

**LINKING POVERTY, HIV AND AIDS KNOWLEDGE TO RISKY
SEXUAL BEHAVIOUR OF YOUNG FEMALES: EVIDENCE FROM
BALAKA**

MASTER OF ARTS (ECONOMICS) THESIS

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**UNIVERSITY OF MALAWI
CHANCELLOR COLLEGE**

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Master of Arts (Economics) Thesis

By

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Thesis submitted to the Department of Economics, Faculty of Social Science, in partial
fulfillment of the requirements for a degree of Master of Arts in Economics

UNIVERSITY OF MALAWI

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APRIL, 2012

DECLARATION

I, the undersigned, hereby declare that this thesis is my original work and has not been submitted to any other institution for similar purposes. Where other people's work has been used acknowledgements have been made.

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Date:

CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

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DEDICATION

To my family

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ABSTRACT

This thesis analyzes the impact of poverty and HIV and AIDS knowledge on risky sexual behaviour. Risky sexual behaviour is defined as sex with non-marital/non-cohabiting partners without using a condom. Two alternative measures of poverty are used: income and wealth status. Wealth status is used in order to establish the robustness of the poverty variable. The thesis uses dataset from the first wave of a study on young female adult (YAFAs) done in Balaka by the University of Pennsylvania under the Tsogolo La Thanzi (TLT) project. The project is a four year longitudinal study. The sample size was 1493. The decision to indulge in risky sexual behaviour is modeled as a choice model and estimated using a probit model. The study shows that income, wealth status, HIV and AIDS knowledge, are insignificant in determining risky sexual behaviour. However, perception on condom uses, education, and employment status are found to be predictors of risky sexual behaviour. The study concludes that strategies that empower women, including education and employment, are influential in determining the use of condoms. Furthermore, strategies which aim at changing beliefs on condom use are essential in encouraging safe sex.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ART	Anti Retro-Viral Therapy
BLUE	Best Linear Unbiased Estimator
CHAM	Christian Health Association of Malawi
GDP	Gross Domestic Product
FGLS	Feasible Generalized Least Squares
GoM	Government of Malawi
HIV	Human Immunodeficiency Virus
IHS	Integrated Household Survey
LM	Lagrange Multiplier
LPM	Linear Probability Model
MCP	Multiple Concurrent Partnerships
MDHS	Malawi Demographic Health Survey
MICS	Multiple Indicator Cluster Survey
MoH	Ministry of Health
NAC	National AIDS Commission
NSO	National Statistical Office
OLS	Ordinary Least Squares
PMTCT	Prevention of Mother To Child Transmission
PCA	Principal Component Analysis
STI(s)	Sexually Transmitted Infection(s)
SWAp	Sector Wide Approach

TLT	Tsogolo La Thanzi
UNAIDS	Joint United Nations Programme on HIV and AIDS
UNDP	United Nations Development Programme
UNGASS	United Nations General Assembly Special Session
VIF	Variance Inflation Factor
YAFA	Young Female Adults
WMS	Welfare and Monitoring survey

CHAPTER ONE

INTRODUCTION

1.0 Background

Poverty has always been linked to communicable diseases. The conditions of poverty are some of the very conditions in which communicable diseases such as tuberculosis and malaria among others, thrive. Currently, HIV and AIDS is the fastest spreading communicable disease to become part of this vicious cycle of poverty and communicable diseases, whose main transmission mode is unsafe sex. However, the ways in which poverty heightens vulnerability to this disease, and the effects of HIV and AIDS on poverty, are still not well understood (Dinkelman, Lam and Leibbrandt, 2008). Poverty may raise the probability of contracting HIV in several ways: malnutrition, which in turn increases susceptibility to any disease; poverty-related lack of education and information may be a barrier to individuals changing their behaviours; while specific sexual behaviours adopted by poor individuals in poor communities may directly increase vulnerability (Dinkelman et al., 2008 ; Baird, Chirwa, McIntosh, and Ozler, 2010).

Sexual behaviour can be in various forms such as condom use and multiple concurrent partnerships, among others. The outcomes of sexual behaviour include HIV

and AIDS infection, gonorrhoea, syphilis, and unwanted pregnancies, among others. Of these different sexual behaviour outcomes, HIV and AIDS has been the focus of public discussion as well as policy initiative in the country due to its socio and economic impact. The country's efforts are apparent inadequate to cope with the rapid increase in the infection rates. HIV and AIDS is a socio-cultural, economic, political, development and health issue which has brought havoc to all sectors of the economy in Malawi and other developing countries (GoM, 2006). It is a social problem due to its negative consequences on communities and social structures. It is a cultural issue because some cultural practices and beliefs fuel the spread of the disease and mask positive traits of the system while encouraging stigma, discrimination and denial (GoM, 2006). It is a political problem because a sick person will not contribute to the political development of the country. It is also considered to be a health issue because it affects directly a large number of people and the health-care system itself or fabric of society (GoM, 2006). HIV and AIDS is an economic issue as it leads to reduction in economic growth by reducing the productivity of the labour and draining investment resources in all sectors. HIV and AIDS is a development issue because it affects negatively all sectors of the economy (GoM, 2006). Despite coordinated efforts the country still faces a number of challenges in containing the spread and impact of HIV and AIDS on development (GoM, 2006).

Recent evidence suggests that the burden of new HIV infections in developing countries is concentrated among young people and females (UNGASS, 2010). Given that the burden of new HIV infections in developing countries is concentrated among the young and females, there is emerging awareness that even with knowledge of how to protect oneself from infection, such information may not always be usable in daily

situations of economic and social disadvantage that characterize the lives of many young people, especially females (UNAIDS, 2004).

In Malawi the burden is disproportionately female, and younger women are particularly affected. The prevalence among women aged 15 to 24 is around 9 percent, compared to 2 percent among men (NSO and ORC MACRO, 2005; UNGASS, 2010) of the same age group. HIV prevalence is also higher in female adults aged 15 to 49 years (13.3 percent) compared to men (10.2 percent).¹ Just like other developing nations, women in Malawi are socially and economically subordinate to men (Chimbiri, 2003; Swidler and Watkins, 2007; Limwame and Kumwenda, 2009), which reduces their bargaining power for safe sex due to their financial dependence. This financial dependence brings in an economic dimension into sexual behaviour.

1.1 Problem Statement

Individual's sexual behaviour matters in as far as susceptibility to HIV is concerned (Baird et al., 2010), and background factors determine the speed of transmission. These background factors include sexual behaviour, poverty, education, migration and urbanization among others (Ochieng', 2007). However, the main driving force of susceptibility is sexual behaviour. In Malawi, the youth face an unrelenting and increasing threat of HIV (GoM, 2008). Nevertheless, there is difference in terms of HIV prevalence and susceptibility within the youth group, with young women aged 15 to 24

¹ The recent statistics from the 2010 Malawi Demographic Health Survey (MDHS) done by NSO indicate that in Malawi, adult HIV prevalence decreased slightly between the 2004 MDHS and the 2010 MDHS, from 12 to 11 percent, respectively. HIV prevalence among women remained at 13 percent over the same period while among men it decreased from 10 to 8 percent. However, it is important to note that none of these decreases in HIV prevalence are statistically significant.

being around 9 percent, compared to 2 percent among men of the same age group (NSO and ORC MACRO, 2005; UNGASS, 2010; NSO and ICF MACRO, 2011). The likely cause may be the difference in sexual behaviours due to low bargaining power for safe sex, because of financial dependence on their partners. As women tend to be poorer than men, they are vulnerable to “transactional sex” (Swidler and Watkins, 2007; Chirwa and Chizimbi, 2008). The question that arises is whether poverty/economics issues are the driver of female sexual behaviour.

Several researchers have suggested that poverty may be a motivation for young women to indulge in risky sexual behaviour in Malawi (Madise, 2007; Baird et al, 2010). Credible causal evidence regarding the effect of increased income on risky sexual behaviour among young people is however practically non-existent. The evidence on whether poorer individuals are more likely to conduct risky sexual behaviour and contract HIV is virtually mixed (Madise, 2007). The difference has been due to the various definition of risky sexual behaviour. Many are quick to assert that poverty is a determinant of HIV status for women because poor women are more likely to engage in risky sexual activities. Others such as Swidler and Watkins (2007) argue that it is not women’s poverty, but the relative wealth of men that is the cause of transactional sex, and as such improving women’s economic circumstances is unlikely to decrease women’s vulnerability to HIV infection by reducing transactional sex. Some have attributed it to culturally constructed beliefs and ethnicity (Hickey, 1997). However, these studies did not take into account the perception women have towards condom use, employment status, and HIV and AIDS knowledge as factors influencing sexual behaviour.

Given the current low of HIV knowledge of HIV at national level among the youth, despite the high awareness, it is worth examining if this has any bearing on risky sexual behaviour in addition to the poverty. This study, set out to undertake an empirical analysis of research data to fill this knowledge gap.

1.2 Objectives of Study

1.2.1 General Objective

The main objective of this study is to investigate the role of poverty, and HIV and AIDS knowledge (sexual transmission) in determining the sexual behaviour of young female adults, using Balaka as a case study

1.2.2 Specific Objectives

The specific objectives of the study are:

- i. To analyse the impact of current income on sexual behaviour of young females
- ii. To analyse the impact of HIV and AIDS knowledge on the sexual behaviour of young females.

1.2.3 Hypotheses

To investigate the above objectives, the following null hypotheses will be tested;

- i. Current income has no impact on young females sexual behaviour
- ii. HIV and AIDS knowledge has no impact on young females sexual behaviour

1.3 Justification of Study

Study of youth sexual behaviour is necessary because patterns of sexual behaviour formed during adolescence may influence behaviour in adult life and consequently affect long-term progress in the fight against HIV and AIDS. In a country with different prevalence rates of HIV infection among young females, which is primarily determined by sexual behaviour, understanding of motivations behind risky sexual behaviour is an important step towards dealing with the HIV pandemic. The contribution of this study is therefore the extension of knowledge on the role of poverty, as well as HIV knowledge in affecting sexual behaviour.

1.4 Organization of the Study

The rest of the study is organized in five chapters. Chapter two gives an overview of poverty, sexual behaviour and HIV and AIDS in Malawi. Chapter three reviews the relevant literature whereby sexual behaviour is discussed from a theoretical perspective and the major empirical studies on sexual behaviour as well as poverty relevant to this study are discussed. Chapter four describes the methodology in which an econometric model of sexual behaviour is estimated as specified by Dinkelman et al., (2008), but with some modifications in accordance with data availability and the reviewed literature. Chapter five presents and discusses the empirical results. It gives the interpretation of the results obtained from the econometric and statistical tests. Finally, Chapter six provides the policy implications of the results obtained, as well as the concluding remarks, and the limitation of the study.

CHAPTER TWO

AN OVERVIEW OF POVERTY, HIV/ AIDS AND SEXUAL BEHAVIOUR IN MALAWI

2.0 Introduction

This chapter presents an overview of sexual behaviour, HIV/AIDS and poverty in Malawi. We go on to outline the forms of sexual behaviour practised in Malawi. In addition to this the chapter outlines the current poverty levels and the trends.

2.1 Poverty

Poverty reduction has been at the centre of development policy in Malawi since the early 1990s. However, until recently, progress in reducing poverty has been slow. The poverty line in Malawi has been calculated at 16,165 Malawi Kwacha (MK) per person per year, or 44.3 MK per person per day². Income measures of poverty indicate that as of 2005, more than half of the population (52 percent) lived below the poverty line and over one fifth (22 percent) lived in ultra-poverty. In other words, about 6.4 million Malawians lived in poverty and as many as 2.7 million Malawians, about one in every five people,

² The poverty line level is based on average national prices for February-March 2004. At the time of the IHS2, MK44.3 was roughly equivalent to US\$0.50.

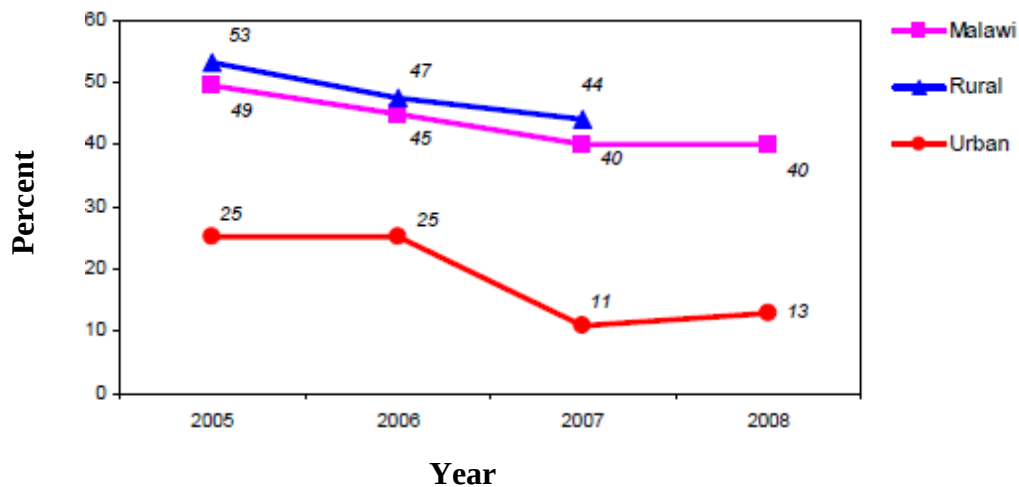
lived in such dire poverty that they could not afford to meet even the daily-recommended food requirements (NSO and ORC-MACRO 2005; MEPD, 2009; GoM and World Bank, 2010). The poverty gap and severity of poverty measures confirmed that by 2008, the worst poverty is concentrated in rural areas in the south and central regions, while the northern region is better off (51 percent in the south, 40 percent central and 35 percent north). Furthermore, Malawi indicated a very high inequality index (Gini 0.38), reflecting profound inequities in the access to assets, services and opportunities across the population (NSO and ORC-MACRO 2005; GoM and World Bank 2010). Over the past four years, progress in reducing poverty has moved faster when compared to the 1998 to 2004 period. The first household survey in 1998 measured the poverty rate to be 54 percent (NSO, 2001; NSO and ORC MACRO, 2005). Seven years later, the second household survey showed the poverty rate to be 52 percent. The 2004-2008 periods showed a considerable drop in poverty, from 52 percent to 40 percent. The projections suggest declining poverty trends. Based on a projection of 12 percent reduction in four years, the poverty headcount would be well below 20 percent in 2015 (MEPD, 2009)³.

³ Although the decline was said to be linear, what we are not certain of is whether the 40 percent poverty rate was established using the same technique as was the case with the 52 percent decline

Nevertheless, there are good reasons to believe that much of the recent drop in poverty is a result of good crop harvests registered in the current years (MEPD, 2009). Subsidized farm inputs and good climatic conditions are some of the factors that have led to increased production in the country. It can be said that in 2008, about 15 percent of people were still living in ultra-poverty, which refers to the condition of extreme deprivation. Overall, poverty continues to be much higher in rural areas than in urban areas, and the south is still the poorest region in Malawi. With a high national population share, this region also has the highest absolute number of the poor in the country. The northern region is the only region where there was some ultra-poor poverty decrease from 18 percent to 11 percent in 2007 to 2008, respectively (MEPD, 2009).

Despite the recent trends in poverty, given the results in IHS1 (Integrated Household Survey), IHS2 and Welfare Monitoring Survey (WMS), poverty still remain most persistent in rural areas, both in absolute and relative terms. Figure 1, shows poverty trends measured through the headcount ratio during the period 2005 to 2008. The snapshot view indicates that the poverty level in urban areas has increased from 11 percent in 2007 to 13 percent in 2008.

Figure 1: National, Urban and Rural Poverty Trends in Malawi 2005-2008



Source: MEPD 2009

Furthermore, the national decrease in the share of both poor and ultra-poor was stronger in urban than in rural communities from 2006 to 2007. The ultra-poverty level declined from 2005 to 2007 but remained the same in 2008. The number of urban ultra-poor diminished strongly from 2005 to 2007 but increased in 2008 (MEPD, 2009).

Eradicating extreme poverty is one of the eight MDG goals. Using 1990 as a baseline, the poverty headcount in Malawi was estimated at 54 percent in 1998. The 2004 IHS survey estimated it at 52 percent (NSO, 2005). The 2004 linear projection for the 2015 poverty headcount is 51 percent, whereas the actual MDG target is 27 percent. Despite the fact that this target seemed completely unattainable in 2004 when IHS data was used, recent data from the 2008 WMS estimates national poverty at 40 percent which is not different from the 2007 WMS (MEPD, 2009; UNDP 2009) estimates. A linear projection based on the 12 percent reduction of poverty during the four year period,

suggest a poverty level well below MDG target of 27 percent in 2015. It is expected that the 2015 target will be met (MEPD, 2009).

However, the comparability of these figures from the IHS and WMS must be treated with caution. The NSO uses a poverty model that ignores seasonality to estimate trends in poverty over time using Welfare Monitoring Surveys. In this case, using a model that does not account for seasonality to estimate poverty may give biased and inconsistent estimates of poverty. This is particularly the case with the annual welfare monitoring data which is collected over a shorter period (one month) than the data used for estimating the baseline model using the integrated household data (Chirwa, Dorward, and Marcella, 2009). What is important is that they show a model base trend in poverty , which is yet to be verified using the data from the next integrated household survey (IHS3), which is yet to be released.

However, still we can learn something from the general poverty trends in the country from Figure1 despite the difference in the methodology of the surveys used. The 12 percent drop in poverty level from 2004 to 2007 suggests that poverty level well below 20 percent in 2015 can be achieved, hence fulfilling the MDG goal target of 27 percent. It remains likely that much of the recent drop in the poverty level is due to favourable weather conditions which have contributed to good agricultural output that makes it difficult to make reasonable predictions of future trends.

2.2 Sexual Behaviour

2.2.1 Common Forms of Sexual Relationships and Risky Sexual Behaviour

Sexual relationships take a lot of forms in the country (Chirwa and Chizimbi, 2009), and are known with different names. The most common is *chibwenzi/zibwenzi*. This is generally a love affair between a man and a woman and is manifested in different types. Extra-marital sexual relationships with a former lover are also common and are usually described as “madzi saiwala khwawa”. This is done in secret with former lovers. *Kusasa fumbi* is another form which is prevalent in the country. This in literal terms means “dusting off” and is done as a puberty rites of passage for the new initiates. In addition to these, *fisi* is common in the country. *Fisi* (hyena) is a secret male sexual performer who goes into the girls’ lodging places to do the ritual or one who, by arrangement or hire, goes into a home of a barren man to impregnate the wife. Such practices may result in informal or temporary sexual relationships. *Kukhalira limodzi* or *kulowana* or *banja longolowana* is also practiced in the country. This refers to cohabitation.

Transactional sexual relationships (Swidler, 2007; Chirwa and Chizimbi, 2009; Limwame and Kumwenda 2009) is where sexual favours are exchanged with material and/or non-material favours and items, but in an imbalanced power relationship that often favours the male side. It is different from casual and other commercial sex in the sense that it is combined sexual relations of mutual affection with overt economic exchange. In addition to the previously mentioned, *uhule* is also practiced. In simple terms this strictly means prostitution. It is a professional and entrepreneurial sexual transaction, done as a business but sometimes carrying social obligations. Nevertheless, the term *hule* may

apply to a person who freely and frequently changes sexual partners or one who engages in multiple sexual partnerships even if such a person is not necessarily a prostitute. Lastly, *kulowa kufa* , is another form of risky sexual behaviour which is done as sexual cleansing for death or any other calamity. The act is common in the southern district of Nsanje (Chirwa and Chizimbi, 2009).

2.2. 2 Median Age at First Sex among 15-24 Years Olds

There is not much variation in as far as sexual debut is concerned for young people in the country. As it can be observed from Table 1, both the Multiple Indicator Cluster Survey (MICS) 2006 and MDHS 2004 point to the same observation that sexual debut among male youth has increased between 2004 and 2006. The age at first sex for females has remained static at 16 over the three reporting points. In terms of location, while the age at first sex is static for females in both urban and rural areas, the MDHS 2004 and MICS 2006 report an increase from the reported 2000 MDHS figures of 15 to 16 for rural males, whilst for urban males the median age at first sex is 16 in the MDHS 2000, 17 in the MDHS 2004 and 16 in the MICS 2006 (NSO and ORC MACRO, 2001, 2004; NSO, 2006).

Table 1: Median Age at First Sex

	MDHS 2000	MDHS 2004	MICS 2006
Male	15	17	16
Female	16	16	16
Location			
Rural Male	15	16	16
Rural Female	16	16	16
Urban Male	16	17	16
Urban Female	16	16	16

Source: NSO and ORC MACRO 2001, 2005, NSO 2006

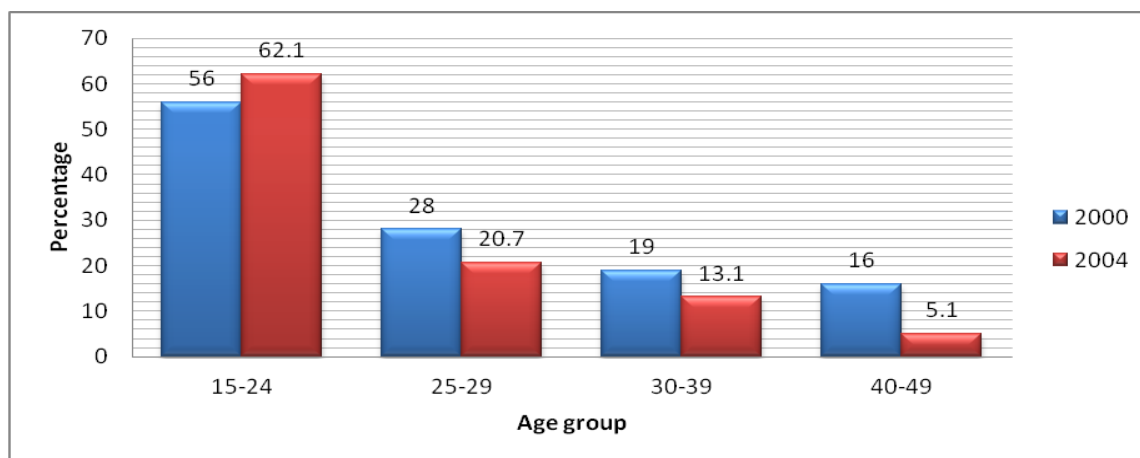
2.2.3 Higher Risk Sex⁴

Figure 2 and Figure 3 present the percentage of men and women reporting risky sexual behaviour. Between 2000 and 2004, the proportion of men reporting higher risk sex increased in the age group 15-24 from 56 percent to 62.1 percent. The trend started going downward in the other age group. In the group 25-29, it dropped from 28 to 20.7 percent respectively. The downward trend continued up to the age of 40-49 where 16 percent was reported in the year 2000 and 5.1 percent was reported in the year 2004, as can be seen in Figure 2. However, a closer comparison of the figures shows that there is a difference in terms of reporting between men and women. From Figure 3, in the age group 15-24, 16 percent reported to have engaged in higher risk sex in the year 2000 and 13.9 percent reported to have engaged in higher risk sex in the year 2004. Nevertheless, the trend started increasing in the older age groups. In the age group 25-29, the reporting

⁴ The DHS defines risk sexual behaviour as sex with non marital/non cohabiting partners. But there seems to be a limited view in this definition because it rules out risky sexual behaviour such as sexual encounters with infected partners within the marriage context

increased from 3 percent to 5.4 percent and in the age group 30-39, the increase was from 4 percent to 4.8 percent and in the age group 40-49, the reporting increased from 2 percent to 3.3 percent.

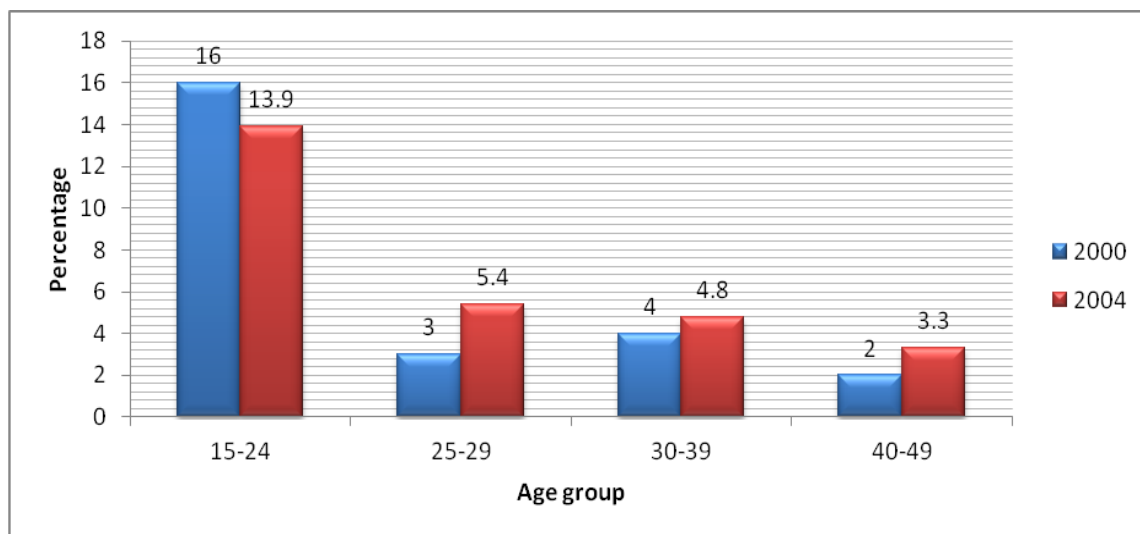
Figure 2: Percentage of Men Reported Higher Risk Sex 2000 - 2004



Source : NAC 2010

The general observation from figure 1 and 2 is that, the trend is going down for men whereas the trend in reporting risky sexual behaviour is increasing for women. One can deduce that men are likely to be engaged in high risk sex than women in all categories of age. Nevertheless, it is possible that women may have under reported: this is one of the problems of studying female sexuality in an African context (Djamba, 1997).

