The timing of first antenatal care visit and factors associated with access to care among antenatal care attendees at Chitungwiza municipal clinics, Zimbabwe

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A mini-thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health at the School of Public Health, University of the Western Cape

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May 2012

KEY WORDS

Antenatal care

Maternal health

Prevention of Mother to Child Transmission (PMTCT) of HIV

HIV

Pregnancy

Access to care

Health service utilization

Primary Health Care

Chitungwiza

Zimbabwe

ABSTRACT

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Background and Rationale

Antenatal care (ANC) is vital for accessing prevention of mother to child transmission (PMTCT) services. The timing of the first ANC visit is critical for HIV infected pregnant women to access antiretroviral (ARV) prophylaxis as recommended. In addition pregnant women access other interventions like syphilis screening and treatment, provision of ferrous iron supplements, malaria prevention and treatment, health education, identification and management of risk factors. There is however paucity of information on factors associated with the timing and adequate use of ANC services in Chitungwiza Township, Zimbabwe.

Aim

This study aimed to determine the factors associated with early access to and adequate use of ANC services among women attending ANC in the four polyclinics in Chitungwiza Township.

Method

The study included a retrospective record review of women who registered for ANC in 2010 and a cross sectional study of pregnant women attending ANC clinic for the first time during the current pregnancy during the survey period. Data on gestation age at first ANC visit, number of ANC visits, age, gravidity, parity, tetanus, iron sulphate, rhesus results, HIV test result, WHO clinical stage, CD4 count, cotrimoxazole, PMTCT option accepted, date of initiation of AZT or ART; partner HIV test results; and infant feeding adherence done was abstracted into an MS Excel spreadsheet from the 2010 ANC registers in the four primary health care clinics. Every fourth record was captured. Exit interviews were also conducted on all women attending ANC for the first time during the current pregnancy using a structured questionnaire. Questions on socio-economic status, pregnancy history, reasons for seeking ANC, knowledge and belief about ANC services and their perception of the service received were asked. The outcome variables were gestation age at first ANC visit and the number of ANC visits. The spreadsheet was imported into Epi Info 7.0.9.7 and STATA 11 for analysis. The questionnaires were captured into an Epi Info 7 database exported to STATA 11 for analysis. A sample of 1,236 of first ANC visit records were abstracted from the 2010 ANC registers in the four primary care clinics and 80 women coming for ANC were interviewed in three clinics. The prevalence of pregnant women attending ANC for the first time at gestation age less or equal

to 14 weeks and the prevalence of women with less than 4 ANC visits were computed. Pearson Chi-square tests were used to determine the strength of the relationships between the dependent variable (gestation age at the time of the first visit) and independent variables of age, marital status, level of education, parity, gravidity. All statistical tests were performed at 5% significance level and estimates were calculated at 95% confidence interval. Multiple logistic regression analysis was used to investigate the association between the outcome and the independent variables. Model interpretation was done using odds ratios (OR). Levels of knowledge and perception about ANC services as well as service content during the visit were also summarized.

Results

Less than 1% of the women who attended ANC in 2010 came for 1st visit at week 14 or less, while of the women interviewed, 2.5% came at similar gestation age. Thirty-nine percent of women attending ANC in 2010 had at least four visits. Lower parity and tetanus immunization were significantly associated with early ANC initiation, while tetanus immunization and syphilis screening were associated with the number of visits.

Among the interviewed women (n=80), 72.1% believed that a pregnant women should start ANC at 14 weeks or earlier. Most women (61.7%) cited having no money for booking as the reason for not coming earlier. Need for husband or partners permission, procrastination and not having any health problems with previous pregnancies were also a barrier to access. Uptake of HIV testing was very high at 94.7% of the women. However partner testing was very low at 2.1%. Knowledge of the appropriate time of the first ANC visit was somewhat high but not universal.

Conclusions and Recommendations

Timely and adequate uptake of ANC services is very low in Chitungwiza Township. The user-fees appeared to be a major barrier to accessing ANC timely. While correct knowledge about when to go for ANC and the health problems women face during pregnancy and childbirth is prevalent, other factors like the need for permission from spouse or partner and procrastination were barriers to seeking service. Abolishing maternity fees should be seriously considered in order to increase access to timely ANC services. Sustainable means of financing services without reducing quality should be sought. There was variable uptake of various interventions in the ANC package due in part to supplies stock outs. There is need for strengthening the procurement and distribution systems so as to ensure continuous supplies at service delivery level.

May 2012

DECLARATION:

I declare that *The timing of first antenatal care visit and factors associated with access to care among antenatal care attendees at Chitungwiza Municipal Clinics, Zimbabwe* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name **ERICA KUFA**   Date **28 August 2012**

Signed

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ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

3TC	Lamivudine
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal care
ART	Antiretroviral therapy
AZT	Azidothymidine
ARV	Antiretroviral
CCZ	Consumer Council of Zimbabwe
CI	Confidence Interval
CSO	Central Statistics Office
DHS	Demographic Health Survey
HIV	Human Immunodeficiency Virus
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome
IPT	Intermittent Preventive Treatment
IQR	Inter-Quartile Range
ITN	Insecticide Treated Net
MDG	Millennium Development Goal
MIMS	Multiple Indicator Monitoring Survey
MMR	Maternal Mortality Ratio
MOHCW	Ministry of Health and Child Welfare
NVP	Nevirapine
OR	Odds Ratio
PMNCH	Partnership on Maternal, Neonatal and Child Health
PMTCT	Prevention of mother-to-child transmission of HIV
Sd-NVP	Single dose nevirapine
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
WHO	World Health Organization
ZDV	Zidovudine
ZDHS	Zimbabwe Demographic Health Survey

CHAPTER 1 - INTRODUCTION

1.1   Background and Rationale

Antenatal Care (ANC) has been shown to improve pregnancy outcomes by identifying potential problems, limiting complications and providing appropriate care (Magadi *et al.*, 2000; Ahmed & Das, 1992; Anandalakshmy, Talwar, Buck-shee & Hingorani, 1993; Mbizvo, Fawcus, Lindmark & Nyström, 1993; Coria-Soto, Bobadilla & Notzon, 1996; Fawcus, Mbizvo, Lindmark & Nyström 1996; Hollander, 1997). The Partnership for Maternal, Newborn & Child Health (PMNCH) reported that if coverage of ANC services in Zimbabwe were increased to 90%, up to 160,000 more newborn lives would be saved (2006). ANC provides an opportunity to prevent, mitigate or manage health problems in pregnant women that can lead to adverse outcomes, provide health information and advice for healthy pregnancy, delivery and postnatal care so as to improve pregnancy outcomes (WHO, 2008). Cheap and effective interventions like the Prevention-of-mother-to-child-transmission of HIV (PMTCT), malaria intermittent preventive therapy (IPT), syphilis screening and treatment, iron therapy, tetanus immunization, family planning and nutritional supplementation are offered to improve outcomes (Gloyd, 2009). It is therefore important to understand the factors associated with optimal and sub-optimal utilization of ANC services.

The importance of PMTCT in the sub-Saharan African region where 92% of HIV-infected children live (UNAIDS, 2010) cannot be overestimated. Universal and timely access to ANC is vital for the effective delivery of PMTCT services. In 2000, the United Nations member states adopted the Millennium Development Goals (MDGs) at the Millennium Summit (WHO, 2010a). The fifth goal was set to reduce the maternal mortality by 75% between 1990 and 2015. The sixth goal was set to combat HIV/AIDS, malaria and other diseases with a target to achieve universal access to treatment for HIV/AIDS for all who need it by 2010. In 2001, the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) set a target for 80% of pregnant women and their children to have access to essential prevention, treatment and care by 2010 to reduce the proportion of infants infected by HIV by 50%, known as the UNGASS target 54 (WHO, 2010a). In 2009, the UNAIDS and WHO agreed to a target of virtual elimination of mother to child transmission of HIV (Sidibe & Tedstrom, 2010) which aims to reduce the number of new paediatric infections by 90% and population level mother-to-child transmission rate to below 5% between 2009 and 2015 (WHO, 2011).

Sub-Saharan Africa has disproportionately, the highest HIV burden in the world with 24 countries in the region having 87% of HIV infected pregnant women in low and medium income countries (WHO, UNAIDS, UNICEF, 2010). This increased HIV burden has been associated with an increase in

maternal mortality. Maternal mortality is defined as the death of a pregnant woman or a previously pregnant woman during a period of no more than 42 days after termination of the pregnancy, with the death being due to causes related to or aggravated by the pregnancy or its management but not from accident or natural incidence (WHO, 2010b). Worldwide there were an estimated 358,000 maternal deaths in 2008 and of these, 355,000 (99%) occurred in developing countries with sub-Saharan Africa and South Asia accounting for 87% (WHO, 2010b). In Zimbabwe, an estimated 42,000 deaths among pregnant women in 2008 were attributed to HIV/AIDS while in sub-Saharan Africa, HIV/AIDS accounted for 9% of maternal deaths (WHO, 2010b).

Maternal mortality ratio (MMR) was highest in sub-Saharan Africa at 640 maternal deaths per 100 000 live births in 1990 and increased by 26% to 870 in 2008. In Zimbabwe, the MMR increased by 102% from 390 to 790 per 100 000 live births during the same period (WHO, 2010b). While maternal mortality due to HIV may be underestimated because the HIV status of pregnant women is not always known, available data indicates that HIV-related maternal mortality has increased considerably (McIntyre, 2005). HIV/AIDS caused an estimated 6% of maternal deaths in Africa (Khan *et al.*, 2006). In a Durban tertiary hospital in South Africa, mortality among HIV infected women was more than twice the mortality among the uninfected and the attributable fraction of overall deaths due to HIV infection was 15.9% (Khan *et al.*, 2001). During the 1990s, as the AIDS epidemic increased, pregnancy-related mortality increased 1.9 and 2.5 times in Malawi and Zimbabwe, respectively (Bicego *et al.*, 2002). Kuhn *et al.* (2005) showed that in Zambia, uninfected infants born to mothers with advanced HIV infection with CD4+ T cells <350 cells/µl were more likely to die and be hospitalized. Timely HIV screening, assessment for indication for HIV treatment and provision of ART to those in need, during ANC contributes to the reduction of maternal mortality due to HIV.

