Education	1.9 (1.2-3.0)	0.008*	0.6 (0.3-1.1)	0.073
Older Partner Age	-	-	2.4 (0.7-7.7)	0.150
Father of child present	-	-	1.0 (0.3-2.9)	0.971

Note: *p<0.05 , †Adjusted odds ratio

Table 4: Multivariate analyses of factors associated frequency of ANC attendance among women aged 18-44 years who reported ever being pregnant (N=829)

Variables	Western Cape *(N=363)*		Tshwane *(N=466)*	
	Odds Ratio† (95% CI)	*p*-value	Odds Ratio† (95% CI)	*p*-value
Living with partner	0.6 (0.3-1.4)	0.259	0.6 (0.2-1.5)	0.246
Never married/single	0.4 (0.2-1.0)	0.037*	0.7 (0.2-2.2)	0.542
Divorced/separated/widowed	0.2 (0.5-0.9)	0.037*	0.7 (0.3-1.3)	0.232
Previous miscarriage	0.4 (0.2-0.8)	0.009*	-	-
More than one child	0.8 (0.4-1.5)	0.410	-	-
Pregnancy Desired	4.1 (1.9-9.0)	0.001*	-	-
High Religiosity	0.7 (0.4-1.6)	0.433	1.4 (0.7-2.6)	0.347
Higher Partner Education	0.7 (0.4-1.6)	0.433	1.1 (0.6-2.1)	0.761
Older Partner Age	0.8 (0.4-1.8)	0.621	-	-
Father of child present	3.0 (1.1-8.8)	0.041*	-	-

Note: *p<0.05, †Adjusted odds ratio.

Women in the Western Cape sample who had a partner who was working during their previous pregnancy were more likely to attend ANC visits adequately compared to those who had a partner who did not work (OR=3.5, *p*<0.001). Women who were with the father of the child during the pregnancy were more likely to attend ANC visits more frequently compared to women who were not with the father of the child (OR=3.4, *p*=0.001). Women who had desired to be pregnant were more likely to attend ANC visits frequently compared to those who had no desire at all (OR=3.4, *p*<0.001). Women who were single or never married (OR=0.4, *p*=0.013) and those who were divorced, separated or widowed (OR=0.3, *p*=0.049) were less likely to attend ANC adequately compared to married women. Having had a miscarriage, was associated with decreased odds of adequate ANC attendance (OR=0.6, *p*=0.039).

Multivariate analyses

Table 3 and Table 4 below, show results of multiple logistic regression modelling and include only variables entered in the two selected models for each site after adjusting for clustering in the Western Cape site and controlling for potential confounders. Odds ratios presented are adjusted odds ratios. Variables originally entered in the model were marital status, miscarriage, employment, parity, desire, self-esteem, social support, social capital, substance use variables, cultural beliefs, mental health, religious orientation and partner characteristics.

(a) Timing of ANC initiation

Western Cape

Being single/never married was associated with increased risk of late booking compared to married women. Single women were less likely to book early for ANC compared to married women (OR=0.5, *p*=0.019). Women who were living with a partner were also less likely to book early compared to married women although the association was not statistically significant after adjusting for clustering (Table 3) (OR=0.6, *p*=0.109). High religiosity was associated with decreased odds of early ANC initiation (OR=0.5, *p*=0.009) whilst having a partner who had completed Grade 9 and above, was associated with early booking (OR=1.9, *p*=0.008).

Tshwane

Women who were employed were more likely to initiate ANC early compared to women who were unemployed (OR=1.6 *p*=0.024). Women who had desired to be pregnant were more likely to initiate ANC early compared to women who had felt no desire at all, to fall pregnant (OR=1.8 *p*=0.013). Partner characteristics such as having an older partner (29 years and older), having had a male partner who had completed Grade 9 and above, being highly religious, having had more than one child and having had a miscarriage before were all associated with elevated odds of early ANC initiation although these associations were non-significant (Table 4).

(b) Frequency of ANC attendance

Western Cape

Being single/never married was associated with increased risk of infrequent ANC attendance compared to married women. Single women were less likely to adequately attend ANC visits compared to married women (OR=0.4 *p*=0.037). Women who were living with a partner were also less likely to adequately attend ANC visits compared to married women (OR=0.2 *p*=0.037). Women who had desired to be pregnant were more likely to adequately attend ANC visits compared to women who had felt no desire at all, to fall pregnant (OR=4.1 *p*=0.001). Having the father of the child she was carrying present in her life during the previous pregnancy was strongly associated with adequate ANC attendance (OR=3.0 *p*= 0.041). Women who had a history of miscarriage were less likely to attend ANC visits adequately compared to women who had never experienced a miscarriage (OR=0.4, *p*=0.009) (Table 4).

Results of multiple logistic regressions of frequency of ANC attendance were not statistically significant for the Tshwane sample.

Discussion

The study aimed to examine psychosocial factors associated with early booking and frequency of ANC attendance in two contrasting geographical sites, a rural and urban setting in South Africa. The demographic variables; marital status and employment were associated with timing of ANC and frequency of ANC attendance across both sites. After adjusting for clustering, psychosocial factors associated with early ANC initiation across both sites were high religiosity, having desired to fall pregnant and higher partner education. Psychosocial factors associated with adequate ANC attendance across both sites were having desired to fall pregnant and having had the father of the child present during the pregnancy. Individual level psychosocial factors such as desire to be pregnant, religious orientation as well as partner characteristics (age and level of education) were more likely to be associated with timing of ANC than community level psychosocial factors such as social support and social capital.

Having the father of the child present in the woman's life during pregnancy was associated with increased frequency of ANC attendance among women in the rural site where partner characteristics (age and education) were also more likely to be associated with ANC attendance than the urban site. However, having a poor relationship with the baby's father, despite his presence during the pregnancy, may also negatively influence antenatal care attendance [28]. Amongst the rural women, higher partner education was associated with early ANC initiation. Other studies have also found that having a husband with low levels of education can be a barrier to access to antenatal care services [7]. Our findings resonate

with those of other studies which found that late attendance to ANC was associated with factors such as unstable relationships with the unborn baby's father, low partner education level and employment status [29,30].

The desire to be pregnant played a protective role in ANC attendance among women in both sites. Women who desired to conceive when they did, initiated ANC early and attended ANC visits more frequently. In the urban site, desire to be pregnant was associated with early ANC initiation and among the Western Cape sample, women who desired the pregnancy were 4 times more likely to attend ANC frequently. Desirability of pregnancy is an important factor in determining timing of ANC initiation and our results confirm findings in previous studies [6,20,31] Because desire to be pregnant is protective against late ANC booking and poor attendance, it may be useful to explore contraceptive use among the same group of women.

High religiosity was associated with decreased odds of early booking among women at the rural site. Studies in South Africa and Zimbabwe have revealed that cultural and religious beliefs influence antenatal care attendance and that practices attached to these beliefs tend to delay ANC initiation [32,33].

Other psychosocial factors associated with late initiation of antenatal care and infrequent ANC visits which were not considered in the current study include abortion contemplation and delayed diagnosis of the pregnancy [6]. In this study, questions on alcohol and drug use during the previous pregnancy may not have been well received and were therefore answered poorly. Sensitive questions of this nature are usually prone to social desirability bias. Lifetime alcohol use, lifetime smoking and the AUDIT were therefore used as a measure of substance use.

Rural versus urban site

The two study sites were geographically contrasting areas. The Western Cape site was a rural farming area with a predominantly coloured population whilst the Tshwane site was an urban township area with a predominantly black population. Psychosocial factors associated with early booking and frequency of ANC attendance differed across the sites. The only psychosocial factor associated with ANC attendance common to both sites was desire to fall pregnant.

Higher partner education was associated with early ANC initiation among rural women whilst the woman's level of education was more correlated with early booking among urban women.

Interestingly, very few psychosocial variables examined were significantly associated with ANC attendance than would be expected. For example social support, social capital, self-esteem and mental health status were not significantly associated with outcome variables (early booking/adequate attendance) as indicated in literature. These findings can be attributed to reduced power of the study arising from how the variables were originally measured, the adaptations (or lack thereof) made to the instruments used and the questionnaire design. The use of a smaller sample size based on the strict inclusion criteria reduced the power of the study and increasing the sample size would address these limitations and ensure that the study is sufficiently powered. Also, non-response could have led to failure to capture those women with poor mental health and low self-esteem etc., resulting in the current findings.

When all factors were considered together, a rural woman who initiated ANC early and adequately attended ANC visits was a married woman who had no history of a previous miscarriage, was not highly religious, had desired to fall pregnant when she conceived and whose partner's highest completed education level was at least Grade 9 and the partner was the father of the child she was carrying. A woman from the urban site who initiated ANC early and adequately attended ANC visits was employed and had desired to fall pregnant when she conceived.

Limitations

The use of a pre-existing data set limited the study to the questionnaire design which was used in the data collection. Recall bias may also have affected the responses given in the questionnaire as women had to remember when they went for their first ANC visit and the frequency of attendance of ANC visits during their last pregnancy which may have subsequently affected the study findings. For example, gestational age at first ANC visit was originally collected in months as this was easier for women to recall and then converted to weeks. This could have resulted in misclassification of early/ late attendance for example, a woman who reported gestational age of 4 months at first ANC visit who could have been either 4 months and 3 weeks pregnant or exactly 4 months pregnant but would be classified as an early attender (16 weeks) regardless.

Although frequency of ANC attendance was explored, our study did not examine frequency of timely ANC attendance. This was not an objective of the study but may also have impacted the findings as 'adequate attendance' defined in the current study was based on the number of ANC visits and not whether the visits were timely, as per the WHO focused ANC model.

We acknowledge that there is potential bias associated with self-report as the participants were not required to present their ANC cards during the interviews to confirm their booking and ANC attendance. It is advisable to adjust for maternal risk when examining the potential association between psychosocial variables and frequency of antenatal care attendance [23]. In the multivariate analyses, the experience of a previous miscarriage was associated with early ANC initiation in both sites (although not statistically significant). Previous history of miscarriage would increase pregnancy risk in a subsequent pregnancy and prompt more clinic visits than a low risk pregnancy. Lastly, the lack of local South African studies using the same instruments used in our study to measure psychosocial factors may have affected the reliability and validity of the instruments used as we could not compare results or ensure appropriate adjustments had been made, for example; for measurement of social support in this study, the tangible support scale was omitted due to duplication with the Social Capital Scale, and the desire to shorten the questionnaire.

Conclusions

Our findings reveal that whilst the majority of women from both sites attended ANC frequently, most women initiated ANC late with less than 50% initiating at or before 16 weeks gestational age. The DHIS data for 2011 [5] suggests that late ANC initiation remains a major concern for maternal health in South Africa with only 34.4 % and 55.6% of pregnant women in Gauteng and Western Cape respectively initiating ANC before 20 weeks. In a country faced with a high HIV/AIDS disease burden, early ANC initiation is crucial as it facilitates early HIV testing and subsequently, early ART initiation for eligible women [5].

