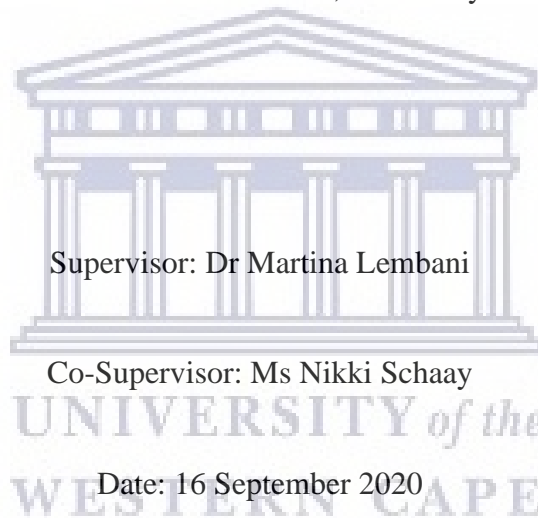


Determining the level of non-booking for antenatal care and associated barriers as well as risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe.

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A mini thesis submitted in partial fulfilment of the requirements for the degree of Master of Public Health at the School of Public Health, University of the Western Cape



DECLARATION

I declare that this thesis entitled “**Determining the level of non-booking for antenatal care and associated barriers as well as risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe**” is my own work. It has not been submitted for any degree or examination in any other university and that all the references I have used or quoted have been acknowledged.

Full name: Patricia Fadzayi Mandima

Date: 16 September 2020

Signed:



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DEDICATION

I dedicate this work to my 4 children, Rufaro, Ruvarashe, Gerald and Jordan and to my nephew Tatenda Chirambamhanda.

ACKNOWLEDGEMENTS

To my husband Dr M Mandima and my children, thank you for your support and patience over the last few years.

To my supervisors, Dr Lembani and Ms Schaay, this wasn't going to be possible without you. Thank you for encouraging me and for pulling me up when I was giving up and thank you for the regular feedback.

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I want to thank the UZCHS-CTRC for financial support and for giving me time to do this work.

Finally, I want to thank the women who participated in this study without whom the study would not have been possible.

And gratitude to the Lord, for good health and a sound mind.

KEYWORDS

Antenatal care

Anti-retroviral therapy

Booked and unbooked women

Chitungwiza

Clinic

Human immune-deficiency virus

Mother-to-Child Transmission

Postnatal care

Prevention-of-mother-to-child transmission

Zimbabwe



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ABBREVIATIONS AND ACRONYMS

ABC	Abacavir
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal care
ART	Anti-retroviral therapy
AZT	Zidovudine
CI	Confidence Interval
DNA	Deoxy ribonucleic acid
EGPAF	Elizabeth Glazer Paediatric AIDS Foundation
eMTCT	Elimination of Mother-to-Child Transmission
HIV	Human Immunodeficiency virus
ICF International	Inner-City Fund International
LIC	Low income countries
LPVr	Lopinavir/ritonavir
MoHCC	Ministry of Health and Child Care of Zimbabwe
MRCZ	Medical Research Council of Zimbabwe
MSM	Men who have sex with man
MTCT	Mother-to-child transmission
NAC	National AIDS Council
NMTPAC	National Medicine and Therapeutics Policy Advisory Committee
NNRTI	Non-nucleoside reverse transcriptase inhibitor

NRTI	Nucleoside reverse transcriptase inhibitor
OR	Odds Ratio
PCR	Polymerase chain reaction
PEP	Post exposure prophylaxis
PI	Protease inhibitor
PMNCAH & N	Reproductive, Maternal, Newborn, Child and Adolescent Health & Nutrition
PMTCT	Prevention of mother-to-child transmission
PrEP	Pre-exposure prophylaxis
sdNVP	Single dose nevirapine
STATA	A statistical analysis software
STI	Sexually transmitted infection
UNAIDS	Joint United Nations Programme on HIV and AIDS
UNICEF	United Nations International Children Emergency Fund
WHO	World Health Organization
UWC	University of Western Cape
ZIMSTAT	Zimbabwe National Statistical Agency

DEFINITION OF KEY TERMS USED IN THIS STUDY

Option A	A group of PMTCT interventions based on anti-retroviral drugs - AZT and sdNVP
Option B	PMTCT intervention based on triple ART which is taken only during pregnancy and whilst breastfeeding - or for life based on the CD4 count.
Option B+	PMTCT intervention based on triple ART which started during pregnancy and continues for life – irrespective of the CD4 count.
Booked women	Refers to women who attended at least one antenatal care visit during a pregnancy.
Unbooked women	Refers to women who did not have contact with antenatal care services during a pregnancy and <i>only</i> present at a clinic during labour or after delivery.
Home delivery	Refers to a situation where a pregnant woman gives birth in any place <i>outside</i> the formal health system.
Clinic delivery	Refers to a delivery occurring in the formal health system.



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ABSTRACT

Background: PMTCT is an effective strategy in preventing paediatric HIV infection. In Zimbabwe the success of PMTCT is entirely dependent on pregnant women accessing antenatal care services and through that, getting linked to PMTCT. Failure of pregnant women to book for antenatal care through the course of pregnancy presents a missed opportunity for PMTCT and a high risk for maternal HIV transmission. It is therefore important to determine the burden of unbooked women and the factors associated with it, if elimination of maternal HIV transmission is to be achieved in the country.

Aim: The aim of the study was to determine the proportion of women unbooked for antenatal care and among them, the proportion of women who were HIV positive and who missed PMTCT during pregnancy. In addition, the study aimed to identify the risk factors associated with unbooking in the city of Chitungwiza, Zimbabwe

Methodology: A cross-sectional study involving review of clinic records for all 4400 women who delivered and/or attended postnatal care at the 4 maternity clinics in Chitungwiza between 01 January 2017 and 31 December 2017. Data was collected retrospectively from maternity records onto a data collection tool. A questionnaire was also administered on 44 booked women and 44 unbooked women to evaluate the risk factors. These data were summarized using frequencies and percentages. Chi-square test was used to determine association between participants' booking status and categorized variables. Multiple logistic regression was used to determine variables associated with booking status while adjusting for other study variables. All statistics tests decisions were concluded at 5% level of significance.

Results: A total of 19% (820 out of 4400) were unbooked for ANC. HIV results showed that 11% were HIV positive. A total of 3% (118 out of 4400) of the women were both unbooked and HIV positive. The HIV positive women were 0.24 times less likely to book than HIV negative women, adjusted OR 0.76, 95% CI (0.61-0.98) P=0.037. Women aged 20-34 years were 1.3 times more likely to book than the teenagers, adjusted OR 1.3, 95% CL (1.04-1.62), P=0.022. Women who delivered at clinics were 5.17 times more likely to have booked compared to those who delivered at home adjusted OR 5.17, 95% CI (4.06-6.57), P < 0.001. Those with unplanned pregnancies were 87% less likely to book for ANC than those with planned pregnancies, adjusted OR 0.13, 95% CI (0.04-0.42), P=0.001. Women with household earnings of US\$200 to US\$500 per month were 4.96 times more likely to book for ANC than those with earnings of below US\$200, adjusted OR 4.46, 95% CI (1.56 – 15.74) P=0.007.

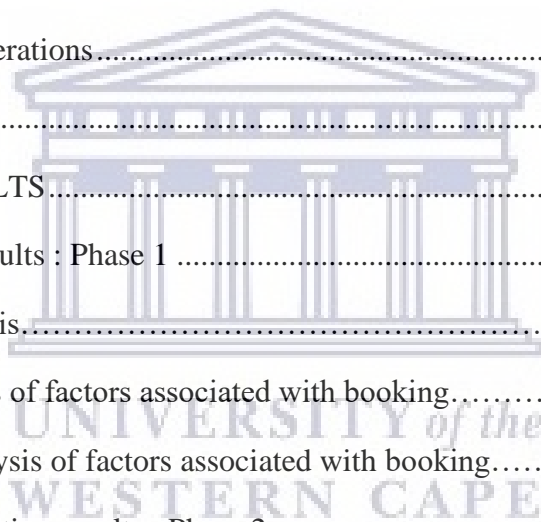
Conclusion Not booking for ANC is a significant problem in the city of Chitungwiza, significantly affecting access to PMTCT services. The results from this study illustrate the need to target socio-economic factors in order to reach the 5% eMTCT target.



TABLE OF CONTENTS

DECLARATION.....	i
DEDICATION	ii
ACKNOWLEDGEMENTS	ii
KEYWORDS	iii
ABBREVIATIONS AND ACRONYMS.....	iv-iv
DEFINITIONS OF KEY TERMS.....	vi
ABSTRACT	vii-viii
TABLE OF CONTENTS.....	ix-xi
LIST OF TABLES	xii-xiii
TABLE OF APPENDICES.....	xiii
1 CHAPTER 1: INTRODUCTION.....	1
1.1 The burden of HIV globally and in Zimbabwe.....	1
1.2 PMTCT globally and in Zimbabwe	2
1.3 ANC: An entry point into health care.....	2
1.4 Elimination of MTCT of HIV in Zimbabwe.....	3
1.5 Gaps in eMTCT in Zimbabwe.....	4
1.6 Problem Statement and Purpose of the Study	5
2 CHAPTER 2: LITERATURE REVIEW.....	6
2.1 Origins of ANC.....	6
2.2 Access to ANC globally and in Zimbabwe.....	6
2.3 Barriers to accessing ANC services.....	7
2.4 PMTCT with ART: a successful HIV prevention strategy.....	8
2.5 Slow progress in eMTCT in Zimbabwe.....	9
2.6 The study setting.....	10
2.7 Summary	10

3	CHAPTER 3: METHODOLOGY.....	12
3.1	Study Aim and Objectives.....	12
3.2	Description of study setting.....	12
3.3	Study Approach.....	13
3.4	Study Design.....	13
3.5	Population and Sampling.....	14
3.6	Data Collection.....	16
3.7	Data management.....	17
3.8	Data Analysis.....	17
3.9	Rigor.....	17
3.10	Ethical Considerations.....	18
3.11	Summary.....	18
4	CHAPTER 4: RESULTS.....	20
4.1	Clinic records results : Phase 1	20
4.1.1	Univariate analysis.....	20
4.1.2	Bivariate analysis of factors associated with booking.....	22
4.1.3	Multivariate analysis of factors associated with booking.....	23
4.2	Questionnaire section results : Phase 2	24
4.2.1	Univariate analysis.....	25
4.2.2	Bivariate analysis.....	31
4.2.3	Multivariate analysis.....	36
4.3	Summary of results.....	37
5	CHAPTER 5: DISCUSSION.....	38
5.1.	Proportion of unbooking in Chitungwiza.....	38
5.2	Proportion of HIV positive unbooked women.....	38
5.3	Factors associated with not booking.....	38
5.4	Generalisability.....	40



5.5	Limitations.....	40
6	CHAPTER 6: CONCLUSION AND RECOMMENDATIONS.....	42
6.1	Conclusion.....	42
6.2	Recommendations.....	43
	REFERENCES.....	44



UNIVERSITY *of the*
WESTERN CAPE

LIST OF TABLES

Table number	Description
Table 4.1.1	General description of the women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January 2017 to 31 December 2017
Table 4.1.2	Bivariate analysis of factors associated with booking status among women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017
Table 4.1.3	Multivariate analysis results of clinic records variables associated with booking status among women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017
Table 4.2.1.1	Descriptive data on socio-economic factors of the 88 booked and unbooked women who delivered in Chitungwiza in 2019
Table 4.2.1.2	Descriptive data on ANC utilisation and history of current and previous pregnancies among booked and unbooked women who delivered in Chitungwiza in 2019
Table 4.2.1.3	Descriptive data for HIV and PMTCT services utilisation among booked and unbooked women who delivered in Chitungwiza in 2019
Table 4.2.2.1	Bivariate analysis of socio-economic factors among 88 booked and unbooked women who delivered in Chitungwiza in 2019
Table 4.2.2.2	Bivariate analysis for HIV and PMTCT service utilisation among 88 booked and unbooked women who delivered in Chitungwiza in 2019
Table 4.2.2.3	Bivariate analysis of ANC utilization and history of current and previous pregnancies among booked and unbooked women in Chitungwiza in 2019

Table 4.2.3	Multivariate logistic regression to determine factors associated with booking status among 88 booked and unbooked women in Chitungwiza in 2019
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LIST OF APPENDICES

Number	Description
Appendix 1	Data extraction tool
Appendix 2	Questionnaire
Appendix 3	Information sheet
Appendix 4	Informed Consent Form Signature page
Appendix 5	Chitungwiza City Ethics Committee Approval
Appendix 6	Letter of approval from Chitungwiza Hospital
Appendix 7	UWC Ethical Approval
Appendix 8	MRCZ Approval

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CHAPTER ONE: INTRODUCTION

It is estimated that approximately 1.3 million women living with the human immunodeficiency virus (HIV) get pregnant each year and without intervention, these women risk transmitting HIV infection to between 195 000 and 585000 infants, representing a maternal HIV transmission risk of 15 to 45%, and thus contributing significantly to new HIV infections globally (WHO, 2019e). Mother-to-child transmission of HIV (MTCT) is responsible for over 90% of all paediatric HIV infections. In an attempt to prevent HIV infection occurring in children, the World Health Organisation (WHO) recommends a range of strategies, namely: the prevention of HIV in women of childbearing age, the prevention of unwanted pregnancies, the prevention of mother-to-child transmission (PMTCT) with anti-retroviral therapy (ART) in HIV positive pregnant women and infant prophylaxis for HIV exposed infants (WHO, 2019e). Antenatal care (ANC) plays a vital role in one of these strategies, namely, PMTCT, since it is the entry point for pregnant women into health care services. Women, who for various reasons fail to utilise ANC, would unfortunately have missed the opportunity to access PMTCT and are at high risk for maternal HIV transmission.

This study reviews the uptake of ANC - and the factors associated with the poor utilization of ANC services in the urban city of Chitungwiza in Zimbabwe. The first chapter of the study report explores the burden of HIV globally and in Zimbabwe specifically, and considers aspects of both the country's ANC services and its PMTCT programme – paying special attention to the gaps that currently exist in MTCT in Zimbabwe. The chapter ends with a description of the problem statement that framed this study and outlines the potential significance of the study.

1.1 The burden of HIV globally and in Zimbabwe

At the end of 2018, approximately 37.9 million people were living with HIV and of these, 1.7 million were children under the age of 15 (WHO, 2019d). In the same year, 1.7 million people became newly infected with HIV around the world (WHO, 2019d), and according to the United Nations International Children's Emergency Fund (UNICEF), this included 160 000 children under the age of nine (UNICEF, 2019b). About 100 000 children died of HIV-related illnesses in 2018 (WHO, 2019f).

Zimbabwe is a sub-Saharan country with a population of 16.5 million and according to its Ministry of Health and Child Care (MoHCC), 2.2 million are living with HIV, including 77 000 children under the age of 15 years. About 89 000 people acquire new HIV infection each

year and this includes 4200 children (MoHCC and National AIDs Council, 2018). The highest burden of HIV in Zimbabwe is carried by women who have an HIV prevalence of 18%, whilst in men, the HIV prevalence is 12% (MoHCC and National AIDs Council, 2018). In the 20-34-year age group in 2014, HIV prevalence was as high as 20% among women and only 10% in men (MoHCC, 2014). The high burden of HIV in women of child-bearing age is of public health concern because, without PMTCT, it can translate to paediatric HIV infection through vertical HIV transmission.

1.2 PMTCT Globally and in Zimbabwe

Approximately 90% of all paediatric HIV infections occur through HIV positive women transmitting the virus to their children in utero, during labour or through breastfeeding (WHO, 2010). MTCT is of global concern because of the high numbers of women with HIV who get pregnant each year. About 1.3 million HIV positive women got pregnant in 2018 (WHO, 2019b) and in Zimbabwe, 63 408 pregnant women were in need of PMTCT in 2017 (Mushavi, 2017). With interventions involving ART, the maternal transmission risk can be reduced to below 1% (MoHCC, 2017a). Unfortunately, about 18% of HIV- infected pregnant women worldwide have no access to ART to prevent the vertical transmission of HIV (WHO, 2019b). In Zimbabwe, it is estimated that 95% of HIV positive pregnant women received ART for PMTCT in 2017 (MoHCC, National AIDS Council, 2018).

1.3 Antenatal care: an entry point into PMTCT services

Prevention of mother to child transmission of infections in utero is vital for the reduction of infant mortality and morbidity and in the promotion of good maternal health (Lema, 2014). Many infections are transmitted from mother to child in utero and these include syphilis, hepatitis B virus and HIV. In most countries, programs to reduce maternal transmission of these infections are linked to ANC services (Lincetto, 2001). In this study, the terms ANC or ANC services are being used to refer to formal health care given to women throughout pregnancy. Internationally, the WHO recommends pregnant women attend at least 8 ANC visits with the first visit occurring during the first trimester (WHO, 2016). However, Zimbabwe has not yet adopted these guidelines and is still using the *Focused ANC model* which requires 4 ANC visits, and more visits only for those with high risk pregnancies (National Medicine and Therapeutics Policy Advisory Committee (NMTPAC) and The AIDS and TB Directorate, MOHCC, 2016). It is well known that ANC presents an important opportunity for pregnant women to be screened and to receive management for conditions which predispose them to both maternal

and foetal adverse pregnancy outcomes. ANC is very critical to a PMTCT programme as it provides the entry point for pregnant women into care and the subsequent ANC contacts provide opportunities for administration of PMTCT interventions to these pregnant women.

Antenatal care services include screening for maternal non-communicable diseases, obstetric complications, foetal abnormalities and maternal infections including HIV. In Zimbabwe, at the first ANC visit for each pregnancy, a woman is counselled and offered rapid point-of-care HIV testing. The HIV results are received on the same day. Those who test HIV positive are initiated on ART, that very day, and receive ART and adherence counselling (in the interest of both, PMTCT and their own health). Their infants start nevirapine HIV prophylaxis immediately after birth until 6 weeks of age after which they start cotrimoxazole prophylaxis. For those who choose to lactate, they are advised to exclusively breastfeed for the first 6 months after which they can use mixed feeding for their infant. An infant HIV diagnosis (by HIV DNA PCR) is performed at 6 weeks and after cessation of breastfeeding (NMTPAC and The AIDS and TB Directorate, MoHCC, 2016). Hence, just a single ANC visit during pregnancy can have a significant impact in reducing mother to child transmission of HIV.

Unfortunately, about 14% of pregnant women worldwide have no access to a single ANC visit with trained healthcare workers (UNICEF, 2018a). According to the Zimbabwe National Statistical Agency (ZIMSTAT) and the Inner-City Fund (ICF) International in the 2015 Zimbabwe Demographic and Health Survey (ZDHS), about 7% of pregnant women fail to access ANC services throughout pregnancy in Zimbabwe, and this percentage is likely to be an underestimate because of the method used to collect the data. (ZIMSTAT and ICF international, 2016). These women, unbooked for ANC, unfortunately miss the opportunity to fully utilise PMTCT services and those who are HIV positive become very high risk for MTCT.

1.4 The elimination of MTCT in Zimbabwe

The rates of HIV infection in children under 2 years of age fell dramatically, in Zimbabwe, from 30% in 2002 to about 9% in 2013, due to the nationwide PMTCT programs and increased access to ART (EGPAF, 2015). The decline in maternal HIV transmission, however, has been very slow since 2013 and by 2017 the maternal HIV transmission rate was still at 6.7%, which is above the Ministry of Health target of 5% for the elimination of MTCT (MoHCC and National AIDs Council, 2018). The Ministry of Health has been working extensively to reach this elimination target and is concerned that there are still hard to reach groups within the population that are not accessing the available PMTCT services, and thus indirectly, contributing to the paediatric infections remaining above 5 % (MoHCC, 2017a). This is

concerning, particularly because the provision of PMTCT services in Zimbabwe started in 2002 and by the end of 2017, 1 560 of the targeted 1 722 health facilities were providing ART and PMTCT services (MoHCC and National AIDs Council, 2018).

1.5 Gaps for MTCT in Zimbabwe

It is acknowledged that despite the increase in availability of clinical and biomedical interventions to prevent MTCT of HIV, more work needs to be done in identifying and targeting those hard to reach populations where vertical transmission is still occurring and where socio-economic barriers might be reducing their access to these key HIV-related interventions (Vhembo, 2019).

There are potentially 5 common ways or gaps which allow for vertical HIV transmission to occur in Zimbabwe and these also indicate where more attention is required to improve access and to support such groups so as to attain the 5% elimination target (WHO, 2015). These are as follows:

1. HIV-positive pregnant women who do not take ART at all throughout the course of their pregnancy *until at or after delivery*. Most of these women might very well not have known their HIV status during the course of their pregnancy and highly likely did not book for ANC.
2. HIV-positive pregnant women who are on ART during their pregnancy but are not fully virally suppressed at delivery - most likely due to poor adherence to ART.
3. HIV-positive women who are not on ART during breastfeeding – and have an infant who is also not on ART for HIV prophylaxis. This group of women most likely did not know their HIV status, did not attend ANC, delivered outside formal health care and did not receive formal postnatal care from the health services.
4. HIV-positive women on ART but not fully virally suppressed during breastfeeding with infants not on ART for HIV prophylaxis.
5. Women who become infected with HIV during the breastfeeding period. These women might have attended all ANC visits and delivered in formal health care but only become infected with HIV during the lactation period and continued to lactate without knowledge of the change in their HIV status. These are at very high risk for MTCT.

The focus of this study is on the first gap, namely, on women who present at maternity clinics either in labour or following a home delivery, having had no prior contact with antenatal care services in the formal health system during the course of their pregnancy – and who are referred

to within the health services and literature as “unbooked women”. Unbooked women, by definition, thus do not access the services that are offered to pregnant women during ANC.

1.6 Problem statement and study purpose

Despite the fact that anti-retroviral drugs have been made available free of charge in the public health sector since 2002 and that HIV care is decentralized so that PMTCT services are available at all maternity health centres in the country, some pregnant women appear to still find it difficult to access these services (ZIMSTAT and ICF international, 2016). These women either come in as unbooked clients at or after delivery without having had a single contact with antenatal care services prior to the delivery. Those newly diagnosed HIV positive would then have missed taking ART during pregnancy and one of the obvious results of this is the children born are at high risk (15 - 45%) of contracting HIV (AVERT, 2019), when such could have been prevented.

Whilst there is provincial data showing an unbooked proportion of 6% (ZIMSTAT and ICF International, 2016), the proportion of unbooked women who come in at the point of labour or delivery and those who come in post-delivery is not known in the city of Chitungwiza. The proportion of these unbooked women who are HIV positive and who have missed utilisation of all PMTCT services during pregnancy, and thus prevention of in-utero and perinatal vertical transmission, is also unknown. The various reasons why women in Chitungwiza fail to access and utilise antenatal care services is also unknown to those working in, and with, the health service.

Determining the extent of unbooked women and the factors associated with unbooking is essential in determining what health promotion strategies and health service actions and resources needed to bring such pregnant women into care. Therefore, this study aimed at determining the proportion of unbooked women for antenatal care at delivery and among them, the proportion of women who were HIV positive and who therefore missed PMTCT services during pregnancy. In addition, the study aimed to identify the risk factors associated with unbooking among women in the city of Chitungwiza, in Zimbabwe.

CHAPTER 2: LITERATURE REVIEW

2.1 The origins of ANC

Antenatal care refers to the ongoing health services provided to women during pregnancy. It is meant to screen out pregnant women for potential obstetric complications, non-communicable and infectious diseases and provide therapeutic and preventive interventions in order to minimise maternal and fetal and/or adverse pregnancy outcomes (Lincetto, 2001). ANC services, as they are commonly provided today, originated in the United Kingdom during the early 20th century with the first clinic opening in 1915 in Edinburgh for the purposes of reducing perinatal mortality arising from eclampsia (Majoko, 2005). At this point, ANC services were for the most part provided through blood pressure measurements and urinalysis. From this starting point, antenatal care services evolved to cover other conditions and included, for example, examinations for possible labour complications and the testing and treatment of infections (Majoko, 2005). The scope of ANC has continued to expand over the years and in 2002, the WHO issued a set of ANC guidelines for developing countries which incorporated the recommended number of times a woman should visit an ANC clinic during her pregnancy and what was proposed in relation to the prevention of mother to child transmission of HIV (Lincetto, 2001). The 2002 guidelines, called the Focused Antenatal Care model, recommended that women with low risk pregnancies attend 4 ANC visits with the first one occurring in the first trimester of pregnancy and women with high risk receive individualised care depending on each woman's needs (Lincetto, 2001). These guidelines were updated again by the WHO in 2016, following the outcome of a series of studies that showed that the recommended 4 visits were few and were associated with more maternal and foetal adverse events (Mchenga, 2019). The new 2016 WHO ANC recommendations, referred to as 'antenatal care for a positive pregnancy experience' recommends at least 8 ANC visits, with the first occurring within 12 weeks gestation (WHO, 2016)

2.2 Access to ANC globally and within Zimbabwe

In developing countries, the provision of antenatal care services within the formal health services started in mid-20th century with national governments receiving support from donor agencies (WHO, 2003). According to the WHO (2019), only about 25% of pregnant women in developing countries had access to ANC in 1990, but the percentage increased to 50% in 2013 (WHO, 2019a). By 2018, 86% of pregnant women, globally, had access to at least one antenatal

visit (UNICEF, 2018a). Utilisation of ANC is generally higher in developed countries compared to the Low-Income Countries (LIC) (UNICEF, 2019a). ANC attendance is lowest in West and Central Africa where 77% attend at least one ANC visit, followed by Southern Asia with 79%, East and Southern Africa are third with at least one ANC visit of 85%. Middle East and North African countries are also at 85%. The highest ANC coverage is in Latin America and the Caribbean, and East Asia and the Pacific where rates are around 98% (UNICEF, 2019a). In LIC, access to ANC is generally found to be lower in rural compared to urban areas (Kamal, 2016).

In Zimbabwe, 92% of rural pregnant women have access to at least one ANC visit compared to 96% in urban areas (ZIMSTAT and ICF International, 2016). According to the 2015 Zimbabwe Demographic and Health Survey (ZIMSTAT and ICF International, 2016), ANC attendance of at least one visit was 93% in Zimbabwe, with this figure ranging from 86-98% between provinces. In Harare province, where Chitungwiza is located, the proportion of ANC booking was 94%. The level of unbooking for ANC is therefore 7% nationally and ranges from 2-14% between provinces and is 6% for Harare province. In the country, approximately 76% attend the recommended 4 antenatal care visits and only 39% attend first ANC visit during the first trimester of pregnancy (ZIMSTAT and ICF International, 2016). Having the first ANC visit in the first trimester is vital because it allows for early detection and timely initiation of interventions to prevent foreseeable adverse outcomes and it is recommended in the WHO ANC guidelines (WHO, 2016). There was a slight improvement in ANC attendance from 2011, when 90% of pregnant women attended at least one ANC visit and 65% attended 4 ANC visits (ZIMSTAT and ICF International, 2012). The 2015, Zimbabwe 4-visit ANC attendance of 76% is comparable to that of other Southern African countries during the same period. South Africa had 75%, Zambia had 55%, Namibia 63% and Botswana with 73% attending 4 ANC visits (UNICEF, 2018b).

2.3 Barriers to accessing ANC services

Many factors have been described which affect access to antenatal care. They include women's perceptions on the importance of ANC and health problems during pregnancy. It has been suggested that marital status, parity, health worker – related factors, the costs of ANC and the fear of HIV testing were some of the factors influential in the utilisation of antenatal care services (Pell, 2003).

A systematic review further identified maternal education, husband's education, availability of ANC services, household income, women's employment, media exposure and having a history

of obstetric complications – along with a women’s marital status, as factors affecting access to ANC. Cultural beliefs and ideas about pregnancy were influences on utilization (Simkhada, 2008). Many studies have shown that poor socio-economic status is associated with poor use of antenatal services (Ejeta, 2017) (Bobo, 2017) (Tarekegn, 2014). For example, attending ANC is associated with costs even in facilities where the service is offered free. Such costs include those required for transport and the time spent at ANC.

Women who have completed secondary school or those with a tertiary education are noted, in many studies, as better utilisers of antenatal care services compared to those with no education and those who did not complete primary or secondary education (Sinyange, 2016) (Oladokun, 2010) (Galvan, 2001). Educated women may have a better perception of the importance of ANC, have a better understanding of health education messages and are less intimidated to approach health care workers (Pell, 2003). Similarly, it has been noted that professional women are good users of antenatal care services compared to unemployed women (Simkhada, 2008) (Oladokun, 2010). Women who get pregnant at ages less than 20 are usually not financially independent, unmarried and have not yet completed secondary or tertiary education and have been identified as poor utilisers of antenatal care services. In some settings, this can be worsened by poor pregnancy disclosure and social stigma (Sinyange, 2016) (Pell, 2003). Researchers have noted that lower parity, a planned pregnancy and past pregnancy complications were associated with better utilisation of ANC (Oladokun, 2010) (Sinyange, 2016)

A positive HIV test result is associated with psychological problems and can be a source of stigma and social harm. It is known in the Chitungwiza community that all pregnant women accessing ANC are to be tested for HIV. A study by Pell (2003) showed that fear of HIV testing is a barrier to accessing ANC by pregnant women (Pell, 2003)

Interestingly, most studies focusing on the risk factors associated with poor utilisation of ANC tend to focus on the comparison between *early* bookers and *late* bookers and do not focus on the risk factors for *not* booking at all. Galvin (2001) showed that non-bookers were likely to be of lower socio-economic status compared to booked women in Harare, Zimbabwe. However, this study was done at a referral hospital where most of the non-bookers had been referred from rural areas which does not reflect the urban Chitungwiza population (Galvin, 2001)

2.4 PMTCT with ART: a successful HIV prevention strategy

Many studies have proved that ART is effective in the prevention of vertical HIV transmission (Siegfried, 2011) (Suksomboon, 2007) (Cooper, 2002). Since 2013, the WHO has recommended triple ART regimens for PMTCT (Mofenson, 2017). It has also been shown that the risk for vertical HIV transmission reduces with reduction in maternal plasma HIV viral load and women with undetectable viral load at delivery at the least risk for HIV transmission (Mofenson, 1999). The ARVs act by reducing the plasma viral load. The level of viral load at delivery is influenced by the duration a woman has been ART during pregnancy. It takes 60 to 147 days from ART initiation to full viral suppression depending on the ART regimen (Jacobson, 2018). It goes on to say that pregnant women on ART for longer durations during pregnancy are less likely to transmit HIV than those on ART for shorter durations. A meta-analysis was performed in 2009, involving 9 studies selected from studies performed around the world which met the criteria. One of the objectives of the study was to evaluate the optimal time to start therapy in relation to the woman's gestational age. The study results showed that starting ART at 28 - 36 weeks gestation was associated with reduced MTCT compared to starting after 36 weeks gestation. The rate of MTCT was 36% lower in those on long duration ART compared to those on short duration ART (Sturt, 2010). The WHO recommend pregnant women to start ART early during pregnancy.

Women who are HIV positive need to therefore access ANC and start ART well before delivery in order to benefit from the preventive effects of ART.

2.5 Slow progress in eMTCT in Zimbabwe

The government of Zimbabwe has renewed efforts for eMTCT and in 2017 published a 5-year plan (2018-2022) for the elimination of MTCT of HIV and Syphilis by 2022 (MoHCC, 2017a). Promoting the availability of quality integrated Reproductive, Maternal, New-born, Child and Adolescent Health & Nutrition (RMNCAH&N) and eMTCT services is one of the strategic intervention areas of the Ministry's 5-year (2018-2022) plan.

The programmatic targets of the plan include the increase of ANC coverage to >95% , increasing the coverage of HIV testing of pregnant women by >95% and increasing ART coverage for HIV positive pregnant women by >95% by 2022 The expected impact of these targets is to reduce MTCT to <5% by 2022 (Mushavi, 2018). However, per ZDHS 2015 data, ANC coverage is already at 93% (ZIMSTAT and ICF international, 2016) and ART coverage for HIV positive women was already 95% in 2017 (MoHCC and National AIDS Council,

2018), showing that biomedical interventions are almost already saturated and alone will not bring down MTCT to <5% by 2022.

It is therefore important that the Ministry and Zimbabwean government acknowledge the need to address some of the more socio-cultural and economic barriers that reduce the population's access to PMTCT. Whilst the Ministry's 5-year plan identifies barriers to eMTCT, practical ways of overcoming these barriers still need to be identified and actioned to reduce them. The barriers identified are as follows:

- Financial barriers like user fees and transport costs.
- Late ANC booking resulting from cultural and religious practices and knowledge gaps.
- Distance to health facilities and other geographical barriers.
- Stigma and discrimination leading to poor disclosure (MoHCC, 2017a).

2.6 The study setting

The study site, Chitungwiza, is the third most populous city in Zimbabwe, and is situated about 30km south of the capital city, Harare. It has a population of 356,840 and an annual growth rate of 1%. About 64% of the population is comprised of adolescents and adults over 15 years of age, among whom 30% are women of child-bearing age. (ZIMSTAT and ICF international, 2016). The overall adult prevalence of HIV in Chitungwiza in the 15-49-year age group is estimated to be 15%, with women harboring higher burden of disease at 18% prevalence in comparison with 12% among men. The prevalence among antenatal clinic attendees is 16% (ZIMSTAT and ICF International, 2016). Public health antenatal care is provided at 4 maternity clinics in the city by trained midwives and complicated cases are referred to Chitungwiza government hospital located 4-6km from each clinic.

2.7 Summary of literature review

PMTCT with ART can reduce MTCT to below 1% (MoHCC, 2017a). Zimbabwe has strengthened access to PMTCT through integration with ANC services since its introduction in the country, from 3 pilot sites in 1999 to 1560 sites in 2010 (Mushavi, 2018). This resulted in the reduction of MTCT from 30% in 2002 to 6.7% in 2017 (MoHCC, National AIDS Council, 2018). As of 2017, 93% of pregnant women are reported to attend at least one ANC visit and 95% of HIV positive pregnant women have access to ART for treatment and for PMTCT (Mushavi, 2018). Despite these interventions, MTCT of HIV has remained above the eMTCT target of 5% (MoHCC, National AIDS Council, 2018). One of the reasons for persistent MTCT is pregnant women not accessing antenatal care during pregnancy, hence

missing PMTCT with ART, with the resultant effect of carrying the high risk of 15-45% for MTCT (AVERT, 2019). There is possibility that the ANC attendance of 93% could be an overestimate because of the research method used which is prone to recall bias and lying to please the interviewer. Estimation using a more reliable method is required in order to assess the true burden of non-usage of ANC services in the urban city of Chitungwiza. The continued MTCT despite availability of biomedical services points to either overestimation of access to these services or some socio-geo-economic and cultural barriers to access, which need to be identified and ameliorated as we start another 5-year plan for elimination of paediatric HIV infection.



CHAPTER 3: METHODOLOGY

This chapter states the aim and objectives of this study. It gives a description of the study setting, approach and design. The study population is defined, and sample selection discussed. Data extraction and the variables considered are described. The statistical analyses conducted on the data and the ethical considerations considered during this study are also explained.

3.1 Study aim and objectives

3.1.1 Study Aim

The aim of the study is to determine the proportion of women unbooked for antenatal care at delivery and among them, the proportion of women who are HIV positive and who therefore missed PMTCT during pregnancy. In addition, the study aims to identify the risk factors associated with unbooking among women in the city of Chitungwiza.

3.1.2 Study Objectives.

1. To determine the proportion of pregnant women who did not have any contact with antenatal care services during pregnancy (i.e. unbooked women) at all 4 public maternity clinics in the city of Chitungwiza from 01 January to 31 December 2017.
2. To measure, amongst this cohort of unbooked women, the proportion that were HIV positive and thus missed out on PMTCT services offered as part of the ANC services at Chitungwiza's maternity clinics from 01 January to 31 December 2017
3. To determine sociodemographic, psychosocial and clinical factors associated with unbooking for ANC service.

3.2 Description of study setting

The study was carried out in Chitungwiza which is the third most populous city in Zimbabwe, situated about 30km south of the capital city, Harare. Chitungwiza is an urban city surrounded by urban Harare on the northern side, peri-urban informal settlements on the western side, then a rural setting on the south and eastern sides. The city is divided into 4 urban sub-districts, Seke North, Seke South, Zengeza and St Mary's and each district is serviced by a polyclinic with a similar name as the district. The polyclinics, which belong to Chitungwiza City Municipality, offer preventive and curative services including STI treatment, maternity care (antenatal, delivery and postnatal) and HIV treatment services including PMTCT services. Each polyclinic attends to about 110 deliveries per month. The maternity side of the clinics is staffed by midwives who refer complicated cases to the government- run Chitungwiza General Hospital

situated about 4-6 km from each clinic. The clinics have been offering PMTCT services, since 2002, to the Chitungwiza urban and peri-urban community. There is also a private hospital in the city and many private doctors. Some women prefer maternity care in nearby Harare. Since November 2017, maternity user fees were abolished in government hospitals. At the time of administration of the study questionnaire, only booked women were found at the 4 polyclinics. The unbooked women were now populating the government general hospital for free delivery and postnatal care which was not offered at the clinics. The study was carried out in 2018 and early 2019 at the 4 polyclinics through collection of data from clinical records of all the women who delivered at the clinics from 01 January 2017 to 31 December 2017 and through administration of a questionnaire to postnatal women in the clinics and the general hospital in 2019.

3.3 Study Approach

In this study, a quantitative approach was used. This was the best approach because the study required to test pre-set objectives through the examination of relationships between booking for ANC and other variables. The study also needed to answer the 'How many?' question by determining the frequency of unbooking and other variables in the selected population. For this study, outcomes were already pre-formulated, and counts were required from patient records. A structured technique with close ended questions needed to be applied for data collection, and data needed to be numbered and to be analysed with the use of statistical procedures. The study did not need to explore the meanings individuals or groups ascribe to problems, as such, characteristics of groups rather than individuals' were studied, therefore, the qualitative approach was not feasible (Creswell, 2014; Robson, 2011).

3.4 Study design

Descriptive and analytical quantitative research methods were used in this study. The descriptive method was employed because of the need to determine frequencies and distribution of variables in a population of postpartum women. A non-interventional analytical method was used in order to assess the relationships between variables (Creswell, 2014).

The study is a cross-sectional study involving 2 phases. Phase 1 was a cross-sectional study based on retrospective review of clinic records for women who delivered and/or received postnatal care at the 4 maternity clinics in Chitungwiza between 01 January 2017 and 31 December 2017, to determine frequency of unbooking among the women. An analytic cross-sectional study was also conducted based on the review of clinic records to determine the association between booking status and HIV status, age, clinic attended and place of delivery.

Phase 2 was an analytic cross-sectional study among 44 unbooked and 44-booked postnatal women who delivered at the 4 clinics in 2019.

Cross sectional studies provide information about the frequency and patterns of diseases in a population at a specified time (Hennekens and Buring, 1987). This study sought to determine the frequency of non-booking in a population of pregnant women in Chitungwiza and this was best achieved using a cross-sectional design. The study also sought to determine the pattern of distribution of specific variables related to risk factors of unbooking between the booked and unbooked women. The differences in the frequency of these variables can only be determined using an analytic design of which a cross-sectional design is one.

Other analytical designs like a case control or cohort studies are not appropriate since they do not provide information on the frequency of the variable under study in the population. They are more useful in evaluating relationships between exposure and disease hence they are important as follow-up studies following a descriptive cross-sectional survey. Cohort studies require more resources and time which both are not available in this situation (Hennekens and Buring, 1987).

Data from cross-sectional studies can be of great value to public health administrators in assessing the health status and health care needs of a population. In addition, the data allows for efficient allocation of resources and to determine which population groups to be targeted for health education, prevention and treatment programs (Hennekens and Buring, 1987).

The retrospective review of records was appropriate because data on women who delivered was available from the clinic records, allowing the data collection to take a relatively little time. A prospective survey would have taken a year of data collection which is too long for the limited time available for this study.

3.5 Study population and sampling

Phase 1: Maternity registers were used to capture women who were registered to have delivered and/or received postnatal care at the 4 maternity clinics between January and December 2017. Women of all ages were included. Data on booking status, age, HIV status and place of delivery was available for all the women in the maternity registers. Women who were referred, during labour, for further care and did not deliver at the clinics were not included because these did not have complete data. Women who delivered prematurely were also not included because those unbooked still had opportunity to book had they delivered at term and could therefore not be assigned a booking status since booking status is the primary outcome measure. There

was a total of 4400 women who had delivered at term and these included those who delivered at the 4 health facilities and those who had delivered at home.

Phase 2: The 88 women, 44 booked (control group) and 44 unbooked (cases) were selected from the postnatal wards to complete the structured questionnaires. The cases were sampled using consecutive sampling as unbooked women were recruited as they came until sample size was achieved. Controls were recruited using systematic sampling of 1: 6

3.5.1 Inclusion and Exclusion Criteria

For Phase 1, women who had delivered at term at any one of the clinics between 01 January and 31 December of 2017 were included. Women presenting to the clinics after term home deliveries were also included. Women whose term infants were delivered as still births or who had died soon after birth were included. Women with miscarriages, abortions and preterm deliveries were excluded.

For Phase 2, post-partum women who had delivered term babies and were Chitungwiza residents were included. The following women were excluded

- Women with severe post-partum haemorrhage or sepsis.
- Women with psychosis or severe depression.
- Women with any other illnesses which made it impossible for them to sit up in bed.
- Women with miscarriages and pre-term deliveries.
- Women referred from outside Chitungwiza

3.5.2 Sample size determination

For Clinic records: The Dobson's sample size calculation was used to determine minimum sample size, using level of significance of 5% and the expected proportion (p) of booked women in the target population of 93% and margin of error of 5%. The minimum number of participants required from each clinic at 5% level of significance, assuming $p = 93\%$ [ZIMSTAT, 2016] and 5% error of margin was 100. The total minimum sample size required was 400 participants for all clinics. However, since the clinic records were already available, a sample size of 4400 was used in the analysis.