The PMTCT strategy targets a 50% reduction in new infections among women of child-bearing age, reducing unmet need for family planning among HIV infected women to 0%, reducing HIV transmission of HIV from mother to child to less than 5% and reducing maternal, infant and child deaths due to HIV by 90% by 2015 (WHO, 2011). However, PMTCT programmes have mainly focused on reduction of vertical transmission by administering antiretroviral (ARV) prophylaxis to infected mothers during pregnancy and delivery and to the infants soon after birth (WHO, 2004). This makes ANC a critical platform for preventing vertical transmission over and above its traditional role in the provision of maternal health services.

Furthermore, issues regarding access to ANC services impact the delivery of PMTCT services. Recent changes to the WHO guidelines on provision of ARVs for PMTCT recommend that HIV

infected pregnant women who do not yet need antiretroviral therapy for their disease be started on ARV prophylaxis from 14 weeks gestation age instead of the previously recommended 28 weeks (WHO, 2010c). When an HIV infected woman first attends ANC therefore determines if they receive this recommended care. It is therefore important to understand the factors that influence when pregnant women first attend ANC.

1.2   Problem Statement

In 2010, the WHO updated the PMTCT guidelines and the major changes were that HIV infected pregnant women are started on ARV prophylaxis as early as 14 weeks gestation age or as soon as possible thereafter from the recommended 28 weeks (WHO, 2010c). Starting ARV prophylaxis earlier has been shown to reduce the risk of transmission in the prenatal period (Townsend *et al.*, 2009; Hoffman *et al.*, 2009). However for the HIV-infected women to fully benefit from the proposed changes in guidelines, they need to present for ANC at gestation age earlier than 14 weeks. The standard guidelines for ANC recommend that pregnant women attend the first ANC visit during the first trimester. While Demographic and Health Surveys collect these data at population level, the reports do not present an in-depth analysis of factors associated with the timing of the first ANC visit. Available data on the prevalence of women starting ANC early presents time categories as less than 4 months or 16 weeks; 16-27 weeks and 28 weeks or more. Data routinely reported by health facilities is typically aggregated thus limiting possible analysis. This study therefore sought to determine the proportion of women attending the first antenatal visit early, *i.e.* at 14 weeks of gestation or earlier and those that present for ANC late, *i.e.* at 15 weeks or later. More importantly, the study also sought to determine the factors associated with the timing of the first ANC visits among pregnant women attending primary care clinics in Chitungwiza urban township in Zimbabwe.

1.3   Motivation for conducting study

The purpose of this study was to assess when pregnant women access ANC services. The study also explored the factors associated with the time of initiation of ANC in order to recommend actions or interventions geared to motivate and enable pregnant women, especially those who are HIV infected, to seek ANC early.

1.4   Aims and Objectives

1.4.1 Aim

To describe the timing of the first ANC visit and determine the factors associated with initiation of ANC among pregnant women in Chitungwiza.

1.4.2 Objectives

- To determine the timing of the first ANC visit among pregnant women attending primary care clinics in Chitungwiza.
- To assess the factors associated with early or late initiation of ANC among pregnant women attending primary care clinics in Chitungwiza

CHAPTER 2 - LITERATURE REVIEW

2.1   HIV/AIDS, Maternal and Child Health

The UNAIDS estimated that there were 2,500,000 children infected with HIV globally with 2,300,000 of them in the sub-Saharan Africa region and Zimbabwe accounted for 150,000 (UNAIDS, 2010). Of the 400,000 newly infected children, an estimated 370,000 contracted HIV during the perinatal and breastfeeding period (UNAIDS, 2010).

Without any intervention, the risk of mother to child transmission of HIV is between 15% and 30% in non-breastfeeding populations. Breastfeeding increases the risk by 5% to 20% to a total of between 20% and 45% (De Cock *et al*., 2000). The WHO strategy for reducing mother-to-child transmission of HIV is four-pronged, aiming to reduce the incidence of HIV among women of childbearing age, eliminate unwanted pregnancies among those infected through access to family planning services, prevent transmission of HIV from mother-to-child through provision of antiretroviral (ARV) prophylaxis to infected women and provision of appropriate treatment, care and support to mothers living with HIV and their children and families (WHO, 2010a).

The risk of mother to child transmission of HIV can be reduced to below 2% by a number of interventions including provision of antiretroviral (ARV) prophylaxis to the mother, caesarean section delivery and avoiding breastfeeding (Read, 2005; Dorenbaum, 2002 & Thorne *et al.*, 2005). However in low-income countries like Zimbabwe, elective caesarian delivery is not often feasible and refraining from breastfeeding may not be acceptable or safe. Therefore PMTCT interventions have mainly focused on preventing infection around the time of labour and delivery, which accounts for up to two-thirds of transmission. In 2000, the WHO recommended that Zidovudine (ZDV) alone or in combination with Lamivudine (3TC) and Nevirapine (NVP) be used to reduce the risk of maternal transmission of HIV. The simplest regimen shown to be feasible and acceptable was a single dose of 200mg oral Nevirapine at the onset of labour and 2 mg per kilogram weight of Nevirapine to the infant within 72 hours of birth (WHO, 2004).

Based on further scientific evidence and expert opinion, the WHO updated the guidelines for PMTCT in 2004 (WHO, 2004). The key recommendations were that all HIV infected pregnant women who need ARV treatment for their own health should be put on antiretroviral therapy based on ARV treatment guidelines. Pregnant women with no indications for ARV treatment should be given prophylaxis. The recommended regimens were ZDV from 28 weeks pregnancy plus a single dose of NVP at the onset of labour for the mother and a seven-day course of ZDV for the infant. Alternative regimens based on ZDV alone, short-course ZDV + 3TC, or single-dose NVP

alone were also recommended. However, it was noted that the introduction of more complex but efficacious regimens should not hinder expansion of PMTCT programmes using the simple single-dose NVP and where possible countries could switch to the more complex regimens (WHO, 2004).

2.2   Antenatal Care as key arena for PMTCT

The WHO guidelines were further updated in and these recommended that HIV infected women with no indications for antiretroviral therapy (ART) should be given Azidothymidine (AZT) from 28 weeks of pregnancy or as soon as possible thereafter, and AZT and 3TC during delivery plus a single dose of Nevirapine (sd-NVP). This should be followed by AZT and 3TC for seven days post-delivery. A single dose of NVP and AZT for one week were recommended for the infants (WHO, 2006a). This recommendation required that women attend antenatal care (ANC) early during the course of pregnancy. The guidelines were updated again in 2010. The key change to the recommendation was that HIV infected pregnant women can be given AZT twice a day from 14 weeks of pregnancy or as soon as possible thereafter together with a single dose of NVP at onset of labour followed by AZT + 3TC for 7 days postpartum. Another recommended option was triple ARV prophylaxis from as early as 14 weeks continued until delivery. If the woman breastfeeds, prophylaxis should be continued until seven days after the infant stops breastfeeding (WHO, 2010c). Again key to these recommendations was that pregnant women attend ANC early enough to fully benefit from the prescribed regimens.

PMTCT using ARV prophylaxis largely depends on the identification of HIV infected women before or during pregnancy. Only 26% of pregnant women in low and medium income countries received an HIV test in 2009 up from 7% in 2005 (WHO, UNAIDS, UNICEF, 2010). In Eastern and Southern Africa, an estimated 50% of pregnant women were screened for HIV in 2009 while in Zimbabwe, the figure was 46% (WHO, UNAIDS, UNICEF, 2010). ANC plays a critical role in the identification of HIV positive pregnant women through HIV testing and counseling, which should be an integral part of care during pregnancy. The coverage of ANC services, timing of the first visit and health facility delivery or skilled birth attendance are therefore pivotal to the success of PMTCT programmes.

2.3   Benefits of ANC beyond PMTCT

Attendance of antenatal clinics and being attended to by a skilled professional at delivery are associated with a reduction in maternal mortality (Magadi *et al.*, 2006 & UNICEF). Interventions beneficial to mother and child like iron and folate supplements, screening and treatment of syphilis, monitoring of fundal height, malaria prevention, PMTCT and tetanus immunization are offered within ANC. It is important for women to begin attending ANC early to fully benefit from these interventions.

ANC is an entry point to health promotion and preventive services and promotes use of skilled assistance at delivery (Maternal and Child Health Division, 2007). Bloom *et al.* (1999) controlling for relevant socio-demographic and maternal history factors, showed that the odds of using trained assistance at delivery was almost four times higher in women who had relatively high level of ANC than those with relatively low level of ANC. ANC is an important determinant of safe delivery providing health education on how to recognize and act on symptoms leading to potentially serious conditions as a strategy for reducing maternal mortality (Nuraini & Parker, 2005).

ANC assists in preventing, detecting, alleviating and managing pregnancy complications, pre-existing conditions worsened by pregnancy and effects of unhealthy lifestyles (PMNCH, 2006). Basic elements of ANC include confirmation of pregnancy, monitoring of pregnancy progress, assessment of maternal and fetal well-being, detection and management of complications, tetanus immunization, iron and folic acid supplementation (WHO, 2007a & b). Health information and counseling on home care, safer sex, breastfeeding, family planning and healthy lifestyle, birth and emergency planning, information on danger signs in pregnancy and emergency preparedness are provided. Services like syphilis screening and treatment, infant feeding counseling, advice on mode of delivery treatment of opportunistic infections and provision of ART in cases of severe HIV infection; antimalarial intermittent preventive treatment (IPT), promotion of insecticide treated nets (ITNs) and treatment of malaria are also offered (WHO, 2007a & b).

2.4   Importance of timing of ANC visits

Following a multi-centre randomized control trial comparing the traditional ANC model with one with fewer visits and emphasis on interventions known to be effective (Villar *et al.*, 2001), WHO recommended a new model of ANC based on a focused four goal-oriented visits for women whose pregnancies are progressing well (PMNCH, 2006). The aim of the focused ANC package is to provide specific evidence-based interventions at critical times during pregnancy. It recommended that pregnant women make the first antenatal visit as early as possible in pregnancy in the first trimester. The second and third visit should be between 24 to 26 weeks and 32 weeks respectively, while the fourth visit at 36 to 38 weeks (PMNCH, 2006). The first visit focuses on confirming pregnancy and expected date of delivery, classifying the woman for basic four visit ANC or specialised care, screening, treating and giving preventative measures, advising and counselling as well as supporting the woman to develop and birth and emergency plan. The second visit should consist of assessment of the mother's and unborn baby's well being, exclusion of anaemia and pregnancy induced hypertension, reviewing and modifying the birth and emergency plan, in addition to preventive measures, advice and counselling. In addition to content of second visit, the third visit also consists of exclusion of multiple pregnancies. The fourth visit focuses on exclusion

of abnormal presentation over and above the focus of third visit (PMNCH, 2006). Majoko *et al.* (2007) conducted a randomized controlled trial of the standard ANC model and a five visit model in rural Zimbabwe. The study showed that reduced visit model was suitable for implementation in the local setting and more effective in that it increased adherence to procedures and there was better use of institutional health care. This varied from the WHO proposed four visit model in that it had more visits and the first visit was recommended earlier than 20 weeks. Second, third and fourth visits were recommended at 24 to 28 weeks, 32 to 34 weeks and 36 to 38 weeks respectively, with content similar to the visits in the four-visit model. An additional visit was recommended at 40 to 41 weeks which also focused on checking maternal and fetal wellbeing and referral for induction of labour at 42 weeks. The reduced visit model was adopted in Zimbabwe in 2008 with the guidelines recommending six visits for women with uncomplicated pregnancy and the first visit in the first trimester before 16 weeks (Ministry of Health and Child Welfare, 2008a). The guidelines recommend an earlier first visit at 16 weeks or earlier and a second visit 4 weeks later. Timing of the subsequent visit is similar to the timing third, fourth and fifth visits in the model used by Majoko *et al*. (2007).