Recommendations

Our study identified psychosocial factors associated with early ANC booking and frequency of ANC attendance. These findings are useful to inform planning of health education programmes on antenatal care and for the implementation of holistic interventions aimed at improving ANC adherence (early initiation and adequate attendance) for better health outcomes for women in South Africa as timing of initiation of antenatal care in previous pregnancies may influence timing of initiation in subsequent pregnancies. In addition, this information could provide useful insight for further longitudinal studies to determine directionality of the relationship between these psychosocial factors and ANC attendance as well as factors associated with frequency of timely ANC attendance which was not explored in the current study.

High religiosity was a barrier to ANC attendance for rural women in our study decreasing odds of early ANC initiation by half. Interventions to reduce prevalence of late ANC booking and poor ANC attendance in rural communities should engage religious leaders and aim to address any misconceptions about ANC and educate them on the importance and benefits of early ANC initiation and adequate ANC attendance. Religious leaders are often regarded as “wise” and tend to have influence over the behaviour of other community members.

Employed women were more likely to initiate ANC early compared to unemployed women in the urban site. Late ANC initiation by unemployed women may be attributed to inability to meet the costs associated with the ANC visit such as transport and food, despite the actual health service being provided free of charge. Employed women may also have access to health insurance and seek private health care services and better quality of care compared to unemployed women who rely on the public health facilities. In the public

health sector, increasing the number of antenatal clinics physically detached from the main health facility and introducing mobile ANC clinics in both rural and urban areas could increase utilization of these services and motivate early ANC initiation and adequate attendance. Introduction of mobile antenatal clinics to service the antenatal population would address the issue of lack of access to antenatal clinics and eliminate travel costs associated with the antenatal care visit.

Strong desire to be pregnant was protective against late ANC initiation among rural women and protective against inadequate ANC attendance among urban women. Women above 25 years in the urban site were twice as likely to have desired to fall pregnant compared to younger women. Health education programmes should be tailored to the different social contexts and age categories of women, to encourage free interaction and be aimed at informing and educating all women on the different family planning options available to prevent unintended pregnancy and make these options easily accessible to all women.

Maternal health in many developing countries including South Africa is still viewed as a woman's issue due to socially constructed gender roles and men are generally not actively involved in reproductive health issues [34]. The findings of this study show that having the father of the child present in the woman's life during pregnancy increases odds of frequent ANC attendance three fold and highlight a need to involve men in reproductive health issues including family planning and maternal health care.

Our study identified psychosocial factors associated with early ANC initiation and frequency of ANC attendance. Because the data used in this study came from a cross-sectional survey, our findings cannot confirm causal relationships because of a lack of temporality, but suggest non-directional associations between the psychosocial factors and outcomes

(timing of ANC initiation and frequency of ANC attendance) which could be usefully explored in longitudinal studies.

Abbreviations

ANC: Antenatal Care; WHO: World Health Organisation; MMR: Maternal Mortality Ratio; LMIC: Low and Middle Income Countries; DHIS: District Health Information System; BANC: Basic Antenatal Care; MOS: Ran Medical Outcomes; AUDIT: Alcohol Use Disorders Identification Test; AIC: Aikakes Information criterion.

Competing interests

The authors declare that they have no competing interests.

References

1. Hoque M, Hoque E, Kader, SB: **Audit of antenatal care in a rural district of KZN, South Africa**. *SA Fam Pract* 2008, **50**:66a-66d.

2. Saving Mothers 2008-10: National Committee for Confidential Enquiries into Maternal Deaths: **Saving Mothers 2008-2010: Fifth report on Confidential Enquiries into Maternal Deaths in South Africa.** Pretoria: National Department of Health; 2012. [http://www.health.gov.za/docs/reports/2012/Report_on_Confidential_Enquiries_into_Maternal_Deaths_in_South_Africa.pdf]

3. World Health Organization, United Nations Children's Fund, United Nations Population Fund, The World Bank: *Trends in maternal mortality: 1990–2008*. Geneva: World Health Organization. 2010. [http://whqlibdoc.who.int/publications/2010/9789241500265_eng.pdf]

4. Villar J, Bergsjo P: **WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model**. Geneva: WHO; 2002.

5. Bamford L: **Maternal, Newborn and Child Health**. *In South African Health Review 2012/13: Durban.* Edited by Padarath A, English R: Health Systems Trust. 2013. URL: [http//www.hst.org.za/publications/south-african-health-review-2012/13]

6. Low P, Paterson J, Wouldes T, Carter S, Williams M, Percival T. **Factors affecting Antenatal Care Attendance by Mothers of Pacific Infants living in New Zealand.** *New Zealand Medical Journal* 2005, **1216:**1-10.

7. Finlayson K, Downe S. **Why Do Women Not Use Antenatal Services in Low- and Middle-Income Countries? A Meta-Synthesis of Qualitative Studies.** *PLoS Med* 2013, **10**: e1001373. doi:10.1371/journal.pmed.1001373.

8. Pell C, Mencana A, Were F, Afrah NA, Chatio S, Manda-Taylor L, Hamel MJ, Hodgson A, Tagbor H, Kalilani L, Ouma P, Pool R. **Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi.** *PLoS ONE* 2013, **8**: 1-11.

9. Gross K, Alba S, Glass TR, Schellenberg J, Obrist B. **Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania.** *BMC Pregnancy and Childbirth* 2012, **12**:1-12.

10. Myer L, Harrison A. **Why do women seek Antenatal Care late? Perspectives from rural South Africa.** *Journal of Midwifery and Women's Health* 2003, **48**: 268-272.

11. United Nations, *The Millennium Development Goals Report 2013*, 1 July 2013, ISBN 978-92-1-101284-2, available at: [http://www.refworld.org/docid/51f8fff34.html]

12. Tran TK, Gottval K, Nguyen HD, Ascher H, Petzold M. **Factors associated with antenatal care adequacy in rural and urban contexts-results from two health and demographic surveillance sites in Vietnam.** *BMC Health Services Research* 2012, **12**: 1-10.

13. Benediktsson I, McDonald SW, Vekved M, McNeil DA, Dolan SM, Tough SC: **Comparing CenteringPregnancy® to Standard Prenatal Care Plus Prenatal Education.** *BMC Pregnancy and Childbirth* 2013*,* **13**(Suppl 1):S5.

14. Leal MC, Pereira APE, Lamarca GA, Vettore MV: **The Relationship between Social Capital, Social Support and the Adequate Use of Prenatal Care.** *Cad. Saúde Pública, Rio de Janeiro* 2011, **27(**Sup 2):S237-S253.

15. Morojele NK, London L, Olorunju SA, Matjila MJ, Davids AD, Rendall-Mkosi KM. **Predictors of risk of alcohol-exposed pregnancies among women in an urban and a rural area of South Africa.** *Social Science & Medicine* 2010, **70**: 534–542.

16. Rosenberg, M: *Society and the adolescent self-image*. Princeton NJ: Prince University Press; 1965.

17. Martin KS, Rogers BL, Cook JT, Joseph HM. **Social capital is associated with decreased risk of hunger.** *Social Science & Medicine* 2004, **58**: 2645–2654.

18. Sherbourne C, Stewart A. **Rand medical outcomes study (MOS) social support survey scale.** *Social Science & Medicine* 1991, **32:** 705-714.

19. Stewart AL, Hays RD, Ware JE. **The MOS Short-Form General Health Survey: reliability and validity in a patient population.** *Medical Care* 1988, **26:** 724–735.

20. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. **Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption. II.** *Addiction* 1993, **88**:791-804.

21. Myer L, Smit J, Roux LL, Parker S, Stein DJ, Seedat S. **Common Mental Disorders among HIV-Infected Individuals in South Africa: Prevalence, Predictors, and Validation of Brief Psychiatric Rating Scales.** *AIDS Patient Care and STDs* 2008, **22**: 147-158.

22. Vythilingum B, Roos A, Faure SC, Geerts L, Stein DJ. **Risk Factors for Substance Use in Pregnant Women in South Africa.** *South African Medical Journal* 2012, **102**: 851-854.

23. Ncama BP, McInerney PA, Bhengu BR, Corless IB, Wantland DJ, Nicholas PK, Davis SM. **Social Support and Medication Adherence in HIV Disease in KwaZulu-Natal, South Africa**. *International journal of nursing studies* 2008, **45**: 1757-1763.

24. Futterman D, Shea J, Besser M, Stafford S, Desmond K, Comulada WS, Greco E. **Mamekhaya: A Pilot Study Combining a Cognitive-Behavioral Intervention and Mentor Mothers with PMTCT Services in South Africa.** *AIDS Care* 2010, **22**:1093-1100.

25. Bornman E. **Self-Image and Ethnic Identification in South Africa.** *The Journal of Social Psychology* 1999, **139**: 411-425.

26. Westaway MS, Wolmarans L. **Depression and Self-esteem: Rapid Screening for Depression in Black, Low literacy, Hospitalized Tuberculosis Patients**. *Social Science & Medicine* 1992, **35**:1311-1315.

27. O'keefe EA, Wood R. **The Impact of Human Immunodeficiency Virus (HIV) Infection on Quality of Life in a Multiracial South African Population**. *Quality of Life Research* 1996, **5**: 275-280.

28. Pagnini DL, Reichman NE. **Psychosocial Factors and the Timing of Prenatal Care Among Women in New Jersey's HealthStart Program.** *Family Planning Perspectives* 2000, **32:** 56–64.

29. Bhatta DN. **Involvement of Males in Antenatal Care, Birth Preparedness, Exclusive Breast feeding and Immunizations for Children in Kathmandu, Nepal.** *BMC Pregnancy and Childbirth* 2013, **13:**14.

30. Abrahams N, Jewkes R, Mvo Z. **Health Care–Seeking Practices of Pregnant Women and the Role of the Midwife in Cape Town, South Africa. 2001.** *Journal of Midwifery & Women's Health* 2001, **46:** 240-247.

31. McCaw-Binns A, Grenade J, Ashley D. **Under-users of Antenatal Care: A Comparison of Non-attenders and Late Attenders for Antenatal Care, with Early Attenders.** *Soc. Sci. Med* 1995, **7:** 1003-1012.

32. Ngomane S, Mulaudzi FM. **Indigenous Beliefs and Practices that Influence the Delayed Attendance of Antenatal Clinics by Women in the Bohlabelo district in Limpopo, South Africa.** *Midwifery* 2012, **28:**30–38.

33. Mathole T, Lindmark G, Majoko F, Ahlberg BM. **A Qualitative Study of Women's Perspectives of Antenatal Care in a Rural Area of Zimbabwe.** *Midwifery* 2004, **20:**122–132.

34. Sonke Gender Justice Network: *Literature Review on Men, Gender, Health and HIV and AIDS in South Africa.* 2008.

Appendix 1

BMC Public Health: Instructions for authors

Research articles

Criteria

Research articles should report on original primary research, but may report on systematic reviews of published research provided they adhere to the appropriate reporting guidelines which are detailed in our Editorial Policies. Please note that non-commissioned pooled analyses of selected published research will not be considered.

Submission process

Manuscripts must be submitted by one of the authors of the manuscript, and should not be submitted by anyone on their behalf. The submitting author takes responsibility for the article during submission and peer review.