For questionnaires: The Dobson's method was also used, using $p=93\%$ and margin of error of 5%. The minimum sample size was 100. However, a sample size of 88 was used because of time, and other unforeseeable constraints. Administration of questionnaires started in August 2018 after receiving approval from MRCZ and from Chitungwiza City Ethics Committee. By

October, we had seen less than 5 unbooked mothers and realised that pregnant women were now going straight to Chitungwiza Hospital because maternity services were now free at the hospital unlike at the clinics. We only got permission to access Chitungwiza Hospital women on 29 November 2018 and the UWC Ethics Committee Approval expired before we had completed the recruitment of the full sample size of 100 women. This had the impact of reducing the power of the study in detecting the differences between the booked and unbooked women.

3.6 Data collection

Phase 1: Maternity registers were used to collect data on all booked and unbooked women who delivered at all 4 clinics from 01 January to 31 December 2017. A counsellor was hired to do the data abstraction. Age, HIV status, place of delivery and clinic attended were collected on each woman and this data was used to describe the population and to determine any associations between these and booking status. The data was recorded onto a data extraction tool (Appendix 1). This information was used to calculate the total proportion of unbooked women and the proportion of unbooked women who are HIV positive.

Phase 2: Data on risk factors was collected from 88 postpartum women, 44 booked and 44 unbooked, completing a structured questionnaire (Appendix 2). This phase was to further determine the factors associated with unbooking among pregnant women in Chitungwiza. A structured questionnaire was used to collect information on various socio-demographic data (age, level of education, occupation, income, marital status and religion), ANC utilisation (ANC booking status, number of ANC visits, reasons for no ANC booking), HIV and PMTCT service utilisation (HIV status, when HIV testing was done, Fear of HIV testing, HIV treatment, CD4 count and viral load) other ANC associated factors (cost for ANC, parity, number of pregnancies, infant mortality). . All these data were important in describing the study population and in determining any associations between them and booking status. All the data were collected as categorical data e.g. age was collected as <20 years, 20 – 34 years, >34 years and household income per month as < US\$200, US\$200-US\$500, >US\$500

A trained counsellor was hired to assist with administration of the questionnaire. Clinic records were used to verify some information before completion of questionnaires e.g. HIV status and booking status.

The same structured questionnaire was administered in a uniform manner to both the booked and unbooked women in Shona or English depending on the woman's preference. Each

questionnaire completion lasted 15 to 20 minutes and was performed in a private space to ensure confidentiality. The questionnaires doubled as pre-structured data collection forms. Upon receiving permission to perform the study at the clinics by the City Health Department, the clinic managers were notified about the study. A trained research assistant visited clinics twice a week because patients are discharged on day 3 post-delivery. At Chitungwiza hospital, only those women resident in Chitungwiza were included. Those referred from outside Chitungwiza were excluded from the study.

3.7 Data Management

Phase 1: Data was collected on the data extraction tool and entered onto an excel spreadsheet. No coding was done, for example on the HIV status, HIV positive or HIV negative was entered. Numerical data was grouped into categories.

Phase 2: Data was collected onto the structured questionnaire, categorised and coded. For age, <20 years was coded as 1, 20-34 years as 2 and >34 years as 3. The coded data was captured onto Epi-info software package. Categorical variables were created to simplify data analysis.

3.8 Data analysis

Data for clinic records - phase 1 and for questionnaires - phase 2 were captured electronically using excel spread sheet and Epi-Info respectively. All the data was categorized hence summarized using frequencies and percentages. Chi-square test was used to determine association between participants' booking status and categorized variables. Associations showing P values of less than 0.05 were further analysed by multiple logistic regression to determine the association with booking status while adjusting for other study variables. All statistic tests decisions were concluded at 5% level of significance. All statistical analyses were performed in STATA software package version 13.

3.9 Rigor

Validity is the ability to ensure that the findings of study do not have another explanation apart from what the study was meant to measure (Hennekens and Buring, 1987). Reliability is the ability of the measuring tool to give the same result after repeated assessments (Heale and Twycross, 2015). To ensure validity and reliability, a study should be controlled for bias, confounding and chance right from study design to data analysis (Hennekens and Buring, 1987)

- a) **To reduce selection bias:** the study population was well defined and there was a clear inclusion and exclusion criteria. Both cases and controls were obtained from the same population. A clear sampling method was adhered to.

b) **To reduce measurement bias:**

A data collection tool and a structured questionnaire were used on all participants. To reduce Information bias: The questionnaires were completed soon after delivery (0-3 days) and this solved the problem of recall bias. Data was verified with clinic records to ensure completeness.

c) **To reduce confounding:** Control for age, marital status, economic status was done at data analysis

d) **To reduce chance:**

A large enough sample size, from sample size calculation, was used. Tests of statistical significance, t test and chi-square test were performed during data analysis.

3.10 Ethical Considerations

Approval for conducting this study was provided by the Bio-Medical Research Ethics Committee at the University of the Western Cape (Appendix 3), and the Medical Research Council of Zimbabwe (Appendix 4). Permission to conduct the study in Chitungwiza and at Chitungwiza Hospital was granted by the Chitungwiza Ethics Committee (Appendix 5) and the Chitungwiza Hospital Clinical Director (Appendix 6), respectively.

The questionnaires were administered in a private space and the names of the participants were not captured in the data extraction tool or the questionnaires to ensure confidentiality (Cash, 2009). The study participants signed the informed consent form before completing the questionnaire. All the data extraction sheets, and informed consent forms were kept in a locked drawer in the researcher's office and the electronic records were kept on the researcher's password protected computer.

Results obtained from the study were presented in an aggregated form which did not identify individual patients and were shared with the School of Public Health at the University of the Western Cape.

3.11 Summary

The study was done to determine the proportion of unbooking as well as the proportion of unbooked HIV positive pregnant women in Chitungwiza and to identify the factors associated with unbooking in this population. The results of the study are generalizable to Chitungwiza city and other urban cities in Zimbabwe and in LIC. The study was in two parts: Phase 1, a quantitative descriptive cross-sectional retrospective analysis of all records that met the inclusion criteria for women who delivered at the 4 maternity clinics in Chitungwiza between

01 January and 31 December 2017. Phase 2 a quantitative non-interventional analytic cross-sectional study involving completion of questionnaires by 44 booked and 44 unbooked postnatal women to determine the factors associated with unbooking. Information collected was analysed using STATA to determine the proportions and the relationships between variables. Approval for conducting the study was obtained from all relevant authorities. Findings from the study are presented in chapter 4.



CHAPTER 4: RESULTS

Introduction

This chapter presents the study findings in line with the key objectives outlined in the methodology chapter. The results from the clinic records of the women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017 -Phase 1 and results from questionnaires completed by 88 booked and unbooked women who delivered in Chitungwiza -Phase 11 are presented separately. The characteristics of the study population are initially summarised for each phase, to give a description of the population. This is followed by a bivariate analysis with Fisher's exact tests to assess the association between booking status and all the other variables. Finally, a multivariate analysis on variables that were associated with booking status follow to show the odds ratios, confidence intervals and p values.

4.1 Description and Analysis of clinic records (Phase 1) results

The results in this section show the univariate analysis of the descriptive characteristics of the 4400 women who delivered and/or received postnatal care at the 4 maternity clinics between January and December 2017, whose data was extracted from clinic records. It also shows bivariate analysis results for the associations between booking status and HIV infection, age, place of delivery and clinic attended. A multivariate analysis of those variables which showed association with booking status is presented lastly.

4.1.1 Univariate analysis of clinic records (Phase 1) results

Table 4.1.1 shows description of characteristics of the 4400 women who delivered and/or received postnatal care at the 4 maternity clinics in 2017.

Booking status: A total of 820 out of the 4400 (19%) women did not have contact with ANC during pregnancy. The rate of unbooking was therefore very high.

HIV status: Out of the 4400 women, a total 470 were HIV positive, giving an ANC prevalence of 11%.

Place of delivery. Of the 4400 women in postnatal care, 3999 delivered at the clinics under trained birth attended whilst as many as 401 (9.1%) delivered outside the health system and presented at the clinics only for postnatal care.

Clinic Attended: Seke South clinic attended to the largest number of women. Of the 4400 women, 1397 (32%) were from Seke South clinic, 1264 (28%) were from Seke North clinic, 1012 (23%) from St Mary clinic and 727 (17%) were from Zengeza Clinic.

Age: The most common age group was the 20-34 years group, contributing 75% of the population with 3304 women, 14% (597 women) were less than 20 years of age and 11% (499 women) were above 34 years of age.

Table 4.1.1 General description of the women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017

Variable	Frequency (percentage in study population)
Clinic attended	
Seke North	1264 (28)
Seke South	1397 (32)
St Marry	1012 (23)
Zengeza	727 (17)
Age in years	
<20	597 (14)
20-34	3304 (75)
>34	499 (11)
HIV status	
Negative	3930 (89)
Positive	470 (11)
Booking status	
Booked	3580 (81)
Unbooked	820 (19)
Place of delivery	
Clinic	3999 (91)
Home	401 (9)
Home delivery unbooked	207(5)
Home delivery unbooked and HIV positive	47(1)

4.1.2 Bivariate analysis of factors associated with booking status

Table 4.1.2 shows results of bivariate analysis with chi-squared test to show factors associated with unbooking among the 4400 postnatal women at the 4 maternity clinics. Only those factors with p values < 0.05 have an association with booking.

4.1.2.1 Clinic attended: The percentage of unbooking was highest at St Mary's clinic, compared to other clinics. A total of 23% ,236 of the 776 of those attended at St Mary's clinic were unbooked, 218 of the 1046(17%) from Seke North were unbooked, 253 of the 1144 (17%) from Seke South and 113 of 614 (16%) from Zengeza clinic were unbooked. There was more unbooking at St Mary's clinic compared to other clinics and the difference was statistically significant. $P < 0.001$

4.1.2.2 Age: Unbooking was highest among the younger and the older participants. Among the 597 participants aged less than 20 years, 136 (23%) were unbooked and 115 of the 499(23%) women aged over 34 years were unbooked. Only 17%, 567 of the 3304 women aged 20-34 years were unbooked. Unbooking was lowest in the 20-34 years age group and difference was significant. $P < 0.001$

4.1.2.3 Place of delivery: There were 401 women who delivered outside the health system and 207 of these (51%) were unbooked. Among the women who delivered at the clinics, 613 of 3999 (15%) were unbooked. Home delivery had the most unbooking and this was statistically significant. $P < 0.001$

4.1.2.4 HIV status: Of the 820 unbooked women, 118 (14 %), were HIV positive. This was higher compared to the general HIV prevalence of 11% for the total sample. HIV infection was even higher among unbooked women who delivered outside the health system. Out of the 207 unbooked women who delivered at home, 47 of them (23%) were HIV positive. Out of the overall sample of 4400, 118 (3%) women were both unbooked and HIV positive, presenting high risk for HIV transmission. Only 18%, (702 out of the 3930) of HIV negative women, were unbooked, compared to 25% who were unbooked among the HIV positive women (118 of 407), showing an association between unbooking and HIV infection. $P < 0.001$

Table 4.1.2 Bivariate analysis of factors associated with booking status among women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017

Variable	Booking Status		p-value
	Booked	Un-booked	
Clinic attended, n (%)			
Seke North	1046 (83)	218 (17)	<0.001
Seke South	1144 (83)	253 (17)	
St Marry	776 (77)	236 (23)	
Zengeza	614 (84)	113 (16)	
Age in years, n (%)			
<20	461 (77)	136 (23)	<0.001
20-34	2737 (83)	567 (17)	
>34	384 (77)	115 (23)	
HIV status, n (%)			
Negative	3228 (82)	702 (18)	<0.001
Positive	352 (75)	118 (25)	
Place of delivery, n (%)			
Clinic	3386 (85)	613 (15)	<0.001
Home	194 (48)	207 (51)	
Home Deliveries n (%)			
HIV positive	35(43)	47(57)	<0.157
HIV negative	159(50)	160(50)	

4.1.3 Multivariate analysis of factors associated with booking

A multivariate analysis was performed on all the variables which showed association with booking in the bivariate analysis. This was done to further describe the relationship with OR and CI and to adjust for confounding. After multivariate analysis, age <20 years, St Mary's clinic, HIV positive status and home delivery were risk factors for unbooking as shown in table 4.1.3.

The HIV positive women were 0.24 times less likely to book than HIV negative women, Adjusted OR 0.76, 95% CI (0.61-0.98) P=0.037. Women attended at St Mary's clinic were 23% less likely to book compared to Seke North women, Adjusted OR 0.77, 95% CI (0.62-0.96), P=0.020. Women aged 20-34 years were 1.3 times more likely to book than those aged < 20 years, Adjusted OR 1.3, 95% CL (1.04-1.62), P=0.022. Women who delivered at clinics were 5.17 times more likely to have booked compared to home deliveries Adjusted OR 5.17, 95% CI (4.06-6.57), P < 0.001.

Table 4.1.3 showing multivariate analysis results of clinic records variables associated with booking status among women who delivered and/or received postnatal care in Chitungwiza clinics from 01 January to 31 December 2017.

Variable	Adjusted OR	95% CI	p-value
HIV Status			
negative	Reference		
positive	0.76	0.61-0.98	0.037
Clinic attended			
Seke North	Reference		
Seke South	0.85	0.69-1.05	0.138
St Mary's	0.77	0.62-0.96	0.020
Zengeza	0.98	0.76-1.27	0.902
Age			
<20 years	Reference		
20-34 years	1.3	1.04-1.62	0.022
>34	1.12	0.83-1.51	0.464
Place of delivery			
Home delivery	Reference		
Clinic delivery	5.17	4.06-6.57	<0.001

4.2 Description and analysis of results from questionnaires of 88 booked and unbooked women who delivered in Chitungwiza-Phase 2

The results in this section show the univariate analysis of the descriptive characteristics of the 88 postnatal women, 44 booked and 44 unbooked women who responded to questionnaires in order to determine factors associated with unbooking. The factors included age, level of education, family income, parity, pregnancy complications, pregnancy planning, fear of HIV testing and others described in chapter 3. Bivariate analysis results then follow, showing the associations between booking status and all the factors. Only the associated factors with p values <0.05 are further analysed in multivariate analysis to further describe their relationships with unbooking

4.2.1 Univariate analysis

This section shows description of characteristics of the 88 women, 44 booked and 44 unbooked who responded to questionnaires to determine factors associated with unbooking.