2.5 Use of ANC services

The standard indicators used to track the use of ANC are the percent of pregnant women attending the ANC at least once during the given pregnancy and the percent of pregnant women attending ANC for at least four visits (WHO, UNICEF, 2003). UNICEF reported that the percent of women who attended ANC at least once between 2005 and 2009 was 72% in Africa. The percent of those who attended ANC at least four times during the same period was 45% in Africa and 39% in East and Southern Africa (UNICEF, 2011).

Eastern and Southern Africa is the epicenter of the global HIV epidemic. Of the 25 countries which carry the largest number of HIV-positive pregnant women in low and medium income countries accounting for 91% of global need for PMTCT, 16 (Angola, Burundi, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe) are in Eastern and Southern Africa (Mahy *et al.*, 2010). The latest Multiple Indicators Monitoring Survey (MIMS) done in 2009 reported that 93% of pregnant women in Zimbabwe who delivered in the preceding two years received ANC at least once in the last pregnancy. The Zimbabwe Demographic and Health Survey (ZDHS) reported that 93.8% and 71.1% of women who had a live birth in five years preceding the 2005-6 survey had at least one and four ANC visits respectively during their last pregnancy (CSO, 2007).

In sub-Saharan Africa, most women start attending ANC late, *i.e.* after the first trimester and do not return for subsequent visits. Numerous studies have been done on the factors and reasons

related to late entry into ANC and inadequate access (Atuyambe *et al.*, 2008; Van Eijk *et al.*, 2006; Ochako *et al.*, 2011; Myer & Harisson, 2003, Magadi *et al.*, 2007 & Jimoh, 2003). Shamkhada *et al.* (2007) did a review of literature on the factors affecting utilization of ANC services in developing countries. The common factors affecting utilization of services were maternal education, husband's education, marital status, availability of services, cost, household income, women's employment, media exposure and a history of pregnancy-related complications. Educated women are likely to start ANC early (Miles-Doan & Brewster, 1998; Matthews *et al.*, 2001) and receive the recommended number of visits (Nielson *et al.*, 2001 & Erci, 2003). Women with at least secondary education in Kenya were more likely to go for ANC early and make the first visit earlier than those with primary education but those with no education were 1.7 times more likely to seek ANC early than those with primary education (Ochako *et al.*, 2011). The authors postulated that this may have been because of the lower proportion of women with no education compared to those with primary education (14% compared to 65% respectively). It also postulated that it may be because less educated women were more likely to be married and more likely to access targeted towards married women. In Andra Pradesh, India (Navaneetham & Dharmalingam, 2002) and the Philippines (Miles-Doan & Brewster, 1998), the husband's education was a strong predictor of increased ANC use while in Karnataka it was not (Matthews *et al.*, 2001).

A higher parity was observed to be a barrier to adequate use of the service (Erci, 2003; Nielson *et al.*, 2001, Glei *et al.*, 2003, Bhattia & Cleland, 1995, Sharma, 2004, Mekonnen & Mekonnen, 2003). However in women with higher parity used ANC more often in Ethiopia (Mekonnen & Mekonnen, 2003) and earlier in India (Matthews *et al.*, 2001). While some studies have found that women in their thirties attend ANC earlier and more frequently than teenagers and older women (Bhattia & Cleland, 1995; McCaw-Binns *et al.*, 1995; Miles-Doan & Brewster, 1998, Matthews *et al.*, 2001), some have shown that age was not a significant predictor of ANC utilization (Celik & Hotchkiss, 2000; Nasir & White, 2003; Overbosch *et al.*, 2004; Kabir *et al.*, 2005). The relative importance of parity as opposed to age as a factor is also debatable as adolescents were more likely to present for ANC about two and a half weeks later and make fewer visits in their second pregnancies (Smith & Pell, 2001; Blankson *et al.*, 1993). There was a significant association of the age at marriage and at pregnancy with utilization of ANC services (Sharma (2004), Pallikadavath *et al.* (2004), Obermeyer and Potter (1991), Bhattia and Cleland (1995), Matthews *et al.* (2001), McCaw-Binns *et al.* (1995), Ciceklioglu *et al.* (2005), Miles-Doan and Brewster (1998)). Married women were more likely to have more ANC visits and go for the first visit earlier (McCaw-Binns *et al.*, 1995 & Glei *et al.*, 2003). In Kenya, unmarried women who started childbearing below 20 years of age had fewer ANC visits than married women who started childbearing later (Magadi *et al.*, 2000).

Waiting time and availability of service or a healthcare worker have been shown to be associated with utilization. In Kenya and Tamil Nadu, South India, women who lived near village health worker or nurse were more likely to receive adequate and early ANC visits than women without one (Magadi *et al.*, 2000 & Neilson *et al.*, 2001). Availability of local community health care workers encouraged women to use ANC services (Griffith & Stephenson, 2001). Long waiting periods were a barrier to use (Chowdhury *et al.*, 2003 & Mathole *et al.*, 2004) and the opening times of the service were an important factor in a Bangladesh urban slum (Chowdhury, 2003). Increasing distance or time travelled to health facility was associated with fewer ANC visits (Magadi *et al.*, 2000), and uncomfortable transport, poor road conditions and difficulties in crossing big rivers were also barriers to access (Chowdhury *et al.*, 2003; Mathole *et al.*, 2004; Mumtaz & Salway, 2005).

Adamu & Salihu (2002) and Overbosch *et al.* (2004) found that costs of service were a major factor deterring use of service. Women of higher economic status received adequate and earlier ANC than those of low economic status (Magadi *et al.*, 2000). White collar workers or civil servants used ANC more than housewives and unemployed women (Miles-Doan & Brewster, 1998; Kabir *et al.*, 2005) and those in paid employment started ANC earlier (Magadi *et al,* (2000). Women whose husbands were unemployed or labourers had inadequate ANC access (Ciceklioglu *et al.*, 2005). The Chitungwiza municipal clinics currently charge US$30 for antenatal, delivery and postnatal care.

Health insurance coverage had a positive impact on the use of ANC services (Ciceklioglu *et al.*, 2005; Celik & Hotchkiss, 2000). Women who experienced complications during earlier pregnancies were significantly more likely to seek ANC early and have adequate visits (McCaw-Binns *et al.,*1995 & Paredes *et al.,* 2005). Some women sought ANC late because they were not sure that they were pregnant (Myer & Harisson, 2003). In Zimbabwe, fear associated with local beliefs about early pregnancy period being most vulnerable to witchcraft and fear of being tested for HIV and the result being recorded on ANC card were cited as reasons for coming after the first trimester. Others feared that they may be bewitched if the blood collected ended up in the wrong hands (Mathole *et al.*, 2004). In rural Zimbabwe, poor quality of care and health workers' negative attitudes were barriers to utilization of ANC services according to Mathole *et al.* (2004).

Unintended pregnancies were associated with less use of ANC because of delays in recognizing or acknowledging the pregnancy. Knowledge and use of family planning had a positive effect on ANC use in Nepal, India, Kenya and Jamaica (McCaw-Binns *et al.*, 1995 & Magadi *et al.*, 2000).

National Demographic and Health Surveys (DHS) also report data on the distribution of women with a live birth in the preceding 5 years by the number of antenatal visits during the last pregnancy and timing of first antenatal visit during that pregnancy. Information from the DHS is however limited in that the only factor included in the reported analysis is residence (ICF International Inc, 2011). The ZDHS in 2005-6 reported that 27.2% of pregnant went for the first ANC visit before four months gestation age, while 42.6% attended between four and five months; 22.2% between six and seven months and 2.6% at eight months or later. The median gestation age at first ANC visit was 5 months (CSO, 2007). The Ministry of Health and Child Welfare (2009) national health profiles indicated that in Chitungwiza, 33.4% of women attending ANC in 2008 attended before 16 weeks pregnancy and 32.7% attended in the last trimester, that is at 28 weeks or more. At the national level, 19.5% of pregnant women first attended ANC at less than 16 weeks.

CHAPTER 3 - METHODOLOGY

3.1   Study Design

The study is a quantitative observational cross-sectional survey describing and quantifying factors associated with early and late ANC seeking.

3.2   Study population

The study population was pregnant women seeking antenatal care at all 4 primary care clinics in Chitungwiza.

The Central Statistics Office projected the 2012 population figures for Chitungwiza as follows: total population of 357,116; with 87,101 women of child-bearing age; 16,570 expected pregnancies and 16,570 expected deliveries (CSO, 2004). The average ANC attendance over the period 2006 to 2008 was 6585 ranging from 4496 to 8774 (MOHCW, 2007; MOHCW, 2008b; MOHCW, 2009). No precise data on family planning use in Chitungwiza are available. However, the use of any family planning method and use of modern family planning methods in the Harare region were 71.9% and 70.2% respectively in 2005/6 (CSO, 2007). Chitungwiza is traditionally a dormitory town to Harare. A 1990 Chitungwiza Socio-Demographic Survey by the University of Zimbabwe showed that 67.5% of currently married women were using modern family planning methods (Mupambirei & Ziramba, 2002).   The public health system in Chitungwiza is organized such that there are four polyclinics (Seke North, Seke South, St Mary's and Zengeza) run by the municipal authorities and a government hospital serves as a referral center for the clinics and Mashonaland East Province which is the administrative hierarchy.