Please note that *BMC Public Health* levies an article-processing charge on all accepted Research articles; if the submitting author's institution is a BioMed Central member the cost of the article-processing charge may be covered by the membership (see About page for detail). Please note that the membership is only automatically recognised on submission if the submitting author is based at the member institution.

To facilitate rapid publication and to minimize administrative costs, *BMC Public Health* prefers online submission.

Files can be submitted as a batch, or one by one. The submission process can be interrupted at any time; when users return to the site, they can carry on where they left off.

See below for examples of word processor and graphics file formats that can be accepted for the main manuscript document by the online submission system. Additional files of any type, such as movies, animations, or original data files, can also be submitted as part of the manuscript.

During submission you will be asked to provide a cover letter. Use this to explain why your manuscript should be published in the journal, to elaborate on any issues relating to our editorial policies in the 'About *BMC Public Health*' page, and to declare any potential competing interests. You will be also asked to provide the contact details (including email addresses) of potential peer reviewers for your manuscript. These should be experts in their field, who will be able to provide an objective assessment of the manuscript. Any suggested peer reviewers should not have published with any of the authors of the manuscript within the past five years, should not be current collaborators, and should not be members of the same research institution. Suggested reviewers will be considered alongside potential reviewers recommended by the Editorial team, Editorial Advisors, Section Editors and Associate Editors.

Assistance with the process of manuscript preparation and submission is available from BioMed Central customer support team.

We also provide a collection of links to useful tools and resources for scientific authors on our Useful Tools page.

File formats

The following word processor file formats are acceptable for the main manuscript document:

- Microsoft word (DOC, DOCX)
- Rich text format (RTF)
- Portable document format (PDF)
- TeX/LaTeX (use BioMed Central's TeX template)
- DeVice Independent format (DVI)

TeX/LaTeX users: Please use BioMed Central's TeX template and BibTeX stylefile if you use TeX format. During the TeX submission process, please submit your TeX file as the main manuscript file and your bib/bbl file as a dependent file. Please also convert your TeX file into a PDF and submit this PDF as an additional file with the name 'Reference PDF'. This PDF will be used by internal staff as a reference point to check the layout of the article as the author intended. Please also note that all figures must be coded at the end of the TeX file and not inline.

If you have used another template for your manuscript, or if you do not wish to use BibTeX, then please submit your manuscript as a DVI file. We do not recommend converting to RTF.

For all TeX submissions, all relevant editable source must be submitted during the submission process. Failing to submit these source files will cause unnecessary delays in the publication procedures.

Publishing Datasets

Through a special arrangement with LabArchives, LLC, authors submitting manuscripts to BMC Public Health can obtain a complimentary subscription to LabArchives with an allotment of 100MB of storage. LabArchives is an Electronic Laboratory Notebook which will

enable scientists to share and publish data files in situ; you can then link your paper to these data. Data files linked to published articles are assigned digital object identifiers (DOIs) and will remain available in perpetuity. Use of LabArchives or similar data publishing services does not replace preexisting data deposition requirements, such as for nucleic acid sequences, protein sequences and atomic coordinates.

Instructions on assigning DOIs to datasets, so they can be permanently linked to publications, can be found on the LabArchives website. Use of LabArchives' software has no influence on the editorial decision to accept or reject a manuscript.

Authors linking datasets to their publications should include an Availability of supporting data section in their manuscript and cite the dataset in their reference list.

Preparing main manuscript text

General guidelines of the journal's style and language are given below.

Overview of manuscript sections for Research articles

Manuscripts for Research articles submitted to *BMC Public Health* should be divided into the following sections (in this order):

- Title page
- Abstract
- Keywords
- Background
- Methods

- Results and discussion
- Conclusions
- List of abbreviations used (if any)
- Competing interests
- Authors' contributions
- Authors' information
- Acknowledgements
- Endnotes
- References
- Illustrations and figures (if any)
- Tables and captions
- Preparing additional files

The **Accession Numbers** of any nucleic acid sequences, protein sequences or atomic coordinates cited in the manuscript should be provided, in square brackets and include the corresponding database name; for example, [EMBL:AB026295, EMBL:AC137000, DDBJ:AE000812, GenBank:U49845, PDB:1BFM, Swiss-Prot:Q96KQ7, PIR:S66116].

The databases for which we can provide direct links are: EMBL Nucleotide Sequence Database (EMBL), DNA Data Bank of Japan (DDBJ), GenBank at the NCBI (GenBank), Protein

Data Bank (PDB), Protein Information Resource (PIR) and the Swiss-Prot Protein Database (Swiss-Prot).

You can download a template (Mac and Windows compatible; Microsoft Word 98/2000) for your article.

For reporting standards please see the information in the About section.

Title page

The title page should:

- provide the title of the article
- list the full names, institutional addresses and email addresses for all authors
- indicate the corresponding author

Please note:

- the title should include the study design, for example "A versus B in the treatment of C: a randomized controlled trial X is a risk factor for Y: a case control study"
- abbreviations within the title should be avoided

Abstract

The Abstract of the manuscript should not exceed 350 words and must be structured into separate sections: **Background,** the context and purpose of the study; **Methods**, how the study was performed and statistical tests used; **Results**, the main findings; **Conclusions**, brief summary and potential implications. Please minimize the use of abbreviations and do not cite references in the abstract. **Trial registration**, if your research article reports the

results of a controlled health care intervention, please list your trial registry, along with the unique identifying number (e.g. **Trial registration**: Current Controlled Trials ISRCTN73824458). Please note that there should be no space between the letters and numbers of your trial registration number. We recommend manuscripts that report randomized controlled trials follow the CONSORT extension for abstracts.

Keywords

Three to ten keywords representing the main content of the article.

Background

The Background section should be written in a way that is accessible to researchers without specialist knowledge in that area and must clearly state - and, if helpful, illustrate - the background to the research and its aims. Reports of clinical research should, where appropriate, include a summary of a search of the literature to indicate why this study was necessary and what it aimed to contribute to the field. The section should end with a brief statement of what is being reported in the article.

Methods

The methods section should include the design of the study, the setting, the type of participants or materials involved, a clear description of all interventions and comparisons, and the type of analysis used, including a power calculation if appropriate. Generic drug names should generally be used. When proprietary brands are used in research, include the brand names in parentheses in the Methods section.

For studies involving human participants a statement detailing ethical approval and consent should be included in the methods section. For further details of the journal's editorial policies and ethical guidelines see 'About this journal'.

For further details of the journal's data-release policy, see the policy section in 'About this journal'.

Results and discussion

The Results and discussion may be combined into a single section or presented separately. Results of statistical analysis should include, where appropriate, relative and absolute risks or risk reductions, and confidence intervals. The Results and discussion sections may also be broken into subsections with short, informative headings.

Conclusions

This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations can be provided, which should precede the competing interests and authors' contributions.

Competing interests

A competing interest exists when your interpretation of data or presentation of information may be influenced by your personal or financial relationship with other people or organizations. Authors must disclose any financial competing interests; they should also

reveal any non-financial competing interests that may cause them embarrassment were they to become public after the publication of the manuscript.

Authors are required to complete a declaration of competing interests. All competing interests that are declared will be listed at the end of published articles. Where an author gives no competing interests, the listing will read 'The author(s) declare that they have no competing interests'.

When completing your declaration, please consider the following questions:

Financial competing interests

- In the past five years have you received reimbursements, fees, funding, or salary from an organization that may in any way gain or lose financially from the publication of this manuscript, either now or in the future? Is such an organization financing this manuscript (including the article-processing charge)? If so, please specify.

- Do you hold any stocks or shares in an organization that may in any way gain or lose financially from the publication of this manuscript, either now or in the future? If so, please specify.

- Do you hold or are you currently applying for any patents relating to the content of the manuscript? Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript? If so, please specify.

- Do you have any other financial competing interests? If so, please specify.

Non-financial competing interests

Are there any non-financial competing interests (political, personal, religious, ideological, academic, intellectual, commercial or any other) to declare in relation to this manuscript? If so, please specify.

If you are unsure as to whether you, or one your co-authors, has a competing interest please discuss it with the editorial office.

Authors' contributions

In order to give appropriate credit to each author of a paper, the individual contributions of authors to the manuscript should be specified in this section.

According to ICMJE guidelines, An 'author' is generally considered to be someone who has made substantive intellectual contributions to a published study. To qualify as an author one should 1) have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) have been involved in drafting the manuscript or revising it critically for important intellectual content; 3) have given final approval of the version to be published; and 4) agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.

We suggest the following kind of format (please use initials to refer to each author's contribution): AB carried out the molecular genetic studies, participated in the sequence

alignment and drafted the manuscript. JY carried out the immunoassays. MT participated in the sequence alignment. ES participated in the design of the study and performed the statistical analysis. FG conceived of the study, and participated in its design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

All contributors who do not meet the criteria for authorship should be listed in an acknowledgements section. Examples of those who might be acknowledged include a person who provided purely technical help, writing assistance, or a department chair who provided only general support.

Authors' information

You may choose to use this section to include any relevant information about the author(s) that may aid the reader's interpretation of the article, and understand the standpoint of the author(s). This may include details about the authors' qualifications, current positions they hold at institutions or societies, or any other relevant background information. Please refer to authors using their initials. Note this section should not be used to describe any competing interests.

Acknowledgements

Please acknowledge anyone who contributed towards the article by making substantial contributions to conception, design, acquisition of data, or analysis and interpretation of data, or who was involved in drafting the manuscript or revising it critically for important intellectual content, but who does not meet the criteria for authorship. Please also include the source(s) of funding for each author, and for the manuscript preparation. Authors must

describe the role of the funding body, if any, in design, in the collection, analysis, and interpretation of data; in the writing of the manuscript; and in the decision to submit the manuscript for publication. Please also acknowledge anyone who contributed materials essential for the study. If a language editor has made significant revision of the manuscript, we recommend that you acknowledge the editor by name, where possible.

The role of a scientific (medical) writer must be included in the acknowledgements section, including their source(s) of funding. We suggest wording such as 'We thank Jane Doe who provided medical writing services on behalf of XYZ Pharmaceuticals Ltd.'

Authors should obtain permission to acknowledge from all those mentioned in the Acknowledgements section.

Endnotes

Endnotes should be designated within the text using a superscript lowercase letter and all notes (along with their corresponding letter) should be included in the Endnotes section. Please format this section in a paragraph rather than a list.

References

All references, including URLs, must be numbered consecutively, in square brackets, in the order in which they are cited in the text, followed by any in tables or legends. Each reference must have an individual reference number. Please avoid excessive referencing. If automatic numbering systems are used, the reference numbers must be finalized and the bibliography must be fully formatted before submission.

Only articles, datasets, clinical trial registration records and abstracts that have been published or are in press, or are available through public e-print/preprint servers, may be cited; unpublished abstracts, unpublished data and personal communications should not be included in the reference list, but may be included in the text and referred to as "unpublished observations" or "personal communications" giving the names of the involved researchers. Obtaining permission to quote personal communications and unpublished data from the cited colleagues is the responsibility of the author. Footnotes are not allowed, but endnotes are permitted. Journal abbreviations follow Index Medicus/MEDLINE. Citations in the reference list should include all named authors, up to the first 30 before adding '*et al.*'..