Figure 3: Percentage of Women Reported Higher Risk Sex 2000-2004



Source: NAC 2010

2.2.4 Active Population Using Condoms at Last High-risk Sex

Table 2 shows the trends in condom use in the period 2000 to 2006. The 2004 MDHS indicates that 47.1 percent of males and 30.1 percent of females reported using a condom at last sex with a non-regular partner. The implication is that there is an increase from 38.9 percent for males and 28.7 percent for females from 2000 MDHS. If compared to the 2006 MICS, the corresponding proportions were 57.2 percent for males and 37.5 percent for females. The proportion for urban males and females using condoms were higher relative to their rural counterparts. The general observation is that more males use condoms than females and that condom use is higher in urban than in rural areas (NSO and ORC MACRO, 2005; NSO, 2006)⁵.

⁵ This comparison using the MICS and the MDHS must be taken with caution since these two surveys use different methodologies. What is important is that they all point out the general trends in sexual behaviour regarding condom use.

Table 2: Trends in Condom Use (percent) 2000 to 2006

	MDHS 2000	MDHS 2004	MICS 2006
Male	38.9	47.1	57.2
Female	28.7	55.9	37.5
Rural			
Male	36	30.1	55.7
Female	23.4	24.8	34.6
Urban			
Male	49.7	57.2	63.3
Female	44.3	43.7	44.9
Young People(15-24)			
Male			57.5
Female			39.5

Source: NSO and ORC MACRO, 2005; NSO, 2006

Given that observation, one may still think of a number of issues causing the disparity in the use of condoms. This may be due to difference in power relation which renders women to have little control on the use of condoms (NAC, 2009). Furthermore, this could be as a result of information asymmetry, with those in urban areas having more access to information compared to their rural counterparts. Promotion of the female condom, as well as intensified reach of information, education and communication messages in the rural areas, and improvements in access and use of condoms could result in a significant shift in this statistics (NAC, 2009)

Recent results from the MDHS 2010 survey show that there is great variation in as far as sexual behaviour is concerned in the country. Among men who had two or more partners in the past 12 months, 27 percent reported using a condom at the last sexual

intercourse. As compared to women, 25 percent reported using a condom at the last intercourse. Among all male respondents who have had sexual intercourse, the mean number of partner in their life time is 4, twice that of women. Men with no education are more likely than others to have two or more partners in the past 12 months (11 percent versus 9 percent). However, they are less likely to have used a condom at last sex (13 percent versus 21 percent or higher). Overall, 9 percent of men reported that they had two or more partners in the past 12 months. A general comment from the MDHS 2010 results indicate that condom use amongst women is very low despite being slightly higher than the 2004 figures. The background factors leading to these, still need to be investigated (NSO and ORC MACRO, 2011).

2.3 Attitudes towards Condom Use

Many people in Malawi have negative attitude towards condoms (Kornfield and Namate, 1997). There are still considerable myths and misconception about condom at community level. Condoms are sometimes associated with promiscuity, commercial sex, or distrust of one's partner, and are also perceived by some to reduce sexual pleasure. People usually say that "they do not like to eat sweets inside their wrappers" furthermore, some individuals reportedly believe that condoms are ineffective (Chimbiri, 2003; Limwamwe and Kumwenda, 2009). In addition to this, some people in a new relationship may start with condom use in the initial stages only to abandon them later once "trust" appears to have been developed between the partners (Swidler, 2007; NAC, 2009).

2.4 Drivers of Multiple Concurrent Partnerships (MCP)

There are a lot of drivers for MCP. These include cultural, material, interpersonal, mobility and physical distance, sexual pleasure and displeasure. The material drivers include among others materialism and investment. These are poverty driven (However, the connection is not as direct as otherwise thought to be). Interpersonal factors include peer pressure, mistrust between partners, physical and non-physical violence, use of bad language, non-constructive criticisms that do not offer solutions, failure to provide comfort when needed. Personal motives include the quest for honour, the need for pleasure, leisure and entertainment, competition among members of the same age groups and consumerism and material comfort. Mobility and physical distance between partners may drive a spouse to look for an alternative sexual pleasure and displeasure. The search for sexual satisfaction, expertise, competence and sexual pleasure that is assumed or understood to be not readily available in steady relationships drives many people to try it with other partners (Chirwa and Chizimbi, 2009).

An earlier study by Limwame and Kumwenda (2009) identified similar drivers. These include material gains, sexual variety, sexually appealing features, “out-of-fashion” or “outdated” wives, sexually skilled partners, menstruating, childbirth, marital misunderstandings, gender issues, peer pressure, parental pressure, habit, fame, women’s seductive dressing, lack of self-control, revenge on cheating spouses, impact of frequent travel, and previous partners (Munthali, Chimbiri, Zulu, 2004; Madise et al., 2007; Limwamwe and Kumwenda, 2009). In addition to these, other drivers include ease of communication, for example, the coming of cell phones which has enhanced easy communication, advances in family planning methods/birth control which has removed

the fear of pregnancy, exposure to visual and audio forms of entertainment with explicit sexual contents such as, blue movies, and lastly, occupations that enable one to take advantage of a client who is in a weaker position or desperately in need of assistance.

MCP exist in spite of a number of potential deterrents to it such as strong religious beliefs in monogamy, fear of violence, negative public image, fear of litigation , psychological trauma accompanying revelation of infidelity, fear of material costs related to maintenance of multiple sexual partners (Madise et al., 2007;Limwamwe and Kumwenda , 2009)

2.5 HIV and AIDS

2.5.1 Epidemiological Patterns of HIV in Malawi

Malawi continues to experience a severe HIV epidemic. Since 1985 when the first AIDS case was reported, HIV prevalence increased significantly particularly among persons aged 15-49. The HIV prevalence rose to 16.2 percent in 1999, before declining to around to 12 percent since 2007. As already indicated, the prevalence is higher among females at 13 percent than males (10 percent). This translates into about 1 million Malawians living with HIV, including roughly 100,000 children under the age of 15 years (NAC, 2010). About 88 percent of all new infections are acquired through unprotected heterosexual intercourse and about 10 percent through mother to child transmission. The remaining 2 percent is attributed to blood transfusion, contaminated medical and skin piercing instruments.

2.5.2 HIV Prevalence by Age and Sex

The prevalence distribution by age in Malawi is typical of HIV epidemics at similar stages in Eastern and Southern Africa. HIV prevalence is high among young people. The MDHS 2004 and 2010 indicated that within the age group 15-29, the prevalence is much higher in women than men. In the age group 15-19, the prevalence is 3.7 percent for females and 0.4 percent for males. The prevalence for the age group 20-24 is 13.2 percent for females and 9.8 percent for males. However, the trend changes for the age above 30 years, where men have a higher prevalence than women where the statistics being at 17.0 percent for females and 17.5 percent for males (NSO and ORC MACRO, 2005; NSO and ORC MACRO, 2011).

The incidence becomes higher in youth as they begin to engage in sexual activity and with minimal consistent condom use. Incidence of HIV occurs at a younger age in females than males but with relatively equal cumulative incidence or prevalence impact over time as male prevalence rates exceeds those of females at age 30 and above. Although the national HIV prevalence is declining, on average there are 90,000 new HIV infections each year with at least half occurring among the youth aged 15-24. The majority of people being those previously considered being at low risk, for example, couples and partners (NAC, 2009; NAC, 2010).

However the most recent statistics indicate that the adult prevalence by age and sex is declining at national level although the prevalence is still higher in women. Although such is the case, the declines are not statistically significant (NSO and ORC MACRO, 2011)

2.5.3 HIV and AIDS Knowledge and Awareness

Knowledge essentially is the recall recognition of specific and universal elements in a subject area. In the context of HIV and AIDS, having knowledge implies ability to recall facts concerning causes, transmission and prevention concerning HIV and AIDS (Odu and Akanle, 2008). In 2004 MDHS, 47 percent of women knew that HIV could be prevented by using a condom and by limiting sexual partners. This compares with 66 percent in 2010. Among men, this percentage increased from 53 percent in 2004 to 66 percent in 2010. Overall, women residing in urban areas are more likely to be knowledgeable about HIV prevention methods than their counterparts residing in rural areas.

The same pattern is true for men (NSO, 2011). Additionally, comprehensive knowledge is higher among youths in urban areas than among youths in rural areas, especially among women. Among both sexes, the proportion with comprehensive knowledge tends to increase with level of education and wealth quintile. Among young women, the level of comprehensive knowledge about HIV is highest in the southern region (50 percent), compared with 36 percent in the central region, and 31 percent in the northern region. In as far as HIV testing is concerned, the proportion of persons 15 years and above that had undergone an HIV and AIDS test increased from 33 percent in 2008 to 41 percent in 2009. Similarly, the proportion of persons 15-24 year olds who had undergone an HIV and AIDS test increased from 14 percent in 2005 to 24 percent in 2007 and to 46 percent in 2009 (NSO, 2004; NAC, 2010). The greatest challenge is that despite the high knowledge, it is still not being put to practice (Munthali, 2002).

2.5.4 National Response to HIV and AIDS

In response to this HIV and AIDS pandemic, the government has developed and is implementing several strategies and plans aimed at reducing the transmission of HIV through sexual intercourse and mother to child, among others. Some of the strategies and plans are the national behaviour change intervention strategy for HIV and AIDS and Sexual Reproductive Health (2003); National Plan of Action for scaling up Sexual and Reproductive Health HIV prevention for young people (2008-2012); plan for scaling up HIV Testing and counselling (2006-2010); Plan for scaling up Prevention of Mother To Child Transmission of HIV services in Malawi (2008-2012), ART scale up plan (2006-2010); Condom Strategy (2006); Abstinence Strategy (2008) and lastly, Mutual Faithfulness Strategy (2008-2012); Mostly, the HIV prevention strategies being implemented address behaviour change, HTC, PMTCT, STI management and blood safety (NAC, 2009).

2.6 Conclusion

This chapter has given a brief overview of sexual behaviour, poverty and risky sexual behaviour in Malawi. Various forms of risky sexual behaviour being practiced in Malawi have been explained. Furthermore, the current trends in HIV and AIDS knowledge have been outlined. It can be concluded that although HIV and AIDS awareness is high, there is low comprehensive knowledge in HIV and AIDS. The available data indicates that poverty trends are going down. The next chapter undertakes a literature review, where the theoretical and empirical literature is presented.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

The chapter presents a summary and discussion of what other researchers have done in the area of risky sexual behaviour. The chapter has three sections. Section 3.2 provides some theoretical literature that gives the theoretical framework upon which the study is based. The second section, 3.3, presents some empirical evidence on risky sexual behaviour, and lastly section 3.4 concludes the chapter.

3.1 Theoretical Framework

3.1.1 Rational Choice Theory

Since sexual behaviour is a decision which is assumed to be rational it can be explained using rational choice theory. Rational choice theory examines how rational individuals make consumption choices when faced with limited resources. The limited resources determine what options an agent can afford. Given a set of available consumption bundle an individual attempts to pick the best one that maximizes the utility of the agent in question. According to Krepps (1990) and Mascollel (1995), the

individual is assumed to be rational and this rational behaviour is characterized by using the axioms of completeness, transitivity and continuity.

In this theory, it is assumed that each decision maker is able to compare two alternatives “x” and “y” in the choice set U . If “x” is strictly preferred to “y” ($x > y$) the decision maker either prefers “x” to “y” or is indifferent ($x \sim y$). The ranking that occurs with the various options is what defines individual’s utility. In this context, the theory can be applied to sexual behaviour in the following way. An individual compare alternative sexual behaviour (“x” to “y”) in order to maximize utility. This depends on the preferences and the expected utility from each, subject to the costs. The costs among others are things such as being infected with diseases and loss of dignity in society. The benefits may include the sexual pleasure derived from the acts as well as the income earned from transactional sex.

However, one can still criticise the theory in as far as sexual behaviour is concerned since it does not fully explain every aspect of sexual behaviour. This is so since it includes only rational sexual decisions, where as some sexual decisions may be irrational such as fulfilling cultural obligations such as ritual sexual cleansing, which may be imposed on the individual and not out of free will. Furthermore, practices such as rape may not be explained by this theory.

Becker (1976) set out to explain human behaviour using an economic approach. His proposition was that most types of human behaviour can be seen as rational and utility maximizing. The approach has four main axioms; first, human behaviour is interlinked in market systems in which choices of individuals are shaped by costs and benefits in the context of stable preferences; second, resources are scarce and desirable, and they are

allocated by market influences; third, there is competition among sellers of goods or services; fourth, individuals want to maximize their outcomes, which define their utility. The individuals mutually maximize their utility and the cost to each agent is not necessarily the money cost since sex is a “non market good”⁶. The costs are the outcomes of the sexual acts, which may include sexual transmitted disease among others. In this context is sex risky. Risky sex is transactions that take place under conditions of uncertainty. This results from lack of assurance on the quality of the service under transaction.

Philipson and Posner (1993) explain risky sexual behaviour subject to HIV constraint. In this framework, an individual makes a choice between safe and unsafe sex. “Safe sex” means sex with condoms and is completely safe, and “unsafe sex” denotes all other forms of sex and is equally unsafe. Individuals engaged in sexual trade with each other are denoted as m , for male, and f , for female. Their explanation rules out homosexuality. The decision to engage in unsafe sex is modelled as a problem of making a rational choice under condition of uncertainty. The expected utility (EU) of risky sex for m and for f is equivalent to the benefits (B) minus the expected costs (C) of risky sex. Given the notation, the utility functions are defined as:

$$EU_m = B - C(P_{tf}(1 - P_m)P_f), \quad (3.1)$$

$$EU_f = B - C(P_{tm}(1 - P_f)P_m), \quad (3.2)$$

where, EU = expected utility of the sexual behaviour, B = benefit of unsafe sex

C = cost of becoming infected with HIV, P_{ti} = probability of transmission; $i = m, f$

⁶ The theory can be criticized for ignoring that the market for sex exist

P_i = probability that m or f is already infected; $i = m, f$. Only when the expected utility of both individuals are positive is when the exchange will occur i.e if $(EU_m, EU_f) > 0$. The benefit (B) of unsafe sex is synonymous to the disutility of using a condom as per assumption. The benefit is assumed to be mutual although the utilities may be different. This means that sexual pleasure with no condom is not the same for the two (Philpson and Posner, 1993).

Individuals in the sex trade are assumed to be non-altruistic to each other, meaning that the cost to one's sexual partner if he or she becomes infected is not a cost to oneself. Altruism can either reduce or increase the cost of risky sex. It is likely for an altruist to switch to safe sex to avoid infecting the partner than an egoist. Similarly, an altruist may be more willing to engage in unsafe sex if it improves his or her partner's utility. The two utility functions defined thus create the joint demand for unsafe sex for all possible infection probabilities of m and f . By voluntary utility-maximizing behaviour of rational individuals, the cost can easily increase (Philpson and Posner, 1993). The theory can be criticized because it ignores the ways in which political, social, and cultural inequalities such as ethnicity, gender, class, and tribe may systematically bias safe sex market negotiations, including those over safe sex. In addition to this, the theory is much more centered on the costs of unsafe sex it explains nothing on the cost of safe sex. Apart from the cost of the condoms are associated time costs, and social costs such as ridicule of people in possession of condoms. Even where the government provides them people have to leave other important issue and travel to issuing place.

Extending the standard utility framework, Francis (2005) presents a simple model of sexual behaviour that is useful to understand the trade-offs among sexual activities (behaviour). The model shares a basic assumption that sexual behaviour is rational. In the model, an individual rationally chooses between two sexual activities. Preferences over the sexual activities are assumed to be biologically determined. The utility function for the individual is given as $U = U(X_1, X_2)$, where X_1 and X_2 denote the consumption of sexual activities one and two, and the goods are substitutes. Consumption, broadly defined, incorporates three distinct but interrelated dimensions of sexuality: behaviour, desire, and identity. Each activity is associated with a cost, which is all-encompassing in that it includes the potential costs of sexually transmitted diseases, pregnancy, social stigma, time, and direct or indirect monetary expenses. Let C_1 and C_2 denote the cost of sexual activities one and two.

An individual is endowed with total resources R . This captures the notion that an individual has limited time, money, and physical capacity. Hence, the resource constraint is $R = C_1X_1 + C_2X_2$. In order to maximize his or her utility an individual optimally allocates resources between sexual activities subject to this constraint. From this it can simply be deduced that $\frac{\partial X_1}{\partial C_1} < 0$ and $\frac{\partial X_2}{\partial C_1} > 0$ is simply the law of demand for the alternative sexual activity. The implication of the model is that as the cost of one sexual activity rises relative to the cost of the other, consumption of the first sexual activity decreases, and consumption of the second increases. Thus the model sheds light on the trade-offs among sexual activities such as the trade-off between vaginal and oral sex; protected and unprotected sex; and promiscuity and monogamy.

A quick observation of the theoretical explanations above can show that all the above mentioned theories are based on rational choice and have the same implications. The differences are the way in which they define their costs. Whereas Philipson and Posner define costs in terms of cost arising out of HIV, Francis includes things such as time, as well as direct monetary expenses. It must be noted out that the theories are weak when it comes to explaining sexual behaviour when it is irrational and when the economic aspect is ruled out. These theories also ignore the ways in which political, social, and cultural inequalities such as ethnicity, gender, class, and tribe may systematically bias safe sex market negotiations, including those over safe sex. In addition to this, the theories are much more centered on the costs of unsafe sex and ignore the costs of safe sex.

3.2 Theoretical Perspectives on Female Sexual Behaviour in Africa

Djamba (1997) suggests that in order to understand female sexual behaviour in Africa, theoretical approaches can be grouped into three broad categories: anthropological perspectives, rational adaptation or economic perspective, and social disorganization theory.

3.2.1 Anthropological Approaches

These emphasize the role of social structures in influencing sexual behaviour. Factors such as religion and kinship are among the greatest factors that affect female sexual behaviour in Africa. With religion, it is argued that Africa is highly religious and that most religions are conservative when it comes to female sexuality, thereby

controlling sexual behaviour. In as far as kinship is concerned the different explanations converge towards Goethals hypothesis of “patrilineal bias.” Where the kinship system is more patriarchal, the sanctions against female (non-marital) sexual behaviour become more and more severe than in a matrilineal situation (Goethal, 1978; Djamba, 1997).

3.2.2 Rational Adaptation or Economic Perspective

Proponents of the rational adaptation perspective argue that the current sexual behaviour of women, especially the unmarried ones, is economically rational. Under the rational adaptation assumption, sexual relations are viewed as a means by which young women get economic benefits (Coleman, 1988; Djamba, 1997). A major weakness of the theory is that while it is true that women have limited access to economic resources in many African countries, their entry into sexual relations may not be merely the result of poverty but also biological which determine the structure of interaction between potential sex partners. It can be observed that this is just the rational hypothesis put in an African context.

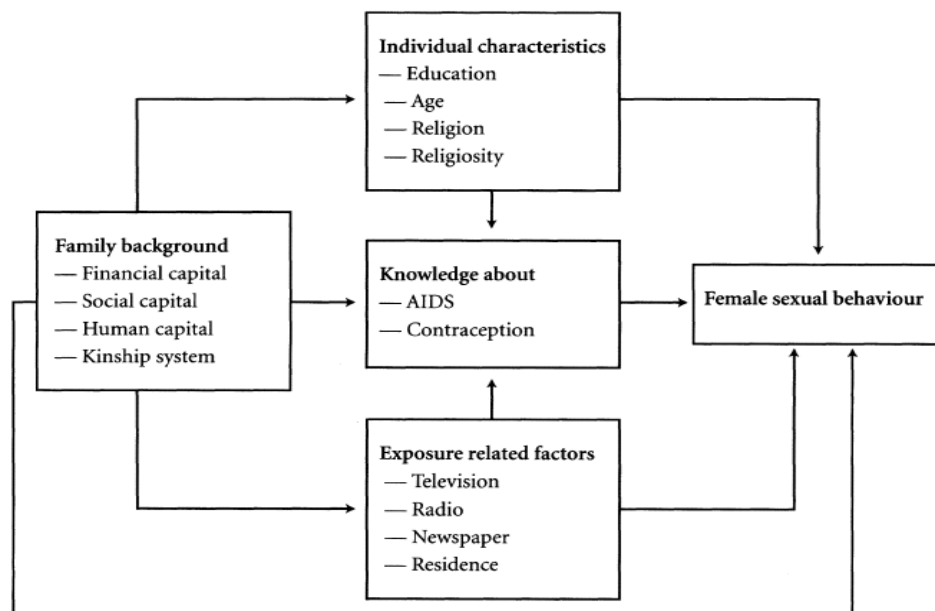
3.2.3 Social Disorganization Theory

This relates female sexual activity to change in social control, called social disorganization. The view is that the current level of female sexual activity results from the breakdown of social control that older persons had over younger ones. Factors which are held accountable for the loosening of social controls are education, urbanization, and the mass media. It is argued that these factors are associated with the westernization of

Africa, which leads to deferred marriage while removing youth from parental surveillance (Hirshi, 1969; Djamba, 1997)

In summarizing the theoretical perspectives, Djamba comes up with a conceptual framework for analyzing female sexual behaviour based on Coleman's work. He argues that family background variables are key factors of socialization and social control, especially in the area of female sexual behaviour. The framework defines three types of family resources, or capital, which are assumed to affect children's socialization: financial capital, human capital, and social capital. Financial capital is essential in testing assumptions of the rational adaptation theory. The theory is summarized in Figure 4.

Figure 4: Conceptual Framework for Understanding Female Sexual Behaviour in Africa



Source: Djamba 1997

3.3 Empirical Literature

A study of risky sexual behaviour and condom use in Malawi (Madise and Chanon, 2004), established that 12.6 percent of sexually active females in the sample were seen to have had risky sexual intercourse. Most were classified as risky due to the presence of STI in the last 12 months indicating large levels of passive exposure. Condom use with a marital partner, a girlfriend or fiancée or a casual partner showed no variation at the cluster or district level. Matrilineal ethnicities were, in general, seen to be more likely to engage in risky sexual intercourse and less likely to use a condom. This study, however, did not look at the effect of HIV knowledge on the aforesaid risky sexual behaviour.

Using logistic regressions, Madise, Zulu, and James (2007), looked at the link between poverty and risky sexual behaviour in four countries by examining the effect of wealth status on age at first sex, condom use, and multiple partners using nationally representative adolescents' data from Burkina Faso, Ghana, Malawi, and Uganda. The studies used Demographic Health Surveys for representative countries. Wealth status was determined using wealth quintiles derived from information on the presence or absence of household assets and amenities as proposed by Filmer and Pritchett (2001). Results showed that the wealthiest girls in Burkina Faso, Ghana, and Malawi had later sexual debut compared with their poorer counterparts but this association was not significant for Uganda. Wealth status was weaker among males and significant only in Malawi, where those in the middle quintile had earlier sexual debut. Wealthier adolescents were most likely to use condoms at the last sexual act, but wealth status was not associated with number of sexual partners.

Despite the fact that the link between wealth status and sexual behaviour was found not to be consistent, there is evidence that poor females are vulnerable to infection because of earlier sexual debut and non-use of condoms. It must be observed however, that despite the contextual factors, the study did not take into account the effect of economic stress and HIV knowledge as well as perceptions on condom use.

Hickey (1997) conducted a longitudinal study in Mchinji in Malawi on factors explaining the observed pattern of sexual behaviour. The study was ethnographic⁷ in nature and sought to describe how the cultural construction of gender and sexuality shapes notions of both male and female sexuality and reproductive health. The results show that traditional beliefs do have a place in people's lives, concerning sexuality. In addition to this, there is a difference in power sharing in relationship with male counterparts having more power in sexuality. In as far as sexual communication is concerned, it was found that communication on sexuality within gender is not a problem but across gender. It should be noted however that despite the rich nature of the study, it clearly ruled out the role of economics in determination of sexuality, which this study intends to address.

Baird et al (2010), aimed to provide new causal evidence on the effects of a conditional programme (with only school attendance used as a condition for the transfers) on the self-reported sexual behaviour of the young female beneficiaries of the program. The results indicate that after one year, the program led to large increases in self-reported school enrolment, as well as declines in early marriage, teenage pregnancy, sexual activity, and risky sexual behaviour. In other words, as girls and young women returned to (or stayed in) school, they significantly delayed the onset (and, for those already

⁷ Ethnographic study studies the opinions, attitudes and customs as well as traditions of a group of people.

sexually active, reduced the frequency) of their sexual activity (Baird et al, 2010). It can be concluded that income has a negative relationship with sexual behaviour. However, the paper does not capture the influence of HIV and AIDS knowledge or that of attitudes towards condoms on sexual behaviour.

Awuso-Asare and Annim (2008) explore the determinants of sexual risk-taking behaviour especially the effects that variations in household wealth status, gender and different sub-population groups have on this behaviour in Kenya and Ghana. Wealth quintiles were used as a proxy for economic status, while non-marital and non-cohabiting sexual partnerships were considered indicators for risky sexual behaviour. The results were mixed. For females, there appeared to be an increasing probability of sexual risk taking by wealth status in Kenya; while in Ghana, an inverted J-shaped relationship is shown between wealth status and sexual risk taking. When controlled for other variables, the relationship between wealth status and sexual risk-taking behaviour disappears for females in the two countries. For males, there was no clearly discernable pattern between wealth status and sexual risk-taking behaviour in Ghana, while there is a general trend towards increasing sexual risk-taking behaviour by wealth status in Kenya. In general, for both Ghana and Kenya, men in the highest wealth quintile were found to be more likely to have multiple sexual partners than the other groups.

Dinkelman et al., (2008), investigated the link between household income and income stress, and risky sexual behaviour of young people, using a panel of young adults in Cape Town. The results indicated that females in poorer households were more likely to be sexually active in 2002 and more likely to have their sexual debut by 2005. In addition, girls in households experiencing negative economic shocks were more likely to

reduce condom use between 2002 and 2005. However, they are less likely to have multiple partners in 2002 or have transitioned to multiple partners by 2005. Males who experienced a negative shock were more likely to have multiple partners. Furthermore they established that there was to be no systematic difference in condom use at last sex by household income levels or income shocks.

Hallman (2004) came up with results similar to Dinkelman et al (2008). His study investigates how relative socioeconomic status influences the sexual behaviours of young women and men aged 14–24 years in KwaZulu-Natal Province, South Africa, believed to have high HIV prevalence and high rates of poverty and inequality. In their results, relative economic disadvantage is found to significantly increase the likelihood of a variety of unsafe sexual behaviours and experiences. Low socioeconomic status has more consistent negative effects on female than on male sexual behaviours; it also raises female risk of early pregnancy

According Tivory and Swidler (2009), it is not women's poverty but the relative wealth of men that is the cause of transactional sex, and as such improving women's' economic circumstances are unlikely to decrease women's' vulnerability to HIV infection. Cost and availability may limit condom use, especially in very poor countries like Malawi. In Malawi, *Chishango* condoms are heavily subsidized and widely available. Sensuality is the first semiotic axis that structures the meanings of condom use.

3.4 Conclusion

The chapter has reviewed different studies on risky sexual behaviour. However, household demographic and economic characteristics have showed mixed results in as far as their impact on risky sexual behaviour is concerned. This has been due to the various definitions of what constitute risky sexual behaviour. The next chapter presents the methodology used in the study; the empirical model, diagnostic methods and data sources.

CHAPTER FOUR

METHODOLOGY

4.0 Introduction

This chapter presents the methodology of the study. It has been organized in six sections. Section 4.1 presents the modeling framework and econometric specification. Description of the variables is presented in section 4.2, data source is explained in section 4.3, and diagnostic measures to be done are in section 4.4. Section 4.5 presents the ethical procedure undertaken and lastly section 4.6 concludes the chapter.

4.1 Modeling Framework and Econometric Specification

The definition of the behaviour which constitutes risky sexual behaviour has varied between studies, with the obvious result of difficulty in comparisons between investigations (Madise, 2007). Risky sexual behaviour includes early sexual debut (age less than 18), unprotected sexual activity, inconsistent use of condoms, high-risk partners , sex with a partner who has other partners or more than one partner at a time , survival sex (sex in exchange for money, drugs, food, or shelter), (Taylor-Seehafer and Rew, 2000; Hallman, 2004; Madise, 2007;Warren, 2010), among others. In this study risky

sexual behaviour is defined as having unprotected sex with non marital/non cohabiting partners (Gruber, 2000; Hallman, 2004; Madise, 2007; Nnko, Mwaluko Urassa, Zaba, 2004; Dinkelman et al., 2008; Warren, 2010).

4.1.1 Analytical Modeling

Since the dependent variable follows a choice, there are basically three ways of formulating choice models. For the case where one is looking at a discrete choice model, linear probability model (LPM), logit or probit models could be deployed. For dichotomous choice models, bivariate probit and logit models could be used. The choice model is formulated as (Greene, 2003; Gujarati, 2003);

$$y_i^* = \alpha_i X + \varepsilon_i, \quad (4.1)$$

where $y_i = \begin{cases} 1 & \text{if } y_i^* > 1 \\ 0 & \text{if } y_i^* < 1 \end{cases}$

$y_i = 1$, if the individual uses a condom; $y_i = 0$, if the individual chooses not to use a condom, X_i are explanatory variables and ε_i is an error component. So that in a linear probability model (LPM), the probability of the individual indulging in risky sexual behaviour is given by;

$$p_i = E(y = 1 | X) = \alpha_i + \alpha_i X_i \quad (4.2)$$

Since in this formulation, $\text{var}(\mu_i) = p_i(1 - p_i)$ it can be observed that the error term will depend on the observed probability hence heteroscedastic (Gujarati, 2003). In the presence of heteroskedasticity, the OLS estimators, although unbiased, are not efficient. In addition to the OLS estimators being inefficient, their estimated probabilities

sometimes lie outside the logical range of 0 and 1 and the error term follows a Bernoulli and not the normal distribution, such that such a model cannot be used for inference. We therefore cannot use a LPM. Alternatives to the LPM are the probit and logit models. Probit and logit models give similar results. The choice between the two models is solely dependent on the probability distribution assumption.

The study adopts the probit model. The probit model could be formulated as in equation 4.2 above but is based on the following cumulative standardized normal distribution (Gujarati, 2003; Cameron and Trivedi, 2005);

$$F(z) = \Phi(z) = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}z^2} \quad (4.3)^8$$

so that the change in the probability of an individual using a condom given their characteristics, X_i would be given as follows;

$$\frac{\partial P(y_i = 1)}{\partial x} = f(z)\alpha_i = \Phi(z)\alpha_i \quad (4.4)^9$$

4.1.2 Empirical Specification

This study adopts the specification by Dinkelman et al., (2008). However, it is modified to accommodate other variables not used by Dinkelman et al., (2008). Variables such as HIV knowledge, perception/beliefs on condom use, access to condoms have been added to the model. The specification thus becomes;

⁸ See also Greene (2003)

⁹ Greene 2003

$$y_j = \alpha_0 + \alpha_1 X_j + \alpha_2 I_j + HIV_j + \varepsilon_j \quad (4.5)$$

where X_j is a set of individual-level covariates (age, education, etc), and HIV_j is a variable which assess if one is aware of the sexual behaviour which leads to HIV transmission. Using the above specification, this study defines income as current income earned by an individual and in addition to these, we make use of other variables which are the controls namely education, age, marital status, perception on condom use, religion, and employment. The wealth status index will be introduced solely to establish the robustness of the results.

4.2 Description of Variables

Sexual Behaviour

This is the dependent variable.¹⁰ The proxy used for risky sexual behaviour is condom use with non marital sexual partners (Gruber, 2000; Hallman, 2004; Nko et al, 2004; Madise, 2007; Dinkelman et al, 2008; NSO, 2005; Warren, 2010). Condom use takes the variable of 1 for non risky individuals and 0 for risky individuals.

Poverty: This study uses income as a proxy for poverty. This variable is measured as a continuous number. The relationship between income and risky sexual behaviour can be positive, neutral as well as negative. The positive relationship comes in the sense that people with more income are more likely to be involved in extra marital affairs, multiple partners, since they have access to wider networks (Djamba, 1997;

¹⁰ In the study, the set of sexual behaviour captured include number of multiple sex partners (MCP), condom use at last sex, sex under the influence of alcohol, illicit drugs.). Given the low response and gaps in the number of partners (MCP) variable, as well as the low variation in the variable which captures sex under influence of alcohol, the study thus used condom use as the only variable therefore make use of condom use with non-marital sexual partners, as a measure of high risk sex.

Madise, 2007; Warren, 2010). This view challenges the other view that poverty is the driving force of risky sexual behaviour. On the negative part of the argument, it is argued that poor people take risks as part of survival strategies. Furthermore low socio-economic status makes it impossible for poor people to pursue protective behaviours even though they have knowledge because their financial dependence on the sexual partners reduces their negotiation power (Swidler and Watkins, 2007; Dinkelman, 2008).

Religion: Religion is any specific system of belief about deity, often involving rituals, a code of ethics, a philosophy of life, and a worldview, which is a set of basic foundational beliefs concerning deity, humanity and the rest of the universe (Djamba, 1997; De Walque, 2006; Ochieng', 2007;Dinkelman, 2008) . The religious variables used were, catholic, muslim, indigenous religion, and protestant christians (reference category). The catholic religion was singled out due to its different social teachings on condoms (De Walque, 2006; Warren, 2010). The direction of influence can take various forms since different religions teach different ideologies in as far as condom uses are concerned. In this study, religion is a dummy variable taking the value of 1 if the individual belongs to a particular religion and 0 other wise.

Belief/Perception on Condom use: Even when people believe that condom use is appropriate, wise, or even a matter of life and death, the general perception about condom use and the perceived “sweetness” of sex has an effect on its use. On one hand, if people regard condoms to reduce the sweetness of sex, they are likely not to use it; on the other hand if they believe that it does not have any impact on the sweetness of sex, they are likely to use it (Peterson and Bakerman, 2006;Tivory and Swidler, 2009). Sensuality is the first semiotic axis that structures the meanings of condom use. The study captured

beliefs about condoms as a binary variable taking a value of 1 if condom use is thought to bring less pleasure and 0 if condom use is believed not affect sexual pleasure.

HIV and AIDS Knowledge (sexual transmission): Knowledge essentially is the recall recognition of specific and universal elements in a subject area. In the context of HIV and AIDS, having knowledge implies ability to recall facts concerning causes, transmission and prevention concerning HIV and AIDS. It is expected that when one has the knowledge of HIV and AIDS, the accompanying behaviour would be logical. That is, having the knowledge of prevention, transmission and other facts would motivate logical safe sex behaviour. In other words, knowledge contributes to behaviour modification (Odu and Akanle, 2008; Lema et al., 2008). Despite the logical expectation from knowledge of HIV and AIDS, there has not been a consensus on the direction of influence of HIV and AIDS knowledge on sexual behaviour. The UNAIDS (1997) report has shown that, of 53 studies that evaluated specific interventions, 27 reported that HIV and AIDS and sexual health education which aimed at promoting awareness, neither increased nor decreased sexual activity. Twenty-two reported that HIV and/or sexual health education delayed the onset of sexual activity, reduced the number of sexual partners, or reduced unplanned pregnancy and STD rates. Only three studies found increases in sexual behaviour (UNAIDS, 1997). Thus knowledge is expected to take any sign. The variable will take the value of 1 if one knows sexual transmission methods and 0, otherwise.

Marriage: In this study, marriage refers to the marital status of the individual at the time of the study. Marriage will be used to refer to situation where one is in a union defined as legal according to the culture of the area (Djamba, 1997; Ochieng', 2007; De Walque, 2006). The variable is a dummy which takes on the values 1 if an individual is married and 0 otherwise.

Age: Refers to number of years lived since birth and ranges from 14–25 in this study. This has a biological effect since it determine the stage with which one enters into the sexual market (Hallman, 2004; Dinkelman et al., 2008; Warren, 2010). The *apriori* sign for this variable can either be positive or negative.

Access to Condoms: Low interest regarding condom use is associated with difficulty in obtaining and using them (Nichols, Woods, Gates and Sherman, 1986). In some areas of the country people have to travel long distances to have access to protectives either at free government amenities or at private traders (Philipson and Posner, 1995). Access can affect use in the sense that the more an individual has access to condoms, the more one is likely to use condoms *ceteris paribus*. Thus a positive sign is expected. In the analysis, access is binary whether their cause of non use of condom was due to accessibility or not. It takes the value of 1 if the reason was due to unavailability due to access and 0 otherwise.

Education: This refers to the gradual process of acquiring knowledge in an institutional environment usually divided into stages such as nursery, primary, secondary and tertiary. In this study formal education is in terms of levels of education: no-education, primary, and secondary, will be used. The variable is in the form of a dummy, where no-education has been used as a benchmark. For each of the variables, it takes the

value of 1 if a particular status in terms of education attainment is observed and 0, otherwise. Likewise, the more educated an individual is, the more they are likely to be knowledgeable in issues pertaining to sexual behaviour and control (Warren, 2010; Baird et al, 2010). Therefore a positive sign is expected for condom use.

Employment: This refers to the status of being in a steady job or not. In the study, this was constructed from the occupation status of the individuals. The categories defined are steady work, temporary work, no work, and piece work. One argument is that when individuals are in employment (either self or not), they can easily support themselves. Thus their dependence on others through transactional sex is reduced. Another argument states that being in steady employment assures one of steady income which makes easier to have a large social network which can in turn result in increased sexual activity (Swidler and Watkins, 2007; Dinkelman et al, 2008; Warren, 2010). This means that both a positive and negative influence can result. The variable in question takes the value of 1 if the individual is employed and 0, otherwise.

Household Wealth Index: In order to check the robustness of the results, the study makes use of the wealth index. The method employed to construct a household wealth index is the Principal Component Analysis (PCA). This follows methods proposed by Filmer and Pritchett (2001). Principal component analysis seeks to describe the variation of a set of multivariate data in terms of a set of uncorrelated linear combination of the original variables, where each consecutive linear combination is derived so as to explain as much as possible of the variation in the original data, while being uncorrelated with other linear combinations. The index is constructed from information on household ownership of durable goods and its housing characteristics (Doorslaer, Wagstaff,

Lindelov and O'Donnell, 2008). Ownership of a particular item is given a weight of 1 and if the household does not own that item, it is assigned a weight of 0. In constructing a wealth index, the first principal component is taken to represent the household's wealth (Rustein and Johnson, 2004; Vyas and Kumarayanake, 2006 ;Howe, Hargreaves and Huttly, 2008). In the study, the asset index constructed represents the wealth status and is a continuous variable.

4.3 Data Sources and Study Design

The data for the study was obtained from Tsogolo la Thanzi (TLT), an ongoing longitudinal study in Balaka district. The study is among others exploring how the AIDS epidemic in Malawi is shaping reproductive behaviour among young adults and how in turn, reproductive behaviours play into the future of the epidemic. Furthermore, it is also trying to understand the temporal and causal relationship between reproductive goals, sexual behaviour, concern about HIV, educational attainment and marriage.

Simple random sampling was used to draw a representative population from villages around Balaka. A complete household listing was conducted of every household within a 7 km radius of the center of town; the catchment area includes a mix of rural and peri-urban communities around Balaka (Chiumia, 2010). The household listing provided a sampling frame of all 15-25 year olds within the catchment area. From this list, a random sample of 1500 women and 600 men were recruited to participate in the study. Interviews are carried out at the TLT centre situated at the center of town, and the interviews last for an hour or two.

The first wave of data collection took place between May and August 2009. Follow up interviews are scheduled 3 months later. At the centre, some respondents get tested for HIV and pregnancy, with all the ethical procedures being followed. The study makes use of the first wave data due to availability.

4.4 Diagnostic Tests

4.4.1 Multicollinearity

Multicollinearity is one of the problems encountered in regressions. In Classical Linear Regression Model (CLRM), it is also assumed that there is no linear relationship among all or some of the regressors. When there is perfect or near-perfect linear relationship among some or all of the explanatory variables in a regression model it leads to indeterminate regression coefficients and infinite standard errors. Multicollinearity among the explanatory variables can be assessed using the pair-wise correlations or Variance Inflation Factor (VIF). The suggested rule of thumb is that if the pair wise or zero order correlation coefficient between the regressors is high in excess 0.8, then multicollinearity is a serious problem. Using the VIF multicollinearity is a serious problem if the VIF is in excess of 10 (Gujarati, 1993).

Various remedial measures to multicollinearity are suggested. However, for the purpose of this study, if multicollinearity is evident, the process of transforming variables into their first difference form will be used. This method entails running the regression, not on the original variables but on the differences of successive values of the variable. Another advantage of first difference transformation is that it may make a non-stationary time series stationary.

4.4.2 Heteroscedasticity

In addition to multicollinearity, heteroscedasticity is also one of the problems in Classical Linear Regressions. The Classical Linear Regression Model also assumes that the variance of each disturbance term conditional on the chosen values of the explanatory variables is some constant number. This is referred to as homoscedasticity but when the variance of each disturbance term is not a constant number it is called heteroscedasticity. In a situation of heteroscedasticity, OLS estimators, though linear and unbiased, they are not minimum variance among the class of linear estimators when disturbances are heteroscedastic. The issue is that outliers can bias regression slopes, particularly if they have significant leverage. Heteroskedasticity problems often arise from cross-sectional differences; the simplest way to deal with this is to take group means.

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity is the test for higher order heteroskedasticity. The procedure involved is that one estimates an equation first and then run the *hetprob* command in Stata. This test tests the null hypothesis that there is no difference in the error variances, the alternative that the error variances are a multiplicative function of one or more variables. A significant value will result in rejection of the null hypothesis hence implying heteroscedasticity. In most cases, where there is heteroscedasticity, models are usually fitted with estimated or feasible generalized least squares (EGLS or FGLS). However in this study any potential heteroscedasticity in the probit models is resolved by using robust standard errors.

4.4.3 Correct Model Specification and Overall Significance of the Model

Another assumption of the Classical Linear Regression Model is that there is correct model specification. To test the likelihood of incorrect model specification, that is to say, whether the model has omitted certain variables, has incorrect functional form, or there is correlation between explanatory variables and the residuals, the Ramsey RESET can be used. A significant p-value of the RESET test implies these two problems are present. The model is re-run using another functional form and by adding in new variables as stipulated by theory. However, it must be noted that it is difficult to determine what the exact problem between the two is exactly indicated by the RESET. Therefore, a mechanical method may be used through trial and error of the two solutions suggested. When using maximum likelihood estimation, three classical test statistics for the overall significance of the model namely, the likelihood ratio, the LaGrange Multiplier and the Wald test are used.

All these three have the same distribution asymptotically and test the null hypothesis that the explanatory variables are jointly equal to zero i.e. $H_0 : \beta_{1k} = \beta_{2k} = \dots \beta_{jk} = 0$ against the alternative hypothesis that the explanatory variables are jointly not equal to zero i.e. $H_1 : \beta_{1k} \neq \beta_{2k} \neq \dots \beta_{jk} \neq 0$. This study, adopts the likelihood ratio test which reports the Wald statistic. The likelihood ratio test is defined as follows

$$LR = -2 \ln \lambda = 2 * [\log L(\beta_1) - \log L(\beta_1)] \quad (4.6)$$

where we denote the ML estimator under the restriction by β_0 and β_1 when restrictions are not imposed. This test statistic, just as the other two, follows a chi-squared distribution, evaluated at the critical value given by the degrees of freedom. The Wald test statistic is reported automatically by the regression results in Stata. For the goodness of fit test, we use pseudo R^2 . This statistic, just as R^2 in linear models, gives the variation in the dependent variable that is explained by the independent variables. The model selection will be based on the Akaike Information Criterion.

4.4.4 Endogeneity

A variable is said to be endogenous when there is a correlation between the parameter or variable and the error term. Endogeneity can arise as a result of measurement error, simultaneity, omitted variables, and sample selection errors. This implies that the regression coefficient in an Ordinary Least Squares (OLS) regression is biased, however if the correlation is not contemporaneous, then it may still be consistent (Woodridge, 2002; Cameron and Trivedi, 2005). There can be a possibility of causality between poverty and risky sexual behaviour. This is because poverty can cause a person to indulge into risky sexual behaviour such as survival sex. Likewise risky sexual behaviour such as outcomes such as HIV and AIDS, among others leads to ill health which in turn reinforces aspects of poverty by undermining labour capabilities and eroding human capital potential. Due to lack of instruments in the literature, estimation is done without testing for endogeneity.

4.5 Ethical Consideration

For each respondent, the interview is done in a private room and the respondent is assigned a neutral number. They are told in advance about the confidentiality of the information and are then asked to participate. Every respondent is given ethical clearance at the beginning of the study. This is in line with the National Health Research Committee recommendations. The study obtained ethical clearance from National Health Research Ethics Committee.

4.6 Conclusion

The chapter has provided a detailed description of the methodology used in the estimation of various relationships in the study. The estimation procedure used has been adopted from Dinkelman et al., (2008). The chapter has also explained the variables and data used in the study. Various diagnostic measures to be used have outlined been. In addition to these, the data sources have been explained. The next chapter provides the empirical analysis of the data.

CHAPTER FIVE

PRESENTATION AND INTERPRETATION OF THE RESULTS

5.0 Introduction

This chapter presents and interprets the results of the study. The chapter is presented in four sections. Section 5.1 presents descriptive statistics of the variables used, section 5.2 presents the bivariate analysis of the dependent variable with some selected variable. Section 5.3 presents the econometric analysis and the interpretation. Lastly, section 5.4 concludes the chapter.

5.1 Descriptive Analysis of the Data

Table 3, shows the descriptive statistics of the variables used in the study. It outlines the means, standard deviation, minimum and maximum observations of the variables under study. The summary is of the whole sample.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Condom Use	724	0.189	0.392	0	1
Income	1490	1720.268	5317.909	0	103000
Catholics	1487	0.323	0.468	0	1
Moslem	1487	0.204	0.403	0	1
Employment status	1490	0.299	0.458	0	1
Indigenous religion	1487	0.046	0.209	0	1
Marital Status	1490	0.420	0.494	0	1
Primary Education	1490	0.610	0.488	0	1
Secondary Education	1490	0.355	0.479	0	1
AIDS and HIV (sexual transmission awareness)	1490	0.754	0.431	0	1
Access to Condoms	1490	0.023	0.149	0	1
Age of respondent	1490	19.526	3.266	14	26
Belief on Condom Use	1490	0.332	0.471	0	1

Source: Own calculation based on TLT data

Income has a mean value of about 1720.27 kwacha (two significant figures). This implies that the average, earning is 1720 Malawian Kwacha per month. The variable also has a standard deviation of approximately 5317.909, which shows that there is a wide range among the high earners and low income earners. This can be seen from the range, which is between 0 and 103000 kwacha per month, implying that some earn more than others.

A quick look at the dependent variable shows the mean of 0.189 and standard deviation of 0.392 and the maximum value of it being 1 and minimum 0. From the mean itself, the implication is that condom use with a non marital sexual partner is at 18.9

percent. This is despite the knowledge of HIV sexual transmission being as high as 75 percent. The statistics also show that the income variable, followed by the age of the individual variables have the highest standard deviation. Furthermore, the age variable exhibits a mean of about 20. The minimum and maximum ages for the individual's are 14 and 26 respectively.

In as far as education is concerned the statistics shows that 61 percent has attended primary school education and 35.5 percent being secondary school, the rest being those with no education and tertiary education. This means that the post primary education attainment is low in the area. The statistics also show that 42.01 percent of the sample is married. The religion variable shows that 32.3 percent are catholics, 4.5 percent are of indigenous faith, where as 20.3 percent are muslims. The remaining 56.2 percent are protestant christians¹¹. Lastly, it can be seen that of the respondents in the sample who were asked on perception of sexual satisfaction with condom use, it was observed that 33.2 percent felt that condom use reduces sexual satisfaction.

5.2 Bivariate Analysis

Having presented the descriptive statistics, it is worthwhile to observe bivariate relationship between some selected variables and the dependent variable. We start with Table 4, where the relationship between condom use and access to condoms is explained.

¹¹ These are christians who are not catholics.

Table 4: Relationship between Condom Use and Access to Condoms

	Condom Use at Last Recent Sex		
	Not Used		used
	N	(percent)	N (percent)
Access to Condoms			
Access not a problem	558.0	(80.5)	135.0 (19.5)
Access was the problem	29.0	(93.5)	2.0 (6.5)
Total	587.0	(81.1)	137.0 (18.9)

Source: Own calculation based on TLT data

Accessibility can also affect the use of condoms (Tivory and Swidler, 2007). In the study people were asked if the reason for not having protected sex with the mentioned partner was due to lack of access to condoms. Of the 587 people who never used condoms, 558 (95.5 percent) indicated that limited access to condoms was not a cause at all. This means that only 4.5 percent had unsafe sex due to access issues. Despite this, in the category of those who said that access was not a problem, only 135(19.5 percent) used condoms. Whereas 558 (80.5 percent) still did not use a condom. This suggests that access to condoms is a sufficient but not necessary condition to encourage condom usage by these young women.

Having presented the relationship between condom use and access to condoms, the next table-Table 5, presents the relationship between condom use and perceptions on condoms.

Table 5: Relationship between Condom Use and Perception on Condom Use

	Condom Use at Last Recent Sex		
	Not used	Used	Total
	N (Percent)	N (Percent)	N (Percent)
Condoms not Sweet			
No	348.0 (78.4)	96.0(21.6)	444.0 (100.0)
Yes	239.0 (85.4)	41.0(14.6)	280.0 (100.0)
Total	587.0 (81.1)	137.0(18.9)	724.0 (100.0)

Source: Own calculation based on TLT data

Daily attitudes toward condoms affect the preference and in turn affect the demand for safe sex. In the study, people were asked to give an opinion on the belief in the area that “sex with condom is not sweet”. In other words, people were asked on the perception that they have regarding sexual satisfaction using condoms. The results are summarised in Table 5. From the table, it can be seen that those who indicated that condoms affected the sexual satisfaction had low usage. In this category, only 41(14.6 percent), used condoms. This is lower than those who had the perception that condoms did not affect sexual satisfaction (21.6 percent). For the non-users, 239 (85.4 percent) indicated that condoms affected sexual satisfaction; whereas 348(78.4 percent) reported that condoms never affected any sexual satisfaction, but nevertheless, most of them never used any condoms. Table 6 is to follow up next, and it presents the relationship between condom use and income.

Table 6: Relationship between Income and Condom Use

Income quintile	Condom at Last Recent Sex					
	Not used		Used		Total	
	N	(Percent)	N	(Percent)	N	(Percent)
Quintile1	285.0	(81.9)	63.0	(18.1)	348.0	(100.0)
Quintile2	87.0	(82.9)	18.0	(17.1)	105.0	(100.0)
Quintile3	147.0	(79.5)	38.0	(20.5)	185.0	(100.0)
Quintile4	44.0	(78.6)	12.0	(21.4)	56.0	(100.0)
Quintile5	24.0	(80.0)	6.0	(20.0)	30.0	(100.0)
Total	587.0	(81.1)	137.0	(18.9)	724.0	(100.0)

Source: Own calculation based on TLT data

Income is split into five quintiles. From the analysis, there is no discernible pattern in relation to condom. It can be seen that in the lowest income category, 285(81.9 percent) reported to have not used a condom out of the 348 people. This implies that only 63(18.1 percent) used condoms. Thus, those who reported no condom use were higher than those who did. Likewise, in the second income category, out of the 105 individuals in this category, only 18(17.1 percent) used condoms against 87 (82.9 percent). In the richest category, only 6(20 percent) used condoms out of the 30 individuals. This implies that there is still low use of condoms at all income levels in each category. Furthermore, when compared across quintiles, there is no pattern as to whether there is increase in condom use with increasing income or reduced condom use with reduced income.

An asset index is introduced as an alternative measure for poverty. This was done in order to check the robustness of the results due to the fact that more zeros were reported in the income variable. Presented below in table 7 is the relationship between condom use and Wealth status.

Table 7: Relationship between Condom Use and Wealth Status

Wealth	Condom Use at Last Recent Sex					
	Not used (percent)		Used (percent)		Total (percent)	
Quintile1	128	(84.21)	24	(15.79)	152	(100.00)
Quintile2	115	(80.99)	27	(19.01)	142	(100.00)
Quintile3	112	(79.43)	29	(20.57)	141	(100.00)
Quintile4	121	(83.45)	24	(16.55)	145	(100.00)
Quintile5	111	(77.08)	33	(22.92)	144	(100.00)
Total	587	(81.08)	137	(18.92)	724	(100.00)

Source: Own calculation based on TLT data

From Table 7, it can be seen that there is no systematic pattern to show if belonging to a particular wealth status has any impact on condom use. In quintiles one, two and four, less than 20 percent used a protective. In the poorest group (quintile1), only 24 (15.79 percent) reported to have used protective out of the 152. This means that 128 (84.21 percent) did not use any protective. In the first place, it may seem that there is some marginal increase in condom use from the first quintile to the third and then drops in the fourth quintile, where 24(16.55 percent) reported to have used a protective. The highest number in terms of use was reported in the richest category (22.92 percent) and the lowest was in the first and fourth quintiles. However it can be concluded that there is low use of condoms in all wealth status categories.

In Table 8, the relationship between condom use and HIV and AIDS knowledge is presented.

Table 8: Relationship between Condom Use and HIV and AIDS Knowledge

Condom Use at Last Recent Sex					
	Not Used		Used		Total
	N	(percent)	N	(percent)	N (percent)
AIDS/HIV Knowledge					
Not knowledgeable	214.0	(77.8)	61.0	(22.2)	275.0 (100.0)
Knowledgeable	373.0	(83.1)	76.0	(16.9)	449.0 (100.0)
Total	587.0	(81.1)	137.0	(18.9)	724.0 (100.0)

Source: Own calculation based on TLT data

Having the knowledge of prevention, transmission and other facts relating to HIV and AIDS would motivate logical safe sex behaviour (Odu B and Akanle, 2008). As stated in the methodology, questions pertaining to sexual transmission of HIV and AIDS were asked. Of the people who were aware of these transmission methods, 449 individual were aware of the sexual transmission routes. Of those who were aware, 373(83.1 percent) reported to have not used a condom, and 76 (16.9 percent) never used a condom. In the category of those who were not aware, 214(77.8 percent) never used a condom, and 61(22.2 percent) used a condom.

Despite the high awareness, there is still low usage of condoms. Thus the knowledge is not being put into practice (Munthali et al., 2004). These findings are not different from those established by NSO and ORC MACRO (2005), where condom usage was established to be low within the ages 15-25 of the young females. The next table presents the relationship between condom use and membership of the catholic church.

Table 9: Relationship between Condom Use and Catholic Denomination

	Condom Use at Last Recent Sex		
	Not used	Used	Total
	N (percent)	N (percent)	N (percent)
Catholic			
No	392.0 (80.0)	98.0 (20.0)	490.0 (100.0)
Yes	195.0 (83.3)	39.0 (16.7)	234.0 (100.0)
Total	587.0 (81.1)	137.0 (18.9)	724.0 (100.0)

Source: Own calculation based on TLT data

The catholic social teaching does not allow the use of artificial methods of birth control, including condoms (Paul VI, 1968). These may have been one factor which has contributed to low use of condoms among catholics. Of the 587 individuals who never used condoms, 195 were catholics. However 234 individuals in the sample were catholics, and in the category of catholics, 195 (83.3 percent) reported to have not used any condom, and only 39(16.7 percent) of the catholics used condoms.

Table 10 present the relationship between secondary education and condom use, this table follows next.

Table 10: Relationship between Condom Use and Secondary Education

	Condom Use at Last Recent Sex		
	Not used		Used
	N	(percent)	N (percent)
Secondary Education			
No	383.0	(83.6)	75.0 (16.4)
Yes	204.0	(76.7)	62.0 (23.3)
Total	587.0	(81.1)	137.0 (18.9)

Source: Own calculation based on TLT data

Education plays a vital role in enlightening individuals about the various contemporary issues regarding safe sex and sexuality. In the current Malawi secondary school syllabus, issues to do with condom use have been incorporated as part of Life Skills Education. From the sample, of the 266 who reported to have secondary education, 204 (76.7 percent) reported to have not used any condoms, however, 23.3 percent reported to have used a condom at the current sexual encounter. This is more than those who had no secondary education whose statistics stand at 16.4 percent in as far as condom usage is concerned. Of the 458(63.25 percent) of the total respondents) who reported to have no secondary education, 383(83.6 percent) did not use any condom.

The last bivariate analysis is between condom use and employment status. This is discussed in table 11.

Table 11: Relationship between Condom Use and Employment Status

Condom Use at Last Recent Sex					
	Not used		Used		Total
	N	(percent)	N	(percent)	N (percent)
Woman has Stable Job					
No	375.0	(82.4)	80.0	(17.6)	455.0 (100.0)
Yes	212.0	(78.8)	57.0	(21.2)	269.0 (100.0)
Total	587.0	(81.1)	137.0	(18.9)	724.0 (100.0)

Source: own calculation based on TLT data

It has been argued by Swidler (2007) as well as Djamba (2008) that employment is seen as a cushion for transactional sex. Of those who reported to have been in employment, 212 (78.8 percent) reported to have not used any condom whereas 57(21.2 percent), indicated that they used a condom. This is higher than the statistics reported by those who were not employed (455). In the unemployed category, 80(17.6) indicated that they did use some condom where as 375(82.8 percent) did indicate that they never used any condoms.

Since the above relationships do not control for the effect of other variables, a multivariate analysis in form of regression would give meaningful insights. The next section presents the econometric analysis of the issue at hand.

5.3 Econometric Results

5.3.1 Diagnostic Results

Different diagnostic tests were carried out to check that estimation, hypotheses testing and statistical inferences of the model are made with accuracy. By allowing for robust standard errors in the command, any potential heteroscedasticity in the probit models is resolved. However, we note that the McFadden R^2 were low in all models. This is nevertheless a key concern as cross sectional data analysis normally exhibits low

R^2 values compared to time series. Joint significance of the independent variables is checked by the Wald-Chi which is significant at 1 percent. There was no serious case of multicollinearity amongst the explanatory variables since the correlations do not exceed the suggested rule of thumb of 0.8.

The econometric results presented are the marginal effects only. Firstly, the results with Income and HIV and AIDs knowledge as the main explanatory variables are presented in Table 12. Non-linearity between age (column 1) and risky sexual behaviour, as well as income and sexual behaviour is checked. The result showed that the age squared variable which is introduced is insignificant. Furthermore the Wald-Chi statistic was insignificant at all levels (Chi = 0.06, Prob>Chi2 = 0.8102), and it did not improve the pseudo R^2 . This means we can estimate a model without the squared age. In column 2 we control for HIV and AIDS knowledge. Having done this it is observed that the pseudo R^2 was reduced as compared to the results in column 3. Therefore the results in column 3 are the ones we interpret since the model is encompassing of the other two, since it reported a low Akaike information than the others.

Table 12: Econometric Results for Income and HIV and AIDS Knowledge

	Marginal Effects for Income and HIV and AIDS Knowledge		
	(1)	(2)	(3)
Log Income	0.00042 (0.0052)	0.0000235 (0.00501)	0.0003377 (0.0051)
Catholics	-0.0518* (0.0300)	-0.0513* (0.0301)	-0.0522* (0.02998)
Muslim	-0.0317 (0.0357)	-0.0355 (0.0351)	-0.0325 (0.0354)
Employment	0.0945** (0.0443)	0.0976** (0.0439)	0.0953** (0.0442)
Indigenous Religion	-0.1360** (0.0365)	-0.137** (0.0361)	-0.1360** (0.0366)
Marital Status	0.0821** (0.0354)	0.0821** (0.0345)	0.0835** (0.0347)
Primary Education	0.2190** (0.0993)	0.215** (0.101)	0.2183** (0.0998)
Secondary Education	0.351** (0.1450)	0.349** (0.147)	0.3517** (0.1453)
HIV and AIDS Knowledge	-0.0321 (0.0305)		-0.0319 (0.0305)
Condom Access	-0.0904 (0.0565)	-0.0899 (0.0579)	-0.0907 (0.0565)
Age of Respondent	-0.0019 (0.0735)	-0.0264*** (0.00579)	-0.0256*** (0.0058)
Age Square	-0.0004 (0.0017)		
Beliefs on Condom Use	-0.0499* (0.0287)	-0.0521* (0.0283)	-0.0496* (0.0287)

Source: Own calculation based on TLT data

Note: ***, **, * denotes significance at 1 percent, 5 percent and 10 percent respectively while figures in parentheses are robust standard errors.

Interpretation of the Results

In the interpretation of probit models, marginal effects, which are more meaningful, are used instead of the actual coefficients. Marginal effects captures the probability and are obtained by taking the derivative of the dependent variable with respect to a specific regressor, holding other regressors constant (Gujarat, 2003; Cameron and Trivedi, 2005)

Income: An analysis of the results indicates that the probability of income affecting condom use is zero. This is also consistent with Dinkelman et al., (2008). This may be due to the fact that income may have been underreported due to other things such as inability to recall. Other reasons which may cause the non-insignificant relationship between income and sexual behaviour, is the inclusion of people who were in school, as these may be counted as dependents and not in the working category. Furthermore, it may be due to the non- understanding of the respondents of what constitutes income. Other background factors are worth citing to have impact on sexual behaviour rather than income. Thus the null hypotheses of income having no impact on risky sexual behaviour cannot be rejected.

HIV and AIDS Knowledge: Despite the high level knowledge and awareness of HIV-sexual transmission, there is still no pattern of influence. Similar results were established with the NSO and ORC MACRO (2005), Odu and Akanle (2008), NSO and ICF MACRO (2011), where despite the high awareness of HIV and AIDS, there is still low condom use. It is hard to know what the specific reasons that are still making condom usage to be low despite the HIV and AIDs message being disseminated. The variable was found to be insignificant at all levels. The conclusion from this can be that

knowledge of the diseases and transmission of the causing organism is not a sufficient reason to influence safe sexual behaviour. Based on the above findings there is a need for further investigation of what constrains people from changing sexual behaviour despite the enormous knowledge they have of HIV and AIDS prevention and dangers of the epidemic.

Primary Education: The no education variable was set as a benchmark for the education variable. From the results, the likelihood of women with primary education using condom is 21.8 percentage points as compared to the no education group. The implication is that primary education attainment has a positive effect on condom use, implying low risky sexual behaviour. This may be linked to the introduction of Life Skills Education in primary schools in which safe sex is part of the curriculum. This result proves that some minimum level education is important in as far as reducing risky sexual behaviour is concerned.

Secondary Education: From the results, it shows that the probability of a young woman using a condom given secondary school education status increases by 35 percentage points if she has secondary education as compared to no-education at all. The implication of these two education variables is that education status has a positive relationship with sexual behaviour. Education increases exposure to new things related to sexual behaviour. In as far as these education variables are concerned, exposure to academic subjects such as Biology, Social Studies, Life Skills Education, among others, are factors which enlighten young people on safe sex methods. The positive association between sexual behaviour and education was also established by Buve et al (2002), NSO

(2005), Madise (2007), and also Baird et al (2010), where education was positively associated with condom use.

Perception on Condom Use: In the study people were asked on their perception concerning the sexual satisfaction obtained with or without condom i.e whether condom use lessens sexual pressure. The variable is found to be significant at the 5 percent level. Given the results, it can be said that this perception reduces condom use by 5 percentage points. This essentially implies the negative attitude towards condom usage increases sexual riskiness. This also concurs with the finding by Ankomah (1999), Tivory and Swidler (2007), Limwamwe and Kumwenda (2009), where negative attitude towards condoms were found to have a negative effect on condom use. Thus it can be deduced that programs targeting change of perception are worth being done to change the mindset

Catholic: Compared with protestant¹² Christians, the likelihood of young woman to use a condom reduces by 5.2 percentage points as compared to non-catholic Christians. The variable is significant at 10 percent level significance. This may be attributed to the catholic social teaching which gives a different perspective on condom usage which is different from protestant christian churches. The catholic church officially believes that it is wrong to use any form of intervention, from sterilization to condoms (Paul VI 1968,¹³; De Walque, 2006).

¹² Protestant churches are those Christians which are non-Catholic.

¹³ Further discussions on catholic teachings on condom use be can be found at <http://www.guardian.co.uk/books/2011/apr/14/catholic-church-contraception-mistranslation> <http://www.lifenews.com/2010/11/21/int-1694/> <http://www.dailyprincetonian.com/2003/10/21/8911/>

Muslim: The results indicate that the variable is insignificant at all levels. The Muslim faith is open to condom use and considers condom use as a personal choice. However, from these results it shows that it does not influence sexual behaviour in as far as condom use is concerned.

Indigenous Religion: The variable is significant at 5 percent significant level. The interpretation of it is that the likelihood of a young female who belongs to an indigenous religion to using a condom reduces by 13.6 percentage points as compared to a protestants. The difficult part is to un-earth the actual beliefs in the indigenous religion which contribute to such kind of behaviour.

Marital Status: Marital status was defined as either being married or not. From the results, the likelihood of a young woman using a condom with a non-marital sexual partner increases by 8.4 percentage points. The variable is significant at the 5 percent level. The meaning of this is that married individuals are not risky, as defined these results are consistent with Buve et al (2002), United Nations (2005) who also conclusively established that condom use outside marriage is increasing.

Employment: This variable is significant and has a positive sign. It can be said that employment increases the likelihood of condom use by 9.5 percentage points. This implies that employment has a positive effect on reduction of risky sexual behaviour. The positive sign can also interpret as to say that dependence on others through transactional sex is reduced.

Access to condoms: This variable is insignificant at all levels. If access and cost are important factors in the use of condoms among young people in Africa, we should see a strong positive relationship between poverty status and use of condoms. This is in

contrast to results by Madise et al (2007) who found out that access to condoms in rural areas affected condom use in a negative way and Schuster et al (2008) who found out that improved condom access increases condom use among young female adults in America. However one can still argue that the cultural values of the two countries which may influence use are different. Condoms are given free at the nearest health centers and at Banja La Mtsogolo clinics in the study area (Chiumia, 2010). Thus one may attribute condom none use to attitudes, and dislike not access.

Age: Age determines the point at which an individual enters into the sexual market. This variable has been found to be significant at the 1percent level. The variable suggests that within this age band, the likelihood of a woman using a condom is 4.9 percentage points. This concurs with the results from the MDHS2000,2004 and 2010 survey results, where there was higher sexual risk in terms of condom usage was established within the age group 15 -24, as compared to the rest of the age categories.

Due to the large variance observed in the income variable an alternative measure of poverty is used to establish the robustness of the results. The wealth index has been constructed using the method of principal component analysis. Just as in the previous analysis, firstly we check if there is non-linearity between sexual behaviour and wealth status. A squared term is introduced and the results are in column 1. However, it can be seen that the wealth squared term is insignificant ($\chi^2 = 0.09$, Prob > $\chi^2 = 0.7652$). This is also verified by the Wald-chi statistic which is insignificant, implying that there is no non-linearity between wealth status (poverty) and risky sexual behaviour. Thus we can estimate a model without the squared term and still obtain the robust results. In column 2 the model is estimated without the HIV and AIDS knowledge variable.

However the results indicated that there was a drop in the Macfaden R-squared and the Akaike information also increased. Due to this, the variable was introduced and an encompassing model was estimated as indicated in column 3. All the results are reported in Table 13, and only marginal coefficients are reported.

Table 13: Econometric Results for Wealth Status and HIV and AIDS Knowledge

Marginal Effects for Wealth Status and HIV and AIDS Knowledge			
	(1)	(2)	(3)
Wealth	0.0091 (0.0509)	0.00602 (0.0108)	0.00589 (0.0107)
Wealth Square	0.00251 (0.0084)		
Catholics	-0.0522* (0.0298)	-0.0515* (0.0299)	-0.0525* (0.0298)
Muslim	-0.031 (0.0358)	-0.0340 (0.0354)	-0.0312 (0.0357)
Employment	0.0999** (0.0337)	0.100** (0.0337)	0.0999** (0.0337)
Indigenous	-0.135*** (0.0369)	-0.136*** (0.0364)	-0.135*** (0.0369)
Marital Status	0.0871** (0.0352)	0.0850** (0.0349)	0.0863** (0.0351)
Primary Education	0.222** (0.0984)	0.216** (0.100)	0.219** (0.0988)
Secondary Education	0.350** (0.146)	0.344** (0.148)	0.347** (0.146)
HIV and AIDS Knowledge	-0.0313 (0.0304)		-0.0316 (0.0304)
Condom Access	-0.0899 (0.057)	-0.0890 (0.0583)	-0.0898 (0.0568)
Age of Respondent	-0.0260*** (0.0058)	-0.0266*** (0.00577)	-0.0258*** (0.0058)
Beliefs on Condom Use	-0.048 (0.0285)	-0.0506 (0.0282)	-0.0482 (0.0285)

Source: Own calculation based on TLT data

Note: ***, **, * denotes significance at 1 percent, 5 percent and 10 percent respectively while figures in parentheses are robust standard errors.

Wealth: An analysis of the results indicates that the probability of wealth affecting condom use is zero. This is not far much different from the results established using the income variable. In this case the null hypothesis cannot be rejected.

HIV and AIDS knowledge: Despite the high knowledge and awareness of people on HIV-sexual transmission (75 percent) on the observation, there is still low usage. The variable is also insignificant at all levels. Thus it can be concluded that knowledge of HIV and AIDS is not sufficient to influence safe sexual behaviour. The results are consistent in all the models.

Primary Education: As indicated in the methodology, no-education variable was set as a reference category for the education variable. The results obtained are similar to the ones where income variable was used as a proxy for poverty. The variable is significant at 5 percent level. It can be said that, the likelihood of women with primary education using condom is 21.9 percentage points as compared to the no-education group. This implies that primary education attainment has a positive effect on condom use, entailing low risky sexual behaviour.

Secondary Education: Just like in the analysis where income was used as a proxy for poverty, the results show a positive relationship between condom use and secondary education. The variable is significant at 5 percent level as well. This means that the likelihood of a young woman to use a condom is 34.7 percentage points if she has secondary education as compared to no-education at all.

Perception on Condom Use: Unlike in the previous scenario where income was used as a proxy for poverty. The use of wealth status as proxy for poverty has caused the perception on condom variable to be insignificant. In this scenario, the variable is not significant at all levels.

Catholic: The variable is significant at 10 percent significance level. A negative sign is observed as well. It can be said belonging to catholic faith reduces condom use by 5.3 percentage point as compared to non-catholic Christian.

Muslim: The results indicate that the variable is insignificant at all levels. However, just like other religions, the muslim faith is neutral to the use of contraceptives by its members.

Indigenous Religion: A negative relationship is observed for condom use in as far as indigenous religion is concerned. The likelihood of a young female who belongs to this religious faith to use a condom reduces by 13.6 percentage points as compared to the Protestants. This result tends to be consistent in all the models as well.

Marital Status: From the results, the likelihood of a young woman using a condom with the non-marital sexual partner increases by 8.6 percentage points. The variable is significant at the 5 percent level.

Employment: This variable is significant and has a positive sign. It can be said that employment increases the likelihood of condom use by 9.9 percentage points. The positive sign imply a positive relationship between condom use and employment status. The positive sign can also interpret as to say that dependence on others through transactional sex is reduced.

Access to Condoms: This variable is insignificant at all levels. If access and cost are important factors in the use of condoms among young people in Africa, we should see a strong positive relationship between poverty status and use of condoms. Condoms are given free at the nearest health centres and at Banja La Mtsogolo clinics in the study area (Chiumia, 2010).

Age: As already indicated, age determines the entry point into the sexual market. The results show that the variable is significant at 1 percent level. The variable suggests that within this age band, the likelihood of a woman to use a condom is 2.6 percentage points. This is lower than what was obtained using income as a proxy for poverty.

5.4 Conclusion

The results show that poverty as well as HIV and AIDS knowledge does not affect risky sexual behaviour, as measured by non-condom use. Variables such as education, negative attitudes towards condoms, marital status do affect risky sexual behaviour. Two alternative measures of poverty were used to establish the results. Both measures show no significant impact on risky sexual behaviour. The next chapter will give a summary of the study policy implication, limitations and direction for further studies.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 Summary of Results

The study used the probit model with the objective of finding out the effects of poverty, HIV and AIDS knowledge on risky sexual behaviour, where risky sexual behaviour was defined as having sex with non-married/non-cohabiting partners (Gruber 2000, Hallman 2004). The purpose of the study was to investigate whether income, knowledge of HIV and AIDS (Sexual intercourse as transmission mode) has impact on risky sexual behaviour. The proxy used for risky sexual behaviour was non-use of condoms with non marital sexual partners.

The null hypothesis that income does not influence sexual behaviour could not be rejected at all levels of significance. Likewise, the null hypothesis that HIV and AIDS knowledge does not affect sexual behaviour could not be rejected either as the variable was found to be insignificant. This was one of the issues that the UNAIDS (1997) report established in trying to see the impact of awareness on sexual behaviour. From this study, the variables that were found to have an impact were primary education, employment status, condom beliefs, and religious beliefs held by catholics and adherence of traditional

religions. On the bases of these findings it can be said that other background factors which are non money metric measures are important predictors of risky sexual behaviour.

6.2 Policy Implications

The results have various policy implications. In as far as the impact of education is concerned, the programmes which improve the education of women must be scaled up. Furthermore programmes which will not only improve the literacy levels, but have the out-curriculum effect of reducing sexual behaviour, must be put in place in addition to the existing ones. Programmes which aim at changing the attitudes or perceptions on condoms must continue. Positive attitudes towards condom use will in turn affect the rate at which safe sex is practised.

Increasing access to condoms must continue for example distribution of condoms in schools, HIV and AIDS awareness campaigns should be scaled up. Programmes which aim at economically empowering women for example soft loans for small scale business should also be put in place. Further to this, religious institutions must sensitize their people on the need to practice safe sex despite their religious doctrines. People must be allowed to exercise free will in as far as use of protectives is concerned. Despite all this, it must be noted that changing sexual behaviour is not easy.

6.3 Study Limitations and Area for Further Research

Assessment of risky sexual behaviour is somewhat challenging (Djamba 1997; Nnko et al., 2004) particularly when young people and females are the subject. This is due to the fact that measurement of behaviour usually relies on verbal reports, which can suffer from a number of biases, both intentional and unintentional. The low variation in some sexual behaviour variables may be attributed to under reporting.

Further research could be carried out in panel data to assess the impact of changes in income of the women on change in risky sexual behaviour over time. Furthermore, the use of other variables such as community poverty rates, to capture that community, and household effects could be very helpful. In addition to this, the use of the “best friends approach”¹⁴ can be another method to capture sexual behaviour. Given that respondents tend to underreport sexual behaviour, it is worthwhile to use biometric measures to capture sexual behaviour. Besides these points, a study that looks at the role of poverty as well as HIV and AIDS knowledge on young males of the same ages (15-24), may be informative. The results of this study should be treated with caution as no endogeneity test was done.

¹⁴ This is where you ask the sexual behaviour of the respondent’s friend

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APPENDICES

APPENDIX 1: Non- linearity between Age and Risky Sexual Behaviour

```
test AGE2
( 1) AGE2 = 0
      chi2( 1) = 0.06
      Prob > chi2 = 0.8102
```

APPENDIX 2: Non-Linearity between Wealth and Risky Sexual Behaviour

```
test Wealth_sq
( 1) Wealth_sq = 0
      chi2( 1) = 0.09
      Prob > chi2 = 0.7652
```

APPENDIX 3: Derivation of the Wealth Index

The wealth index is derived the method of principal component analysis (PCA). PCA involves breaking down assets (e.g. radio, wrist watch) or household service access of a household (e.g. water, electricity) into categorical or interval variables (Filmer and Pritchett, 2001). The variables are then processed in order to obtain weights and principal components. This method aggregate several binary asset ownership variables into a single dimension. If a particular asset is present, a value of 1 is assigned and if not present, a value of zero is assigned (Doorslaer, Wagstaff, Lindelow and O'Donnell, 2008).

The results obtained from the first principal component (explaining the most variability) are usually used to develop the asset index based on the formula:

$$A_j = \sum_k \left[f_k \frac{a_{jk} - \bar{a}_k}{s_k} \right]$$

Where A_j , is the wealth index of a household j , a_{jk} denotes the value assigned to a variable that indicates the presence of the asset k in household . $\bar{a}_k$ and s_k is the sample means and the standard deviation for asset k across households and f_k represents the weight that the Principal Component Analysis (PCA) technique assigns to household asset k . In the construction of living standards indices on the basis of principal components analysis, it is generally assumed that the first component captures is an adequate measure of welfare (Rustein and Johnson, 2004; Howe, Hargreaves and Huttly, 2008;)