3.3   Study Sample

3.3.1   Sample Size

For Data abstraction

The sample size estimation of 2,094 was based on the average of annual ANC bookings reported between 2006 and 2008 at 6,585, and using the average of those reported starting ANC at 14 weeks or less, an estimated 23.6% of pregnant women initiating at ANC prior to 14 weeks and allowing for 10% for missing variables and unusable records (MOHCW 2007, MOHCW 2008, MOHCW 2009). However the number of ANC bookings based on the registers rounded up to the next hundred was 1,500 in Zengeza and Seke South clinics, 1,600 in St Mary's clinic and 1,200 in Seke North. Using the Epi Info StatCalc program assuming a confidence level of 95% and allowing

10% for missing variables or unusable records, the sample size was calculated to be 258, 258, 260 and 225 for the respective clinics giving a total of 1,024.

For exit interviews with women attending ANC

All women attending ANC for their first visits from 23 - 30 April 2012 were eligible for inclusion in the survey. The average weekly number of ANC first visits for Seke North, Seke South, St Mary's and Zengeza was 22, 28, 30 and 28 respectively.

3.3.2   Sampling Procedures

Data abstraction

Abstraction of data was conducted in the four clinics over a 4 day period beginning 16th April 2012. Four data collectors were recruited and trained on the line listing of the variables to be abstracted and the ANC registers. Data from the ANC registers covers the whole year to minimize effects of seasonal patterns. However, limited socio-demographic data is collected on the women.

Abstraction of data from ANC registers: A systematic sampling procedure was applied. Every 4th record for a first ANC visit in the ANC registers for the year 2010 was abstracted into the survey data collection tool. The year 2010 was selected as it is the latest year for which the whole cohort completed all ANC visits and the registers no longer being used so as not to disrupt service in the clinic.

Exit interviews

Consecutive sampling of all pregnant attending ANC for the first visit was done. ANC "bookings" or first visits are done on Mondays. Sampling was done on two consecutive Mondays – 23th and 30th of April 2012 in the four clinics. Data was collected through questionnaire-based interviews.

First ANC visits are attended to on Mondays when women are given a lecture/health talk, a tour of the health facility, examinations and tests. Due to the long waiting times, response rates were low and therefore the data collection was done on two consecutive Mondays to achieve the sample size. The exit interviews allowed for collection of socio-demographic data and more importantly, elicited reasons for the timing of the first ANC visit.

3.4   Variables

The following variables were abstracted from the ANC registers:

Outcome- date of booking, date of last menstrual period, gestation age at first ANC visit, number of ANC visits during the pregnancy.

Covariates- age, gravidity, parity, tetanus, iron sulphate, rhesus results, HIV test result, WHO clinical stage, CD4 count, cotrimoxazole, PMTCT option accepted, date of initiation of AZT or ART; partner HIV test results; and infant feeding counselling done.

The following variables were collected using the exit interviews:

Outcome-gestation age at first ANC visit

Covariates- residence, distance from clinic, time travelled to clinic, marital status, level of education, occupation, partner's level of education, partner's level of education, household income, economic status, antenatal history, whether pregnancy was planned or not, use of family planning, knowledge and beliefs about ANC, reasons for timing of ANC first visit, reasons for attending ANC, perceptions about service

3.5   Data management and analysis

Data abstracted from the ANC registers were captured into customized MS Excel spreadsheets. The data was imported into Epi Info 7.0.9.7 and STATA version 11 for analysis. Data were reviewed at the end of each day and issues raised rectified the next day. Ten percent of records were sampled and cross-checked with the ANC registers for validation.

Data from exit interviews was collected using hard copy questionnaires and captured using Epi Info 7.0.9.7.

Univariate analyses was done including the calculation of the prevalence of pregnant women attending ANC for the first time at gestation age less or equal to 14 weeks and the prevalence of women with less than 4; and between 4 and 6 visits during pregnancy. Analytical statistics were used to assess association between dependent and independent variables. Pearson Chi-square tests were used to determine the strength of the relationships between the dependent variable (gestation age at the time of the first visit) and independent variables of age, marital status, level of education, parity, gravidity. All statistical tests were performed at 5% significance level and estimates were calculated at 95% confidence interval.

Multiple logistic regression analysis was used to investigate the association between the outcome and the independent variables. Model interpretation was done using odds ratios (OR).

3.6   Validity

The data abstraction study collected measurable data known to be important factors for ANC and recommended within the ANC registers. These were collected at the time of the first visit by the

nurses for the purpose of managing antenatal care attendees. The exit interviews were limited to women attending ANC for the first time during the current pregnancy. Data like the gestation age was validated using the woman's ANC card.

Generalization of findings will be limited only to women attending antenatal care in Chitungwiza municipal clinics. Generalization to all urban areas may be limited due to tariff differences with other areas. The tariffs in Chitungwiza municipal clinics are higher than in government-operated clinics while lower than in the private sector. Sampling for the data abstraction study was done over the whole year to avoid biases associated with seasonality.

3.7   Reliability

The data were abstracted from the existing registers using a specific sampling method that can be replicated to obtain the same measures.

The questionnaire for the exit interviews was pretested and translated into Shona, which is the predominant language in the area. Internal consistency was ensured by asking related questions differently.

3.8   Limitations of the study

Since the study employed a cross-sectional design with both outcomes and the independent variables measured at the same time, cause-effect relationships cannot be demonstrated.

The study was also localized in an urban township and may not be representative of the entire country or all urban areas. The survey findings may be generalized to the population who use ANC services offered in the public clinics in similar urban areas. Findings may not be generalizable to those in rural areas and those in urban areas who seek services in the private sector.

The data was abstracted from only the ANC register, therefore associations with the obstetric outcomes recorded in the delivery and the postnatal care registers was not possible.

3.9   Ethical Considerations

3.9.1   Approvals

Ethical approval for the study was granted first by the University of the Western Cape's Senate Research and Ethics Committee (Annex 1). Permission was sought and obtained from the Chitungwiza Municipal authorities to both access data from the registers and conduct interviews in their clinics.

3.9.2 Confidentiality

Data was collected on secured personal laptops, saved on one central computer and deleted from the other computers after the data collection and back-up. The data files were stored on password protected DVDs which were kept secured with access only to the investigator and study supervisor.

Data from the questionnaires were captured into a database which is password protected. Hard copies of the questionnaires have been securely stored and data from the survey will be used only for the authorized purposes and in the case of any additional uses, explicit permission will be sought from the Chitungwiza Municipal authorities. No personal details identifying participants were collected.

3.9.3 Informed consent

Each participant interviewed signed a consent form after a briefing on the survey. The consent form was available in Shona and English (Annex 2). For the data abstraction, once approval has been granted at the municipality head office, consent for conducting the exit interviews at the clinic at specific times and extracting data was sought from respective clinic management.

3.9.4 Benefits of the study

Survey participants were provided with pamphlets with information on the benefits of ANC, HIV and syphilis screening and infant feeding. Due to the long waiting times, refreshments in the form of a drink and cookies were provided for participants who, by the time of the interview had been waiting for at least 3 hours. The results of the survey will be made available for use by Chitungwiza municipality to improve service delivery so as to increase access to quality ANC services.

3.9.5 Risks for participating in the study

There were no anticipated risks to participants save for misunderstanding of the information on the pamphlets. To minimize this, the pamphlets in local language were made available.

CHAPTER 4 - RESULTS

4.1   ANC register abstractions

A total of 1,265 records were abstracted from ANC registers from all four clinics. After excluding 29 records which were missing age, gestation age, gravidity or number of ANC visits, a total of 1,236 records were included for analysis (Figure 1). The demographic distribution for the sample is shown in Table 1. The median age was 25.5 years [interquartile range (IQR 21.0- 29.5 years)] with a range of 15 to 44 years while the median gravidity was 2.5 (IQR 1.0-3.0). The median parity was 1 (IQR 0.0-2.5). Of the women, 5.3% had no HIV test result recorded in the register.   The antimalarial variable was discarded at collection as Chitungwiza is in a non-malaria endemic or epidemic area and therefore IPT is not provided as part of ANC.

Figure 1: Mapping of records abstracted from ANC registers
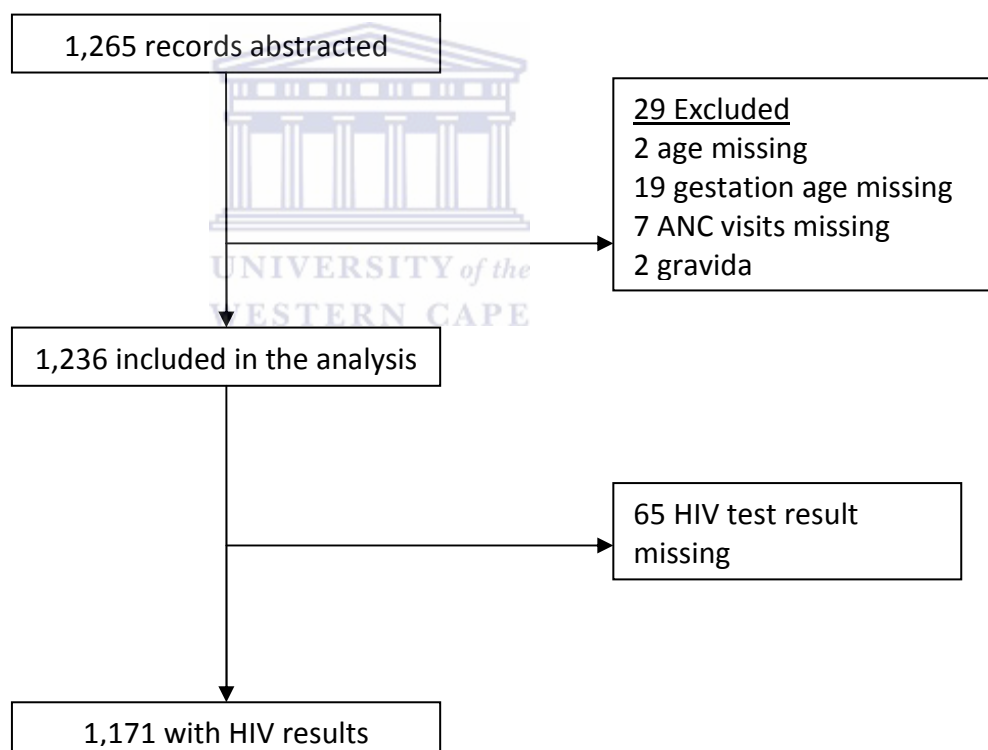
Number of ANC visits and gestation age at first ANC visit

Thirty-nine percent (38.8%) of women had at least 4 ANC visits and 10.9% had at least 6 visits recommended in the national ANC guidelines. The median number of ANC visits per woman was 3 [IQR (2-4 visits)] with a range of 1 to 7. The median gestation age at first ANC visit was 31.5 weeks [IQR (27.5-35.0 weeks)]. Less than one percent (0.7%) of women first attended ANC at gestation age of 14 weeks or earlier, which is the recommended gestation age for initiating ANC. Increasing

the gestational age threshold to 22 weeks, showed that 8.6% of women first came for ANC at 22 weeks or earlier.