4.2.1.1 Descriptive data on socio-economic factors

A total of 88 participant's data, 44 booked and 44 unbooked, was used for analysis of questionnaire section. The most common age group was 20 to 34 years constituting 50% of the sample. Those educated up to secondary school constituted 74% while the rest went up to at primary school level. Unemployment rate was 68%, 6% and 26% were employed formally and informally respectively. Those who earned less than US \$200 were 54% and 46% earned US\$200 to US\$500 Poverty is high in Chitungwiza as none of the 88 women had a family income of over US\$500. A total of 85% were required to pay booking fees. About 58% of the women claimed that the booking fee was expensive to them whilst 42% claimed the fee was not expensive. About 81% of the women were married whilst the rest were single. On religious orientation, 31% were of the white garment and 33% were from Pentecostal churches, 29% were from mainline churches and 7% were of other religious orientations. See table 4.2.1.1

Table 4.2.1.1: Descriptive data on socio-economic factors of the 88 booked and unbooked women who delivered in Chitungwiza in 2019

Variable	Frequency (percentage in the population)
Age in years	
<20	23 (26)
20-34	50 (57)
>34	15 (17)
Level of Education	
Primary	23 (26)
Secondary or more	65 (74)
Employment	
Formal	5 (6)
Informal	23 (26)
None	60 (68)
Income in US\$	
>500	0 (0)
200-500	41 (54)
<200	33 (46)
Required to pay booking fees	
Yes	73(85)
No	13(15)
Booking is expensive	
Yes	43(58)
No	31(42)
Marital status	
Married	71 (81)
Other	17 (19)
Religion	
White garment	26 (31)
Pentecostal	28 (33)
Mainline	25 (29)

Other	6 (7)

4.2.1.2 Descriptive data for ANC utilisation and history of current and previous pregnancies among booked and unbooked women who delivered in Chitungwiza.

Out the 44 booked women from the control group, 16% had a single ANC visit, 66% had 2 to 4 visits and 18% had more than 4 ANC visits. Of the unbooked study participants, 82% reported that they had no money as a reason for being un-booked, others did not know about booking or were just lazy or were not prepared to attend ANC. Almost all the participant, 96%, were not afraid of getting HIV test during pregnancy booking and 4% feared HIV testing, however none of the unbooked patients gave fear of HIV testing as a reason for not booking.

Majority of the women, 33%, were in their first pregnancy. A total of 32% of the women reported to have encountered death of a child, of these, 45% were miscarriages, and the rest died after birth. Of the 88 women, 53% claimed that the index pregnancy was planned whilst in 47% of the women, the pregnancy was unintentional. Only 14% of the women had experience of a pregnancy complication. See table 4.2.1.2 below

Table 4.2.1.2 showing descriptive data on ANC utilisation and history of current and previous pregnancies among booked and unbooked women who delivered in Chitungwiza in 2019

Variable	Frequency (Percentage in population)
Booking status	
Booked	44 (50)
Un-booked	44 (50)
Number of clinic visits	
1	7 (16)
2-4	29 (66)
>4	8 (18)
Reason for not booking	
No money	32 (82)
Did not know	1(3)

Lazy to attend ANC	5 (13)
Unprepared	1(3)
Fear of getting HIV test	
Yes	2 (4)
No	86 (96)
Total number of pregnancies	
1	29(33)
2	17(20)
3	19(22)
4	16(18)
5	6(7)
Number of living children	
0	5(6)
1	32(38)
2	20(24)
3	19(22)
4	9(11)
Number of pregnancies after HIV testing	
0	39(47)
1	13(16)
2	16(19)
3	11(13)
4	4(5)
Death of a child in the family	
Yes	24(29)
No	59(71)
Age of child at death	
Miscarriage	10(45)

<=6 months	9(41)
>6months	3(14)
Was the pregnancy planned	
Yes	50(57)
No	38(43)
Challenges during pregnancy	
Yes	8(14)
No	80(86)

4.2.1.3 Descriptive data for HIV and PMTCT services utilisation among 88 booked and unbooked women.

As shown in table 4.2.1.3, uptake of HIV testing was very high with 98% of the women having HIV test results. Of all the women only 15 % received their last HIV test before pregnancy, 44% had latest HIV testing during pregnancy, 6% during labour and 35% after delivery. A total of 21% of the study participants were HIV positive. Of those that were HIV positive, 29% were not on ART during pregnancy. Among those HIV positive with available results, 25% had a CD4 count less than 350 and 76% had undetectable viral load. This indicate that the general condition of the HIV positive women was good.

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Table 4.2.1.3. showing descriptive data for HIV and PMTCT services utilisation among booked and unbooked women who delivered in Chitungwiza in 2019

Variable	Frequency (Percentage in population)
HIV status	
Negative	68 (79)
Positive	18 (21)
When the last HIV test was performed	
Before pregnant	14 (16)
During pregnant	41 (47)
During Labour	5 (6)
After pregnancy	26 (31)
ARV uptake during pregnancy	
Yes	15 (83)
No	3 (17)
Time on ARV in months	
<=12	4 (22)
>12	14 (78)
CD4 count/ cells/mm³	
<350	2 (18)
>=500	9 (82)
Viral load /copies/ml	
Undetectable	8 (73)
<=1000	2 (18)
>1000	1 (9)

4.2.2 Bivariate analysis of factors associated with booking status among 88 booked and unbooked women

Bivariate analysis was performed to determine the factors which are associated with unbooking using the Fischer's exact test. Only those factors with p values < 0.05 were associated.

4.2.2.1 Bivariate analysis of socio-economic factors

As shown in table 4.2.2.1, there was an association between booking status and the following variables: household income, level of education, obligation to pay maternity fees and perception on cost of booking. All the other variables showed no association with booking status.

Household income: Only 37% of women with household income less than US\$200 were booked compared to 70% booked among those who earned US\$200-500 and this was statistically significant ($p = 0.007$).

Obligation to pay fees: There was an association between no obligation to pay booking fees and unbooking. About 77% of those not obliged to pay booking fees were unbooked compared to 47% unbooked among those required to pay booking fees ($p=0.041$). Those not obliged to pay are under social security or other charity organizations hence poorer than those obliged to pay ANC fees.

Perception on cost of booking: Only 35% were not booked among those who said cost of booking was not expensive compared to 61% among those who said the cost was expensive ($p = 0.034$)

Level of education: Of those with secondary education or more, 52% were not booked compared 43% among those who only reached primary school. ($p= 0.038$)

Age: Only 46% were not booked among the 20-34 years age group compared to 52% among those less than 20 years and 60% among those >34 years. However, the difference did not reach statistical significance.

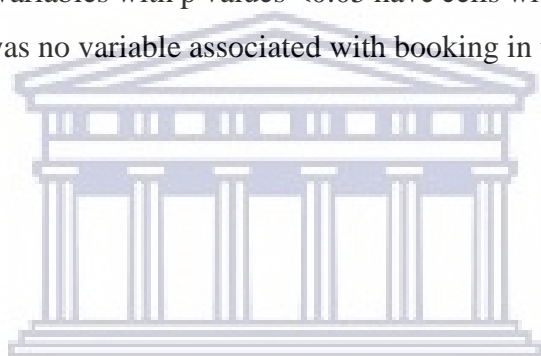
Table 4.2.2.1 showing bivariate analysis of socio-economic factors among 88 booked and unbooked women who delivered in Chitungwiza in 2019

Valuable	Booked n (%)	Unbooked n (%)	P = value
Age (years)			
< 20	11(48)	12 (52)	
20-34	27 (54)	23 (46)	0.644
>34	6 (40)	9 (60)	
Level of education			
Primary school	13(57)	10(43)	
Secondary school and above	31(48)	34(52)	0.038
Employment			
Formal	2(40)	3(60)	
Informal	12(52)	11(48)	1.000
None	30 (50)	30(50)	
Income			
200-500	25 (63)	16 (37)	
<200	10 (30)	23 (70)	0.007
Obligation to pay ANC fees			
Yes	39(53)	34(47)	0.041
No	3(23)	10(77)	
Cost of booking is expensive			
Yes	28 (65)	15(35)	0.034
No	12(39)	19(61)	
Marital status			
married	37 (52)	34 (48)	0.591

Single	7 (41)	10 (59)	
Religion			
White garment	12 (46)	14 (54)	
Pentecostal	13 (46)	15 (54)	0.711
Mainline	15 (60)	10 (40)	
other	3 (50)	3 (50)	

4.2.2.2 Bivariate analysis for HIV and PMTCT service utilisation

As shown in table 4.2.2.2, variables with p values <0.05 have cells with 0 values and these will not be considered. There was no variable associated with booking in this category.



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Table 4.2.2.2 showing bivariate analysis for HIV and PMTCT service utilisation among 88 booked and unbooked women who delivered in Chitungwiza in 2019

HIV Status	Booked n (%)	Unbooked n (%)	P-value
Negative	33 (49)	35 (51)	0.794
Positive	10 (56)	8 (44)	
When last HIV test was performed			
Before current pregnancy	6 (43)	8 (57)	
During current pregnancy	6 (15)	34 (85)	0.000
During labour	5 (100)	0 (0)	
After delivery	24 (92)	2 (8)	
On ARVs during pregnancy			
Yes	6 (40)	9 (60)	0.030
No	3(100)	0 (0)	
Duration on ARVs			
0-12moths	3 (75)	1 (25)	0.576
>12 months	6 (43)	8 (57)	
CD4 Count			
0-349	2	0	0.109
>350	2 (22)	7 (78)	
Viral load			
undetected	3 (38)	5 (62)	
<1000	1 (50)	1(50)	0.697
>1000	1(100)	0 (0)	

4.2.2.3 Bivariate analysis for ANC utilisation and history of current and previous pregnancies

As shown in table 4.2.2.3, there was associated between booking and planning for pregnancy. All other factors showed no association.

Planned pregnancy: There was an association between planning for pregnancy and booking status ($p = 0.006$), 66% of participants who planned for the pregnancy were booked compared to 30% among those who claimed the pregnancy was not planned.

Table 4.2.2.3 showing bivariate analysis of ANC utilization and history of current and previous pregnancies among booked and unbooked women in Chitungwiza in 2019

	Booked	Unbooked	P-value
Total number of pregnancies			
1	14(48)	15(52)	
2	8 (47)	9 (53)	
3	11 (58)	8 (42)	0.951
4	7 (44)	9 (56)	
5	3 (50)	3 (50)	
Number of live children			
0	2 (40)	3 (60)	
1	15 (47)	17 (53)	
2	10 (50)	10 (50)	0.815
3	8 (42)	11 (48)	
4	6 (67)	3 (33)	
Number of pregnancies after knowing HIV status			
0	18 (46)	21 (54)	
1	15 (47)	17 (53)	
2	10 (50)	10 (50)	0.563
3	8 (42)	11 (48)	

4	6 (67)	3 (33)	
A dead child			
Yes	11 (46)	13 (54)	0.629
No	32(54)	27 (46)	
Age child died			
miscarriage	3(30)	7(70)	
0-6 months	5 (56)	4 (44)	0.427
➤ 6 months	2 (67)	1 (33)	
Pregnancy planning			
unplanned	17 (34)	33 (66)	0.001
planned	26 (70)	11 (30)	
Challenges with previous pregnancies			
Yes	3(38)	5(62)	0.706
No	26 (51)	25 49)	

4.2.3 Multivariate logistic regression to determine factors associated with booking status.

Those factors which showed association with booking were subjected to multivariate analysis to adjust for other variables and to further describe the association. After the analysis, only household income and planning for pregnancy were associated with booking

Household income: There was an association between level of income and booking status after adjusting for other study variables, Adjusted OR 4.96, 95% CI (1.56 – 15.74) P=0.007 as shown in Table 4.2.3. Those who earned between US\$200-US\$500 were 4.96 more likely to book for ANC than those who earned <US\$200.

Planning for pregnancy: There was an association between planning for pregnancy and booking status after adjusting for other study variables, Adjusted OR 0.13, 95% CI (0.04-0.42) P = 0.001 The odds of booking among those who did not plan for pregnancy were 0.87 times less that of participants with planned pregnancies. Those with unplanned pregnancies were 87% less likely to book than those with planned pregnancies.

Table 4.2.3: Multivariate logistic regression to determine factors associated with booking status among 88 booked and unbooked women in Chitungwiza in 2019

Variable	Adjusted OR	95% Confidence Interval	p-value
Household Income			
<200	Reference	-	-
200-500	4.96	1.56-15.74	0.007
Pregnancy planning			
Yes	Reference	-	-
No	0.13	0.04-0.42	0.001

4.3 Summary of results

A total of 19% (820 out of 4400) were unbooked for ANC. HIV results for all the 4400 women were available and 470 (11%) were HIV positive. A total of 3% (118 out of 4400) of all the women were both unbooked and HIV positive and these missed opportunities to fully utilise PMTCT. The HIV positive women were 0.24 times less likely to book than HIV negative women, Adjusted OR 0.76, 95% CI (0.61-0.98) P=0.037. Women attended at St Mary's clinic were 33% less likely to book compared to Seke North women, Adjusted OR 0.77, 95% CI (0.62-0.96), P=0.020. Women aged 20-34 years were 1.3 times more likely to book than the teenagers, Adjusted OR 1.3, 95% CL (1.04-1.62), P=0.022. Women who delivered at clinics were 5.17 times more likely to have booked compared to home deliveries Adjusted OR 5.17, 95% CI (4.06-6.57), P < 0.001. Those with unplanned pregnancies were 87% less likely to book for ANC than those with planned pregnancies, Adjusted OR 0.13, 95% CI (0.04-0.42), P=0.001. Those earning US\$200 to US\$500 were 4.96 times more likely to book for ANC than those participants earning below US\$200. Adjusted OR, 4.46 95% CI (1.56 – 15.74) P=0.007

CHAPTER 5: DISCUSSION

The objectives of this study were to determine the proportion of unbooking for ANC among pregnant women in Chitungwiza and measure the proportion that were unbooked HIV positive who would have missed the opportunity to fully utilise PMTCT services. The study also had an objective to determine the factors associated with unbooking for ANC in the population of pregnant women in Chitungwiza.

