

**INVESTIGATING SEXUAL RISK BEHAVIOR AMONG
PATIENTS RECEIVING
ANTIRETROVIRAL THERAPY (ART) IN
UMLAZI, KWAZULU-NATAL, SOUTH AFRICA**

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ABSTRACT

In the last seven to eight years, Antiretroviral Treatment (ART) has received an increasing amount of attention internationally. It has come to be viewed as an important way of preventing new HIV infections and prolonging HIV-positive peoples' lives. In late 2003 the increased attention, amongst other factors, led the South African government to publish a comprehensive health care plan stating that all citizens in South Africa who need ART should receive it by year 2009.

Patients' adherence and their sexual behavior are crucial to the success of ART. This thesis focuses on what factors influence patients' sexual behavior after commencing ART. It will especially look at ART patients' perception of their own infectiousness, as studies have suggested that lower viral loads caused by ART will increase their sexual risk behaviour. The research was conducted on patients attending Ithembalabantu Clinic in KwaZulu-Natal, South Africa.

Qualitative and quantitative data were used in the study. The quantitative data involved 271 face-to-face interviews based on a survey. The qualitative data involved conducting 20 semi-structured interviews.

The results indicated that consistent condom use was high among the sample population (72%), and only two females and seven males having multiple partners (7%). However, due to ART just recently having been introduced in South Africa, the average time spent on ART was 14 months. The findings reveal that a partner's attitude to HIV/AIDS and the levels of communication and openness in a relationship influenced consistent use of condoms. The use of condoms was significantly related to knowledge of partners' status. A high level of sexual assertiveness amongst the females in the sample might have made it easier for them to negotiate condom use. The stage at which members of the sample population entered the relationship was also a predictor of condom use. People who were unemployed and over 35 years in age were less likely to use condoms consistently.

The study also examined the respondents' perception of their own infectiousness. The results indicate that respondents and participants felt that it was just as, or even more dangerous, to

have sexual intercourse without a condom when they are on ART. Few of the participants in the study understood the concept of viral load. They used the same explanation for both viral load and CD4 count.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
DOH	Department of Health
HAART	Highly Active Antiretroviral Therapy
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
IMR	Infant Mortality Rate
MSM	Males who have Sex with Males
NGO	Non-governmental Organization
OI	Opportunistic Infections
PERSAL	Personnel Administration System
RHRU	Reproductive Health Research Unit
RNA	HIV Ribonucleic Acid
SABCOHA	The South African Business Coalition on HIV/AIDS
SADHS	South African Demographic and Health Survey
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TAC	Treatment Action Campaign
TPB	Theory of Planned Behaviour
UN	United Nations
US	United States
VCT	Voluntarily Counselling and Testing
WHO	World Health Organization

TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGMENTS	iv
ACRONYMS	v
TABLE OF CONTENTS	vi

CHAPTER 1: INTRODUCTION

1.1	Introduction	1
1.2	Background for the Research	2
1.2.1	<i>The Epidemiology of HIV/AIDS</i>	2
1.2.2	<i>The Global Epidemic</i>	3
1.2.3	<i>The Sub-Saharan Epidemic</i>	3
1.2.4	<i>The Epidemic in South Africa and KwaZulu-Natal</i>	4
1.3	The Impact of the HIV/AIDS Epidemic in South Africa	5
1.4	Access to Antiretroviral Therapy	6
1.4.1	<i>What is ART?</i>	6
1.4.2	<i>Access to Antiretroviral Therapy</i>	7
1.5	Purpose of the Study	8
1.6	Objectives	9
1.7	Organization of the Research Report	10

CHAPTER 2: LITERATURE REVIEW

2.1	Introduction	11
2.2	Adherence and the Role of Condoms	11
2.3	What Factors Influence Adherence?	13
2.3.1	<i>Poor Adherence</i>	13
2.3.2	<i>Suboptimal Adherence</i>	14
2.3.3	<i>Adherence Training</i>	14

2.4	Condom Use	15
2.4.1	<i>Barriers to Condom Use</i>	16
2.4.1.1	<i>Gender Roles and Multiple Partners</i>	16
2.4.1.2	<i>Intimacy and Trusting the Partner</i>	17
2.5	Condom Use and Disclosure After VCT	18
2.5.1	<i>Rates of Disclosure in Sub-Saharan Africa</i>	19
2.5.2	<i>Determinants of Disclosure</i>	19
2.5.3	<i>Rates of Condom Use After VCT in Developed Countries</i>	20
2.5.4	<i>Rates of Condom Use After VCT in Developing Countries</i>	21
2.6	Gender Roles and VCT	22
2.7	ART and Risky Sexual Behaviour	23
2.7.1	<i>ART and Sexual Behaviour in Developed Countries</i>	23
2.7.2	<i>ART and Sexual Behaviour in Sub-Saharan Africa</i>	24
2.7.3	<i>ART and Perception of Infectiousness</i>	25
2.8	Summary	27

CHAPTER 3: THEORETICAL FRAMEWORK

3.1	Introduction	29
3.2	Health Related Conceptual Frameworks	29
3.2.1	<i>Health Belief Model</i>	29
3.2.2	<i>Theory of Planned Behaviour</i>	30
3.2.3	<i>Stages of Change</i>	31
3.2.4	<i>The Social Learning Theory/Social Cognitive Theory</i>	31
3.3	Applicability of the Models to this Study	32
3.4	Summary	33

CHAPTER 4: METHODOLOGY

4.1	Introduction	34
4.2	Study Design	34
4.3	Study Setting	34
4.3.1	<i>Study Site</i>	35

4.4	Methods of Data Collection	35
4.4.1	<i>Semi-Structured interviews</i>	35
4.4.2	<i>Survey</i>	36
4.5	Sampling	37
4.5.1	<i>Semi-Structured Interviews</i>	37
4.5.2	<i>Survey Interviews</i>	38
4.6	Methods of Analysis	39
4.6.1	<i>Semi-Structured Interviews</i>	39
4.6.2	<i>Structured Interviews</i>	40
4.7	Transferability, Generalizability and Reliability	40
4.8	Ethical considerations	42
4.9	Limitations of the study	42
4.10	Summary	44

CHAPTER 5: QUALITATIVE ANALYSIS

5.1	Introduction	45
5.2	Analysis of Data	45
5.2.1	<i>Characteristics of the Participants</i>	45
5.2.2	<i>Sexual Desire After Commencing ART</i>	45
5.2.3	<i>Multiple Sexual Partners</i>	46
5.2.4	<i>Disclosure to Sexual Partner</i>	48
5.2.5	<i>Disclosure and Condom Use</i>	50
5.2.6	<i>Condom Use</i>	52
5.2.7	<i>Perception of Infectiousness</i>	55
5.3	Summary	56

CHAPTER 6: QUANTITATIVE ANALYSIS

6.1	Introduction	57
6.2	Descriptive Analysis of Data	57
6.2.1	<i>Description of Respondents in the Survey</i>	57
6.2.2	<i>Knowledge, Attitudes and Perceptions of Condoms and ART</i>	59
6.2.3	<i>Number of Sexual Partners after ART</i>	62
6.2.4	<i>Description of Communication about Status with Sexual Partners</i>	63
6.2.5	<i>Description of the Nature of Communication between Partners</i>	64
6.2.6	<i>Condom Use</i>	66

6.3	Factors Related to Condom Use – Bivariate Analysis	67
6.3.1	<i>Condom Use and Perception of Infectiousness</i>	68
6.3.2	<i>Condom Use and Communication about Status between Partners</i>	68
6.3.3	<i>Condom Use by Socio-Demographic Variables</i>	70
6.3.4	<i>Condom Use and Time</i>	73
6.4	Factors Related to Condom Use – Multivariate Analysis	73
6.5	Summary	75

CHAPTER 7: DISCUSSION AND RECOMMENDATIONS

7.1	Discussion	77
7.2	Key Findings and Recommendations	86

REFERENCES	90
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CHAPTER 1: INTRODUCTION

1.1 Introduction

Since the first person infected with HIV was discovered in 1981 more than 25 million people have died from HIV/AIDS (UNAIDS, 2006). At the end of December 2005, an estimated 40.3 million people were living with the virus (UNAIDS, 2006). HIV/AIDS hinders development in all countries with a high prevalence rate. In the hardest hit countries it is eradicating decades of health, economic and social progress. In addition it reduces life expectancy and deepens poverty (UNAIDS, 2004a).

In the 1990s, efforts to mitigate the impact of HIV/AIDS focused on preventing new infections through behaviour change. Throughout that decade, limited resources were dedicated to providing antiretroviral drugs that prolong infected peoples' lives. Since year 2000 there has been an increased emphasis on access to antiretroviral therapy (ART), which has subsequently led to a drastic increase in the number of people receiving ART. In 2001, the UN/WHO/World Bank's "accelerated access" initiative was launched. It cut prices of some antiretroviral drugs by 85 percent in sub-Saharan Africa (WHO, 2001). The same year the Global Fund to Fight AIDS, Tuberculosis and Malaria was established. Substantial sums of money from this fund were donated to facilitate the introduction of ART in developing countries (WHO, 2005). The UNAIDS/WHO "3 by 5" initiative was launched two years later. The aim of this initiative was to provide three million people with ART before the end of 2005 (WHO, 2005).

The number of people on ART in sub-Saharan Africa has increased from 400 000 in December 2003 to approximately one million in mid-2005. Out of 49 focus countries in the "3 by 5" initiative, 40 have set national treatment targets, and 34 of them are developing, or have completed, national treatment scale-up plans (WHO, 2005). South Africa launched its plan for treatment scale-up in November 2003. 'The Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa' has got several objectives, one is to provide ART to all South Africans who need it by year 2009 (South African Department of Health, 2003a).

The increased emphasis on ART underlines the importance of investigating the effectiveness of the drugs. ART prolongs people's lives and prevents the persons on therapy from spreading the HIV to others (Haubrich, Little, Currier, *et al.*, 1999, Mannheimer, Matts, Child & Chesney, 2002, Bangsberg, Moss & Deeks, 2002b). The success of ART depends on patients' adherence to ART, which has been found to be less than perfect in both developing and developed countries (Bangsberg, Bronstone & Chesney, 2002a, Gordillo, Del Amo, Soriano & Gonzales-Lahoz, 1999, Meilo, Guiard-Schmid, Tzeuton *et al.*, 2002, Laurent, Diakhate, Fatou Ngom *et al.*, 2002, Weiser, Wolf, Bangsberg *et al.*, 2003, Stout, Leon & Niccolai, 2003).

The main focus of this study is not on adherence to ART, which is undeniably of utmost importance for the effectiveness of the drugs, but rather on an area that has received less attention, namely condom use among ART patients. With imperfect adherence, the continuous use of condoms is important to prevent new infections, re-infections and drug resistance (Mannheimer, Friedland, Matts, Child & Chesney, 2002). Investigating the use of condoms is especially important considering that condom use in sub-Saharan Africa is low (Agha, Kusanthan, Longfield, Klein & Berman, 2002, Maharaj & Cleland, 2004, South African Department of Health, 2004).

1.2 Background to the Research

1.2.1 The Epidemiology of HIV/AIDS

It is difficult to accurately determine how many people are infected with HIV/AIDS worldwide. Not many people come forward for testing, and one cannot definitely diagnose HIV infection in the absence of HIV testing. Poor surveillance systems in many countries also make reporting of detected cases harder. Most available figures are, therefore, only estimates of the number of people infected with HIV. Each estimate indicates the lowest and the highest number of people possibly infected. This study will use the median estimate that is derived from these numbers.

1.2.2 The Global Epidemic

At the end of 2005, an estimated 38.6 million people were carriers of HIV worldwide (UNAIDS, 2006). In 2005, 4.1 million people were newly infected with HIV (UNAIDS, 2006). Young people between the age of 15 and 24 accounts for almost half of all new infections worldwide (UNAIDS, 2005). The same year, 2.8 million people died due to AIDS (UNAIDS, 2006). Out of all these deaths 570 000 were children under the age of 15. Through the 1980s and parts of the 1990s the populations of low- and middle-income countries had significantly rises in life expectancy. However, since 1999, primarily as a result of AIDS, average life expectancy has declined in 38 countries (UNAIDS, 2004c).

1.2.3 The Sub-Saharan African Epidemic

Towards the end of 2005 sub-Saharan Africa was home to more than two thirds of the people living with HIV/AIDS globally. However, only 10 percent of the world's population lives in sub-Saharan Africa (UNAIDS, 2005). This means that 25.8 million people in this region are infected with HIV/AIDS (UNAIDS, 2006). Females are considerably more vulnerable to HIV infection than males, as 13.5 million of all those infected are females. This is also the case with people aged 15-24 years, where an estimated 4.6 percent of females and 1.7 percent of males were living with HIV in 2005 (UNAIDS, 2005). The same year, an estimated 3.2 million people became newly infected. The incidence of HIV infection increased by 200 000 from 2003 to 2005 (UNAIDS 2005). The epidemic is currently the leading cause of death in sub-Saharan Africa. In 2005, 2.4 million people died of AIDS in this region, accounting for 77 percent of the deaths due to AIDS worldwide (UNAIDS, 2005).

Not all of sub-Saharan Africa is equally affected. The southern part of Africa is the worst affected region in the world (UNAIDS, 2006). In the worst affected countries in this region up to 60 percent of today's 15-year-olds will not reach their 60th birthday (Timaecus & Jassen, 2003).

Table 1.1: Antenatal prevalence for year 2003 or 2004 in females aged 15-49 years	
Angola	3.7 %*
Botswana	24.1 %
Lesotho	23.2 %*
Namibia	19.6 %**
South Africa	18.8 %*
Swaziland	33.4 %*
Zambia	17.0 %**
Zimbabwe	20.1 %*

Source: UNAIDS 2006

In the four southern African countries where the HIV/AIDS prevalence exceeds 20 percent, people born between 1995 and 2000 are only expected to live for 49 years. In the absence of AIDS, life expectancy would have been 62 years (UNAIDS, 2004b). In Swaziland, Zambia and Zimbabwe, the average life expectancy of people born over the next decade is projected to drop below 35 years of age in the absence of ART (UN Population Division, 2003 cited in UNAIDS, 2004b).

Zimbabwe is the only country in southern Africa where the epidemic's growth seems to be slowing. The HIV prevalence among pregnant females has declined from 26 percent in 2002 to 20.1 percent in 2004 (UNAIDS, 2006). There is also evidence that suggests that the incidence rates are declining. Changes in sexual behaviour within casual relationships and reduction in the number of sexual partners appear to have contributed to the decline (UNAIDS, 2005).

1.2.4 The Epidemic in South Africa and KwaZulu-Natal

Proportionally, South Africa carries the highest burden of people living with HIV/AIDS in the world (UNAIDS, 2006). In 2004 South Africa had an estimated 4.5 to 6.5 million infected people (Shisana & Simbayi, 2002, UNAIDS, 2004d, Dorrington, Bradshaw & Budlender, 2002, UNAIDS, 2006). In 2005, the antenatal prevalence rate for females aged 15 to 49 years was 29.5 percent, while the HSRC/Nelson Mandela Household survey conducted in 2004 estimates the prevalence rate to be 24.4 percent, while the UNAIDS estimates the prevalence to be 18.8 percent at the end of 2005 (Shisana, Rehle & Simbayi, 2005, UNAIDS, 2006).

In 2002, AIDS accounted for 40 percents of the deaths in South Africa, which makes it the leading cause of mortality in the country (Dorrington, Bourne, Bradshaw, 2001). The same year it caused 52 percent of the deaths in KwaZulu-Natal (Doherty & Colvin, 2004). In 2003 alone, 370 000 South Africans were estimated to have died from AIDS.

The life expectancy at birth has declined from 57 years in 1996 to an estimated 48.9 years for males, and 53.1 years for females in 2004 (Dorrington, Budlender, Johnson & Bradshaw, 2004). South Africa has now failed to meet the UN millennium goal which aims to keep the Infant Mortality Rate (IMR) in each country below 50 per 1000 live births. The IMR was estimated to be 56 per 1000 live births in 2004 (Dorrington *et al.*, 2004).

In South Africa, the epidemic proportionally affects twice as many African as white people, but unlike other African countries there appears to be no difference in the infection rate between urban and rural areas (Dorrington, Bradshaw & Budlender, 2002). In 2004, the prevalence among females was 20.2 percent and 11.7 percent among males (Shisana *et al.*, 2005).

Incidence rates are regarded as the most accurate way to report the development of the epidemic, as prevalence is not necessary affected by dramatic changes in number of new cases. In 2002 an estimated 2.1 percent of the uninfected population in South Africa became infected with HIV (Dorrington *et al.*, 2002). The highest incidence rates were experienced by KwaZulu-Natal together with the Free State and Mpumalanga (Dorrington *et al.*, 2002).

According to the 2005 HSRC/Nelson Mandela communication survey, the HIV prevalence rate amongst 15-49 year olds in KwaZulu-Natal is 21.9 percent (Shisana *et al.*, 2005). The prevalence found amongst females in the communication survey is lower than the rate detected in the 2004 antenatal survey. Females aged 15-49 years in the communication survey had a prevalence rate of 30.4 percent, while the antenatal survey found the prevalence to be 40.7 percent (Shisana *et al.*, 2005). These prevalence rates put KwaZulu-Natal at the epicentre of the HIV epidemic in South Africa and the rest of the world.

1.3 The Impact of the HIV/AIDS Epidemic in South Africa

The majority of the people infected with HIV/AIDS are in their reproductive years. In sub-Saharan Africa the people aged 15-49 also have the highest productivity. Whole countries and households depend on their labour to support unemployed people. HIV/AIDS has, therefore, had a profound impact at both the macro- and micro- levels of the economy (Sunter & Whiteside, 2000).

The AIDS epidemic's two most serious macro-economic effects are a reduction in the labour supply and increased production costs. The South African Business Coalition on HIV/AIDS (SABOCHA) reports that more than 30 percent of companies have experienced reduced labour productivity or increased absenteeism (Doherty & Colvin, 2004).

The health sector is also affected. AIDS has caused a large increase in the number of patients, and at the same time has led to the deaths of health personnel. In the absence of ART, South Africa is predicted to lose 16 percent of its health workers due to the epidemic (Doherty & Colvin, 2004).

The economic impact is, however, first felt by individuals. Sickness and loss of income sends poor households into deeper poverty. A study in South Africa and Zambia, found that the monthly income of households coping with an AIDS related illness fell from 66 to 80 percent (Steinberg, Johnson, Schierhout & Ndegwa, 2002). On average HIV/AIDS-care related expenses can absorb one-third of a household's monthly income (Steinberg *et al.*, 2002).

1.4 Access to Antiretroviral Therapy

1.4.1 What is ART?

There are three different types of ART, namely: mono-, dual- and triple- therapy. The most common antiretroviral (ARV) pills can be divided into three different categories. The ART is given a name according to how many ARV categories that are combined in the therapy. Mono- and dual- therapy is not recommended as drug resistance develops quickly, and renders ART unable to fight HIV as effectively as a triple combination (Sunter & Whiteside, 2001, Weidle, Malamba, Mwebaze *et al.*, 2002). A combination of pills from three different

categories of ARV drugs are therefore provided by the South African government. All references to ART in this study will refer to this type of triple combination therapy. In some instances the term HAART (Highly Active Antiretroviral Therapy) might also be used to describe this type of combination.

1.4.2 Access to Antiretroviral Therapy in South Africa and Other Developing Countries

ART is reaching only a fraction of those who need it in developing countries. Efforts to fight HIV/AIDS have previously focused on changing people's behaviour, not on providing medication to prolong the lives of those who have already contracted the virus (UNAIDS, 2003b). By mid-2005, 1.3 million people worldwide received ART. The number of people on ART in sub-Saharan Africa has increased drastically the last two years. In 2003, 50 000 people received ART, by the end of 2005 the number of people in sub-Saharan African receiving ART had expanded to approximately 800 000 (UNAIDS, 2003b, UNAIDS, 2006). Still, demand for medication continues to outstrip supply and the capacity of health systems in most sub-Saharan countries to provide it. At least 900 000 South Africans who needed ART were not receiving it in mid 2005 (UNAIDS, 2005). Only countries such as Botswana and Uganda have coverage rates above 50 percent. Most countries have rates below ten percent (UNAIDS, 2006).

Lack of financial and human resources, as well as minimal health infrastructure, are the main reasons why developing countries experience such a treatment-gap. The South African cabinet presented a strategic plan to roll out ART to all citizens before year 2009 (South African Department of Health, 2003a). Previous to the presentation of this plan the President had questioned the causal link between HIV and AIDS and stated that he did not know anyone who has, or have had, HIV/AIDS. He also labelled ARV drugs as too toxic for people to use (Health Systems Trust, 2000). The non-governmental organization (NGO), Treatment Action Campaign (TAC), used methods of civil disobedience, lobbying in parliament and building alliances with workers' unions, to pressurize the government into rolling out ART to all citizens in need of it (TAC, 2004). TAC was preparing to take the government to court for violating citizens' constitutional rights, when the government responded by presenting the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa, which includes a plan for providing ART in the public sector.

In South Africa the number of people on ART increased from 5000 in 2004 to roughly 190 000 at the end of 2005 (UNAIDS, 2006). However, only a limited number of these people receive their medication from the government. In January 2005 the government provided medication to 32 302 people (Health Systems Trust, 2005). The number of people currently on treatment is tens of thousands less than the target stated in the government's operational plan (TAC, 2004). In KwaZulu-Natal, the government aimed to have almost 25 000 people on treatment by March 2004. However, only an estimated 6086 were on treatment when the target date arrived (TAC, 2004).

Both KwaZulu-Natal and other provinces are experiencing human resource shortages in relation to the roll-out of ART. They find it difficult to fill all the positions needed with qualified health personnel. The Personnel Administration System (PERSAL) database estimates that from 2001 to 2003 there were 169 191 vacant public health sector posts, and 42 000 of these were nursing positions (PERSAL database cited in Padarath, Ntuli & Berthiaume, 2004). It is estimated that there is a need for 13 805 additional public health posts to implement the government's operational plan (South African Department of Health, 2003a).

The ASSA 2000 Intervention Model indicates that ART treatment is likely to have a profound impact on slowing down the epidemic. The model projects that by 2010 114 000 deaths can be avoided per annum if half of the South African citizens that need ART receive the drugs (Dorrington *et al.*, 2004).

1.5 Purpose of the Study

The increased focus on ART as a strategy to mitigate the impact and further spread of the HIV/AIDS epidemic underlines the importance of investigating possible obstacles to the effectiveness of ART. Several studies, most of them from developed countries, have been conducted on adherence to the treatment (see: Bangsberg *et al.*, 2002a, Gordillo *et al.*, 1999, Bartlett, 2002). Few studies have looked at patients' perceptions of risk of transmission after commencing ART, and the impact that has on their use of condoms and number of sexual partners (Sarna, Luchters, Kaai *et al.*, 2005, Moatti, Prudhomme, Traore *et al.*, 2003, Bunnell,

Ekwaru, Solberg *et al.*, 2006, Stolte, Dukers, de Wit, Fennema & Coutinho, 2002, Perez, Rodes & Casabona, 2002). Most of these studies have also taken place in developed countries.

It is difficult to determine how great is the risk of HIV transmission amongst people on ART in the absence of condom use. No clinical studies have been conducted to determine the likelihood of transmission of HIV through sexual intercourse in relation to patients' adherence to ART. However, it is clear that the continuous use of condoms after commencement of ART is important, as drug adherence is likely to be less than perfect and the HIV will then not be totally suppressed in the patients' blood.

Condom use in the general sub-Saharan population is low (see: Lagarde, Carael, Glynn *et al.*, 2001, Foss, Watts, Vickerman & Sleaf, 2003). In South Africa one third of females aged 15 to 49 reported using a condom during last sexual intercourse (South African Department of Health, 2004). Imperfect adherence and low rates of condom use increases the likelihood of new infections, re-infections and drug resistance. In patients where poor adherence and inconsistent use of condoms are combined drug resistant strains could spread. With wider treatment access this might inadvertently weaken prevention efforts. It is therefore important to investigate sexual behaviour and perceptions, attitudes and knowledge related to ART and condom use amongst patients that have commenced ART in South Africa.

1.6 Objectives

Due to the limited amount of information collected to date on the relationship between sexual behaviour and ART, this study will be exploratory. The objectives stated below are generated for the study's premise.

The overall objective of the study is:

- To understand existing sexual risk behaviour (both preventive and protective behaviour) among patients receiving ART.

The more specific objectives of the study are:

- To explore ART patients' sexual behaviour after commencement of ART
- To ascertain ART patients' perception of infectiousness.

Both qualitative and quantitative methods are used to achieve these objectives. The data was collected at Ithembalabantu Clinic in Umlazi Township outside Durban, South Africa.

1.7 Organisation of the Research Report

This thesis has been organized into seven chapters. The **first chapter** provides background information and rationale for the study, as well as the aims of the research. The **second chapter** is a review of relevant literature related to adherence, condom use and disclosure after VCT and disclosure and condom use after starting ART. It will also discuss some of the determinants of condom use in the general population. The **third chapter** reviews theories of behaviour change and outlines why this study has chosen not to use a specific theoretical framework. **Chapter four** describes the research methodology used. It discusses how the study was conducted and justifies the choice of data collection methods used. **Chapters five and six** outline the results of the qualitative and quantitative data analysis. **Chapter seven** offers a discussion of the findings of the two preceding chapters and a conclusion. The conclusion summarizes the research discussed and provides recommendations for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

On the 19th of November, 2003, the South African government launched the 'Operational Plan for Comprehensive HIV and AIDS care, management and treatment for South Africa', which includes the provision of HAART (Highly Active Antiretroviral Therapy) in the public sector (South African Department of Health, 2003a). The plan states that 1.4 million South Africans should be able to access treatment free of charge before year 2009 (South African Department of Health, 2003a). ART prolongs the life of people infected with HIV, in addition it prevents new infections through lowering the patients' viral load. However, the success of the therapy in treating AIDS and preventing new infections depends on the level of adherence and the use of condoms.

When aiming to provide treatment for more than a million South Africans it is important to map factors determining the success of ART in the country. The level of adherence determines the level of infectiousness, and how long the individual patient will live and be productive. With imperfect adherence, condom use becomes important as a means of preventing the spread of the disease. This study is mainly focusing on condom use after commencement of ART, but since adherence and condom use are so closely linked both factors will be reviewed here.

2.2 Adherence and the Role of Condoms

Research indicates that failure to take antiretroviral medication at the same time every day results in virologic suppression failure and a more rapid development of drug resistance, which then will lead to an increased infectiousness and a more rapid progression into, and of, AIDS (Haubrich *et al.*, 1999, Mannheimer *et al.*, 2002, Bangsberg *et al.*, 2002b). In order to suppress the HIV Ribonucleic Acid (RNA)¹ to undetectable levels (<50 copies/ml) the rates of adherence have to be above 95 percent, but even with these adherence levels some patients display detectable HIV RNA (Stone, 2001, Mannheimer *et al.*, 2002, Weidle *et al.*, 2002).

¹ RNA is found in the nucleus of the cell where it transmits genetic information from DNA and controls certain chemical processes in the cell.

The majority of studies on adherence have been conducted in resource-rich settings. Most of these studies have found average adherence rates of 50 to 80 percent (Bangsberg *et al.*, 2002a, Gordillo *et al.*, 1999). Evidence also suggests that adherence rates decrease over time (Bartlett, 2002). Studies on adherence to ART in resource-poor settings are limited, and the sample sizes in the existing studies are relatively small. Longitudinal studies also have limited timeframes. Most of the findings from studies in sub-Saharan Africa indicate that adherence levels are comparable to, and higher than, findings in resource-rich settings (see: Meilo *et al.*, 2002, Laurent *et al.*, 2002, Weiser *et al.*, 2003, Stout *et al.*, 2003). However, recent studies done in South Africa indicate rates of adherence above 90 percent (Orrell, Badri, Bangsberg & Wood, 2003, Poole, Chesney, Mdani *et al.*, 2002, Dong, Thomas, Mokokape *et al.*, 2004). These rates are higher than the ones found in developed countries.

The risk of developing resistant viruses and transmitting the resistant virus to a sexual partner increases as adherence levels decreases (Mannheimer *et al.*, 2002). Since adherence levels are inadequate, and resistance to HIV has been detected in a substantial number of people with adherence levels both below and above 95 percent (Bangsberg, Moss & Deeks, 2004), condom use will be of crucial importance if the effectiveness of ART in reducing new infections is to be optimal.

The HI-virus mutates in response to ART (Sunter & Whiteside, 2001, Bangsberg *et al.*, 2002b). How fast the virus mutates depends, as mentioned, on the level of adherence. Therefore, over time, resistance develops to certain antiretroviral combinations (Mannheimer *et al.*, 2002). When one is not adhering adequately to ART, and not using condoms, the drug-resistant HIV can be transmitted to sexual partners, resulting in drug resistance in both partner/s and patient (Kozal, Amico, Chiarella *et al.*, 2004).

The prevalence of ART-resistant HIV in newly acquired infections in North America and Europe is estimated to range from 8 to 26 percent (Little, Holte, Route *et al.*, 2002, Wainberg & Friedland, 1998, Richman, Morton, Wrin *et al.*, 2004, Grant, Hecht, Warmerdam *et al.*, 2002, Boden, Hurley, Zhang *et al.*, 1999, Weinstock, Zaidi, Heneine *et al.*, 2004, Wensing, van der Vijven, Asjo *et al.*, 2003). In a study by Kozal *et al.* (2004) 15 out of 333 patients on ART were found to both have ART resistance and engage in high risk sexual behaviour. These 15 patients exposed 28 partners of a negative or unknown HIV-status to HIV infection.

This indicates that ART resistant viruses spread. However, as Nattrass (2004) argues one cannot draw a straight link between risky sexual behaviour by people on ART and increased risk of HIV transmission, since ART patients have lower viral loads, and hence are less infectious. She argues “as greater risk behaviour and lower infectivity work in opposite directions, the net impact on transmission risk is unclear” (Nattrass, 2004:135). According to this argument the timing of behaviour change in relation to when ART becomes successful in suppressing viral load will be crucial, as the risk of infection is higher before the viral load becomes undetectable. Despite the lack of knowledge around net transmission rates, the studies above indicate that people who are on ART do transmit resistant strains of the virus to others. Despite this, there are only a few surveys in the developing world that aim to map out and understand the dynamics of high risk sexual behaviour after commencement of ART.

2.3 What Factors Influence Adherence?

Adherence is crucial to the success of ART. Different factors are likely to influence people’s adherence. Some factors are more likely to produce poor adherence, others are likely to produce sub-optimal adherence.

2.3.1 Poor Adherence

There is a strong correlation between poor adherence and other risk factors such as active drug- and alcohol use (Dybul, Fauci, Bartlett *et al.*, 2002). People suffering from depression are also more likely to adhere poorly to ART than those who do not (Dybul *et al.*, 2002, Gordillo *et al.*, 1999). People with depression and/or active drug use are also more likely to have a weak social network, which again can have an impact on the strength of the support they receive from family and friends. A patient’s social support network often reminds them to take their drugs, helps collect their drugs from the clinic, and supports patients when they feel stigmatised. Research indicates that those who have some degree of social support and social stability, such as a permanent place to live, are less likely to have problems with adherence (Altice, Mostashari & Friedland, 2001, Bouhnik, Chesney, Moreau *et al.*, 2001). People who have strong self-efficacy are also more likely to adhere to their treatment (Chesney, 2000, Gifford, Bormann, Shively *et al.*, 2000). These people believe that they will be able to take their treatment on time, every day, and that no one else can hinder them from doing so.

Correlations have also been found between high risk behaviours such as active drug- and alcohol use, non-use of condoms and poor adherence to medications (Hecht, Grant & Petropoulos, 1998). It is therefore important to identify people with other high risk behaviours as they are more likely to transmit resistant HIV-virus to their partners (Hecht, Grand Petropoulos *et al.*, 1998)

It has been argued that people living in Africa are less likely to adhere to ART than HIV-positive people in the developed world (Steven, Kaye & Corrah, 2004). The issues of not being able to get to the clinic to pick up medication, and not being able to buy food has been raised in this regard. However, most studies do not find an association between low educational status, limited resources and *poor* adherence (Orrell *et al.*, 2002, Poole *et al.*, 2002).

2.3.2 Suboptimal Adherence

Predictors of *suboptimal* adherence on the other hand are partly associated with socioeconomic factors. Lack of emotional and practical support, having limited health literacy and living in unstable and marginal housing are factors found to impact negatively on adherence rates (Friedland & Williams, 1999, Kalichman, Ramachandran & Catz, 1999). A study done in Botswana, a country that made ART available in the public sector in 2001, indicated that financial constraints, hunger, inadequate transportation, stigma and reliance on traditional health beliefs were major barriers to adherence (Weiser, Wolf, Kebaatswe *et al.*, 2002). Many of the patients in the study indicated that their limited resources made it difficult for them to pay for transport to the clinic, which in turn kept them from seeing the doctor and picking up their medication (Weiser *et al.*, 2002).

The majority of studies fail to link general rates of adherence with demographic characteristics such as age, gender and race (Stone, 2001).

2.3.3 Adherence Training

Randomized clinical trials indicate that adherence training can, possibly, play a significant role in improving adherence to ART (Goujard, Bernard, Sohler *et al.*, 2003, Tuldra, Fumaz, Ferrer & Bayes, 2000). A comprehensive educational programme that increases patients'

readiness to commence ART, and commitment to taking the drugs correctly, has been shown to improve adherence rates by 50 to 56 percent (Goujard *et al.*, 2003). Tuldra *et al.* (2000) found that a group that received individual counselling by a psychologist had adherence rates of 94 percent, whilst among others who received group support the adherence rates were 69 percent. Training has the potential to increase patients' self-efficacy, and as mentioned above several studies have indicated that self-efficacy plays an important role in encouraging adherence.

2.4 Condom Use

The use of latex condoms, if used consistently and correctly, is considered to be an effective barrier against the risk of HIV infection (Cates, 2001). According to a survey conducted by the National Institute of Health in the US, breakage and slippage occurs in an estimated 1.6 to 3.6 percent of coital acts (Cates, 2001). However, the condom use rates in the South African population are low and the barriers to condom use are several. Males and females who are aware that they are living with HIV and who are taking ART are likely to face many of the same condom-negotiation challenges as other people who do not know their HIV status. It is therefore important to look at general barriers to condom use in the South African society.

One third of the females aged 15 to 49 used a condom during last sexual intercourse (South African Department of Health, 2004). However, condom use rates among females currently in a union are even lower. Out of these females 15.4 percent used a condom the last time they had intercourse (South African Department of Health, 2004). Among females aged 15 to 19 the percentages are higher. Out of all females 48.1 percent were using a condom during last intercourse. Data collected in KwaZulu-Natal in year 1999 and 2000 indicates that only 4.9 percent of cohabiting/married females, and 1.9 percent of the males, used condoms consistently (Maharaj & Cleland, 2004). The HSRC/Nelson Mandela Household survey found substantially higher condom use rates at last sexual intercourse (Shisana *et al.* 2005). Among single 15 to 24 year old respondents, 69 percent used condoms during last sexual intercourse. Almost 52.4 percent of those aged 25 to 49 did the same. In addition, 25 percent of married or cohabiting 15 to 24 year olds used condoms whilst 21 percent of cohabiting or married 25 to 49 year olds used this form of protection. Females were significantly less likely to use condoms than males (Shisana *et al.*, 2005).

2.4.1 Barriers to Condom Use

Condom use requires the cooperation of both partners, while female-controlled methods that do not protect against STDs and HIV/AIDS can be used without the consent of the male partner. The use of condoms therefore poses several different challenges to those who want to use them. Studies have shown that there are numerous barriers to condom use in sub-Saharan Africa (Caldwell, 2000, Biddlecom & Fapohunda, 1998, Jewkes, 2002, Blanc, 2001). The most salient ones will be addressed in the following sections.

2.4.1.1 Gender Roles and Multiple Sexual Partners

Attitudes and perceptions towards sexual intercourse are a part of each country's culture. In sub-Saharan Africa this is reflected in specific gender roles and unequal gender relations. Patriarchal norms and the economic dominance of males influence the status and role of females, and keep them from assuming responsibility for their own sexual health. In such societies it becomes difficult for females to negotiate condom use with their male partners.

Condom use requires the cooperation of both partners, while other forms of contraceptives can be used by females without the knowledge of the male. Such use is therefore often covert and not discussed with the male (Rutenberg, Biddlecom, Kaona *et al.*, 2000). Males, on the other hand, have previously not been the ones using contraceptives, hence it does not come naturally to them to take responsibility for family planning (Rutenberg *et al.*, 2000). This might make it even more difficult for females to negotiate condom use with their partners.

Transactional relationships are very prominent in KwaZulu-Natal and the rest of South Africa (Adler, 1998, Leclerc-Madlala, 2002). In such relationships females have sex with males in exchange for financial support. Females in such situations will find it difficult to negotiate condom use because of the economically-dependent nature of their sexual relationships. The fear of losing access to the resources the males provides might outweigh the fear of contracting HIV/AIDS. As one 23 year-old male in St. Wendolins explained "A slim little Nokia will do the job for a while, but to keep the females flowing you need a nice car" (Leclerc-Madlala, 2002:12).

The commonality of transactional relationships is combined with a widespread acceptance of males having multiple sexual partners (Carael, Cleland, Denheffe *et al.*, 1995, Harrison, Lurie & Wilkinson, 1997, Carael, Cleland & Ingham, 1994). The tradition of polygamy has facilitated this cultural acceptance. This was exemplified in a case study conducted in KwaZulu-Natal. The male participants said they felt all their partners would understand if they had more than one sexual partner (Harrison *et al.*, 1997). This cultural acceptance is also closely linked to perceptions around the male identity. In many communities manliness is associated 'with the ability to attract and maintain multiple sexual partners' (Leclerc-Madlala, 2002:31-32). These views facilitate and precipitate multiple partnerships in the region. To many females this might signal that their partner is less committed to them and hence find it difficult to negotiate condom use, because he might break off the relationship.

The associations of condoms with promiscuity make behaviour change difficult (Preston-Whyte & Zondi, 1999). Females are often met with accusations of infidelity or the perception that they have many sexual partners if they suggest using a condom with their partner (Varga, 2000). African females also feel social pressure to prove their fertility, as their worth as females are derived from their ability to produce children (Tillotson & Maharaj, 2001). These factors, amongst others, make behaviour change difficult. Having said this, it is important to recognize that some changes in attitude are evident. Zulu-speaking adolescent males indicated in focus group discussions that they believed *isoka* (the practice of multiple sexual partnerships) was "risky" and "stupid" (Tillotson & Maharaj, 2001:93). In addition, recent studies have shown an increase in condom use among young people in South Africa (RHRU, 2003, Shisana & Simbayi, 2002). The evidence is few and far between, but they clearly illustrate that sexual behaviour is dynamic and changing.

2.4.1.2 Intimacy and Trusting the Partner

Negotiating condom use is difficult since stigma is frequently attached to this method of protection. Condoms are often associated with casual sex and multiple partners (Maharaj, 2001, Maharaj & Cleland, 2004, Varga, 2000). Many females are therefore scared of suggesting condom use, since their partner may interpret it as a sign that they are sleeping around or having other sexual partners. A male participant in a study in KwaZulu-Natal illustrates this: "If my regular partner gives me a condom, I cannot accept it. This means she

is a prostitute” (Maharaj & Cleland, 2004:120). Furthermore, the suggestion of using condoms can imply lack of commitment and emotional distance (Agha *et al.*, 2002).

There are also other negative associations to condom use that are more closely related to the type of relationship. A survey conducted in eight sub-Saharan African countries found that trust in the relationship was a major reason for not using condoms (Agha *et al.*, 2002). Other studies have found that the type of relationship impacts on the use of condoms (Maharaj & Cleland, 2004, Macaluso, Demand, Artz & Hook, 2000). These studies found that consistent use of condoms is lower in regular relationships and among married/cohabiting couples. According to the study by Agha *et al.* (2002), reduction of pleasure or dislike of condoms was only the second most important reason for not using them. The study done by Maharaj and Cleland (2004) mirror this finding. In the Population Services International’s survey partner objection was given as the third most important reason for not using condoms (Agha *et al.*, 2002).

2.5 Condom Use and Disclosure after VCT

No causal link has been established, but studies have found that VCT increases the likelihood of condom use (The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000). VCT has been found to facilitate communication about condom use amongst couples in the United States (Allen, Seruflira, Gruber *et al.*, 1993). However, most studies do not look at condom use in relation to VCT, but in relation to disclosure to a partner, assuming that disclosure enables the couples to make informed reproductive health choices.

The results are not so homogenous in developed countries when looking at decreased risk behaviour amongst couples where one of the partners has disclosed their HIV status (Allen *et al.*, 1993, Crepaz & Marks, 2003, Allen, Tice, Van De Perre *et al.*, 1992, Deschamps, Pape, Hafner & Johnson, 1996, Geary, King, Forsberg *et al.*, 1996). One can therefore not automatically draw a correlation between disclosure and condom use. However, due to the large number of studies in the developing world suggesting a positive association between disclosure and decrease in sexual risk behaviour, this study will review the possible connection.

2.5.1 Rates of Disclosure in Sub-Saharan Africa

Research conducted in sub-Saharan Africa on disclosure to current/last sexual partner displays varying results (Antelman, Fawzi, Kaaya *et al.*, 2001). Among the 14 studies identified in an extensive literature search by Medley, Garcia-Moreno, McGill and Maman (2004) the rates of disclosure to sexual partner ranged from 16.7 percent to 86 percent. Few of these studies did however assess how long it took the participants to disclose. The studies that provided a timeframe for disclosure indicated that disclosure rates increased substantially with time. In Dar Es Salaam, Tanzania, a study indicated that 22 percent of HIV-positive pregnant females disclosed to their partners within the first two months of getting to know their status. However, in four years only 40 percent of them had disclosed to their partners (Antelman *et al.*, 2001). In Soweto, South Africa, 56 percent of the participants who had known their status for six months had disclosed to their sexual partners (Sempe, Mtshizana, Ramashiga *et al.*, 2004). One can therefore conclude that time influences disclosure rates in sub-Saharan Africa.

2.5.2 Determinants of Disclosure

Unequal gender relationships in sub-Saharan Africa create numerous barriers for women disclosing their status. For females the barriers include fear of partner's reaction and possible violence. Poor communication patterns between partners, and a partner's negative attitude towards HIV-testing could exacerbate this fear (Maman, Mbwapbo, Hogan *et al.*, 2001). In developing countries the female's primary fear is abandonment and rejection (Maman *et al.*, 2001, Medley *et al.*, 2004). The same was found in a review of studies done in United States on disclosure and sexual risk behaviour (Simoni & Pantalone, 2004). In sub-Saharan Africa many females are not working, and therefore rely on their partners' for support. The fear of abandonment and rejection are therefore closely linked to the fear of loss of economic support (Medley *et al.*, 2004). Females are also afraid of being accused of infidelity.

Despite these fears, the majority of the studies conducted in sub-Saharan Africa examined by Medley *et al.* (2004) reported positive outcomes related to disclosure. In three of the studies, which were conducted in South Africa, Burkina Faso and Kenya, the participants received kindness and understanding. Another important finding was that disclosure was not associated with the dissolution of marriages in any of the 14 studies examined (Medley *et al.*, 2004).

Females in these studies did in fact perceive the risk of a negative outcome to be more likely than it was. However, it could be that females who believe in the safety and strength of their relationship are the ones that choose to disclose (Medley *et al.*, 2004).

In the sub-Saharan region of Africa, unequal power relations between males and females are evident in relation to disclosure. Males, unlike females, have reported that they do not find the process of disclosure particularly troublesome (Maman *et al.*, 2001). In a qualitative study conducted in Tanzania, 17 males, 15 females and 15 couples, who came to the VCT clinic were asked how they felt about disclosing their status to their partners. Most of the males had made the decision to come for testing on their own, without informing their partner. One male said "I decided to test. But even if I tell her she would not object. Am I not the father? I can comfortably go." (Maman *et al.*, 2004:598). This was not the case for the females that were interviewed. The majority was hesitant, and was feeling scared and guilty for going for a test without their partner's knowledge.

2.5.3 Rates of Condom Use After VCT in Developed Countries

Serovich and Mosack (2003) have warned against automatically drawing correlations between disclosure and decreased sexual risk behaviour. They argued that some people will knowingly place themselves at risk of HIV infection, as a way of demonstrating how committed they are to the relationship. This cautioning is appropriate because the results from studies that measure sexual behaviour change after disclosure of HIV-status are conflicting.

Studies done in developed countries amongst couples where the primary partners are either HIV-negative or do not know their status have come up with different results. When examining the result of several of these studies it is hard to detect a definite trend. In a review of research conducted in the United States Simoni & Pantalone (2004) conclude that in 7 out of 15 studies there were no correlation between condom use and disclosure to primary partner. However, these reviewed studies indicate that when disclosure has taken place, and both partners are HIV-positive, the partners are less likely to use a condom (see: Marks, Richardson, Maldonado *et al.*, 1991, Sheon & Crosby, 2004). These couples felt that they are less of a threat to their partners' health since their status is the same (Sheon & Crosby, 2004).

The number of people using condoms and disclosing to their partners differs greatly from study to study, and between different groups. In the United States, Marks and Crepas (2001) found that 25 percent of the male participants with a partner that was HIV-negative or had an unknown status were more likely to have unprotected anal or vaginal intercourse with their partner. The study also found that unsafe sex was associated with substance abuse, having a partner with unknown status, casual relationships, and a more recent HIV diagnosis. Among HIV-positive girls in 13 cities in the United States, 53 percent had sexual intercourse without protection in the three months leading up to the study. The non-use of condoms was related to greater age difference between the partners, the partner being HIV-positive, and the length of the partnership (Sturdevant, Belzer, Weissman *et al.*, 2001). Women were more likely to disclose their status to their partner if they believed that their partners were HIV-positive.

The studies reviewed in Simoni and Pantalone (2004) found disclosure rates of 50 to 90 percent. However, studies that specifically looked at disclosure rates in relation to knowledge of partner's status found substantially lower disclosure rates to partners that did not know their status. This indicates that the knowledge of partner's status, either positive or negative, encourages disclosure.

2.5.4 Rates of Condom Use After VCT in Developing Countries

Studies on condom use after VCT in developing countries differ from the findings in developed countries. Information collected in this part of the world is also slightly less detailed. There are, for example, a limited number of studies that provide information on sexual behaviour and disclosure among concordant couples. The studies mentioned below look at couples where one partner is HIV-negative and the other does not know his or her status.

Most studies conducted illustrate a close relationship between disclosure and sexual behaviour change. Research done among couples with discordant HIV-status in Zaire, Kenya, Tanzania, Trinidad, and Zambia indicates decreased risk behaviour in people who go for VCT and disclose to their partners (Kamenga, Ruyder, Jingu *et al.*, 1991, Allen *et al.*, 2003, The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000). In a cross-country randomised controlled trial measuring condom use amongst people receiving VCT in Trinidad, Kenya and Tanzania, the males reported a 35 percent decline in unprotected

intercourse, while females reported a 39 percent decline (The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000). The same study also found that the number of non-primary partners was reduced. In addition, the number of non-primary partners with whom participants had unprotected sexual intercourse decreased (The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000).

However, quantitative studies have argued that the effect of VCT on decreasing risky sexual behaviour disappears with time (Temmerman, Moses, Kiragu *et al.*, 1990, Krabbendam, Kuijper, Wolffers, Drew *et al.*, 1998). In Kampala, Uganda, people's sexual risk behaviour decreased straight after VCT. However, the same people reverted one year later to the same sexual behaviour as was prevalent in the general population (Muller, Barugahare, Schwartlender *et al.*, 1992). A study done in the Gambia had similar findings (Wilkins, Alonso, Baldeh *et al.*, 1989).

Only a limited number of qualitative studies have been conducted on this issue. Meursing's longitudinal qualitative study in South Africa (1999) concluded that HIV-positive individuals (who are not on ART) did not succeed in maintaining long-term consistent condom-use. The study argues that HIV-positive people encounter the same barriers to condom use as other people who are not HIV-positive, such as gender inequality, denial, and the desire for children. In addition, stigma and prejudice make negotiating safer sex particularly difficult (Meursing, 1999).

2.6 Gender Roles and VCT

As discussed previously in this chapter, gender inequalities in the sub-Saharan African region have serious implications for the negotiation and use of condoms. The research done among females in developed countries on condom use and disclosure might therefore not be very applicable in this setting. There are much fewer males in sub-Saharan Africa that attend VCT services than females (Beck, 2004). In the developing world most VCT services routinely target females at family planning and antenatal facilities. There are few facilities that target males, and even fewer that cater for couple counselling.

Little research has therefore been done on the sexual behaviour of males after undergoing VCT in developing countries. The few studies that have been conducted suggest that males

who know their status are more likely to use condoms with their partner/s (Allen *et al.*, 1993, Allen *et al.*, 2003). Some studies substantiate this by indicating that it is harder for a female partner that is HIV-negative to sustain condom use than for a male partner with the same status, because the man is more dominant in most sub-Saharan African relationships (Allen *et al.*, 1992, Kamenga *et al.*, 1991). The most effective way of changing a couple's sexual behaviour seems to be targeting both sexual partners as opposed to only one (Solomon, Rooyen, Griesel *et al.*, 2004). Couples' testing has also got the potential to facilitate disclosure of HIV-status. This substantiates the argument that disclosure plays a major role in promoting condom use amongst HIV-positive people in developing countries.

2.7 ART and Risky Sexual Behaviour

Despite the rapid scale up of ART in many developing countries, and the financial resources made available by the United Nations and the WHO only a limited number of studies have looked at sexual behaviour among ART patients in developing countries. The same is the case for developed countries where ART has been readily available for a much longer period of time. Studies from both developed and developing countries will therefore be reviewed.

2.7.1 ART and Sexual Behaviour in Developed Countries

A meta-analytic review comparing 16 studies covering high risk sexual behaviour amongst people on ART and people who are HIV-positive but not on ART has been conducted. This review of studies from industrialized countries indicates that the prevalence of unprotected sex was not significantly higher among those receiving ART than those who were not receiving treatment (Crepaz, Hart & Marks, 2004). Amongst those receiving ART between 9 and 56 percent engaged in high risk behaviour. Amongst those not receiving ART between 11 and 77 percent engaged in high risk behaviour. Heterosexual males were overrepresented in the review.

As ART patients feel increasingly healthy, and their hopes for the future increase, the desire to have children might arise. This is especially relevant in sub-Saharan Africa where fertility and children play an important role both culturally, economically and socially (Tillitson & Maharaj, 2001, Preston-Whyte & Zondi, 1999). The desire to have children may act as a barrier to condom-use among the ART patients. Little research on the desire to have children

among patients on ART has been conducted in the developing world. There is also limited research done on fertility desires among HIV-positive people. A study of patients in Switzerland found that 45 percent of the HIV-positive females and 38 percent of the HIV-positive males still wanted to have children (Panozzo, Battegay, Friedl *et al.*, 2003). However, the article does not mention whether these males or females were in discordant relationships.

2.7.2 ART and Sexual Behaviour in Sub-Saharan Africa

A limited number of studies have been, and are in 2006 being conducted, within the area of ART and high risk sexual behaviour in sub-Saharan Africa. In a study in rural Uganda, 926 HIV-positive adults were followed in a home-based ART program (Bunnell, Ekwaru, Solberg *et al.*, 2006). Partner-based analysis indicates an increase in consistent condom use with negative partners or partners of unknown status amongst the people enrolled in the ART program. At baseline, 59 percent used condoms consistently. When followed up after having taken ART for six months, 82 percent used them consistently. Overall, there was a 70 percent reduction in the number of unprotected sexual acts with a partner of known negative or unknown sero-status. Similar findings were made in Kampala, Uganda (Bateganya, Colfax, Shafer *et al.*, 2005). Patients undergoing ART were 2.82 times more likely to use condoms consistently than those who were not on treatment. The same study also found that ART-experienced patients were 1.57 times more likely to disclose to their partner than those who were ART naïve.

The study in rural Uganda also estimated the risk of HIV transmission to cohabiting and sexually active HIV-negative partners. At baseline, the risk of transmission was 43.5 per 1000 person years while at follow up it had decreased to 0.8 per 1000 person years. This represents a 98 percent decrease in the risk of transmission six months after introducing ART. A year later VCT was repeated for the HIV-negative partners. Three people had then sero-converted, two of them due to inconsistent condom use with their partner on ART, and one due to unprotected sex with a second HIV-positive partner (Bunnell *et al.*, 2006). The respondents in this study also report an increase in sexual desire after having started ART. At the baseline only one percent of the participants reported increased sexual desire the last three months, while at follow up six months later 19 percent reported increased sexual desire (Bunnell *et al.*, 2006).

The Population Council in Kenya has also conducted research on sexual behaviour amongst people on ART. They compared the behaviour of 179 patients that had been on ART for at least six months with 143 HIV-positive patients who had received treatment for opportunistic infections (OI's) for at least five months (Sarna *et al.*, 2005). Less than half of the respondents reported not having had sexual intercourse in the last six months. Respondents on ART were significantly more likely to use condoms with their regular partner than the group who were not on ART. In the group on ART, 93 percent used condoms at last sex, and 53 percent used condoms consistently. Respondents on ART were also significantly more likely to report sex with a regular partner (Sarna *et al.*, 2005). Several factors were found to be significantly associated with unprotected sex: partner's HIV status, disclosure of own HIV status to partner, and number of partners. The calculated odds ratios indicate patients receiving treatment for OI's were four times more likely to report unprotected sex with a regular partner than patients on ART (Sarna *et al.*, 2005). The study therefore concludes that no evidence suggest that sexual risk behaviour might increase with the initiation of ART in the study context. The multivariate analysis found marital status to be a significant predictor of unprotected sexual intercourse with regular partners, whilst gender was not. A study conducted in the Ivory coast using the case control method also found that the patients on ART had a lower risk behaviour than those who were not on ART (Moatti *et al.*, 2001).

One study conducted in Rwanda looked at fertility desires among HIV-positive females of childbearing ages. The females in this study who had fewer than four children were more likely to become pregnant than those who had four or more children (Allen *et al.*, 1993). This could indicate that the desire to have children is an obstacle to condom use in developing countries. However, more research needs to be conducted to establish this.

2.7.3 ART and Perception of Infectiousness

The previous section examined studies that look at ART patients' sexual behaviour, both in developed and developing countries. This section will look at the potential impact perception of own infectiousness may have on the sexual behaviour of patients on ART. As the literature available is limited the examination will focus on research from developed countries. Little research focussing on this topic has been conducted in developing countries.

When commencing ART, a patient's viral load decreases, and, therefore, people taking the drugs with effective levels of adherence will become less infectious. The risk of transmitting the virus to a partner therefore decreases. Due to the decrease in infectiousness and then of the risk of transmitting the virus, it has been argued that people on ART will find it less important to use condoms (Marseille *et al.*, 2002).

Most of the research that looks at perception of own infectiousness among people who are on ART have been done among homosexual males frequenting bars, STD clinics and nightclubs in developed countries. Stolte *et al.* (2002) examined the relationship between treatment optimism and high-risk sexual behaviour in a cohort of 146 gay males in Amsterdam. The participants were interviewed every six months for two and a half years. The optimistic males were 1.6 times more likely to switch to high risk behaviour than other males. However, the attributed risk indicated that only 8 percent of the change to high risk behaviour could be explained by HIV treatment optimism (Elford, 2004). Another study conducted among homosexuals in Barcelona found that participants agreeing to the statement "HIV positive persons taking ARV therapy are unlikely to transmit HIV" were 1.9 times more likely to have unprotected anal intercourse with a casual partner (Perez *et al.*, 2002). These findings indicate that the contribution of treatment optimism to the overall increase in high risk sexual behaviour remains modest amongst homosexual males in developed countries. Studies also indicate that few homosexuals see treatment as a reason to relax measures they take during sex to prevent HIV transmission (see: Vanable, Ostrow, McKirman *et al.*, 2000, Van de Ven, Kippax, Knox *et al.*, 1999, Elford, Bolding, Maguire & Sherr, 2000, Cox, Beauchemin, Allard *et al.*, 2004)

Nattrass (2004) regards the impact of the availability of life-prolonging treatment on attitudes and risk behaviour in the broader population to be an issue of greater importance. The availability of ART might contribute to relaxation in safety measures, and people seeing it as less important to use condoms now that medication can prolong their lives. The International Collaboration on HIV Optimism (2003) did a cross-sectional study among males who have sex with males (MSM) in five cities where ART had been widely available for four years. The males interviewed were however not on ART themselves. The participants were asked to respond to statements such as "If every HIV-positive person took the new treatments, the AIDS pandemic would be over" and "HIV/AIDS is a less serious threat than it used to be because of new treatments". Most males in the five cities disagreed or disagreed strongly with

these and similar statements, meaning that most of the males were far from being optimistic, but were rather realistic about the benefits of the drugs (The International Collaboration on HIV Optimism, 2003).

Having reviewed some of the studies done on ART optimism and perception of own infectiousness, and the possible relationship of these perceptions to sexual behaviour among homosexual males in developed settings, one has to question whether the information gathered are transferable to a resource poor country. In a poor country the socio-demographic variables differs, and most people undergoing treatment are heterosexual males and females (Caldwell, 2000). These differences and inequalities in resources available will influence how people in developed countries see and understand their own infectiousness. It is also likely that the lack of female empowerment in the developing countries will decrease females' ability to limit high risk behaviour.

2.8 Summary

Several factors influence why people engage in high risk sexual behaviour. ART patients face many of the same challenges as people in the general population when wanting to use condoms, such as gender inequalities, fear of losing their partner and fear of partner's violence. However, other factors such as a partner's HIV status and disclosure of HIV status to a partner are also found to be important.

It has been argued that HIV-positive people will relax their preventive measures when starting ART, due to a decrease in infectiousness. However, the limited existing literature indicates that people on ART do not necessary look upon themselves as less infectious, and do not, therefore, relax their protective measures. In fact, the few studies done in developed countries suggest a decrease in sexual risk behaviour among people on ART compared to people who are not. This is substantiated by the findings in studies conducted in developing countries. They found that respondents on ART were more likely to use a condom consistently than people who were HIV-positive and not on ART.

Having said this, a substantial number of people on ART seem to engage in unprotected sexual intercourse. This is cause for major concern as it will contribute to the spread of drug-resistant HIV. In developing countries, little quantitative or qualitative research has been

conducted on people on ART and their attitudes, perceptions and practices around sexual behaviour. This study is an attempt to address this gap.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

In order to place the study into a broader theoretical framework the following sections will review and critique different behavioural models. This chapter reviews three models that focus on individual factors that may lead to behaviour change. One model describing interpersonal factors that might lead to change will also be reviewed. The health belief model, the theory of planned behaviour and the stages of change are individual models. On the other hand, the theory of social learning (also known as the social cognitive theory) takes environmental influences into account to a larger extent. These theories are not specific to a particular behaviour, and can be applied to a larger number of topics and individuals (Fisher & Fisher, 2000).

The models that have been developed to assess AIDS risk reduction behaviour, such as the AIDS risk reduction model, will not be considered here. These models are fairly comprehensive, and are based on a range of other models. However, they assume that the individual does not know that s/he is HIV-positive (Fisher & Fisher, 2000). Arguably, they are therefore not applicable to this study.

3.2 Health Related Conceptual Frameworks

3.2.1 The Health Belief Model

The health belief model (HBM) has been described as the parent of the health behaviour change models (Fisher & Fisher, 2000). It has been applied extensively to explain and predict a variety of health behaviours (Fisher & Fisher, 2000). The HBM asserts that people will engage in preventive behaviour if they feel susceptible to a health condition, and if they believe that this condition is severe. The likelihood of acting to decrease susceptibility depends on the perceived difficulties and benefits that are linked to change in the behaviour (Fisher & Fisher, 2000). Other variables such as the person's knowledge about the disease, prior contact with the disease, age, race, and sex will also influence the decision to change or not change a specific behaviour.

The weakness of this model is that it is limited to individual health beliefs. It does not take into account cultural, economic and environmental factors that can influence health behaviours. The influence of social norms and peers are also not counted for. In the 1980s, cues to action and the concept of self-efficacy were added as components to the model (Fisher & Fisher, 2000). This component of the model incorporates advice from others and the mass media (Fisher & Fisher, 2000). The concept of self-efficacy explains “the perceived likelihood that one can personally perform the preventive behaviour successfully and experience positive expected outcomes” (Fisher & Fisher, 2000:6). This component is very important since using condoms is not something you can do personally, but in cooperation with your partner.

Despite these additions, the HBM remains a model that largely analyzes obstacles to behaviour change at an individual level, where the perceived benefits of the change are weighed up against the perceived barriers to taking action.

3.2.2 The Theory of Planned Behaviour

The theory of planned behaviour (TPB) is also used to predict and explain health behaviours. It assumes that people are rational and logical. TPB assumes that the most important determinant of a person’s behaviour is his/her intentions. These intentions are made up of attitudes towards the behaviour, normative beliefs and a person’s perceived ability to control the proposed change in behaviour (Fischer & Fischer, 2000). The TPB also recognizes that there can be discrepancies between a person’s perceived ability to control his/her own behaviour, and their actual ability to do so.

The TPB, like the health belief model, is criticised for not incorporating specific constraints around cultural, environmental and economic factors. The TPB assumes that individuals control their own behaviours.

3.2.3 Stages of Change model (Trans-theoretical model)

The stages of change model assumes that change is best viewed as a process and as a continuous cycle (Fisher & Fisher, 2000). The first stage of the model is *pre-contemplation*. At this stage the individual has no intention of changing their behaviour, and many are unaware of their problems. The second stage is *contemplation*. In this stage people are aware that the problem exists, but are yet not committed to take action. In the *preparation* stage the individual intends to take action in the next month or/and have unsuccessfully taken action in the past year (Nutbeam & Harris, 2000). In the fourth stage, the individual has taken *action*. They have modified their behaviour or/and their environment in order to overcome their problems. Six months after the action have taken place the person enters the *maintenance* stage (Fisher & Fisher, 2000). In the fifth stage the individual works on preventing a relapse, and they consolidate the gains attained during the action stage.

The stages of change can be looked upon as a cycle, where the individual is constantly contemplating and re-evaluating the changes that have taken place. After the maintenance phase the person can go into relapse or after a longer period of time they can be considered to have terminated their previous risk-behaviour (Nutbeam & Harris, 2000).

The stages of change considers the process of behaviour change, but does not try to explain what factors influence behaviour change or relapse into an old behaviour. The model should therefore be combined with other behavioural models that focus on these factors.

3.2.4 The Social Learning Theory/Social Cognitive Theory

The social learning theory focuses on the learning that occurs within a social context. According to Albert Bandura, the founder of the theory, learning is a three-way interaction between the environment, the individual's internal events, and the individual's behaviour (Gredler, 2001). This theory was for the first time proposed in the 1960s. It focused on observation, imitation and modelling as major components of the learning process. However, it proposed that learning may or may not lead to behaviour change (Gredler, 2001).

In 1986, Bandura modified the social learning theory. The new social cognitive theory emphasized the role of societal morals in reinforcing and penalizing different types of behaviour change (Bandura, 1991). Both the social learning theory and the social cognitive

theory advocate that the consequences and reactions of others to a particular behaviour will influence whether the behaviour will be repeated. The social learning theory does therefore theorize that humans tend to choose people with similar standard of conduct to enhance compatibility between social and personal values and behaviour (Bandura, 1993).

The social learning theory emphasizes the role of the social environment in relation to behaviour change, and puts less emphasis on how individuals' attitudes and experiences form part of the change.

3.3 Applicability of the Models to this Study

Behavioural theories are supposed to be used to predict and explain the nature of behaviours in a relatively wide variety of circumstances (Van Ryn & Heany, 1992). When examining this definition it becomes apparent that the applicability and transferability to a very specific group of people may be difficult. This is especially true for people who know that they are HIV-positive. HIV-positive people know that not using condoms can put their sexual partners at risk. This knowledge adds a new dimension to the cost and benefit approach that is incorporated in most models. The individual might then not just consider the costs and benefits for her/himself, but also for their partner/s. The social cognitive theory does to a certain extent take this into account. It proposes that societal values, reinforcement and punishment play a role in behaviour change. However, it assumes that if the person does not change the behaviour some sort of negative reaction will come out of it, and that will not be beneficial for them.

Condom use and sexual behaviour change does not take place in a vacuum. The individual might recognize the importance of using condoms, but sometimes the partner may refuse to use this form of protection. Therefore, predicting behaviour change based on one individual's intentions is flawed. The societal stigma around HIV and AIDS might also hinder the person from disclosing his/her status to their sexual partners, which again will have impact on the partner's willingness to use condoms. The social cognitive theory's emphasis on the societal context is therefore highly appropriate.

The concept of self-efficacy, which is introduced in the health belief model, theory of planned behaviour and other models, could to a certain extent be applied to this issue. Empirical

research has found that people who believe that their partner/s have a positive attitude to HIV are more likely to disclose and/or negotiate condom use. However, this assumes that HIV-positive people look upon disclosure and condom use as beneficial, and want to change their behaviour. The benefits of condom use and disclosure might not always be evident to the HIV-positive person. Since they already are infected they might not find a reason to protect themselves.

The concept of perceived vulnerability might to a limited extent be applied to this study. How infectious the HIV-positive individual perceives him/herself to be might have an impact on their decision to change their behaviour. If they perceive themselves to be likely to pass on the virus, they might use condoms or abstain to protect their partners, and themselves. It would therefore be useful to look at this aspect in the study.

The stages of change theory emphasizes the process more than the individual predictors of behaviour change. This theory emphasizes that the behaviour change is constantly re-evaluated. With a change in partner, for example, condom use would have to be reassessed by the individual. In order to consistently use condoms there needs to be motivation and a perception of the benefits by, and for, both partners.

3.4 Summary

After having reviewed some of the behaviour models that exist, it is apparent that parts of the reviewed theories are relevant to this study. However, these parts are fragmented, and the models are not sufficiently sophisticated to accurately predict determinants of sexual behaviour change among people who are HIV-positive and on ART. This study will therefore not use a specific existing theory to guide the design, the collection and analysis of data.

CHAPTER 4: METHODOLOGY

4.1 Introduction

The choice of methodology is guided by the objectives of the study as well as the time and resources available to conduct it. The careful selection and justification of the methods chosen is important as it is likely to have a profound impact on the outcome of the research (Yin, 1984). Most of this chapter outlines and justifies the methods used in this study. Four main phases are considered in chronological order: firstly, study design; secondly, study setting; thirdly, methods of data collection and fourthly, sampling and methods of data analysis. As part of the data analysis, issues around the reliability and generalizability of data will be considered. The last section of the methodology will outline the main limitations of the study.

4.2 Study Design

Due to the sensitive nature of the topic under investigation a longitudinal study design would have been ideal. Such a design would have increased the likelihood of the respondents giving truthful answers as the field worker is given time to establish a relationship with the interviewee (Babbie & Mouton, 2001). However, this was not feasible due to time pressure and financial constraints.

Little research had been conducted on ART and sexual behaviour. It was therefore desirable not to operate with hypotheses in this study, but rather first conduct qualitative exploratory research that would provide in-depth information on the subject. Qualitative methods provide information on processes, activities and episodes, rather than statistics (Yin, 1994). From the descriptive information a more specific quantitative questionnaire was developed.

4.3 Study Setting

KwaZulu-Natal is situated on the north Indian Ocean coast line of South Africa. It is densely populated with close to 9.1 million inhabitants. The majority of the population is IsiZulu-speaking Africans. Umlazi Township is situated 15 kilometres outside Durban, the province's main city. Umlazi is a black township, and is with two million inhabitants the second largest

township in South Africa. It consists of both formal and informal settlements. Prince Mshiyeni Memorial Hospital is the only hospital in the area, and it has 22 clinics under its administration.

4.3.1 Study Site

The study was conducted among ART patients at the Ithembalabantu Clinic in Umlazi Township. At the time the research was conducted the clinic had 500 patients on ART (Patient records, Ithembalabantu Clinic, 2005). All the patients attending the clinic were African, with the exception of a few Coloureds. The ages of the patients ranged from 18 to 62, and close to 90 percent of them were unemployed (Personal conversations with nurse at Ithembalabantu Clinic, 2005). The majority of the patients reside in Umlazi. However, a substantial amount of patients come from other townships such as Claremont, Kwa-Mashu and Inanda.

The clinic started treating people living with HIV/AIDS in 2001. The treatment was totally free to the patients, as the drugs, CD4 counts, counselling sessions and staff salaries are sponsored by foreign NGOs.

4.4 Methods of Data Collection

This study uses a combination of qualitative and quantitative methods to explore the objectives of the study. Triangulation is a research technique that is used to examine the same phenomenon from multiple perspectives. Since every method has its weakness, triangulation offers a way to strengthen the study by counterbalancing this weakness with the strength of the other method(s) (Jick, 1983). The triangulation technique therefore increases the reliability and validity of the study.

4.4.1 Semi-Structured Interviews

A qualitative design is structured to look for “what is special and different – what distinguishes the case or group, what characterizes the community and its values” (Seaman, 1987:171). A semi-structured interview based on a semi-structured questionnaire provides the best from both worlds. It can capture in-depth information, but it also allows for the collection

of highly specific information within a narrow area of research (Seaman, 1987). In this study, the research objectives are fairly narrow and the issues under investigation are clear and focused. One could therefore argue that a semi-structured interview would be more appropriate to use than an in-depth interview, which is more open-ended and driven by the information the participant provides (Babbie & Mouton, 2001).

To make sure that the researchers asked the appropriate follow-up questions, several probes were incorporated in the data collection tool. Precise and understandable probes increase the likelihood of getting coherent and compatible information. Informal conversations with the nurses working in the clinic aided the development of relevant probes and topics in the semi-structured interview guide.

However, semi-structured interviews do not allow issues that participants find important to be explored openly. This is a major constraint since the main aim of an exploratory study is to undertake a preliminary investigation prior to a structured study of the phenomenon (De Vos, 1998). Presenting a very narrow focus might prevent the initial study from providing enough general information that a more structured study might need.

In order to increase the internal reliability of the study participants were interviewed by a person of their own sex. All researchers used in this study were isiZulu-speaking and all participants were interviewed in isiZulu. The semi-structured interviews were recorded, then transcribed and simultaneously translated into English by two isiZulu-speaking transcribers.

4.4.2 Survey

Based on the information gathered in the semi-structured interviews, a survey questionnaire was developed. The survey was administered by face-to-face interviews. The strengths of a survey are that it is easy to administer, one can manage to study a large sample of informants without difficulty, the data can be collected over a short period of time, and one can also manage to study a fairly large number of variables (Babbie & Mouton, 2001). By conducting face-to-face interviews one is also less likely to get “don’t know” answers, and it is likely to improve the accuracy of the data (Struwig & Stead, 2001). The interviewer has with this method the opportunity to clear up misunderstandings and rephrase questions to make them easier for the respondent to understand (Babbie, 1999).

With survey questionnaires, as with several other methods, respondents might not answer truthfully because they cannot remember or they wish to present themselves in a socially acceptable manner. Survey questionnaires also makes it easier for the respondent to lie, since the survey only requires short answers and has no follow-up questions. This is especially important to keep in mind in this study, which deals with sensitive issues such as HIV/AIDS and sexual behaviour (Catania, Gibson, Chitwood & Coates, 1990).

There are also biases attached to both qualitative and quantitative methodologies. In the case of a highly structured interview, it is likely the structure will reflect the preconceptions of the compiler. Research has indicated that the way the questions around condom use are phrased has an impact on the answers given by the respondents (DiFranceisco, McAuliffe & Sikkema, 1998, Babbie, 1999). A great deal of time and thought was therefore spent making sure the survey questions were neutral, informal, non-judgemental and as open as possible. After having finalized the English version of the questionnaire it was translated into isiZulu. To make sure that the isiZulu version was accurate, the questionnaire was translated back into English again. Irregularities in the translation were then corrected.

4.5 Sampling

4.5.1 Semi-Structured Interviews

Four pilot interviews were conducted to test the interview guide and to determine the need for further training of two isiZulu-speaking researchers. After further development of the guide and training of the researchers, 20 new semi-structured interviews were conducted. Six of the participants interviewed were male, and 13 were female. There were fewer males than females interviewed, as the males only constituted 30 percent of the patients in the clinic.

The concept of theoretic sampling was applied when choosing patients for semi-structured interviews. Theoretical sampling selects participants on the basis of relevant categories, issues, themes, and concepts that emerge prior to and during data collection (Strauss & Corbin, 1990). The objective of theoretical sampling is to uncover diversity by facilitating the identification of a full range of possibilities that are theoretically relevant to the research

question (Strauss & Corbin, 1990). This study attempted to stretch the diversity of data within a small number of participants through choosing participants with a variety of characteristics. Several dependent variables might influence the sexual behaviour of patients. Therefore, in order to get a good theoretical sample, this study chose participants to achieve diversity in age, time on ART, sexual partners, and disclosure. However, the participants were only chosen if they fulfilled the criteria for inclusion, which were being 18 years of age, and having been on ART for two months or more. The participants were recruited when they came into the clinic to collect their medication.

The gold standard in qualitative research is to saturate all the themes arising from the data collected. If saturation was to be achieved one would have to continue conducting interviews until no new themes came out of the transcripts (Strauss & Corbin, 1990). This concept was, however, not applied in this study as available resources and time constraints would not allow it. The aim of the semi-structured interviews was to discover some basic categories and a few of their properties. This is in line with the aims of an exploratory study (Glaser & Strauss, 1967). The main aim of the exploratory design is to uncover generalizations and develop hypotheses around a little known subject. Findings should later be investigated and tested with more precise and more complex designs (De Vos, 1998).

Deciding not to aim for saturation has got implications for the transferability of the data. Due to the lack of saturation there is a chance that other researchers who were to conduct the same research in Ithembalabantu clinic might discover other categories and themes, and hence emerge with different answers than the ones presented here.

4.5.2 Survey Interviews

In total 15 pilot interviews were conducted to test the rigorousness of the questions in the survey, and to ascertain the need for further training of the researchers. After having altered the survey, 293 interviews were conducted. Only patients that were older than 18 years, had been on ART for more than two months, and having had one or more sexual partners after VCT were included in the study. The respondents were recruited when they came into the clinic to collect their medication. The respondents were chosen on the basis of their willingness to participate in the study. All patients who were willing, fulfilled the criteria for inclusion and agreed to sign a written informed consent form were admitted into the study. No

interview was started before the respondent had understood his/her rights, and signed the written informed consent form. The study was aiming to conduct 300 interviews but due to the limited number of people in the sample population it was difficult to find participants who had been on ART for longer than two months and have had a sexual partner after going for VCT.

4.6 Methods of Analysis

4.6.1 Semi-Structured Interviews

After transcribing and translating the semi-structured interviews, a grounded theory approach was employed to analyse the qualitative data. Glaser and Strauss (1967), the founders of grounded theory, came up with the constant comparative method of data analysis (Maykut & Morehouse, 1994). This method is used to generate a theory within a new area of research (Maykut & Morehouse, 1994). Grounded theory is suitable for studies that have no theoretical propositions stated in the beginning of the project (Maykut & Morehouse, 1994). Few studies have been conducted within the area of ART and sexual behaviour among heterosexuals in developing countries, and little is known about the subject. Grounded theory is therefore suited for this analysis.

Three main steps were followed (Maykut & Morehouse, 1994). First, each line in the transcripts as well as the individual interviews was given a number. This process made it possible to refer to all the different segments in the transcripts. The smaller units of meaning within the data were then identified, which later helped to define larger categories of meaning (Guba & Lincoln, 1985 cited in Maykut and Morehouse, 1994). These units of meaning were often sentences that were responses to certain questions. The meaning was reviewed for recurring concepts and themes. From this, one prominent theme was chosen. The unitised categories were then carefully examined to see which of them fell under this theme. When no more units of meaning could be placed under the first theme, a second theme was chosen. This process repeated itself several times. All in all, 20 main themes emerged, but only five of them were directly related to the objectives stated above. These themes are included in chapter five.

One of the great biases in open-ended interviews is the influence of the analyst's subjectivity in the interpretation-phase (Babbie, 1999). To minimize this bias the process described above were followed rigorously.

4.6.2 Structured Interviews

The data from the survey questionnaires that were administered by face-to-face interviews were data captured and cleaned using SPSS². The same software was used for the data analysis.

The data were re-structured and it was found that 22 respondents out of 293 have not had sexual partners after starting ART. While recognizing that abstinence is a form of sexual behaviour, these people were excluded from the analysis, because the main objective of this study is to look at variables related to condom use. In total 271 respondents were included. The study is open to error because of the small sample size, and hence reduces generalizability.

Frequencies, bivariate analysis, and multiple logistic regressions were run to determine possible relations between variables.

4.7 Transferability, Generalizability and Reliability

Sexual behaviour is a sensitive and often taboo topic (Menka, 2003, Carael, 2003). In many societies, there are strong norms around what is socially acceptable for a female and a male in terms of sexual behaviour. Males are, for example, more likely than females to report multiple sexual partners and a higher frequency of sexual contact because of societal acceptance (Catania *et al.*, 1990, Catania, Binson, Chanchola & Pollack, 1996, Catania, Binson, van der Straten & Stone, 1995, Varga, 2000). Social norms are therefore an obstacle to acquiring truthful answers in this study.

In order to minimize the embarrassment and increase the likelihood of getting reliable answers the interviewers started out asking relatively non-threatening questions concerning

² Statistical Package for Social Sciences.

demographic characteristics. The questions related to sexual behaviour were asked towards the end of the interview (Babbie & Mouton, 2001). The interviewee is put at ease by unthreatening questions in the beginning, and is after this more likely to answer more intimate questions truthfully (Fontana & Frey, 1994, Bernard, 1994). In the semi-structured interviews some questions were asked twice, but in different ways. This consistency check was employed to increase reliability, and as a way to assess the accuracy of the information given by the participants.

The reliability and validity of answers given by informants was kept in mind when reading the interview transcripts and analysing the collected qualitative data. Due to the possibility of providing socially desirable answers, over-reporting of condom use is likely to happen. A study that used both self-report and biological markers as a way of assessing condom use found that sperm was detected in 50 percent of the cases that reported always using condoms (Allen *et al.*, 2003).

However, there is a distinct difference between the respondents considered in the studies above, and the respondents in this study. These respondents know that they are HIV positive. Most likely, they also know that unprotected sexual intercourse will have a negative impact on their partners and potentially themselves. It is clear that according to societal norms using condoms would be the right thing to do. The danger of getting socially desirable answers is therefore even greater in this situation than in sexual behaviour research where the respondents do not know their status (Weinhardt *et al.*, 1998).

This survey will not be aiming to generalize on behalf of other South African people on ART. Firstly, the study setting and its population are very specific. The sample can therefore not represent the ART population in other clinics providing similar services. Secondly, the number of patients interviewed is limited, and saturation will not be reached. The semi-structured interviews will not for these reasons aim for transferability, which is used to judge the extent to which qualitative findings can be applied to other contexts (Sandelowski, 1986, Erlandson, Harris, Skipper & Allen, 1993). As mentioned previously, the qualitative sampling and analysis will use theoretical sampling, and through that approach rather aim to emphasize the “uniqueness of human experiences and contexts, which thus seeks variation and not repetition” (Sandelowski, 1986).

Even though no random sampling was employed, it could be argued that the respondents in this study, which constitutes 60 percent of the patients in the clinic, are representative of the whole clinic population. The structured interviews will therefore generalize on behalf of ART patients at Ithembalabantu clinic.

4.8 Ethical Considerations

Respondents in this study were on ART. They were interviewed in the clinic when they came to collect their medication. The respondents are sick, and they suffer from a highly stigmatised disease. The field workers approached the potential respondents while they were waiting for their medication. The field workers made sure that they fulfilled the inclusion criteria, and then proceeded to explain to them the purpose of the study. After having assured them of their anonymity and confidentiality they were asked if they were willing to participate in the study. The respondents were then asked to read and sign the written informed consent form.

The study chose not to interview patients who had been on ART for less than two months as the patient might still have a low CD4 count, and feel physically weak. The side effects of the antiretroviral drugs can also be more severe the first month of treatment. People under 18 years of age were not interviewed as they by South African law are not considered adults, and are therefore a vulnerable group. Special ethical precautions have to be taken if one is to interview persons who are under the age of 18.

A small token of appreciation was offered to the respondents for the time spent answering the questions. The study was given full ethical clearance by the Humanities Ethics Committee at the University of KwaZulu-Natal. Ethical clearance was also obtained from the Ithembalabantu Clinic's Medical Board.

4.9 Limitations of the Study

The study used a cross-sectional design. With this design no conclusions on causal links can be drawn. It can also introduce re-call bias. Studies have found that if patients are asked to answer questions concerning sexual behaviour more than three months ago, the validity of the answers would be compromised (Graham, Catania, Brand, Duong & Chanchola, 2003). In

this study patients are asked how many sexual partners they have had in the last three months, but not how many times they have had sexual intercourse.

The fact that the author is not isiZulu speaking and could not interview the participants herself is a major limitation to the study. It kept the investigator from following up interesting topics that emerged from some of the semi-structured interviews. Kaufman and Myers (1997) state that the bias increases by 50 percent when one has to use people who are not working on the research project to collect the data.

For the structured interviews all people eligible for the study were interviewed. Some people were often in a hurry to get to work or they sent someone to collect their medication. As a result, they did not have time to stay behind for the interview. People who are working are therefore underrepresented in the survey. Also people who felt comfortable talking about sexual behaviour were probably more likely to agree to be interviewed than people who did not feel comfortable talking about it. Research have found that people who are considered as having less conservative sexual attitudes, attended church less often, and drank alcohol more often were more likely to answer questions around sexual behaviour (Dunne *et al.*, 1997)

Females did interview males for the quantitative part of the study. This increases the likelihood of socially desirable answers, as males might feel that they need to adhere to certain social perceptions of masculinity, such as having many partners (Harrison *et al.*, 1997, De Zoysa, Sweat & Denison, 1996, Caldwell, 2000). However, it was largely due to financial constraints that it was not possible to hire a male researcher, who would only interview the male clients, as they were few.

The aim of this study is to understand sexual behaviour after the commencement of ART. However, the survey questionnaire did not include patients that have had no sexual partner after undergoing VCT. This means that people who chose to abstain from sex after finding out about their HIV-positive status were not included in the study. The focus of this study was on condom use and number of sexual partners amongst people on ART. It was beyond the scope of this study to focus on these issues as well as abstinence. A conscious choice to exclude people abstaining was therefore made. Abstinence as a risk reducing behaviour among people on ART is significant, and in a study with a wider scope it would and should have played a large role.

4.10 Summary

This study employed triangulation, which here involves the use of both quantitative and qualitative methods. The qualitative part of the study, which consisted of semi-structured interviews, was completed first. The information gathered in 20 semi-structured interviews informed the development of the survey questionnaire. In the quantitative part of the study survey questionnaires were conducted using face-to-face interviews. Respondents were patients at Ithembalabantu clinic in Umlazi Township outside Durban in KwaZulu-Natal, South Africa.

CHAPTER 5: QUALITATIVE ANALYSIS

5.1 Introduction

The main purpose of the qualitative phase of the research was to provide in-depth information that could inform the creation of the survey questionnaire. This chapter aims to provide an in-depth understanding of condom use and sexual behaviour amongst males and females who are on ART. The information provided in this chapter will be substantiated and elaborated upon using the quantitative data in chapter six.

5.2 Analysis of Data

5.2.1 Characteristics of the Participants.

Six males and fourteen females participated in the qualitative part of the study. Four females and one male did not have a sexual partner and three participants had more than one sexual partner at the time they were interviewed. Five participants reported that they had partners who knew were HIV-positive. Seven participants reported that they had one partner whose HIV status they were unaware of. Most of the participants started ART either in 2003 or 2004.

5.2.2 Sexual Desire after Commencing ART

Increasing the knowledge about sexual desires among people on ART is important as increased desire might affect frequency of sexual intercourse and, hence, also increase potential high risk behaviour. The participants were asked to describe their sexual desire at the present (at the time when the study was conducted), compared to when they were not on ART.

In the interviews it was clear that their attitude towards, and interest in, sex changed after they found out their status, or after they started ART. However, it was difficult to deduce among those who felt a decrease in their libido whether the change in behaviour happened

after VCT or after starting ART. Participants cited health concerns as one of the main reasons for having less frequent sex or for being less interested in sex.

I do not enjoy sex the way I was enjoying sex before I was HIV positive. Before I was HIV positive I was doing sex maybe three times per day, if I loved to do sex three times. But now I am concerned about my status, if I am doing sex too much, my body feels tired and my white blood cells feels tired even if we are using condoms. We were also taught that at the training.

Female, age 29

I have to take it easy, not to overdo it.

Female, age 36

Some participants expressed an increase in sexual desire levels and they attributed this to the ART.

Many people here at Ithembalabantu clinic are saying that when continuing with ARVs they feel sexually active. I agree with those patients because everything in the body goes back to normal. So, now you live a normal life, therefore, it is possible that you feel like being sexually active.

Male, age, 33

There was only one participant who felt that the ART could impact negatively on sexual performance. However, he was reluctant to indicate the implications of this for his sexual desire.

*(...) most of us are complaining about these drugs. These drugs cause dysfunctions to some people.
(...) The penis doesn't stay as strong as it did before I started treatment.*

Male, age 41

In general, it seems like most participants experienced an increase in desire for sex after starting ART, but they reported having less sex because they wanted to protect their health and preserve their strength.

5.2.3 Multiple Sexual Partners

Unprotected sex with multiple sexual partners increases the risk of HIV transmission. There is a strong tradition of multiple partnerships in South Africa, due to several historical, cultural and economical factors (see: Carael *et al.*, 1995, Harrison *et al.*, 1997, Carael *et al.*, 1994). It is therefore important to examine the attitudes towards multiple sexual partners.

Participants indicate that multiple partners are common among both females and males. However, the male participants were eager to point out that multiple partners were common also amongst females, not just amongst males. The females on the other hand pointed out that males were more likely than females to have multiple partners.

(...) if you are not satisfying a woman (in terms of sexual intercourse) she can get many boyfriends. If you have good things (money and material things) she won't break-up with you, but instead she will have other sexual partners. She will also focus on the one that is performing well when having sex.

Male, age 30

Men won't have enough. They are like dogs. If I'm not there, since he's in Mpangeni I don't know what he is doing there.

Female, age 29

Several of the male participants pointed out that females have more than one sexual partner to gain material possessions and sexual satisfaction. One female participant agreed with the males and stated that females seek multiple partners for these reasons.

(...) it happens sometimes when you are not satisfied. Sometimes it happens for money. (...) Like when you want money or if he buys you clothes

Female, age 26

Most of the single female participants reported that their previous boyfriends had several girlfriends, and the participants therefore terminated the relationship. Participants with multiple partners before commencing ART dropped several of them after starting treatment. They claimed that it was not healthy for them to engage in frequent sexual activity now that they had started treatment. Even those participants with only one partner reported that the frequency of intercourse with their partner had decreased after finding out about their status and commencing treatment.

None of the female participants reported currently having more than one sexual partner. Several of the male participants said they had more than one partner, but not many of them wanted to talk about themselves in relation to this. Most of their statements were related to why so many females have multiple partners. The females were more willing to share personal experiences of having had partners that had been unfaithful to them.

Only one female participant talks openly about having had multiple partners that gave her clothes and money for transport. She had multiple partners before she found out about her

status, but stopped this behaviour after she found out that she was pregnant. Her child is now more than two years old.

Three male participants still have more than one sexual partner, but generally it seems like the ART or VCT has made participants more careful in their sexual relationships. They reported negative attitudes towards others having multiple partners, and some of the participants preferred to abstain from sexual relationships.

After I had discovered my HIV status I started to drop them one by one. I ended up having two sexual partners, the two that I have now. I was afraid during that time HIV/AIDS was so popular. HIV/AIDS patients were popular during that time.

Male, age 30

Yes, it has changed because now I am not sexually active. To stay away from sex is the good thing.

Male, age 33

If you have a partner you don't do things the way you want. And now that I have my children in our own home, maybe a man will dislike my children. If I tell him that I have a virus maybe he'll talk to everyone about it. I think it's alright that I stay with my children.

Female, age 40

The participants are not very willing to reveal their own attitudes to multiple partners. They point to the opposite sex. The males claim that multiple partnerships are quite common among females, while the females say they are common among the men. They are not so willing to talk about their own sentiments and experiences with regard to the issue of multiple partnerships.

5.2.4 Disclosure to Sexual Partner

Disclosure has been known to facilitate communication between partners and increased openness around HIV/AIDS (Kamenga *et al.*, 1991, Allen *et al.*, 2003, The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000, Paxton, 2004). Most of these studies have found disclosure to be associated with increased likelihood of using condoms.

For most of the participants it took some time before they managed to disclose their status to both partners and family. Those living with their partners were more likely to disclose their status than those who were not. The partners perceived reaction also determined how long it took the participant to disclose.

If you are not open with a person, you start with cracking some jokes about it to see his reaction. I was suspecting the symptoms in his blood. You know your partner if he's not feeling well. He was home for the weekend, and I was feeling guilty. I decided to tell him the following week. He thought I was just joking, I showed him the results as a proof.

Female, age 29

I wanted him to know the truth so that we can start a new life. We were not using a condom before. I decided that we have to be careful now.

Female, age 29

Many of the participants were scared of their partner's reaction. They expressed concern that their partner would leave them after they had disclosed their status and as a result, they delayed informing their partner. However, most participants felt guilty for lying to their partners about their status and therefore decided to reveal their status.

I was scared that he was going to leave me. I love him. But I was also thinking about my life, that we have to be careful and help each other.

Female, age 29

He asked me why I didn't breastfeed. I said "they said I shouldn't." I was afraid of telling him, I always postponed telling him. I ended up telling him that I'm not breastfeeding because I'm HIV positive and I'm taking antiretroviral drug.

Female, age 26

The reaction to the disclosure of status differed amongst the participants' partners. Some got angry while others refused to believe them. In addition, some were abandoned by their partners while others were supported by their partners after the anger had subsided. "He was furious... He was furious" said a 29 year old participant about her partner's reaction to the disclosure. However, the partner did not desert her like she feared he would. In fact, the opposite occurred. His attitude started changing after his initial anger had subsided. He now accompanies her to the clinic and is also considering VCT. Another female had a very different experience. She was scared of telling her partner about her status, but he gave her support and their relationship improved as a result of the disclosure.

I called him and gave him the results. He read it and said nothing. He hugged me, asked if the child was okay. I told him the child was going to be okay, she'll get help. He gave me so much love, loved me more than ever. We even stopped fighting. If anything was wrong we will sit down and talk about it. If I'm angry he calms me down.

Female, age 24

One female and one male participant had not disclosed to their partners. Both of them were scared of the reaction of their partners.

I don't know. I will tell him if I get a chance. I'm afraid. Others kill each other. (...) I heard that, a female told her boyfriend that she is positive. The boyfriend killed her. I don't know. I'm scared.
Female, 32

It is because I don't know how strong they are mentally. I might tell and all of the sudden they are having stress, you see. I don't want to create stress for them. Other people are failing to accept and maybe they will not be the same towards me. They might not accept it.
Male, age 30

In general, the participants, both male and female, found it difficult to disclose their status to their partners. The disclosure of their status led in some instances to the break-up of their relationships. As a result, five of the participants were not in a relationship at the time of the interview. However, some of those who were currently in a relationship had initially experienced anger and frustration from their partners, but over time the partners became supportive of them.

5.2.5 Disclosure and Condom Use

Increased condom use has been observed in couples where one person has disclosed his or her status. Condom use is even higher in those relationships where it is known that one partner is HIV-positive and the other one is HIV-negative. (Kamenga *et al.*, 1991, Allen *et al.*, 2003, The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000). The failure to disclose may serve as an obstacle to negotiating condom use within a relationship, since the partner may demand an explanation for the insistence on condom use.

When asked why they decided to disclose their status, participants explained that they wanted to use condoms with their partner/s. They felt that disclosing would facilitate condom use.

It's because I knew my status – I knew I was HIV positive. I have to use the condom for the rest of my life, so that I will live for longer.
Female, age 26

Most participants who had started a new relationship after commencing ART had disclosed to their new partners and discussed the use of condoms before entering into sexual relations. However, a number of participants indicated that they were abandoned by their partners when they disclosed their status and attempted to negotiate condom use.

(...) a lot of people leave you if you tell them about your condition especially if they believe they are negative, but those who believe they are positive stay.
Male, age 39

They run away if you tell him to use a condom. They dislike it, saying it hurts and causes friction. I think that is not true, they just don't like it.

Female, age 24

One of the male participants did not disclose his positive status to his former partner. He and his partner did not use condoms during sexual intercourse, and his partner later died from an AIDS related disease. He feels that he has caused her death, and only entered a sexual relationship again four years after her death. He says he disclosed to his current girlfriend because he knew that one day she would ask him why they are using condoms.

We were together in the house, and tears started to roll down my face. One thing that I liked when I was explaining to her about my status was that we were using condoms when we had sex.

Male, age 33

Another female participant also struggled with a similar feeling of guilt. She disclosed to her partner after she started ART, and the couple only started using condoms after she told him. The partner then went for an HIV-test and found that he was positive. The participant feels guilty for not disclosing and not insisting on condom use earlier. She fears that she might have been the one who infected him.

Fertility plays a major cultural and social role in sub-Saharan Africa (Tillotson & Maharaj, 2001). One female participant without children points out that it is important to disclose because some males might propose love or marriage because they want to have children. She says that it is therefore important to be open about your status before entering a sexual relationship.

Some men fall in love with a partner simply because he wants children or because he wants to establish a family so it is good I told him I am positive. If you are telling him that you need to use a condom he cannot understand. But the best thing is to tell and he will start to forget about having children and he must forget that you will have sex without condoms.

Female, age 29

There is one female participant who has not disclosed her status to her partner. She met her partner after she found out about her status but before she commenced ART. Yet she manages to use condoms consistently. She was not feeling too well when she met him, and she uses her illness as a reason for why they have to use condoms. She uses condoms consistently to protect her partners against HIV infection.

I know for sure that I am HIV positive and I wish to tell him, but I don't know how. (...) I tell him that I am still sick. I am not alright to have sex without a condom.

Female, age 34

Nearly all participants associated condom use with disclosure of HIV status. They felt that it is difficult to use condoms consistently with their partners if they had not disclosed. Those entering new relationships after commencing ART all disclosed their status to their partners and explained that if they were to stay together condoms would have to be used consistently.

5.2.6 Condom Use

Most participants were aware of the importance of condoms. They stated that the main reason for using condoms was preventing infection of partners, and re-infection of themselves and their partners.

It is because they want us not to infect other people and to avoid the re-infection when maybe sleeping with someone who is HIV positive. Even though you are on treatment you can re-infect yourself and your partner, and that causes the CD 4 count to drop.

Male, age 30

The reason why I have to use a condom is that I will be spreading the virus and infecting her maybe if she is not infected.

Male, age 29

Studies in the United States on the relationship between condom use and disclosure have found that the status of your partner (being HIV-positive or negative) has a greater influence on condom use than disclosure (Marks, Richardson & Maldonado, 1991, Sheon & Crosby, 2004, Marks & Crepas, 2001). One of the male participants has got two partners, and has disclosed to both of them. One partner is positive and the other partner does not know her status, but he assumes she is positive because they have had sex without a condom for a long time. He claims that it is not important to use condoms as both his partners are HIV-positive. However, there are other participants with positive partners that say using condoms are important. One female participant has a partner on ART, and they use condoms consistently. She says that attending training together made it easier for them to agree on using condoms.

Being in a long-term relationship seems to be an obstacle to condom use. Participants find it difficult to start using condoms when they have been in the relationship for a long time without using them. They have then gotten used to having sex without a condom, and found

that using it lead to a decreased sensitivity for the males. Also some participants faced problems with putting on the condom because of lack of experience with them.

It's not easy if you've been together for a long time and you have to use a condom all of a sudden. It's not easy.

Female, age 26

Yes, and she understands why we have to use condoms although it is difficult to use a condom for the first time since it is something that you are not familiar with it.

Male, age 29

The 26 year old female participant quoted above did initially not disclose to her partner, and she was not using a condom for a period of four to five months. This was while she was on ART. In the end it was the clinic that indirectly forced her to disclose, because she thought they could see it in her blood that she did not use a condom.

I was afraid that the clinic would know that I was up to something bad (...) The sister would look at me and say "Do you still use a condom," and I would say "Yes," and she said "Are you sure?" and I said "Yes," while I knew that I was lying. They always ask us if we still use a condom. A doctor drew a chart about the people in Johannesburg explaining that they are in group A, and that they do not carry the same virus as us. It depends on where you come from. I thought the doctor was right; my boyfriend had a job in Johannesburg.

Female, age 26

There was one male participant who had a lot to say about condoms. He has in the past had many negative experiences in relation to insisting on using condoms and disclosing his status. All his previous partners had run away when he told them about his status and kept on insisting on condom use. He claims that the females feel sexually dissatisfied when he uses a condom, as they experience no pleasure. Another male claims that he loses his erection when using the condom, and wants to go for an operation to change this.

It has to do with the belief that sex is about satisfaction. If you are in a relationship and you keep on wearing a condom you are boring them. The person you are in love with does not want to hear about it (...) the problem is the condom. Girls do not want to use a condom. They do not feel you love them. They just say so many things. Other girls they don't want condoms. They say they don't feel comfortable with it and you have to tell them that you have this disease.

Male, age 39

Once I had used condoms I had a low erection so my penis did not reach to certain parts of her private part where she feels most pleasure. In other words I was useless to her. She did not feel pleasure. Number six did not like condom and number seven did not feel pleasure, which means I had the same two problems after each other.

Male, age 39

There are also several female participants who reported that they have had partners run away because they insisted on using condoms. The main reason given by their male partners, like the male participants' female partners, was lack of sexual pleasure.

Lots of people don't like using a condom, especially men. They say they don't feel you if they use a condom

Female, age 36

Negative experiences with condom use and disclosure have led many participants to look for a HIV-positive partner. One male participant explained that he wants someone who will understand the importance of using condoms, and who will accept his status. Despite their negative experiences with negotiating condom use several participants reported that they kept being assertive on the issue and insisted upon condom use. They also explained to their partners why it was important.

Like when you ask him to use a condom. When I asked my partner to use a condom, he asked why we were using it now. I told him that we are using it now because I am HIV positive, I don't want to infect him and if you have it you won't infect me, otherwise the virus will grow high

Female, age 36

Research has indicated that it is difficult to sustain consistent condom use with the same partner over time (Plichta *et al.*, 1992, Fortenberry, Harezlak, Katz, Tu & Orr, 2002). Participants also experienced difficulty in using condoms consistently over a period of time. One female (age 36) met her partner after she started ART, and they did not start out using condoms because her partner did not believe her when she explained she was positive. In the end she had to show him her test results, and then they started using condoms. However, it is not easy because her partner does not like the condom and sometimes he refuses to use it, as is illustrated by the following comment: "he uses a condom in the beginning, after some time he doesn't want to".

Most participants reported obstacles to condom use. For most participants these obstacles were related to their partners not wanting to use condoms. Some of the participants struggled with partners leaving them when they insisted on condom use. Lack of sexual pleasure was used as the main reason for not wanting to use condoms. Participants with partners that are positive and on ART report not having had problems negotiating consistent condom use. Those participants having started their relationship before going for VCT and not having used condoms previously found it difficult to use condoms.

5.2.7 Perception of Infectiousness

It has been suggested that the introduction of ART can lead to a relaxation in preventative measures. It has been assumed that ARV-patients perceive themselves to be less infectious when taking ARV drugs, and therefore do not see the need to use condoms (Marseille *et al.*, 2002). Evidence of the opposite was found among the participants in the semi-structured interviews. Most of the participants seem to think that the chance of infecting someone is the same when you are on ART. However many of them add that it is more dangerous to infect someone now, because ART makes the HI-virus to mutate in the blood. The statement below by one male participant aptly illustrates what many other participants were saying in relation to perception of infectiousness.

There are lot of chances. You need to use a condom because if you don't use a condom it means you are spreading the virus. You can spread it to your partner especially if you are using drugs. It is worse if you are using drugs (...) You find that the virus in the body increases in size.

Male, age 33

Several participants try to explain the risk of infecting their partners with a resistant strain of the virus that will result in their partner not being able to utilize ART when he or she will need them. They therefore realize that sleeping with their partner can be particularly dangerous when on ART.

The participants do not know what viral load is, and only a few could accurately describe their CD4 count. None of the participants knew that viral load measures level of infectiousness, and as a result, they could not make the connection between having an undetectable viral load and decreased chances of transmitting the virus to one's sexual partner. The low level of knowledge about the viral load could be related to the information received at the clinic. The clinic uses patients' CD4 count to measure clinical progress of patients instead of viral load tests, which are more expensive.

The qualitative findings do not indicate that the level of infectiousness influences the use of condoms amongst the participants. The findings rather suggest that the participants find it more important to use condoms when having commenced ART.

5.3 Summary

The findings of the qualitative study suggest people on ART experience an increase in sexual desire, but they choose not to act upon it. Frequent sexual intercourse is perceived to be damaging to their health as it drains them of energy. Several participants also indicated that they reduced their number of sexual partners after commencing ART. It took most of the participants some time to disclose to their partners, as they were afraid they would get angry and abandon them. However, most participants felt compelled to disclose so they could negotiate condom use with their partner. The participants seem to understand the importance of using condoms, and most of them reported using condoms consistently. Barriers to condom use which were listed include: partner refusal; having been with their partner for a long time; their partner being HIV-positive, and difficulties sustaining condom use over a longer period of time. However, the participants do not perceive themselves as less infectious when on ART, and feel that it more important to use condoms now, then when they were not on ART.

CHAPTER 6: QUANTITATIVE ANALYSIS

6.1 Introduction

This chapter presents and analyses the findings from the survey. First, the basic socio-demographic characteristics of the sample will be described to provide contextual information for the interpretation of findings of the survey. The chapter will also address knowledge, attitudes and perceptions of patients at Ithembalabantu clinic who were receiving ART. It will then look at condom use and some of the barriers to it. The chi-square test will be used to describe the statistical relationships between condom use and other variables. Lastly a multiple logistical regression will attempt to measure the effect certain variables have on condom use.

6.2 Descriptive Analysis of Data

6.2.1 Description of Respondents in the Survey

The sample consisted of 293 patients who were receiving ART at Ithembalabantu clinic in Umlazi Township outside Durban in KwaZulu-Natal. There were 22 respondents who had not had a sexual partner after starting ART. This analysis includes only the 271 respondents in the sample who have had a sexual partner after commencing treatment.

The mean age of the sample was 34.6 years, and the age of the respondents ranged from 18 to 58 years. The vast majority of the sample was female. Only 20 percent was male (see: Table 6.1). At the time of the survey, approximately 30 percent of the patients in Ithembalabantu clinic were male, and many of them were working. As a result, they did not come to collect their medication themselves. One fifth of the respondents were currently employed, with males more likely than females to be working. According to the majority of unemployed respondents (67%), the main reason for their unemployed status was inability to find work. Only 12 percent were presently too sick to continue working. The respondents were relatively well educated as almost three quarters of the respondents had upper secondary schooling or higher. Only 1 percent had no schooling.

Table 6.1: Description of respondents' socio-demographic characteristics by sex

Variable	Female %	Male %
Age (years)		
Less than 35	55	37.0*
35 and above	45	63.0
Living situation		
Married/living together	23	43**
Neither	77	57
Highest level of schooling obtained		
Did not pass a grade	1	2
Primary school	6	0
Lower secondary	19	32
Upper secondary	63	55
Higher education	11	11
Employment status		
Employed	16	37**
Unemployed	84	63
Number of living children		
0	19	15
1	37	20
2+	44	65
N	217	54

* Significant at 0.05

**Significant at 0.01

Almost three quarters of the sample were neither married nor living with their partners. Few respondents were engaged, divorced or separated. However, almost seven percent of the respondents were widowed. More than half of the respondents had two or more living children, while 17 percent had no children. The mean number of living children was 1.8.

At the time of the survey, respondents reported having known their status for an average of three years and two months. The females had known about their status on average for ten months longer than the males. The maximum time someone had known about their status was 14 years and seven months, and the shortest time was three months and 28 days. The respondents have on average been on ART for 14 months, and the time on treatment ranged from 2 to 57 months. These periods of time are all relatively short, since ART is a lifelong

commitment. However, it does reflect the fact that ART has only recently been introduced in South Africa.

6.2.2 Knowledge, Attitudes and Perceptions of Condoms and ART

Perception of Infectiousness

It has been argued that having close friends or family members who are suffering or have died of AIDS can increase a person's perception of their risk of HIV-infection (Gregson *et al.*, 1998). This change in perception could influence individuals' decision to change their behaviour (Gregson *et al.*, 1998, McIntyre *et al.*, 2001). Almost 86 percent of all the respondents knew someone close to them who had died, or was suffering, from AIDS. The respondents in this study were already aware that they are infected, but the suffering and death of others close to them might have encouraged them to protect their partners.

HIV positive people on ART become less infectious if they take their treatment correctly, and it has been argued that this knowledge can be an obstacle to condom use (Marseille *et al.*, 2002).

How the patients understand the concept of viral load could have an impact on how they perceive their own infectiousness (which is determined by the viral load in the blood). The respondents were asked 'what does viral load mean?' and, thereafter, were asked to choose between four alternative answers. Half of the respondents gave the correct answer, while one third reported that viral load is the same as CD4 count. This could be related to the clinic using the CD4 count to measure the medical progress of clients. The training therefore focuses on explaining the concept of the CD4 count, while the viral load is not thoroughly explained. Close to 80 percent of the respondents gave the correct alternative for CD4 count.

The respondents were asked three different questions in order to determine how they looked at their infectiousness *before* starting ART, and *after* starting ART. Table 6.2 indicates that the majority of respondents found it *dangerous* to sleep with someone without a condom, irrespective of them being on ART or not. However, one third of the respondents thought it was *very dangerous* to sleep with someone without a condom *before* they started ART

treatment, while three times as many thought it was *very dangerous* to sleep with someone without a condom *after* they started ART. This perception is underlined by the answers given to the question ‘are you more or less likely to transmit the virus to your partner now that you are on ARVs compared to when you were *not* on ARVs?’ Out of all respondents 90 percent said they were more likely to transmit the virus now that they were on ARVs.

Table 6.2: Responses in percentages to statements related to perception of infectiousness.

Statements	Female %	Male %
How dangerous do you think it was for you to sleep with someone without a condom <i>after</i> you started ARV treatment?		
Very dangerous	92	91*
Dangerous	7	9
How dangerous do you think it was for you to sleep with someone without a condom <i>before</i> you started ARV treatment?		
Very dangerous	30	24*
Dangerous	61	67
Are you more or less likely to transmit the virus to your partner now that you are on ARV compared to when you were <i>not</i> on ARV?		
More likely	92	85
Less likely	4	4
Same likelihood	4	11
N	217	54

Note: Percentage of those answering somewhat/little/not dangerous are not displayed.

The results displayed in Table 6.2 indicate that the respondents did not look at themselves as less infectious after having commenced ART.

It is important to note that recall bias can occur when asking questions concerning the past. The respondents might not clearly remember how infectious they thought themselves to be before they started ART. The questions displayed in Table 6.2 are also open to interpretation. The respondents might not interpret before ART to be the period between VCT and ART. The question could for respondents refer to the period when they did not know about their status, and hence they would then not look at themselves as very infectious.

Description of Knowledge about ART

Assessing the general knowledge of ART in the group is important, as it can give an indicator of the quality of the training the clinic provides. Inadequate knowledge about the drugs could also lead to imperfect adherence (Tuldra, 2001, Goujard *et al.*, 2003). General knowledge about ART seems to be high in the sample as most of the respondents answered the knowledge questions correctly. Table 6.3 indicates that almost all respondents understand that ART will not be a cure, but that the virus stays hidden in their bodies as long as they take the drugs correctly. However, it is important to note that 10 percent think that ART can cure AIDS if it is taken a couple of months after the infection took place.

Table 6.3: Percentage of respondents who agree with specific statements related to knowledge about ART

Statement	Female %	Male %
When taking ART the virus will be removed from my body and never come back	1	2
The virus stays hidden in my body as long as I'm taking ART correctly	98	98
If taken within a few months after being infected ART can cure AIDS	10	13
The HIV will eventually become resistant to ART, and will stop working	83	65
N	217	54

Description of Attitudes to Condoms amongst Female and Male Respondents

Studies show that positive attitudes to condoms are important when wanting to introduce condom use (Stiffman, Doré & Cunningham, 1994, Kapiga, Lwihula, Shao & Hunter, 1995, Abdool Karim, Abdool Karim, Preston-Whyte, & Sankar, 1992). Some interesting differences were found between females and males in terms of attitudes to condom use in the study. Even though the difference between females and males are not large, it seems like the males think

that the females feel less pleasure when using condoms, while the females think that the males are feeling less pleasure. This incongruence could partly be due to lack of communication between partners. If the couples to a larger extent communicated about condoms and pleasure they might find that this is not such an issue for their partner.

Table 6.4: Percentage of respondents who agree with specific attitude statements related to condoms.

Statement	Female %	Male %
When using condoms less sexual pleasure is felt by the female	18	22
When using condoms less sexual pleasure is felt by the male	29	22
Condoms create an emotional barrier with your partner	33	31
Condoms make it difficult to maintain an erection	35	37
Your partner will suspect you being positive if you insist on using condoms	74	67
N	217	54

The statements in Table 6.4 indicate that the number of respondents with negative attitudes to condom use is relatively low, concentrating around 20 to 35 percent. However, one statement differs from the others. A substantial number of respondents argued that partners would have suspected them of being HIV positive if they insisted on using condoms. This suspicion made it difficult for the respondents to negotiate condom use with their partners without having disclosed their status. More than one third of females and males reported that condoms made it difficult to maintain an erection. A slightly higher percentage of females than males felt that condoms created an emotional barrier between themselves and their partner when having sexual intercourse.

6.2.3 Number of Sexual Partners after ART

This section will aim to describe the number of partners the respondents have had after they started ART. It is important to describe number of concurrent partners, and frequency of consecutive partners, as they are important indicators of high-risk behaviour (Remez, 2000).

Few of the respondents (7%) reported having had more than one partner after starting ART. Only two females and six males reported having had two concurrent partners, while four

females and four males reported having had two consecutive partners after starting the treatment. Only one male respondent reported having had three concurrent partners or more, while one female and one male reported having had three consecutive partners or more after starting treatment. All in all, 22 percent of the males and 4 percent of the females reported having had more than one partner after starting ART. None of the males and 5 percent of the females reported not having a current partner.

Males and females gave different answers to the question 'Do you think this partner had other partners but you?' There was a significant association between gender and believing that their partner has more than one partner ($df=2$, $P=0.000$). Almost 75 percent of the females believed that their last sexual partner had other partners apart from them, while 25 percent of the males did the same. However, it is important to keep in mind that number of sexual partners is a sensitive issue, and respondents might be tempted to give socially desirable answers.

As mentioned above, few respondents reported having had concurrent partners after starting ART. This analysis will therefore not draw a distinction between consecutive and concurrent partners. First partner will therefore refer to the partner the respondent had sexual intercourse with most recently. Second partner will refer to the partner the respondent had sexual intercourse with before the first partner. Third partner will refer to the partner the respondent had sex with before s/he engaged in intercourse with partner number two.

6.2.4 Description of Communication about Status with Sexual Partners

Studies have shown that disclosure can facilitate communication and behaviour change in relationships (Allen, Serufilira, Gruber *et al.*, 1993, The Voluntary HIV-1 Counselling and Testing Efficacy Study Group. 2000). More than 80 percent of the respondents disclosed their status to their most recent sexual partner. Almost two thirds of respondents with two partners had disclosed to their second partner. All respondents with three partners had disclosed to their third partner.

Table 6.5: Percentage of respondents who answered yes to specific statements related to communication about status in their relationships.

Variable	Female %	Male %
Disclosed to first partner	81	87
Disclosed to second partner	57	68
Know first partner's status	53	69
Know second partner's status	0	33
N	217	54

When giving reasons to why they had not disclosed to their first partner two thirds of the respondents said they were afraid that their partner would abandon them. More than half of the respondents (58%) were also afraid that the partner would disclose their status to others. This study has therefore, like other studies, found that fear of stigmatisation and loss of partner's support and love to be major obstacles to disclosure (Maman *et al.*, 2001, Medley *et al.*, 2004). However, this study indicates that few were abandoned by their partners after disclosure. Close to 82 percent of the respondents who disclosed to their last sexual partner were still in relationship with him or her.

Knowledge of a partner's status can also increase the likelihood of disclosure, and increase the use of condoms (Maman *et al.*, 2001, Medley *et al.*, 2004). More than half of the respondents know the status of their last sexual partner. Proportionally fewer among those having had two partners after starting ART knew the status of their second partner. Amongst those who did know the status of their sexual partners 72 percent had a first partner that was positive, and 28 percent had a first partner that was negative. Of all respondents who had a second partner only five respondents knew the status of this partner. All five partners were positive.

6.2.5 *Description of the Nature of Communication between Partners*

The nature of the relationship the respondents have with their partner/s could potentially play an important role when wanting to negotiate condom use. It is therefore important to attempt to describe the nature and extent of communication that the respondents have with their partner/s.

Studies show that partner objection is an important obstacle to condom use (Agha *et al.*, 2002, Najjumba, Ntozi, Ahimbisibwe, Odwee, & Ayiga, 2003). However, before the partner can refuse to use condoms the respondent must have sufficient courage to introduce the issue. It requires a certain amount of assertiveness from both females and males to do so. However, females will find the negotiation more difficult due to unequal gender relations in the South African society (Adler, 1998, Leclerc-Madlala, 2002). Studies have found that many females do not disclose their status or discuss condom use with their partner because they are scared of both verbal and physical harassment from their partner (Maman *et al.*, 2001, Medley *et al.*, 2004). In this study, 8 percent of the female- and 4 percent of the male respondents had experienced violent behaviour from a partner in relation to taking ART.

Table 6.6: Percentage of respondents who agree with specific statements related to sexual assertiveness.

Statements	Female %	Male %
I can initiate sexual intercourse with my partner if I want to	88	93
A female has a right to refuse sex if she does not feel like it	5	7
I can refuse to have sex with my partner	96	100
If I asked my sexual partner to use condoms s/he would be angry	46	23
The female has the greater influence over the use of condoms	83	46
N	217	54

Both female and male respondents feel strongly that females in the general population have not got the right to refuse sex. Despite this 96 percent of the female respondents feel that *they* can refuse to have sex with their partner, and initiate sexual intercourse (88%). A significant association is found between gender and the statement ‘If I asked my partner to use a condom s/he would be angry’ ($df=2$, $P=0.002$). Only 23 percent of the males felt that their female partners would be angry if he asked her to use a condom, while twice as many females felt the same. It is also worth observing that there is a significant association between gender and the statement “The female has the greater influence over the use of condoms” ($df=2$, $P=0.000$). Only 46 percent of male respondents agreed to the statement, while 83 percent of the female respondents did the same.

The results suggest that female respondents are fairly assertive and sure of their right to initiate and refuse sexual intercourse as well as demanding the use of condoms. The males in the survey also believe that females can refuse sexual intercourse, and many feel that females assert more power over condom use than males. Male respondents also believe that the female has the right to be assertive on the issue of condom use even though it might result in the refusal of intercourse.

Table 6.7 indicates that nearly all respondents had discussed using condoms with their most recent sexual partner. However, not all these respondents have had arguments or disagreements about condoms. Nearly half of the females have had such arguments or disagreements, while substantially fewer males reported the same.

Table 6.7: Percentage of respondents who answered yes to questions related to communication about condoms with their partners.

Questions	Female %	Male %
Ever discussed using condoms with first partner	97	98
Ever disagreed/ had arguments with first partner about condoms	49	15
Joint decision to use/not use a condom with first partner	52	72
N	217	54

Describing who made the decision to use or not to use condoms in the relationship might give an indication of who has the power to make the reproductive decisions. Almost three quarters of the male respondents, while close to half of the females reported that they made the decision to use or not to use a condom together with their partner. One quarter of the males, and more than 40 percent of the females made the decision themselves.

6.2.6 Condom Use

The consistent use of condoms is high in the sample compared to the general South African population (South African Department of Health, 2004, RHRU, 2003, Shisana *et al.*, 2005). Almost three quarters of all the respondents used condoms consistently with their last sexual partner. Consistent condom use is in this study defined as using condoms every time you have

sexual intercourse. However, 27 percent of the sample is at risk of spreading the virus to their partners, or re-infecting themselves and their partners. More males (82%) than females (71%) use condoms consistently. Consistent condom use is slightly lower with the second last person the respondents had sex with (68%). The chi-square test indicates that there is no significant difference in condom use with last partner and second last partner ($df=2$, $P=0.819$). Out of the respondents who have had a third sexual partner after starting ART, two were using condoms consistently while one respondent never used condoms with this third partner.

Table 6.8: Percentage of respondents using condoms by type of sexual partner.

Response	First partner		Second partner	
	%	N	%	N
Always	73	197	68	13
Sometimes	22	60	21	4
Never	5	14	1	2
N	100	271	100	19

The majority of respondents indicated that they used a method to prevent pregnancy at last sexual intercourse. However, few respondents indicate that they used condoms as a method to prevent pregnancy. Only one third of those answering yes said they used condoms.

Those who did not use condoms consistently were asked to state reasons why they did not do so. Most respondents indicated more than one reason. Partner objection, reduction of pleasure and difficulty in discussing the use of condoms were important reasons for not using them.

6.3 Factors Related to Condom Use – Bivariate Analysis

It is beyond the scope of this thesis, and impractical, to explore all the relationships that can be related to condom use in writing. Several of the factors explored by the author were not found to be significantly related to condom use, and will not appear in this section. Only factors that have been suggested as important by the literature and determinants that in course of the analysis have come up as statistically significant will be described below.

This section will look at the relationship between condom use with last sexual partner and a number of background characteristics. There are only 19 respondents who reported having had more than one partner after starting ART. This number is too low for significance testing, and the analysis will therefore only focus on condom use with last sexual partner. The condom use variable for last sexual partner was recoded into a dichotomous variable, where 1 was those who used condoms consistently and 0 was those who did not. This new variable has been used in all tests stated below, unless otherwise has been specified.

6.3.1 Condom Use and Perception of Infectiousness

Few of the respondents seem to perceive themselves as less infectious now that they are on ART (see: Table 6.2). Hence, it is unlikely that the respondents' perceptions of their own infectiousness could have been an obstacle to condom use. No significant relationship was found between condom use with first partner and any of the statements described in Table 6.2 (see: page 62). This is underlined by the fact that only 4 out 271 respondents agreed with the statement that 'being on ART makes it less important to use a condom'.

Close to 90 percent of the respondents have had a close friend or family member dying of AIDS. However, there were no relationship between this factor and having used condoms consistently with last sexual partner ($df=1$, $P=0.903$).

6.3.2 Condom Use and Communication about Status between Partners

Table 6.9 indicates that there is a relationship between condom use and the nature of communication about condom use in the relationship. However, it is, as mentioned before, not possible to determine causality. One cannot know whether condom use causes the discussion, or whether communication about condoms causes condom use. The associations described below should therefore be interpreted with caution.

Table 6.9: Percentage of respondents who use condoms consistently, by specific statements related to communication about condom use with last sexual partner.

Statement	Respondents	
	%	N
Discussions/arguments about condom use with first partner		
Yes	51	58**
No	88	139
The female has the greatest influence over the use of condoms		
Agree	72	147
Disagree	71	29
If I asked my sexual partner to use a condom s/he would be angry.		
Agree	61	68**
Disagree	81	118
Your partner will suspect you being positive if you insist on using condoms		
Agree	74	144
Disagree	71	41
Decision to use condoms with first partner		
Participant	72	76**
Partner	29	4
Joint decision	77	117

* Significant at 0.05 **Significant at 0.01 ***Significant linear trend at 0.05

Having had disagreements or arguments about condom use is significantly associated with condom use. A significant linear association was also detected between this statement and condom use. Out of those participants who have had discussions or arguments about condoms, 51 percent used condoms consistently, while 88 percent of those who have not had these disagreements do the same. 'If I asked my sexual partner to use a condom s/he would be angry' is similar to the question 'ever having had discussions or arguments about condom use'. However, the former statement measures something slightly different, as it implies that asking the partner to use condoms will lead to anger. Causality is built into the statement. There is a significant association between condom use and the statement 'If I asked my sexual partner to use a condom s/he would be angry'. More than 60 percent of the respondents who agree to this statement use condoms consistently, while more than 80 percent of those who disagree do the same. A partner's negative attitude to condom use could, therefore, be a

predictor of inconsistent/non-use of condoms amongst people on ART attending Ithembalabantu clinic.

A relatively high percentage of respondents agree with the statement 'the female has the greatest influence over the use of condoms' (83%). Still, no significant association was found between the statement and condom use ($df=2$, $P=0.906$). This might indicate that the perception of females' being in control of condoms is not what determines the actual use, but rather arguments, anger and discussions around this form of prevention.

It is interesting to look at who decided that the couple should or should not use condoms in relation to the actual use of condoms. There is a significant association between condom use and 'decision to use condoms with first partner'. Close to 80 percent of those who made the decision to use condoms together used condoms consistently, while only 29 percent of the cases where the partner made the decisions to use/or not use condoms did the same. Also it has to be pointed out that it was very rare that the respondents' partners made the decision around condom use (5%).

It was not possible in this study to determine whether condom use predicts disclosure or whether disclosure predicts condom use. Most studies assume the latter, but the responses to the statement 'Your partner will suspect you being HIV-positive if you insist on using condoms' should evoke caution on this note. More than quarters of the respondents said that insisting on condom use would make their partner suspect them of being HIV positive. From this statement one could argue that the use of condoms facilitates disclosure.

6.3.3 Condom Use by Socio-Demographic Variables and Partnership Characteristics

When using a dichotomized version of the condom use variable, there did not seem to be any significant difference in condom use between the females and males. Still males used condoms more often than females (see: Table 6.10). No significant difference was found in relation to educational status or age. However, there was a significant difference in condom use between those who were employed and those who were unemployed. Those who were employed were more likely to use condoms.

Surveys conducted in the South African population indicate that the condom use rates are lower among cohabiting or married couples than among people who are not married or cohabiting (South African Department of Health, 2004, Maharaj & Cleland, 2004, Shisana & Simbayi, 2002). No significant difference in condom use was found between people who are cohabiting or married and those who were not. In fact, in this study a higher percentage of those living together/being married used condoms consistently than those respondents who did not live together. One of the reasons for this might be that the number of respondents being married or cohabiting is low. Only one quarter of the respondents fall into this category. In the 1998 SADHS 43.2 percent of the respondents were married or cohabiting (South African Department of Health, 1999).

No association was found between disclosure and condom use. However, when substituting the dichotomized version of the condom use variable with the original one, a significant linear association was found ($r=4.279$, $df=1$, $P=0.038$). On the other hand, a significant association was found between condom use and knowledge of first partner's status when using the dichotomized version of the condom use variable ($r=5.207$, $df=1$, $P=0.022$, $df=1$, $P=0.022$). Table 6.10 indicates that close to 80 percent of those who knew their first partner's status were using condoms consistently, while only two thirds of those who did not know their first partner's status did the same. There is also a significant relationship between disclosure to a first partner and knowing that first partner's status ($r=43.187$, $df=1$, $P=0.000$, $df=1$, $P=0.000$). Only 10 percent of those who knew their first partner's status had not disclosed to him or her.

Table 6.10 Percentage of sexually active respondents using condoms consistently with their first partner, by selected background - and partnership characteristics.

Variables	Respondents %	N
Sex		
Females	71	153
Males	82	44
Age		
Less than 35	77	106
35 and above	69	91
Marital status		
Married/living together	78	56
Neither	71	141
Current employment status:		
Employed	89	49**
Unemployed	69	148
Family/close friend suffering or dying of HIV/AIDS.		
Yes	73	169
No	74	25
Current desire for more children with partner		
Yes	77	62
No	71	134
Disclosed to most recent partner		
Yes	75	167
No	63	30
Knowledge of status of most recent partner		
Yes	78	115***
No	66	74
Status of most recent partner		
Positive	75	79
Negative	85	35
Duration of relationship		
Before VCT	64	108**
After VCT	90	28
After ART	84	63

* Significant at 0.05 **Significant at 0.01 ***Significant linear trend at 0.05

It has been argued that condom use is different in concordant and discordant couples (Marks, Richardson & Maldando, 1991, Sheon & Crosby, 2004, Simoni & Pantalone, 2004). Out of those having a negative first partner 85 percent used condoms consistently, whilst 75 percent of those who had a positive partner did the same. In this study, the difference between the two groups was not found to be significant. However, it is important to keep in mind that the sample is relatively small, and that difference between the groups might have become significant with a bigger sample.

6.3.4 Condom Use and Time

In the qualitative chapter it was suggested that the length of the participants' relationships could influence the use of condoms. Table 6.10 indicates that 65 percent of those who started going out with their first partner before VCT use condoms consistently, while 90 percent of those who started going out with their last sexual after VCT did the same. There is a significant association between when respondents started going out with their sexual partners in relation to going for VCT and condom use.

It has previously been argued that adherence to ART might decline over time because people start to feel healthier and are therefore more prone to forget taking their drugs (Bartlett, 2002). It has also been argued that there is an association between decreased adherence and other high-risk behaviours such as alcohol abuse and inconsistent condom use (Flaks, Burma, Gourley, Rietmeijer & Cohn, 2003). One therefore has to question whether the likelihood of using condoms will decrease with decreased adherence. The importance of asking this question is substantiated by studies conducted in the general population. They have found that it is difficult to sustain consistent condom use over a period of time (Katz, 2000, Misovich, Fisher & Fisher, 1997).

6.4 Factors Related to Condom Use – Multivariate Analysis

Multiple logistic regressions were conducted as a way to control for all of the other factors being considered. All variables in Table 6.10 were entered into the regression model except disclosure to last sexual partner and status of most recent partner. There were only 148 respondents who knew the status of their most recent partner, and it would therefore have created too many missing values if this variable was included in the analysis. Disclosure was excluded due to difficulty with determining causality. The numerical variable time on ART was recoded into four categories. Category one represents the respondents who have been on ART for the shortest period of time.

Table 6.11: Multiple logistic regressions of respondents using condoms consistently by selected independent variables

		Odds Ratios	95% C.I		N
			Lower	Upper	
Age					
	Under 35	1.00			130
	35 and above	0.50*	0.262	0.941	125
Living situation					
	Married/living together	1.00			71
	Neither	0.68	0.326	1.432	184
Sex					
	Female	1.00			203
	Male	1.46	0.615	3.476	52
Employment					
	Employed	1.00			52
	Unemployed	0.35*	0.132	0.936	203
Know someone who died of AIDS					
	Yes	1.00			224
	No	0.92	0.358	2.337	32
Know first partners' status					
	Yes	1.00			145
	No	0.47*	0.246	0.891	110
Start of relationship with first partner					
	Before VCT	1.00			156
	After VCT	6.71**	1.814	24.821	31
	After ART	3.13**	1.411	6.923	68
Time on ART					
	Group 1	1.00			51
	Group 2	2.12	0.897	5.030	75
	Group 3	1.52	0.645	3.593	63
	Group 4	2.79*	1.106	7.035	66
Constant	1	6.127			

* Statistically significant at 0.05 level

** Statistically significant at 0.01 level

Table 6.11 indicates that in terms of significance levels the results of the multivariate analysis did not change much from the bivariate analysis. The relationship between employment and condom use became slightly weaker. The strongest relationship was found between condom use and when people started to go out with their partners. The respondents who started going out with their partners after VCT were 6.71 times more likely to use condoms consistently with their last sexual partner than those who started going out with their last sexual partner before VCT. Those who had started their last sexual relationship after ART were 3.13 times more likely to have used condoms consistently than those who started going out with their last

sexual partner before VCT. Those who did not know the status of their most recent partner were only half as likely to have used condoms consistently with this partner as those who did know their last partners status.

Employment was also found to play a role in the use of condoms. Those respondents who were employed were more likely to have used condoms consistently with their last sexual partner, than those who were unemployed. Those above the age of 35 were only half as likely to have used condoms consistently with their last sexual partner compared to those under the age of 35.

As mentioned previously the amount of time the respondent had been taking medication was significantly associated with condom use. Also the chi-square test indicated that the categorized version of the variable time on ART was of borderline of significance ($\chi^2=3.810$, $df=1$, $P=0.051$, $df=3$, $P=0.061$). However, findings from the survey do not correspond to studies in the general population, which argues that condom use decreases with time (Katz, Fortenberry, Zimet, Blythe & Orr, 2000, Misovich, Fisher & Fisher, 1997). The odds ratios show that respondents who have been on ART for the longest time (group 4) were 2.79 times more likely to have used condoms consistently than the respondents who have been on ART for the shortest time (group 1). The reason for this incongruence might be that the respondents have on average been on ART for only 14 months. It might also take people some time to adjust to using condoms after starting ART. It is possible that the onset of the decline in condom use will happen at a later stage.

6.5 Summary

The survey indicated that there are a relatively high number of respondents using condoms. However, some respondents put themselves and their partners at risk by never using condoms, or only using them occasionally. Almost all respondents had only one current partner and the frequency of concurrent partners are low. Knowledge about ART was high, and generally attitudes to condom use were positive. However, acceptance of and belief in female sexual assertiveness was low both among males and females. Female respondents also indicated having had problems talking about condoms. Many of the variables related to communication between respondents and their partners were associated with condom use. Yet, the causality

was not clear and it is difficult to draw any distinct conclusions from these significant associations.

High rates of disclosure were found in the sample. However, fewer respondents knew the HIV status of their partners. A relatively large proportion of those who knew their partner's status had HIV positive partners.

A number of factors were significantly related to condom use. Both the bivariate and multivariate analysis indicated that respondents were less likely to use condoms consistently: when they had started a relationship with their partner before going for VCT; if they were unemployed; if they did not know their partners status, and if they were over the age of 35.

CHAPTER 7: DISCUSSION AND CONCLUSION

7.1 Discussion

The aim of this study was to explore the sexual behaviour of males and females on ART, focusing more specifically on condom use and multiple partners as well as determining some of the factors that influence risky sexual behaviour. This chapter contains a discussion of the qualitative and the quantitative results presented in the two preceding chapters in light of the literature review. It will also provide conclusions and recommendations for further research.

There was a higher proportion of females (80%) than males (20%) in the sample. This is mainly due to the fact that there were a higher proportion of females (70%) attending the clinic (Patient records, Ithembalabantu clinic, 2005). The relatively low number of males attending the clinic is not surprising. Studies have found that females are more likely to attend VCT services and also, actively seek health care than males (Courtenay, 2000, UNAIDS, 2000, Shisana *et al.*, 2005). Many of the males receiving medication at the clinic were working. They were therefore not able to pick up the medication themselves or they were in a hurry to leave the clinic. Many of the males were therefore not able to participate in the study. This exacerbated the disparity in the sample. Most of the data was not analyzed along the lines of gender due to the limited number of males in the survey.

The participants in the semi-structured interviews indicated that they have reduced their number of sexual partners after starting ART. They often said that too much sex was not good for their health, and pointed out that they have to take care of themselves now that they are on treatment. However, most participants indicated that their level of sexual desire had increased after starting treatment, but underlined that they did not act upon this desire since too much sex was not good for their health now that they are on treatment. Many of the female participants also believed that their partner had ended other relationships when the female participants told them about their status. The participants' attitude to multiple partners was reflected in the survey's findings. Very few of the respondents (7%) had had multiple partners after starting ART. In total, only seven males (13%) and two females (1%) had multiple partners. The number of female respondents having multiple partners in the study's survey is comparatively lower than the findings in the general population (South African Department of

Health, 2004, Shisana *et al.*, 2005). The SADHS (2004) reports that 2.5 percent of females aged 15 to 49 years have had two or more partners in the last 12 months, while 4.4 percents of the males report the same. In the HSRC study (2005) 36.2 percent of the males and 21.2 percent of the females aged 20 to 24 reported having more than one partner. Among the males aged 25 to 50, 11.5 percent had more than one sexual partner, while 2.5 percent of the females in the same age group had multiple partners.

In general it appears that the number of sexual partners and the frequency of sexual intercourse have decreased since the respondents started ART. It also seems like the respondents are more aware of the importance of taking care of their health. These findings are substantiated by the case control study conducted by Sarna *et al.* (2005).

Some studies argue that it is culturally acceptable for males to have multiple sexual partners, as it is looked upon as a sign of masculinity. (Carael *et al.*, 1995, Harrison *et al.*, 1997, Carael *et al.*, 1994, Hackney, 2002). However, it is less acceptable for a female to have multiple partners as it is a sign of promiscuity. Cultural and social norms could therefore have inflated the reporting amongst male respondents, and deflated the reporting among females (Varga, 2002, Leclerc Madlala, 2002, Catania *et al.*, 1990). However, it is vital to note that the respondents have received adherence training at the clinic, and have been advised to keep only one partner. Given that the interviews took place in the clinic, it is important to consider that many respondents, both male and female, might have answered according to what the clinic has advised.

One of the aims of this study was to investigate the level of condom use among respondents, as inconsistent or non-use of condoms could lead to the spread of drug-resistant strains of HIV. Of all the sexually active respondents, 73 percent used condoms consistently with their last sexual partner, while 22 percent used condoms inconsistently. Only 5 percent reported never using condoms. These condom use rates are substantially higher than what has been found in the general population (South African Department of Health, 2004, RHRU, 2003, Shisana *et al.*, 2005). This study indicates that commencing ART or going for VCT could be predictors of consistent condom use, as other studies have indicated (Sarna *et al.*, 2005, Moatti *et al.*, 2001, Bateganya *et al.*, 2005, Bunnell *et al.*, 2006) The level of condom use detected in this study was, however, consistent with the findings of a limited number of studies on this issue (Bunnell *et al.*, 2006, Sarna *et al.*, 2005, Moatti *et al.*, 2003). For

example, one study from Kenya found that 72 percent of the patients on ART used condoms consistently (Sarna *et al.*, 2005). Another study conducted in rural Uganda found that 82 percent of the patients on ART always used condoms (Bunnell *et al.*, 2006). The findings from the qualitative data in this study suggest a sound knowledge of condoms, and a strong motivation among the participants to use them. The participants displayed good insight into the reasons why it is important to use condoms consistently. They observed that they would get sicker, and that the virus would be allowed to increase in their blood if they do not use condoms. Others used condom because of the desire to protect their partners from infection or re-infection.

There are 27 percent of the respondents who do not use condoms consistently, and major obstacles to condom use exist. The ones most frequently mentioned among people who do not use condoms consistently in the survey are objections from partner (57%), reduction of pleasure (51%) and difficulty in discussing the use of condoms with partner (31%). There was a significant relationship between having had discussions/arguments about condom use with last sexual partner and inconsistent condom use with the same partner ($r=37.560$, $df=1$, $P=0.000$, $df=2$, $P=0.000$). Similarly, there was a significant relationship between the statement “If I asked my sexual partner to use a condom s/he would be angry” and condom use. ($r=15.933$, $df=1$, $P=0.000$, $df=8$, $P=0.007$). The consistent use of condoms was lower amongst those who agreed with the statement, than amongst those did not agree. These findings highlight that partner objection is a significant obstacle. However, one should be careful to avoid making hasty conclusions on this issue. The study’s qualitative findings indicated that it was not always the participant’s partner who objected to condom use, and in some instances it could also be the respondents. A male participant who was not using condoms indicated that he chose not to use them as they made him lose his erection. Another participant said he and his partners had agreed to not use condoms because they were all HIV-positive.

These findings suggest that the nature of communication between partners is strongly related to condom use. Information given in the qualitative interviews underlines this. Negotiation of consistent condom use was easier in relationships where both partner and participant had gone for adherence training. Other studies have similar findings where couples have gone for VCT counseling together (The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000). The joint training and counseling provides the same knowledge and information to the

couple as well as facilitating open communication in the relationship. Research indicates that such an environment is conducive to the successful negotiation of consistent condom use (The Voluntary HIV-1 Counselling and Testing Efficacy Study Group, 2000, Kamenga *et al.*, 1991).

It is not only joint counseling and training that can contribute to an increased openness in the relationship. Disclosure of HIV positive status by one or both partners also creates an increased openness in the relationship, which can facilitate successful negotiation of condom use (Kamenga *et al.*, 1991, Allen *et al.*, 2003, Crepaz & Marks, 2003). In this study, 82.3 percent of the respondents had disclosed their status to their last sexual partner. There is a strong linear relationship between disclosure to last sexual partner and using condoms consistently, sometimes and never ($r=4.297$, $df=1$, $P=0.038$). However, both this study and other studies found a stronger relationship between consistent condom use and knowledge of partner's status. (Marks *et al.*, 1991, Sheon & Crosby, 2004, Simoni & Pantalone, 2004, Sturdevant *et al.*, 2001). Only 54.2 percent of the respondents in this study knew the status of the person they had sex with last time. These respondents were almost 60 percent more likely to use condoms consistently than those who did not ($df=1$, $P=0.005$).

Once again it is difficult to determine whether the use of condoms led to the discovery of the partner's status, or the discovery of the partner's status led to the use of condoms. Further research using a longitudinal method would be needed to determine causality in relation to this.

Results from studies conducted in the United States have found that discordant couples were more likely to use condoms consistently than concordant couples (Marks *et al.*, 1991, Sheon & Crosby, 2004, Marks, Richardson & Maldando, 1991, Crepaz & Marks, 2003). These studies were conducted among people who knew their status but were not necessarily on ART. This study found that 15 percent who knew that their partner was negative put their partner and themselves at risk by agreeing to have sex without a condom, while more than 25 percent of those with a positive partner did the same. Consistent use of condoms is higher in the discordant couples than what other studies in this region has indicated (Allen *et al.*, 1992, Kamenga *et al.*, 1991). The reason for this might be found in the ART adherence training, where the patients at the clinic are told about re-infections and drug resistance. Few studies

have been conducted on concordant couples' sexual behaviour in sub-Saharan Africa, and it is therefore difficult to say how frequent consistent condom use is in these relationships.

It is important to keep in mind that this study is cross-sectional, and therefore, one cannot determine causality. Most studies assume that disclosure facilitates condom use, but that might not necessarily be so. The responses of participants to the statement 'Your partner will suspect you of being HIV-positive if you insist on using condoms' should evoke caution on this note. Out of all the participants, 72 percent said that insisting on condom use would make their partner suspect them of being HIV positive. One could therefore also argue that the use of condoms facilitates disclosure.

The qualitative analysis indicates that many respondents felt they had to disclose so they could justify using a condom. Several of the participants had tried to use condoms without disclosing, but ended up having to tell their partner because they could not sustain consistent use. The participants found it especially hard to negotiate condom use without disclosing in long-term relationship and also, in relationship where condoms had not been used previously. These couples had established a habit of not using condoms, and the introduction of condoms was therefore questioned. It seemed to be easier to introduce condoms in relationships that had been established after going for VCT or commencing ART. These participants told their new partners that they had to use condoms before entering the relationship. Some of them also disclosed their status before having sexual intercourse, because the partner refused to use condoms. Reasons such as wanting to do things right, and taking care of their own health, were used to justify this behaviour. These participants also indicated that the issue of condom use would come up anyway, so it was better to insist on condom use before having sex. The survey substantiates this. Those who started going out with their partner after VCT were more likely to use condoms than those who started going out with their partner before VCT. Those respondents who started going out with their partner after starting ART were more likely to use condoms than those who started going out with their partner before VCT.

In certain studies, positive attitudes to condom use have been related to high levels of condom use (MacPhail & Campbell, 2001, Agha & Rossem, 2004). Both the qualitative and quantitative research indicates that some of the respondents had problems related to the condoms itself, which could result in negative attitudes to condom use. More than 30 percent of the survey respondents felt that condoms created an emotional barrier between them and

their partner, and that the condom made it difficult to maintain an erection. However, the respondents seemed to be most concerned with their partners suspecting them of being positive if they insisted on condom use (74%). This indicates that the greatest obstacles to condom use were not related to condoms in themselves, but in partner's reaction to insisting on the use of them.

In the qualitative analysis it came out quite clearly that some of the respondents held negative perceptions of, and also, had negative experiences with, condoms. Several of the females and the males reported having had partners that had left them because of their insistence on using condoms. One male said that he had had so many females leaving him that he now is looking for an HIV-positive female to marry. He claims that she will understand the importance of using condoms. Many of the single females also observed that as it was very difficult to negotiate condom use, they would rather be alone. This finding may be linked to male-dominance over the decision to use condoms, which has been identified in several studies (MacPhail & Campbell, 2001, Varga, 1999, Nzioka, 2001). However, it is interesting to note that the females in the survey displayed a high degree of sexual assertiveness. Most females believed they had the greater control over condom use, as well as feeling that they had the right to refuse sex. This high degree of assertiveness could have contributed to the comparatively high use of condoms in the sample.

Self-efficacy is, as previously described, a key component of several well known models aiming to describe the process of behaviour change. However, it is important to note that while 95 percent of the female respondents feel that they have the right to refuse sex, only 5 percent feel that females in the general population can do the same. It is possible that this perceived difference between themselves and females in the general population is a result of the changes they went through during and after going for VCT and ART training. It is also possible that the improvement of their physical health has positively influenced their self-esteem and sense of responsibility for their own health. One respondent in the qualitative interviews said she felt that she had through ART been given a second chance to live, and that she now had to take good care of this chance. However, this study cannot verify these assumptions as it is a cross-sectional study. A longitudinal method measuring female assertiveness using both qualitative and quantitative methods would be needed to clarify these issues around increased assertiveness. Despite the strong assertiveness displayed amongst respondents in this study, partner's reactions and attitudes appears to be stronger indicators of

condom use than respondent's assertiveness (see: Table 6.9). A longitudinal study could more clearly map out how strongly increased assertiveness attribute to the use of condoms amongst people on ART.

Most respondents reported experiencing problems related to condom use, yet the qualitative and quantitative results suggest that the level of condom use is high. One of the reasons for this might be that the respondents feel that it is very dangerous to have sex without a condom after they had commenced ART (92%), and therefore use them despite the difficulties they experience in so doing. The high level of sexual assertiveness displayed above probably also assists the respondents with negotiating condom use with their partner. In fact, 97 percent of female and 98 percent of male participants in the study had discussed using condoms with their last sexual partner.

The mean age of the respondents was 35, and only 27 percent of the sample were living with, or were married to, their partner. The survey does not show a significant relationship between using condoms consistently and various socio-demographic variables such as age, sex and living situation. Still, when controlling for other variables the multiple regression includes age. Respondents aged 35 and above were 50 percent less likely to use condoms than those who were below the age of 35 ($df=1$, $P=0.032$). There was also a significant association between age and when the respondents entered into the relationship ($r=4.562$, $df=1$, $P=0.033$, $df=2$, $P=0.043$). A little more than 50 percent of respondents being younger than 35 years entered their last sexual relationship before going for VCT, while close to 70 percent of respondents being 35 years and older did the same. As previously mentioned in this chapter, findings from both the qualitative and quantitative analysis indicate that it is harder to negotiate condom use when one has been going out with a partner for a long time. One could therefore expect that the difficulty in negotiating condoms and disclosing might increase with age.

Studies conducted in sub-Saharan Africa have reported that many females do not want to disclose because they are scared their partner would leave them. As shown in much of the literature on the subject, for many respondents their partner was their main source of economic support (Maman *et al.*, 2001, Medley *et al.*, 2004). In this survey, only 16.1 percent of the females were working, while 37.1 percent of the males were employed. Both the bivariate and the multiple regressions show a relationship between condom use and

employment status. After controlling for other variables such as education, the multiple regressions indicate that respondents who were employed were more likely to use condoms consistently than those who are unemployed. This suggests that access to financial resources plays a role in an individual wanting to insist on consistent use of condoms. However, none of the participants in the semi-structured interviews directly linked difficulty of using condom with being economically dependent on their partners.

Some researchers have suggested that the introduction of ART can lead to a relaxation in protective measures after the commencement of treatment (Marseille *et al.*, 2002). ART lowers the viral load, and hence the patient will be less infectious. It has been argued that reduced infectiousness will translate into an understanding of reduced infectiousness and that people as a result of this understanding will take greater behavioural risks. Both the qualitative and the quantitative data suggest that the respondents did not perceive themselves to be less infectious after they started ART. Parts of the research indicated the opposite. The survey's respondents were asked 'Are you more or less likely to transmit the virus to your partner now that you are on ARV compared to when you were *not* on ARV?' More than 90 percent of respondents indicated that they were more likely to transmit the virus now. No significant relationship was found between this question and condom use. Similar findings have been observed in Uganda, Cote d'Ivoire and Kenya (Bunnell *et al.*, 2006, Sarna *et al.*, 2005, Moatti *et al.*, 2003). The qualitative analysis supports this research. The researchers conducting the interviews indicated that they had to ask the question concerning the necessity of using condom after one has commenced treatment several times. Not because they did not understand it, but because they found the question irrelevant, as if the answer was implicit. All of them answered that it was just as important, or even more important, than before.

The research indicates that the participants and respondents did not completely understand the concept of infectiousness, as they did not manage to distinguish between viral load and CD4 count. However, they indicated that ART made the virus decrease in their blood but never linked this to infectiousness and viral load. These findings identify Marseille *et al.*, (2002) argument as flawed, as it indicates that the respondents did not understand the concept of infectiousness, and that commencing ART has provided a reason for using condoms.

Studies indicate that adherence to antiretroviral drugs and consistent condom use might decrease with time (Bartlett, 2002, Temmerman *et al.*, 1990, Krabbendam *et al.*, 1998, Muller

et al., 1992, Wilkins *et al.*, 1989, Diamond, Richardson, Milam *et al.*, 2005). This study found that consistent condom use increases with an increase in the respondents time on ART (df=270, $P=0.021$). In relation to this result, it is important to keep in mind that the respondents had at the time of the interview on average been on ART for 14 months, and that most studies indicate decline in adherence and condom use commences after several years. It is possible that the relatively low number of people reporting condom use after only a few months on ART could be related to them not having disclosed to their partner. The qualitative analysis substantiates this. Several respondents did not start using condoms straight after commencing ART or going for VCT, as it took them some time to disclose to their partner. Participants indicate that the time after going for VCT or starting ART was difficult, and that they were struggling to convince partners of their positive status.

The information gathered and discussed above indicates that elements of the behavioural theories discussed in chapter three could be applied to this study. The people on ART seem partly to struggle with the same obstacles as people wanting to use condoms in the general South African population. As mentioned previously a high degree self-efficacy amongst female respondents might have contributed to condom use. This element from the theory of planned behaviour or the health belief model, which aims to describe behaviour change at an individual level, could be used in a model aiming to describe the process of behaviour change amongst the respondents in this survey.

The TPB includes attitude to behaviour change as part of the model. The respondents and participants expressed many of the same negative perceptions and attitudes to condoms as people in the general population. However, other attitudes specifically related to HIV-positive status and being on ART are found to be more important. Participants and respondents found it even more important to use condoms now that they were on ART, so they could protect themselves and their partners. One could therefore argue that respondents apply the HBM principle of perceived benefits and difficulties when commencing condom use. On the other hand it is important to note that single respondents in the semi-structured interviews choose to abstain from sex or they are looking for a HIV-positive partner. The social learning theory theorizes that humans tend to choose people with similar standard of conduct to enhance compatibility between social and personal values and behaviour (Bandura, 1993). Results from this survey indicate that relationship to partner is key to consistent condom use. The social learning theory could certainly be applied to respondents who started their relationships

after VCT or started ART as they disclosed and/or demanded condom use before entering the relationship. If partners did not accept this premise they terminated the relationship.

If a behavioural model was to be suitable for people on ART it would need to incorporate the perspective of the patient on ART. They are different from people in the general population because they receive medication many cannot afford and many of them had been very close to dying before they got better. ART patients have also received training other people have not. Their assertiveness and self-efficacy might therefore be stronger than other peoples. There might therefore be a need to use a model where the self-efficacy component is more nuanced. However more studies focusing on ART patients self-efficacy need to be conducted to provide more in-depth information. The partner plays a major role in relation to condom use. Specific indicators related to partner's status should therefore be incorporated into a comprehensive model aiming at understanding the behaviour of HIV-positive people, as well as people on ART.

7.1 Key Findings and Recommendations

This study found relatively high levels of consistent condom use among people on ART. More than 70 percent of the respondents used condoms consistently with their last/current sexual partner. This level of condom use is consistent with findings from similar studies (Sarna *et al.*, 2005 Bateganya *et al.*, 2005, Bunnell *et al.*, 2006). The level of condom use is higher than what is found in the general population (Shisana *et al.*, 2005; South African Department of Health, 2004). It was found that the sample population confronted many of the same challenges as people who do not know their status when negotiating condom use. The study found that respondents' partner's attitudes to HIV/AIDS, and communication patterns and openness in their relationships all played major roles in the success of condom negotiation. A high level of sexual assertiveness and being employed made it easier for the female respondents to demand the use of condoms, but partner's attitudes and arguments in the relationship appeared to take precedence.

It was not possible in this study to determine why the use of condoms is higher among the sample on ART than in the general population. A study using the case-control method or a longitudinal method would be needed to gather this information. However, the study indicates that knowing ones status, as well as having been given extensive training before entering the

ART programme could be factors that contribute to a relatively high use of condoms. Also getting a second chance to live through accessing treatment, after having been close to death might have given the patients renewed sense of self-esteem and personal strength to stand up for themselves.

At what stage the respondents entered the relationship with their last sexual partner was an important predictor of condom use. Entering the relationship before going for VCT made it difficult to negotiate condom use as one had to introduce condoms into a relationship where the couple had not previously used condoms. Also having to disclose to someone they may not have seen for a long period of time made it difficult for respondents to use condoms due to fear of accusations of infidelity, and of it emerging that they had transmitted the virus to the partner.

The strongest bivariate associations were found between low condom use and a positive response to statements related to partner communication, such as have had “discussions/arguments about condom use with first partner”. Unfortunately it is not possible to determine whether it was the condom use that caused the arguments or the arguments that encouraged them to use or not use condoms. Most of the communication indicators can therefore not be put in multiple regressions. Still, these findings suggest that the attitudes of, and communication with one’s partner are of great importance to use or non- use of condoms. A positive attitude to condom use and HIV/AIDS and a lack of arguments around condom use, in addition to the respondents’ ability to assert themselves, appear to be of crucial importance to the consistent use of condoms. There were also other factors that are considered predictors of open communication in a relationship that were shown to influence condom use. Disclosure, and especially knowledge of a partner’s status, was found important.

Some studies have suggested that the desire to have children could be a potential barrier to condom use amongst people on ART (Panozzo *et al.*, 2003, Allen *et al.*, 1993). One could assume that this is especially true in the sub-Saharan setting where fertility and having children is an extrinsic part of the female identity (Tillotson & Maharaj, 2001, Benefo, 2004). In this study very few respondents wanted to have children, and no significant relationship was found between non-use of condoms and the desire to have children. Female participants in the semi-structured interviews indicated that it would take too much of their strength to

have children. However, the main reason given was that they had to have sex without a condom, and that could put both themselves and their partner at risk.

One of the aims of this study was to explore the association between condom use and the ART patients' perception of their own infectiousness. Nothing in this study suggests that there is a relationship between commencing ART and an increase in risky sexual behaviour. The study rather suggests the opposite - a decrease in number of sexual partners and an increase in consistent condom use. Both the quantitative and qualitative findings suggest that the respondent thinks it is just as necessary, or even more necessary, to use condoms when having commenced ART. However, it is important to point out that ART is a life-long commitment and the sample population was still relatively "young" at the time the study was conducted. At the time of the interview, respondents had on average been on treatment for 14 months. It is therefore possible that their perception might change with time, as their health status further improves. It would also be important to substantiate this finding with research conducted at sites where training thoroughly inform patients about the meaning of viral load and its role in reducing infectiousness when on ART.

In summary this study has found that ART through proper adherence training should provide another opportunity to reinforce prevention efforts and to increase HIV-positive patients' sexual assertiveness. ART does through proper adherence training, and by having a positive effect on patients' health, increase the likelihood of consistent condom use. However, this is an exploratory study and therefore it has some limitations. Further research is needed to prove or refute its findings. Research conducted at other sites with different resources available for training, such as public hospitals, would be especially useful. Extensive in-depth research is needed to explore sexual assertiveness and functions around partner objection amongst ART patients. Longitudinal quantitative studies documenting the sexual behaviour of ART patients over several years are needed to more accurately determine the consistency of patients' condom use over time. A longitudinal design is more likely to produce reliable answers as the researcher will be able to establish a better relationship with the patient, as well as being able to document changes in condom use over a period of time. Such a longitudinal study could also more clearly investigate the importance of female assertiveness amongst females on ART. Studies comparing assertiveness, sexual behaviour and attitudes to condoms amongst people who do not know their status, people who have gone for VCT, and patients who have commenced ART and been through adherence training are also needed. Such studies could

indicate how much of the change in assertiveness, behaviour and attitudes could be attributed to VCT and commencing ART/going for adherence training.

Patients who had abstained from sex since they got to know their positive HIV status are not included in this study. The study excludes a large proportion of the population on ART when only focusing on patients who have had sexual intercourse after commencing ART. Other studies have found that large numbers of ART patient are abstaining (Sarna *et al.*, 2005, Bunnell *et al.*, 2006, Bateganya *et al.*, 2005). However, little qualitative information is available on this topic, and there is a need to explore abstinence as a way of decreasing sexual risk behaviour in a qualitative study.

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APPENDIX 1

GUIDE FOR IN-DEPTH INTERVIEWS WITH PATIENTS ON ANTIRETROVIRAL THERAPY

1. Have you heard of ART?

(If no, have you heard of Antiretrovirals?)

(If no, what do you call the medication that you are coming to this clinic to collect?)

2. How did you hear about Ithembalabantu?

(Probes: Was it difficult to get treatment from here? Why/why not?)

Personal information:

Age:

Children:

Sexual Partner/s:

Does this partner stay with you?

When got to know of HIV-status:

When started ART:

Knowledge:

3. What do you know about ART?

(Alternatively refer to it in the same way as the patient does).

(Probes: Why is it important to take the antiretroviral drugs at the same time every day? What happens to the HIV-virus when you start taking ART? How likely are you to infect your sexual partners when you are on ART? Does the form of the HIV-virus change when you start taking ART? If yes, how can this influence your partner?)

4. What are some of the advantages of being on ART?

(Probe: Has your health improved? If yes, what impact has that had on your life?)

5. What are some of the disadvantages being on ART?

(Probe: What side effects have you experienced? How severe has these side effects been? Did you feel that you had to disclose to your family when starting to take ART? Why/why not? Did you feel that you had to disclose to your partner when starting to take ART? Why/why not?)

6. What type of drugs are you currently taking and how often do you take them?

(Probe: When do you usually take them? How do you remember to take them?

Have they ever changed the type of drugs you are taking? If yes. Why?

If female and Nevirapine mentioned, why are you on Nevirapine?

If female and Stockrine mentioned, why are you on Stockrine?)

Perceptions:

7. How sick were you before you started ART?

(How long have you been sick before you started ART? What were your CD4 count when you started ART? What is it now? What training did you receive at Ithembalabantu before you started ART? How long did this training last?)

8. How does the antiretroviral drugs make you feel?

(Probe: Do you think the antiretroviral drugs are working? Why/why not?)

9. What made you decide to come to Ithembalabantu?

(Probes: Do you feel stigma since only HIV-positive people come to Ithembalabantu? Was it difficult to decide to come here? What made you choose to come here rather than another clinic?

10. How do you find the providers at Ithembalabantu?

(How strict are they with adherence? What happens to you if you do not adhere to your drugs? Does the clinic react somehow? How is the provider's attitude to people with HIV/AIDS? How does the providers help you with your adherence to ART?)

After VCT:

11. How did you find out about your HIV-status?

(Probe: Was your partner sick? Did you suspect you had HIV before you went to the doctor? Why/why not? Did you have a partner/s at the time? If yes, was he/she/they HIV-positive? What has happened to these partner/s?)

12. Do you think having to take tablets influence disclosure of HIV/AIDS?

Why/Why not?

(Probes: Have you told your *family* about your status?

If yes, why did you tell your family? How long after you found out about your status did you tell them? When did you tell them? How did they react? Has disclosing to your family helped you? Why/why not? If no, why did you not tell them? How do you manage to hide the drugs and going to the clinic from them? Are you planning on telling your family? Do you think your family know even though you have not told them? Why/why not?

Have you told your *partner/s* about your status? (Please include all partners that the participant has had after VCT) If yes, how long after you found out that you were HIV-positive did you tell him/her? How did s/he react? Why did you tell your partner? Did you find it difficult to tell him/her? Why/why not? How has the disclosure influenced your relationship? How has it influenced his view on HIV? Has it made it easier for you to talk about HIV and ART? Please describe the situation when you disclosed to your partner. If no, why have you not told him/her? If you were to tell him/her, would it be difficult? Why/why not? Do you think your partner would leave you if you told him/her about your status? Do Why/why not? Do you think your partner/s know even though you have not told him/her? Why/why not?)

13. For those who did disclose only after they started ART: Why did you choose to disclose after you commenced ART?

Sexual practices:

14. Before you found out you were HIV-positive, did you use any form of contraception?

(Probes: If yes, which one? If no, why not? Was this partner HIV-positive? Had s/he gone for test?)

15. After you found out you were HIV-positive, did you use any form of contraception?

(Probes: If yes, which one? If no, why not? What were your reasons for using this method of preventing pregnancy? Was this partner HIV-positive? Had s/he gone for a test?)

16. Have you ever used condoms?

(Probes: Why did you start/not start using condoms? Is it difficult to negotiate condom use? Why/ why not? If yes, How often did you use condoms? How did you negotiate condom use with your partner?)

17. Have you been treated for STIs after you found out you were HIV-positive?

(Probes: How many times? When? Before or after you commenced ART? What STI were you treated for? Where did you get treated?)

18. How many sexual partners have you had since you found out you were HIV-positive?

(Did you use contraceptives with these partners? If yes, which one? Why did you use this particular contraceptive? Were any of these partner/s HIV-positive? Has any of these gone for a HIV-test? Are your current partner HIV-positive? Has he gone for a test? How does this influence your communication about HIV? What might be some of reasons for people not using condoms? Do you think the length of the relationship influences whether one uses condoms or not? Why/why not? How long has you stayed with your current partner?)

19. Do you want to have children? Why/why not?

(Probes: If yes, are you currently trying to have children? Is wanting to have children problematic when on ART? Why? Why not? Can attempting to have a partner harm your partner? Why/why not?)

20. How likely do you think you are to transmit the virus to your partner when you are on ART?

(Why? How does this influence your condom use? How has your attitude to condom use changed since you started ARVs?)

For those who have had a partner after commencing ART, but are currently not in a sexual relationship:

21. What happened to your last partner?

(Probes: Why did you break up? How has this break-up influenced you? What type of partner are you looking for now? If not mentioned: Would you prefer your partner to be HIV-positive? Why/why not? Have you attempted negotiating condom use before? How did you find this experience?)

For those who have had no partners after commencing ART:

22. Why have you not had any sexual partners after commencing ART?

(Probes: Are you looking for a partner? Why/why not? If yes, what type of partner are you looking for? If not mentioned: would you prefer your partner to be HIV-positive? Why/why not? Have you attempted negotiating condom use before? How did you find this experience? If not looking, do you see yourself living without a partner for the rest of your life? Why have you come to this conclusion?)

23. What happened to your former partner?

(Have this influenced your decision concerning the type of partner you want/not wanting a partner?)

APPENDIX 2

Form Nr. []/[]/[]

Name of RI:	
Date of interview: DD/MM/YY	[][]/[][]/[][]
Date of informed consent DD/MM/YY	[][]/[][]/[][]

Antiretroviral Treatment and High Risk Sexual Behavior.

Introduction:

I am I am currently working with Lene Leonhardsen, who is a Masters student at the University of KwaZulu Natal. She is conducting a study on ARV treatment and peoples' behavioural change following commencement of ARVs. We are very grateful that you volunteered some of your time to answer these questions. I must stress that the questionnaire is completely confidential. The information you give will never appear together with your name. You may also ask me to clarify questions if you don't understand them. The aim of this study is to find out what problems people who are taking Antiretroviral treatment are facing. It is therefore important that you answer the questions honestly. May I continue?

Thank you.

Section 1: DEMOGRAPHIC INFORMATION				
QID	Question	Response options/codes	Coded response	Skip pattern
1.	Sex:	Female 01 Male 02	[][]	
2.	How old were you at your last birthday?	Specify: _____	[][]	
3a.	Are you married or currently living with a partner?	Currently married 01 Living together (but not married) 02 Neither 03	[][]	If married skip to 3c. If Living together skip to 4.
3b.	If neither: What is your current marital status? Read out options	Never married 01 Engaged 02 Widowed 03 Divorced 04 Separated 05 Other (specify) _____ 98	[][]	Skip to 4a

3c.	If married, do you normally live with your husband/wife? In order to be living with your partner you have to sleep in the same house as him/her more than 15 nights a month.	Yes 01 No 02	[][]	
4a.	Which of these categories best describes your work situation?	Employed 01 Self-employed 02 Unemployed 03	[][]	If self-empl. or empl. skip to 5.
4b.	If unemployed, are you	Looking for work 01 Not looking for work 02	[][]	
4c.	If unemployed, what is your reason for not working? Do not read. Multiple answers	Do not want to work 01 Lost job because people found out that I had HIV 02 Presently too sick to carry on working 03 I cannot find work 04 Do not need to work 05 Never worked 06 Student 07 Housewife 09 Disabled 10 Other (specify): _____ 98	[][] [][] [][] [][] [][] [][] [][] [][]	
5.	What is the highest grade/level of schooling you passed? Do not read	Haven't passed a grade 01 Primary school 02 Lower secondary 03 Upper secondary 04 Higher education 05	[][]	
6a.	Has a member of your family or friends ever suffered or died of AIDS	Yes 01 No 02 Do not know 99	[][]	If no skip to 7.
6b.	If yes, how many friends suffered or died because of AIDS?	Specify: _____ Do not know 99	[][]	
6c.	How many family members died because of AIDS?	Specify: _____ Do not know 99	[][]	

Section 2: KNOWLEDGE OF VIRAL LOAD AND CD4 COUNT				
QID	Question	Response option/codes	Coded response	Skip pattern
7.	When did you have your first HIV-test?	Month: _____ Do not remember 95 Year _____ Do not remember 95	[][] [][]	
8.	When did you start ARV treatment?	Month: _____ Do not remember 95 Year: _____ Do not remember 95	[][] [][]	
9a.	What was your CD4 count before you started ARV?	Specify: _____ Do not remember 95	[][]	

9b.	What was your CD4 count when you last measured it?	Specify: _____ Do not remember 95	[][]	
9c.	What does the CD4 count measure? Prompt. Multiple answers possible	Changing number of white blood cells in your immune system 01 Whether I have been using a condom or not 02 How good my body is at fighting the infection 03 Whether the amount of virus in your blood is increasing or decreasing 04 Do not know 99 Other (specify): _____ 98	[][] [][] [][]	
10.	What do the viral load measure? Prompt. Multiple answers possible.	Changing number of white blood cells in your immune system 01 Whether the virus in your blood is increasing or decreasing 02 How well my blood is 03 How long your life will be 04 Do not know 99 Other (specify): _____ 98	[][] [][] [][]	

Section 3: KNOWLEDGE ABOUT ARV TREATMENT

Now I am going to ask you questions concerning your knowledge about ARV treatment.
Do you think the following statements are true or false?

QID	Questions	Response options/codes	Coded response	Skip pattern
11.	When taking ARV the virus will be removed from my body and never come back.	True 01 False 02 Do not know 99	[][]	
12.	The virus will stay hidden in my body as long as I am taking ARV correctly.	True 01 False 02 Do not know 99	[][]	
13.	The HIV tries tricking the ARV by changing its form.	True 01 False 02 Do not know 99	[][]	
14.	If taken within a few months after being infected, ARV can cure AIDS.	True 01 False 02 Do not know 99	[][]	
15.	The HIV will eventually become resistant to the ARV, and they will stop working.	True 01 False 02 Do not know 99	[][]	

Section 4: PERCEPTION OF RISK OF TRANSMISSION

The next questions are designed to teach us more about your attitudes to HIV and ARV's. Please remember there are no right and wrong answers. So feel free to tell us what you think.

16.	Are you more or less likely to transmit the virus to your partner now that you are on ARV compared to when you were <i>not</i> on ARV? Prompt	More likely 01 Less likely 02 Same likelihood 03 Do not know 99	[][]	
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17.	How dangerous do you think it was for you to sleep with someone without a condom before you started ARV treatment? Show visual scale	Very dangerous 01 Dangerous 02 Somewhat dangerous 03 Not very dangerous 04 Not dangerous 05 Do not know 99	[][]	
18.	How dangerous do you think it was for you to sleep with someone without a condom after you started ARV treatment? Show visual scale	Very dangerous 01 Dangerous 02 Somewhat dangerous 03 Not very dangerous 04 Not dangerous 05 Do not know 99	[][]	
Do you agree or disagree with the following statements:				
19.	It can be harmful to me and my partner if we try to have a baby while I am on ARV.	Agree 01 Disagree 02 Do not know 99	[][]	
20.	It is ok to try to have a baby if my CD4 count is above 800 and my partner is HIV-positive with an undetectable viral load.	Agree 01 Disagree 02 Do not know 99	[][]	
21.	I cannot have a baby if I do not know my partner's status.	Agree 01 Disagree 02 Do not know 99	[][]	
22.	ARV can reduce risk of transmission of infection.	Agree 01 Disagree 02 Do not know 99	[][]	
23.	Treatment with ARV makes using condoms less important.	Agree 01 Disagree 02 Do not know 99	[][]	
24.	You cannot transmit the HIV virus to your sexual partner/s when you are taking ARV Assuming you are not using condoms.	Agree 01 Disagree 02 Do not know 99	[][]	
25.	If a cure for HIV were discovered I would stop using a condom.	Agree 01 Disagree 02 Do not know 99	[][]	

Section 5: PERCEPTIONS AND ATTITUDES TO ANTIRETROVIRAL TREATMENT				
How strongly do you agree or disagree with the following statements?				
SHOW VISUAL CARD.				
QID	Statements	Response options/codes	Coded Response	Skip pattern
26.	AIDS has become a less serious illness because of ARV.	Strongly agree 01 Agree 02 Neither agree or disagree 03 Disagree 04 Strongly disagree 05 Do not know 99	[][]	
27.	It is too early to tell if ARV will be successful in the long term.	Strongly agree 01 Agree 02 Neither agree or disagree 03 Disagree 04 Strongly disagree 05 Do not know 99	[][]	

28.	With ARV AIDS can be managed like any other disease.	Strongly agree 01 Agree 02 Neither agree or disagree 03 Disagree 04 Strongly disagree 05 Do not know 99	[_][_]	
29.	ARV medications are not as effective as they are made out to be.	Strongly agree 01 Agree 02 Neither agree or disagree 03 Disagree 04 Strongly disagree 05 Do not know 99	[_][_]	

<p>In relation to the following situations how confident are you that you can take your ARV correctly? The word correctly here means taking all the medication, on time, always and never forgetting.</p> <p>SHOW VISUAL CARD.</p>				
30.	In a situation where the ARV makes you sick.	Not confident 01 Not very confidence 02 Somewhat confident 03 Confident 04 Very confident 05 Do not know 99	[_][_]	
31.	In the situation where you travel away from home.	Not confident 01 Not very confidence 02 Somewhat confident 03 Confident 04 Very confident 05 Do not know 99	[_][_]	
32.	In the situation where you are busy participating in community events such as funerals and weddings.	Not confident 01 Not very confidence 02 Somewhat confident 03 Confident 04 Very confident 05 Do not know 99	[_][_]	
33.	In a situation where your partner/family has got a negative attitude to you taking ARV.	Not confident 01 Not very confidence 02 Somewhat confident 03 Confident 04 Very confident 05 Do not know 99	[_][_]	

Section 6: SIDE EFFECTS AND QUALITY OF LIFE				
34.	How sick were you before you started taking ARV treatment? Show visual card.	I was close to dying 01 I was very sick 02 I was sick 03 I was a little sick 04 I was not sick 05		
35.	What impact has taking ARV had on your quality of life? Show visual card	Very positive impact 01 Positive impact 02 Somewhat positive 03 Little positive impact 04 No positive impact 05 Do not know 99	[_][_]	

36.	Have you experienced any of the following related to taking ARV treatment? Read out options. Multiple responses possible.	Physical side effects 01 Negative comments from partner/s 02 Violent behaviour from partner/s 03 Negative comments from family/friends/community 04 Violent behaviour from family/friends community 05 Other (specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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Section 7: ATTITUDES TO CONDOM USE AMONG PATIENTS ON ARV TREATMENT

To help prevent the spread of AIDS, we need to know more about all the different types of sexual practices people engage in. Some of these questions are rather detailed and personal. Since this survey is confidential, no one will know your answers. How strongly would you say that people who are on ARV agree or disagree with the following statements:

SHOW VISUAL CARD.

QID	Statements	Response options/codes	Coded Response	Skip pattern
37.	When using a condom less sexual pleasure is felt by the female	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	
38.	When using the condom less sexual pleasure is felt by the male	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	
39.	Condoms create an emotional barrier with your partner.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	
40.	Condoms make it difficult to maintain an erection.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	
41.	Condoms make the penis dry.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	

42.	Some condoms can make the penis itchy.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
43.	Your partner will suspect you being HIV-positive if you insist on using condoms.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
For the next question please tell me how strongly you agree or disagree with the following statements: SHOW VISUAL CARD				
44.	I can initiate sexual intercourse with my partner if I want to.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
45.	A woman has the right to refuse to have sex if she does not feel like it.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
46.	I can refuse to have sex with my partner.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
47.	If I asked my sexual partner to use a condom he would be angry.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
48.	The woman has the greater influence over the use of condoms.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
49.	I think it is acceptable for a woman to have more than one sexual partner.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	

Section 8: SEXUAL INTERCOURSE AND SEXUAL PARTNERS

Now I am going to ask you about some of the views you have on sexual intercourse. Could you please state how strongly you agree or disagree with the following statements:

SHOW VISUAL CARD.

QI	Statement	Response options/codes	Coded resp.	Skip pattern
50.	ARV has had positive impact on my sex life.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
51.	People on ARV should not have sex as often as people who are not on ARV.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
52.	Taking ARV can make it difficult for a man to get an erection	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	
53.	ARV decreases people's desire for sex.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[][]	

We are now going to ask questions so we can learn more about your sexual partners. The number of sexual partners people have may differ from person to person. Please answer these questions as honestly as you can. Since this survey is confidential, no one will know your answers.

54.	Have any of your previous sexual partners died of AIDS?	Yes 01 No 02 Do not know 99	[][]	
55.	Have you had any sexual partners since you started ARV?	Yes 01 No 02 Refused 97	[][]	If no, skip to 94.
56.	In the past 3 months, how many partners have you had sex with?	Specify: _____ Refused 97	[][]	
57.	How many sexual partners do you currently have?	Specify: _____ Refused 97	[][]	

Please tell me whether you agree or disagree with these statements:

Please show visual card.

58.	After starting ARV I am less interested in sex than I used to be.	Agree 01 Disagree 02 Refused 97	[][]	
59.	When on ARV, I feel drained of energy the day after having sex.	Agree 01 Disagree 02 Refused 97	[][]	

60.	After starting ARV I have not noticed any change in my interest in sex.	Agree 01 Disagree 02 Refused 97	[][]	
61.	My partner is much less interested in having sex after I started ARV.	Agree 01 Disagree 02 Refused 97	[][]	
62.	I am having more sex now than before I started ARV.	Agree 01 Disagree 02 Refused 97	[][]	

Section 9: CHILDREN

63a.	Altogether, how many children have you given birth to? If none, write 0.	Specify: _____	[][]	If none, skip to 64a.
63b.	How many of your children are still alive? If none, write 0	Specify: _____	[][]	If none skip to 64a.
63c.	If any: How old is your youngest child?	Nr. of Months: _____ Do not remember 95 Nr. of years: _____ Do not remember 95	[][] [][]	
63d.	What is your youngest child date of birth?	Specify: _____ Do not remember 95		
64a.	Do you want to have children now?	Yes 01 No 02 Unsure 03	[][]	
64b.	Do you want to have children some time in the future?	Yes 01 No 02 Unsure 03	[][]	
64c.	Does your partner/s want to have children?	Yes 01 No 02 Unsure 03	[][]	

Section 10: DISCLOSURE AFTER STARTING ARV TREATMENT

QID	Statements	Response options/codes	Coded response	Skip patt.
65.	How often does your family remind you to take your medication?	Never 01 Occasionally 02 Sometimes 03 Always 04 Not applicable 94	[][]	
66.	Have you disclosed your status to anyone?	Yes 01 No 02	[][]	
67.	If yes, who have you disclosed your status to? Do not read. Multiple answers possible.	Partner/s 01 Parent/s 02 Grandparent/s 03 Sibling/s 04 Other relatives 05 Friend/s 06 Neighbour/comm. Mem. 07 Roommates 08 Other (specify): _____ 98	[][] [][] [][] [][] [][] [][] [][] [][] [][]	

68.	In general, how satisfied are you with the overall support you get from your family? Please show visual card	Very dissatisfied 01 Dissatisfied 02 Neither dissatisfied or satisfied 03 Satisfied 04 Very satisfied 05 Do not know 99 Not applicable 94	[] []	
Could you please indicate how strongly you agree or disagree with the following statements: SHOW VISUAL CARD				
69.	When both partners got HIV there is no need to use a condom.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[] []	
70.	It is difficult to keep your status a secret when you are staying with your partner.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[] []	
71.	Being on ARV makes it easier to be open about your status.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[] []	
72.	It is difficult to insist on condom use when you have not disclosed your status to your partner.	Strongly agree 01 Agree 02 Neither agrees or disagrees 03 Disagree 04 Strongly disagree 05 Refused 97	[] []	

lease ask about the participants' three most recent sexual partners.

We are now going to ask you some questions related to sexual partners you have had after you went for VCT. We will start with the most recent one, then ask about the second most recent one, and then lastly the third most recent partner. Please give us the initials of your three most recent sexual partners so we can separate them from each other.

ID	Statements/ questions	Response options	Coded resp.	Response options	Coded resp.	Response Options	Coded resp.
	Ask 73-93 beginning with Partner 1, being the most recent partner.	Partner 1* _____ *Refers to the most recent partner.		Partner 2* _____ *Refers to the second most recent partner.		Partner 3* _____ *Refers to the third most recent partner.	
3.	When did you start having sexual relations with this partner? Prompt	Before VCT 01 After VCT 02 After ARV 03 Do not remember 95	[][]	Before VCT 01 After VCT 02 After ARV 03 Do not remember 95	[][]	Before VCT 01 After VCT 02 After ARV 03 Do not remember 95	[][]
4.	Do you know your partner's HIV- status?	Yes 01 No 02 Unsure 03 If no skip to 77.	[][]	Yes 01 No 02 Unsure 03 If no skip to 77.	[][]	Yes 01 No 02 Unsure 03 If no skip to 77.	[][]
5.	If yes, what is your partner's HIV- status?	Positive 01 Negative 02	[][]	Positive 01 Negative 02	[][]	Positive 01 Negative 02	[][]
6.	Who tested first, you or your partner?	Me 01 My partner 02 We tested together 03 Do not know 99	[][]	Me 01 My partner 02 We tested together 03 Do not know 99	[][]	Me 01 My partner 02 We tested together 03 Do not know 99	[][]
7.	Have you disclosed to this partner?	Yes 01 No 02 Refused 97	[][]	Yes 01 No 02 Refused 97	[][]	Yes 01 No 02 Refused 97	[][]
3.	If yes, when did you disclose your status to this partner? Prompt.	Before starting ARV 01 After starting ARV 02 At the same time as starting ARV 03 Do not remember 95	[][]	Before starting ARV 01 After starting ARV 02 At the same time as starting ARV 03 Do not remember 95	[][]	Before starting ARV 01 After starting ARV 02 At the same time as starting ARV 03 Do not remember 95	[][]

9.	If no, why have you not disclosed to your partner? Do not read. Multiple responses possible.	<p>I'm afraid my partner will leave me 01 [] []</p> <p>My partner doesn't like the condom 02 [] []</p> <p>I'm economically dependent on my partner 03 [] []</p> <p>I'm afraid my partner will tell other people 04 [] []</p> <p>I'm afraid my partner will be angry 06 [] []</p> <p>My partner has negative attitudes to people with HIV/AIDS 07 [] []</p> <p>I was using condoms so I thought s/he was protected 08 [] []</p> <p>Other(specify): _____ 98 [] []</p>	<p>I'm afraid my partner will leave me 01 [] []</p> <p>My partner doesn't like the condom 02 [] []</p> <p>I'm economically dependent on my partner 03 [] []</p> <p>I'm afraid my partner will tell other people 04 [] []</p> <p>I'm afraid my partner will become angry 06 [] []</p> <p>My partner has negative attitudes to people with HIV/AIDS 07 [] []</p> <p>I was using condoms so I thought s/he was protected 08 [] []</p> <p>Other (specify): _____ 98 [] []</p>	<p>I'm afraid my partner will leave me 01 [] []</p> <p>My partner doesn't like the condom 02 [] []</p> <p>I'm economically dependent on my partner 03 [] []</p> <p>I'm afraid my partner will tell other people 04 [] []</p> <p>I'm afraid my partner will become angry 06 [] []</p> <p>My partner has negative attitudes to people with HIV/AIDS 07 [] []</p> <p>I was using condoms so I thought s/he was protected 08 [] []</p> <p>Other (specify): _____ 98 [] []</p>
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Section 11: INFORMATION ON CONDOM USE AFTER STARTING ARV TREATMENT

Please continue from the last section.

I	Statements	Response options	Coded resp.	Response options	Coded resp.	Response options	Coded resp.
10.	How would you describe this sexual partner? Prompt.	<p>Wife/husband 01</p> <p>*Living together 02</p> <p>**Boy/girlfriend 03</p> <p>Sex worker 04</p> <p>***Casual partner 05</p> <p>*Live in same house, but not married.</p>	[] []	<p>Wife/husband 01</p> <p>*Living together 02</p> <p>**Boy/girlfriend 03</p> <p>Sex worker 04</p> <p>***Casual partner 05</p> <p>**A person you spend time with regularly but do not live with.</p>	[] []	<p>Wife/husband 01</p> <p>*Living together 02</p> <p>**Boy/girlfriend 03</p> <p>Sex worker 04</p> <p>***Casual partner 05</p> <p>***A person you have sex with occasionally.</p>	[] []
11.	How long have you been/were you in a sexual relationship with this person?	<p>Months: _____</p> <p>Do not remember 95</p> <p>Years: _____</p> <p>Do not remember 95</p>	[] [] [] []	<p>Months: _____</p> <p>Do not remember 95</p> <p>Years: _____</p> <p>Do not remember 95</p>	[] [] [] []	<p>Months: _____</p> <p>Do not remember 95</p> <p>Years: _____</p> <p>Do not remember 95</p>	[] [] [] []

2.	Are you still in a sexual relationship with this person?	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>
3.	If no, when did you stop having sexual relations with this person? Prompt.	Before starting ARV treatment 01 After starting ARV treatment 02 Before VCT 03 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Before starting ARV treatment 01 After starting ARV treatment 02 Before VCT 03 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Before starting ARV treatment 01 After starting ARV treatment 02 Before VCT 03 Refused 97	<input type="checkbox"/> <input type="checkbox"/>
4.	Is/was your sexual partner sick?	Yes 01 No 02 Do not know 97 At the time you were going out	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Do not know 97 At the time you were going out	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Do not know 97 At the time you were going out	<input type="checkbox"/> <input type="checkbox"/>
5.	Did you or this sexual partner use any method to prevent pregnancy the last time you had sex?	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/>
6.	If yes, what methods did you use? Do not read. Multiple answers possible.	Pill 01 Injection 02 IUD 03 Condom 04 Other(specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pill 01 Injection 02 IUD 03 Condom 04 Other (specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pill 01 Injection 02 IUD 03 Condom 04 Other (specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7.	If condoms not mentioned above: Have you or this partner ever used condoms?	Yes 01 No 02 Refused 97 If no or refused skip to 89	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97 If no or refused skip to 89	<input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97 If no or refused skip to 89	<input type="checkbox"/> <input type="checkbox"/>
8.	If yes, how often do/did you use condoms with this partner? Do not read	Always 01 Sometimes 02 Refused 97 If always or refused skip to 90	<input type="checkbox"/> <input type="checkbox"/>	Always 01 Sometimes 02 Refused 97 If always or refused skip to 90	<input type="checkbox"/> <input type="checkbox"/>	Always 01 Sometimes 02 Refused 97 If always or refused skip to 90	<input type="checkbox"/> <input type="checkbox"/>

9.	Why do/did you not use condoms with this partner? Do not read. Multiple answers possible.	S/he is positive 01 Condoms reduce pleasure 02 Condoms would make my partner suspicious of my positive status 03 Found it difficult to discuss 04 Did not have them with me 05 We were trying to have a baby 06 Other(specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	S/he is positive 01 Condoms reduce pleasure 02 Condoms would make my partner suspicious of my positive status 03 Found it difficult to discuss 04 Did not have them with me 05 We were trying to have a baby 06 Other (specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	S/he is positive 01 Condoms reduce pleasure 02 Condoms would make my partner suspicious of my positive status 03 Found it difficult to discuss 04 Did not have them with me 05 We were trying to have a baby 06 Other (specify): _____ 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
0.	Have you ever discussed using a condom with this partner?	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 97	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.	Who made the decision to use/not use a condom? Do not read	Myself 01 My partner 02 Joint decision 03 Not sure 04 Don't know 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Myself 01 My partner 02 Joint decision 03 Not sure 04 Do not know 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Myself 01 My partner 02 Joint decision 03 Not sure 04 Do not know 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.	Have you ever disagreed or had arguments about using condoms with this partner?	Yes 01 No 02 Refused 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Refused 99	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.	Do you think this partner has/had any other sexual partners but you?	Yes 01 No 02 Don't know 03 If had no more partners after VCT, skip to 94.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Don't know 03 If had no more partners after VCT, skip to 94.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Yes 01 No 02 Don't know 03	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Section 12: SEXUAL BEHAVIOR AND DISCLOSURE AFTER VCT

We are now going to ask you some questions that relate to your sexual behaviour after you went for VCT. Please answer honestly. All information you give us is confidential and will remain within the research team.

ID	Statements/questions	Response options/codes	Coded resp.	Skip pattern
4.	Are you currently looking for a partner?	Yes 01 No 02 Refused 97	[][]	If no or refused skip to 96.
5.	What HIV-status would you want your future partner to have?	Positive 01 Negative 02 Do not know 99	[][]	
want you to think back on the time between you getting to know your HIV-status and you starting ARV.				
6.	How many sexual partners did you have between going for VCT and starting ARV?	Specify: _____ Refused: 97	[][]	
7.	During the same period, did you have more than one partner at the same time?	Yes 01 No 02 Refused 97	[][]	If answered section 10 & 11 skip to 106.
How can you think of the most recent person you had a sexual relationship with?				
8.	Did you know this partner's HIV-status?	Yes 01 No 02 Unsure 03	[][]	
9.	Did you disclose your status to this partner?	Yes 01 No 02 Refused 97	[][]	
00.	If no, why did you not disclose your status to this partner? Do not read. Multiple answers possible.	I was afraid my partner would leave me 01 I had problems with using the condoms 02 I was economically dependent on my partner 03 I was afraid my partner would become violent 04 I was afraid my partner would be angry 05 My partner had negative attitudes to people with HIV/AIDS 06 I was afraid my partner would tell other people 07 Other (specify): _____ 98	[][] [][] [][] [][] [][] [][] [][]	
01.	After VCT, did you or your partner, use any method of prevention?	Yes 01 No 02 Do not know 99	[][]	If no skip to 103
02.	If yes, which methods did you use? Do not read. Multiple answers possible.	Pill 01 Injection 02 IUD 03 Condom 04 Others (specify): _____ 05 Do not know 99	[][] [][] [][] [][]	
03.	If condoms not mentioned above: After VCT did you or this partner ever use condoms?	Yes 01 No 02 Refused 97	[][]	
04.	If yes, how often, after VCT, did you use condoms with this partner? Do not read	Always 01 Sometimes 02 Refused 97	[][]	If no skip to 106.

05.	What is the reason why you are not with your partner anymore? Do not read, multiple answers are possible.	S/he died 02 S/he broke up with me when I told him/her about my status 03 We fell out of love with each other 04 I broke up with him/her because s/he did not want to use a condom 05 S/he broke up with me because I insisted on using condoms 06 S/he broke up with me when I got sick 07 I broke up with him/her when s/he got sick 08 Other (specify): 98	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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Section 12: HOUSEHOLD INFORMATION

I am going to finish off the interview by asking you some questions about your home. Your home is defined as the house you sleep in for more than 15 nights in a month.

ID	Statements/questions	Response options	Coded response	Skip pattern
06.	Are the following available at your home? Please read out options	Electricity 01 Running water inside the house 02 A radio 03 A TV 04 A landline 05 A refrigerator 07 Car 08	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
07.	How many people live in your home?	Specify: _____	<input type="checkbox"/> <input type="checkbox"/>	
08.	How many rooms does your home have?	Specify: _____		
09.	Do you rent out any of the rooms in your home?	Yes 01 No 02	<input type="checkbox"/> <input type="checkbox"/>	
10.	If yes, how many?	Specify: _____		
11.	What material is the house you live in made of?	Specify: _____		
12.	What material are the floors in your house mainly made of? Do not read. Multiple answers possible.	Earth/sand/dung 01 Wood 02 Cement 03 Carpet/tiles/vinyl 04 Polished wood 05 Other (specify) _____ 06	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Is there anything else you would like to add or questions that you would like to ask?

I would like to thank you for your time and effort spent on answering these questions. We give you R15 as a token of appreciation for your time spent on answering these questions.