Figure 2 shows proportion of women who first came for ANC at 22 week or earlier and of those with at least 4 ANC visits. The differences in the proportions across the 4 clinics were not statistically significant. Only 0.4% had adequate ANC defined as having the first visit at 14 weeks or earlier and at least 4 visits.

Table 1: Characteristics of early bookers compared to late bookers among women attending ANC in Chitungwiza primary care clinics, data from ANC registers

Variable (n, %)	Early bookers[†] (N=106)	Late bookers[α] (N=1130)	p-values	<4 ANC Visits	4+ ANC Visits	p-value
Clinic						
Seke North	27 (25.4)	215 (22.2)		190 (25.1)	88 (18.4)	
Seke South	36 (34.0)	340 (30.1)	0.292	204 (27.0)	172 (35.9)	0.001*
St Mary's	18 (17.0)	286 (25.3)		198 (26.1)	106 (22.1)	
Zengeza	25 (23.6)	253 (22.4)		165 (21.8)	113 (23.6)	
Age						
<25	62 (58.5)	511 (45.2)	0.009*	336 (44.4)	237 (49.5)	0.080
>=25	44 (41.5)	619 (54.8)		421 (55.6)	242 (50.5)	
Parity						
0	55 (51.9)	420 (37.2)	0.003*	258 (34.1)	217 (45.3)	0.000*
1+	51 (48.1)	710 (62.8)		499 (65.9)	262 (54.7)	
HIV Status						
Negative	90 (84.9)	954 (84.4)		629 (83.1)	415 (86.7)	
Positive	10 (9.4)	117 (10.4)	0.943	88 (11.6)	39 (8.1)	0.142
No Test Result	6 (5.7)	59 (5.2)		40 (5.3)	25 (5.2)	
Syphilis Status						
Negative	70 (74.5)	791 (70.0)		513 (67.8)	357 (74.5)	
Positive	0 (0.0)	3 (0.3)	0.559	2 (0.2)	1 (0.2)	0.040
No Test Result	27 (25.5)	336 (29.7)		242 (32.0)	121 (25.3)	
Tetanus Immunization						
Yes	94 (88.7)	1,010 (89.4)	0.823	662 (87.5)	442 (92.3)	0.007*
No	12 (11.3)	120 (10.6)		95 (12.5)	37 (7.7)	
Iron supplement						
Yes	7 (6.6)	165 (14.6)	0.023	95 (12.5)	77 (16.1)	0.081
No	99 (93.4)	965 (85.4)		665 (87.5)	402 (83.9)	

*p<0.01, [†]Early bookers=starting ANC at <= 14 weeks, [α]Late bookers =starting ANC at >14 weeks

p-value calculated from chi-square

Figure 2: Proportion of women attending ANC at <=22 weeks gestation age and 4 or more ANC visits in 4 primary health care clinics, Chitungwiza (n= 1,236)
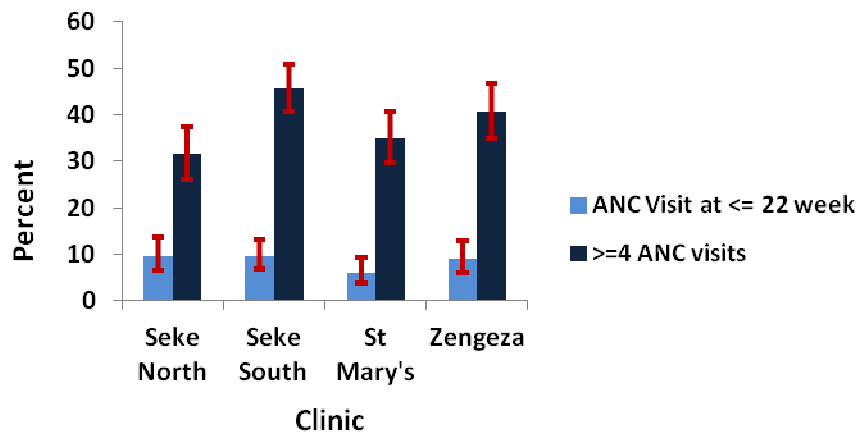
Decreasing age (OR=1.7, p=0.012), lower parity (OR=1.8, p=0.003) and receiving iron supplements were associated with first visit at 14 weeks or earlier, while parity (OR=0.6, p=0.0001) and receiving tetanus immunization (OR=1.7, p=0.008) were associated with the number of ANC visits the pregnant women made. The gestation age at first ANC visit and number of ANC visits were not significantly different among those who tested positive for HIV, or negative or did not receive result or accept the test. Table 2 shows the univariate analysis of the independent factors associated with early ANC initiation and adequate number of ANC visits. Stratified analysis showed that receiving iron supplements and tetanus immunization were not significantly associated with earlier initiation of ANC of adequate number of visits among the lower and higher parity women.

Table 2: Univariate analysis of factors associated with early ANC initiation and adequate visits among women attending ANC in Chitungwiza primary care clinics, data from ANC registers

Variable	Gestation age at 1st visit			Number of ANC visits		
	OR	CI	p-value	OR	CI	p-value
Age	1.7	1.1-2.5	0.012*	0.8	0.6-1.0	0.09
Parity	1.8	1.2 - 2.7	0.003**	0.6	0.5-0.8	0.0001**
HIV status	1.1	0.6-2.2	0.908	0.7	0.5-1.0	0.060
Iron supplementation	2.4	1.1-5.3	0.019*	1.3	1.0-1.8	0.091
Tetanus immunization	1.1	0.6-2.0	0.869	1.7	1.2-2.6	0.008**
Syphilis screening	0.8	0.5 -1.3	0.375	1.4	1.1-1.8	0.012*

*p<0.05, **p<0.01

p-value calculated from chi-square

In the multivariate regression analyses, parity was significantly associated with gestation age at first visit but not with adequate ANC visits. Women with parity of 1 or more were likely to start ANC later. There was a significant association between tetanus immunization and both gestation

age at first visit and number of ANC visits. Syphilis screening had a significant relationship with the number of ANC visits (Table 3). Age and HIV test result were not significantly associated with either outcome.

Uptake of elements of ANC

Various elements are offered as part of ANC services. Table 4 below shows the proportion of women who received each component of ANC. There was variable uptake of the various components with the uptake highest in HIV testing and lowest in partner HIV testing. Among the HIV-infected women identified, 70% had a CD4 count done, 80.3% had a clinical assessment of HIV/AIDS treatment eligibility, 65.2% were provided with either ART or ARV prophylaxis. Only 33.1% had received infant feeding counseling. Of the women who received ARV drugs, 9.5% were provided with a single dose of nevirapine.

Table 3: Predictors of early initiation of ANC and adequate number of visits using multivariate regression model among women seeking ANC in 4 Chitungwiza primary care clinics

Variable	Regression Coefficient (s.e)	p-value
Gestation age at 1st visit		
Age	0.017 (0.043)	0.686
Parity	0.854 (0.219)	0.000*
Iron supplementation	0.507 (0.448)	0.259
Tetanus immunization	-1.483 (0.496)	0.003*
Syphilis screening	0.003 (0.003)	0.430
Number of ANC visits		
Age	0.001 (0.013)	0.910
Parity	-0.108 (0.067)	0.107
Iron supplementation	0.270 (0.138)	0.049
Tetanus immunization	0.593 (0.151)	0.000*
Syphilis screening	0.004 (0.001)	0.001*

p-value calculated from chi-square

4.2   Exit Interviews of women attending ANC

A total of 96 women were interviewed from the four clinics. However due to last minute logistical challenges an adequate sample size could not be achieved in one clinic and it was excluded from analysis. Figure 3 presents a mapping of the data collected in these interviews. The demographic distribution of the sample is shown in Table 5. The sample was fairly homogeneous with regard to marital status (96.3% were married), place of residents (96.3% stayed in Chitungwiza),

husband/partner's education (81.3% completed secondary school) and whether or not they were currently living with spouse or partner (95% were currently living with spouse or partner).

Table 4: Percent of women receiving interventions during ANC visit in four Chitungwiza primary care clinics, data from ANC registers

ANC component	% of women received service
N=1,236	
Blood group typing	69.7
Blood pressure measurement	69.5
Iron supplement	13.8
Syphilis screening	70.6
Tetanus immunization	89.3
Weight	93.7
HIV testing	94.7
Partner HIV testing	2.1
N=127 [α]	
CD4 count	70.1
ART / ARV prophylaxis	65.2
Infant feeding counselling	33.1
Clinical staging	80.3
Cotrimoxazole	4.7

[α] N=number of HIV positive women

Figure 3: Mapping of collected data during exit interviews in 4 primary health care clinics, Chitungwiza
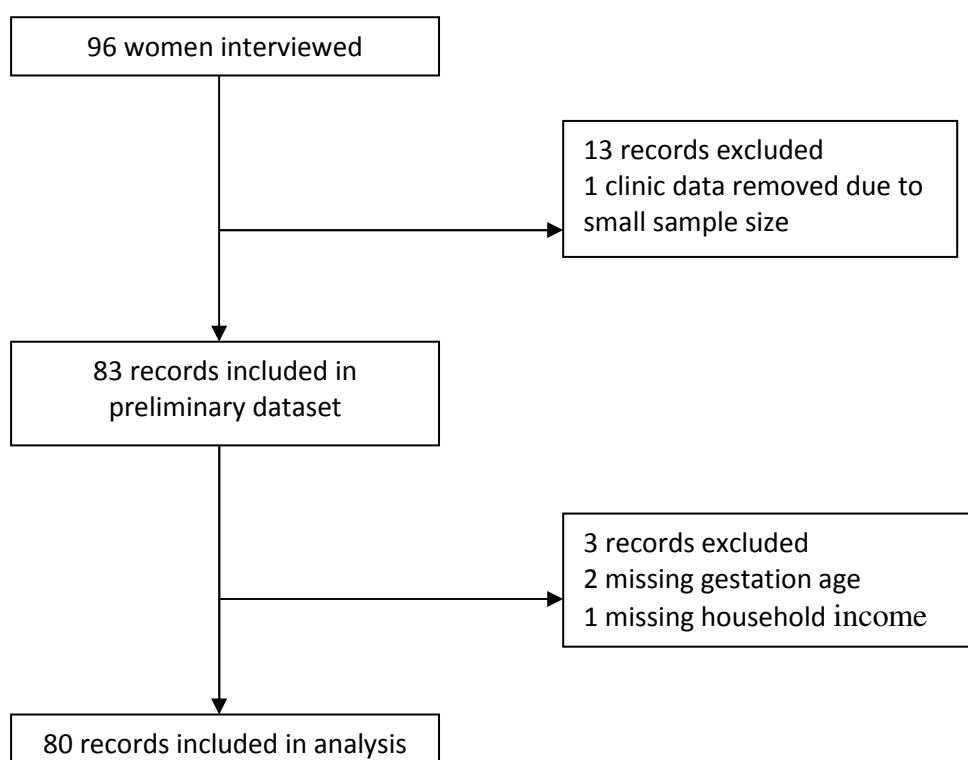
Approximately 71% of the women were unemployed and 20.5% reported being traders/vendors or being self-employed without specifying the nature of the employment. Sixty-eight percent of women walked to the clinic and 31% used public transport to get to the clinic, with the median transport cost being $0.75 [IQR($0.45-$0.75)]. Eighty percent took less than half an hour to get to the clinic.

Eighty women were included in the analysis of the exit interviews. The median age was 24.5 years [IQR (20. -29.5 years)]. Median gravidity was 2 [IQR (2-3.5)]. Parity ranged from 0 to 4 with median of 1. Twenty-five percent of the women reported that their pregnancies were unplanned. Ninety-five percent of the women reported having accepted an HIV test. The median number of years spent in school among the women was 11 years, [IQR (9.5-11 years)]. This is equivalent to the years spent to complete the General Secondary School Ordinary Level Certificate.

Gestation age at first ANC visit

The gestational age at first booking was 29.5 weeks [IQR (25.5-34 weeks)] and ranged from 4 to 39 weeks. Only 2.5% of the women presenting for their first ANC visit had gestation age ≤ 14 weeks, a proportion higher that suggested by the abstraction of 2010 data. Using a threshold of 22 weeks, 12.5% of the women first came for ANC at week 22 or earlier. There were 43 women with gravidity of 2 or more, who attended ANC during the previous pregnancy and reported gestation age at which they started ANC. Of these, 74.2% started ANC during the current pregnancy, later than during the previous pregnancy. The women also reported on the gestation age they thought pregnant women should start ANC, which we defined as ideal gestation age at first visit. Reported median ideal gestation age at first ANC visit was 12.5 weeks, IQR(12.5-16.5 weeks) with a range of 3 to 28 weeks, while 72.1% of the women thought first ANC visit should be at 14 weeks or earlier and 81% believed first visit should be at 16 weeks or early.

A univariate analysis showed no significant association of age, gravidity, reported ideal gestation age, planned pregnancy, role in decision making on how money is spent, use of modern family planning methods or level of income with the gestation age at first ANC visit. Since none of the factors had a significant association, regression model was not done (Table 6).

Reported reasons for late initiation of ANC

The most common reason for starting ANC late was not having money for ANC fees which are required to be paid in full at the first visit even though it covers ANC, delivery and postnatal visit. Among those with previous pregnancies, not having had any problems with the previous pregnancy was reported as a reason for delay. Shown in Figure 4, are the reasons cited for delayed ANC first visit and the proportion of women citing them. The woman, or her husband or partner being away was cited as a reason for delaying seeking ANC by 8.8% of the women. These were

mainly women who have homes in both Chitungwiza and the rural areas or in the diaspora (mainly Botswana and South Africa) and either took time to decide where they would deliver or delayed coming to Chitungwiza. In Shona, there is a tradition of sending the woman back to her family for delivery of the first child known as "*kusungira*". The ceremony for this comes with the cost of the goat and other stuff required. Some women cited delays in this ceremony being done as a reason for delay, as this can determine where the woman will deliver, if her family is in a different locale. Procrastination was also reported as a factor reported by 11.3%. In one clinic a woman reported that she had first come for ANC at 4 weeks and was told to come back when the pregnancy was 3 months or more.

Table 5: Demographic distribution of sample, among pregnant women attending ANC for the first time during current pregnancy, 3 Chitungwiza primary care clinics.

Variable (n,%)	Early Bookers[‡] (N=10)	Late Bookers[α] (N=70)	p-value	Variable (n,%)	Early Bookers[‡] (N=10)	Late Bookers[α] (N=70)	p-value
Clinic				*Who decides on how money is spend*			
Seke North	4 (40.0)	13 (18.6)	0.062	Self	1 (10.0)	11 (15.7)	0.824
Seke South	4 (40.0)	25 (35.7)		husband/partner	3 (30.0)	15 (21.4)	
St Mary's	2 (20.0)	32 (45.7)		Jointly	6 (60.0)	41 (58.6)	
Woman's education				Others	0 (0.0)	3 (4.3)	
Primary	2 (20.0)	21 (30.0)	0.670	*Planned Pregnancy?*			
Secondary	8 (80.0)	47 (67.1)		No	2 (20.0)	18 (25.7)	0.696
Tertiary	0 (0.0)	2 (2.9)		Yes	8 (80.0)	52 (74.3)	
Travel Time				*Use family planning*			
<15 minutes	5 (50.0)	36 (51.4)	0.911	No	7 (70.0)	36 (51.4)	
15-29 minutes	3 (30.0)	20 (28.6)		Yes	3 (30.0)	34 (48.6)	
30-59 minutes	2 (20.0)	11 (15.7)		*Ideal 1st visit Gestation age*			
60+ minutes	0 (0.0)	3 (4.3)		<=14 weeks	9 (90.0)	47 (68.1)	0.155
Type of transport				>14 weeks	1 (10.0)	22 (31.9)	
Walking	6 (60.0)	48 (68.6)	0.772	*Accepted HIV test*			
Public transport	4 (40.0)	21 (30.0)		No	0 (0.0)	4 (5.7)	0.438
Private transport	0 (0.0)	1 (1.4)		Yes	10 (10.0)	66 (94.3)	
Household income (US$)				*Age*			
<500	9 (90.0)	61 (87.1)	0.798	<25 years	4 (40.0)	42 (60.0)	0.231
500+	1 (10.0)	9 (12.9)		>=25 years	6 (60.0)	28 (40.0)	
Parity				*No booking money*			
0	3 (30.0)	29 (41.4)	0.732	No	3 (30.0)	28 (40.0)	0.544
1+	7 (70.0)	41 (58.6)		Yes	7 (70.0)	42 (60.0)	

p-value calculated from chi-square, [‡]Early bookers=starting ANC at <= 14 weeks, [α]Late bookers =starting ANC at >14 weeks

Asked why they thought pregnant women should start ANC early, the most common reasons were that they could be tested for HIV and if positive start taking medicine early (33.3%) and that they could be examined and any problems identified could be attended to early (30.8%). Twelve percent believed that, that is when a woman is sure she is pregnant and can feel the baby move.

### *Reported personal reasons for seeking ANC*

Self-reported reasons why the women had come for ANC were mainly to be monitored and treated for any health problems that may arise (31.3%), HIV testing (27.5%) and to be able to deliver at a health facility (12.5%) (Figure 4). Women also sought ANC so that in the event they became ill during the pregnancy, they could be attended to at the facility at no additional cost. The desire to know the position of the baby and whether the baby is growing well were reported by 11.3% of the women. Three women reported attending ANC because that is what is supposed to be done when one is pregnant and one was forced to go for ANC by her husband. Five percent sought ANC to get information.

Table 6: Univariate analysis of factors associated with early initiation of ANC, data from exit interviews in 3 Chitungwiza primary care clinics.

Variable	OR	CI	p-value
Age	0.4	0.1-1.7	0.393
Parity	0.6	0.1-2.5	0.732
Idea Gestation Age	4.2	0.5-35.5	0.293
Planned Pregnancy	0.7	0.1-3.7	1.000
Role in decision making	1.2	0.3-5.3	0.923
Use of family planning	2.2	0.5-9.2	0.446
Income	1.3	0.1-11.8	0.798

Value of p calculated from chi-square

Figure 4: Reported reasons for delayed initiation of ANC, data from exit interviews in 3 Chitungwiza primary care clinics
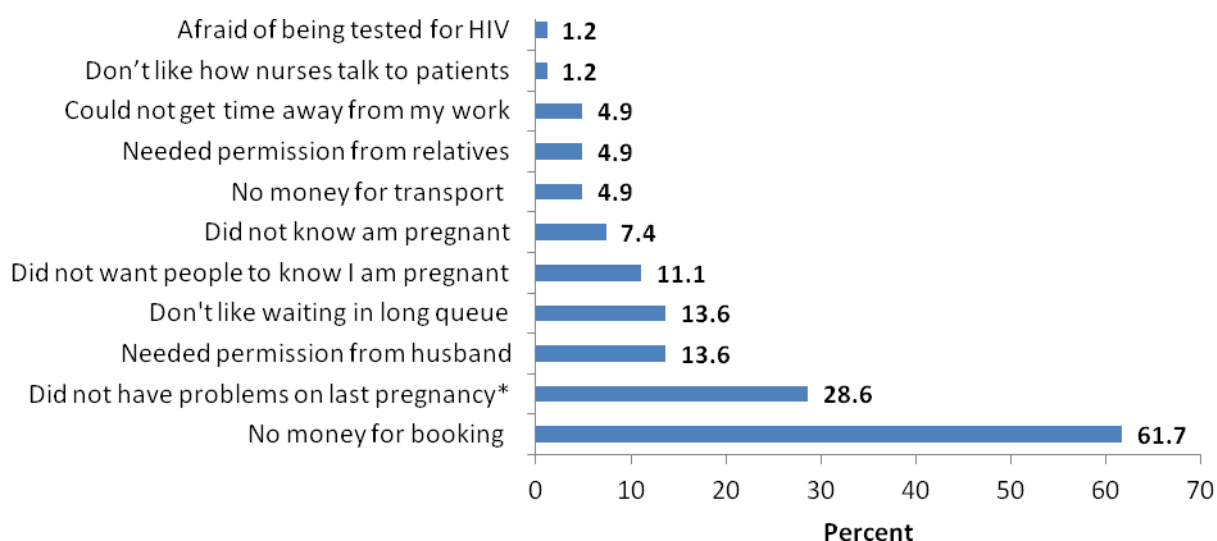
* denominator used is 43 representing those with gravidity of 2 or more

Reported general reasons why pregnant women seek ANC

The women were asked what they thought were the general reasons why pregnant women seek ANC services. Forty-six percent of women reported HIV testing and prevention of mother to child transmission of HIV as a reason why pregnant women sought ANC. Thirty-five percent (35%) cited the need to have general health problems identified and managed timely and appropriately. Eleven percent (11%) and ten percent (10%) of women thought women sought ANC for health education and information, and to know about the baby's health or position respectively. Three women (3.8%) did not know why women sought ANC.