Any *in press* articles cited within the references and necessary for the reviewers' assessment of the manuscript should be made available if requested by the editorial office.

Style files are available for use with popular bibliographic management software:

- BibTeX
- EndNote style file
- Reference Manager
- Zotero

Examples of the *BMC Public Health* reference style are shown below. Please ensure that the reference style is followed precisely; if the references are not in the correct style they may have to be retyped and carefully proofread.

All web links and URLs, including links to the authors' own websites, should be given a reference number and included in the reference list rather than within the text of the

manuscript. They should be provided in full, including both the title of the site and the URL, in the following format: **The Mouse Tumor Biology Database** [http://tumor.informatics.jax.org/mtbwi/index.do]. If an author or group of authors can clearly be associated with a web link, such as for weblogs, then they should be included in the reference.

Examples of the *BMC Public Health* reference style

Article within a journal

Koonin EV, Altschul SF, Bork P: **BRCA1 protein products: functional motifs.** *Nat Genet* 1996, **13:**266-267.

Article within a journal supplement

Orengo CA, Bray JE, Hubbard T, LoConte L, Sillitoe I: **Analysis and assessment of ab initio three-dimensional prediction, secondary structure, and contacts prediction.** *Proteins* 1999, **43**(Suppl 3):149-170.

In press article

Kharitonov SA, Barnes PJ: **Clinical aspects of exhaled nitric oxide.** *Eur Respir J*, in press.

Published abstract

Zvaifler NJ, Burger JA, Marinova-Mutafchieva L, Taylor P, Maini RN: **Mesenchymal cells, stromal derived factor-1 and rheumatoid arthritis [abstract].** *Arthritis Rheum* 1999, **42:**s250.

Article within conference proceedings

Jones X: **Zeolites and synthetic mechanisms.** In *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Edited by Smith Y. Stoneham: Butterworth-Heinemann; 1996:16-27.

Book chapter, or article within a book

Schnepf E: **From prey via endosymbiont to plastids: comparative studies in dinoflagellates.** In *Origins of Plastids. Volume 2.* 2nd edition. Edited by Lewin RA. New York: Chapman and Hall; 1993:53-76.

Whole issue of journal

Ponder B, Johnston S, Chodosh L (Eds): **Innovative oncology.** In *Breast Cancer Res* 1998, **10:**1-72.

Whole conference proceedings

Smith Y (Ed): *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Stoneham: Butterworth-Heinemann; 1996.

Complete book

Margulis L: *Origin of Eukaryotic Cells.* New Haven: Yale University Press; 1970.

Monograph or book in a series

Hunninghake GW, Gadek JE: **The alveolar macrophage.** In *Cultured Human Cells and Tissues.* Edited by Harris TJR. New York: Academic Press; 1995:54-56. [Stoner G (Series Editor): *Methods and Perspectives in Cell Biology,* vol 1.]

Book with institutional author

Advisory Committee on Genetic Modification: *Annual Report.* London; 1999.

PhD thesis

Kohavi R: **Wrappers for performance enhancement and oblivious decision graphs.** *PhD thesis.* Stanford University, Computer Science Department; 1995.

Link / URL

The Mouse Tumor Biology Database [http://tumor.informatics.jax.org/mtbwi/index.do]

Link / URL with author(s)

Corpas M: **The Crowdfunding Genome Project: a personal genomics community with open source values** [http://blogs.biomedcentral.com/bmcblog/2012/07/16/the-crowdfunding-genome-project-a-personal-genomics-community-with-open-source-values/]

Dataset with persistent identifier

Zheng, L-Y; Guo, X-S; He, B; Sun, L-J; Peng, Y; Dong, S-S; Liu, T-F; Jiang, S; Ramachandran, S; Liu, C-M; Jing, H-C (2011): **Genome data from sweet and grain sorghum (Sorghum bicolor)**. *GigaScience*. http://dx.doi.org/10.5524/100012.

Clinical trial registration record with persistent identifier

Mendelow, AD (2006): **Surgical Trial in Lobar Intracerebral Haemorrhage**. Current Controlled Trials. http://dx.doi.org/10.1186/ISRCTN22153967

Preparing illustrations and figures

Illustrations should be provided as separate files, not embedded in the text file. Each figure should include a single illustration and should fit on a single page in portrait format. If a figure consists of separate parts, it is important that a single composite illustration file be submitted which contains all parts of the figure. There is no charge for the use of color figures.

Please read our figure preparation guidelines for detailed instructions on maximising the quality of your figures.

Formats

The following file formats can be accepted:

- PDF (preferred format for diagrams)
- DOCX/DOC (single page only)
- PPTX/PPT (single slide only)
- EPS
- PNG (preferred format for photos or images)
- TIFF
- JPEG
- BMP

Figure legends

The legends should be included in the main manuscript text file at the end of the document, rather than being a part of the figure file. For each figure, the following information should be provided: Figure number (in sequence, using Arabic numerals - i.e. Figure 1, 2, 3 etc); short title of figure (maximum 15 words); detailed legend, up to 300 words.

Please note that it is the responsibility of the author(s) to obtain permission from the copyright holder to reproduce figures or tables that have previously been published elsewhere.

Preparing tables

Each table should be numbered and cited in sequence using Arabic numerals (i.e. Table 1, 2, 3 etc.). Tables should also have a title (above the table) that summarizes the whole table; it should be no longer than 15 words. Detailed legends may then follow, but they should be concise. Tables should always be cited in text in consecutive numerical order.

Smaller tables considered to be integral to the manuscript can be pasted into the end of the document text file, in A4 portrait or landscape format. These will be typeset and displayed in the final published form of the article. Such tables should be formatted using the 'Table object' in a word processing program to ensure that columns of data are kept aligned when the file is sent electronically for review; this will not always be the case if columns are generated by simply using tabs to separate text. Columns and rows of data should be made visibly distinct by ensuring that the borders of each cell display as black lines. Commas should not be used to indicate numerical values. Color and shading may not be used; parts of the table can be highlighted using symbols or bold text, the meaning of which should be explained in a table legend. Tables should not be embedded as figures or spreadsheet files.

Larger datasets or tables too wide for a portrait page can be uploaded separately as additional files. Additional files will not be displayed in the final, laid-out PDF of the article, but a link will be provided to the files as supplied by the author.

Tabular data provided as additional files can be uploaded as an Excel spreadsheet (.xls) or comma separated values (.csv). As with all files, please use the standard file extensions.

Preparing additional files

Although *BMC Public Health* does not restrict the length and quantity of data included in an article, we encourage authors to provide datasets, tables, movies, or other information as additional files.

Please note: All Additional files **will be published** along with the article. Do not include files such as patient consent forms, certificates of language editing, or revised versions of the main manuscript document with tracked changes. Such files should be sent by email to editorial@biomedcentral.com, quoting the Manuscript ID number.

Results that would otherwise be indicated as "data not shown" can and should be included as additional files. Since many weblinks and URLs rapidly become broken, *BMC Public Health* requires that supporting data are included as additional files, or deposited in a recognized repository. Please do not link to data on a personal/departmental website. The maximum file size for additional files is 20 MB each, and files will be virus-scanned on submission.

Additional files can be in any format, and will be downloadable from the final published article as supplied by the author. We recommend CSV rather than PDF for tabular data.

Certain supported files formats are recognized and can be displayed to the user in the browser. These include most movie formats (for users with the Quicktime plugin), mini-websites prepared according to our guidelines, chemical structure files (MOL, PDB), geographic data files (KML).

If additional material is provided, please list the following information in a separate section of the manuscript text:

- File name (e.g. Additional file 1)
- File format including the correct file extension for example .pdf, .xls, .txt, .pptx (including name and a URL of an appropriate viewer if format is unusual)
- Title of data
- Description of data

Additional files should be named "Additional file 1" and so on and should be referenced explicitly by file name within the body of the article, e.g. 'An additional movie file shows this in more detail [see Additional file 1]'.

Additional file formats

Ideally, file formats for additional files should not be platform-specific, and should be viewable using free or widely available tools. The following are examples of suitable formats.

- Additional documentation
    - PDF (Adode Acrobat)
- Animations
    - SWF (Shockwave Flash)
- Movies

- MP4 (MPEG 4)
- MOV (Quicktime)

- Tabular data
  - XLS, XLSX (Excel Spreadsheet)
  - CSV (Comma separated values)

As with figure files, files should be given the standard file extensions.

Mini-websites

Small self-contained websites can be submitted as additional files, in such a way that they will be browsable from within the full text HTML version of the article. In order to do this, please follow these instructions:

1. Create a folder containing a starting file called index.html (or index.htm) in the root.
2. Put all files necessary for viewing the mini-website within the folder, or sub-folders.
3. Ensure that all links are relative (ie "images/picture.jpg" rather than "/images/picture.jpg" or "http://yourdomain.net/images/picture.jpg" or "C:\Documents and Settings\username\My Documents\mini-website\images\picture.jpg") and no link is longer than 255 characters.
4. Access the index.html file and browse around the mini-website, to ensure that the most commonly used browsers (Internet Explorer and Firefox) are able to view all parts of the mini-website without problems, it is ideal to check this on a different machine.

5. Compress the folder into a ZIP, check the file size is under 20 MB, ensure that index.html is in the root of the ZIP, and that the file has .zip extension, then submit as an additional file with your article.

Style and language

General

Currently, *BMC Public Health* can only accept manuscripts written in English. Spelling should be US English or British English, but not a mixture.

There is no explicit limit on the length of articles submitted, but authors are encouraged to be concise.

BMC Public Health will not edit submitted manuscripts for style or language; reviewers may advise rejection of a manuscript if it is compromised by grammatical errors. Authors are advised to write clearly and simply, and to have their article checked by colleagues before submission. In-house copyediting will be minimal. Non-native speakers of English may choose to make use of a copyediting service.

Language editing

For authors who wish to have the language in their manuscript edited by a native-English speaker with scientific expertise, BioMed Central recommends Edanz. BioMed Central has arranged a 10% discount to the fee charged to BioMed Central authors by Edanz. Use of an editing service is neither a requirement nor a guarantee of acceptance for publication. Please contact Edanz directly to make arrangements for editing, and for pricing and payment details.

Help and advice on scientific writing

The abstract is one of the most important parts of a manuscript. For guidance, please visit our page on Writing titles and abstracts for scientific articles.

Tim Albert has produced for BioMed Central a list of tips for writing a scientific manuscript. American Scientist also provides a list of resources for science writing. For more detailed guidance on preparing a manuscript and writing in English, please visit the BioMed Central author academy.

Abbreviations

Abbreviations should be used as sparingly as possible. They should be defined when first used and a list of abbreviations can be provided following the main manuscript text.

Typography

- Please use double line spacing.
- Type the text unjustified, without hyphenating words at line breaks.
- Use hard returns only to end headings and paragraphs, not to rearrange lines.
- Capitalize only the first word, and proper nouns, in the title.
- All lines and pages should be numbered. Authors are asked to ensure that line numbering is included in the main text file of their manuscript at the time of submission to facilitate peer-review. Once a manuscript has been accepted, line numbering should be removed from the manuscript before publication. For authors submitting their manuscript in Microsoft Word please do not insert page breaks in

your manuscript to ensure page numbering is consistent between your text file and the PDF generated from your submission and used in the review process.

- Use the *BMC Public Health* reference format.
- Footnotes are not allowed, but endnotes are permitted.
- Please do not format the text in multiple columns.
- Greek and other special characters may be included. If you are unable to reproduce a particular special character, please type out the name of the symbol in full. **Please ensure that all special characters used are embedded in the text, otherwise they will be lost during conversion to PDF.**

Units

SI units should be used throughout (liter and molar are permitted, however).

Appendix 2

Appendix 2.1: Bivariate analyses of associations between all demographic and all psychosocial factors examined against early booking among women aged 18-44 years who reported ever being pregnant (N=829): Comparison for early ANC initiation.

Variable	Tshwane(urban) N (% Early booking)	(OR) *p*-value	Western Cape (rural) N (% Early booking)	(OR) *p*-value
Age				
18-24	27 (36)	-	31 (41)	-
25-34	86 (42)	(1.3)0.338	64 (43)	(1.1)0.817
35-44	103 (55)	(2.1)0.006*	70 (50)	(1.4)0.208
Marital Status				
Married	69 (58)	-	64 (54)	-
Living with a partner	26 (45)	(0.6)0.114	56 (44)	(0.7)0.116
Never married/single	16 (48)	(0.7)0.357	37 (37)	(0.5)0.016*
Divorced/separated/widowed	92 (39)	(0.5)0.001*	8 (47)	(0.8)0.604
Employed				
Yes	113 (54)	(1.7)0.005*	131 (44)	(0.8)0.404
No	103 (40)		34 (50)	
Education				
Below Grade 9	196 (46)	(1.2)0.629	117 (45)	(1.1)0.623
Grade 9 and above	20 (50)		48 (48)	
Race				
Black/African	166 (44)	(1.3)0.393	11 (37)	(1.5)0.333
Coloured	28 (50)		152 (46)	
White	-		-	
Miscarriage				
Never	160 (44)	(1.5)0.065	125 (44)	(1.2)0.412
At least 1 miscarriage	56 (54)		39 (49)	
Parity				
0-1 child	72 (48)	(1.2)0.256	50 (41)	(1.3)0.189
More than one child	144 (43)		115 (48)	
Desire				
Yes	161 (50)	(1.7)0.015*	142 (49)	(2.1)0.008*
No	55 (38)		23 (32)	
Social Support				
Positive social interaction				
Strong	95 (50)	(1.3)0.190	72 (52)	(1.5)0.056
Weak	121 (44)		93 (42)	
Affectional support				
Strong				
Weak	97 (51)	(1.3)0.131	78 (50)	(1.4)0.108

	119 (44)		87 (42)	
Emotional support				
Strong	51 (46)	(1.0)0.922	46 (50)	(1.6)0.052
Weak	165 (46)		119 (42)	
Social Capital				
Strong	59 (49)	(1.1)0.537	62 (43)	(0.8)0.348
Weak	157 (46)		103 (48)	
Mental Health				
High	64 (48)	(1.1)0.629	119 (44)	(0.8)0.369
Low	152 (46)		46 (49)	
Cultural Influences				
Male entitlement				
Agree	78 (44)	(0.9)0.472	42 (48)	(1.1)0.623
Disagree	138 (48)		123 (45)	
Wrong to not have children				
Agree	92 (48)	(1.1)0.502	114 43)	(0.8)0.427
Disagree	124 (45)		51 (47)	
Female Worth				
Agree	145 (47)	(1.0)0.844	143 (47)	(1.4)0.257
Disagree	71 (46)		22 (39)	
Male Worth				
Agree	138 (47)	(1.0)0.994	139 (46)	(1.3)0.393
Disagree	78 (47)		26 (41)	
Self Esteem				
High	54 (47)	(1.0)0.960	43 (46)	(1.0)0.861
Low	162 (46)		122 (45)	
Religious Orientation				
Highly religious	69 (53)	(1.4)0.092	41 (37)	(0.6)0.021*
Not religious	146 (44)		123 (50)	
Partner Characteristics				
Age				
Older than 29yrs	202 (48)	(2.2)0.018*	87 (48)	(1.2)0.368
Younger than 29yrs	14 (30)		78 (43)	
Employed				
Yes	165 (52)	(2.0)0.001*	143 (47)	(1.4)0.209
No	51 (35)		22 (38)	
Education	44 (48)	(0.9)0.660	91 (41)	(1.5)0.026*
Below Grade 9	157 (46)		56 (54)	
Grade 9 and above				
Father of the child present				
Yes	17 (48)	(1.7)0.111	154 (47)	(2.0)0.063
No	199 (35)		11 (31)	

Substance Use				
Ever smoked				
Yes	43 (50)	(1.2)0.478	110 (42)	(0.7)0.072
No	173 (46)		55 (53)	
Ever drank alcohol				
Yes	86 (49)	(1.2)0.426	115 (43)	(0.7)0.196
No	129 (45)		50 (51)	
AUDIT				
Score ≥ 8	14 (45)	(0.9)0.891	140 (44)	(0.6)0.148
Score < 8	202 (46)		25 (56)	

Appendix 2.2: Bivariate analyses of associations between all demographic and all psychosocial factors examined against frequent attendance among women aged 18-44 years who reported ever being pregnant (N=829): Comparison for adequate ANC attendance.

Variable	**Tshwane(urban) N (% Early booking)**	**(OR) *p*-value**	**Western Cape (rural) N (% Early booking)**	**(OR) *p*-value**
Age				
18-24	63 (84)	-	56 (75)	
25-34	165 (81)		112 (75)	(1.0)0.935
35-44	165 (88)	(0.8)0.601	116 (83)	(1.7)0.125
		(1.4)0.418		
Marital Status				
Married	107 (89)	-	101 (85)	-
Living with a partner	47 (81)	(0.5)0.141	102 (80)	(0.7)0.289
Never married/single	28 (85)	(0.7)0.497	70(71)	(0.4)0.013*
Divorced/separated/widowed	193 (82)	(0.6)0.086	11 (65)	(0.3)0.049*
Employed				
Yes	174 (83)	(0.8)0.312	229 (78)	(0.8)0.558
No	219 (86)		55 (81)	
Education				
Below Grade 9	360 (85)	(0.9)0.739	209(80)	(0.7)0.255
Grade 9 and above	33 (83)		75 (75)	
Race				
Black/African	321 (85)		22 (74)	
Coloured	47 (84)	(0.9)0.847	258 (78)	(1.3)0.521

White	-		-	
Miscarriage				
Never	304 (84)		228 (81)	(0.6)0.039*
At least 1 miscarriage	89 (86)	(1.2)0.513	55 (70)	
Parity				
0-1 child	136 (81)	(1.5)0.133	94 (76)	(1.2)0.549
More than one child	257 (86)		190 (79)	
Desire				
Yes	264 (82)	(0.6)0.067	241 (83)	(3.4)<0.001*
No	129 (89)		43 (59)	
Social Support				
Positive social interaction				
Strong	166 (87)	(1.5)0.137	111 (80)	(1.2)0.556
Weak	227 (82)		173 (77)	
Affectional support				
Strong	169 (88)	(1.6)0.069	119 (77)	(0.9)0.560
Weak	224 (82)		165 (79)	
Emotional support				
Strong	97 (87)	(1.4)0.312	68 (81)	(1.2)0.492
Weak	296 (83)		216 (77)	
Social Capital				
Strong	99 (82)	(0.8)0.377	110 (75)	(0.8)0.274
Weak	294 (85)		174 (80)	
Mental Health				
High	115 (86)	(1.3)0.424	213 (79)	(1.2)0.608
Low	278 (83)		71 (76)	
Cultural Influences				
Male entitlement				
Agree	154 (88)	(1.5)0.167	70 (80)	(1.1)0.733
Disagree	239 (83)		214 (78)	
Wrong to not have children				
Agree	159 (84)	(0.9)0.692	90 (75)	(0.8)0.294
Disagree	233 (85)		194 (80)	
Female Worth				
Agree	261 (84)	(0.9)0.786	234 (76)	(0.5)0.064
Disagree	132 (85)		50 (88)	
Male Worth				
Agree	252 (85)	(1.1)0.792	228 (76)	(0.5)0.052
Disagree	141 (84)		56 (88)	
Self Esteem				
High	98 (85)	(1.0)0.960	76 (82)	(1.3)0.346
Low	295 (84)		208 (77)	
Religious Orientation				

Highly religious Not religious	116 (89) 275 (83)	(1.6)0.126	84 (75) 196 (79)	(0.8)0.357
Partner Characteristics *Age* Older than 29yrs Younger than 29yrs *Employed* Yes No *Education* Below Grade 9 Grade 9 and above *Father of the child present* Yes No	 354 (85) 39 (83) 275 (85) 118 (80) 75 (84) 289 (85) 354 (85) 39 (81)	 (1.1)0.787 (1.5)0.103 (0.9)0.730 (1.3)0.536	 142 (78) 142 (78) 251 (82) 33 (57) 170 (80) 80 (78) 264 (81) 20 (56))	 (1.0)0.921 (3.5)<0.001* (1.1)0.757 (3.4)0.001*
Substance Use *Ever smoked* Yes No *Ever drank alcohol* Yes No *AUDIT* Score ≥ 8 Score < 8	 71 (83) 321 (85) 142 (80) 250 (87) 27 (87) 366 (84)	 (0.8)0.585 (0.6)0.060 (1.3)0.662	 198 (76) 86 (83) 208 (78) 76 (78) 249 (78) 35 (78)	 (0.7)0.194 (1.1)0.847 (1.0)0.936

WOMEN, PREGNANCY AND HEALTH

QUESTIONNAIRE

ENGLISH -FINAL

Questionnaire Number	
Interviewer Number	
Enumerator Area	

University of Pretoria

MRC SOUTH AFRICA

UNIVERSITY OF CAPE TOWN

GENERAL INSTRUCTIONS

We will work through the questionnaire as follows: All your answers will be marked in my copy of the questionnaire. I will ask the questions and give you the answer choices. You will have a copy of the questionnaire so that you can follow along. Pick the answer that is the closest to how you feel. Usually I will want you to tell me the number that goes with the answer you pick. The interview will take between forty five minutes and one hour to complete.

Please note that there are no right or wrong answers to the questions asked. Please feel free to answer just what you think. If there are questions you really do not want to answer, you may skip them.

PLEASE REMEMBER THAT YOUR NAME WILL NOT BE PUT ON THIS QUESTIONNAIRE. Your answers will not be shared with anyone. Only the research staff will have access to the questionnaire once it has been completed.

Thank you for helping us with this study.

TIME NOW: _____

DATE: _____

Section 1: Demographic Characteristics

First we would like to ask you a few questions about yourself.

Throughout the questionnaire, please circle the correct response.

1.1 How old are you? _____years

1.2 What is the highest level of education you have passed?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub B/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school – complete	15
Degree	16

1.3 What is your current marital status?

Legally married	1
Traditionally married	2
Living with man or woman in union	3
Never married/Single	4
Divorced	5
Married but separated	6
Widow	7

1.4 Which of the following is the main language spoken at home? (Please circle only one)

English	1
Afrikaans	2
IsiXhosa	3
IsiZulu	4
SeSotho	5
SeTswana	6
SePedi	7
SiSwati	8
TshiVenda	9
Zitsonga	10
IsiNdebele	11
Other (Please specify)	12

1.5 Which race group do you consider yourself to belong to?

Black/African	1
Coloured	2
White	3
Asian/Indian	4
Other (Please specify)	5

Section 2: Economic factors

Now we would like to ask a few questions about you, your work and the money that is available to you to spend.

2.1 Have you done any paid work in the last 12 months?

No	0
Yes	1

2.2 Which of the following describes your current employment status?

Unemployed	1
Employed part-time	2
Employed full-time	3
Self-employed	4

2.3 What kind of work do you do? (If working, please tell me your occupation. For example, plumber, street trader, cattle farmer, primary school teacher, domestic worker)

Not working	0
Working (Please specify)	1

2.4 If you are not working, how do you spend your free time when other people are at work?

2.5 Please indicate which of the following are your sources of income. Please answer this question whether or not you are working.

		Yes	No
A	Work	1	0
B	Spouse/partner	1	0
C	Parents	1	0
D	Brothers and/or sisters	1	0
E	Children	1	0
F	Child Support Grant	1	0
G	State Old Age Pensions	1	0
H	Disability Grant	1	0
I	Care Dependency Grant	1	0
J	Foster Care Grant	1	0
K	Grants-in-Aid	1	0
L	Workman's Compensation Fund	1	0
M	Other (Please specify)	1	0

Section 3: Household factors

3.1 Is the house you live in:

Owned by your family	1
Rented	2
Owned by farmer	3
Other (please specify)	4

3.2 How many rooms are there in the house?

	Rooms

3.3 How many bedrooms are there in the house?

	Bedrooms

3.4 How many bathrooms are there in the house?

	Bathrooms

3.5 Does your house have:

		Yes	No
A	Electricity	1	0
B	A radio	1	0
C	A television	1	0
D	A telephone	1	0
E	A fridge	1	0
F	A computer	1	0
G	A washing machine	1	0
H	A cell phone (anybody)	1	0

3.6 Which of the following live in the same household with you?

		Yes	No
A	Live alone	1	0
B	Husband	1	0
C	Partner	1	0
D	Child or Children	1	0
E	Brother(s) and/or sister(s)	1	0
F	Mother/Female guardian	1	0
G	Father/Male guardian	1	0
H	Grandparent(s)	1	0
I	Other (please specify)	1	0

3.7 How many people usually live and sleep in your household?

	Number of people

3.8 Let us speak about your household and what it can afford. How often do the people here go hungry or have no food to eat?

Never	0
Seldom	1
Sometimes	2
Often	3

3.9 Your family has enough money for:

		Never	Some-times	Always	Not Applicable
A	Buying food	0	1	2	9
B	Paying for transport (bus, taxi, train fare, petrol bills)	0	1	2	9
C	Paying bills (rent, light, water, telephone, etc.)	0	1	2	9
D	Paying doctors and for medicine	0	1	2	9
E	Buying school supplies, uniforms, books, shoes	0	1	2	9
F	Buying clothes	0	1	2	9
G	Buying firewood, coal, paraffin	0	1	2	9
H	Paying for funerals and other ceremonies/festivities	0	1	2	9

Section 4: Community

4.1 For how long have you lived in this community?

	Years
	Months

Please indicate the extent to which you agree with the following statements about your community.

		Strongly Agree	Moderately Agree	Neither Agree Nor Disagree	Moderately Disagree	Strongly Disagree
4.2	There are many recreational facilities in your community	0	1	2	3	4
4.3	You can easily use the recreational facilities in your community	0	1	2	3	4
4.4	It is easy for you to buy alcohol in your community if you want to	0	1	2	3	4
4.5	A lot of people drink heavily in your community	0	1	2	3	4
4.6	Your community accepts the abuse of alcohol	0	1	2	3	4
4.7	There are many advertisements of alcoholic drinks in your community	0	1	2	3	4
4.8	People around here are willing to help their neighbours	0	1	2	3	4
4.9	This is a close-knit or tight neighbourhood where people generally know each other	0	1	2	3	4
4.10	If you had to borrow R100 in an emergency, you could borrow it from a neighbour	0	1	2	3	4
4.11	People in this neighbourhood generally don't get along with each other	0	1	2	3	4
4.12	People in this neighbourhood can be trusted	0	1	2	3	4
4.13	If you were sick you could count on your neighbours to shop for groceries for you	0	1	2	3	4
4.14	People in this neighbourhood do not share the same values	0	1	2	3	4

Section 5: Your feelings about yourself

Below is a list of statements dealing with your general feelings about yourself. Please indicate the extent to which you agree with each statement.

		Strongly agree	Agree	Disagree	Strongly disagree
5.1	On the whole, I am satisfied with myself	1	2	3	4
5.2	At times, I think I am no good at all	1	2	3	4
5.3	I feel that I have a number of good qualities	1	2	3	4
5.4	I am able to do things as well as most people	1	2	3	4
5.5	I feel I do not have much to be proud of	1	2	3	4
5.6	I certainly feel useless at times	1	2	3	4
5.7	I feel that I am a person of worth, at least on an equal plane with others	1	2	3	4
5.8	I wish I could have more respect for myself	1	2	3	4
5.9	All in all, I am inclined to feel that I am a failure	1	2	3	4
5.10	I take a positive attitude towards myself	1	2	3	4

Section 6: Health

6.1 In general, would you say your health is:

Excellent	1
Very Good	2
Good	3
Fair	4
Poor	5

6.2 For how long (if at all) has your health limited you in each of the following activities? Please choose one number on each line.

		Limited for more than 3 months	Limited for 3 months or less	Not limited at all
A	The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports	1	2	3
B	The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries	1	2	3
C	Walking uphill or climbing a flight of stairs	1	2	3
D	Bending, lifting or stooping	1	2	3
E	Taking a ten-minute walk	1	2	3
F	Eating, dressing, bathing or using the toilet	1	2	3

6.3 How much bodily pain have you had during the past 4 weeks?

None	1
Very Mild	2
Mild	3
Moderate	4
Severe	5
Very Severe	6

6.4 Does your health keep you from working at a job, doing work around the house or going to school?

Yes, for more than 3 months	1
Yes, for 3 months or less	2
No	3

6.5 Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health?

Yes, for more than 3 months	1
Yes, for 3 months or less	2
No	3

For each of the following questions, please choose the number for the one answer that comes closest to the way you have been feeling during the past month.

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
6.6	How much of the time, during the past month, has your health limited your social activities (like visiting friends or close relatives)?	1	2	3	4	5	6
6.7	How much of the time, during the past month, have you been a very nervous person?	1	2	3	4	5	6
6.8	During the past month, how much of the time have you felt calm and peaceful?	1	2	3	4	5	6
6.9	How much of the time, during the past month, have you felt downhearted and blue?	1	2	3	4	5	6
6.10	During the past month, how much of the time have you been a happy person?	1	2	3	4	5	6
6.11	How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6

6.12 Please choose the number that best describes the extent to which each of the following statements is true or false for you.

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	I am somewhat ill	1	2	3	4	5
B	I am as healthy as anybody I know	1	2	3	4	5
C	My health is excellent	1	2	3	4	5
D	I have been feeling bad lately	1	2	3	4	5

Section 7: Alcohol Use

The questions in this section are about your drinking of alcoholic beverages.

7.1 Have you ever had a drink containing alcohol?

No	0
Yes	1

IF NO PLEASE GO TO QUESTION 7.26.

7.2 How old were you when you first started drinking alcohol?

	Years

7.3 Do you still take a drink with alcohol sometimes?

No	0
Yes	1

7.4 Why did you stop drinking alcohol?

Not applicable/still drinking alcohol	9

_____

_____

_____

7.5 When did you stop drinking alcohol?

0-6 months ago	1
7-12 months ago	2
13-24 months ago	3
25-36 months ago	4
37 months or more	5
Not applicable	9

IF YOU HAVE NOT HAD AN ALCOHOLIC DRINK IN THE PAST YEAR, PLEASE GO TO QUESTION 7.26.

7.6 How often do you have a drink containing alcohol?

Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

7.7 On how many days have you drunk alcohol during the past month?

	Days

7.8 What type(s) of alcoholic beverages do you usually drink?

		Yes	No
A	Beer	1	0
B	Cider (e.g. Crossbow, Crown, Hunters, Redds, Savannah, Strongbow)	1	0
C	Bottled wine	1	0
D	Papsak wine	1	0
E	Coolers (e.g. Archers, Bacardi Breezer, Brutal Fruit, Esprit, Hooch, Red Square, Smirnoff Spin, Smirnoff Storm, Smirnoff Triple Spin, Solantis)	1	0
F	Spirits (e.g. gin, whisky, vodka, brandy)	1	0
G	Liqueurs (e.g. Amarula)	1	0
H	Home brew	1	0

7.9 Where do you buy your alcohol?

		Yes	No
A	I do not buy my alcohol	1	0
B	Liquor store	1	0
C	Supermarket/Café	1	0
D	Spaza shop	1	0
E	Night club/Disco	1	0
F	Shebeen	1	0
G	Restaurant/Pub	1	0
H	Tavern	1	0
I	Neighbour	1	0
J	Other (Please specify)	1	0

7.10 When you are not paying for your alcohol, how do you get it?

		Yes	No
A	I make it myself	1	0
B	I get it on credit	1	0
C	I work for it	1	0
D	I exchange goods (e.g. clothes) for it	1	0
E	It is bought for me/given to me	1	0
F	I take it without paying for it	1	0
G	Other (Please specify)	1	0

7.11 How many drinks containing alcohol do you have on a typical day when you are drinking? (Please note that one drink is equivalent to one can or bottle of beer, cider or coolers, one glass of wine, or one tot of spirits).

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If you drink homebrew please indicate the name of the homebrew, type of container, and quantity consumed.	6

7.12 In which of the following type(s) of venues or events do you usually drink alcohol?

		Yes	No
A	Home	1	0
B	Park/Outdoors	1	0
C	Restaurant	1	0
D	Tavern	1	0
E	Shebeen	1	0
F	Bar	1	0
G	Car park(s)	1	0
H	Friend's home	1	0
I	Party	1	0
J	Festival/Concert	1	0
K	Other (please specify)	1	0

7.13 With whom do you usually drink alcohol? (Please circle only one)

Alone	1
With friend(s)	2
With relative(s)	3
With partner	4
With whoever is in the drinking place	5
With other (please specify)	6

Below is a list of questions about your drinking behaviour. Please choose the option that best reflects your behaviour

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7.14	How often do you have six or more drinks on one occasion?	0	1	2	3	4
7.15	How often during the last year have you found that you were unable to stop drinking once you had started?	0	1	2	3	4
7.16	How often during the last year have you failed to do what was normally expected from you because of drinking?	0	1	2	3	4
7.17	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	0	1	2	3	4
7.18	How often during the last year have you had a feeling of guilt or remorse after drinking?	0	1	2	3	4
7.19	How often during the last year have you been unable to remember what happened the night before because you had been drinking?	0	1	2	3	4
7.20	Have you or someone else been injured as a result of your drinking?	0	1	2	3	4
7.21	Has a relative, friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?	0	1	2	3	4

7.22 Have you ever felt you ought to cut down drinking?

No	0
Yes	1

7.23 Have people annoyed you for criticising your drinking?

No	0
Yes	1

7.24 Have you ever felt guilty about your drinking?

No	0
Yes	1

7.25 Have you ever had a drink first thing in the morning?

No	0
Yes	1

7.26 Whom among the following family members has had an alcohol problem?

		Yes	No
A	Mother	1	0
B	Father	1	0
C	Uncle	1	0
D	Aunt	1	0
E	Sister	1	0
F	Brother	1	0

7.27 Are there any warning labels about the health risks of drinking alcohol on any alcohol containers?

No	0
Yes	1
Do not know	2

7.28 Does the drinking of alcohol during pregnancy have any effect on the unborn foetus?

No	0
Yes	1
Sometimes	2
Don’t know	3

7.29 In what ways can a baby be affected if a mother drinks in pregnancy?
[This question is to be coded by the interviewer, according to the instructions received.]

	Yes	No
A Social integration	1	0
B Physical growth	1	0
C Intellectual ability	1	0
D Learning problems	1	0
E Behavioural problems	1	0
F Specific facial features	1	0
G Speech problems	1	0
H Other (please specify)	1	0

Section 8: Smoking and Other Drug Use

8.1 Have you ever tried or experimented with cigarette smoking, even one or two puffs?

No	0
Yes	1

IF NO PLEASE CIRCLE 9 or 99 (NOT APPLICABLE) FOR Q8.2, Q8.3, Q8.4 AND Q8.5. THEN GO TO Q8.6

8.2 How old were you when you smoked a whole cigarette for the first time?

	Years
99	Not applicable

8.3 Have you ever smoked at least 100 cigarettes (5 packets of cigarettes) or the equivalent amount of tobacco in your lifetime?

No	0
Yes	1
No applicable	9

8.4 During the past 30 days, on how many days did you smoke cigarettes?

	Days
99	Not applicable

8.5 During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

I did not smoke during the past 30 days	0
Less than 1 cigarette per day	1
1 cigarette per day	2
2 to 5 cigarettes per day	3
6 to 10 cigarettes per day	4
11 to 20 cigarettes per day	5
More than 20 cigarettes per day	6
Not applicable	9

8.6 Have you ever used snuff?

No	0
Yes	1

8.7 How old were you when you first used snuff? CIRCLE 99 IF YOU HAVE NEVER USED SNUFF.

	Years
99	Not applicable

8.8 During the past 30 days, on how many days did you use snuff? CIRCLE 99 IF YOU HAVE NEVER USED SNUFF.

	Days
99	Not applicable

8.9 Have you ever taken medicines for purposes other than their intended use (e.g. to change the way you feel, think, or behave)?

		Yes	No
A	Over-the-counter medication	1	0
B	Prescription medication	1	0

8.10 Have you ever used any of the following drugs?

		Yes	No
A	Dagga	1	0
B	Mandrax	1	0
C	Heroin	1	0
D	Crack/cocaine	1	0
E	Ecstasy	1	0
F	Methamphetamine (tik)	1	0
G	Other	1	0

8.11 During the past 30 days, on how many days did you use each of the following drugs, if at all?

		0 days	1 or 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
A	Dagga	0	1	2	3	4	5	6
B	Mandrax	0	1	2	3	4	5	6
C	Heroin	0	1	2	3	4	5	6
D	Crack/cocaine	0	1	2	3	4	5	6
E	Ecstasy	0	1	2	3	4	5	6
F	Methamphetamine (tik)	0	1	2	3	4	5	6
G	Over-the-counter medication (not for its intended use)	0	1	2	3	4	5	6
H	Prescription medication (not for its intended use)	0	1	2	3	4	5	6
I	Other	0	1	2	3	4	5	6

Section 9: Sexual Behaviour

This section deals with sexual behaviour. Please note that these questions concern any male partner, including husbands, males with whom you are cohabiting, or other partners.

9.1 When was the last time you had sex, if ever?

Never	0
Within the last week	1
Within the last month	2
More than one month ago	3

IF YOU HAVE NEVER HAD SEX, PLEASE GO TO QUESTION 10.5

9.2 Who did you last have sex with?

Husband	1
Boyfriend	2
Other regular partner	3
Casual acquaintance	4
Someone just met	5
Other (Please specify)	6

9.3 How old were you when you first had sex?

	Years

9.4 What is the total number of sexual partners you have had in the past three months?

None	0
1	1
2-3	2
4-5	3
6-7	4
8-9	5
More than 9	6

9.5 How often have you had sex under the influence of alcohol in the past three months?

Never	0
1-3 times	1
4-6 times	2
7-9 times	3
10-12 times	4
More than 12 times	5

Section 10: Use of Condoms

The questions in this section concern condom use.

10.1 How frequently have you used condoms with your spouse or regular partner(s) in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no spouse or regular partner in the past three months)	9

10.2 How frequently have you used condoms with casual partners in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no casual partner in the past three months)	9

10.3 The last time you had sex, was a condom used?

No	0
Yes	1
Don't know	2
Not applicable	9

10.4 Why did you not use a condom the last time you had sex?

		Yes	No	Not Applicable
A	I did not want to use a condom	1	0	9
B	I did not need to use a condom	1	0	9
C	I did not like condoms	1	0	9
D	I did not know about condoms	1	0	9
E	I did not have a condom	1	0	9
F	Other (Please specify)	1	0	9
G	I used a condom the last time I had sex	1	0	9

10.5 Where can you get condoms from?

		Yes	No
A	Government Hospital	1	0
B	Day Hospital/Clinic	1	0
C	Community Health Centre	1	0
D	Family Planning Clinic	1	0
E	Mobile Clinic	1	0
F	Community Health Worker	1	0
F	Private Hospital/Clinic	1	0
G	Pharmacy	1	0
H	Private Doctor	1	0
I	Supermarket	1	0
J	Filling station	1	0
K	Other (Please specify)	1	0

10.6 How easy is it for you to buy condoms in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.7 How easy is it for you to get free condoms from clinics in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.8 How important is it for you to use condoms when you have sexual intercourse with a casual partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

10.9 How important is it for you to use condoms when you have sexual intercourse with your regular partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

Section 11: Use of Contraceptives

11.1 How old were you when you had your first period?

Less than ten years old	1
Ten to fifteen years old	2
Sixteen to twenty years old	3
Beyond twenty years old	4

11.2 Have you ever used anything or tried in any way to delay or avoid getting pregnant?

No	0
Yes	1

IF NO PLEASE GO TO Q11.8

11.3 Which is the main method that you are <u>using now to delay or avoid getting</u> pregnant?

Pill	1
IUD	2
Injections	3
Diaphragm/foam/jelly	4
Condom	5
Female sterilisation	6
Male sterilisation	7
Calendar/rhythm	8
Withdrawal	9
Traditional herbs/remedies	10
Abstinence	11
Other (Please specify)	12
None	99

11.4 How long have you used this method?

	Years
	Months
99	Not applicable

11.5 Which are the methods that you have <u>used in the past</u> to delay or avoid getting pregnant?

		Yes	No
A	Pill	1	0
B	IUD	1	0
C	Injections	1	0
D	Diaphragm/foam/jelly	1	0
E	Condom	1	0
F	Female sterilisation	1	0
G	Male sterilisation	1	0
H	Calendar/rhythm	1	0
I	Withdrawal	1	0
J	Traditional herbs/remedies	1	0
K	Abstinence	1	0
L	Other (Please specify)	1	0
M	Unsure	1	0
N	None	1	0

11.6 Where do/did you obtain the method you are using currently?

Government Hospital	1
Government Clinic	2
Community Health Centre	3
Family Planning Clinic	4
Private Hospital	5
Private Clinic	6
Private Doctor	7
Mobile clinic	8
Pharmacy/Chemist	9
Traditional healer	10
Faith healer	11
Don’t know	12
Other (Please specify)	13
Not applicable	99

11.7 How old were you when you first used something to avoid getting pregnant?

	Years
99	Not applicable

11.8 From whom did you first get information about methods to avoid pregnancy? (Circle as many as apply)

		Yes	No
A	Mother	1	0
B	Sister	1	0
C	Father	1	0
D	Other Relative	1	0
E	Friend	1	0
F	Teacher	1	0
G	Nurse	1	0
H	Doctor	1	0
I	Social Worker	1	0
J	Poster/Leaflet/Magazine	1	0
K	Radio/Television	1	0
L	Other (Please specify)	1	0

11.9 Did your parent(s) or guardian(s) give you advice on contraceptives or explain how to use them?

No	0
Yes	1

Section 12: Social Support

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
12.1	Someone you can count on to listen to you when you need to talk	1	2	3	4	5
12.2	Someone to give you information to help you understand a situation	1	2	3	4	5
12.3	Someone to give you good advice about a crisis	1	2	3	4	5
12.4	Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
12.5	Someone whose advice you really want	1	2	3	4	5
12.6	Someone to share your most private worries and fears with	1	2	3	4	5
12.7	Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
12.8	Someone who understands your problems	1	2	3	4	5
12.9	Someone who shows you love and affection	1	2	3	4	5
12.10	Someone to love and make you feel wanted	1	2	3	4	5
12.11	Someone who hugs you	1	2	3	4	5
12.12	Someone to have a good time with	1	2	3	4	5
12.13	Someone to get together with for relaxation	1	2	3	4	5
12.14	Someone to do something enjoyable with	1	2	3	4	5

Section 13: Culture

This section has questions concerning your culture. We are interested in knowing what kinds of behaviour would be considered to be in accordance with your culture and the kinds of behaviours that would be unacceptable according to your culture.

13.1 According to your culture men are entitled to have as many children as they wish to have

Strongly agree	1
Moderately agree	2
Moderately disagree	3
Strongly disagree	4

13.2 According to your culture, how wrong is it not to have children if you do not want to?

Always wrong	1
Usually wrong	2
Sometimes wrong	3
Never wrong	4

13.3 According to your culture, having children is a sign that you are a worthy woman.

Very true	1
Somewhat true	2
Somewhat untrue	3
Very untrue	4

13.4 According to your culture, for a man to have children is a sign that he is a worthy man.

Very true	1
Somewhat true	2
Somewhat untrue	3
Very untrue	4

Section 14: Pregnancy Experiences

Now I would like to ask you about your pregnancies and the health of your last born child.

14.1 How many children have you given birth to in your lifetime?

None	0
One	1
Two	2
Three	3
Four	4
Five	5
Six	6
Seven	7
Eight	8
Nine	9
Ten	10
More than ten	11

14.2 How many miscarriages have you had in total, if any?

None	0
1 to 2	1
3 to 4	2
5 or more	3

IF NEVER PREGNANT AND NEVER HAD MISCARRIAGES, PLEASE GO TO SECTION 17.

14.3 At the time you became pregnant with your last child, how much did you want to become pregnant then?

A great deal	1
A little	2
Not much	3
Not at all	4

IF RESPONDENT ANSWERED "A GREAT DEAL", THEN Q14.4 SHOULD BE "NOT APPLICABLE"

14.4 How much longer would you like to have waited?

	Months
	Years
9	Not applicable

14.5 When you were pregnant, to whom did you go for antenatal care for this pregnancy? (Circle as many as apply)

		Yes	No
A	No one	1	0
B	Doctor	1	0
C	Nurse/midwife	1	0

D	Traditional birth attendant	1	0
E	Other person (Please specify)	1	0

Where did you go for antenatal care the majority of times during the last pregnancy?

Public hospital	1
Private hospital	2
Public clinic	3
Public surgery	4
Private midwife's office	5
Other (please specify)	6
Not applicable	9

14.7 How many months pregnant were you when you first received antenatal care?

[ ] Months

14.8 How many times did you go for antenatal appointments during this pregnancy?

[ ] Times

14.9 What was the outcome of the pregnancy?

Full-term	1
Pre-term (premature)	2
Still-born	3
Voluntarily terminated pregnancy	4
Miscarriage	5

14.10 Did you have any complications at birth?

No	0
Yes (please specify)	1

14.11 Where did you give birth?

Home	1
Government Hospital	2
Day hospital/clinic/community health centre	3
Private hospital/clinic	4
Other (Please specify)	5

14.12 Who assisted with the delivery? (Please circle as many as apply)

	Yes	No
A. Doctor	1	0
B. Nurse/midwife	1	0
C. Traditional birth attendant	1	0
D. Relative/friend	1	0
E. Other (please specify)	1	0

14.13 Was your child delivered by caesarean section?

No	0
Yes	1

14.14 How much did your child weigh at birth?

	Kilograms
99	Do not know/do not remember

14.15. How old were you when you gave birth to your last child?

	Years
99	Do not know/do not remember

Section 15: Pregnancy and Alcohol Use

I would like you to now think about this pregnancy or the last time you became pregnant.

15.1 How many months pregnant are you right now?

Not Pregnant	0
1 month	1
2 months	2
3 months	3
4 months	4
5 months	5
6 months	6
7 months	7
8 months	8
9 months	9
Do not know	10

15.2 When last were you pregnant?

In the past year	1
More than one year but less than two years ago	2
More than two years but less than three years ago	3
More than three years but less than four years ago	4
More than four years but less than five years ago	5
More than five years ago	6

15.3 Did you plan to stop smoking because of the pregnancy?

No	0
Yes	1
Not applicable/Not smoking at time of falling pregnant	9

15.4 Did you plan to stop drinking because of the pregnancy?

No	0
Yes	1
Not applicable/Not drinking at time of falling pregnant	9

IF NOT APPLICABLE, PLEASE GO TO QUESTION 16.1

15.5 Whom among the following has advised you to stop drinking during pregnancy? (Please circle as many as apply)

		Yes	No
A	No one	1	0
B	Doctor	1	0
C	Nurse/midwife	1	0
D	Social Worker	1	0

E	Traditional birth attendant	1	0
F	Other person (please specify)	1	0

15.6 Please specify how your drinking changed when you received the advice, and the reason(s) for the change:

I stopped drinking	0	
I reduced my drinking	1	
My drinking did not change	2	
I increased my drinking	3	

15.7 Which of the following factors made it difficult for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	Influences from my friend(s)	0	1	2	3	4
B	Influences from my partner(s)	0	1	2	3	4
C	Influences from family member(s)	0	1	2	3	4
D	Stress	0	1	2	3	4
E	I felt addicted	0	1	2	3	4
F	I enjoyed drinking too much	0	1	2	3	4

15.8 Which of the following factors made it easy for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	My friend(s)	0	1	2	3	4
B	My partner(s)	0	1	2	3	4
C	Family members	0	1	2	3	4
D	Health and/or Social Services	0	1	2	3	4
E	Lack of stress	0	1	2	3	4
F	I did not feel addicted	0	1	2	3	4
G	I did not enjoy drinking anymore	0	1	2	3	4

15.9 During the three months <u>before you became pregnant</u>, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.10 During the three months <u>before you became pregnant</u>, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.11 During the three months before you became pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6

Now I would like you to think about the period during which you were pregnant…

15.12 After you knew you were pregnant, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.13 After you knew you were pregnant, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.14 After you knew you were pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6

15.15 After you knew you were pregnant, how easy/difficult was it to reduce/stop your drinking?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3
I did not try to reduce my drinking/I never drank before	9

Now I would like to ask you about your next pregnancy, if you were to become pregnant again in the future.

15.16 For you to abstain from alcohol during your next pregnancy would be:

Extremely good	1
Moderately good	2
Neither good nor bad	3
Moderately bad	4
Extremely bad	5

15.17 For you to abstain from alcohol during your next pregnancy would be:

Extremely easy	1
Moderately easy	2
Neither easy nor difficult	3
Moderately difficult	4
Extremely difficult	5

15.18 For you to abstain from alcohol during your next pregnancy would be:

Completely under your control	1
Moderately under your control	2
Neither under your control nor not under your control	3
Moderately not under your control	4
Extremely not under your control	5

15.19 Most people who are important to you think that you should abstain from alcohol during your next pregnancy:

Strongly agree	1
Moderately agree	2
Neither agree nor disagree	3
Moderately disagree	4
Strongly disagree	5

15.20 How likely is it that you will abstain from alcohol during your next pregnancy?

Extremely likely	1
Moderately likely	2
Neither likely nor unlikely	3
Moderately unlikely	4

Extremely unlikely	5

The next questions are about the health of your last born child, and of your children in general.

15.21 If your child has any problems, how severe are they?

	Not at all	Mildly	Moderately	Severely	Not applicable
A Social integration	0	1	2	3	9
B Physical growth	0	1	2	3	9
C Intellectual ability	0	1	2	3	9
D Learning	0	1	2	3	9
E Behavioural	0	1	2	3	9
F Specific facial	0	1	2	3	9
G Speech/language	0	1	2	3	9

15.22 Have you ever been told that a child of yours has foetal alcohol syndrome?

No	0
Yes	1
Maybe	2
Not applicable	9

Section 16: Male partners

The questions in this section are about the man who was in your life at the time of your last pregnancy.

16.1 Who was in your life?

No one	0
Father of the child	1
Someone else	2

IF NO ONE WAS IN YOUR LIFE AT THE TIME OF YOUR LAST PREGNANCY, PLEASE GO TO SECTION 18

16.2 How old was he then? _____years

16.3 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub b/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school – complete	15
Degree	16
Do not know	17

16.4 Did he work?

No	0
Yes	1

16.5 What was his occupation? That is, what kind of work did he mainly do?

Not working	9
Type of work	

Please indicate how strongly you agree or disagree with the following statements.

		Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
16.6	You were satisfied with your relationship with this person	1	2	3	4	5
16.7	Sometimes there were serious disagreements between you and him	1	2	3	4	5
16.8	Sometimes there was hitting or slapping between you and him	1	2	3	4	5
16.9	You had a lot of control in your relationship with him	1	2	3	4	5
16.10	There was a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
16.11	How often did he have a drink containing alcohol?	0	1	2	3	4
16.12	How often did you drink with him?	0	1	2	3	4
16.13	How often did he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
16.14	Was he or someone else ever injured as a result of his drinking?	0	1	2
16.15	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

16.16 How many drinks containing alcohol did he have on a typical day when he was drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5

16.17 Did you feel obliged to drink alcohol when your partner was drinking?

Never	0
Sometimes	1
Always	2

Section 17: Your Current Partner

We would now like to ask some questions about your current partner. Please note that these questions apply to all women in this study. They even apply to women who answered about a partner in Section 16.

17.1 Who is your current partner?

No one	0
The father of my last child	1
Not the father of my last child, because I do not have a child	2
Not the father of my last child, although I have a child	3

IF NO ONE, PLEASE MOVE TO SECTION 18.

17.2 Is your current partner the person you just spoke about in Section 16?

No	0
Yes	1
Not applicable (respondent skipped Section 16)	9

17.3 How old is he now? _____ years

17.4 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub B/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school – complete	15
Degree	16

17.5 Does he currently work?

No	0
Yes	1

17.6 What is his occupation? That is, what kind of work does he mainly do?

Not working	9

Type of work	

Please indicate how strongly you agree or disagree with the following statements.

	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
17.7 You are satisfied with your relationship with this person	1	2	3	4	5
17.8 Sometimes there are serious disagreements between you and him	1	2	3	4	5
17.9 Sometimes there is hitting or slapping between you and him	1	2	3	4	5
17.10 You have a lot of control in your relationship with him	1	2	3	4	5
17.11 There is a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
17.12	How often does he have a drink containing alcohol?	0	1	2	3	4
17.13	How often do you drink with him?	0	1	2	3	4
17.14	How often does he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
17.15	Has he or someone else ever been injured as a result of his drinking?	0	1	2
17.17	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

17.17 How many drinks containing alcohol does he have on a typical day when he is drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5

17.18 Do you feel obliged to drink alcohol when your partner is drinking?

No	0
Yes	1

Section 18: Religious Orientation

These questions inquire about some aspects of your religious life. Please answer each by choosing the option which best represents your normal practice.

18.1 How religious do you consider yourself to be?

Very religious	1
Quite religious	2
Fairly religious	3
Not very religious	4
Not at all religious	5

18.2 How often do you attend religious services?

Frequently	1
Often	2
Sometimes	3
Seldom	4
Never	5

18.3 How often do you pray?

Five times a day	1
More than twice a day	2
Once a day	3
Only when necessary	4
Seldom if ever	5

18.4 How often do you read the Holy Scriptures/Koran…..?

Daily	1
Often	2
Occasionally	3
Seldom	4
Never	5

18.5 How often do you watch or listen to religious programmes on television or radio?

Always	1
Frequently	2
Sometimes	3
Rarely	4
Never	5

18.6 How important is your religious belief in your daily life?

Of utmost importance	1
Of great importance	2
Of some importance	3

Of little importance	4
Of no importance	5

Section 19: Mass Media

Finally, this last section asks about you and the mass media: radio, television, newspapers and magazines.

19.1 Which magazine do you read most often?

19.2 Which local newspaper do you read most often?

19.3 Which national newspaper do you read most often?

19.4 Which radio station do you listen to most often?

19.5 Which television channel do you watch most often?

THANK YOU VERY MUCH

WE REALLY APPRECIATE YOUR HELP

I certify that this interview has been completed in full; with the respondent and according to the instructions I received from the trainers; and that the information I received will be kept strictly confidential.

SIGNED:

_____

(INTERVIEWER'S SIGNATURE)

_____

(DATE)

_____

(EXACT TIME OF COMPLETION)