5.1 Proportion of unbooking in Chitungwiza

The study identified the burden of unbooking for ANC in Chitungwiza to be 19%. This burden is much higher and even triples the 6% unbooking suggested for Harare province in the 2015 National Demographic and Health Survey (ZIMSTAT and ICF International, 2016).

5.2 Proportion of HIV positive unbooked women

A total of 3% of all women delivering and/or receiving postnatal care at Chitungwiza maternity clinics were both unbooked and HIV positive. These are women who did not access PMTCT services offered during ANC and are at high risk for perinatal HIV transmission. Unless such women are identified and brought into care, children will continue to be born with HIV amidst tried and tested HIV prevention measures.

About 11% of the women in the sample of 4400 clinic records were HIV positive. This percentage was lower than the Zimbabwe national ANC prevalence of 16%. The lower percentage could be explained by the declining national HIV incidence which went down from 1% in 2015 to 0.54% in 2017 (MoHCC and National AIDS Council, 2018). From the questionnaire data involving 88 women, 21% were HIV positive. This high percentage could be explained by the smaller sample size and cannot be generalised.

5.3 Factors associated with not booking

5.3.1 HIV Infection

The percentage of HIV infection among unbooked women who delivered at the 4 clinics between 01 January and 31 December 2017 was higher than in the general sample, 14% versus 11%. Again, only 18%, (702 out of the 3930) of HIV negative women, were unbooked, compared to 25% who were unbooked among the HIV positive women (118 of 407). There was therefore a strong association between unbooking and being HIV positive. The reason for this is not known but it could be because the factors associated unbooking such as low socio-

economic status, are the same factors associated with HIV acquisition. However, from the questionnaire data, there was no association between HIV infection and unbooking. This was because there was a small number of HIV positive women, 18 out of 88.

5.3.2 Place of delivery

Of the 820 unbooked women, only 25% (201) delivered at home, representing 52% of the 401 home deliveries. This shows that even when unbooked, most women prefer to deliver under supervision of health care providers, reflecting a high knowledge about the importance of health-care facility delivery in the Chitungwiza community. However, almost half of the women who delivered at home were booked for ANC, and among all the booked cases 85% delivered in health institutions and the other 15% delivered at home. This scenario in which women who are booked for ANC deliver outside the health institutions has been identified in Ghana, Nigeria, Senegal and Nepal where only 38%, 68.5%, 76% and 50% of women booked for ANC deliver in health institutions respectively (Siyoum, 2018). In a study performed in a district in Ethiopia, 68% of all women booked for ANC delivered at home (Siyoum, 2018). Nationally, about 50% of all booked women deliver outside health institutions in Ethiopia (Kasaye, 2017). In Zimbabwe, nationally, 93% of pregnant women attended at least one ANC visit but only 72% delivered in health institutions (ZIMSTAT and ICF International, 2016). Time taken to reach health facility, lack of knowledge about the signs of labour, unplanned pregnancy and less than 4 ANC visits were identified as associated with home deliveries in ANC booked women (Siyoum, 2018) (Kasaye, 2017). That home delivery is high risk for perinatal mortality is already established (Teferra, 2012) and the WHO recommends skilled delivery in a health institution as a strategy to reduce perinatal mortality rate (WHO, 2016).

There were 47 HIV positive unbooked women who delivered at home and these form a subgroup of very high risk for MTCT as the infants would have started breastfeeding before initiating infant prophylaxis and would have missed the post exposure prophylaxis effect of nevirapine which is given immediately after birth. The nevirapine dose given at birth is already established to be effective in reducing perinatal HIV transmission (Stringer, 2003)

5.3.3 Clinic attended

Unbooking was significantly higher in St Mary's compared to the other 3 clinics. This could be explained by the lower socio-economic status of St Mary's as it services more peri-urban overcrowded informal settlements compared to other clinics. It is common knowledge that peri-

urban informal settlements are associated with poverty and unemployment which negatively affect utilisation of health services requiring user fees.

5.3.4 Age

From the clinical records data, women less than 20 years and those above 34 were less likely to book compared to the 20-34-year olds and this was clinically significant. This was similar to results from the questionnaire data, even though significance was not reached. These results were in contrast with the 2015 ZDHS data which showed highest ANC attendance of 94.6% among those aged < 20years compared to 93% in those above 20 years (ZIMSTAT and ICF international, 2016).

5.3.5 Household income

Poverty is a deterrent to ANC utilisation as evidenced by the significantly lower bookings among those with household income less than US\$200 compared with those earning between US\$200-500. This is supported by a study in Kenya which showed low household income as a factor associated with low uptake of ANC and PMTCT (Zegeye, 2018) and the studies in Benin (Dansou, 2017) and in Nepal (Joshi, 2014) showed the same results.

5.3.6 Unplanned Pregnancies

Unplanned pregnancies were associated with reduced utilisation of ANC and represents unmet need for contraception. The WHO recommend prevention of unwanted pregnancies as one of 4 pronged efforts to reduce perinatal HIV transmission (WHO, 2019c). In Zimbabwe, the overall unmet need for contraception was 10% and was highest in women < 20 years at 12.6%. Those above 34 years had an average unmet need of 11.7%. Level of unmet need was lowest in those aged 20-34 years with 9.6% (ZIMSTAT and ICF international, 2016).

5.4 Generalisability

Results from phase 1 of the study would be generalizable to the study area and to other high-density urban areas in Zimbabwe and other resource-limited countries. It is possible that results from phase 2 of the study could be explained by chance because of the small sample size, hence can only be generalised with care.

5.5 Limitations of the study

The study was designed as a cross-sectional study and can therefore only capture association but not causation.

The study was not able to capture all unbooked women from Chitungwiza as some women deliver at home under the care of traditional birth attendants and do not visit the antenatal clinics.

As Chitungwiza is only 28 km from Harare (the capital of Zimbabwe), some women opt to seek ANC at Harare clinics and others in private centres in Chitungwiza, thus were not captured by the study and not represented in the study. The phase 2 questionnaires were completed after the introduction of the scrapping off of maternity user fees at government hospitals (Kamhungira, 2017). However, user fees continued to be a requirement at the 4 Chitungwiza city council maternity clinics. This policy did not affect women who were already booked. These continued to deliver at the maternity clinics. However, those who were unbooked, still required to pay at delivery at the city council clinics, preferred to go for free delivery at Chitungwiza hospital. In order to reach the sample size of unbooked women, it became necessary to follow the women to Chitungwiza hospital. Hence most of the interviews for unbooked women were carried out at the hospital instead of the city council maternity clinics. As a result, questionnaires were completed at different places for booked and unbooked women. The extra permission required for Chitungwiza hospital ate up on time so the total calculated sample size of 100 could not be reached. This had the impact of reducing the power of the study in detecting the differences between controls and cases.

Seriously ill women were excluded from participating in phase 2 of the study. Unbooking for ANC is associated with pregnancy complications and excluding these women would likely compromise the results of the study. Again, the sample size of 88 for phase two of the study was small and the results need to be generalised with care.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The purpose of this study was to determine the proportion of women unbooked for antenatal care at delivery and among them, the proportion of women who were unbooked and HIV positive, and who therefore missed out on the PMTCT interventions that are routinely available to them during a pregnancy. In addition, the study aimed at identifying the risk factors associated with unbooking among pregnant women in the city of Chitungwiza.

Although provincial data on the percentage of unbooked women is available from the 2015 ZDHS, there is no available *local* data for the burden of unbooking in Chitungwiza. This data is important for local outreach and health service planning and the intention of this study was to contribute to providing such local-level data. It must be borne in mind that the ZDHS results are based on women responding to a question on their booking status on the last baby they had in the past 5 years. According to the ZDHS 2015, *“women who had a live birth in the 5 years preceding the survey were asked a number of questions about maternal and child health care. For the last live birth in that period, mothers were asked about antenatal care (ANC) during the pregnancy, assistance during delivery, the location of the delivery, and the timing of postnatal care”* (ZIMSTAT and ICF International, 2016). In this case, the desire to please the interviewer and recall bias cannot be ruled out and could result in an *underestimate* of the problem of unbooking based on experiences with unbooked women in the city (Chadwick, 2017). It was the intention of this study to provide more reliable local data on the burden of unbooking - based on a more reliable method i.e. using delivery records. The available national data on ANC access is not linked to antenatal HIV prevalence data hence national, provincial and local data on the percentage of unbooked HIV positive pregnant women is not readily available. This study aimed to provide that data for Chitungwiza and so inform the planning of local interventions that will assist reduce some of the barriers to ANC and PMTC access and thus support greater progress towards the eMTCT target.

ANC utilisation in Chitungwiza is not optimal, with as much as 19% of pregnant women having no access to ANC services during pregnancy. These women remain at high risk of preventable maternal and foetal perinatal morbidity and mortality. Interestingly, the burden of unbooked women is much higher than the 6% from the DHS data which is being used to inform planning in the city.

The 3% unbooked HIV positive women and the association between unbooking and HIV infection makes unbooking for ANC a contributing factor to the persistent perinatal HIV transmission.

Poor household income and unintentional pregnancies were strongly associated with unbooking in this study. Other factors as; age younger than 20 or above 34 years, coming from St Mary's clinic and home delivery were also associated with unbooking for ANC in Chitungwiza.

Programs that target the poor, HIV positive women, pregnant teenagers and older pregnant women and women from peri-urban areas could help improve ANC attendance hence PMTCT uptake in Chitungwiza.

6.2 Recommendations

- Improving ANC utilisation in Chitungwiza need to be prioritised with interventions targeting socio-economic barriers. In Tanzania, the use of community health workers (CHWs) to identify pregnant women in the community and counselling on ANC attendance was very effective in improving ANC and PMTCT uptake among pregnant women (Lema, 2014) .
- There is need to sustain the abolishing of maternity user fees in this poor community to improve ANC utilisation (Kamhungira, 2017). Programs that reduce out-of-pocket payment for ANC like the abolition of maternity user fees by the government or the introduction of the Urban Voucher system (World Bank, 2019) for poor urban women may increase utilisation of ANC service and help reduce perinatal HIV transmission.
- It is critical to further examine the unmet need for contraception and boost access to contraception in order to avoid unwanted pregnancies.
- It is important to use local data for local planning and response instead of depending on national DHS data as it does not completely represent the local situation.

REFERENCES

AVERT, 2019. Prevention of mother-to-child Transmission of HIV.[Online] Available at: https://www.avert.org/professionals/hiv-programming/prevention/prevention-mother-child#A_comprehensive_approach_to_PMTCT [Accessed 04 Nov 2019].

Bedri A, Gudetta B, Isehak A, Kumbi S, Lulseged S, Mengistu Y, Bhore AV, Bhosale R, et al . (2008). Extended-dose nevirapine to 6 weeks of age for infants to prevent HIV transmission via breastfeeding in Ethiopia, India, and Uganda: an analysis of three randomised controlled trials.*Lancet*, 26 July, 372(9635), pp. 300-313.

Bobo F, et al,(2017). Inequities in utilization of reproductive and maternal health services in Ethiopia. *Int J Equity Health*, 19 June.16(105).

Cash R. et al. (2009) *Casebook on Ethical Issues in International Health Research*. WHO. Available at: http://apps.who.int/iris/bitstream/10665/44118/4/9789241547727_eng.pdf (Accessed: 10 October 2017).

Chadwick EG, Tierney C, Coletti A, Cotton MF, Ruel TD, Reding CA, Zimmer B, Qin M, Jean-Philippe P, Hazra R, Jackson C, Spector S, Capparelli EV, Mirochnick M, Purdue LT, Costello D, Jennings C, Luzuriaga K, Perlowski C, Bwakura-Dangarembizi M, Naidoo KL. (2017). *Asymptomatic Hematologic Toxicity with Very Early Combination Antiretroviral Therapy (cART) in In Utero HIV-infected Infants*. 9th HIV Paediatrics Workshop. Paris

Cooper ER, Charurat M, Mofenson L ,Hanson C, Pitt J, Diaz C, Hayani C, Handelsman E, et al. (2002). Combination Antiretroviral Strategies for the Treatment of Pregnant HIV-1–Infected Women and Prevention of Perinatal HIV-1 Transmission. *JAIDS*, Volume 29, pp. 484-494.

Creswell JW. (2014). The selection of a research approach. In: *Research Design*. USA: Sage Publications, p. 32.

Creswell JW. (2014) *Research design*. USA : Sage Publications.

Dansou J, Adekunle A, Arowojolu A. (2017). Factors associated with antenatal care services utilisation patterns amongst reproductive age women in Benin Republic: An analysis of 2011/2012 Benin Republic's demographic and health survey data.. *Niger Postgrad Med J.* , Apr-Jun, 24(2), pp. 67-74.

Ekwempu C. (1988). The influence of antenatal care on pregnancy outcome. *Trop J Obstet Gynaecol*, 1(1), pp. 67-71.

Elizabeth Glazer Paediatric AIDS Foundation (EGPAF), www.pediaids.org. [Online] Available at: https://www.pediaids.org/wp-content/uploads/2015/09/Zim_US_June2018.pdf [Accessed 12 Nov 2019].

European collaborative study. (2007). Time to Undetectable Viral Load after Highly Active Antiretroviral Therapy Initiation among HIV-Infected Pregnant Women. *Clinical infectious diseases*, 15 June, 44(12), pp. 1647-1656.