Knowledge on health problems faced by women in having children

High blood pressure and HIV/AIDS were the most common health problems the women identified as being faced by women in having children, with 24.4% and 21.8% of women respectively citing them. While delivery by caesarean section is not a health problem per se but management of high risk delivery, 14.1% of women identified it as a problem. Abortion and haemorrhaging which are major causes of maternal mortality were identified by 12.8% and 6.4% of the women respectively while 5.1% reported that child-bearing could result in death. Twenty-six percent of the women reported that during their visit they had not been told about signs to watch out for that may show that there are problems with the pregnancy.

Interventions received during visit

The content of the first ANC visit includes HIV and syphilis screening, HIV counseling, education about PMTCT and signs that may indicate problems with the pregnancy, tetanus immunization and provision of iron supplements. The percent of women who reported having had each is shown in Table 7 below.

Table 7: Uptake of selected ANC intervention among pregnant women attending first ANC visit in Chitungwiza primary health clinics, data from exit interviews

ANC intervention / component	n	%
Gave a blood sample	73	91.3
Blood pressure measured	69	86.3
Told about mother to child transmission of HIV	74	92.5
Offered HIV tested	76	95.0
Accepted HIV test	76	95.0
Told about signs of problems with pregnancy	59	73.8
Given tetanus injection	70	87.5
Given iron tablets	64	80.0

Perception of ANC service

Respondents were asked to score various aspects of ANC services on a scale of 1 to 5, with 1 being poor and 5, excellent.

Table 8: Perception of antenatal service among pregnant women attending first ANC visit in Chitungwiza primary health clinics, data from exit interviews

Attribute	Percent who perceived attribute as excellent	Percent who perceived attribute as poor	Median Score	IQR
Friendliness of the nurse who attended to me	68.8	1.3	5	[4.5-5]
Friendliness of the other staff at the clinic	64.9	1.3	5	[4-5]
Usefulness of the information provided	89.6	0	5	[5-5]
Cleanliness of the clinic	39.0	2.6	4	[3-5]
Staff accommodating your questions and concerns about the pregnancy	85.7	1.3	5	[5-5]
Privacy	79.2	9.1	5	[5-5]

Usefulness of the information provided and the staff accommodating questions and concerns about pregnancy were most perceived as excellent. Cleanliness of the clinic scored the least (Table 8). Forty-two percent of the women indicated that what they liked most about their visit was the lecture and the health information given and 39.0% liked the friendly, helpful and efficient service. The women were also asked what they liked most and least about their visit. Eighteen percent of the women were most happy about HIV testing and receiving their results and 7.8% liked everything about the service. The least liked aspect was the unclean or locked toilets reported by 37.7% of the women. Eighteen percent of women least liked the long waiting times. The women were also asked about the waiting time and the all indicated waiting times of 3 hours or more in all facilities. Some aspects of HIV testing were found least favourable by 6.6% of the women. One woman reported that they had been told to come for their result the following week and three women reported that they had been given the results hastily and in groups and did not feel free to ask the questions they had about their result. This issue was reported in one clinic.

CHAPTER 5 - DISCUSSION

Both data abstracted from the registers and the exit interviews suggest that a very low proportion of pregnant women in Chitungwiza present for ANC at 14 weeks gestation age or earlier - less than 1% and 2.5% respectively. The Zimbabwe Demographic Health Survey (ZDHS) of 2010-11 reported that 54.5% of the urban women who reported being pregnant during the 5 years preceding the survey, started ANC at 5 months gestation age or earlier. This is much higher than the 8.6% of women first attending ANC at 22 weeks (5 months) or earlier observed in this study. The DHS reported data for all urban areas in Zimbabwe with women in Chitungwiza possibly maybe starting ANC disproportionately later than in other urban areas. This could be due to differences in the tariffs charged with Chitungwiza clinics charging higher than in government-operated clinics. Tariffs in smaller urban areas are also lower than in larger urban areas like Chitungwiza. The difference could also be attributed in part to recall bias since it was reported for a period of five years preceding the survey.

Higher parity was significantly associated with higher gestation age at first ANC visit among women who sought ANC in 2010. This was an expected observation as other studies (Matthews *et al*. (2001), Glei *et al*. (2003), Bhattia and Cleland (1995), Erci (2003), Nielsen *et al*. (2001), Paredes *et al*. (2005), Sharma (2004), Celik and Hotchkiss (2000), Ciceklioglu *et al*. (2005), Mekonnen and Mekonnen (2003)) have shown that women with higher parity tend to seek ANC later than those with first pregnancy especially where the women did not experience any problems during previous pregnancy. This is also consistent with the observation from the exit interviews where over a quarter of women with at least one previous live birth reported delaying ANC because they had no problems during the last pregnancy.

There was a significant relationship between tetanus immunization and gestation age at first ANC visit and the number of visit. Five does of tetanus toxoid vaccine are needed to achieve protection for the rest of childbearing years. The first dose is administered on a pregnant woman during the first ANC visit. The second dose is given 4 weeks later, while third dose is given 6 months later or during a subsequent pregnancy. The fourth dose is given a year later and the fifth another year thereafter (WHO, 2006b). Women with higher parity are most likely to have received five doses in previous pregnancies and not receive any during current pregnancy. Women with higher parity are also known to start ANC later and have fewer visits as observed by this and other studies (Erci, 2003; Nielson *et al.*, 2001, Glei *et al.*, 2003, Bhattia & Cleland, 1995, Sharma, 2004, Mekonnen & Mekonnen, 2003). The relationship between tetanus immunization and gestation age at first visit and the number of visits is confounded by parity.

In 2011, Zimbabwe started implementing an updated policy on the prevention of mother-to-child transmission of HIV which states that HIV infected pregnant women should be started on ARV prophylaxis or ART as needed as early as 14 weeks gestation age. While the majority of pregnant women attending ANC, 95% and 94% from the register abstraction and exit interviews respectively were screened for HIV, this study shows that testing is not happening early enough in clinics in Chitungwiza. Earlier initiation of ARV therapy further reduces the risk of mother to child transmission of HIV. Ciaranello *et al.* (2012) investigated the uptake of PMTCT services, infant feeding practices and specific regimens necessary to achieve the goal of elimination of paediatric HIV cases using a computer model simulating a cohort of HIV-infected women pregnant and breastfeeding women. They concluded that improved access to PMTCT services, retention of women in care and support for medication adherence throughout pregnancy and breastfeeding are necessary in addition to implementation of the guidelines. Timely access to ANC services is key to supporting adherence to appropriate ARV prophylaxis throughout pregnancy as well as improving access to PMTCT services. In a setting where 11% of the women tested were HIV-infected, delaying ANC presents missed opportunities for eliminating maternal transmission of HIV infection.

The high uptake levels for HIV testing in the ANC are also observed in the 2009 HIV sentinel survey which observed that 84.7% of pregnant women on first ANC visit accepted an HIV test (MOHCW, 2010). The 2010/11 Zimbabwe DHS indicated that 74.8% of women who delivered in the two years preceding the survey had been tested during ANC during the most recent pregnancy. Data from DHS is population-based and includes women who did not attend ANC hence the lower proportion. In urban areas where ANC is more accessible, 80% of women were tested (CSO, 2012).

To increase sensitivity of analysis to establish the measures of association, a threshold of 22 weeks was selected to allow for analysis. Among the women attending first ANC visit in 2010, parity had a significant association with the number of ANC visits, with parity zero women likely to have at least 4 visits. No other factors had a significant association with the timing of the first ANC visit or the number of ANC visits in the study. The reasons for this are perhaps multiple. One important consideration though is the small sample size used in the exit interviews. The near homogeneity of sample in terms of important factors like income, place of residence, level of education and occupation of the women, may have also contributed to this. A study with a larger sample size should be considered.

However, the sample distribution mirrored the patterns observed in the two most recent HIV sentinel surveys with available data, conducted in Zimbabwe in 2006 and 2009 (MOHCW, 2006 &

MOHCW, 2010). These collected HIV prevalence data among women attending ANC for the first time during the current pregnancy in 19 health facilities throughout the country. Data for the 2006 survey was collected over a 10 week period while for the 2009 survey, 13 weeks. Site level demographic distribution of the sample in the two surveys was not available so comparison could not be made for one of the study facilities which was a sentinel site in both surveys (MOHCW, 2006 & MOHCW, 2010).

Of the women interviewed, 57.5% were below 25 years of age, while in the 2006 and 2009 surveys, this proportion was 58.8% and 55.1% respectively. Ninety-six percent of women interviewed were married compared to 92.5% and 94.1% in the 2006 and 2009 surveys respectively. In 2006, 41.7% of the women were prima gravida while in 2009, those with first pregnancy consisted 42.2% of sample while of the women interviewed this proportion was 38.8%. Similarities in distribution were also observed for parity, level of education and occupation of the women. The sample distribution by age, gravidity and parity in the 2006 and 2009 sentinel surveys was also mirrored in the distribution of the sample abstracted from the 2010 ANC records (MOHCW, 2006 & MOHCW, 2010).   The findings from the study may therefore be generalized to the population of pregnant women attending ANC in public health facilities.

Most women were aware of when to start ANC and why it was necessary to access ANC services but reported that they were hindered mostly by lack of money for booking. Physical access to the clinic was not an issue as most women either walked for less than 30 minutes or used public transport and only 5% of women cited lack of transport money as a factor. Since January 2012, Chitungwiza Municipality clinics charge US$30 for antenatal care, delivery and postpartum visit, which is a 40% reduction from what was previously being charged. These fees include charges for ANC visits, normal vaginal delivery and postpartum visits. It remains to be seen what the impact of this reduction will be on the uptake of services. In a population where most of the women (70.5%) were unemployed, ANC booking fees is a key barrier to access to services. The Consumer Council of Zimbabwe (CCZ) put the poverty datum line for a family of six at US$510 per month (2012). This means that as much as 87.5% of the women may have been from poor households. The power imbalance within unions as a barrier to access was also observed as 13.8% had to seek their husband or partner's permission to seek ANC. Permission is most likely tied to the provision of resources for seeking care, namely the user fees. However none of the reasons for starting ANC late were significantly associated with late ANC initiation.

A reflection on the debate on whether to abolish or retain user fees by James *et al.* (2006) concluded that especially for the poor, user fees are an important barrier to accessing health services. In addition to user fees additional barriers include other costs (for example for transport,

lost wages), quality, information and cultural barriers. While evidence has shown that abolition of fees can lead to increased uptake of services, for effectiveness and sustainability of access to the poor, user fees abolition should be done within a broader package of reforms with buy in from a broad stakeholder base and appropriate management of the alternative financing mechanisms replacing the user fees and be appropriate for the context (James *et al.*, 2006). In October 2011, Zimbabwe launched the Health Transition Fund, which is poised to be a financing mechanism to pool resources for the revitalizing the health sector including contributing to the scrapping of maternity user fees (Tapfumaneyi, 2011).

The women's personal reasons for seeking ANC and the reasons they reported as general reasons why pregnant women seek ANC services were mainly associated with the HIV testing. While this is good for the prevention of mother-to-child transmission of HIV, over-emphasis on HIV can be detrimental to other components of ANC. There is need for promotion of ANC as a package of different services beneficial to pregnant women, positioning HIV related services as part of ANC and not as the objective. The women were quite aware of the health problems faced by women during pregnancy or delivery and some important causes of maternal mortality like haemorrhage, hypertensive disorders, HIV/AIDS and abortion which account for 33.9%, 9.1%, 9.7% and 3.9% of maternal deaths in Africa respectively (Khan *et al.*, 2006). However the knowledge on when to start ANC is far from universal with more than a quarter believing ANC should start after 14 weeks and nearly a fifth believing it should start later than 16 weeks. While not the most critical barrier to access, the knowledge of when a woman is supposed to start ANC, the importance of the service and the potential dangers associated with pregnancy that may be averted if timely care is sought are an important motivation for seeking care on time.

Regarding the content of the ANC, there was variable uptake of the different components of care with very few having universal uptake. For some components this was due to stock-outs of supplies as in the case of HIV testing where in one clinic it was indicated in the register that at one time there were no HIV tests kits over a two week period which may point to less than optimal procurement and distribution systems. Stock outs of the iron phosphate and folic acid were also reported. The data on tetanus immunization and provision of iron supplements should also be interpreted with caution as in the register, the affirmative is indicated with a tick, while the negative by a blank, which leads to ambiguity between a negative and a missing value. From the register one cannot get data on the number of tetanus vaccines the woman has received. The coverage of cotrimoxazole prophylaxis, ART and ARV prophylaxis, infant feeding counseling suggest that while ANC is managing to identify HIV-infected women, a good proportion of these women are falling through the cracks with significant effect on the impact of the PMTCT programme. HIV screening among the pregnant women's partners was extremely low. Most

women do not come for ANC with their partners but are encouraged to inform their partners of the need for testing. It was reported than some partners do come for testing later and on their own and there no clear mechanisms for the linking their result to the woman's record in the ANC register. Some partners may also choose to go for testing elsewhere. Partner screening for HIV is an important component of PMTCT to identify and promote appropriate prevention methods among discordant couples or couples where both are infected. The long waiting times may also exclude men who may not be able to take much time from work to come for ANC services.

Ongoing efforts to evaluate and improve quality of service should be made. The general uncleanliness of the toilets at the facilities is a cause for concern especially in an area which has had big cholera and typhoid outbreaks. The long waiting times of 3 hours or more can be a barrier to access. ANC "bookings" or first visits are done on Mondays when a group lecture is given on ANC in general and HIV testing and counseling and a tour of the maternity and labor ward is given. The women are then taken through individually for physical examinations and blood sample collection for HIV and syphilis screening and blood-grouping. Individual HIV counseling is done and then they wait for results. Women coming for ANC first visit on any other day are encouraged to come back the following Monday. Those who choose to be served then may miss out on the health information than is given in the lecture. Those who arrive late when the lecture is finished also miss out.
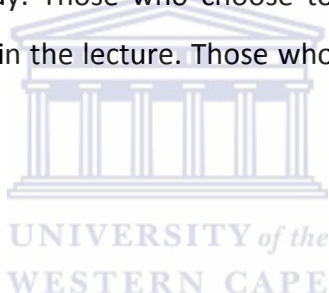
CHAPTER 6 - CONCLUSIONS AND RECOMMENDATIONS

Women come to clinics in Chitungwiza Township late for ANC and do not make adequate number of visits. Correct knowledge about when to start ANC is not universal. User fees are a key barrier to timely access to ANC. Gender power imbalance is also an important barrier. Women presenting for ANC are not receiving all recommended interventions. While HIV screening among those coming for ANC is universal, substantial proportion of HIV infected women do not receive HIV/AIDS related services offered within the ANC package. Male involvement in PMTCT is limited.

While the issue of abolishing maternity user fees is generally agreed in Zimbabwe, there is need for high level political commitment to move the agenda forward and find a context appropriate and sustainable way to abolish user fees. Chitungwiza municipality, as provider to a mainly poor population should find a sustainable approach to providing maternal health services without compromising the quality of services. Payment terms over the pregnancy period should also be considered for those that may not be able to pay the S$30 lump sum. In view of the recent reduction in maternity fees, there is need for close monitoring to see if there is adequate impact on uptake of services. Without this, it will be near impossible to attain the MDGs on maternal health, and elimination of new paediatric infections.

Concerted efforts to increase levels of correct knowledge about ANC, its benefits, when to start and the dangers of foregoing ANC should be made through coordinated health promotion and health education campaigns with support from health partners.

Regular quality of service assessments need to be instituted to provide a framework for continuous system adjustment to ensure improvements in the quality of service, including identifying and addressing any ethical issues around service provision.

There is need for gender sensitive programming that improves access to poor women who cannot access services and to their male partners.

The complaints raised by some women regarding being given their HIV results in a group and being asked to come back for results in one week raises serious ethical issues which need to be investigated and addressed with promptness.

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ANNEXES

Annex 1: University of the Western Cape Senate Research Committee Approval

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

UNIVERSITY *of the*
WESTERN CAPE

14 December 2011

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by: Ms E Kufa (School of Public Health)

Research Project: The timing of first antenatal care visit and factors associated with access to care among antenatal care attendees at Chitungwiza Municipal Clinics, Zimbabwe

Registration no: 11/10/38

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Annex 2: Exit Interview Informed Consent Form

UNIVERSITY OF THE WESTERN CAPE

School of Public Health

Private Bag X17 ● **BELLVILLE** ● 7535 ● South Africa

RECORD OF INFORMED CONSENT TO CONDUCT AN INTERVIEW

Date:
Interviewer:
UWC Student no: 2520854
Tel: 077 213 8044   Fax:
E-mail: ericakufa@hotmail.com
Institution: University of the Western Cape
Interviewee's pseudonym:
Place at which the interview was conducted: **Chitungwiza**

_____

Mazvita nekubvuma kupindura mibvunzo yangu. Zvinotevera itsananguro yezvikonzero nemadonzo emibvunzo iyi. Munokumbirwa kuratidza kubvuma kwenyu nekusaina pafomu rino.

1. Nezve arikubvunza mubvunzo
Zita rangu ndinonzi_____, ndiri mudzidzi pachikoro cheUtano hwevanhu (Public Health) paUniversity ye Western Cape. Sechidimbu chezvidzidzo zvangu ndinofanirwa kuita ongororo. Ndiri kuongorora zvekuenda kwemadzimai kuscale. Murairidzi wangu ndi **Dr Ehimario Igumbor** vanobatika panumber dzinoti +27 21 959 3520 kana kuti fax inoti 021 959 2872 kana e-mail eigumbor@uwc.ac.za

2. Donzo remibvunzo
Mibvunzo irikubvunzwa kuti titsvage ruzivo nezve kuzvitakura kwemadzimai nekuenda kuscale muChitungwiza. Ndinoda kuziva kuti madzimai anozoenda kuscale pazera ripi repamuviri, nezvikonzero zvacho. Ruzivo rwandichaunganidza ruchabatsira veChitungwiza Municipality nevebazi rezvehutano kuronga nezveutano hwemadzimai paanenge akazvitakura nevana vadiki. Ndichakubvunzai mibvunzo pamusana penyu, nhoroondo yekubata pamuviri, zvamunofunga nekuziva pamusoro pekuenda kuscale, zvikonzero mauya kuscale panguva yamauya, nemaonerero amaita kubatsirwa kwamaita pamauya kuscale nhasi.

3. Mabvunzirwo emibvunzo
Ndichakubvunzai mibvunzo yakanyorwa pafomu iri. Kana paine mubvunzo wamunenge musina kunzwa kana kunzwisisa, sunungukai kunditaurira kuti ndidzokorore kana kutsanangura. Mibvunzo iri muzvikamu 6 uye ndinodaira ndichatora maminitsi 15 enguva yenyu. Pakupedzisera ndichakupai mapepa anotaura nezvekudzivirirwa kweHIV kubva kunamai kuenda kumwana, kuenda kuscale, nekupa vana vacheche chikafu.

4. Anonymity of contributors
Panguva dzese, ndichachengeta mhinduro dzenyu pakati pedu uye ndichakudeedzai nezita remadunhurirwa ramuchasarudza. Ndichachengeta zvinoratidza kuti makapindura mibvunzo pakachengeteka, ndozozviparadza kana ndapedza kubvundza vamwe vese mibvunzo.

5. Zvingakutadzisai kupindura mibvunzo
 Munogona kusasunnguka kupindura mimwe mibvunzo. Kana paine zvamusingadi kutaura nezvazvo makasununguka kunditaurira. Hazvindikanganisi uye hapana zvingaitika kana mukasapindura mubvunzo. Ndingazoda kuudzwa nemi kana ndabvunza zvamisingadi kutaura nezvazvo. Pane nguva ipi zvayo, makasununguka kumisa hurukuro kana musingachadi kuenderera mberi.

6. Bvumo
6.1 Bvumo yearikupindura mibvunzo
Ari kupindura mibvunzo anokumbirwa kupa bvumo yake pazasi.
6.2 Bvumo yearikubvunza mubvunzo
Ndinovimbisa kuchengetedza zvese zvandichaongorora pakawandika. Mhinduro dzichashandiswa zvandareva pamusoro asi dzinogona kushandiswa kuongorora zvimwe ndisina kudzoka kunotsvaga imwe. Zvimwe zvingashanduka pachibvumirano ichi zvichatanga zvazviswa nekubvumiranwa nemi.

Mubvunzi anosiyina:

Anopindura anosayina:
Musi:
Zvimbo: