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Prevalence and determinants of non-barrier contraceptive use in HIV-positive women who attend HIV services at public sector clinics in Gugulethu

In partial fulfilment of the requirements for the degree of Masters of Philosophy in Public Health (specialisation epidemiology and biostatistics)

University Of Cape Town

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Abstract

Background

South Africa has one of the highest prevalences of HIV-infection in women of reproductive age and a high rate of unplanned pregnancy. It is important to explore contraceptive use in HIV-positive women to better understand how to facilitate service delivery to those women wishing to avoid pregnancy. While it is critical to emphasise condom use, information is needed on the factors that contribute to non-barrier contraceptive use (NBCU) and its prevalence among HIV-positive women in order to afford women the opportunity to choose to have maximum dual method protection to prevent both infection and unwanted pregnancy. While there is literature on people living with AIDS and contraceptive use from other areas of the world, there is little quantitative research conducted in a South African context, although there is evidence of a high proportion of unwanted pregnancy among HIV-positive women in this setting.

Rationale and Justification for Research

Information is needed to understand the factors that contribute to NBCU by HIV-positive women, including the prevalence of these determinants. By better understanding the obstacles to non-barrier contraceptive use, both HIV and reproductive health services will better be able to provide more appropriate contraceptive health care to HIV-positive women.

Aims

The aim of this study is to determine the prevalence of NBCU and the types of methods used innon-pregnant, HIV-positive women, and to determine the factors that influence the choice of NBCU.

Objectives

To determine the prevalence of NBCU in a population of HIV-positive South African females; To determine what factors influence NBCU in women infected with HIV, including whether or not NBCU changes after an HIV-positive diagnosis; To compare the NBCU prevalence among HIV-positive women who want children in the future to

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those who do not want children in the future, and who are currently on antiretroviral therapy (ART) to those who are not currently on ART; To determine what factors influence NBCU for particular subsets of women, including those with and without fertility intentions in the next 12 months and women currently on and not on ART; To determine the unmet need for non-barrier contraception in HIV-positive women.

Methods

This study will form a part of a larger cross-sectional study, which collected data on the fertility intentions and the utilization of HIV and reproductive health services of 459 HIV-seropositive men and women from the peri-urban informal settlement of Gugulethu, located outside of Cape Town, from May to September 2006. Data was collected by trained fieldworkers through the use of a standardised quantitative survey instrument. A qualitative study consisting of in-depth interviews and focus groups with HIV-infected men was also conducted as part of the larger research project. After being cleaned, data was transferred to STATA Release 10 (STATACorp, College Station, USA) where bi-variate and multi-variate statistical analysis was performed.

Ethics

The Ethical Review Committee of the World Health Organisation and the Research Ethics Committee of the University of Cape Town, the research partners in this study, granted ethical approval to the larger cross-sectional study to which this sub-study is part. All participants who agreed to the voluntary interview provided informed consent, and although the risk of personal harm was very low, effort was put forth to minimise non-maleficence.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CI	Confidence Interval
HIV	Human Immunodeficiency Virus
IUD	Intra-Uterine Device
NBC	Non-barrier Contraception
NBCU	Non-barrier Contraceptive Use
PMTCT	Prevention of Mother-to-Child Transmission
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
TB	Tuberculosis
VCT	Voluntary Counselling and Testing
WLH	Women Living with Human Immunodeficiency Virus

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1. Introduction

1.1 Problem Statement

South Africa has one of the largest populations of HIV-infected persons in the world, at an estimated 5.7 million people (UNAIDS, 2008). The vast majority of those infected are in their reproductive years, with a disproportionate number of females being infected (UNAIDS, 2008). Thanks to the introduction of ART and PMTCT, people with HIV/AIDS are living longer and women are much less likely to transmit the virus to their children in utero and while breastfeeding (da Silveira Rossi, et al, 2005, Williams, et al, 2003) An estimated 29.3% of pregnant women are infected with HIV (Department of Health, 2009).

There is inconclusive evidence from around the globe as to whether there is an association between a reduction in fertility and a female's sero-positive HIV status (Magalhães, et al, 2002, Thackway, et al, 1997, Delvaux & Nöstlinger, 2007), with diversity in fertility intentions (Meursing & Sibindi, 1995; Smits, et al. 1999; Chen, et al. 2001; Nebie,et al, 2001; Kirshenbaum et al. 2004) More recent evidence seems to indicate that an HIV positive diagnosis is not necessarily the key determining factor in whether HIV positive people decide whether to have (further) children or not. A recent study in South Africa found that an almost similar proportion of the HIV-positive women and men attending an HIV care centre intended to have biological children at some stage as did not intend having children (Cooper, et al, 2009).

Globally, over half of all pregnancies in the general population of women are unintentional, which suggests a large unmet need for contraceptive services (Cates & Steiner, 2002). International research shows that sero-positive women have a high rate of unplanned pregnancy (Mitchell & Stephens, 2004). In a study of HIV infected individuals in South Africa in HIV care, 11% reported becoming pregnant after being aware of their HIV status and all these pregnancies were reportedly unintentional . Among women on highly active antiretroviral therapy (HAART), 9% reported having been pregnant since commencing HAART and of these 30% of pregnancies were reportedly unintentional. (Cooper ,et al, 2009).

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> AIDS related causes are the main cause of maternal death in South Africa (Department of Health, 2009b) and a recent study found that very ill HIV –positive women were seven times more likely to die in childbirth than other high risk pregnant women (Black et al, 2009). It is important to assist women in general to avoid unintentional pregnancies through providing information and access to contraception. However, tthe findings on unintended pregnancies among HIV-positive women, in light of the high maternal mortality rates among women living with HIV whose immune system has become severely compromised, adds urgency to the issue of ensuring that women living with HIV (WLH) in South Africa are able to optimise access to contraception should they wish to avoid pregnancy .. Clearly interventions to address the gaps in contraceptive needs is required both in the broader reproductive health services and within HIV care settings. Lack of easy access to contraceptive measures may lead to pregnancies occurring in the most unsafe conditions and clients' desires to prevent or discontinue pregnancies will not be met.

Despite evidence of the high prevalence of HIV/AIDS and unplanned pregnancy in South Africa, little information is available on Non-Barrier Contraceptive Use (NBCU) by HIV-positive women in the country. In 2003, globally of the 5.2 million women who were married or regularly cohabitating, 55.6% were currently using NBC and 15% of this population alone had an unmet need for family planning (United Nations Department of Economic and Social Affairs, 2007). In South Africa, where there is relatively high ever contraceptive use (61%) relative to other countries in Southern Africa, the majority of women (71%) only use contraceptives once they have had a first child (South African Demographic and Health Survey, 2001). In addition, 35% of teenagers have been pregnant by age 19 years and 98% of teenage pregnancies are unintended. In South Africa, 74% of the general population of women using contraception, used a hormonal contraceptive methods (either the injectable or the pill) versus 4% condom use to avoid pregnancy (Rees, 2008). There is very limited information on contraceptive use and especially NBCU and knowledge of what factors contribute to NBCU in HIV-positive women. Adding to our knowledge base in this area would not only be beneficial for addressing inadequacies in current

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HIV and reproductive health services, but also for creating national programmes to promote the use of NBC by HIV-positive women to prevent unintended pregnancies.

1.1.1 Non-Barrier vs. Barrier Methods of Contraception

Reasons for Use

Sexually active persons tend to use contraception for one or both of two reasons: to prevent the transmission/acquisition of STIs and HIV/AIDS and to prevent unwanted pregnancy (Cates & Steiner, 2002). Barrier methods (male and female condoms) are the most effective forms of contraception for preventing the transmission of infection, but are not the most effective forms of contraception for preventing pregnancy, due to incorrect and inconsistent use (Mitchell & Stephens, 2004). Contrastingly, non-barrier methods of contraception (sterilisation [male and female], oral pills, injectables, implants, and intrauterine devices) are most effective at avoiding pregnancy, but much less effective at preventing infection. The use of contraception to prevent both STI transmission and pregnancy is known either as dual protection (Myer, et al, 2002) when barrier methods are used to prevent both or when both barrier methods and a NBC method are used concomitantly.

Given the massive proportion of the HIV epidemic in South Africa and the endemic nature of STI's, if only one method is going to be used, health professionals within HIV or STI care and treatment, may advocate that those at high risk of STI infection use condoms. On the other hand, sexual and reproductive health services if they are unware of a client's HIV status may promote primarily a NBC method to prevent pregnancy with condom- back up use until this is effective. Clients and couples with steady partners are likely to have diverse needs with some being most concerned about an unintended pregnancy, while others may be more worried about contracting STIs (Cates & Steiner, 2002).

Negotiating Contraception

In many developing countries, including South Africa, there is evidence that many women in general feel uncomfortable "negotiating" contraceptive use with a male

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partner (Santos, et al, 1998, Feldman & Maposhere, 2003, Delvaux & Nöstingler, 2007). Sexual and reproductive health (SRH) services apart from STI's tend to be seen as a 'women's area' and it has been difficult to involve a general population of men in SRH services. Some men may also disapprove of their female partners using a contraceptive method (Cooper et al, 2004) and women may therefore, consider it important to have the opportunity to use contraceptive methods that are not reliant on the male partner, but are controlled by the woman herself. Other than the female condom and the potential promise of microbicides in the future, these women-controlled methods are mainly of the non-barrier form. While they do not protect against infection unless used together with barrier methods, they are very effective at preventing pregnancy if taken correctly (Cates & Steiner, 2002). Hence in the South African context there is a need among all women and especially HIV positive women, given the potential risks of pregnancy if they are ill, to have access to to different forms of NBC, as well as barrier methods.

In South Africa, in particular, there is a lack of information about the use of non-barrier methods of contraception by HIV-positive women, as many of the governmental policies for WLH have focused on the promotion of barrier methods. Combined with the fact that ART allows sero-positive persons to live longer as well as reduces the risk of MTCT, family planning is not only relevant to HIV-positive women, but it is vital that these women are given proper counselling on issues surrounding the topic. Also important to HIV-positive women are the concern of STI and HIV/AIDS transmission. Contracting an STI can not only worsen the woman's condition, but may also make her more infective when having intercourse. It imperative to gain greater knowledge on the use of NBC in HIV-positive women in order to better aid them with reproductive and HIV-services.

1.1.2 Factors Associated with NBCU

Sociodemographic Factors

Like the general population, an HIV-positive woman's need for contraception will change over the course of her life, which may suggest that NBCU may be correlated with age (Magalhães, et al, 2002). Studies from other countries have

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found that level of education is positively associated with NBCU (Allen, et al, 1993, Mitchell & Stephens, 2004).

Factors Associated with Diagnosis

Research from Brazil and a variety of other countries (Magalhães, et al, 2002, Meursing & Sibindi, 1995; Smits, et al. 1999; Chen, et al. 2001; Nebie,et al, 2001; Kirshenbaum et al. 2004) suggests that an HIV-positive diagnosis can impact on both women and men's sex lives. Knowledge of a positive sero-status may cause the woman to feel more uncomfortable about sexual intercourse, resulting in reduced sexual activity (Santos, et al, 1998). However, as the women become more comfortable with their sero-status and particularly if they become well again on HAART, they may increase their sexual activity. This increases their need for both barrier and non-barrier contraceptive methods. Other Brazilian research showed that women's contraception use changed in a statistically significant way, following an HIV-positive diagnosis (Magalhães, et al, 2002)

Drug Interactions

Many of the NBC methods are hormonal in nature. Although more research is necessary, it is suggested that the protease inhibitors and non-nucleoside reverse transcriptase inhibitors found in some types of HAART, such as Nevirapine, interact with the levels of steroids in hormonal contraceptive pills, causing the method to be less effective. This interaction seems to be particular to the pill, as HAART does not appear to reduce the efficacy of the injectable depot medroxyprogesterone acetate (DMPA) (El-Ibiary & Cocohoba, 2008). Therefore, clinicians suggest that women on the pill use a barrier method to help prevent unwanted pregnancy (Cejtin, 2003, Mitchell & Stephens, 2004), although it may be possible to take a non-ritonavir boosted atazanavir or non-ritonavir boosted indinavir to increase the contraceptive efficacy of the pill when taken with HAART (El-Ibiary & Cocochoba, 2008) . Similarly, there is an interaction between the pill and tuberculosis (TB) drug Rifampicin, in which use of Rifampicin causes the pill to be less effective (Cejtin, 2003, Mitchell & Stephens, 2004). This is particularly problematic in the South African context, as South Africa has a very high prevalence (692 cases per 100,000 people) and incidence

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(948 cases per 100,000 people) of TB with extremely high co-infection rates of HIV and TB. Of the 73% incident cases of TB, half are HIV-positive (World Health Organisation, 2009). Hormonal oral contraceptive may also be less effective if taken concomitantly with Rifabutin (used for TB treatment), certain epilepsy drugs (Phenytoin,Carbamazepine, barbiturates, Primidone, Topiramate, Oxcarbazepine, Lamotrigine) or antiretroviral drugs Ritonavir and Efavirenz (World Health Organisation, 2008). Due to its possible reduced efficacy, HIV-positive women on ART or Rifampicin may be advised not to use the pill or may themselves believe that the method is not worth taking, and may therefore have a lower prevalence of NBCU than HIV-positive women who are TB-negative and not on ART. Issues have also been raised about the possible complications of intra-uterine device (IUD) use in HIV-positive women, such as an increased risk of acute pelvic inflammatory disease (Cetjin, 2003, Mitchells & Stephens, 2004). However, recent evidence suggests that except for individuals with particular circumstances, use of the IUD is not only safe, but effective, for HIV-positive women (Stringer, et al, 2007).

Relationship Status

Existing evidence from studies in other countries on the association between a WLH's relationship status and her NBCU is mixed, with some claiming that the length of the relationship does not appear to influence NBCU (Smits, et al, 1999), while other evidence suggests that single women may be more likely to use certain methods, such as injectables (Allen, et al, 1993). A study from Uganda found a positive correlation between NBCU and the number of sexual partners (Kiddugavu, et al, 2003).

Barrier Methods

Although dual protection is the ideal for HIV-positive women, as it helps to prevent both STI and HIV/AIDS transmission and unwanted pregnancy, research strongly suggests that adding a second method may be to the detriment of first method (Cates & Steiner, 2002) (Mitchell & Stephens, 2004). A study of 1232 WLH in the United States showed that women using more effective forms of contraceptive methods (tubal ligation [OR 17.2, 95% CI 1.28-2.33]; oral

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contraception [OR 1.44, 95% CI 1.00-2.08]), were less likely to use condoms than women not using these contraception methods (Diaz, et al, 1999). It is not known whether HIV-positive women who are using condoms may have a lower prevalence of NBCU than HIV-positive women who do not use condoms or visa versa.

Fertility and Children

Research from a study of HIV-positive women in Brazil suggests that NBCU is associated with the woman's number of living children, in terms of the prevalence of the method used (Magalhães, et al, 2002). An American study found that the fertility intentions of HIV-positive women (women who did not wish to become pregnant) were associated with NBCU (Lindsay, et al, 1995). A woman's fertility intentions would be expected logically to influence whether contraception is used and the type of contraception used (i.e. barrier or non-barrier) in terms of its perceived effectiveness in preventing pregnancy, particularly in an HIV-positive context.

Access to NBCU

Researchers from a Rwandan study concluded that the low prevalence of hormonal contraception in this country may be due to access issues, as nearly 50 percent of women who did not use such contraception said they would use hormonal injectable contraceptives, if available (Allen, et al, 2003). While access to contraceptives in South Africa is likely to be better, it is not known what contraceptive methods availability and access issues affect WLH in particular. Issues of accessibility as well as affordability (of the contraceptive itself or travelling to access it as in the case of South Africa) have been raised by other researchers, who note that some forms of NBCU require regular interaction with health services (Delvaux & Nöstlinger, 2007, Mitchell & Stephens, 2004).

1.1.3 Limitations of Existing Studies

As little research exists on the factors that affect NBCU in HIV-positive women, particularly in a South African context. The proposed study will add to the current very limited knowledge. Several studies on the topic have been conducted

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in different countries such as Brazil, Rwanda, and the United States (Magalhães, et al, 2002, Allen, et al, 1993, Diaz, et al, 1995). However, it is difficult to extrapolate these findings to South Africa, due to contextual issues (i.e. high prevalence of tubal ligation in Brazil compared to South Africa and social differences) (United Nations Department of Economic and Social Affairs, 2007). There is general consensus internationally that more research on this topic in a diversity of contexts is needed (Allen, et al, 1993, Lindsay, et al, 1995, Delvaux & Nöstlinger, 2007).

Many of the studies under review only focus on one aspect of the factors affecting NBCU in HIV-positive women, such as pregnancy in HIV-positive women compared to HIV-negative women, fertility in HIV-positive women, and broader attitudes towards contraceptive uses in HIV-positive women, thus giving an incomplete or inaccurate portrayal of unmet need for contraception, factors influencing non-use and the types of methods used (Lindsay, et al, 1995, Thackway, et al, 1997, Cejtin, 2003). The proposed analysis and paper will encompass this wide variety of issues that are related to NBCU in HIV-positive women in Cape Town, South Africa.

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1.2 Rationale and Justification

There is a lack of information on NBCU in HIV-positive females in a South African context. Knowledge of what factors influence NBCU in HIV-positive females would be very beneficial to health researchers, as this information would help in understanding the reproductive health needs of this population. It will also aid in creating health policy and improved service delivery of contraception to HIV-positive women not wishing to become pregnant. Most of the governmental policy on contraception targeted at HIV-positive individuals has focused on the knowledge and free distribution of male condoms, critical to prevent infection and re-infection. However, less attention has been paid to ensuring NBC awareness, knowledge and access to avoid unwanted pregnancies, which has especially dire consequences for HIV-positive women, as they may compromise the health of an unwell HIV-positive woman and lead to vertical transmission.

1.3 Hypotheses

•An HIV-positive diagnosis changes a woman's use of NBC.

•Prevalence of NBCU is lower among HIV-positive women than the general South African population.

•Women who wish to have a child in the next 12 months have a lower prevalence of NBCU than women who do not wish to have a child in the next 12 months.

•Women currently on ART have a higher prevalence of NBCU than women not currently on ART.

•Reasons for an HIV-positive woman's use of NBC include sociodemographic factors, factors associated with HIV-diagnosis, potential drug interactions, relationship status, use of male or female condoms, access to NBC, and her fertility intentions.

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1.4 Aims and Objectives

1.4.1 Aims

The aim of this study is to determine the prevalence of NBCU in HIV-positive women from the township of Gugulethu, compared to the general South African population, and to determine the factors that influence the choice to use NBC.

1.4.2 Objectives

The key objectives of this study are:

(i) To determine the prevalence of NBCU in a population of HIV-positive South African women

(ii) To determine if an HIV-positive diagnosis influences NBCU

(iii) To determine what factors influence an HIV-positive woman's decision not to use NBC

(iv) To determine and compare the prevalence of NBCU among HIV-positive women who wish to have a child in the next 12 months to the prevalence of NBCU in HIV-positive women who do not wish to have a child in the next 12 months.

(v) To determine what factors influence NBCU in the subgroups of those currently on ART and those not currently on ART, and those with fertility intentions and those without, paying special attention to barrier methods as a predictor for those not using NBC.