Ghada Saad–Haddad, Jocelyn DeJong, Nancy Terreri, María Clara Restrepo–Méndez, Jamie Saad–Haddad G, DeJong J, Terreri N, Restrepo–Méndez MC, Perin J, Vaz L, Newby H, Amouzou A, Barros A, Bryce J. (2016). Patterns and determinants of antenatal care utilization: analysis of national survey data in seven countdown countries. *J Glob Health*. 6(1): 010404.

Heale R. and Twycross A. (2015) ‘Validity and reliability in quantitative studies.’, *Evidence-based nursing*. Royal College of Nursing, 18(3), pp. 66–7. doi: 10.1136/eb-2015-102129.

Hennekens CH and Buring JE. (1987). *Epidemiology in medicine*. Philadelphia: Lippincott Williams and Wilkins.

Jacobson K and Ogbuagu O. (2018). Integrase inhibitor-based regimens result in more rapid virologic suppression rates among treatment-naïve human immunodeficiency virus-infected patients compared to non-nucleoside and protease inhibitor-based regimens in a real-world clinical setting: A retrospective cohort study. *Medicine(Baltimore)*, October, 97(43), p. e13016. doi: 10.1097/MD.00000000000013016.

Joshi C, Torvaldsen S, Hodgson R, Hayen A (2014). Factors associated with the use and quality of antenatal care in Nepal: a population-based study using the demographic and health survey data.. *BMC Pregnancy Childbirth*, 3 March, 3(14), p. 94.

Kamal N, Curtis S, Hasan MS, Jamil K . (2016). Trends in equity in use of maternal health services in urban and rural Bangladesh. *International Journal for Equity in Health*, 15(27).

Kamhungira T.(31 December 2017). Government Scraps Maternity fees. *Daily news*.

Kasaye HK, Endale ZM, Gudayu TW, Desta MS, 2017. Home delivery among antenatal care booked women in their last pregnancy and associated factors: community-based cross sectional study in Debreworkos town, North West Ethiopia, January 2016. *BMC Pregnancy and Childbirth*, Volume 17, p. 225.

Lema IA, Sando D, Magesa L, Machumi L, Mungure E, Mwanyika Sando M, Geldsetzer,P, Foster D, et al. (2014). Community Health Workers to Improve Antenatal Care and PMTCT Uptake in Dar es Salaam Tanzania a Quantitative performance evaluation. *J Acquir Immune Defic Syndr*, 67(4), pp. 195-201.

Lincetto O, Mothebesoane-Anoh S, Gomez P, Munjanja S. (2001). *Antenatal care*. [Online] Available at: https://www.who.int/pmnch/media/publications/aonsectionIII_2.pdf

Majoko F. (2005). Accessing antenatal care in rural Zimbabwe. *Digital Comprehensive Summaries of Uppsala University Dissertations from the Faculty of Medicine*, ISSN (78):1651-6206

Mchenga M, Burger R, von Fintel D. (2019). Examining the impact of WHO's Focused Antenatal Care policy on early access, underutilisation and quality of antenatal care services in Malawi: a retrospective study. *BMC Health Services Research*, 19(295), p. Published online.

Mofenson LM, Lambert JS, Stiehm R, Bethel J, William A. Meyer, Whitehouse J, Moye J, Reichelderfer P, et al. (1999). Risk Factors for Perinatal Transmission of Human Immunodeficiency Virus Type 1 in Women Treated with Zidovudine. *New English Journal of Medicine*, Volume 341, pp. 385-393.

Mofenson LM. (2017). *State of the Art in prevention of mother to child transmission of HIV*. Second workshop on prevention trials in infants born to HIV positive mothers. Maputo, Mozambique. Global HIV Vaccine Enterprise.

MoHCC and National AIDS Council, 2018. *GLOBAL AIDS RESPONSE 2018*. [Online] Available at: https://www.unaids.org/sites/default/files/country/documents/ZWE_2018_countryreport.pdf [Accessed 07 October 2019].

MoHCC, 2014. *Zimbabwe national HIV & AIDS strategic plan 2015-2018: Government of Zimbabwe commitment towards fast tracking 90:90:90 targets by 2020 and ending AIDS by 2030*, Harare: National AIDS Council of Zimbabwe.

MoHCC, 2017a. *Elimination of Mother-to-child transmission of HIV and Syphilis 2018-2022*. [Online]

Available at: <http://nac.org.zw/wp-content/uploads/2019/02/Zimbabwe-Elimination-of-Mother-to-Child-Transmission-of-HIV-and-Syphilis-2018-2022-1.pdf>

[Accessed 05 November 2019]

MoHCC, 2017b. *Operational and Service Delivery Manual for the Prevention, care and treatment of HIV in Zimbabwe* Harare, Zimbabwe: Ministry of Health and Child Care. Available at: <http://ophid.org/treat-all-toolkit/MOHCC%20Guidelines/MOHCC%20Zimbabwe%20OSDM%202017.pdf> [Accessed 17 October 2017].

Mushavi A. (2018). *Zimbabwe Elimination of Mother-to-Child Transmission Program*, Adherence Conference, Cresta lodge, Harare, Zimbabwe: UZCHS-CTRC.

National Medicine and Therapeutics Policy Advisory Committee (NMTPAC) and The AIDS and TB Directorate, MOHCC, 2016. *Guidelines for Antiretroviral Therapy for the Prevention and Treatment of HIV in Zimbabwe, 2016.* [Online] Available at: https://aidsfree.usaid.gov/sites/default/files/zw_arv_therapy_prevention.pdf [Accessed 07 October 2019].

Pell C., 2003. Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi. *PLOS ONE*, 15 January.

Robson C. (2011) *Real World Research*. 3rd edn. United Kingdom: John

Siegfried N, van der Merwe L, Brocklehurst P, Sint TT. (2011). Antiretrovirals for reducing the risk of mother-to-child transmission of HIV infection. *Concraine Database Syst Rev*, 6 (7) : CD003510. doi: 10.1002/14651858.CD003510.pub3.

Simkhada B., 2008. Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature. *JAN*, 61(3), pp. 244-260.

Sinyange NS, et al. (2016). Factors associated with late antenatal care booking: population based observations from the 2007 Zambia demographic and health survey. *Pan Afr Med*, 24 October.25(109).

Siyoum M, Astatkie A, Mekonnen S, Bekele G, Taye K, Tenaw Z, Yohannes Z, Kassaye Z. (2018). Home birth and its determinants among antenatal-care booked women in public hospitals in Wolayta Zone, southern Ethiopia. *PLOS one*, 13(9), p. e0203609.

Stringer JSA, Sinkala M, Chapman V, Edward P, Acosta A, Grace M. Aldrovandi, Mudenda, V, Acosta EP, Aldrovandi GM, Stout JP, Goldenberg RL, Kumwenda R, Vermund SH. (2003). Timing of the maternal drug dose and risk of perinatal HIV transmission in the setting of intrapartum and neonatal single-dose nevirapine. *AIDS*, 17(11), pp. 1659-1665.

Sturt AS, Dokubo EK, Sint TT. (2010). Antiretroviral therapy (ART) for treating HIV infection in ART-eligible pregnant women. *Conchraine Database Syst Rev*, Volume 3, doi: 10.1002/14651858.CD008440.

Suksomboon N, Poolsup N, Ket-Aim S. (2007). Systematic review of the efficacy of antiretroviral therapies for reducing the risk of mother-to-child transmission of HIV infection.. *J Clin Pharm ther*, June, 32(3), pp. 293-311.

Tarekegn S. (2014). Determinants of maternal health service utilization in Ethiopia: analysis of the 2011 Ethiopian Demographic and Health Survey. *BMC Pregnancy Childbirth*, 7 May.14(161).

Teferra AS, Alemu FM, Woldeyohannes SM. (2012). Institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Sekela District North West of Ethiopia: A community - based cross sectional study. *BMC Pregnancy and Childbirth*, Volume 12, p. 74.

UNAIDS, 2011. *The Global Plan Towards the Elimination of New HIV Infections Among Children by 2015 and Keeping Their Mothers Alive*. [Online] Available at:

https://www.unaids.org/en/resources/documents/2011/20110609_JC2137_Global-Plan-Elimination-HIV-Children_en.pdf

[Accessed 02 June 2017]

UNICEF, 2018a. *Antenatal care :Only half of women worldwide receive the recommended amount of care during pregnancy.* [Online]

Available at: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

[Accessed 11 November 2019]

UNICEF, 2018b. *Data by topic and country.* [Online]

Available at: <https://data.unicef.org/country/bwa/>

[Accessed 11 November 2019].

UNICEF, 2019a. *Antenatal Care.* [Online]

Available at: <https://data.unicef.org/topic/maternal-health/antenatal-care/>

[Accessed 08 November 2019].

UNICEF, 2019b. *Global and Regional Trends.* [Online]

Available at: <https://data.unicef.org/topic/hivaids/global-regional-trends/>

[Accessed 08 November 2019]

Vhembo T, MbengeranwaT, MhembereT, Stranix-Chibanda L, Bwakura-Dangarembizi M. (2019). *Reasons for new paediatric HIV infections:Findings from a cohort of HIV infected children screened at Harare family Care Clinical Research Site.* Mexico, International AIDS Society.

WHO, 2003. *Antenatal care in developing countries. Promises, achievements and missed opportunities: an analysis of trends, levels and differentials.* [Online]

Available at:

https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9241590947/en/[Accessed 17 September 2017].

WHO, 2010. *PMTCT Strategic Vision 2010–2015*. [Online]
Available at: https://www.who.int/hiv/pub/mtct/strategic_vision.pdf
[Accessed 10 October 2017]

WHO, 2015. *Guidelines on when to start ART and on Pre-exposure prophylaxis for HIV*. [Online]
Available at: <https://www.who.int/hiv/pub/guidelines/earlyrelease-arv/en/>
[Accessed 17 August 2019]

WHO, 2016. *WHO recommendations on antenatal care for a positive pregnancy experience*. [Online]
Available at: www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/
[Accessed 4 September 2018]

WHO, 2019a. *Sexual and Reproductive Health: More women worldwide receive early antenatal care, but great inequalities remain*. [Online]
Available at: <https://www.who.int/reproductivehealth/early-anc-worldwide/en/>
[Accessed 09 October 2019]

WHO, 2019b. *Global Health observatory data: Prevention of mother-to-child transmission (PMTCT)*. [Online]
Available at: https://www.who.int/gho/hiv/epidemic_response/PMTCT_text/en/
[Accessed 07 November 2019]



WHO, 2019c. *Global Information and Education on AIDS: Prevention of Mother-to-Child Transmission of HIV.* [Online]
Available at: <https://www.avert.org/professionals/hiv-programming/prevention/prevention-mother-child#World Health Organization PMTCT guidelines>
[Accessed 22 October 2019]

WHO, 2019d. *HIV/AIDS key facts.* [Online]
Available at: <https://www.who.int/en/news-room/fact-sheets/detail/hiv-aids>
[Accessed 07 November 2019]

WHO, 2019e. *Mother-to-child transmission of HIV.* [Online]
Available at: <https://www.who.int/hiv/topics/mtct/en/>
[Accessed 07 November 2019]

WHO, 2019f. *Summary of the global HIV epidemic (2018).* [Online]
Available at: https://www.who.int/hiv/data/2018_summary-global-hiv-epi.png?ua=1
[Accessed 07 November 2019].

World Bank, 2019. *Improving access to maternal health for Zimbabwe's expectant mothers* [Online]
Available at: <https://www.worldbank.org/en/news/feature/2019/01/10/improving-access-to-maternal-health-for-zimbabwes-expectant-mothers>
[Accessed 10 Sep 2019].

Zegeye, EA, Mbonigaba, J, Dimbuene, ZT. (2018). Factors associated with the utilization of antenatal care and prevention of mother-child HIV transmission services in Ethiopia: Applying a count regression model. *BMC Women's Health*, Volume 18, p. 187.

ZIMSTAT and ICF International, 2012. *2010-2011 Zimbabwe Demographic and Health Survey*, Calverton, Maryland: ZIMSTAT and ICF International Inc.

ZIMSTAT and ICF International, 2016. *Zimbabwe Demographic and Health Survey 2015: Final Report.*, Rockville, Maryland, USA: ZIMSTAT and ICF International. Available at: [www.zimstat.co.zw › sites › files › img › publications › Health › ZDHS_2015](http://www.zimstat.co.zw/sites/files/img/publications/Health/ZDHS_2015)



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APPENDIX 1: Clinic records data extraction tool



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809 Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

Clinic name.....

Month (2017)

Participant ID	Age	HIV status	Booking status	Type of delivery

Enter the following codes for each entry

HIV positive – 0

HIV negative - 1

Booked – 0

Unbooked – 1

Home delivery – 0

Clinic delivery – 1

Age < 20 – 0

20-34 years- 1

>34 years -2



APPENDIX 2: Structured Questionnaire



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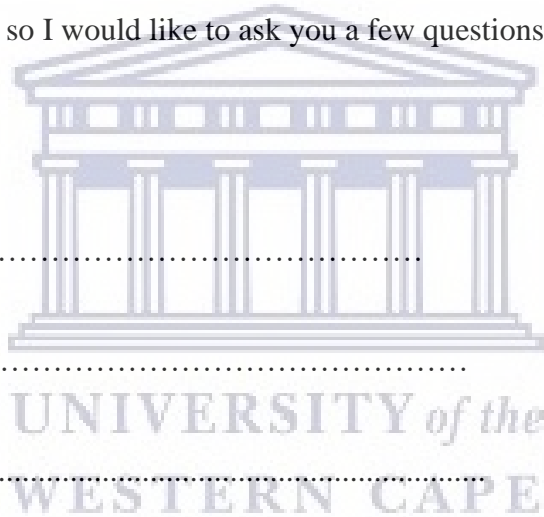
E-mail: soph-comm@uwc.ac.za

Preamble:

My name is Patricia F Mandima, a student studying for a Master of Public Health at the University of Western Cape- South Africa. You have agreed to participate in the study looking at the use of ANC services so I would like to ask you a few questions.