(vi) To determine if there is a large unmet need for NBC in HIV-positive women and to make recommendations for health policy and guidelines surrounding their contraceptive needs

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2. METHODS

2.1 Study Design

The proposed study is a sub-set of a larger cross-sectional study by Cooper, et al (2005), *Fertility Intentions, contraceptive service needs and reproductive decision-making among HIV-infected women and men in Cape Town, South Africa.* that analyzed fertility intentions, contraceptive service needs and reproductive decision making of HIV-positive persons from Gugulethu, South Africa. The interviews were conducted from May to September 2006 at two public sector health care centres in Gugulethu with VCT, pMTCT, ART, and general HIV services.

2.2 Population and Sampling

Participation in the study was voluntary, and subjects were randomly sampled each day from the health care centre's patient register and approached to participate in the survey. These health care centres were located in Gugulethu, an area with a high HIV-prevalence located outside of Cape Town, and served a mostly black, urban and peri-urban, working class population. The randomly selected patients were thought to be representative of the population of Gugulethu that was seeking HIV-related health care and services. The final sample size of the study was 459 people, with an 88% response rate amongst females and 90% amongst males. Although this study was

conducted at two different sites, it is not considered to be a cluster study because the two health care centres were located in the same area and served the same population. Two sites were used in order to reach the target sample size within the specified time frame of the study.

2.3 Measurement

2.3.1 Instrument

A quantitative survey was developed for the use of interviewing subjects. This standardised instrument was administered to participants in their mother tongue (isiXhosa) by trained same-sex interviewers, who had previous experience working with HIV-infected individuals. The survey included questions pertaining to demographic and socioeconomic characteristics, partnership status and sexual activity, HIV-infection and ART, use of and access to contraceptive and reproductive health services, and fertility intentions. The questionnaire asked women about their contraceptive use before and after HIV-positive diagnosis.

2.3.2 List of Variables

Outcome Variable

Current NBCU Use

Participant was currently using at least one type of NBC or patient was not using at least one type of NBC. NBC was defined as oral contraceptive pill, 2-month injectable, 3-month injectable, IUD, female sterilisation, male sterilisation, or other NBC method.

Determinants

Sociodemographic Variables

Age: measured in years

Occupation: employed or unemployed

Education: highest level completed

Household income: Less than R1000, or

R1000 and greater

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Factors Associated with HIV-diagnosis

Years Since Diagnosis: Measured in years

ART Status: Patient currently on ART or patient currently not on ART

Contraception

NBCU Before Diagnosis: Patient used NBC before HIV-positive diagnosis or did not use NBC before HIV-positive diagnosis

NBCU After Diagnosis: Patient used NBC after being diagnosed HIV-positive diagnosis or patient did not use NBC after being diagnosed HIV-positive

Perceived Difficulty in Accessing NBC: Very easy, easy, difficult, very difficult, or don't know/unsure

Condom Use After Diagnosis: Patient has used male or female condoms since HIV-positive diagnosis or patient has not used male or female condoms since diagnosis

Relationship

Sexual Relationship Status: In a sexual relationship or not in a sexual relationship

Relationship Type: Married, living with boy/girlfriend, or living apart from boy/girlfriend

Sexual partners in past 6 months: The number of sexual partners the woman has had in the past 6 months

Children & Fertility Intentions

Living Children: The number of living children of the study participant

Fertility Intentions: Would like to have a child right now, maybe would like to have a child in the next 12 months, maybe would like to have a child sometime in the future, doesn't want a child in the future, or don't know/unsure

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3. ANALYSIS

3.1 Data Cleaning

Data from the cross-sectional survey was entered into a template using Microsoft Access 2000, which allowed for anonymity of data. Subsequently, data was transferred to STATA Release 10 (STATACorp, College Station, USA), where it was cleaned for analysis. Cleaning processes included checking for problematic data through frequency distributions and internal logic checks.

3.2 Statistical Methods

As this analysis is concerned with NBCU in HIV-positive women, all men (157) and pregnant women (122) will be excluded from analysis, as they are believed to have different contraceptive needs than non-pregnant women, leaving 180 women for analysis in this report. In order to determine which factors influence NBCU in HIV-positive women, various logistic regression models (all HIV-positive women, HIV-positive women with fertility intentions in next 12 months, HIV-positive women without fertility intentions for the next 12 months, HIV-positive women on ART, HIV-positive women not on ART) will be built using the various risk factors. During the model building process, variables will be added one at a time, and models will be assessed on their goodness of fit and maximum likelihood. The final models will be validated by an analysis of their residuals.

To examine if NBCU changes before and after diagnosis, a McNemar's test of association will be calculated from a 2x2 table that examines NBCU Before (yes/no) and NBCU After (yes/no) HIV diagnosis.

Before beginning the model building procedure, all variables will be explored in order to determine the nature of each variable and its relationship with the outcome variable, as well as its relationship with the other determinant variables and problems in the data, if necessary. For the continuous variables, histograms will be used to assess normality, and summary statistics and box-and-whisker plots, stratified by outcome, will be created to infer associations with the outcome. Tabulated statistics will be calculated between categorical variables and the outcome variable in order to assess possible relationships.

3.3 Dummy Tables

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Table I for objective (i): Frequencies of NBCU before and after diagnosis

	Frequency	Percent
No Use Before, No Use After		
No Use Before, Use After		
Use Before, No Use After		
Use Before, Use After		

Table II for objective (ii): Determinants of NBCU in HIV-positive women

Variable	OR (95% CI)	P-Value
Sociodemographic		
Age		
Occupation		
Employed		
Unemployed		
Education		
Household Income per month		
<R1000		
R1000+		
Factors Associated with HIV-diagnosis		
Years Since HIV+ Diagnosis		
ART Status		
Yes		
No		
Contraception		
NBCU Before Diagnosis		
Yes		
No		
NBCU After Diagnosis		
Yes		
No		
Perceived Difficulty in Accessing NBC		
Very Easy or Easy		
Very Difficult or Difficult		
Don't Know/Unsure		
Condom Use After Diagnosis		
Yes		
No		
Relationship		
Sexual Relationship Status		
In a Sexual Relationship		
Not in a Sexual Relationship		

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Relationship Type		
Married		
Living with Boy/girlfriend		
Living Apart from Boy/girlfriend		
Sexual Partners in Past 6 Months		
Children & Fertility Intentions		
Living Children		
Fertility Intentions		
Right Now		
May in Next 12 Months		
May Sometime in Future		
Do Not Want Children in Future		
Don't Know/Unsure		

Table III for objective (iii): Prevalence of NBCU in HIV-positive women with and without fertility intentions in the next 12 months

	Frequency of NBCU	Percent
May Want Children in Next 12 Months		
Do Not Want Children in Next 12 Months		

Table IV for objective (iv): Determinants of NBCU in HIV-positive women with and without fertility intentions in the next 12 months

	With Fertility Intentions	Without Fertility Intentions
Variable	OR (95% CI); P-value	OR (95% CI); P-value
Sociodemographic		
Age		
Occupation		
Employed		
Unemployed		
Education		
Household Income per month		
<R1000		
R1000+		
Factors Associated with HIV-diagnosis		
Years Since HIV+ Diagnosis		
ART Status		
Yes		
No		

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Contraception		
NBCU Before Diagnosis		
Yes		
No		
NBCU After Diagnosis		
Yes		
No		
Perceived Difficulty in Accessing NBC		
Very Easy or Easy		
Very Difficult or Difficult		
Don't Know/Unsure		
Condom Use After Diagnosis		
Yes		
No		
Relationship Status		
Sexual Relationship Status		
In a Sexual Relationship		
Not in a Sexual Relationship		
Relationship Type		
Married		
Living with Boy/girlfriend		
Living Apart from Boy/girlfriend		
Sexual Partners in Past 6 Months		
Children & Fertility Intentions		
Living Children		
Fertility Intentions		
Right Now		
May in Next 12 Months		
May Sometime in Future		
Do Not Want Children in Future		
Don't Know/Unsure		

Table V for objective (v): Women with possible unmet NBC needs

	Fertility Intentions	Frequency	Percent
No Use of Any Contraception	*May Want Children Sometime in Future*		
	Do Not Want Children in Future		
	Don't Know/Unsure		
	Total		

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Use of Barrier Methods Only	*May Want Children Sometime in Future*		
	Do Not Want Children in Future		
	Don't Know/Unsure		
	Total		

4. ETHICS AND COMMUNICATION

4.1 Ethics

Ethical approval for larger study, of which this proposed study is a sub-set of, was granted by the Ethical Review Committee of the World Health Organisation and the Research Ethics Committee of the University of Cape Town, the research partners in this study.

4.1.1 Respect for Persons

Participants in the study were given information about the project's purposes and content in their local language (isiXhosa) or English, as a way of disclosing information in an understandable manner. Participation in the study was voluntary, and all those who agreed to take part in the project provided their written informed consent. Only those who were 18 years of age or older were approached for questioning and participants were allowed to withdraw at any point during the study.

4.1.2 Beneficence

Researchers attempted to minimise the potential risks of the study, which included stigmatisation, discomfort, and emotional distress. Same sex interviewers administered the questionnaire in private rooms in order to make the participant more comfortable and able to provide honest answers. Researchers referred those experiencing emotional distress to counselling.

Only those involved in the project will have access to questionnaires and no identifying information will be recorded on the questionnaire, as a way of ensuring confidentiality and anonymity. The proposed study will keep the anonymity of participants, as no identifying names or addresses are recorded in the database being analysed.

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Participants were monetarily compensated for any transport costs they incurred in order to take part in the study.

The possible benefits to the participant are great, as well as for those infected with HIV in Gugulethu and the greater Cape Town area. The results from this analysis will lead to greater knowledge of the aspects of NBCU in this population, which will allow for a more effective delivery of reproductive health services by providers in the area.

4.1.3 Justice

Researchers and the public will have access to the results of this study through its dissemination in a report and an article for publication. Relevant information will also be distributed to policy makers, in order to guide them on health policy surrounding NBCU in HIV-positive women.

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4.2 Stakeholders

Stakeholders who are expected to have an interest in the outcome of the project include: The Department of Health, the broader research community (both those in South Africa and abroad), people living with HIV/AIDS, and those working HIV and reproductive health services.

4.3 Reporting and Communication

Stakeholders will receive the results from this project through a submission of reports.

5. LOGISTICS

5.1 Timetable

Month	**Anticipated Progress**
March – September 2009	Proposal preparation
October 2009	Proposal preparation Submission and approval by departmental research ethics committee Data Analysis

November 2009	Data Analysis Dissertation write up
December 2009	Submission of final report to department

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Prevalence and determinants of non-barrier contraceptive use in HIV-positive women who attend HIV services at public sector clinics in a high HIV prevalence suburb of Cape Town, South Africa

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Submitted to the University of Cape Town in partial fulfilment of the requirements for the degree of Master of Public Health with specialization in Epidemiology and Biostatistics

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DECLARATION

I, Nancy Maksimoski, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work, nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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10 May 2010

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CI	Confidence Interval
HIV	Human Immunodeficiency Virus
IUD	Intra-Uterine Device
NBC	Non-barrier Contraception
NBCU	Non-barrier Contraceptive Use
OR	Odds Ratio
pMTCT	Prevention of Mother-to-Child Transmission
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
TB	Tuberculosis
VCT	Voluntary Counselling and Testing
WLH	Women Living with Human Immunodeficiency Virus

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LITERATURE REVIEW

1.1 Problem Statement

South Africa has one of the largest populations of HIV-infected persons in the world, at an estimated 5.7 million people (UNAIDS, 2008). The vast majority of those infected are in their reproductive years, with a disproportionate number of females being infected (UNAIDS, 2008). An estimated 29.3% of pregnant women are infected with HIV (Department of Health, 2009). However, due to the introduction of antiretroviral therapy (ART) and prevention of mother-to-child transmission (pMTCT), people with HIV/AIDS are living longer and pregnant women living with HIV are much less likely to transmit the virus to their children in utero and while breastfeeding (da Silveira Rossi, et al, 2005; Williams, et al, 2003)

There is inconclusive evidence from around the globe as to whether there is a reduction in intentions to have children as a result of a woman's sero-positive HIV status (Magalhães, et al, 2002; Thackway, et al, 1997; Delvaux & Nöstlinger, 2007). Existing studies indicate that an HIV-positive diagnosis is not necessarily the key determining factor in whether HIV-positive people decide whether to have (further) children or not, and that there is diversity in fertility intentions (Meursing & Sibindi, 1995; Smits, et al. 1999; Chen, et al. 2001; Nebie, et al, 2001; Kirshenbaum, et al. 2004). A recent study in South Africa found that an almost similar proportion of the HIV-positive women and men attending an HIV care centre intended to have biological children at some stage as did not intend to have children (Cooper, et al, 2009). This underscores the need for reproductive services to address the specific needs of both those women wishing to become pregnant more safely as well as those wishing to avoid pregnancy either temporarily or permanently.

Unintentional pregnancy constitutes a problem independently of HIV/AIDS. Globally, over half of all pregnancies in the general population of women are unintentional, which suggests a large unmet need for contraceptive services in general (Cates & Steiner, 2002). In sub-Saharan Africa, an estimated 14 million unintended pregnancies arise each year (Hubacher, et al, 2008). In South Africa, where there is relatively high ever contraceptive use among ever sexually active women (85.4%) relative to other countries in Southern Africa, of these women, the majority (63.4%)

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only use contraceptives once they have had a first child (South African Demographic and Health Survey, 2007). South Africa has the second highest overall prevalence of modern method contraceptive use amongst women who are married or cohabitating in all of Africa, after the island of Reunion (United Nations Department of Economics & Social Affairs, 2007). These women also have a much higher prevalence of injectables than the rest of the continent (28.4% vs 5.9%) (United Nations Department of Economics & Social Affairs, 2007). South African women experience high rates of unintended pregnancy, with 35% of teenagers reporting having been pregnant by age 19 years and 53% of pregnancies reportedly being either unplanned (36%) or unwanted (17%) (Department of Health, 2001). In Cape Town, an estimated 98% of teenage pregnancies are unintended (Vundule, et al, 2001).

International research shows that sero-positive women, too, have a high rate of unplanned pregnancy (Mitchell & Stephens, 2004). In a study of HIV infected individuals in South Africa in HIV care, 11% reported becoming pregnant after being aware of their HIV status and all these pregnancies were reportedly unintentional. Among women on highly active antiretroviral therapy (HAART), 9% reported having been pregnant since commencing HAART and of these 30% of pregnancies were reportedly unintentional (Cooper, et al, 2009).

AIDS related causes are the main cause of maternal death in South Africa (Department of Health, 2009b), and a recent study found that very ill HIV–positive women were seven times more likely to die in childbirth than other high risk pregnant women (Black, et al, 2009). It is important to assist women in general to avoid unintentional pregnancies through providing information and access to contraception, as the lifetime risk of maternal death in South Africa is an estimated 1 in 110, compared to 1 in 7300 for developed regions (World Health Organisation, et al, 2007). However, the findings on unintended pregnancies among HIV-positive women, in light of the high maternal mortality rates among women living with HIV whose immune system has become severely compromised, adds urgency to the issue of ensuring that women living with HIV (WLH) in South Africa are able to optimise access to contraception, should they wish to avoid pregnancy. Lack of adequate knowledge, counselling or easy access to contraception may lead to pregnancies occurring in the most unsafe conditions and clients' desires to prevent or discontinue

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pregnancies will not be met. On the other hand, increased use of effective contraception (non-barrier and barrier methods) by WLH who do not wish to have a child or further children could potentially have an important impact on reducing unintended pregnancies, maternal morbidity and mortality in high risk WLH as well as avert HIV infections in partners. Clearly interventions to address the gaps in meeting women's contraceptive needs are required both in the broader reproductive health services and within HIV care settings.

In order to begin to address these gaps, it is necessary for health services to understand not only the magnitude of this unmet need, but how it is distributed in the population. In 2003, of the 5.2 million women globally who were married or regularly cohabitating, 55.6% were currently using non-barrier contraception (NBC), and 15% of this population alone had an unmet need for family planning (United Nations Department of Economic and Social Affairs, 2007). In South Africa, 74% of the general population of women using contraception used hormonal contraceptive methods (either the progesterone-only injectable contraceptive or the oral contraceptive pill) versus 4% condom use to avoid pregnancy (Rees, 2008). However, there is very limited information on contraceptive use, and especially non-barrier contraception use (NBCU), and knowledge of what factors contribute to NBCU in HIV-positive women. Adding to our knowledge base in this area would not only be beneficial for addressing inadequacies in current HIV and reproductive health services, but also for creating national programmes to promote the use of NBC by HIV-positive women to prevent unintended pregnancies.

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1.2 Use of Different Methods of Contraception

1.2.1 Reasons for Use

Sexually active persons tend to use contraception for one or both of two reasons: to prevent the transmission/acquisition of sexually transmitted infections (STIs) and HIV/AIDS and to prevent unwanted pregnancy (Cates & Steiner, 2002). Barrier methods (male and female condoms) are the most effective forms of contraception for preventing the transmission of infection, but are not the most effective forms of contraception for preventing pregnancy, due to incorrect and inconsistent use (Mitchell & Stephens, 2004). Contrastingly, non-barrier methods of contraception

(sterilisation [male and female], oral contraceptive pills, progesterone-only injectable contraceptives, implants, and intrauterine devices) are most effective at avoiding pregnancy, but do not prevent infection. The use of contraception to prevent both STI transmission and pregnancy is known as dual protection (Myer, et al, 2002). This can either be in the form of use of barrier methods only to prevent both infection and pregnancy, or dual method use when both barrier methods and a NBC method are used concomitantly to achieve this same end.

Given the massive size of the HIV epidemic in South Africa and the endemic nature of STIs, if sexually active clients choose to use only one method, health professionals within HIV or STI care and treatment services, may primarily advocate use of condoms to prevent STI infection, re-infection or further HIV transmission. On the other hand, within sexual and reproductive health services that have had a historical focus on pregnancy prevention, if health care providers are unaware of a client's HIV status, their primary focus may be on promoting a NBC method to prevent pregnancy with condom- back up use until this is effective. Clients are likely to have diverse needs with some who believe themselves to be in steady, monogamous relationships perhaps being most concerned about an unintended pregnancy, while others who engage in more casual sexual relationships may be more worried about contracting STIs (Cates & Steiner, 2002).

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1.2.2 Negotiating Contraception

In many developing countries, including South Africa, there is evidence that many women in general feel uncomfortable "negotiating" contraceptive use with a male partner (Santos, et al, 1998; Feldman & Maposhere, 2003; Delvaux & Nöstingler, 2007). In a Argentinean study of people living with HIV, 37% of women claimed that condom use was a "point of contention" with their sexual partner, and of the women who did not report regular use of a condom, only 4.8% were attempting to become pregnant (Gogna, et al, 2009). However, recent findings suggest that if family planning services were better integrated with HIV services this could facilitate opportunities for young males to join their partners for the contraception consultation, and South Africa may have a higher prevalence of condom and dual method use as a result (MacPhail, et al, 2007). Sexual and reproductive health (SRH) services, apart from those for STIs, have tended to be seen as a 'women's health area', which has

made it difficult to involve a general population of men in SRH services. Some men may also disapprove of their female partners using a contraceptive method (Cooper, et al, 2004) and women may, therefore, consider it important to have the opportunity to use contraceptive methods that are not reliant on the male partner, but are controlled by the woman herself. Other than the female condom and the potential promise of microbicides in the future, these women-controlled methods are mainly of the non-barrier form. While they do not protect against infection unless used together with barrier methods, they are very effective at preventing pregnancy if taken correctly (Cates & Steiner, 2002). Hence, in the South African context there is a need among all women, and especially HIV positive women, given the potential risks of pregnancy if they are ill or wish to avoid having a child or further children, to achieve better access to different forms of NBC, as well as barrier methods.

In South Africa, in particular, there is a lack of information and focus on the use of non-barrier methods of contraception by HIV-positive women, as many of the governmental policies for WLH have focused predominantly on the promotion of barrier methods. However, given the importance of WLH avoiding unwanted pregnancies, it is vital that these women are given proper counselling on issues surrounding the topic of NBC, while at the same time emphasising the importance of barrier contraceptive use to avoid infection. This greater knowledge on the use of NBC, in addition to barrier contraceptive methods, in HIV-positive women can aid them in accessing contraceptive methods best suited to their individual needs.

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1.3 Factors Associated with NBCU

1.3.1 Sociodemographic Factors

Like the general population, an HIV-positive woman's need for contraception is likely to change over the course of her life, which may suggest that NBCU may be correlated with age (Magalhães, et al, 2002). In the general population of sexually active South African women, contraceptive use (barrier and non-barrier) appears to be inversely correlated with age, with those in the youngest group (15-19) having the highest prevalence of contraceptive use (68.7%), with prevalence decreasing with each subsequent age group (SADHS, 2007). Studies from other countries have found that another factor positively associated with NBCU is having a higher level of

education (Allen, et al, 1993; Mitchell & Stephens, 2004). According to the 2003 South African and Demographic Health Survey (2007) of the general population of South African women, there no longer appear to be a significant difference between NBCU between urban and non-urban women, as the prevalence of NBCU in these two settings is very similar (57.6% and 53.7%, respectively), due to increased use of NBCU in rural areas.

1.3.2 Factors Associated with HIV Diagnosis that May Impact on Contraceptive Use and Type of Method Used

Research from Brazil and a variety of other countries (Magalhães, et al, 2002; Meursing & Sibindi, 1995; Smits, et al. 1999; Chen, et al. 2001; Nebie,et al, 2001; Kirshenbaum et al. 2004) suggests that an HIV-positive diagnosis can impact on both women and men's sex lives. Knowledge of a positive sero-status may cause the woman to feel more reluctant to engage in sexual intercourse, resulting in reduced sexual activity (Santos, et al, 1998). However, as the women become more comfortable with their sero-status and particularly if they become well again on HAART, they may increase their sexual activity. This increases their need for both barrier and non-barrier contraceptive methods, if they are to avoid infection and unintentional pregnancies. Research from another Brazilian study showed that women's use of different types of contraceptive methods changed in a statistically significant way, following an HIV-positive diagnosis. This study showed that condom use, as well as tubal ligation, increased significantly (8.6% to 41.0%, and 9.5% to 26.6%, respectively), while use of the pill significantly decreased (40.0% to 6.7%) (Magalhães, et al, 2002). This change is confirmed in an American study, which found that after an HIV-positive diagnosis, women were less likely to use the oral contraceptive pill and more likely to use male and female condoms, with 7% using no contraception post-diagnosis, compared to 24% pre-diagnosis (p-value=0.039) (Stanwood, et al, 2007).

1.3.3 Drug Interactions and Contraceptive Method Choice

Many of the NBC methods are hormonal in nature. Although more research is necessary, it is suggested that the protease inhibitors and non-nucleoside reverse transcriptase inhibitors found in some types of HAART, such as Nevirapine, interact with the levels of steroids in hormonal contraceptive pills, causing the method to be

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less effective in preventing pregnancy. This interaction seems to be particular to the pill, as HAART does not appear to reduce the efficacy of the progesterone-only injectable contraceptives, such as depot medroxyprogesterone acetate (DMPA) (the 3 monthly injectable) or norethisterone (the two monthly injectable) (El-Ibiary & Cocohoba, 2008). Therefore, clinicians suggest that women who choose to use the pill also use a barrier method so that both unwanted pregnancy and infection can be more optimally prevented (Cejtin, 2003, Mitchell & Stephens, 2004). It may also be possible to take a non-ritonavir boosted atazanavir or non-ritonavir boosted indinavir to increase the contraceptive efficacy of the pill when taken with HAART (El-Ibiary & Cocochoba, 2008). Similarly, there is an interaction between the pill and the tuberculosis (TB) drug Rifampicin, in which use of Rifampicin causes the pill to be less effective (Cejtin, 2003; Mitchell & Stephens, 2004). This is particularly problematic in the South African context, as South Africa has a very high prevalence (692 cases per 100,000 people) and incidence (948 cases per 100,000 people) of TB with extremely high co-infection rates of HIV and TB. Of the 73% incident cases of TB, half are HIV-positive (World Health Organisation, 2009). Hormonal oral contraceptive may also be less effective if taken concomitantly with Rifabutin (used for TB treatment), or antiretroviral drugs Ritonavir and Efavirenz (World Health Organisation, 2008). Due to its possible reduced efficacy, HIV-positive women on ART or Rifampicin may be advised not to use the pill or may themselves believe that the method is not worth taking, and may therefore have a lower prevalence of use of the pill as a NBC method than HIV-positive women who are TB-negative and not on ART.

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In the past, questions were raised about the possible complications of intra-uterine device (IUD) use in HIV-positive women, such as an increased risk of acute pelvic inflammatory disease (Cetjin, 2003; Mitchells & Stephens, 2004). However, recent evidence suggests that except for individuals with advanced HIV disease (World Health Organisation stage III or IV), a history of bleeding disorders or a history of pelvic inflammatory disease, use of the IUD is not only safe, but effective, for HIV-positive women (Stringer, et al, 2007). A recent study of HIV-positive women also found that women who used an IUD were less likely to experience disease progression than those taking hormonal contraception, such as the oral contraceptive pill (Stringer, et al, 2007). Although the IUD is one of the most effective

contraceptive methods, due to the past World Health Organisation recommendations against its use by HIV-positive women, it is seldom promoted in this population of women. This together with the lack of training in IUD insertion by medical professionals in the public sector has led to a very low prevalence of IUD use generally among South Africa women. Only 1% of women who are married or regularly cohabitating are reported to use IUDS in the country (United Nations Department of Economic and Social Affairs, 2007) and nearly all use occurs in the private health sector.

1.3.4 Relationship Status

Evidence existing from a Rwanda study suggests that an association exists between a WLH's relationship status and her NBCU, as single women, compared to married women, may be more likely to use certain NBC methods, such as injectables (Allen, et al, 1993). Another international study claims that the length of a woman's relationship does not appear to influence NBCU (Smits, et al, 1999). In terms of the number of partners, a study from Uganda found that women with multiple sexual partners were more likely to use hormonal contraception than women with one sexual partner (Kiddugavu, et al, 2003).

1.3.5 Barrier Methods

Although dual protection is the ideal for HIV-positive women, as it helps to prevent both STI and HIV/AIDS transmission and unwanted pregnancy, research strongly suggests that adding a second method may be to the detriment of first method (Cates & Steiner, 2002; Mitchell & Stephens, 2004), despite the fact that some women may view condoms as a way of preventing the spread of disease rather than a contraceptive method (MacPhail, et al, 2007). While one study of 1232 WLH in the United States showed that women using more permanent or effective forms of contraceptive methods such tubal ligation [OR 17.2, 95% CI 1.28-2.33] or oral contraception [OR 1.44, 95% CI 1.00-2.08]), were less likely to use condoms than women not using these contraception methods (Diaz, et al, 1999), it is not known whether the finding would apply more broadly to other HIV-positive women.

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1.3.6 Family Size and Fertility Intentions

Research from a study of HIV-positive women in Brazil suggested that the prevalence of the type of NBC used by women is associated with the number of living children they had. Women with two or more children had a much higher prevalence of using a permanent method to prevent pregnancy, such as tubal ligation, than women with no children (89%, vs. 0%). Women who had one child had a higher prevalence of use of hormonal methods (52% vs. 24%) than women without any children (Magalhães, et al, 2002). A woman's fertility intentions would be expected logically to influence whether contraception is used and the type of contraception used (i.e. barrier or non-barrier) in terms of its perceived effectiveness in preventing pregnancy, particularly in an HIV-positive context.

1.3.7 Access to NBCU

Researchers from a Rwandan study concluded that the low prevalence of hormonal contraception in the country may be due to women's inability to access contraception, as nearly 50 percent of women who did not use such contraception said they would use hormonal injectable contraceptives, if it was made available to them (Allen, et al, 2003). While access to contraceptives in South Africa is likely to be better, there is scant information on contraceptive method availability and access issues that may affect WLH, in particular. Issues of accessibility, as well as affordability (of the contraceptive itself in countries where women pay for their contraception or travelling to access it, as in the case of South Africa, where public sector provision of contraception is free), have been raised by researchers, as possible barriers to NBCU, as by their nature use of the most commonly used NBC methods require regular interaction with health services (Delvaux & Nöstlinger, 2007M; Mitchell & Stephens, 2004).

1.4 Limitations of Existing Studies

Little research exists on the factors that affect NBCU in HIV-positive women, particularly in a South African context. Hence the proposed study will add to the currently very limited knowledge. Several studies on the topic have been conducted in different countries such as Brazil, Rwanda, and the United States (Magalhães, et al, 2002; Allen, et al, 1993; Diaz, et al, 1995). However, it is difficult to extrapolate

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these findings to South Africa, due to contextual issues (i.e. high prevalence of tubal ligation in Brazil compared to South Africa and social differences) (United Nations Department of Economic and Social Affairs, 2007). There is general consensus internationally that more research on this topic in a diversity of contexts is needed (Allen, et al, 1993; Lindsay, et al, 1995; Delvaux & Nöstlinger, 2007).

Many of the studies under review only focus on one aspect of the factors affecting NBCU in HIV-positive women, such as pregnancy in HIV-positive women compared to HIV-negative women, fertility in HIV-positive women, and broader attitudes towards contraceptive use in HIV-positive women, thus giving an incomplete or inaccurate portrayal of unmet need for contraception, factors influencing non-use and the types of methods used (Lindsay, et al, 1995; Thackway, et al, 1997; Cejtin, 2003). The proposed analysis in this paper will encompass a wider variety of factors that may be related to NBCU in HIV-positive women in Cape Town, South Africa, than is the case with most of the studies reviewed.

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2. MANUSCRIPT

2.1 ABSTRACT

Objective This study aimed to determine the prevalence of contraceptive use, and in particular non-barrier contraceptive use (NBCU), in non-pregnant, HIV-positive women, as well as the factors influencing the choice of NBCU.

Methods This sub-study comprised part of a large cross-sectional study that explored fertility intentions and reproductive decision making of HIV –positive persons attending public sector HIV care in a study in a suburb of metropolitan Cape Town.

Results Prevalence of NBCU was 66%, with 18% of women having a potential unmet need for non-barrier contraception (NBC). Non-NBCU was inversely associated with use of antiretroviral therapy (ART) (OR: 0.21 95% CI [0.10-0.44]), and positively associated with having 0 or 1 living children compared to having 2 or more living children (OR: 4.30 95% CI [1.41-13.15], OR:3.36 95% CI [1.44-7.81], respectively), and age (OR: 1.06, 95% CI [1.00-1.16]). For different sub-groups of the study population, non-NBCU appears inversely associated with being employed (OR: 0.17 95% CI [0.04-0.72]) and having one or more sexual partners in the past 6 months (OR: 0.22, 95% CI [0.06-0.88]).

Discussion Although prevalence of NBCU among this study population of HIV-positive women is higher than that of the general population of women, there is still a potential unmet need for NBC among participants. Dual method protection needs to be emphasized to avoid unintended pregnancy, as it can have especially dire consequences for HIV-positive women. Those not currently taking ART may benefit from a greater interaction with HIV-services, as this service may increase knowledge and awareness of NBC.

Keywords: Contraception; HIV; Antiretroviral Therapy; Fertility

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2.2 Introduction

South Africa has one of the largest populations of HIV-infected persons in the world, at an estimated 5.7 million people [1]. The vast majority of those who are HIV-positive are in their reproductive years, with a disproportionate number of females being infected [1], and an estimated 29.3% of pregnant women testing HIV positive [2]. International research shows that sero-positive women have a high rate of unplanned pregnancy [3]. According to a study by Cooper, et al [4], 11% of women not on antiretroviral therapy (ART) reported having become pregnant after being diagnosed HIV-positive, all of which were unintentional, compared to 9% of women on ART that reported becoming pregnant after HIV-diagnosis, of which only a third were unintentional. While it is important for health services to address the issue of unintended pregnancy in all women, there is a particular urgency to do this in the case of HIV-positive women, given the risk of vertical transmission of HIV and the potential negative effects on the health of the women. Local research found AIDS related causes are the main cause of maternal death in South Africa [5], with a recent study finding that very ill HIV –positive women were seven times more likely to die in childbirth than other high risk pregnant women [6].

These findings add urgency to the issue of ensuring that women living with HIV (WLWH) in South Africa are able to optimise access to contraception should they wish to avoid pregnancy. While barrier methods are most effective in preventing transmission of infection, they are less effective for preventing pregnancy due to incorrect and inconsistent use. Contrastingly, non-barrier contraception (NBC) is most effective at avoiding pregnancy but does not prevent infection. Therefore, especially amongst WLWH, health professionals should advocate dual method protection – the use of both a barrier method to prevent transmission of infection and a non-barrier method to maximise protection against an unwanted pregnancy [7].

Despite evidence of the high prevalence of HIV/AIDS and unplanned pregnancy in South Africa, there is very limited information on contraceptive use, and especially non-barrier contraceptive use (NBCU), and knowledge of what factors contribute to NBCU in HIV-positive women. It is difficult to extrapolate findings from international studies on the subject [8-10] to South Africa due to contextual issues.

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While it is critical to emphasise condom use, information on NBCU is needed in order to afford women the opportunity to choose to have maximum dual method protection to prevent both infection and unwanted pregnancy. Adding to our knowledge base in this area would not only be beneficial for addressing inadequacies in current HIV and reproductive health services, but also for creating national programmes to promote the use of NBC and dual method protection by HIV-positive women to prevent unintended pregnancies. In this article we examine prevalence of NBCU and the types of methods used in a group of HIV-positive women attending public sector HIV care (pre and post – ART) in a Cape Town, suburb as well as factors influencing non-use of NBC and this population's potential unmet need for NBC.

2.3 Methods

This sub-study formed part of a larger cross-sectional study by Cooper, et al [11], that examined fertility intentions, contraceptive service needs and reproductive decision making among a representative sample of HIV-positive persons attending HIV care in a high HIV-prevalence suburb in Cape Town, South Africa. The interviews were conducted from May to September 2006 at two public sector health care centres providing voluntary counseling and testing (VCT) for HIV, general HIV care services, ART services and a prevention of mother-to-child transmission of HIV (pMTCT) for women testing HIV positive during pregnancy.

2.3.1 Sampling and Data Collection

A survey was conducted in which interviewers administered standardized structured questionnaires with pre-coded answers, in face-to-face interviews. Interviews were conducted in the subjects' mother tongue and lasted approximately 30 minutes. Individuals were selected to participate at random by researchers using random number sequences and registers of patients attending each service that day. The survey included questions pertaining to demographic and socioeconomic characteristics, partnership status and sexual activity, HIV-infection and ART, use of and access to contraceptive and reproductive health services, and fertility intentions. The questionnaire asked women about their contraceptive use before and after HIV-positive diagnosis. Confirmation of participants HIV status was confirmed with their medical records.

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The final sample size of the study was 459 people, with an 88% response rate amongst females and 90% amongst males. As this analysis is concerned with contraceptive use in HIV-positive women, all men (157 subjects) were dropped from analysis. Pregnant women (122) were also excluded, as they were believed to have different contraceptive needs than non-pregnant women, leaving 180 women for analysis in this report.

2.3.2 Statistical Analysis

All survey data was captured in a Microsoft Access 2000 customised template and transferred to STATA Release 10 (STATACorp, College Station, USA), where all subsequent analysis was performed. NBCU was divided into three categories, as outlined in the questionnaire: Before (use before HIV-positive diagnosis), After (use following HIV-positive diagnosis), and Current (use currently). Tabulated statistics were calculated to compute the study population's NBCU prevalence, as well as its current potential unmet need for NBC. To assess if there was a significant difference in the study variables between non-users and users of NBC, a Chi-square, Wilcoxon or Fisher's Exact test was performed on each variable. To assess which factors influence a WLWH to not currently use NBC, we constructed a series of logistic regression models. Separate models were built for the study population as a whole (all 180 subjects) and for each of the sub-groups we examined (women using ART, women not using ART, women with future fertility intentions, women without future fertility intentions). When building each model, we started with an empty model, and each variable was tested separately for a crude analysis. From this, variables were added one at a time and assessed on their significance (according to Akaikis information criterion, likelihood ratio test, log likelihood, and chi-square). Lastly, as a comparison, a full model (all variables) was constructed. McNemar's Test was used to determine if NBCU changed before and after HIV diagnosis. A non-user of NBC was defined as a study subject who stated she did not use one or more of the listed NBC methods (oral contraceptive pill, the 2-monthly or 3-monthly progesterone-only injectable contraceptive [hereafter referred to at the 2-monthly or 3-monthly injectable contraceptive], intrauterine device, female sterilisation, male sterilisation). A woman with unmet contraceptive needs was defined as a women who did not have fertility intentions in the next 12 months, was sexually active (had one or more sexual

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partners in the past 6 months) and who was not currently taking NBC. All statistical analyses were performed with STATA Release 10

2.3.3 Ethical Considerations

Ethical approval for larger study, of which this study comprise a sub-study, was granted by the Ethical Review Committee of the World Health Organisation and the Research Ethics Committee of the University of Cape Town, the research partners in this study. All participants who agreed to the voluntary interview provided written informed consent and were allowed to withdraw at any point during the study. Although the risk of personal harm was very low, efforts were made to minimise non-maleficence by having same sex interviewers who were trained in research techniques, research sensitivity, and sexual and reproductive health, and the administering of questionnaires occurring in private rooms to make the participant more comfortable and able to provide honest answers. Researchers referred those experiencing emotional distress to appropriate counselling

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2.4 Results

The median age of the women surveyed was 31 years (with a range of 18 to 55 years), the median level education (schooling) completed was 10 years, and the median number of years since being diagnosed as HIV-positive was 3 years. The majority of participants were unemployed (82%); had a household income of R1000 or more per month (61%); had one or more sexual partners in the past 6 months (75%); were currently using ART (58%) and believed it was easy to access contraception (95%). While a significant minority (45%) were open to the possibility of having a child in the future, the majority reported not wishing to have any children in future (55%). In addition, 16% of women had no living children, 42% had one living child and a further 42% had two or more living children. A minority of women (27%) reported not being in a current sexual relationship (Table 1).

As can be seen in Table 1, in a bi-variate analysis, there was a statistically significant relationship (p-value <0.05) between NBCU, median level of education, median time since diagnosis, use of ART, and perceived difficulty in accessing contraception. However, perceived difficulty in accessing contraception was dropped from any further analysis due to statistical power issues, as the vast majority (95%) of the 137

respondents of that question reported that they believed it easy to access contraception, with only 4 women reporting they believed it difficult to access (Table 1).

As shown in Table 2, 158 women (88%) reported ever use of NBC, before having been diagnosed with HIV. The most commonly used methods before diagnosis were the 2- and 3- monthly injectable contraceptive (53% and 52%, respectively) and the oral contraceptive pill (15%). Nine (5%) of the 180 women in the study reported being sterilised before being diagnosed HIV-positive. Twenty-two women (12%) were using dual method protection and 21 (12%) were not using any form of contraception. Use of NBC was reported by 122 women (68%) after diagnosis with HIV, with a large increase in dual method use and condom use (39% and 56%, respectively). At the time of the study 118 women (66%) reported current use of NBC, with 68 (26%) using dual method protection, 13 (7%) using condoms only, and 29 (16%) not using any form of contraception or infection protection. For current users of NBC, the 3-month injectable contraceptive was by far the most widely used form of contraceptive method, with 42% of the study population currently using it. Other forms of contraceptives currently used by study subjects included oral contraceptive pill (1%), two-month injectable (16%), female sterilisation (8%), female condom (1%) and male condom (44%).

An HIV-positive diagnosis has a significant effect on the decision not to use NBCU (p-value <0.0001). Non-users of NBC before diagnosis were 0.23-fold (95% Confidence Interval [CI] 0.11-0.46) as likely to use NBC after diagnosis and 0.27-fold (95% CI 0.14-0.49) as likely to currently be using NBC as women using NBC before diagnosis. However, there was not a significant change in non-use of NBC from the time following diagnosis to current use (time of study participation) (Appendix E.3).

Additionally, according to our calculations, there were currently 32 women (18%) with a potential unmet need for NBC (Table 2).

Table 4 shows the model building process for a logistic regression analysis of all 180 women. The final model (Model 2) shows a highly significant inverse association between current non-use of NBC and use of ART (Odds Ratio [OR]: 0.21 95% CI

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[0.10-0.44]), with non-use of ART making it more likely that a woman would not currently be using NBC. This model also shows an association between non-use of NBC and women having a lower number of living children. Women with no living children were 4.30-fold (95% CI [1.41-13.15]) more likely to be non-users of NBC than women with 2 or more living children, as were women with one living child, who were 3.36-fold (95% CI [1.44-7.81]) more likely to be non-users of NBC than women with 2 or more living children. There was no significant association found between NBCU and having no vs. 1 child in any of the models. Age also proved to be significantly associated with non-use of NBC, with women being 6% (OR: 1.06 95% CI [1.00-1.12]) less likely to be currently be non-users of NBC for every year over the age of 20 (baseline age). No other significate relationships were found between non-NBCU and any of the other variables (Table 4, Model 2).

For those without future fertility intentions (*n=171*) (Table 5, Model 3), an association between non-NBCU and ART use (OR: 0.20 95% CI [0.08-0.50]), number of living children (0 vs. 2+ OR:4.32 95% CI [1.07-17.47], 1 vs. 2+ OR: 3.56 95% CI [1.29-9.82]), and age (OR: 1.10 95% CI [1.03-1.18] still exists, but the strength of the relationships between non-use of NBC and number of living children and non-use of NBC and age are slightly stronger.. There is also an additional significant inverse association (Table 5, Model 3) between being employed (compared to being unemployed) (OR: 0.17, 95% CI [0.04-0.72] and non-use of NBC. For those not currently using ART, there was a significant inverse association between non-NBCU and having one or more sexual partners in the past 6 months (compared to not having any sexual partners) (OR: 0.22 95% CI [0.06-0.88]) (Appendix E.8, Crude Models).

2.5 Discussion

With a current NBCU prevalence of 67.8% and a before diagnosis ever-use prevalence of 88%, this sample of HIV-positive women utilising public sector HIV-care facilities in Gugulethu appears to have a higher current NBC prevalence than the general South African population. Among the general population of South Africa women, modern NBC prevalence is estimated at 43.9% amongst all women 15-49, and 56.4% amongst those having sexual intercourse in the past 4 weeks, while ever-use of contraceptives amongst ever sexually active females is estimated to be 85.4%

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[12]. While these results are encouraging, as the population in this study has a special need for NBC, there is still room for improvement. We estimate that 18% of the population may have an unmet need for NBC, as these women are not currently taking NBC, are sexually active (have had one or more sexual partners in the past 6 months) and did not have any immediate intentions to become pregnant. Although difficult to compare due to different fertility intentions and potential health risks in the two groups, the unmet need for NBC in this sample of HIV-positive women is greater than the unmet need for family planning services (13.8%) in the general population of South African women [12]. The decline in the use of oral contraceptives (15% to 1%) and increase in male condom usage (13% to 56%) from ever use before and after HIV-diagnosis agrees with a recent American study, which found that after an HIV-positive diagnosis, women were less likely to use the oral contraceptive pill and more likely to use male and female condoms, with 7% using no contraception post-diagnosis, compared to 24% pre-diagnosis (p-value=0.039) [13].

The results from this study suggest that the factor that most strongly influences a woman's decision not to use NBC is her use of ART (OR: 0.21 95% CI [0.10-0.44]). Perhaps women not currently using ART are less likely to be users of NBC than women using ART because the women using ART have more interaction with HIV services, and therefore, may receive more education about the importance of NBC as a method of preventing unwanted pregnancy

The finding that shows that women with no children or few children (<2) were more likely to be non-users of NBC, suggests that these women may not be using NBC because they may wish to increase their family size and, conversely, that women with 2 or more children may be using NBC as they do not want to have any more children. Women with 2 or more children may wish to limit their family size due to financial constraints or to protect their health from any hardships that may be incurred from an additional pregnancy due to their HIV-positive status.

Our results show that for every year over 20 years of age, a woman is 6% more likely to be a non-user of NBC (OR: 1.06 95% CI [1.00-1.12]).

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For the sub-group of those without fertility intentions, the associations from the model of All Subjects (inverse association between non-NBCU and use of ART, positive association between non-NBCU and number of living children, age) found in Table 4 Model 2 persisted. In addition, being employed was found to be significantly and inversely related (OR: 0.17 95% CI [0.04-0.72) to non-use of NBC (Table 5, Model 3). Although the reasons for the NBC use in relation to employment status were not probed in this study, women who are unemployed may be less likely to be users of NBC, due to the possible financial constraints of accessing NBC (transport costs, etc).

Having one or more sexual partners in the past 6 months was also significantly inversely associated with non-NBC use in women who were not currently using ART (OR: 0.22 95% CI [0.06-0.88]). This is a logical finding, as it shows that women without a recent sexual partner are more likely to be non-users of NBC, compared to women who have recently been sexually active.

The findings of the study also show that an HIV-positive diagnosis influences a woman's ever use of NBC in a statistically significant way. Of the 58 (32%) women who changed NBCU after diagnosis, 11 (6%) began NBCU, while 47 (26%) discontinued NBCU (Table 2). The majority of those who discontinued use may have done so in favour of solely using a barrier method, as there was only a slight increase in those not using any method of contraception. Although use of dual protection increased after diagnosis, ideally all sexually active women who wish to avoid pregnancy should utilise this method, as it is the ideal for HIV-positive women, as it helps to prevent both STI and HIV/AIDS transmission and unwanted pregnancy [7].

This study has several limitations. As this study is cross-sectional, associations can be formed but no causality can be assessed. In addition, there is likely a degree of recall bias present in the results, as participants were required to answer questions pertaining to the period before HIV-diagnosis and immediately after, with this being a period of up to 9 years for some participants. This study also has a relatively small sample size (180), with some sub-groups of analysis having as few as 20 subjects. Especially among the sub-groups, we may have found that several other variables could have been significantly associated with non-use of NBC, if the sample size was larger.

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Despite the study's limitations, the findings add to our knowledge base on NBC use and could be beneficial for addressing inadequacies in contraceptive service provision for HIV-positive women in this setting. Although 26 percent of HIV-positive women reported currently using dual method contraception to protect themselves from unwanted pregnancy and disease transmission, according to our calculations, there is still a considerable proportion of unmet need (without current fertility intentions, sexually active) for dual use for this population (33%). Governmental policy and health care providers should be encouraged to work together to ensure awareness, knowledge, and access to both barrier and non-barrier methods of contraception. While it is of paramount importance to avoid STI's and further transmission among HIV positive individuals, increased efforts are needed in more effectively promoting additional use of NBCU among HIV positive women. This could decrease unwanted pregnancies, which have especially dire consequences for HIV-positive women, as they may compromise the health of an unwell HIV-positive woman and lead to vertical transmission. Findings from this study also highlight the need for special attention to be given to promotion of NBC among HIV-positive women not currently on ART, as they are most likely to be non-users of NBC.

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2.6 Tables

Table 1
Characteristics of study population, by current non-barrier contraceptive use/non-use

		Not Currently Using NBC (Row%)	Currently Using NBC (Row%)	Total (% of total group)	p-value
MEDIAN AGE *(n=180)*		31	31	31	0.828*
MEDIAN LEVEL EDUCATION COMPLETED *(n=180)*		10	11	10	0.032*^
MEDIAN YEARS SINCE HIV-POSITIVE DIAGNOSIS *(n=179)*		2	3	3	0.001*^
NUMBER OF LIVING CHILDREN (*n=180)*	0	14 (48)	15 (52)	29 (16)	0.058**
	1	29 (38)	47 (62)	76 (42)	
	2+	19 (25)	56 (75)	75 (42)	
EMPLOYMENT STATUS (*n=179)*	Unemployed	53 (36)	93 (64)	146 (82)	0.325**
	Employed	9 (27)	24 (73)	33 (18)	
HOUSEHOLD INCOME PER MONTH (*n=180)*	<R1000	25 (35)	46 (65)	71 (39)	0.861**
	R1000+	37 (34)	72 (66)	109 (61)	
NUMBER OF SEXUAL PARTNERS IN PAST 6 MONTHS (*n=180)*	0	19 (42)	26 (58)	45 (25)	0.205**
	1+	43 (32)	92 (68)	135 (75)	
ART (*n=171)*	Not on ART	37 (51)	35 (49)	72 (42)	<0.000**^
	On ART	21 (21)	78 (79)	99 (58)	
NBCU BEFORE DIAGNOSIS (*n=180)*	No	7 (32)	15 (68)	22 (12)	0.782**
	Yes	55 (35)	103 (65)	158(88)	
PERCEIVED DIFFICULTY IN ACCESSING CONTRACEPTION (*n=137)*	Easy	27 (21)	103 (79)	130 (95)	0.011***^
	Difficult	0	4 (100)	4 (3)	
	Don't Know/Unsure	3 (100)	0	3 (2)	
CONDOM USE AFTER DIAGNOSIS *(n=180)*	No	29 (37)	50 (63)	79 (44)	0.572**
	Yes	33 (33)	68 (67)	101 (56)	
CURRENT SEXUAL RELATIONSHIP STATUS *(n=177)*	Not in a Sexual Relationship	18 (38)	29 (62)	47 (27)	0.762**
	Cohabitating	19 (33)	38 (67)	57 (32)	
	Living Apart from Boy/girlfriend	23 (32)	50 (68)	73 (41)	
FERTILITY INTENTIONS (*n=180)*	Right Now	4 (36)	7 (64)	11 (6)	0.916**
	In Next 12 Months	3 (33)	6 (67)	9 (5)	
	May Sometime in Future	10 (36)	18 (64)	28 (16)	
	Do Not Want a Child	36 (36)	63 (64)	99 (55)	
	Unsure/Don't Know	9 (27)	24 (73)	33 (18)	

*-Wilcoxon Rank-Sum Test, **-Chi-square Test, ***Fisher's Exact Test
^-significant association between variable and outcome (p-value<0.05)

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Table 2
Prevalence of methods of non-barrier and barrier contraceptive use (ever use) before HIV+ diagnosis, after diagnosis, and current use

Method	Ever Use (%) (median time 13 years)	After (%) (median time 3 years)	Current (%)
Oral contraceptive pill	27 (15)	2 (1)	1 (1)
2-monthly progesterone-only injectable contraceptive	97 (53)	38 (21)	28 (16)
3-monthly progesterone- only injectable contraceptive	93 (52)	75 (42)	75 (42)
IUD	3 (2)	0	0
Female sterilisation	9 (5)	13 (7)	14 (8)
Male sterilisation	0	0	0
Female condom	0	2 (1)*	1 (1)
Male condom	23 (13)	100 (56)*	80 (44)
Diaphragm	0	0	0
Other	0	1 (1)	0
No method used	21 (12)	26 (14)	29 (16)
Dual method	22 (12)	71 (39)	68 (26)
Any NBC method	158 (88)	122 (68)	118 (66)

*One user of the female condom also used male condoms

Table 3
Potential unmet non-barrier contraceptive need

Fertility Intentions	No Current NBCU (-)	Current NBCU (+)
Sexually active & would like child within 12 months *(A)*	7 (5%)	13 (10%)
Sexually active & would like child sometime in future *(B)*	**8 (6%)**	16 (12%)
Sexually active & does not want child in the future *(C)*	**22 (16%)**	44 (33%)
Sexually active & unsure of fertility intentions *(D)*	**6 (4%)**	19 (14%)
Not sexually active & would like child within 12 months *(E)*	0	0
Not sexually active & would like child sometime in future *(F)*	2 (4%)	2 (4%)
Not sexually active & does not want child in the future *(G)*	14 (31%)	19 (42%)
Not sexually active & unsure of fertility intentions *(H)*	3 (7%)	5 (11%)

(A-D)-% out of all sexually active women (135)
(E-H)-% out of all not sexually active women (45)

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Table 4: Logistic regression model building process for non-use of NBC by all subjects

Variable	Crude Models	Model 1 *(n=171)*	Model 2 *(n=171)*	Model 3 (All Variables) *(n=168)*
Age (per year, baseline = 20 years)	1.02 (0.98-1.06)		1.06 (1.00-1.12)^	1.07 (1.00-1.14)^
Education (per year, baseline = 2 years)	0.88 (0.76-1.02)			0.87 (0.71-1.07)
Years Since Diagnosis (per year, baseline = 0 years)	0.79 (0.69-0.92)^			0.90 (0.75-1.07)
Living Children*				
0 Children	2.75 (1.12-6.73)^	2.55 (0.96-6.78)^	4.30 (1.41-13.15)^	4.22 (1.24-14.41)^
1 Child	1.82 (0.91-3.65)	2.60 (1.18-5.71)^	3.36 (1.44-7.81)^	3.98 (1.50-10.56)^
Employment Status (employed vs unemployed)	0.66 (0.28-1.52)			0.63 (0.22-1.82)
Household Income (R1000+ vs. <R1000)	0.95 (0.50-1.77)			1.10 (0.49-2.48)
Sexual Partners in Past 6 Months (1+ vs. 0)	0.64 (0.32-1.28)			0.53 (0.16-1.71)
Use of ART	0.25 (0.13-0.50)^	0.23 (0.11– 0.45)^	0.21 (0.10-0.44)^	0.22 (0.09-0.52)^
NBCU Before Diagnosis	1.14 (0.44-2.97)			0.89 (0.28-2.77)
Condom Use After Diagnosis	0.83 (0.45-1.55)			0.93 (0.40-2.17)
Relationship Status**				
Cohabitating	0.63 (0.25-1.55)			1.17 (0.35-3.89)
Living Apart	0.71 (0.36-1.39)			1.04 (0.38-2.89)
Fertility Intentions***				
Fertility Now	1.04 (0.39-2.79)			1.02 (0.30-3.45)
Fertility Future	1.07 (0.46-2.52)			2.02 (0.69-5.93)

*-In comparison to having 2+ living children
**-In comparison to not being in a sexual relationship
***-In comparison to not having any future fertility intentions
^-Factors significantly associate with non-use of NBC = p-value <0.05

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Table 5:Logistic regression model building process for non-use of NBC by women without fertility intentions

Variable	Crude Models	Model 1 *(n=123)*	Model 2 *(n=123)*	Model 3 *(n=123)*	Model 4 (All Variables) *(n=121)*
Age (per year, baseline = 20 years)	1.03 (0.98-1.09)		1.06 (1.0-1.12)^	1.10 (1.03-1.18)^	1.10 (1.02-1.19)^
Education (per year, baseline = 2 years)	0.86 (0.72-1.04)				0.96 (0.75-1.23)
Years Since Diagnosis (per year, baseline = 0 years)	0.79 (0.66-0.93)^				0.91 (0.74-1.13)
Living Children* 0 Children 1 Child	 3.17 (1.01-10.01)^ 1.76 (0.80-3.87)			 4.32 (1.07-17.47)^ 3.56 (1.29-9.82)^	 3.68 (0.82-16.44)^ 2.88 (0.96-8.69)^
Employment status (employed vs unemployed)	0.27 (0.07-0.97)^	0.23 (0.06-0.85)^	0.20 (0.05-0.76)^	0.17 (0.04-0.72)^	0.20 (0.04-1.01)
Household Income (R1000+ vs. <R1000)	0.73 (0.35-1.52)				1.09 (0.42-2.86)
Sexual Partners in Past 6 Months (1+ vs. 0)	0.63 (0.29-1.34)				0.46 (0.12-1.85)
Use of ART	0.28 (0.13-0.61)^	0.25 (0.11-0.57)^	0.23 (0.10-0.53)^	0.20 (0.08-0.50)^	0.19 (0.06-0.56)^
NBCU Before Diagnosis	1.33 (0.39-4.51)				1.24 (0.26-5.9)
Condom Use After Diagnosis	0.93 (0.45-1.91)				1.29 (0.44-3.80)
Relationship Status** Cohabitating Living Apart	 0.50 (0.16-1.53) 0.93 (0.42-2.04)				 1.15 (0.25-5.23) 1.48 (0.44-4.98)

*-In comparison to having 0 living children

**-In comparison to not being in a sexual relationship

^ Factors significantly associate with non-use of NBC = - p-value <0.05

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Attention: Glenda (Name change to study)

UNIVERSITY OF CAPE TOWN

Research Ethics Committee
Faculty of Health Sciences
OMB E46 Room 26, GSH
Queries : Xolile Fula
Tel : (021) 406-6492 Fax: 406-6411
E-mail : Xfula@curie.uct.ac.za

08 October 2003

REC REF: 261/2003

Dr D Cooper
Public Health & Family Medicine

Dear Dr Cooper

TOWARDS DEVELOPING APPROPRIATE REPRODUCTIVE HEALTH SERVICES FOR HIV POSITIVE INDIVIDUALS: UNDERSTANDING HIV POSITIVE WOMEN AND MEN'S REPRODUCTIVE CHOICES AND FERTILITY INTENTIONS

Thank you for submitting your study to the Research Ethics Committee for review.

It is a pleasure to inform you that the Ethics Committee has formally approved the above-mentioned study on the 07 October 2003.

Please quote the Reference number in all correspondence.

Yours sincerely

PROF T ZABOW
CHAIRPERSON

Informed consent for quantitative interviews with HIV women and men (VCT, pMTCT and HIV care participants)

Hello, my name is…….. I work at the University of Cape Town's Women's Health Research Unit. We are talking to HIV positive people from health care facilities around Cape Town. We want to better understand people's attitudes and concerns about having children, and other things having to do with their reproductive health, as well as their experiences with the health care services. We hope that this information will be used to improve health care services for people living with HIV/AIDS.

As someone affected by HIV, we would like to invite you to participate in this study. We think that your experiences can contribute to understanding these issues. We would like to find out about your thoughts and attitudes regarding HIV positive people's childbearing, use of contraception, and access to related health services. This includes your personal experiences of the health care services, and how you think the services may be improved.

Right to refuse or withdraw

You do not have to take part in this research if you do not wish to do so, and refusing to participate will not affect your current or future treatment at the health facility here in any way. You will still have all the benefits that you would otherwise have at this health facility. You may stop participating in the interview at any time that you wish without losing any of your rights as a patient here. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The

Procedures

If you agree to participate, we will ask you to sign a consent form I will also ask you a series of short questions. I will write down your answers so that we know what you have said, but we will not record your name on the questionnaire or anything that could be used to identify you. The expected duration of the entire process will be about 30 minutes.

Confidentiality

The interview will take place in a room in the clinic and no one else but the interviewer will be present. The information recorded is considered confidential, and no one else except our research team will have access to the completed questionnaire. The number assigned to each file will be kept under lock and key and will not be divulged to anyone. The consent form will be kept separately from the questionnaire.

Risks and Discomforts:

Your participation in this study will not involve any risks to you.There is a slight risk that you may share some personal or confidential information by chance or that you may feel uncomfortable about talking about some of the topics. However, you may refuse to answer any question or not take part in a portion of the questionnaire if you feel the question(s) are personal or if you feel uncomfortable.

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Benefits:

There will be no direct benefit to you, but your participation is likely to help us find out more about HIV positive people's reproductive health choices and service needs. You will not be provided any incentive to take part in the research. However, you will be reimbursed with R20 for your time and travel expenses.

Who to contact:

If you have any questions you may ask those now or later. If there is anything that is unclear or you need further information; we shall be pleased to provide it. [Interviewer ask if the respondent has any questions and provide the necessary clarification]. If you wish to ask questions later, you may contact any of the following: Dr Di Cooper, Women's Health Research Unit, Tel: 406-6528; email: dic@cormack.uct.ac.za or Ms Sheila Cishe; Tel: Women's Health Research Unit, Tel: 406-6819

This proposal has been reviewed and approved by the University of Cape Town's Research Ethics Committee, whose task it is to make sure that research participants are protected from harm. If you wish to find about more about the Committee, contact Professor T Zabow, E46 Room 26, Old Main Building Groote Schuur Hospital; Tel: 021-406-6492. We have permission from the health services to conduct this research.

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Certificate of Consent for Quantitative Study

I have been invited to take part in the research on the health of HIV positive people, specifically their decisions to have children, or to use contraception, and health services related to these things. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study and understand that I have the right to withdraw from the interview at any time without in any way affecting my medical care.

Print Name of Subject

_____

Date and Signature of Subject

_____

_____

___/___/___ (dd/mm/yy)

If illiterate

Print Name of Independent Literate Witness. (*If possible, this person should be selected by the participant and should have no connection to the research team.*)

_____

Date and Signature of Independent Literate Witness

_____

_____

___/___/___ (dd/mm/yy)

Print Name of Researcher

_____

Date and Signature of Researcher

_____

___/___/___ (dd/mm/yy)

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Questionnaire for quantitative interviews with HIV infected women & men (update end May 2006)

IMPORTANT: ENROL ANYONE ELIGIBLE: ONLY DON'T INTERVIEW PERSON AT 1ST VISIT IF THEY OR THE PROVIDER FEEL THEY ARE NOT READY TO BE INTERVIEWED. For all questions with pre-coded options except for yes or no, unless otherwise stated, wait for participant's response and then read pre-coded list and check with them which one to circle.

#	Item	Coding	Skip
	NOTE: INTERVIEWER TO COMPLETE A –D BEFORE OR AFTER INTERVIEW		
A	Participant ID number (**Use folder number)**		
B	Facility name		
C	Date of interview	DD/MM/YYYY	
D	Participant source **(Do not read: Interviewer to complete)**	pMTCT=1 VCT=2 HIV care (non –ART) =3 HIV care (ART) = 4 TB service=5 Other=6 specify: _____	
E	Interviewer name		
F	INTERVIEWER: Does the participant meet all study eligibility criteria	Yes=1 / No=0	
G	INTERVIEWER: Has the participant completed the IC process?	Yes=1 / No=0	
	Demographic & socioeconomic characteristics		
	Sex (**Do not read: Interviewer to complete)** [ubuni]	Female=1 Male=2	
	How old are you? [Buyintoni ubudala bakho?]	Age in years	
	Are you currently working or studying? **(Do not read: Interviewer to complete)** [Uyaphangela ngoku?]	working=1 studying = 2 No=0	If _1 to 4, otherwise skip to 5
	What work do you do? [Wenza hlobo luni lomsebenzi?]	Specify: _____	
	What is your home language? [Nithetha oluphi ulwimi ekhaya?]	isiXhosa=1 isiZulu=2 Afrikaans=3 English=4 Other=5 specify: _____	
	What is the highest level of schooling/education that you have completed? [Leliphi elona nqanaba liphezulu uliphumeleleyo esikolweni/ emfundweni?]	Grade: Standard: Post-secondary (describe):	
	What kind of home do you live in? [Uhlala kumhlobo onjani wendlu?]	Shack/informal dwelling=1 Home ownership=2 Flat/council home=3 Other=4 specify:_____	
	Including yourself, how many people live in your household? [Xa uzibala nawe, bangaphi abantu abahlala ekhayeni lakho?]	Number of people	
	What is the approximate income for your household, per month? [Xa uqikelela ungathi ingakanani ingeniso yemali endlini ngenyanga?]	No household income=0 R 1-500 / month = 1 R 501-999 / month = 2 R 1000-1999 / month = 3 R 2000-2999 / month = 4 R 3000-4999 / month = 5 R 5000-7999 / month = 6 R 8000 / month or greater = 7 Don't Know =9	
	Are you or your partner currently pregnant? [Ingaba wena okanye iqabane lakho nikulelwe ngalomzuzu?]	Yes=1 No=0	IF MALE & NO PARTNER SKIP _11
	Do you have any living children of your own? [Ingaba unabo abantwana abangabakho abaphilayo?]	Yes=1 No=0	If no_15
	If yes, how many boys and girls? **(Do not read: Interviewer to complete)** [Ukuba kunjalo ngamakwenkewe neentombi ezingaphi?]]	Males: Females:	
	How old is the youngest of your living children? [Buyintoni ubudala boyena mntwana wakho umncinane kwaba baphilayo?]	Age in years	
	How many of your children are living with you now? [Bangaphi abantwana bakho ohlala nabo ngoku?]	Enter number	

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#	Item	Coding	Skip
	Have any of your children died [Ukhona umntwana wakho owaselwekayo?]	Yes = 1 No = 0	If no _ 17
	If yes, what did he/she die of Ukuba ewe, wabulawa yintoni?]	1 = AIDS related cause 2 = Other 9 = Don't know	
	Are you taking care of any other children who are not your own? [Bakhona abantwana abaphantsi kogcino lwakho abangengobakho?]	Yes=1 No=0	
	Partnership status & sexual activity *Now I would like to ask you some questions about your sexual relationships and past sexual activity* [Ngoku ndingathanda ukukubuza imibuzo emalunga nobuhlobo bokwabelana ngesondo nangokwabelana ngesondo kwixesha elingaphambili]		
	Are you currently in a sexual relationship? [Ingaba ngalomzuzu unabo ubuhlobo bokwabelana ngesondo]	Yes=1 No=0	If no_22
	How would you describe this relationship? **(Read list)** [Ungakuchaza njani ukuhlobana kwakho?]	Married=1 Not married, living together =2 Girlfirend/boyfriend (not living together)=3 Other=4 specify:_____	
	How long have you been in this relationship? [Unethuba elingakanani uhlobana?]	Duration in years (use decimals for months)	
	Is this person the parent of any of your children? [Eliqabane lingaba lingumzali wakhe nawuphina wabantwana bakho]	Yes=1 No=0 N/app (no children)=3	IF NO CHILDREN SKIP_22
	Approximately how many sexual partners have you had in the past 6 months?]Xa uqikelela mangaphi amaqabane okwabelana ngesondo othe wanawo kwezinyanga zintandathu zidlulileyo?]	Number of partners	
	Approximately how many times have you had sexual intercourse in the last month altogether **(interviewer to summarise for all partners**)? [Xa uqikelela ungathi mangaphi amathuba usabelana ngesondo kule nyanga idlulileyo?]	Number of times	IF NO SEXUAL INTERCOURSE SKIP_25
	When you last had sexual intercourse did you use a male or female condom? [Ukugqibela kwakho ukwabelana ngesondo uyisebenzisile ikondom yamadoda okanye yabafazi?]	Yes, male condom=1 Yes, female condom=2 Yes, both=3 No=0	
	How frequently have you / your partner(s) used condoms during sexual intercourse in the last 6 months? (**interviewer to summarise for all partners**) **(read list)** [Uphindaphinde kangakanani wena / iqabane lakho ukusebenzisa ikondom ngethuba nisabelana ngesondo kwezinyanga zintandathu zidlulileyo?]	Always (in 100% of the time)=1 Most times (> half of the time)=2 Some times (about half of the time)=3 Rarely (< half of the time)=4 Never (No condom use in last six months)=5 Not Applicable/not sexually active=0	
	HIV infection / antiretroviral therapy *Now, I would like to ask you some questions about when you found out you had HIV* [Ngoku ndingathanda ukukubuza imibuzo malunga nethuba owafumanisa ngalo ukuba usuleleke yiNtsholongwane ka Gawulayo]		
	When did you find out that you were HIV-positive? [Ufumanise nini ukuba usuleleke yintsholongwane kaGawulayo ?]	Enter year (4 digits): _____ Enter months ago: _____	
	Where did you first find out that you were HIV-positive? [Uyifumanise phi okokuqala ukuba usuleleke yintsholongwane kaGawulayo?]	Tested at ANC/PMTCT service=1 Tested at TB/STI service=2 Tested at Hospital/other health service=3 Partner referral = 4 Other=5 specify:_____	
	Think about **after** finding out you were HIV-positive, how many new sexual partners have you had since then? [Mangaphi amaqabane amatsha othe wanawo ukususela ukufumanisa kwakho ukuba usuleleke yintsholongwane kaGawulayo?]	Enter number	
	Once again, thinking about **after** finding out you were HIV-positive, have you had sexual intercourse more frequently, less frequently, or as frequently, compared to before you knew you were HIV positive? [Ukuphindaphinde ngaphezu kwesiqhelo, ngaphantsi kwesiqhelo okanye ngokwesiqhelo ukwabelana ngasondo emva kokuba ufumanise ukuba usuleleke yintsholongwane kaGawulayo xa uthelekisa nangaphambi kokuba wazi?]	More frequently=1 Less frequently=2 About as often=3 Not sexually active since finding out HIV-positive=4 Don't know/unsure=9	

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#	Item	Coding	Skip
	After you found out that you were HIV-positive, have you/your main partner become pregnant? If yes, how many times? [Ingaba wena okanye iqabane lakho nikhe namitha emveni kokufumasa ukuba usuleleke yintsholongwane kaGawulayo? Ukuba ewe, kangaphi?]	Enter number	If no, or male & no partner_33
	For the last time you became pregnant, **after** you found out you were HIV-positive, were you/your main partner trying to become pregnant at the time? [Ukugqibela kwako oko ukwenzeka, ingaba wena okanye iqabane lakho beniluzama olomitho ngeloxesha?]	Yes=1 No=0	
	What happened with that pregnancy? **(Read list)** [Iziphumo zolumitho beziyintoni?]	Live birth=1 Stillbirth,/ miscarriage=2 Termination of pregnancy=3 Still pregnant now=4	
	Have you (or your main partner) ever been given medication at the clinic to prevent the mother-to-child transmission (pMTCT) of HIV infection? [Ingaba wena (okanye iqabane lakho) nakhe nanikwa amayeza ekliniki okuthintela ukusulelwa komtwana ngumama (pMTCT) yintsholongwane kaGawulayo?] *[Interviewer: carefully distinguish antiretroviral drugs given for PMTCT from other medications given to women during pregnancy]* ***NOTE: IF CURRENTLY PREGNANT INCLUDE THIS PREGNANCY***	Yes=1 No=0 Don't know/unsure = 9	If male and no partner _35
	If yes, during how many pregnancies have you/ main your partner received medication for this purpose? [Ukuba ewe, kukumathuba amangaphi okumitha ufumana amayeza ngale njongo?]	Number	
	ANTIRETROVIRAL THERAPY: ***NOTE: IF PARTICIPANT IS NOT ON ARV'S SKIP TO 42*** Are you currently taking antiretroviral therapy (ART) for treating HIV infection? [Uyalufumana unyango lwamachiza (ART) okunyanga usuleleko yi ntsholongwane kaGawulayo] *[Interviewer: carefully distinguish ART from other medications given to HIV-positive individuals]*	Yes=1 No=0	If no_42
	Approximately how long have you been taking ART? [Xa uqikelela unethuba elingakanani uthatha iART]	Enter year (4 digits): _____ Enter months ago: _____	
	Think about **after** starting to take ART, how many new sexual partners have you had since then? [Mangaphi amaqabane okwabelano ngesondo okhe wanawo ukususela kwakho ukuthatha iART?]	Enter number	
	Once again, think about **after** starting to take ART, have you had sexual intercourse more frequently, less frequently, or as frequently, compared to before you started? [Ukuphindaphine ngaphezu kwesiqhelo, ngaphantsi kwesiqhelo okanye ngokwesiqhelo ukwabelana ngasondo emva kokuba uqalise iART xa uthelekisa nangaphambi kokuba uqale?]	More frequently=1 Less frequently=2 About as often=3 Not sexually active since finding out HIV-positive=4 Don't know/unsure=9	
	After starting to take ART, have you/your main partner become pregnant? If yes, how many times? [Ingaba wena okanye iqabane lakho uikhe wamitha oko wathi waqala I-ART? Ukuba ewe, kangaphi?]	Enter number	If no, or if male and no partner _42
	For the last time you became pregnant **after** starting taking ART, were you/ main your partner trying to become pregnant at the time? [Ukugqibelo kwako oko ukwenzeka ingaba wena okanye iqabane lakho beniluzama olomitho ngelo xesha?]	Yes=1 No=0	
	What happened with that pregnancy? **(Read list)** [Iziphumo zolumitho beziyintoni?]	Live birth=1 Stillbirth, miscarriage=2 Termination of pregnancy=3 Still pregnant now=4	
	Contraceptive services *Next, I would like to know more about your contraceptive use, or your partner's contraceptive use……..* [Ukolandelayo ndingathanda ukwazi malunga nokucwangcisa kwakho okanye ukucwangcisa kwe qabane lakho] Think about **before** you found out you were HIV-positive, did you or your partner use any of the following contraceptive methods? **(Read all options, circle as many as apply)** [Ngaphambi kokuba ufamanise ukuba usuleleke yintsholongwane kaGawulayo ukhe wena okanye iqabane lakho wazisebenzisa ezinye zezintlobo zilandelayo?]	Oral contraceptive pill=1 2-month injectable=2 3-month injectable=3 IUD=4 Female sterilisation=5 Male sterilisation=6 Female condom=7 Male condom=8 Unsure/not applicable= 9 Diaphragm=10 Other methods=11 specify:_____ No method used = 12	NOTE: 2 MONTHLY INJECTION =NUR-ISTERATE /NETEN 3 MONLY INJECTION = DEPO /PETOGEN

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#	Item	Coding	Skip
	Think about **after** you found out you were HIV-positive, have you or your partner used any of the following contraceptive methods? **(Read all options, circle as many as apply)** [Oko wathi wafumanisa ukuba usuleleke yintsholongwane kaGawulayo, ukhe wena okanye igabane lakho wasebenzisa ezinye zezintlobo zilandelayo?]	Oral contraceptive pill=1 2-month injectable=2 3-month injectable=3 IUD=4 Female sterilisation=5 Male sterilisation=6 Female condom=7 Male condom=8 Unsure/not applicable = 9 Diaphragm=10 Other methods=11 specify:_____ No method used = 12	NOTE: 2 MONTHLY INJECTION = NUR-ISTERATE /NETEN 3 MONLY INJECTION = DEPO /PETOGEN
	INTERVIEWER: SKIP IF PARTICIPANT IS NOT TAKING ART Think about **after** you started to take ART, have you or your partner used any of the following contraceptive methods? **(Read all options, circle as many as apply)** [Oko uthe waqalisa ukuthatha I-ART, ukhe wena okanye iqabane lakho wasebenzisa ezinye zezintlobo zilandelayo]	Oral contraceptive pill=1 2-month injectable=2 3-month injectable=3 IUD=4 Female sterilisation=5 Male sterilisation=6 Female condom=7 Male condom=8 Unsure/not applicable= 9 Diaphragm=10 Other methods=11 specify:_____ No method used = 12	NOTE: 2 MONTHLY INJECTION = NUR-ISTERATE /NETEN 3 MONTHLY INJECTION = DEPO /PETOGEN
	Think about **now**, currently, which of the following contraceptive methods are you (or your partner) using? **(Read all options, circle as many as apply)** [Ngoku, zeziphi iintlobo zokucwangcisa ozi (okanye iqabane lakho) sebenzisayo?] *NOTE: INTERVIEWER IF PARTICIPANT IS ALSO USING CONDOMS RESTRICT THIS QUESTION TO METHODS OTHER THAN CONDOMS. IF PARTICIPANT IS ONLY USING CONDOMS OR IS STERILISED GO STRAIGHT TO QUESTION 49.*	Oral contraceptive pill=1 2-month injectable=2 3-month injectable=3 IUD=4 Female sterilisation=5 Male sterilisation=6 Female condom=7 Male condom=8 Unsure/not applicable = 9 Diaphragm=10 Other methods=11 specify:_____ No method used = 12	NOTE: 2 MONTHLY INJECTION = NUR-ISTERATE /NETEN 3 MONTHLY INJECTION = DEPO /PETOGEN
	Where do you/your main partner go (or where would you go) to access contraception? [Uyaphi / iqabane lakho (okanye ningayaphi) ukuyakufumana ucwangciso?]	This health facility=1 Other public health facility=2 Specify: _____ Chemist=3 GP/private doctor=4 Other=5 Specify:_____ Don't know/unsure=9	
	If you/your partner wanted contraception, how difficult or easy do you think it is for you/your partner to access contraception? **(read all options)** [Ukuba wena / iqabane lakho ufuna ucwangciso, ucinga kungalula kangakanani ukuba wena / iqabane lakho ulufumane ucwangciso?]	Very easy=1 Easy=2 Difficult=3 Very difficult=4 Don't know/unsure=9	
	If you/your partner wanted contraception, could you receive contraception during the same visit to this facility when you come to receive HIV-related care (ART or other HIV-related care)? [Ukuba wena / iqabane lakho ufuna ucwangciso, ungalufumana ucwangciso ngaxesha nye undwendwele kule kliniki ngokuzokufumana uncedo olunxulumene nentsholongwane kaGawulayo (ART okanye olunye uncedo olunxulumene netsholongwane kaGawulayo)?]	Yes=1 No=0 Don't know/unsure=9	
	Where do you/your partner go (or where would you go) to access condoms? [Uyaphi wena / iqabane lakho (okanye ungayaphi) ukuyakufumana iikondom?]	This health facility=1 Other public health facility=2 Specify: _____ Chemist=3 GP/private doctor=4 Other=5 Specify:_____ Don't know/unsure=9	
	If you/your partner wanted condoms, how difficult or easy do you think it is for you/your partner to access condoms? **(read all options)** [Ukuba wena / iqabane lakho ufuna iikondom, ucinga kungalula kangakanani ukuba wena / iqabane lakho uzifumane iikondom?]	Very easy=1 Easy=2 Difficult=3 Very difficult=4 Don't know/unsure=9	

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#	Item	Coding	Skip
	If you/your partner wanted condoms, could you receive condoms during the same visit to this facility when you come to receive HIV-related care (ART or other HIV-related care)? [Ukuba wena / iqabane lakho ufuna iikomdom, ungazifumana iikondom ngaxesha nye undwendwele kule kliniki ngokuzokufumana uncedo olunxulumene nentsholongwane kaGawulayo (ART okanye olunye uncedo olunxulumene netsholongwane kaGawulayo)?]	Yes=1 No=0 Don't know/unsure=9	
	Other reproductive health services		
	Have you ever heard of a Pap smear? [Wakhe weva nge Pap smear?]	Yes=1 No=0	
	If NO: A Pap smear is a test that a woman can have to check for any abnormal cells in the mouth of the womb that could lead to cancer. For this, a nurse inserts a speculum (spoon) into the vagina so that she can see the mouth of the womb and uses a spatula to take the sample of cells. [Ukuba HAYI: I-Pap smear luhlolo olungafunyanwa ngowasethyini ukukhangela ukuba akukho zisele ezingaqhelekanga emlonyeni wesibeleko ezinokuthi zikhokhelele kwisifo somhlaza. Ukwenza oku, umongikazi ufaka icepe kwisini ukwenzela abone umlomo wesibeleko aze asebenzise i-spatula ukuthatha isiqingatha sezozisele.]		IF male _ 55
	Have you ever had a Pap smear? [Wakhe wayenziwa I-Pap smear?]	Yes=1 No=0 Don't know/unsure=9	If no _55
	If yes, when was your last Pap smear? [Ukuba ewe, wagqibela nini ukwenza iPap smear?]	Enter year: _____ Code for timing of last Pap smear: Before found out HIV- positive= 1; Since found out was HIV-positive= 2; Since starting ART= 3; Unsure=9	
	Have you ever heard of emergency contraception? [Wakhe weva ngo cwangciso olubonelela ingxaki ngokukhawulezileyo (emergency contraception)?]	Yes=1 No=0	
	If NO: If NO: Emergency contraception are pills that a women can take up to 96 hours after having unprotected sex to help prevent pregnancy. It works best up to 72 after unprotected sex. It is also called the 'morning after' pill. [Ukuba HAYI: Ucwangciso olukhawulezileyo (EC) lichiza elifumaneka kwabasetyhini kumyinge we yure iziyi96 emva kokuba eye wabelana ngesondo engazikhuselanga ukunqanda umitho. Isebenza ngokugqibeleleyo kumyinge we yure eziyi72 emva kokwabelana ngesondo ungasikhuselanga. Iya ibizwe nangokuba yi "morning after pill".] *If the participant now recognizes emergency contraception (by its definition), circle "recognizes EC"*	Recognizes EC=1	
	Think about **after** you found out you were HIV-positive, have you (or a partner) used emergency contraception? [Wakhe wena (okanye iqabane lakho) walusebenzisa ucwangiso olukhawulezileyo (EC) oko wathi wafumanisa ukuba usuleleke yintsholongwane kaGawulayo?]	Yes=1 No=0 Unsure=9	If no_ or IF male & no partner _58
	Think about **after** you started ART, have you (or a partner) used emergency contraception? [Wakhe wena (okanye iqabane lakho) walusebenzisa ucwangciso olukhawulezileyo oko wathi waqala I-ART?]	Yes=1 No=0	If not on ART or male and no partner _58
	GIVE THIS EXPLANATION: Termination of pregnancy (TOP) (abortion) is legal and available to women at certain public health facilities in South Africa. The law allows an abortion/TOP to be accessed by any woman until up to 12 weeks of pregnancy, and for specific reasons up to 20 weeks of pregnancy. [Ukunqamla ukumitha (TOP) (ukuqhomfa) kusemthethweni futhi kuvelelekile kwabasethyini kwindawo zonyango loluntu ezithile apha Emzantsi Afrika. Umthetho uvumela ukuba ukuqhomfa / unqamlo mitho lufumanake kuye nawuphi na owasethyini okumyinge weveki eziyi12 zokumitha, kwimiba ethile uyakuma kwiveki eziyi20 zomitho].		
	Did you know that it is possible for a woman to have a legal abortion/TOP? [Ubuyazi ukuba kuyenzeka ukuba owasethyini aqhomfe / anqamle ukumitha ngokwasemthethweni?]	Yes=1 No=0	
	Think about **after** you found out you were HIV-positive, have you (or a partner) had an abortion/TOP? [Cinga emva kokuba ufumanise wafumanisa ukuba usuleleke yintsholongwane kaGawulayo, ukhe wena (okanye iqabane lakho) waqhomfa / wanqamla ukumitha?]	Yes=1 No=0 Don't know = 9	If no or male and no partner _62

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	If yes, can you give the reason why that pregnancy was terminated [Ukuba ewe, ungasinika isizathu sokuqhomfa esosisu?]	Related to HIV-status = 1 Unrelated to HIV- status = 2 Don't know = 9	
	Was this abortion/TOP provided at a health facility? [Ingaba okukuqhomfa/ olunqamlo mitho lwalwenziwe kwindawo yezempilo]	Yes:, at a public clinic/ hospital=1 at a private clinic or hospital=2 No, not provided at a health facility =3; Don't know=9	
	Think about **after** finding out that you are HIV-positive, have you or your partner ever felt pressurized by a health care provider to have a termination of pregnancy? [Cinga emva kokufumanisa kwakho ukuba usuleleke yintsholongwane ka Gawulayo, ukhe wena okanye iqabane lakho waziva unyanzelwa kumncedi wezempilo ukuba uqhomfe /ukhuphe isisu?]	Yes=1 No= 0 Unsure = 9	
	Think about **after** you started ART, have you (or a partner) had an abortion/TOP? [Emva kokuba waqala I-ART,ukhe wena (okanye iqabane lakho) waqhomfa / wanqamla umitho ?]	Yes=1; No=0 Don't know/Unsure = 9	If no ART or male and no partner _ 67
	If yes, can you give the reason why that pregnancy was terminated [Ukuba ewe, ungasinika isizathu sokunqamla olomitho?]	Related to HIV-status = 1 Unrelated to HIV- status = 2 Don't know = 9	
	Was this abortion/TOP provided at a health facility? [Ingaba okukuqhomfa/ olunqamlo mitho lwalwenziwe kwindawo yezempilo]	Yes: at a public clinic or hospital=1 at a private clinic or hospital=2 No, not provided at a health facility =3; Don't know=9	
	Think about **after** you started ART, have you or your partner ever felt pressurized by a health care provider to have a termination of pregnancy? [Cinga emva kokuba uqalise iART, Ukhe wena okanye iqabane lakho naziva ninyanzeliswa ngumnikezi ncedo wezempilo ukuba uqhomfe / ukhuphe isisu?]	Yes=1 No= 0 Unsure = 9	
	Health status		
	Do you know what your most recent WHO Stage is? [Uyazazi ukuba ukwiliphi ibakala lokugula (WHO Stage)?]	Enter Stage, I-IV Enter 0 if participant does not know	
	Do you know what your most recent CD4 count is? [Uyalazi ubalo lwamajoni omzimba wakho luthini (CD4 count)?]	Enter CD4 count Enter 0 if participant does not know	
	69 a) Which of the following best describes your moving around (mobility) [Ngowuphi kule ilandelayo ocacisa ngcono ngokukwazi kwakho ukuhambahamba]	I have no problems walking =1 I have some problems walking about=2 I am confined to bed=3	
	Which of the following best describes your Daily activities (taking care of yourself, work, study, housework, leisure activities) [Ngowuphi kule ilandelayo ocacisa ngcono ngokwazi kwakho ukwenza imisebenzi yemihla ngemihla (ukuphangela, ukufunda, umsebenzi wasekhaya, nezinto ohambisa ngazo ixesha)] **(Read all options)**	I have no problem performing my usual activities=1 I have some problems with performing my usual activities=2 I am unable to perform my usual activities=3	
	Which of the following best describes your Pain/Discomfort [Ngowuphi kule ilandelayo ocacisa ngcono ngeentlungu obanzo/ ukungakhululeki komzimba] **(Read all options)**	I have no pain/discomfort=1 I have moderate pain =2 I have extreme pain/discomfort=3	
	Which of the following best describes your feelings [Ngowuphi kule ilandelayo ocacisa ngcono ngendlela oziva unodino/ uxheleke ngayo ngokwasemphefumlweni] **(Read all options)**	I am not anxious/depressed=1 I am moderately anxious /depressed=2 I am extremely anxious /depressed=3	
	NB: INTERVIEWER: Complete visual analog scale on separate page attached	**Completed=1**	
	HIV infection disclosure & stigmatization *Now I would like to ask you some questions about who you have discussed your HIV status with, and how you think people feel about you being HIV-positive….* Ngoku ndingathanda ukukubuza imibuzo malunga nokuba ngubani othe wancokola naye ngokuba nentsholongwane kaGawulayo, nokuba ucinga bazive njani ngokuba nalentsholongwane kwakho….		
	Have you discussed your HIV-infection with …. [ASK EACH OPTION] Ukhe wancokola ngokusuleleka kwakho yi tsholongwane kaGawulayo no/ne..		
	Any of your partners? Qabane lakho?	Yes=1 No=0 Not applicable = 3	
	Family members? Amulungu osapho?	Yes=1 No=0 Not applicable = 3	

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	Other household members other than family? Abanye abantu ohlala nabo ekhaya?	Yes=1 No=0 Not applicable = 3	
	Friends? Abahlobo?	Yes=1 No=0	
	Other members of your community? [Abantu abangabanye basekuhlaleni?]	Yes=1 No=0	
	Health care providers other than those giving you HIV care or treatment? [Abanikezi boncedo lwezempilo?]	Yes=1 No=0	
	Other people? [Abanye abantu?] Specify: _____	Yes=1 No=0	
	How did most people, **other than the health care providers**, react when you first told them that you were HIV positive? **(read all options)** [Ucinga ukuba abantu abaninzi, **ngaphandle kwabasebenzi bezempilo**, babonakalise ntoni xawawuqala ukubaxelela ukuba usuleleke yintsholongwane kaGawulayo?]	Very positive=1 Mostly positive=2 Mixed/neutral=3 Negative=4 Very negative=5 Don't know=9	
	Think about **before** you were HIV-positive, did you ever suffer emotional, physical or sexual abuse from a **partne**r? [Cinga **ngaphambi** kokuba ubene ntsholongwane kaGawulayo, wakhe wazifumana uhlukunyazwa ngokwasemphefumlweni, ngokwasemzimbeni okanye ngokwesondo **liqabane** owawunalo?]	Yes = 1 No = 2	
	Think about **after** you have been HIV-positive have you ever suffered emotional, physical or sexual abuse from a **partner**? [Cinga **emva** kokuba ubene ntsholongwane kaGawulayo, wakhe wazifumana uhlukunyazwa ngokwasemphefumlweni, ngokwasemzimbeni okanye ngokwesondo **liqabane** owawunalo?]	Yes = 1 No =2 Unsure = 9 *NB IF PARTICIPANT ANSWERS YES, TO 79 AND/OR 80 REMEMBER TO ASK IF WOULD LIKE TO SPEAK WITH SOMEONE ABOUT THIS AND ADOPT REFERRAL PROCEDURES*	
	If yes, was this because of: **(Read out all options. Circle all that apply)** [Ukuba ewe, kwakenzeke ngenxa:	Your HIV status = 1 Discussing contraception=2 Discussing condom use = 3 Discussing having children=4 Other = 5 Unsure=9	
	Do you think that you can look forward to the future? Ucinga ukuba wena unokujonga ngethemba kwixesha elizayo?	Yes=1 No=0 Don't know = 9	
	Current fertility intentions *Now I would like to ask you some questions about having a child/children* [Ngoku ndingathanda ukukubuza imibuzo malunga nokuba nomntwana / abantwana]		
	Think about **before** you were HIV-positive, what were your views about having a child/more children? [Cinga **ngaphambi** kokuba ubene ntsholongwane kaGawulayo, zazisithini iimbono zakho ngokuba nomntwana / abanye abantwana?]	BRIEFLY Describe	

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#	Item	Coding	Skip
	Think about **now**, which of the following statements best describes your thinking about you / your main partner having a child? **(Read all options, circle one only)** **IF CURRENTLY PREGNANT ASK ABOUT THE FUTURE** 1. I want to have a child right now 2. I may want to have a child in the next 12 months 3. I may want to have a child sometime in the future 4. I have decided that I do not want to have a child in the future 5. I do not know / am unsure about whether I may want to have a child in the future [Cinga ngokwangoku,ngowupi kule migca ilandelayo ocacisa ngcono ingcinga zakho / zeqabane lakho ngokuba nomntwana / abantwana? (Funda zonke anokukhetha kuzo, ukhethe ibenye)] 1. Ndifuna ukuba nomtwana ngoku 2. Ndinafuna ukuba nomntwana kwinyanga ezi12 ezizayo 3. Ndingafuna ukuba nomtwana ngelinye ithuba kwixesha elizayo 4. Ndigqibe ekubeni andifuni kubanamntwana kwixesha elizayo 5. Andiyazi / andiqinisekanga nokuba ndingafuna ukuba nomntwana kwixesha elizayo	Enter 1-5	
	What are the reasons for your decision (in #85 Zithini izizathu zesigqibo sakho (ku #85)?	BRIEFLY Describe	
	After you found out that you are HIV-positive, has your thinking about having children now or in the future changed [**Emva** kokuba wafumanisa ukuba usuleleke yintsholongwane kaGawulayo, ingaba ingcinga zakho ngokuba nabantwana ngoku okanye kwixesha elizayo zatshintsha?]	Yes=1 No=0 Don't know=9	
	If yes, how? If no, why not? [Ukuba ewe, njani? Ukuba hayi, ngoba kutheni?]	BRIEFLY Describe	
	After you started ART, has your thinking about having children now or in the future changed? [**Emva** kokuba waqalisa ukuthatha I-ART Ingaba ingcinga zakho ngokuba nabantwana ngoku okanye kwixesha elizayo zitshintshile oko uthe?]	Yes=1 No=0 Don't know=9	If not on ART go to _ 91
	If yes, how? If no, why not? [Ukuba ewe, njani? Ukuba hayi, ngoba kutheni?]	BRIEFLY Describe	
	91 a) Is your main partner HIV-positive?	Yes=1 No=0 Don't know=9	
	After you found out that you are HIV-positive, have you discussed whether or not to have (more) children with your current main partner? [**Emva** kokuba ufumanise ukuba une ntsholongwane kaGawulayo ukhe wancokola ngokuba (nabanye) nabantwana negabane onalo ngoku?]	Yes=1 No=0	If no or if no partner _93
	If yes, how would you describe your main partner's opinion on whether to have (more) children? [Ukuba ewe, ungazicacisa njani izimvo zeqabane lakho ngokuba (nabanye) nabantwana?]	Very positive=1 Mostly positive=2 Mixed/neutral=3 Negative=4 Very negative=5 Don't know=9	
	How little or much does your main partner's opinion influence your decision whether or not to have children? **(read all options)** [Izimvo zeqabane lakho ingaba zinegalelo elingakanani kwisigqibo sakho sokuba - okanye ukungabinabantwana? (funda zonke anokukhetha kuzo)]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	If no partner go _94
	After you found out that you are HIV-positive, have you discussed whether or not to have (more) children with your family? [**Emva** kokuba ufumanise ukuba une ntsholongwane kaGawulayo ukhe wancokola ngokuba (nabanye) nabantwana nosapho lwakho?]	Yes=1 No=0	If no_96

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	If yes, how would you describe your family's opinion on whether to have (more) children? [Ukuba ewe, ungazicacisa njani izimvo zosapho lwakho ngokuba (nabanye) nabantwana?]	Very positive=1 Mostly positive=2 Mixed/neutral=3 Negative=4 Very negative=5 Don't know=9	
	How little or much does your family's opinion influence your decision whether or not to have children? **(read all options)** [Izimvo zosapho lakho ingaba zinegalelo elingakanani kwisigqibo sakho sokuba - okanye ukungabinabantwana? (funda zonke anokukhetha kuzo)]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
	How do you think most people in your community feel about HIV-positive people who have (more) children? [Ucinga abantu basekuhlaleni bacinga ntoni malunga nabantu abasuleleke yintsholongwane kaGawulayo abaye babe (nabanye) nabantwana]	Most people feel positively=1 Most people feel negatively=2 Most people are neutral/don't care=3 Don't know=9	
	How little or much does the community's opinion influence your decision whether or not to have (more) children? **(read all options)** [Izimvo zabahlali ingaba zinegalelo elingakanani kwisigqibo sakho sokuba - okanye ukungabinabantwana? (funda zonke anokukhetha kuzo)]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4 Not applicable =5	
	How would you feel if you (or your partner) became pregnant in the next few weeks? [Ungaziva njani xa wena (okanye iqabane lakho) unokuthi umithe kwiveki ezimbalwa ezizayo?] *NOTE: IF SHE OR PARTNER IS PREGNANT ASK HOW SHE/HE WOULD FEEL IF THEY WEREN'T CURRENTLY PREGNANT*	Very happy=1 Somewhat happy=2 Mixed feelings/neutral=3 Somewhat unhappy/upset=4 Very unhappy/upset=5 Don't know=9	
100	How do you think your main partner would feel if you (or your main partner) became pregnant in the next few weeks? [Ucinga igabane lakho lingaziva njani xa wena (okanye iqabane lakho) unokuthi umithe kweziveki zimbalwa zizayo?] *NOTE: IF SHE OR PARTNER IS PREGNANT ASK HOW SHE/HE WOULD FEEL IF THEY WEREN'T CURRENTLY PREGNANT*	Very happy=1 Somewhat happy=2 Mixed feelings/neutral=3 Somewhat unhappy/upset=4 Very unhappy/upset=5 Don't know=9	If no main partner _ 101
101	If they knew/know you are HIV– positive, how do you think your family would feel if you (or your partner) became pregnant in the next few weeks and they found this out? [Ucinga usapho lwakho lungaziva njani xa wena (okanye iqabane lakho) unokuthi umithe kweziveki zimbalwa zizayo baze bayifumanise lonto?] *NOTE: IF SHE OR PARTNER IS PREGNANT ASK HOW SHE/HE WOULD FEEL IF THEY WEREN'T CURRENTLY PREGNANT*	Very happy=1 Somewhat happy=2 Mixed feelings/neutral=3 Somewhat unhappy/upset=4 Very unhappy/upset=5 Don't know=9	
102	If they knew/know you are HIV– positive, how do you think people in your community would feel if you (or your partner) became pregnant in the next few weeks and they found this out? [Ucinga abantu basekuhlaleni bangaziva njani xa wena (okanye iqabane lakho) unokuthi umithe kweziveki zimbalwa zizayo baze bayifumanise lonto?]	Very happy=1 Somewhat happy=2 Mixed feelings/neutral=3 Somewhat unhappy/upset=4 Very unhappy/upset=5 Don't know=9	
103	Would you think about adopting a child, instead of becoming pregnant, to have a child? [Ukhe wacinga ngoku funa umntwana ngokwasemthethweni umkhulise njengowakho, endaweni yokumitha ukuze ube nomntwana?]	Yes=1 No=0 Don't know/Unsure = 9	
104	Would you think about caring for someone else's child (e.g family member's) rather than having your own? [Ungacinga ngokukhulisa umntwana womnye umntu (e.g womnye wamalungu osapho) endaweni yokuba nowakho?]	Yes=1 No=0 Don't know/Unsure = 9	
	Interactions with reproductive health services *We are almost finished….. Now I would like to ask some questions about whether any health care providers have discussed having children or contraception with you, and if so, what kinds of things they told you.* [Sele sizakufikelela ekupheleni….. Ngoku ndingathanda ukukubuza imibuzo emalunga nokuba ukhona na umnikezi woncedo lwezempilo okhe wathetha nawe ngokuba nabantwana okanye ngokucwangcisa, ukuba kunjalo ziziphi izinto abakuxelele zona]		

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105	**After** you became HIV-positive, have you discussed having (more) children now or in the future with a doctor working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokuba (nabanye) nabantwana ngoku okanye kwixesha elizayo nogqira osebenza esibhedlele okanye eklinik?]	Yes=1 No=0	If no_109
106	What did that doctor advise about having (more) children? [Yintoni owakuxelela yona logqira malunga nokuba (nabanye) nabantwana?]	To have a child=1 To not have a child=2 Neutral/no advice=3 Other=4 Specify: _____	
107	For you, how unhelpful or helpful was your discussion with that doctor? [Kuwe, yaba luncedo kangakanani looncoko yakho nogqira?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
108	How little or much has that doctor's opinion influenced your decision whether or not to have (more) children? [Izimvo zalogqira ingaba zinegalelo elingakanani kwisigqibo sakho sokuba-okanye ukungabinabantwana?] *CHECK WHETHER THEY HAVE DISCUSSED THIS WITH ANYONE ELSE: LIST NURSE, COUNSELLOR OR ANYONE ELSE AND THEN CONTINUE WITH RELEVANT QUESTIONS. IF NO-ONE ELSE SKIP TO 118*	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
109	**After** you became HIV-positive, have you discussed having (more) children now or in the future with a nurse working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokuba (nabanye) nabantwana ngoku okanye kwixesha elizayo nomongikazi osebenza esibhedlele okanye eklinik?]	Yes=1 No=0	If no_113
110	What did that nurse advise you about having (more) children? [Yintoni owakuxelela yona lomongikazi malunga nokuba (nabanye) nabantwana?]	To have a child=1 To not have a child=2 Neutral/no advice=3 Other=4 Specify: _____	
111	For you, how unhelpful or helpful was your discussion with that nurse? [Kuwe, yaba luncedo kangakanani looncoko yakho nomongikazi?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
112	How little or much has that nurse's opinion influenced your decision whether or not to have (more) children? [Izimvo zalomongikazi ingaba zinegalelo elingakanani kwisigqibo sakho sokuba-okanye ukungabinabantwana?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
113	**After** you became HIV-positive, have you discussed having (more) children now or in the future with a counselor working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokuba (nabanye) nabantwana ngoku okanye kwixesha elizayo nomcebisi wezempilo osebenza esibhedlele okanye eklinik?]	Yes=1 No=0	If no_117
114	What did that counselor advise you about having (more) children? [Yintoni owakuxelela yona lomcebisi wezempilo malunga nokuba (nabanye) nabantwana?]	To have a child=1 To not have a child=2 Neutral/no advice=3 Other=4 Specify: _____	
115	For you, how unhelpful or helpful was your discussion with that counselor? [Kuwe, yaba luncedo kangakanani looncoko yakho nomcebisi wezempilo?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	

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#	Item	Coding	Skip
116	How little or much has that counselor's opinion influenced your decision whether or not to have (more) children? [Izimvo zalomcebisi wezempilo ingaba zinegalelo elingakanani kwisigqibo sakho sokuba- okanye ukungabinabantwana?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
117	**After** you became HIV-positive, have you discussed having (more) children now or in the future with any other person/people, at a public or private facility? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokuba (nabanye) nabantwana ngoku okanye kwixesha elizayo naye nawuphina umnikezi ncedo wezempilo, osebanza kwicandelo loluntu okanye kwelabucala?] *Interviewer: probe for GP, chemist, other health care providers, support group, TAC etc.*	Yes=1 Specify provider/person: _____ No=0	If no_121
118	What did that person/people advise you about having (more) children? [Yintoni owakuxelela yona lomnikezi ncedo malunga nokuba (nabanye) nabantwana?]	To have a child=1 To not have a child=2 Neutral/no advice=3 Other=4 Specify: _____	
119	For you, how unhelpful or helpful was your discussion with that person/people ? [Kuwe, yaba luncedo kangakanani looncoko yakho nomnikezi ncedo?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
120	How little or much has that person's/people's opinion influenced your decision whether or not to have (more) children? [Izimvo zalomnikezi ncedo ingaba zinegalelo elingakanani kwisigqibo sakho sokuba- okanye ukungabinabantwana?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
	Now, I'll ask some questions about what providers discussed with you about contraception [Ngoku ndizakukubuza imibuzo malunga nokuba bancokole bathini abanikezi boncedo malunga nokucwangcisa]		
121	**After** you became HIV-positive, have you discussed using **contraception** with a doctor working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokusebenzisa ucwangciso noggira, osebanza esibhedlele okanye eklinik?] *INTERVIEWER TO CHECK WHETHER THEY DISCUSSED A METHOD OTHER THAN CONDOMS, IF CONDOMS ONLY GO 134*	Yes=1 No=0	If no_125
122	What did that doctor advise you about using contraception? [Yintoni owakuxelela yona loggira malunga nokusebenzisa ucwangciso?]	To use contraception=1 Not to use contraception=2 Neutral/no advice=3 Other=4 Specify: _____	
123	For you, how unhelpful or helpful was your discussion with that doctor? [Kuwe, yaba luncedo kangakanani looncoko yakho noggira?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
124	How little or much has that doctor's opinion influenced your (your partner's) decision to use contraception? [Izimvo zalogqira ingaba zinegalelo elingakanani kwisigqibo sakho (seqabane lakho) sokusebenzisa ucwangciso?] *CHECK WHETHER THEY HAVE DISCUSSED THIS WITH ANYONE ELSE: LIST NURSE, COUNSELLOR OR ANYONE ELSE AND THEN CONTINUE WITH RELEVANT QUESTIONS. IF NO-ONE ELSE SKIP TO 134*	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
125	**After** you became HIV-positive, have you discussed using contraception with a nurse working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokusebenzisa ucwangciso nomongikazi, osebenza esibhedlele okanye eklinik?]	Yes=1 No=0	If no_129

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#	Item	Coding	Skip
126	What did that nurse advise you about using contraception? [Yintoni owakuxelela yona lomongikazi malunga nokusebenzisa ucwangciso?]	To use contraception=1 Not to use contraception=2 Neutral/no advice=3 Other=4 Specify: _____	
127	For you, how unhelpful or helpful was your discussion with that nurse? [Kuwe, yaba luncedo kangakanani looncoko yakho nomongikazi?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
128	How little or much has that nurse's opinion influenced your (your partner's) decision to use contraception? [Izimvo zalomongikazi ingaba zinegalelo elingakanani kwisigqibo sakho (seqabane lakho) sokusebenzisa ucwangciso?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
129	Since you became HIV-positive, have you discussed using **contraception** with a counselor working at a hospital or clinic? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokusebenzisa ucwangciso nomcebisi wezempilo osebenza esibhedlele okanye eklinik?]	Yes=1 No=0	If no_133
130	What did that counselor advise you about using contraception? [Yintoni owakuxelela yona lomcebisi wezempilo malunga nokusebenzisa ucwangciso?]	To use contraception=1 Not to use contraception=2 Neutral/no advice=3 Other=4 Specify: _____	
131	For you, how unhelpful or helpful was your discussion with that counselor? [Kuwe, yaba luncedo kangakanani looncoko yakho nomcebisi wezempilo?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	
132	How little or much has that counselor's opinion influenced your (your partner's) decision to use contraception? [Izimvo zalomcebisi wezempilo ingaba zinegalelo elingakanani kwisigqibo sakho (seqabane lakho) sokusebenzisa ucwangciso?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
133	**After** you became HIV-positive, have you discussed using contraception with any other person/people, at a public or private facility? [Emva kokuba usuleleke yintsholongwane kaGawulayo, ukhe wancokola ngokusebenzisa ucwangciso naye nawuphina umsebenzi wezempilo, osebanza kwicandelo loluntu okanye kwelabucala?] *Interviewer: probe for GP, chemist, other health care providers, support group, TAC etc.*	Yes=1 Specify provider/person: _____ No=0	If no_137
134	What did that person/people advise you about using contraception? [Yintoni owakuxelela yona lomcebisi wezempilo malunga nokusebenzisa ucwangciso?]	To use contraception=1 Not to use contraception=2 Neutral/no advice=3 Other=4 Specify: _____	
135	For you, how unhelpful or helpful was your discussion with that person/people? [Kuwe, yaba luncedo kangakanani looncoko yakho nomnikezi ncedo?]	Very helpful/addressed my needs & questions=1 Moderately helpful/addressed some needs & questions=2 Not helpful at all/ did not address needs & questions=3 Don't know/unsure=9	

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#	Item	Coding	Skip
136	How little or much has that person's/people's opinion influenced your (your partner's) decision whether or not to use contraception? [Izimvo zalomnikezi ncedo ingaba zinegalelo elingakanani kwisigqibo sakho (seqabane lakho) sokusebenzisa ucwangciso?]	Very strongly/must agree with=1 Somewhat/take into consideration=2 Little/not very important to me=3 No influence at all=4	
	Reproductive health options		
137	**After** you found out you had HIV, has a nurse, counselor, doctor or person/people at the clinic/hospital ever talked to you about **abortion/termination of pregnancy** (TOP)? [Emva kokuba ufumanise ukuba une ntsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezampilo okanye ugqira osebenza eklinik / esibhedlele owakhe wakuxelela ngokufumaneka **kokuqhomfa / Ukunqamla umitho** (TOP)?]	Yes=1 No=0	If no_139
138	If yes, what type of person discussed TOP with you? (circle as many as apply) [Ukuba ewe, loluphi udidi lomnikezi ncedo wezempilo owancokola nawe ngeTOP (ketha zonke ezingenayo)]	Nurse=1 Counselor=2 Doctor at public facility=3 GP/Doctor at private facility=4 Other provider=5 Specify:_____	
139	If you or your partner became pregnant now, how likely or unlikely would you/your partner be to have an abortion/TOP?[Ukuba wena okanye iqabane lakho ningamitha ngoku, kulindeleke kangakanani ukuba wena / iqabane lakho ningaqhomfa / TOP]	Very likely =1: Likely=2 Maybe/would consider=3 Unlikely= 4; Definitely not=5 Don't know/unsure=9	
140	**After** you found out you had HIV, has a nurse, counselor or doctor working at the clinic/hospital ever talked to you about **emergency contraception** (EC)? [Emva kokuba ufumanise ukuba une ntsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezempilo okanye ugqira osebenza eklinik / esibhedlele owakhe wakuxelela ngokufumaneka **kocwangciso olukhawulezileyo**?]	Yes=1 No=0	If no_142
141	If yes, what type of person discussed EC with you? (circle as many as apply) [Ukuba ewe, loluphi udidi lomnikezi ncedo wezempilo owancokola nawe ngocwangciso olukhawulezileyo?]	Nurse= 1; Counselor= 2 Doctor at public facility=3 GP/Doctor at private facility=4 Other provider=5 Specify:_____	
142	If you had unprotected sex right now, how likely or unlikely would you/your partner be to use EC? [Ukuba ungabelana ngesondo ungazikhuselanga ngoku, kulindeleke kangakanani ukuba wena / iqabane lakho nisebenzise i-EC?]	Very likely=1; Likely=2 Maybe/would consider= 3 Unlikely= 4; Definitely not= 5 Don't know/unsure=9	
143	**After** you found out you had HIV, has a nurse, counselor, doctor, or person/people at the clinic/hospital ever talked to you about sterilization [Emva kokuba ufumanise ufumanise ukuba unentsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezempilo, ugqira okanye umntu/abantu esibhedlele /ekliniki okhe wathetha nawe malunga nokuvala inzala?]	Yes=1 No=0	
144	Did you ever feel pressurized to have sterilisation by any of these people? [Wakhe waziva unyanzeliswa ukuba uvale inzala nanguye nawuphi na kwababantu?]	Yes=1 No=0	
145	Since you found out you had HIV, has a nurse, counselor or doctor or person/people at the clinic/hospital ever told you about **Pap smears and/or cancer of the womb**? [Oko wathi wafumanisa ukuba une ntsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezempilo okanye ugqira osebenza eklinik / esibhedlele owakhe wakuxelela nge **Pap smear no/okanye umhlaza wesibeleko**?]	Yes=1 No=0	If no_147
146	If yes, what type of person discussed Pap smears/cervical cancer with you? (circle as many as apply) [Ukuba ewe, loluphi udidi lomnikezi ncedo wezempilo owancokola xnawe nge Pap smear / umhlaza wesibeleko?]	Nurse= 1; Counselor= 2 Doctor at public facility=3 GP/Doctor at private facility=4 Other provider=5 Specify:_____	
147	Since you found out you had HIV, has a nurse, counselor, doctor or other person/people at the clinic/hospital ever told you about **health services that can help people to have children when they are having difficulty** (they are trying to have children but can not)? [Oko wathi wafumanisa ukuba une ntsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezempilo okanye ugqira osebenza eklinik / esibhedlele owakhe wakuxelela **ngoncedo lwezempilo elinokuthi luncede abantu bafumane abantwana xa besokola ukubafumana** (bazama ukuba nabantwana ngaphandle kwempumelelo)?]	Yes=1 No=0	If no_149

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#	Item	Coding	Skip
148	If yes, what type of person discussed these services with you? (circle as many as apply) [Ukuba ewe, loluphi udidi lomnikezi ncedo wezempilo owancokola nawe ngoluncedo?]	Nurse=1; Counselor=2 Doctor at public facility=3 GP/Doctor at private facility=4 Other provider=5 Specify:_____ (e.g. support group, TAC etc.)	
	148 b)f there was a way that you/your partner could be helped by a health care provider to become pregnant, that did not involve risking infecting a male partner with HIV (and through medication to prevent infant infection, the chances of infecting a baby was small), would you be interested in this? [Ukuba ibikhona indlela yokuba wena/iqabane lakho uncedwe ngabanikezi ncedo bezempilo ukuba ukhulelwe, ungakhange wabeka iqabane eliyindoda emngciphekweni wokosuleleka yintsholongwane kaGawulayo (futhi ukuba ngamachiza okukhusele usana ekosulelekeni, bekunokuthi kunciphise amathuba okosulela usana), unganawo umdla koku?]	Yes= 1 No = 0 Unsure = 9	
149	**After** you found out you had HIV, has a nurse, counselor, doctor or person/people at the clinic/hospital ever discussed using **condoms** with you? [Emva kokuba ufumanise ukuba une ntsholongwane kaGawulayo, ukhona umongikazi, umcebisi wezempilo okanye ugqira osebenza eklinik / esibhedlele owakhe wancokola ngokusebenzisa **iikondom**]	Yes=1 No=0	If no_152
150	If yes, what type of person discussed condom use with you? (circle as many as apply) [Ukuba ewe, loluphi udidi lomnikezi ncedo wezempilo owancokola nawe ngokusetyenziswa kwekondom? (ketha zonke ezingenayo)]	Nurse=1 Counselor=2 Doctor at public facility=3 GP/Doctor at private facility=4 Other provider=5 Specify:_____	
151	If yes, what did they tell you about the health benefits of condom use? [Ukuba ewe, bakuxelele ntoni malunga nokusetyenziswa kwekondom]	Code responses for (circle as many as apply): Preventing sexually transmitted infection =1 Preventing pregnancy=2 Prevention of re-infection with HIV=3 Male condoms=A	
	Conclusion		
152	Do you think that you may like to discuss issues regarding childbearing or parenthood more in the future with a health care provider? [Ucinga ukuba ungathanda ukucokola ngemibandela enxulumene nokuzala abantwana nangaphezulu kwixesha elizayo?]	Yes=1 No=0	
153	If yes, with whom would you like to discuss these issues? **(Read all, circle as many as apply)** [Ukuba ewe, ungathanda ukuyincokola nabani lemibandela?]	Nurse (professional, enrolled)=1 Counselor=2 Community health worker=3 Doctor=4 Other (professional)=5 specify:_____ Other (non-professional)=6 specify:____	
154	What specific issues would you like to discuss with a health care provider? [Yeyiphi imiba ongathanda ukuncokola ngayo nomnikezi woncedo lwezempilo]	BRIEFLY Describe (open-ended)	
155	Are there any issues that we have not asked you about, regarding your thinking around childbearing and/or contraception or parenthood, that you would like to raise? [Ingaba ikhona imibandela esingakubuzanga ngayo ngokunxulumene noluvo lwakho ngokuzala no/okanye ngokucwangcisa, ongathanda ukuyiphakamisa?]	BRIEFLY Describe (open-ended)	
	This is the end of the interview. Thank you for your time.		

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Appendix E: Additional Tables and Figures

Appendix E.1: Effect of HIV-positive diagnosis on NBCU, McNemar's Test

	P-Value	Odds Ratio	95% CI
Before vs. After	<0.0001	0.2340	(0.1095 - 0.4578)
After vs. Current	0.5966	0.7778	(0.3580 – 1.6552)
Before vs. Current	<0.0001	0.2727	(0.1431 – 0.4896)

Appendix E.2: Summary of non-users of NBC, by time period

	Before Diagnosis		After Diagnosis		Current Use	
	n	%	*n*	%	*n*	%
No NBCU	22	12.2	58	32.2	62	34.4

Appendix E.3: Frequencies of NBCU, before and after diagnosis, and current use

		Frequency	Percent
Before Diagnosis and Current	No Use Before, No Current Use	7	3.89
	No Use Before, Current Use	15	8.33
	Use Before, No Current Use	55	30.56
	Use Before, Current Use	103	57.22
After Diagnosis and Current	No Use After, No Current Use	44	24.44
	No Use After, Current Use	14	7.78
	Use After, No Current Use	18	10.00
	Use After, Current Use	104	57.78
Before and After Diagnosis	No Use Before, No Use After	11	6.11
	No Use Before, Use After	11	6.11
	Use Before, No Use After	47	26.11
	Use Before, Use After	111	61.67

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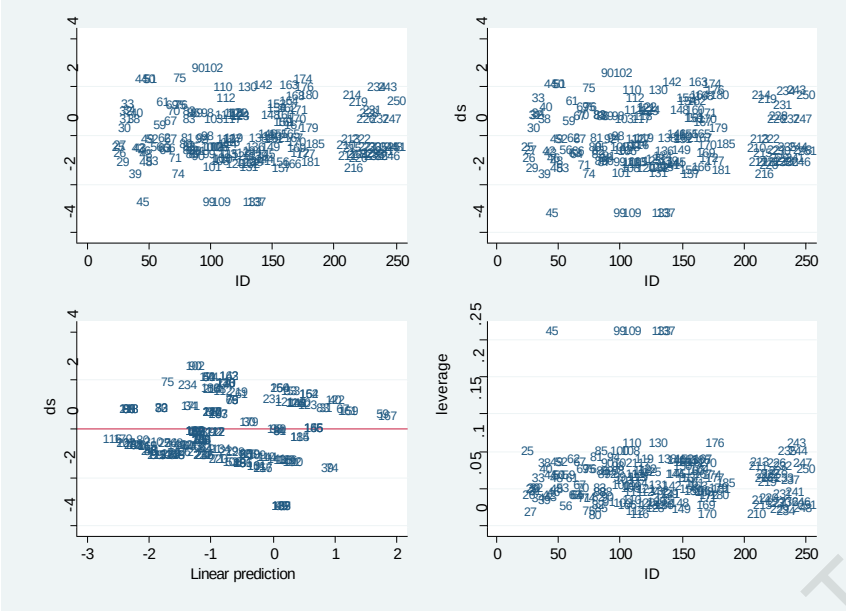
Appendix E.4: Analysis of residuals for table 3, model 2



Appendix E.5: Logistic regression model building process for non-use of NBC by women with current fertility intentions

Variable	Crude Models	Model 1 (All Variables) *(n=20)*^^^
Age (per year, baseline = 20 years)	0.95 (0.80-1.12)	
Education (per year, baseline = 2 years)	0.91 (0.61-1.36)	
Years Since Diagnosis (per year, baseline = 0 years)	0.78 (0.53-1.17)	
Living Children* 0 Children 1 Child		
Employment Status (employed vs unemployed)	2.20 (0.24-20.40)	
Household Income (R1000+ vs. <R1000)	1.80 (0.15-21.48)	
Sexual Partners in Past 6 Months (1+ vs. 0)	^^	
Use of ART	0.33 (0.05-2.24)	
NBCU Before Diagnosis	0.21 (0.02-2.85)	
Condom Use After Diagnosis	1.56 (0.21-11.37)	
Relationship Status** Cohabitating Living Apart^	 1.00 (0.08-12.56) 0.25 (0.02-3.04)	

^-3 failures and 0 successes completely determined
^^-dropped due to collinearity
^^^-8 failures and 2 successes completely determined
**-In comparison to having 2+ living children
***-In comparison to not being in a sexual relationship

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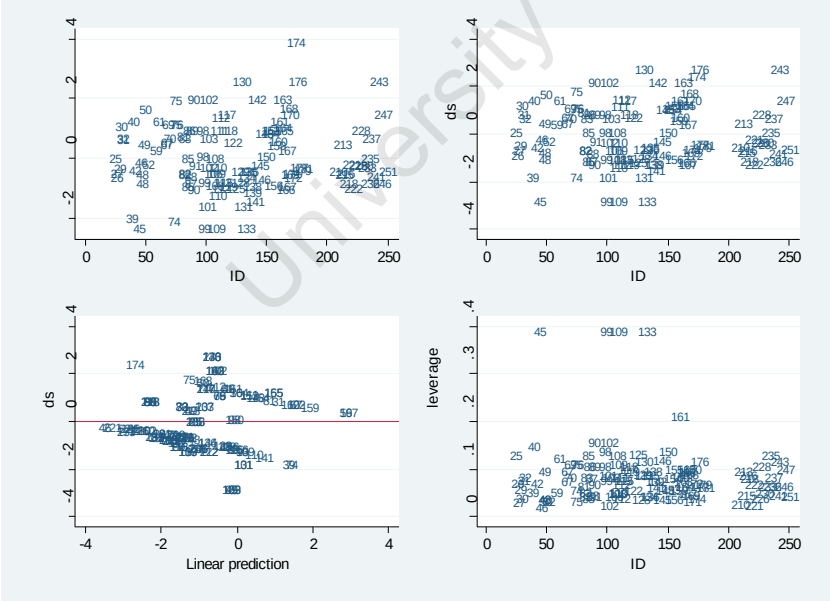
Appendix E.6: Logistic regression model building process for non-use of NBC by women with future fertility intentions

Variable	Crude Models	Model 1 (All Variables) *(n=47)*
Age (per year, baseline = 20 years)	0.96 (0.86-1.08)	0.97 (0.79-1.18)
Education (per year, baseline = 2 years)	0.92 (0.71-1.18)	0.61 (0.30-1.24)
Years Since Diagnosis (per year, baseline = 0 years)	0.80 (0.62-1.05)	0.87 (0.52-1.46)
Living Children*		
0 Children	4.50 (0.42-47.99)	343.72 (0.37-317382.9)
1 Child	3.53 (0.37-33.70)	621.65 (0.71-547648.8)
Employment Status (employed vs unemployed)	2.27 (0.60-8.64)	6.04 (0.42-86.95)
Household Income (R1000+ vs. <R1000)	2.05 (0.54-7.79)	1.40 (0.17-11.27)
Sexual Partners in Past 6 Months (1+ vs. 0)	0.52 (0.07-4.04)	0.69 (<0.01-62.78)
Use of ART	0.18 (0.05-0.65)^	0.06 (<0.01-0.73)^
NBCU Before Diagnosis	0.90 (0.19-4.32)	0.51 (0.05-5.27)
Condom Use After Diagnosis	0.58 (0.17-2.02)	0.37 (0.04-3.79)
Relationship Status**		
Cohabitating	0.80 (0.15-4.30)	0.11 (<0.01-6.07)
Living Apart	0.32 (0.08-1.27)	0.04 (<0.01-1.43)

*-In comparison to having 2+ living children
**-In comparison to not being in a sexual relationship
^-p-value <0.05

Appendix E.7: Analysis of residuals for subjects without future fertility intentions, table 4 model 3



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Appendix E.8: Logistic regression model building process for non-use of NBC by women not using ART

Variable	Crude Models	Model 1 (All Variables) *(n=70)*
Age (per year, baseline = 20 years)	1.02 (0.97-1.08)	1.05 (0.96-1.15)
Education (per year, baseline = 2 years)	0.93 (0.75-1.14)	0.97 (0.73-1.27)
Years Since Diagnosis (per year, baseline = 0 years)	0.93 (0.73-1.17)	1.03 (0.75-1.40)
Living Children*		
0 Children	2.14 (0.63-7.26)	3.55 (0.67-18.69)
1 Child	3.33 (1.10-10.12)	3.34 (0.86-13.02)
Employment Status (employed vs unemployed)	0.39 (0.12-1.29)	0.46 (0.09-2.42)
Household Income (R1000+ vs. <R1000)	0.45 (0.17-1.23)	0.73 (0.19-2.78)
Sexual Partners in Past 6 Months (1+ vs. 0)	0.22 (0.06-0.88)^	0.34 (0.05-2.09)
NBCU Before Diagnosis	1.06 (0.20-5.65)	0.96 (0.13-7.16)
Condom Use After Diagnosis	0.77 (0.29-1.99)	1.23 (0.32-4.75)
Relationship Status**		
Cohabitating	0.37 (0.09-1.53)	0.62 (0.12-3.33)
Living Apart	0.56 (0.20-1.56)	0.70 (0.17-2.83)
Fertility Intentions***		
Fertility Now	0.33 (0.32-3.39)	0.95 (0.17-5.52)
Fertility Future	3.00 (0.56-16.07)	3.82 (0.57-24.49)

*-In comparison to having 2+ living children
**-In comparison to not being in a sexual relationship
***-In comparison to not having future fertility intentions
^-p-value <0.05

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Appendix E.9: Logistic regression model building process for non-use of NBC by women using ART

Variable	Model 1 (Crude)	Model 2 (All Variables) *(n=98)*
Age (per year, baseline = 20 years)	1.02 (0.95-1.09)	1.09 (0.98-1.21)
Education (per year, baseline = 2 years)	0.87 (0.68-1.12)	0.83 (0.59-1.15)
Years Since Diagnosis (per year, baseline = 0 years)	0.86 (0.70-1.06)	0.82 (0.64-1.05)
Living Children*		
0 Children	3.30 (0.72-15.16)	6.52 (0.83-51.13)
1 Child	2.14 (0.68-6.72)	4.35 (0.92-20.66)
Employment Status (employed vs unemployed)	1.06 (0.31-3.64)	0.89 (0.20-4.02)
Household Income (R1000+ vs. <R1000)	1.26 (0.47-3.37)	1.17 (0.36-3.78)
Sexual Partners in Past 6 Months (1+ vs. 0)	0.84 (0.30-2.34)	0.44 (0.06-3.37)
NBCU Before Diagnosis	1.09 (0.28-4.29)	1.12 (0.22-5.80)
Condom Use After Diagnosis	0.71 (0.27-1.88)	1.01 (0.29-3.46)
Relationship Status**		
Cohabitating	1.47 (0.41-5.30)	2.43 (0.27-22.30)
Living Apart	1.06 (0.36-3.18)	1.59 (0.23-11.16)
Fertility Intentions***		
Fertility Now	3.16 (0.63-15.75)	1.22 (0.20-7.53)
Fertility Future	1.12 (0.32-3.91)	1.20 (0.22-6.55)

*-In comparison to having 2+ living children
**-In comparison to not being in a sexual relationship
***-In comparison to not having future fertility intentions

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Appendix F: *Contraception* Journal Instructions to Authors

Editorial Policies

Contraception invites concise reports of original research in the experimental and clinical aspects of all areas of contraception. The purpose of this journal is to provide a medium for the rapid communication of advances and new knowledge in this important field. The Editor anticipates receiving manuscripts from workers in the following areas of research: chemistry, biochemistry, physiology, endocrinology, biology, the medical sciences, and demography. Publication of original papers within 90 days of manuscript receipt is planned. Authors will be advised of disposition of the manuscript within 30 days of receipt.

Manuscript Submission Process ONLINE

All manuscripts must be submitted electronically through the Elsevier Editorial System website (www.ees.elsevier.com/contraception). Select: "New Manuscript". Author guidance is provided for creating and uploading all files and data. The system automatically generates an electronic (PDF) proof, which is then sent to the Editorin-Chief and to designated reviewers. All correspondence about submitted manuscripts also will be handled by e-mail through the EES.

The requirement for manuscripts submitted to Contraception conform to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" established by the International Committee of Medical Journal Editors and published in Annals of Internal Medicine 1988; 108:258-65.

Trial and research guidelines. The following guidelines must be adhered to when formulating the study. Upon submission of the manuscript, authors are to indicate the type of trial/research used on the Author Checklist.

* Randomized controlled trials. Authors are to consult the CONSORT statement. (Moher D, Schulz KF, Altman D, for the CONSORT Group. The CONSORT Statement: Revised recommendations for improving the quality of reports of parallel-group randomized trials. JAMA 2001;285:1987-91) A flow-chart as a figure must be submitted with the manuscript. www.consort-statement.org
* Meta-analysis and systematic reviews of randomized controlled trials. Authors are to consult the QUOROM statement. (Moher D, Cook DJ, Eastwood S, Olkin I, Rennie D, Stroup DF. Improving the quality of reports of meta-analyses of randomized controlled trials: the QUOROM statement. Quality of Reporting of Meta-Analyses. Lancet 1999;354:1896-900.) www.thelancet.com
* Meta-analysis and systematic review of observational studies. Authors are to consult the MOOSE guidelines. (Stroup DF, Berlin JA, Morton SC, et. al., for the Meta-analysis of Observational Studies in Epidemiology (MOOSE) group. Meta-analysis of observational studies in epidemiology: A proposal for reporting. JAMA 2000;283:2008-12." www.jama.ama-assn.org
* Diagnostic tests. Authors are to consult the STARD Initiative. (Bossuyt, PM, Reitsma, JB, Bruns, DE, et. al. Towards complete and accurate reporting of studies of diagnostic accuracy: The STARD Initiative. Clin Chem 2003;49:1-6.) www.clinchem.org

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Previous publication. If a report by the same author(s) has been previously published in any medium that deals in any respect whatever with the same patients, same animals, same laboratory experiments, or same data, in part or in full, as those reported in the manuscript being submitted, two reprints of the article or two copies of the manuscript, be it a full-length report or an abstract, must be submitted with the manuscript. The author(s) should inform the Editor of the circumstances, similarities, and differences of the reports. This requirement also applies to the submission of a manuscript in which a few different patients, animals laboratory experiments, or data were added to those reported in a previous publication or in a submitted or accepted manuscript. Articles previously published in another language will not be considered.

Human and animal experimentation. It is assumed by the Editor that manuscripts emanating from a particular institution are submitted with the approval of the requisite authority. Human experimentation that requires local institutional approval must have this approval before the experiment is started and approval must be so indicated in the Methods section of the submitted manuscript. Reports of experiments on animals must state in the Methods section of the manuscript that the guidelines for the care and use of the animals approved by the local institution were followed. The species of nonhuman animals must be named in the title, abstract, and key words of the manuscript.

Authorship. For manuscripts with two or more authors, each author must qualify by having participated actively and sufficiently in the study that is being performed and reported. The inclusion of each author in the authorship list of a report is based only (1) on substantial contributions to (a) concept and design, or analysis and interpretation of data and (b) drafting the manuscript or revising it critically for important intellectual content; and (2) on final approval by each author of the version of the manuscript. Conditions 1 (a and b) and 2 must both be met. Others contributing to the work should be recognized separately in an Acknowledgment. In the covering letter that accompanies the submitted manuscript, it must be confirmed that all authors fulfilled both conditions.

English language manuscripts should be sent directly to: Shirley Davenport, Contraception Editorial Office, 25313 Via Calinda, Valencia, CA 91355, USA; Tel: 661-259-9566; Fax: 661-255-1480. Authors outside the United States should address manuscripts to a corresponding editors in their own country. Authors in countries not represented by a corresponding editors should send their manuscripts directly to the Editor in California.

Preparation of Manuscripts. The electronic manuscript, tables, and figures must be submitted to the Journal at www.ees.elsevier.com/contraception. Submit figures online in a separate file in EPS, JPEG, or TIFF format (minimum 300 dpi). Figures should not be embedded in the manuscript document. If a figure has been previously published, by you or by others, obtain permission and acknowledge fully in the figure legend. Remove all patient identifying marks (Protection of Patients' Rights to Privacy).

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Manuscripts must be typed double-spaced. Also include five or six keywords and a short running title.

A manuscript length of 5-9 pages, including tables, figures, and references is suggested. Where warranted, longer papers may be accepted.

Title Page. The text of the article should include the following: a STRUCTURED ABSTRACT (with the following subheadings: Background, Study Design, Results, Conclusions) (approximately 150 words) INTRODUCTION, MATERIALS and METHODS, RESULTS, DISCUSSION, and ACKNOWLEDGMENT/ NOTES.

Text. The text of the article should include the following: ABSTRACT (approximately 150 words), INTRODUCTION, MATERIALS and METHODS, RESULTS, DISCUSSION, and ACKNOWLEDGMENT/FOOTNOTES (this is where the author name and address for reprint requests should be listed).

Figures. All figures (photographs, drawings, diagrams, charts) should be clear, easily legible and cited consecutively by Arabic numerals in the text (Figure 1, Figure 2, etc.). Legends should contain sufficient detail to permit figure interpretation without reference to the text. Units should be indicated in the figures. The cost of color reproduction in the print journal is $400 for the first figure on a page. The cost for each additional color figure on the page is $150. Multi-part figures are considered one figure. All color figures will appear on the web site (www.contraceptionjournal.org) at no cost to the authors.

Tables. Tables must be concise, as simple as possible, and cited consecutively by Arabic numerals in the text (Table 1, Table 2, etc.). Each table should be titled and submitted as a separate file. The title of each table should clearly indicate the nature of the contents. Sufficient detail should be included in the table footnote to facilitate interpretation.

References. References must adhere to the specifications of the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" promulgated by the International Committee of Medical Journal Editors.

References are numbered consecutively in the order in which they appear in the text. Citations should be on the line of text enclosed in brackets and the period or comma should follow the reference at the end of the sentence.

Each reference must be cited. Referenced articles must have been published in peer-review publications that are generally accessible. Unpublished data, personal communications, papers presented at meetings and symposia, abstracts, and manuscripts "submitted for publication" are not acceptable as references. Information from such sources may be cited, if necessary, in the text with the sources given in parentheses (e.g., unpublished observations). Papers "in press" may be cited, but must include the journal title, Digital Object Identifier (DOI) and year (if known). Books must include the publisher and year of publication (if known).

References should be listed in numerical order in the Reference Section, immediately following the Acknowledgments section. Reference numbers should be enclosed in

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brackets, with no period after the brackets. Journal names should be abbreviated according to the style of MEDLINE, National Library of Medicine. Please note that no periods are used after the authors' initials or after journal abbreviations. "et al." is used when there are more than six authors. There is a period at the end of each reference. The type and punctuation of references consistent with the "Uniform Requirements" are illustrated as follows:

Journal article, up to six authors:
List all authors when six or fewer.
Baskett TF, Allen AC, Gray JH, Young DC, Young LM. Fetal biophysical profile and perinatal death. Obstet Gynecol 1987;70:357-60.

Journal article, more than six authors:
List only the first three and add "et al." when seven or more.
Pollack MM, Getson PR, Ruttimann UE, et al. Efficacy of intensive care. JAMA 1987;258:1481-6.

Books:
Pritchard JA, MacDonald PC, Gant NF. Williams obstetrics. 17th ed. Norwalk, CT: Appleton-Century-Crofts, 1985.

Chapter in a book:
Roberts ADG, Denholm RB. Changes in cervical collagen with age. In: Chamberlain G, editor. Contemporary obstetrics and gynaecology. London: Butterworths, 1988. p. 259-71.

Edited book:
Creasy RK, Resnik R, editors. Maternal fetal medicine. Philadelphia: WB Saunders, 1984.

Contribution to a previously cited book:
Stirrat GM. Aids to obstetrics and gynecology. 2nd ed.2 3-31.

Book with a volume number:
Lees DH, Singer A. Abdominal operations for benign conditions. Chicago: Year Book, 1978: 1-288. (Lees DH, Singer A. Color atlas of gynecological surgery; vol 2).

Letters to the Editor. This section of the journal is set aside for critical comments directed to a specific article that has recently been published in the journal. Letters should be brief (400 words), double-spaced, and limited to a maximum of 5 citations. The letters and replies should be prepared according to journal format. Illustrative material is accepted only with permission of the Editor. With your correspondence, please include your complete mailing address, telephone and fax numbers, and E-mail address is available.

The Editor reserves the right to shorten letters, delete objectionable comment, and make other changes to comply with the style of the journal. Submit your letters on line to http://www.ees.elsevier.com/contraception .

Guidelines for the Submission of Electronic Manuscripts

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Please note that all manuscripts and revisions should be submitted electronically.

1) Please send papers in MS Word format or a compatible program.

2) All design considerations for typefaces, page layout, and artwork will be handled by the publisher after receipt of the electronic manuscript. There is no need for the author to input special typesetting codes. Please avoid extra formatting (such as centering heads), embedding footnotes in a hidden field, or using a bibliographic or footnote format for reference lists.

3) Be especially sure to distinguish between the letter O and I and the number 0 and 1, respectively.

4) A "hard return" results from tapping the keyboard's Enter key. Use a hard return only to end a paragraph, or for titles, subheads, separate items on a list, etc. Rely on the program's soft return within paragraphs, list items, etc.

5) Use your word processor's capabilities for the following text attributes:

a) bold
b) underline and italic
c) subscript
d) superscript
e) strikeout

Text that will be italic in published form may be keyboarded italic or underlined.

6) Do not use your word processor's hyphenation capabilities. Do not right justify text. Use two hyphens for en-dashes; 3 hyphens for em-dashes.

Any questions regarding contributions to Contraception should be directed to Shirley Davenport in the editorial office: Telephone: (661)259-9566;E-mail: dmishell@yahoo.com

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