Interviewer's name:

1. Participant ID
2. Date of Interview
3. Clinic Name
4. Home address.....



Now I am going to ask you some information about yourself

Participant's socio-demographic characteristics

5. What is your age?
 - <20 years
 - 20- 34 years
 - >34 years

6. What is your level of education?

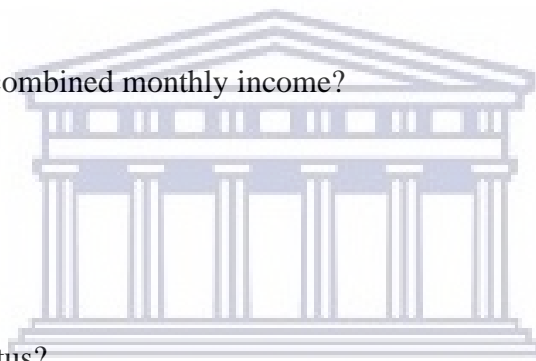
- Never been to school/Primary School not completed
- Primary School Completed
- Secondary School Completed
- Tertiary Education Completed

7. What is your occupation?

- Professional
- Self Employed
- Agriculture
- None

8. What is your family combined monthly income?

- < \$200
- \$200- 500
- >\$500



9. What is your marital status?

- Single
- Married
- Divorced
- Separated
- Widowed

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10. What is your religion

- White garment church
- Pentecostal church
- Mainline church
- Other -----(specify)

I am now going to ask you about booking for antenatal care

ANC utilisation

11. Did you book for antenatal care

Yes

No

12. If yes when did you book

.....

13. How many ANC visits did you have

>4

2-4

1

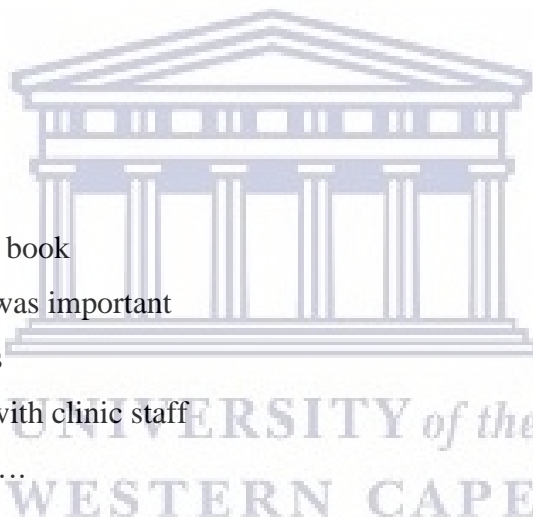
14. If no, why did you not book

Did not think it was important

Money problems

Uncomfortable with clinic staff

Other.....



15. Did fear of HIV testing delay or stopped you from booking for ANC

Yes

No

I am now going to ask you about HIV

HIV and PMTCT services utilisation

16. What is your HIV status?

Negative

Positive

If answer is a, answer 16 and go to question 22

17. When did you last get tested for HIV?

a. Before current pregnancy

b. During current pregnancy

c. During labour

d. After delivery

If answer is c or d go to 22

18. Did you take ARVs during current pregnancy

YES

NO

19. How long have you been on antiretroviral therapy?

0-6 months

7-12 months

greater than 12 months

20. What was your last CD4 count?

0-250

251-349

350 and above

21. What was your last Viral load?

Undetectable

< 1000 copies/ml

> 1000 copies/ml



Now I am going to ask you about things that may make choose to use or not to use ANC

Associated Factors

22. Do you have to pay for ANC (**If no go to Q 25**)?

YES

NO

23. How much does it cost?

.....

24. Did you find the price of ANC affordable?

Yes

NO



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25. How many pregnancies have you had?

0

1

2

3

4

more than 4

26. How many living children do you have?

0

1

2

3

- 4
- more than 4

27. How many pregnancies did you have when you already knew your HIV positive status?

- 0
- 1
- 2
- 3
- 4

28. Did any of your children die?

- Yes
- No

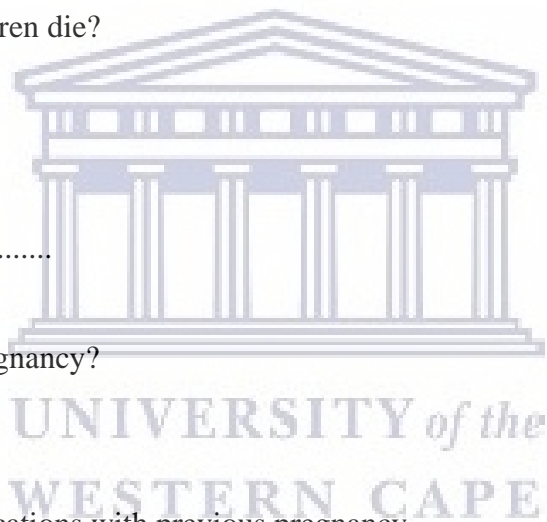
29. If yes at what age.....

30. Did you plan this pregnancy?

- Yes
- No

31. Did you have complications with previous pregnancy

- Yes
- NO
- N/A





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INFORMATION SHEET

Project Title: Determining the level of non-booking for antenatal care and associated barriers and risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe.

What is this study about?

This is a research project being conducted by Patricia Fadzayi Mandima, a student at the University of the Western Cape, Cape Town, South Africa. We are inviting you to participate in this research project by taking part in an interview. We would like to interview mothers who have just given birth to full term babies at the clinic or at home. We would like to interview them on challenges they face whilst accessing antenatal care. The purpose of this research project is to obtain first-hand information from mothers about this topic so that we can use this information to assist antenatal care planning in the city.

What will I be asked to do if I agree to participate?

You will be asked to participate in an interview with the researcher for 15 to 20 minutes. The researcher will have a set of questions that she will be asking you to respond to. The questions that will be asked are to do with your age, HIV status, when you booked, whether you planned the pregnancy, your childbearing history, marital status and your socio-economic status. During the interview, the researcher will be taking down notes.

Would my participation in this study be kept confidential?

The researcher undertakes to protect your identity. To ensure your anonymity, a code will be used and only the researcher will be aware of your true identity. To ensure your confidentiality, only the researcher will have access to the collected data. The collected data will be stored in locked filing cabinet.

What are the risks of this research?

All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimize such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator understand the magnitude of the problem of unbooking and what could be causing it in Chitungwiza. This would help to add onto the body of knowledge and also help health service delivery planning in Chitungwiza.

Do I have to be in this research, and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by **Patricia Fadzayi Mandima and School of Public Health** at the University of the Western Cape. If you have any questions about the research study itself, please contact Patricia Fadzayi Mandima at: 0771 446 705 or pmandima@uzchs-ctu.org. Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Prof Uta Lehmann
School of Public Health
Head of Department
University of the Western Cape
Private Bag X17
Bellville 7535
soph-comm@uwc.ac.za

Prof Anthea Rhoda
Dean of the Faculty of Community and Health Sciences
University of the Western Cape
Private Bag X17
Bellville 7535
chs-deansoffice@uwc.ac.za

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office

New Arts Building,

C-Block, Top Floor, Room 28

University of the Western Cape

Private Bag X17

Bellville 7535





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E-mail: soph-comm@uwc.ac.za

CONSENT FORM

Title of Research Project: Determining the level of non-booking for antenatal care and associated barriers and risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe.

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve, and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

I AGREE TO PARTICIPATE IN THIS STUDY

YES

NO

Participant 's Name.....

Participant 's signature.....

Date.....

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office

New Arts Building,

C-Block, Top Floor, Room 28

University of the Western Cape

Private Bag X17

Bellville 7535

APPENDIX 5: Chitungwiza City Health Approval



**MEDICAL RESEARCH COUNCIL OF ZIMBABWE APPLICATION TO CONDUCT RESEARCH
INSTITUTIONAL ETHICAL REVIEW BOARD REVIEW AND ENDORSEMENT REQUIRED**

Statement from the Institutional Ethics Review Board:

The MRCZ will only accept for review and approval research proposals that have been found both scientifically and ethically acceptable by an Institutional Ethics Review Board (IERB) recognised and operating in accordance with the Guidelines on Institutional Ethical Review Boards set by the MRCZ. In the case of institutions without IERBs, investigators are advised to seek advice from the MRCZ Office.

We the Institutional Ethics Review Committee established by

CHITUNGWIZA CITY HEALTH
(Name of Institution conducting the research/in which the research is to be conducted)

do certify that we have reviewed the research proposal titled

Determining the level of non-booking for antenatal care and associated barriers and risk for mother to child transmission of HIV among pregnant women in Chitungwiza City, Zimbabwe.

submitted by

Patricia Fadzayi Mandima

We attest to the scientific and ethical merit of this study and the competency of the investigator(s) to conduct the project and do hereby recommend the proposal to the MRCZ for approval.

SIGNATURES

Signature

Ethics Committee representative
Name (Please Print)

HERBERT CHITUNGWIZA

Date

12-06-18

**Signature: Head of Ethics
Committee**

(or other authorized signatory)
Name (Please Print)

DR. TONDERAI KASU

12 JUNE 2018

Contact Tel. Number 0772375284 / 0772271401 / 0712832801

E-mail address dr.tonykasu@hotmail.com
dhschitungwiza@gmail.com

OFFICIAL STAMP OF INSTITUTION

**Institution includes Universities, Hospitals, Research Institutes or Companies.*

Last Updated: 09 February 2016

APPENDIX 6: Chitungwiza Hospital Approval



UNIVERSITY OF THE WESTERN CAPE

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E-mail: soph-comm@uwc.ac.za

734 Adylin,
Westgate
Harare

23 November 2018

The Clinical Director

Chitungwiza Hospital

Zengeza 4

Chitungwiza

Dear Sir/Madam

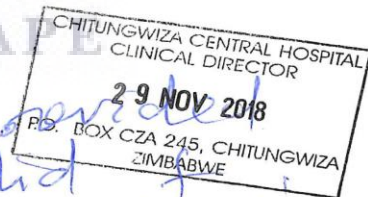
RE: Request for permission to carry out a Masters research by Patricia Fadzayi Mandima

My name is Patricia Fadzayi Mandima and I am a Masters student currently in the process of completing my MPH with the University of the Western Cape, Cape Town South Africa.

As part of the requirements of the MPH, we are required to conduct a small research project. My research project aims is to determine the proportion of women unbooked for antenatal care at or after delivery and among them to quantify the proportion of women who are HIV positive who thus missed taking ART during pregnancy and to identify the risk factors associated with not booking among pregnant women in the city of Chitungwiza.

Please find the protocol attached with this request.

*No objection provided
approval still valid
ethical clearance is
available.*



I would like to request permission to conduct my research '*Determining the level of non-booking for antenatal care and associated barriers and risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe*'

Ethical approval for this research has been approved by the University of the Western Cape's Research Ethics Committee.

I would welcome any questions or concerns you have about this research and can be reached on my mobile (0771446705) or through email (pmandima@uzchs-ctrc.org).

Should you wish to report any problems you have experienced related to the study, please contact:

Prof Uta Lehmann
School of Public Health
Head of Department
University of the Western Cape
Private Bag X17
Bellville 7535
soph-comm@uwc.ac.za

Prof Anthea Rhoda
Dean of the Faculty of Community and Health Sciences
University of the Western Cape
Private Bag X17
Bellville 7535
chs-deansoffice@uwc.ac.za

Sincerely



Patricia Fadzayi Mandima
0771446705
Email: pmandima@uzchs-ctrc.org



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APPENDIX 7: UWC Ethical Approval



OFFICE OF THE DIRECTOR: RESEARCH RESEARCH AND INNOVATION DIVISION

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F: +27 21 959 3170
E: research-ethics@uwc.ac.za
www.uwc.ac.za

12 April 2018

Ms PF Mandima
School of Public Health
Faculty of Community and Health Science

Ethics Reference Number: BM18/1/13

Project Title: Determining the level of non-booking for antenatal care and associated barriers and risk for mother to child transmission of HIV among pregnant women in Chitungwiza city, Zimbabwe

Approval Period: 09 April 2018 – 09 April 2019

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink, appearing to read 'Josias'.

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

PROVISIONAL REC NUMBER -130416-050

APPENDIX 8: MRCZ Approval

Telephone: 791792/791193
Telefax: (263) - 4 - 790715
E-mail: mrcz@mrcz.org.zw
Website: <http://www.mrcz.org.zw>



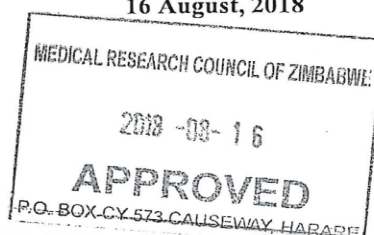
Medical Research Council of Zimbabwe
Josiah Tongogara / Mazoe Street
P. O. Box CY 573
Causeway
Harare

APPROVAL LETTER

REF: MRCZ/B/1549

16 August, 2018

Dr. Patricia Fadzayi Mandima
University of Western Cape
School of Public Health
Bag X 17
Bellville 7535
South Africa



RE: DETERMINING THE LEVEL OF NON-BOOKING FOR ANTE-NATAL CARE AND ASSOCIATED BARRIERS AND RISK FOR MOTHER - TO - CHILD TRANSMISSION OF HIV AMONG PREGNANT WOMEN IN CHITUNGWIZA CITY, ZIMBABWE

Thank you for the above titled proposal that you submitted to the Medical Research Council of Zimbabwe (MRCZ) for review. Please be advised that the Medical Research Council of Zimbabwe has **reviewed and approved** your application to conduct the above titled study. This is based on the following documents that were submitted to the MRCZ for review:

- Study proposal
- Informed Consent (English & Shona versions)
- Data collection tools

APPROVAL NUMBER : MRCZ/B/1549

This number should be used on all correspondence, consent forms and documents as appropriate.

- APPROVAL DATE** : 16 August, 2018
- TYPE OF MEETING** : Expedited
- EXPIRATION DATE** : 15 August, 2019

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted one month before the expiration date for continuing review.

- SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices.
- MODIFICATIONS:** Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices.
- QUESTIONS:** Please contact the MRCZ on Telephone No. (04) 791792, 791193 or by e-mail o.

Other

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.

Yours Faithfully

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH