Research Series No. 53

An assessment of the causal relationship between Poverty and HIV/AIDS in Uganda

Akankunda Bwesigye Denis

September 2007

Economic Policy Research Centre (EPRC)
51 Pool Road Makerere University Campus, P. O. Box 7841 Kampala, Uganda
Tel: 256-41-541023, Fax: 256-41-541022, Email: eprc@eprc.or.ug

See the end of this document for a list of previous papers in the series

An assessment of the causal relationship between Poverty and HIV/AIDS in Uganda

Akankunda Bwesigye Denis[1]

[1] Akankunda prepared this paper under the EPRC/SAGA project.

CONTENTS

List of Tables

List of Figures

"The cost, whether measured in human misery today, or in loss of hope for tomorrow, is simply too high. We have to turn and face [HIV/AIDS] head on." Former UN Secretary-General Kofi Annan

1. INTRODUCTION

In Uganda, the aggregative effects of the HIV/AIDS epidemic has not only impoverished individuals and communities but has also abated the capacity of the micro and macro-economic systems leading to poverty. Whereas poverty in Uganda is decades older than the HIV/AIDS epidemic, the arise of the latter has bestowed a bi-causal relationship that is mutually reinforcing. This causality can be highlighted from the aspects of poverty, which delineate capacities of individuals, households, communities and the economy, and how these very aspects are appalled by the HIV/AIDS epidemic.

Even though HIV prevalence in Uganda is much lower (6.4%, 2006) than it once was (18%, 1990s), AIDS mortality and morbidity is still a threat to economic development (Ministry of Health, 2006). As the disease usually kills young adults, it leaves behind thousands of orphaned children and grandparents placing an additional burden on the individuals, families, communities and the government at large (Food Agriculture Organization, 2005). In the labour force, overhead costs are increasing due to the rising medical expenditures, absenteeism from work and training of replacements (Uganda Aids Commission, 1998). The UNO/HIV/AIDS/STD/PCS[2], predicted a shift in national investments from long-term to short-term, indicating that investment and productivity in agriculture and industry were forecasted to shrink. Unearthing the link between the two is critical for determining appropriate policy measures for addressing their adversities on Uganda's economy.

1.0 Research Questions

In Uganda, the characteristics of the poor are well known. HIV/AIDS is yet one of causal factors to the state of economic strain that contributes the ever-evolving "vicious cycle of poverty" where the children of the poor often become the poor of succeeding generations. Making sense of the causal relationships between HIV/AIDS

[2] Uganda National Operations for HIV/AIDS/STD Prevention, Care and Support, 1994 – 1998

and poverty would require an understanding of the complex socio-economic processes in which Uganda's economy is affected. On the other hand, the importance of seeing poverty as part of dynamic social, economic process is vital in attempt to address the causality between HIV/AIDS and poverty. Therefore, the research question of this study follows as:

What are the socio-economic and demographic factors that reveal the causal relationship between poverty and HIV/AIDS in Uganda?

1.1 Research Objectives

The trends of the HIV/AIDS epidemic have direct implications for intergenerational poverty and impose immense challenges for policy makers. It is imperative to understand how this causality manifests itself on Uganda's population. These intergenerational effects of HIV and AIDS are the longest lasting of all and relate to the mechanisms whereby the epidemic intensifies poverty and leads to its persistence. They are those HIV/AIDS related processes which generate over time; a culture of poverty by their direct and indirect effects on social and economic development. Insight built on the understanding of the realities surrounding the relationship between HIV/AIDS and poverty would henceforth provide a basis for appropriate policy framework. Therefore the objectives of this study would be:

1.1.1 Primary objective

To draw possible recommendations on measures that could counteract the impact of the causality between "HIV/AIDS" and "poverty" in Uganda.

1.1.2 Specific Objective

To examine the socio-economic and demographic factors associated with the link between the spread of HIV/AIDS and poverty in Uganda.

2. LITERATURE REVIEW

2.0 General Overview

HIV/AIDS is currently one of the greatest threats to global development and stability. Since the emergence of the epidemic in the early 1980s, more than 60 million people worldwide have been infected with the human immunodeficiency virus (HIV) and over 20 million have died from AIDS (Food Agriculture Organization, 2004). At present, approximately 42 million people are estimated to be living with HIV/AIDS, of whom 5 million acquired HIV in 2002 alone. In the same year, AIDS claimed more than 3 million lives, most of them young adult breadwinners (Food Agriculture Organization, 2004).

In Sub-Saharan Africa, the epidemic has impacted diverging levels. Of the global 42 million persons living with HIV, two-thirds (31.5 million) are in Sub-Saharan Africa (UNAIDS, 2004). More than 15 million have died from AIDS, and more than 11 million have lost at least one parent to the disease. In some parts of Southern Africa, HIV prevalence rates are exceptionally high; Lesotho, Swaziland, Zimbabwe and Botswana report HIV prevalence rates of over 30 per cent and are reported to be still rising (UNAIDS, 2004).

Out of the global estimates of the 15 million persons who have died from HIV-related illnesses since the start of the epidemic, approximately 9 million were Africans. According to the Uganda Aids Commission, the first AIDS case in Uganda was diagnosed in 1982 and by 1989, an estimated 50% of Ugandans knew someone with AIDS and had the experience of witnessing the demise of a loved one or burial of relatives, colleagues and friends (UNAIDS, 2004).

2.1 HIV/AIDS-poverty pathways model (by a theoretical conceptual framework)

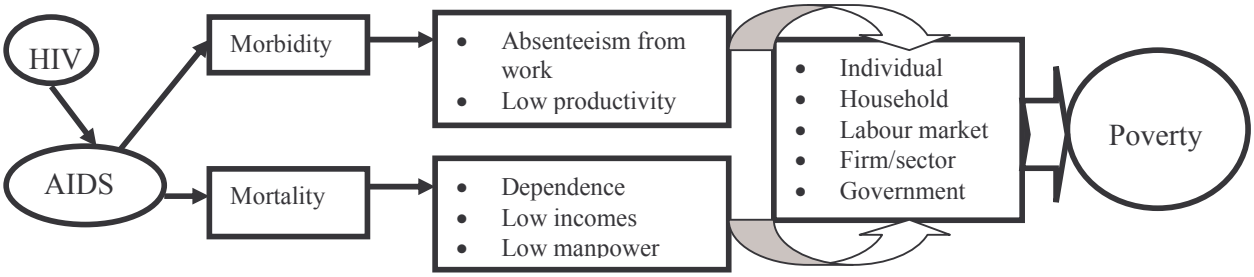


Figure 1: Conceptual Framework demonstrating the link between HIV/AIDS and poverty on economies

Various studies have revealed a bi-causal link between HIV/AIDS and poverty looking at their relationship as two-way street. However, not much research has been undertaken to investigate further, the consequences of this causality on Uganda's economy. For purposes of this study, keen interest will be invested in 'poverty' pathways to HIV/AIDS in Uganda

The HIV/AIDS epidemic has been recognized as a long-term event, lasting many decades which unfold in three waves: HIV prevalence, AIDS deaths, and wider impacts. The world is in the third decade of the epidemic and at present the 'impact' wave is developing in Africa and the world over. As impoverished families try to cope with the HIV/AIDS-associated morbidity and mortality, a significant depletion of assets usually occurs, sending many into destitution (Whiteside and Barnett, 2002). Community safety-nets are breaking down given that many households require assistance to meet their food, cash, care and labour needs, without being able to repay assistance in kind. The epidemic is also decimating labour force, thus fuelling widespread social and economic breakdown. In some countries, more school teachers die annually than can be trained (Whiteside and Barnett, 2002).

In aggregate terms, the HIV/AIDS pandemic produces new mechanisms of impoverishment through creating new patterns of poverty and livelihood insecurity. The outcome is the emergence of a new category of poor people. The 'AIDS-poor' include: households with chronically ill young adults and those that have suffered a young adult-death; households headed by single parents, the elderly or orphans; and households fostering orphans. Women are amongst the most affected: not only are

they more vulnerable to HIV infection biologically but they also bear the brunt of the social and economic costs of the disease.

On the other hand, it is worth pointing out that poverty also worsens the spread of HIV and AIDS. In a summative context, poverty produces mechanisms of vulnerability through creating patterns of individual impoverishment that escalates the spread of HIV infections and AIDS. Such poverty-related impoverishments reduce the ability of communities to sustain themselves; leading to poor socialization, low empowerment, less formal education, high dependence, political conflicts, inadequate life skills, widening gender imbalances and ultimately cultural as well as material inadequacies that worsen the vulnerability to the spread of the epidemic. This perspective has various implications on the spread of HIV/AIDS and will be a relevant consideration in the view of other research findings.

Commonly, the poverty-stricken are women-heads of poor households. Many women have often engaged in commercial sexual transactions in order to sustain their dependents. A study conducted at the coast of Tanzania underlined that women have always had primary responsibility for rearing children and ensuring sufficient resources to meet family needs (Thaxton, 2005).

Some studies have revealed that gender oriented poverty is yet another key co-factor in the transmission of HIV. Young women are particularly at high risk of contracting HIV in developing countries. This is largely attributed to poverty, which weakens the ability of young women to negotiate safe sex given high females' economic dependence on males (Hallman, 2004). Among 15–24-year-olds in developing countries living with HIV/AIDS, 64 percent are female (UNAIDS, 2004). In sub-Saharan Africa, young women are two to three times as likely to be infected as young men, with up to six times the infection rate of their male peers in certain sub-regions (Hallman, 2004). In parts of eastern and southern Africa, more than one-third of teenage girls are infected (UNAIDS, 2004). In South Africa there are five infected 15–24-year-old females for every two infected males the same age (Hallman, 2004).

The worsening poverty levels arising from political conflict in Northern Uganda are partly responsible for the increasing HIV prevalence in this region. Northern Uganda

had the lowest HIV prevalence rate when the epidemic was ravaging in the Southern part of the country before 1986. At this time, the epidemic would have been overshadowed but the political conflict and escalating poverty in this region have worsen the spread of the epidemic (UNAIDS, 2004). Northern Uganda is characterized by conflict, poverty, lack of services, inadequate knowledge and information, and cultural practices that proliferate HIV infection, all of which has inevitably contributed to a further increase in the epidemic (UNAIDS, UNFPA, UNDP, 2005). The IDP[3] settlements provide fertile ground for this scenario. The present statistics already point to an HIV prevalence of more than 12%; twice as much as the national average, according to data from Lacor Hospital, one of the major HIV surveillance sites in the northern region (UNDP, 2004).

The poverty situation in the IDP camps predisposes women and girl-children to HIV infection, given abundant sexual enslavement and rape during abduction. Many of the returnees from captivity could return infected and contribute to the spread of infection in their home communities or other places they settle. Security forces could also contribute to the spread of HIV through incidences sex for small gifts leading to high sexual partner turnover rate. Poverty caused by armed conflict tends to aggravate this partner turnover when women and girls exchange sex for basic needs or for material gain.

Poverty caused by conflict may also lead to the adoption of risky sexual behaviors that predispose women and girls to HIV infection, particularly in the case of breakdown of traditional social support systems and of social norms. Conflict and displacement has also led to the disruption of health services in the North. This situation increases susceptibility of people already infected with HIV, leading to increased probability of morbidity and mortality (UNAIDS, UNFPA, UNDP, 2005).

Undiagnosed and untreated STDs characterize the health status of many poor Africans, which is now recognized as a very significant co-factor in the transmission of HIV (Desmond and Cohen, 1998). It follows that poor households typically have few if any; financial or other assets and are often politically and socially marginalized.

[3] Internally Displaced People

These conditions of social exclusion increase the problems of reaching these populations through programs aimed at changing sexual behaviors that soars the transmission of HIV/AIDS (Desmond and Cohen, 1998).

Another poverty related problem is the transmission of HIV through breast-feeding. This is avoidable and poverty is a clear factor limiting accessibility to the methods for Prevention of Mother to Child Transmission through breast-feeding. Adapting to this method requires the ability to buy baby formula, access to clean water and having knowledge about the need for such a practice, which is unaffordable to the poor (Desmond and Cohen, 1998).

More than one in nine children in Sub-Saharan Africa has lost a parent, and the HIV/AIDS pandemic is the leading cause (UNAIDS, 2004). HIV/AIDS deaths today could potentially have major long-run effects on economic development by affecting the human capital accumulation of the next generation.

The low economic status of the youth has been attributed to the higher HIV infection incidences among this group (Hallman, 2004). Of the estimated 40 million people living with HIV/AIDS worldwide, nearly one third are between the ages of 15 and 24 years. This very age group accounted for two-thirds of newly infected individuals in developing countries in 2003 (UNAIDS 2004). Of the estimated 22 million people who have died of AIDS, half became infected as 15–24-year-olds (Hallman, 2004).

2.2 Uganda's HIV/AIDS historical landmarks and the success story

There was little understanding of AIDS among the Ugandan population between 1982 and 1986. AIDS was a mysterious disease, which first affected fishermen at Kasensero Landing Site on Lake Victoria (Uganda Aids Commission, 1998). Large numbers of people were slimmed to the bones and died. Judging from the symptoms including recurrent fevers, rashes, blisters, and endless diarrhea, people thought witchcraft was the cause of the sickness and went to witch doctors for consultations. Not long after, the disease was found to have a medical name, AIDS but still in Uganda it is known as 'SLIM'. According to the Uganda Aids Commission, the first AIDS case in Uganda was diagnosed in 1982. By 1989, an estimated 50% of Ugandans knew someone with AIDS, and had the experience of witnessing the demise of a loved one, or loss and burial of relatives, colleagues and friends.

Despite Uganda's poor state of economic development, the country has been successful in reducing the HIV epidemic from 30% to 6.4% in the last fourteen years (Ministry of Health, 2006). Uganda has been exhibiting an outstanding example of success in HIV prevention on the African continent and beyond. Many people, from inside and outside Uganda have raised many questions about this success story. Many acknowledge the success and seek to scale-up on the lessons that can be borrowed from Uganda's approach. Others put it down to a modest achievement since the prevalence rate is still high, while the rest dispute the story calling it a myth.

High level of government commitment and openness to HIV/AIDS largely contributed and been reported to have assisted Uganda in reducing the epidemic. In 1986 President Yoweri Kaguta Museveni responded to the emerging HIV crisis in Uganda swiftly, embarking on a nationwide campaign telling people that avoiding AIDS was a patriotic duty, and challenge people to abstain from sex before marriage. The president highlighted on the need for people to remain faithful to their partners and encouraged condom use. Soon, anti AIDS campaigns in Uganda designed the popular ABC acronym (Abstain, Be faithful, and Condom use) to guide a broader context for the war against the disease.

In 1986, Uganda's Health Minister announced to the World Health Assembly in Geneva that there was HIV in Uganda (Uganda Aids Commission, 1998). From that time on, Uganda has been political open and honest about the epidemic, the risks, and how the risks might best be avoided. During this time, President Museveni toured the country, telling people that it was their patriotic duty to avoid contact with HIV. This might be on the contrary with countries in Sub-Saharan Africa, which may partially explain the disparity of Uganda's success when compared to the sister nations in Africa. Uganda's president has been at the forefront for the fight against HIV/AIDS basically through mobilization of international support through funding. Museveni initiated the first AIDS control program in Uganda, establishing the formation of Uganda AIDS Commission to which he is the chairperson.

The Uganda AIDS Commission focuses on providing safe blood products, and educating people about risks. In 1987 sixteen volunteers personally affected by HIV/AIDS, came together to form a community organization called The AIDS Support Organization. In 1988 the first national survey to assess the extent of the epidemic was conducted and found the average prevalence in the population to be 9%. In 1990 the AIDS Information Centre (AIC) was formed to provide voluntary counseling and testing. In 1991 HIV prevalence among pregnant women aged 15 - 24 peaked in this year at 21% while some antenatal clinics reported as high as 30% (Uganda Aids Commission, 1998).

In 1990, the government adopted a multi-sectoral approach to enhance collective responsibility for individuals, community groups, government and other agencies. There have been outstanding efforts to mobilize and unify the response to the epidemic at the international, national, district, and community levels that enabled the country to reduce the infections. This framework is credited to enable smooth and sustainable programs in the HIV/AIDS sector.

HIV/AIDS related deaths partly contribute to a lowered prevalence rate. Since the start of the epidemic, many people have died leaving multidimensional impacts on the country as a whole. According to Population Secretariat of Uganda, there has been increasing mortality due to AIDS; otherwise the national population figure would be higher than the reported 26.6 million. The Ministry of Health (Surveillance Unit)

estimated that there was about 1,050,5557 people living with HIV/AIDS by end of December 2001 and there had been over 940,000 HIV/AIDS-related deaths since the onset of the epidemic in the country. Due to AIDS, life expectancy in Uganda has dropped from 44 to 42 years. It was estimated in a UNDP report that 51% of the population did not have access to healthcare facilities in 2001. Access to basic health care is limited to only 41% of the population. Annual expenditure otherwise called per capita stands at just $12 (10€ / 7£), and 34% of the population live in absolute poverty (living on or earning less than $1 a day and unable to afford enough food to consume 2000 to 3000 calories a day (UNDP, 2004).

There has been a reduction of the pandemic but this should not underscore the emerging vulnerable social groups of populations who have come into sight from the dreadful impacts of the disease. HIV/AIDS scourge has led to increasing number of AIDS orphans. UNAIDS estimated that by 1998 up to 1.1 million children in Uganda had lost either one or both parents to the disease. The traditional African extended family social-network has been over-stretched by AIDS related burden. According to the 2000/1 Demographic and Health Survey (DHS) report, 1 in every 4 families rears an orphan in Uganda. Orphaned children usually bear the brunt of domestic work, and girls are especially vulnerable to HIV infection through early marriages, defilement and sexual abuse. The Uganda National Operational Plan for HIV/AIDS/STD Prevention, Care and Support, 1994-1998 predicted a cumulative total of 815,507 deaths between 1993 and 1998.

Between 1991 and 1993, the HIV prevalence among young pregnant women in Uganda began to decrease. In 1995, Uganda announced it had observed what appeared to be declining trends in HIV prevalence rates. In 1997 Uganda participated in a study of using anti-retroviral drugs to Prevent Mother-to-Child Transmission of HIV (PMCT). In 1998 prevalence among pregnant women aged 15 - 24 had dropped to 9.7%. The ‘Drug Access Initiative’ was established to lobby for reduced prices for antiretroviral (ARVs) medication, and also to establish the infrastructure necessary to allow these drugs to be generally accessible. In 1999 the Ministry of Health started a voluntary door-to-door HIV testing program using rapid tests. In 2000 the government began to 'mainstream' HIV/AIDS issues in Uganda's ‘Poverty Eradication Action Plan’ (UNDP, 2004).

During the 1990s the HIV prevalence rate was reported at 18% while some antenatal care clinics reported over 30%. According to UNAIDS Time Series for Country Estimates-2003, the HIV/AIDS prevalence rate is declining among some Sub-Saharan countries led by Uganda and Kenya and stagnant or even increasing in other countries. Since 1993, HIV infection rates among pregnant women in Uganda (a key indicator of the progress of the epidemic) have been more than halved in some areas and infection rates among men seeking treatment for sexually transmitted infections have dropped by over a third (UNAIDS, 2004).

At the end of 2004, the government and the UN say that only 4.1% of adults had the virus. The country is seen as having implemented a well timed and successful public education campaign, reducing the numbers of people indulging in casual sex as well as significantly cutting the HIV prevalence rate.

Sex education programs in schools and on the radio, focused on the need to negotiate safe sex and encouraged teenagers to delay the age at which they first have sex. Since 1990, USAID-funded a scheme to increase condom use through social marketing of condoms and this has boosted condom use from 7% nationwide to over 50% in rural areas and over 85% in urban areas (STD/ACP-Ministry of Health, June, 2001). The social marketing scheme involved sales of condoms at subsidized prices or free distribution by both the government and the private sector. Health education and other public information campaigns also backed the scheme. Meanwhile more teenage girls reported condom use than any other age group; a trend reflected in falling infection rates among 13-19 year old girls in one of the central districts (Masaka) in rural Uganda; and among 15-year-old boys and girls, the proportion that had never had sex rose from about 20% to 50% between 1989 and 1995 (STD/ACP-Ministry of Health, June 2001).

The 'Success Story' is a heartening development but scaling the country's HIV/AIDS on a global map, the prevalence is still high. To note is that by 2nd May 2005, the Ministry of Health released the 2004/2005 preliminary results of the Uganda HIV/AIDS Sero-Behavioural Survey (UHSBS) which divulged the present prevalence rate stagnant at 6.4% (Ministry of Health, 2006). It is worth noting that the defiant HIV/AIDS prevalence rate has been synonymous with condom shortages and

government's prioritization of "abstinence as opposed to condom use". To this extent, it is recommendable that Ugandan government borrows a leaf from Thailand's success story which stems from the "100% condom use approach" that has seem their HIV prevalence rate reduce from 5% during the nineties to the present 1.5% (Avert, 2005).

3. METHODOLOGY

3.0 Conceptual Framework

Background/ Independent Variables

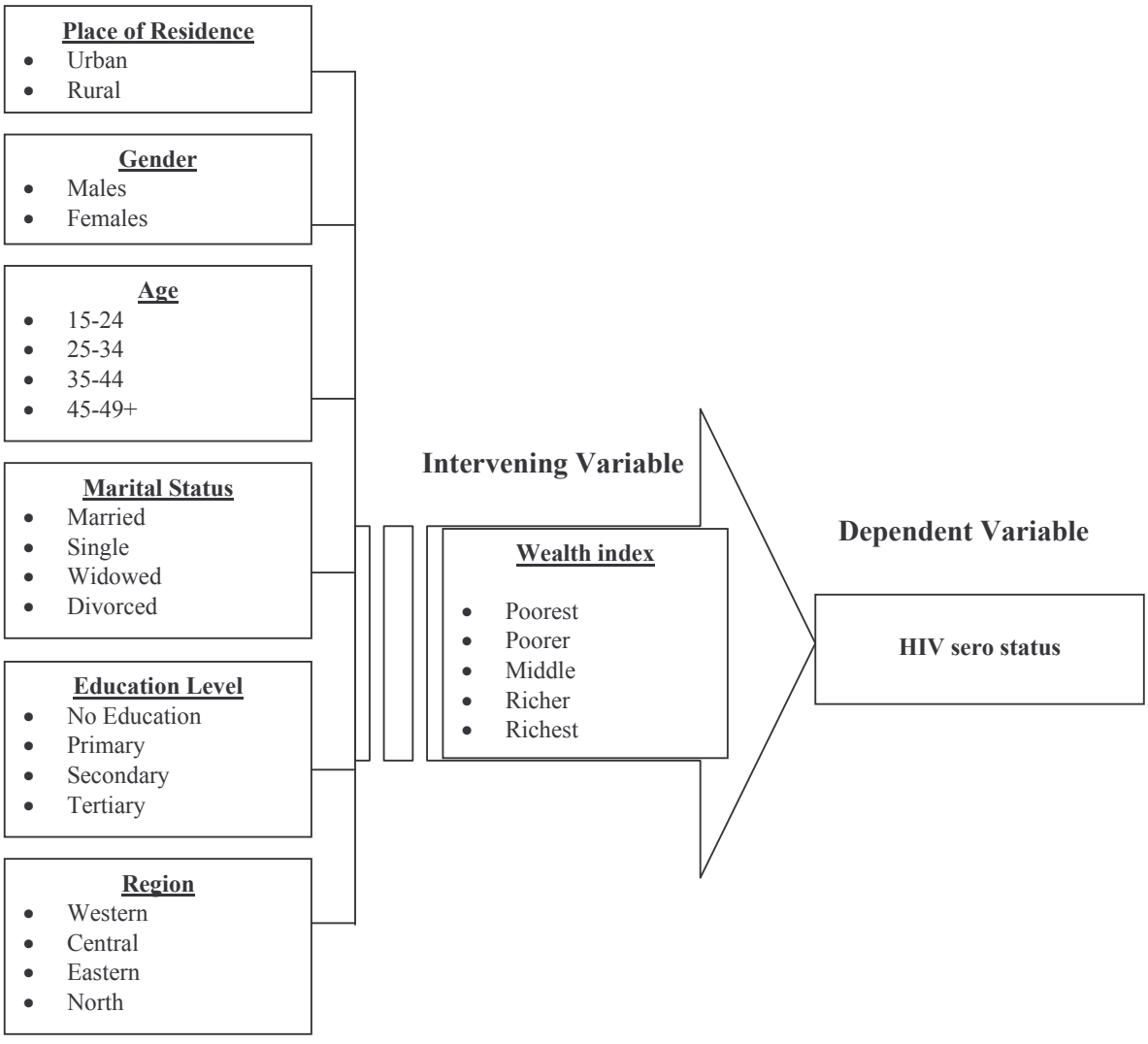


Figure 2: Conceptual framework using social economic characteristics of Ugandans

The relationship between HIV/AIDS and poverty in Uganda will be investigated across demographic characteristics in terms of explanatory, intervening and dependent variables. Explanatory variables are: 'place of residence', 'gender', 'marital status', 'age', 'level of education' and 'regions'. Wealth index (from which, poverty is inferred) will serve as an intervening variable and 'HIV status' as the dependent variable.

3.1 Study Theory

The Health Belief Model

The Health Belief Model (HBM) will be used for the study analysis. This theory was developed in the 1950s by social psychologists Godfrey Hochbaum, Irwin Rosenstock, and Stephen Kegels working in the U.S. Public Health Services. At the core of its formulation is a set of health cognitions concerned with: personal susceptibility to a condition, the perceived severity of that cognition, and the efficacy of behavior (Kirscht, 1989). Susceptibility to a condition represents the personal probability of the threat and is regarded meaningful across health-seeking situations. Efficacy represents the perceived value of the action for reducing the threat (Kirscht, 1989). Health Belief Model is primarily related to assessment of beliefs, knowledge, attitudes, transition to sexual activity, vulnerability to risky sexual activity and contraceptive use.

Where as the application of the model is dynamic, its element of "personal susceptibility to a condition" represent HIV morbidity and AIDS mortality experienced by households and how this relates to households' income index as a proxy for poverty levels in Uganda. This causality will be illustrated across the socio-economic and demographic characteristics of Ugandans.

3.2 Methodology strategy

The indicators of susceptibility have to capture the different contexts in which certain individuals (distinguished by their age, sex, education, place of residence, access to information, age, marital status and economic wealth) are more likely to be poor and HIV positive (as a principal vector of HIV transmission) than the better placed population categories.

Susceptibility to a condition will further explain why some individuals, households and communities are more vulnerable to the effects of HIV/AIDS, once a member of a household is infected with the virus and gradually progresses towards full-blown AIDS. The major determinants of vulnerability are derived from the context of a household and how it makes a livelihood as derived from its economic status. Certain household types are much more vulnerable to the aftermaths of an AIDS related death than others, such as those headed by single parents (male or female), the elderly, orphans, as well as households hosting orphans.

The study will employ the use of "intervening variable model analysis", a model which proposes that independent variables (XX) are correlated with the dependent variable (HIV Sero Status: say Y) not because they exert some direct effect upon the dependent variable, but because they cause changes in an intervening variable (Wealth index: say M), and then the intervening variable causes changes in the dependent variable.
This will follow as below.

- First demonstrating a zero-order correlation between XX and Y while ignoring that intervening variable (M) is significant
- Demonstrating that the zero-order correlation between XX and M (ignoring Y) is significant
- Conduct a multiple regression analysis, predicting Y from XX and M. The partial effect of M (controlling for X) must be significant.
- Finally, looking at the direct effect of XX on Y. This is the Beta weight for X in the multiple regression

3.3 Source of data

The Uganda HIV Sero Behaviour Health Survey (UHSBS, 2005) was used to assess the causal relationship between HIV/AIDS and poverty in Uganda. The UHSBS, 2005 is the latest nationally representative survey conducted in Uganda since 1987-88.

3.4 Unit of Analysis

The UHSBS, 2005, data will used to facilitate the 'assessment of the relationship between poverty and HIV/AIDS in Uganda. A representative probability sample of 9981 individuals was selected for this study. This study represents Uganda as a whole since the sample population is drawn from the national representative survey.

3.5 Operational definitions

Table I: Key variables

Name of the Variable	Description	Descriptive statistics/Measurement scale
Intervening Variables o *Wealth Index*	Grouped according to different levels of economic status	Ordinal 1= Poorest, 2= Poorer, 3= Middle, 4= Richer,5= Richest
Dependent Variable o *HIV Sero status*	This information is derived from the blood testing during the sero survey.	Dichotomous 1= Negative 2= Positive
Independent variables o *Level of education*	Highest level of education completed	Ordinal 0=No education, 1= Primary 2= Secondary , 3= Higher
o *Marital status*	Respondent's marital status at the time of the interview	Ordinal 0= Never married 1= Currently married 2= Formerly married
o *Place of Residence*	Respondent's place of residence	Dichotomous 0= Urban 1= Rural
o *Age*	Respondent's current age at time of survey	Ordinal: for bivariate analysis or interval level for multivariate analysis 0=15-24, 1=25-34 2=35-44, 3=45-49+ years
o *Region*	• Western • Central • Eastern • Northern	Categorical 0=Western, 1=Central 2=Eastern, 3=Northern
o *Sex*	Looking at Ugandan men and women	Dichotomous 1=Males 2=Females

4. STUDY FINDINGS

4.0 Blood Sample from Uganda HIV Sero Behavioral Survey, 2005/2006

All men and women aged 15-59 who were interviewed were asked to voluntarily provide a blood sample for HIV testing including syphilis, herpes simplex virus 2, and hepatitis B. Whereas a sample of 10,437 households was selected for the UHSBS, the actual number considered for a sample in this study was 9981. Of these, 4370 were men and 5611 were women. Albeit blood tests were compiled through a separate data set, this data was merged with the data file for socio-demographic and behavioral characteristics for purposes of this study. Accordingly, a data file containing demographic characteristics of: age, sex, place of residence, region, marital status, level of education and wealth index was extracted from the individual data file to be merged with the HIV tests data set. Thus, the main study report on causal relationship between HIV/AIDS and poverty will contain the analysis of fully linked datasets.

4.1 Characteristics of the respondents by simple frequency

Whereas males and females aged 15-59 were interviewed individually during the survey, the tables in this study focus on age group 15-49+. The age groups below 15 years were not included in the survey. This is because all the HIV indicators agreed upon by the international bodies and the Ugandan government are based on age group 15-49. It will be observed that the proportion of males and females aged 15-49 years decline with increasing age reflecting the comparatively young age structure of the Ugandan population.

Table II: Percentage distribution of respondents by selected background characteristics

Characteristics	Weighed %	Un weighed %	Un weighed #
Marital status			
Never married	31.5	31.2	3119
Currently married	59.4	59.8	5969
Formerly married	9.1	8.9	893
Total	**100**	**100.0**	**9981**
Level of Education			
No Education	17.5	17.7	1763
Primary	73.7	74.3	7411
Secondary	6.8	6.4	642
Post Secondary	2.0	1.7	165
Total	**100**	**100.0**	9981
Age			
15-19	22.6	22.5	2247
20-24	18.9	18.8	1872
25-29	18.1	17.6	1758
30-34	13.9	14.3	1423
35-39	11.7	11.9	1188
40-44	8.1	8.3	825
45-49+ years	6.7	6.7	668
Total	**100**	**100.0**	9981
Place of residence			
Urban	28.1	25.0	2492
Rural	71.9	75.0	7489
Total	**100**	**100.**	9981
Wealth Index			
Poorest	18.1	19.7	1964
Poorer	18.6	20.2	2014
Middle	19.5	19.1	1907
Rich	20.2	20.5	2044
Richer	23.5	20.6	2052
Total	**100**	**100.0**	9981
HIV Sero Status			
Negative	93.2	93.5	9335
Positive	6.8	6.5	646
Total	**100**	**100.0**	9981
Region			
Western	27.1	23.5	2349
Northern	17.4	21.9	2853
Eastern	26.1	28.6	2590
Central	29.3	25.9	2189
Total	**100**	**100.0**	9981
Sex			
Males	43.5	44.0	4391
Females	56.5	56.0	5590
Total	**100**	100.0	9981

Author's calculations

Table II: above presents the background characteristics of 9981 Ugandan men and women of age group 15-49+ who constituted the actual respondents that were blood-sampled and were tested for Sero Behavioral Survey, 2004/2005/6. To note is that this study represents Uganda as a whole since the sample population is drawn from the national representative survey.

Given the demographic characteristics of the respondents, a simple frequency distribution points out some varying percentages worth pointing out. Under marital status, over 59.4 percent of the respondents were married as opposed to 31.5 percent

singles and 9.1percent formerly married respectively. In terms of rural and urban places of residence, 71.9 percent of the tested respondents were residing in the rural areas. And finally, primary level of education represents 73.7 percent which signifies that most of the respondents (over three-quarters) have had at least some formal education with; 17.5 percent of the respondents aged 15-49 having never attended school. The rest of the demographic characteristics (age, sex, region and wealth index) demonstrate a fairly narrow distributional margin.

4.2 National HIV prevalence by cross tabulation of the respondents' characteristics

This section focuses on bivariate analysis by cross tabulation. It shows the direct relationship between the demographic characteristics and the dependent variable (HIV Sero Status); before the intervening variable (wealth index) is put in the equation.

Table IIII: Percentage distribution of Ugandans (men and women of 15-49+) by HIV status across demographic characteristics

	Males		Females		Total	
Background characteristics	**Number**	**Percentage HIV+**	**Number**	**Percentage HIV+**	**Number**	**Percentage HIV+**
Marital Status						
Never Married	1796	2.9	1323	4.3	3119	3.5
Currently married	2329	7.5	3640	6.2	5969	7.5
Formerly married	245	11.8	648	17.0	893	15.6
Level of education						
No Education	484	5.8	1279	5.1	1763	5.3
Primary	3471	5.9	3940	7.5	499	6.7
Secondary	317	6.6	325	8.3	642	7.5
Post Secondary	98	2.0	67	6.0	165	**3.6**
Age						
15-19	1063	2.4	1184	2.7	2247	**2.6**
20-24	768	4.7	1104	5.5	1872	**5.2**
25-29	710	6.1	1048	7.7	1758	**7.1**
30-34	605	7.1	818	12	1423	**9.9**
35-39	548	8.4	640	10	1188	**9.3**
40-44	361	10.2	464	7.8	825	**8.8**
45-49+ years	315	7.6	353	5.4	668	**6.4**
Place of residence						
Urban	1031	8.4	1461	11.4	2492	**10.2**
Rural	3339	5.0	4150	5.4	7489	**5.2**
Wealth Index						
Poorest	820	4.1	1144	4.5	1964	**4.3**
Poorer	916	4.5	1098	3.9	2014	**4.2**
Middle	864	5.0	1043	5.8	1907	**5.4**
Rich	926	7.3	1118	9.7	2044	**8.6**
Richer	844	8.2	1208	10.7	2052	**9.6**
Region						
Western	1033	6.1	1316	7.1	2349	**6.6**
Northern	937	5.5	1252	8.0	2189	**6.9**
Eastern	1289	3.6	1564	4.5	2853	**4.1**
Central	1111	8.5	1479	8.7	2590	**8.6**
National Total HIV prevalence						**6.5**

Author's calculations

4.3 HIV Prevalence Rates across demographic characteristics

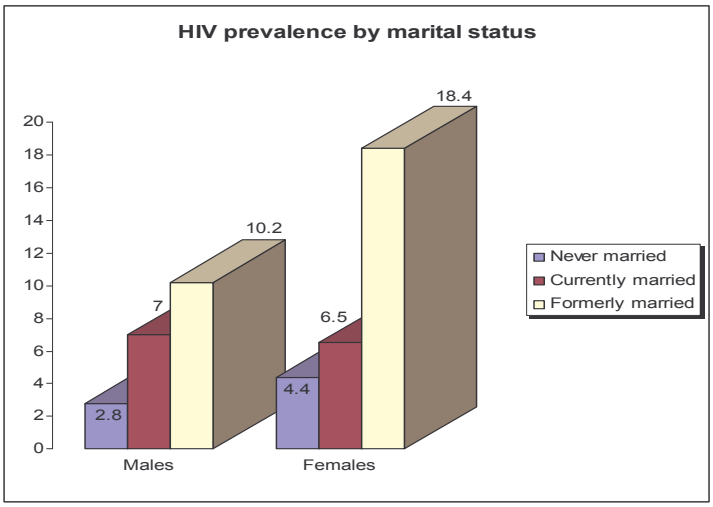
Table 3 above presents the findings from the national HIV testing. Overall, 6.5 percent of Ugandan adult men and women aged 15-49+ are HIV positive. Overall, the HIV prevalence is lower for men than women. On the whole, 5.8 percent of men have HIV, compared to 7 percent of women. Among men, the HIV prevalence increases within higher age groups (2.4%, 4.7%, 6.1%, 7.1%, 8.4%, and 10.2%), except the age group of 45 – 49, whose HIV prevalence is 7.6 percent. For both sexes, HIV prevalence is recorded highest among men aged 40-44 (10.2%) and women of age group 30-34 whose HIV prevalence stands at 12 percent. On the other hand, the disease is significantly low among those in 15-19 age group—3 percent among women and only 1 percent among men. The HIV prevalence among women then rises steadily with higher age groups.

Important to note is that HIV/AIDS prevalence among the single men and women is comparably low as opposed to those who are married and those formerly married. Whereas the rates are lower among this group, single females are almost twice (4.3%) more HIV positive than males (2.9%). However, among the married couples, men are more HIV positive (7.5%) than women (6.2%). To note is that this is not the only case where men are more HIV positive than women. Under the education levels, men with no education are 5.8% HIV positive as opposed to 5.1% of the women. This is not all: It follows that men in their older age groups are more HIV positive than women in the same age groups. Case in point is that 10.2% of men in the age group of 40 – 44 are HIV positive as opposed to 7.8% of the women in the same age group.

Additionally, 7.6% of the men in the age group of 45 – 49+ are HIV positive as opposed to 5.4% of the women in the same age brackets. This may be explained by the fact that older men are likely to engage is casual sex than older women. Of all men and women whose last sexual encounter was casual and were of the age group 40+, 80.8% were men while 19.2% were women. This clearly shows that older men engage in risky sexual behaviors than older women, which, can be used to infer to the higher HIV prevalence among men of older age than women of the same age brackets. Under wealth index, there are also cases where men are more HIV positive

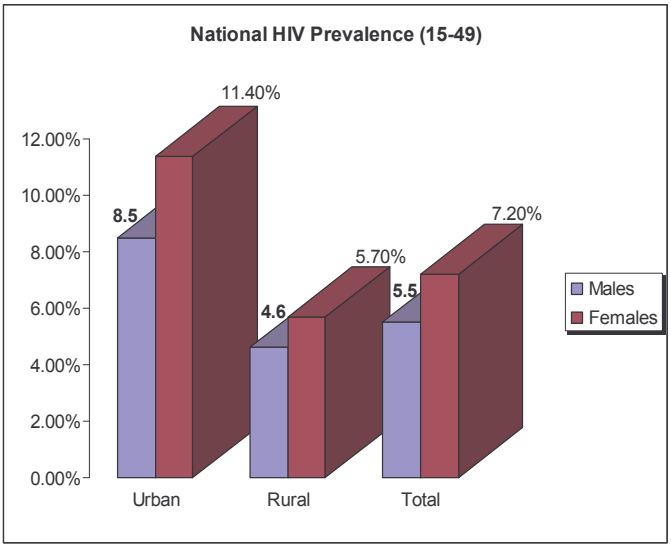
than women. For instance, 4.5% of the men in the "poorer" wealth category are HIV positive as opposed to 3.9% of women under the same economic status.

Figure 3: National HIV prevalence but marital status (men and women 15-49+ yrs)



Of all the population characteristics, marital status has the most differing levels of HIV prevalence. Single men and women recorded HIV prevalence of 3.5 percent, whereas married couples are 7.5 percent HIV positive and those formerly married have a record percent of 15.6 percent, which is the highest by all demographic categorization. This can largely be attributed to AIDS-mortality, which has seen many women widowed. On the other hand, poverty weakens the ability of women to negotiate safe sex given high females' economic dependence on men. This is consistent with Hallman, '2004' findings. The findings of this study are further related with Hallman's assertion that women are two to three times more likely to be infected as men, with up to six times the infection rate of their male peers in certain sub-regions of Sub-Saharan Africa. The UNAIDS also indicate that 64 percent of HIV infections in developing countries occur among women.

Figure 4: National HIV prevalence by gender across rural and urban areas



The HIV prevalence is almost two folds higher among men and women living in urban areas (10.2 percent) as opposed to those in the rural areas (5.2 percent). The trend of HIV prevalence increases with increasing economic status for both

men and women implying that the higher one's wealth index is, the higher the likelihood that they will be HIV positive and vice versa. Comparison across regions shows that central region has the highest levels of HIV prevalence (8.6 percent), followed by the north (6.9 percent), western at 6.6 and lastly the east with 4.1 percent. These variations in HIV prevalence between men and women conform to a study by UNAIDS which found out that in parts of eastern and southern Africa, more than one-third of teenage girls are infected with HIV. Additionally, there are five infected 15–24-year-old females for every two infected males in South Africa. To this extent, it can be concluded that higher HIV prevalence among women as oppose to men; is a Sub-Saharan Africa phenomena.

4.4 National HIV prevalence by Uganda's regions

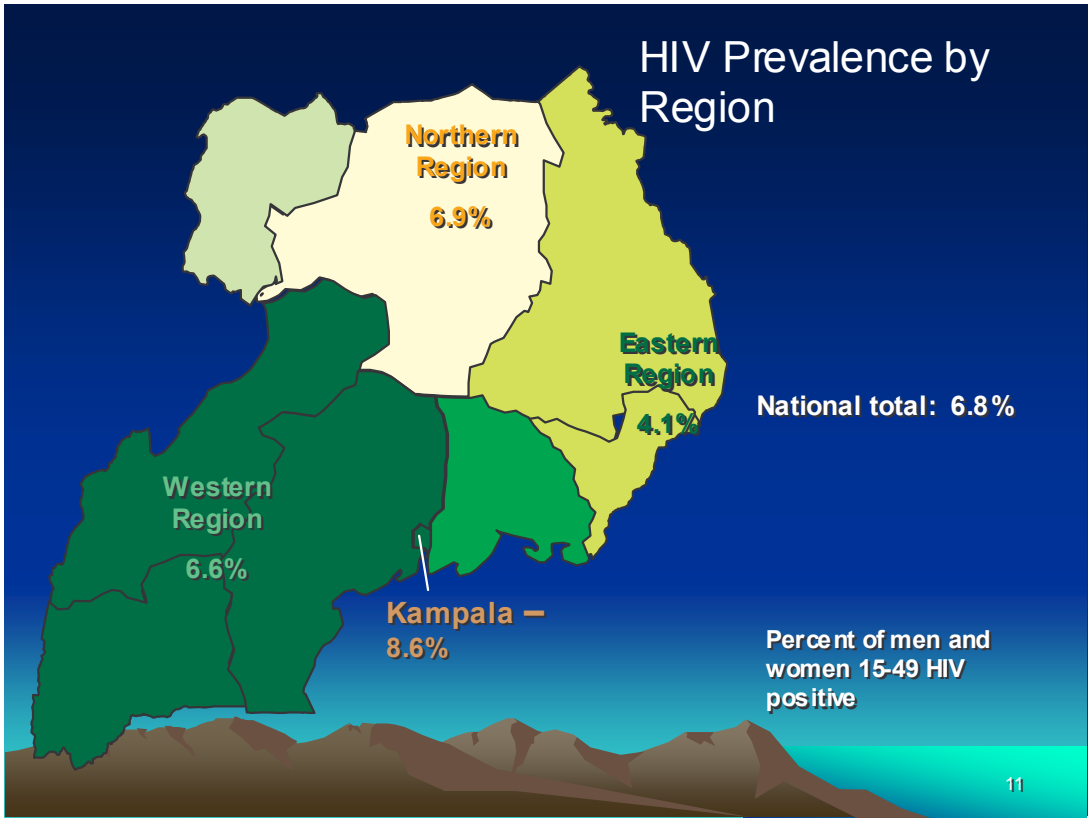


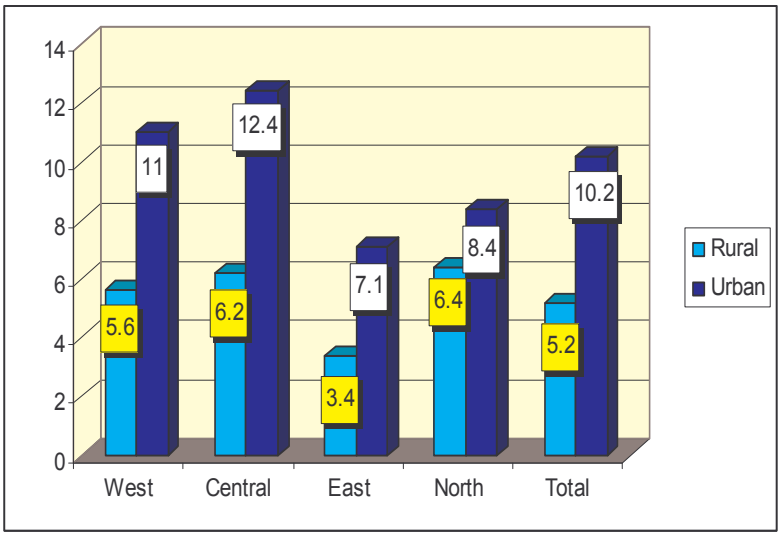
Figure 5: The map of Uganda showing HIV prevalence across regions

As shown above, Central region (Kampala) has the highest HIV prevalence (8.6 percent), followed by the North (6.9 percent), West (6.6 percent) and lastly, East at 4.1 percent. The rates would be much higher in the north except that the West Nile

region was combined with the entire north. Otherwise, north alone stands at 8.7 percent which is even higher than Central region and also the national figure of 6.8 percent. The Central region is a unique unit as compared to the rest of the regions. Whereas, the data cannot aid the explanations to the effect of high HIV prevalence in the Central region, it can be inferred that the effects of urbanization would strongly explain high HIV prevalence.

To point out is that the national HIV figures have been as high as 18 percent in the early 1990s. By mid 2004, Population Reference Bureau (PRB) reported the national HIV prevalence as low as 4.1 percent. However, this was without a nationally representative survey. Nonetheless, the current figure of 6.5 percent is a notable progress given that most countries in the Sub Saharan Africa are still struggling with the epidemic, which is reportedly as high as 20+ percent. This far, Uganda has been exhibiting an outstanding example of success in HIV prevention on the African continent and beyond.

Figure 6: National HIV prevalence by 'urban' and 'rural' areas across regions



Whereas the central region leads in HIV prevalence, a breakdown regions looking at 'rural' and 'urban' shows notable findings. Men and women who reside in the outskirts of the central region which are defined as rural, are 6.2 percent HIV positive; which is less than those from the northern region (6.4 percent). This becomes an area of analysis where the Northern region leads the rest of the regions in the prevalence of the epidemic. This may significantly explain the impact of armed forces and the war to the state of HIV/AIDS in the northern region. As literature suggests, political conflict in Northern Uganda are partly responsible for the increasing HIV prevalence in this region. The situation in the Internally Displaced People's camps predisposes women and girl-children to

HIV infection, given abundant sexual enslavement and rape that would take place during abductions. Many of the returnees from captivity could return infected and contribute to the spread of infection in their home communities or other places where they eventually settled. According to UNFPA, security forces could also contribute to the spread of HIV through incidences of sex for small gifts leading to high sexual partner turnover rate. Armed conflict tends to aggravate this partner turnover when women and girls exchange sex for basic needs or for material gain (UNFPA, 2005).

4.5 National HIV prevalence by wealth index cross demographic characteristics

The use of intervening variable model was put in the equation to unearth the relationship between HIV status and respondents' economic status across background characteristics. Detailed explanation on the table below follows:

Table IV: Percentage distribution of men and women (15-49+) by HIV status across wealth index

	Poorest		Poorer		Middle		Richer		Richest	
Background characteristics	**Number**	**% HIV+**	**Number**	**% HIV+**	**Number**	**% HIV +**	**Number**	**% HIV +**	**Number**	**% HIV +**
Marital Status										
Never married	489	2.2	479	1.9	571	3.2	688	5.1	892	4.0
Currently m'd	187	4.4	157	4.4	1144	5.7	1170	8.7	989	11.5
Formerly m'd	1288	9.1	1378	9.6	192	10.4	186	21.0	171	28.1
Education										
No Education	640	4.1	484	3.1	350	6.0	209	9.1	80	15.0
Primary	1307	4.4	1513	4.5	1507	5.4	1662	8.7	1422	10.3
Secondary	16	6.3	16	6.3	49	0	157	7.0	404	8.7
Post Secondary	1	0	1	0	1	0	16	12.5	146	2.7
Age										
15-19	417	2.4	393	1.8	460	2.4	451	3.8	526	2.5
20-24	377	5.0	352	3.7	339	3.2	379	6.3	425	7.1
25-29	341	3.8	402	4.2	311	5.8	341	10.3	363	11.3
30-34	251	6.8	298	6.0	284	9.5	309	11.3	281	15.7
35-39	250	5.6	237	6.3	217	7.8	256	11.7	228	14.9
40-44	182	4.4	168	3.6	170	7.1	171	14.0	134	17.2
45-49+ years	146	2.7	164	4.9	126	5.6	137	8.0	95	13.7
Residence										
Urban	38	5.3	98	8.2	183	14.2	549	10.2	1624	10.0
Rural	1926	4.3	1916	4.0	1724	4.5	1495	8.0	428	8.4
Sex										
Men	820	4.1	916	4.5	864	5.0	926	7.3	844	8.2
Women	1144	4.5	1098	3.9	1043	5.8	1118	9.7	1208	10.7
Region										
Western	483	5.8	515	5.0	476	5.0	458	10.3	389	7.7
Northern	504	4.6	480	6.0	354	7.3	484	8.7	367	8.7
Eastern	754	3.1	543	2.8	607	3.5	572	5.1	377	7.4
Central	223	4.9	476	2.9	442	7.0	530	10.0	919	11.8
Total for all	**1964**	**4.3**	**2014**	**4.2**	**1907**	**5.4**	**2044**	**8.6**	**2052**	**9.6**

Author's calculations

The wealth index is categorized as "poorest", "poorer", "middle", "richer" and the "richest". The link between poverty and HIV/AIDS is analyzed along wealth index across all demographic characteristics of Ugandans. Going by 'marital status' vis-à-vis economic status, the HIV prevalence remains lowest among the singles as compared by the 'married' and those 'formerly married'. The married couples follow while those 'formerly married' come last. Across wealth index, HIV prevalence increases with increasing economic status and is incomparably high among the 'formerly married'.

The 'richest' lead in high HIV prevalence across all the forms of marital and economic status. HIV prevalence among the 'richest' is 4% among the singles followed by 11.5% among the married and 28.1% among the formerly married. This scenario may be explained by the fact that most of the richer people tend to originate from urban settings. It can be hypothesized so given that most of the rural population is engaged in subsistence agriculture and the odds of them being rich are predictably slim. Given the higher HIV prevalence rates in urban setting as opposed to rural areas, it can be inferred that the interaction between being 'rich' and living in urban areas reinforces the odds of higher HIV infection rates among this population group.

Across education levels, HIV prevalence among the "poorest" and the "poorer" increases with higher level of education except, for those with 'post secondary' level. When comparing the two extremes of education levels and economic status, the 'poorest' that have attained no education have low HIV rates (4.1%) than the richest who also have no education (15%). The same explanation that most of richer individuals reside in urban areas could be used to explain this scenario. As earlier pointed out, the majority of richer people predictably reside in urban settings given the economic activities that they engage in. On the contrary, it can be assumed that most of the poor population originates from rural areas where subsistence agriculture comprises over 80% of people's livelihood. Going by this argument, the odds of being rich among rural based population are plausibly slim. Therefore it can be inferred that the higher HIV prevalence among urban population is a result of the interaction between 'higher incomes' and 'residing in urban areas'.

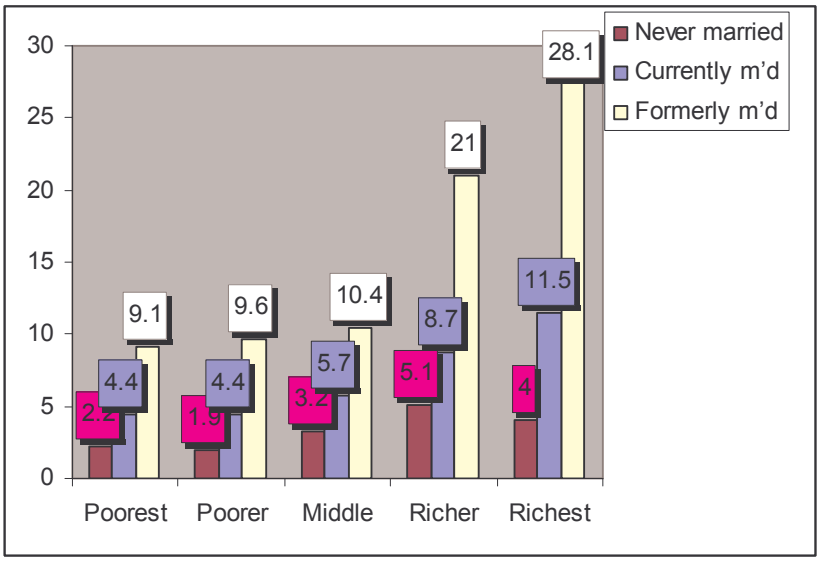
To note is that HIV prevalence among the 'richest' reduces with increasing levels of education. This will be further illustrated through a graph. Further with wealth index

and education levels, the HIV prevalence among the 'middle' income earners closely compares with the national HIV prevalence rate (6.8%). For instance, 6% of those with 'no education' who fall under the 'middle' income category are HIV positive while 5.4% of those who completed 'primary' education are HIV positive. Overall, the HIV prevalence among these groups is lower than the national HIV prevalence rate.

Across age groups vis-à-vis wealth index, the 'poorest' of age group 30 – 34 have the highest HIV prevalence (6.8%) as opposed to other age groups. Among the 'poorer' aged 35 – 39, the rate is 6.3%. On the other hand, the figure is 9.5% among those with 'middle' income of ages 30 – 34. The HIV prevalence stands at 14% among the 'richer' of age group 40 – 44. And finally, 17.2% of the richest who fall under the age group of 40 – 44 are HIV positive. Given the various income categories among different age groups, HIV prevalence is most high among people within the age groups of 30 – 34 and 40 – 44 and is much higher among richer people. The youngest age group of 15 – 19 has the lowest HIV prevalence rates across all wealth indexes and these rates are significantly lower than the national figure (6.8%). It was hypothesized that young people are more at risk of HIV infection given their social-economic marginalization. Perhaps this assumption can only explain the prevailing levels of HIV prevalence among young people but cannot offer a comparative explanation looking at young and older people respectively.

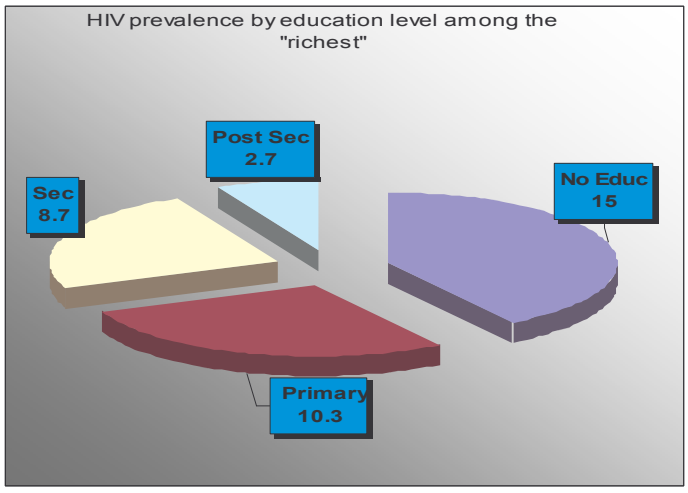
By place of residence and economic status, the HIV prevalence is consistently lower in rural areas than in urban areas across all wealth indexes of Ugandans. Rural population as classified by "poorest", "poorer" and "middle", have HIV prevalence of 4.3%, 4% and 4.5% respectively. On the other hand, the rates increase with higher economic index as seen by 8% among the richer and 8.4% among the richest. Among the urban residents, the HIV prevalence rates are recorded highest (14.2%) among those in the "middle" category of economic status.

Figure 7: HIV prevalence by marital status across wealth index



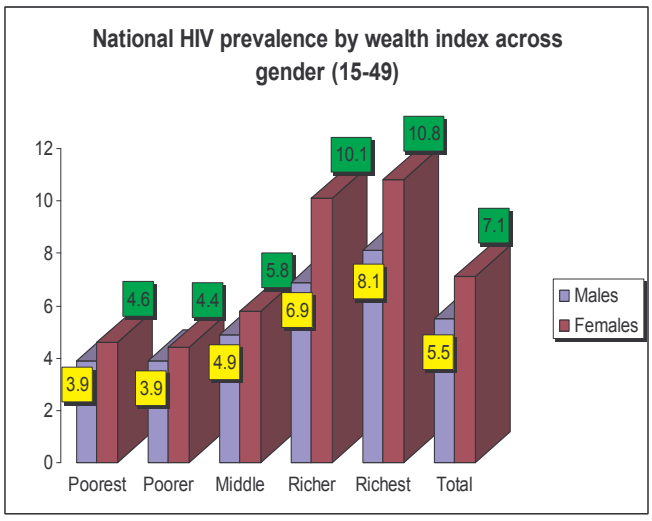
The' richest-formerly married' are three quotas more HIV positive than the 'never married and the 'currently married' by all economic status. However, there is a relatively similar level of HIV prevalence among the 'formerly married' that fall under lower economic status ('poorest', 'poorer' and 'middle'). As earlier noted, it is highly probable that the 'formerly married' are the widowed by HIV/AIDS. However, the data set does not have a variable, which can be used to establish this anonymous.

Figure 8: A unique finding of HIV prevalence by education level among the 'richest'



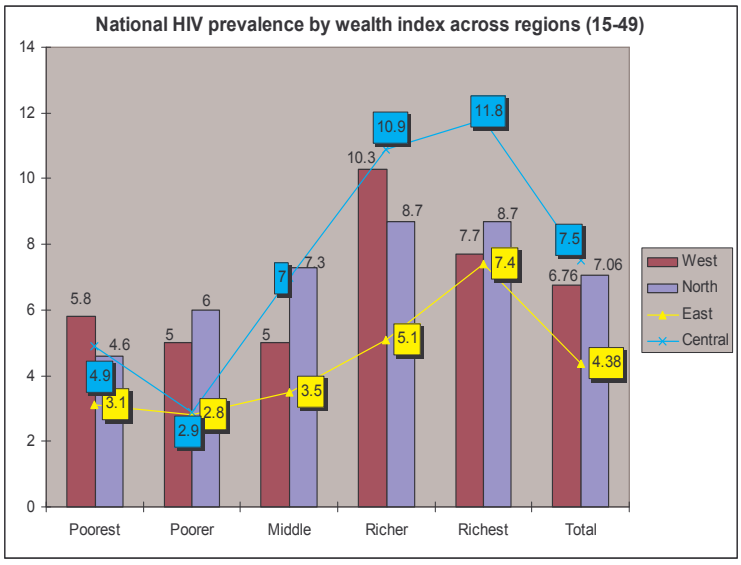
Unlike other income groups under various levels of education, the HIV prevalence reduces with higher levels of education among the 'richest'. To note is that there is a sharp difference between the 'richest' who have no education (15% and only 2.7%) and 'richest'-highly educated. In other wards, Ugandan-rich have differing levels HIV based on their level of education. The educated-rich do seem to have better health seeking sexual behaviors than the uneducated rich which makes education a strong predictor for the incidences of HIV infection among Ugandans.

Figure 9: HIV prevalence by gender across wealth index



Most studies show that women as opposed to men are most vulnerable to HIV infection given their general low economic status. Indeed, this study as demonstrated by the graph aside; found out that Ugandan women are more HIV positive than men across all levels of economic status. The surprising part is that richer women are more likely to be HIV positive (10.1% and 10.8%) than their poorer counterparts are (4.6%, 4.4% and 5.8%). Evidently, the HIV prevalence increases with increasing economic status among both men and women as may be noted from the illustration above.

Figure 10: Regional HIV prevalence by wealth index



The richest from Kampala region lead with the highest HIV prevalence (11.8%) which is almost double the national figure (6.5 percent). This is followed by the 'richer' from the same region (10.9%), then the richer from Western region (10.3%), followed by both the 'richer' and 'richest' from Central' region who both tie at 8.7 percent. Eastern region has the lowest HIV prevalence across all levels of economic status among Ugandans. The North and Western regions have closely competing levels of HIV prevalence across all levels of economic status. Overall, the Eastern region presents the lowest HIV prevalence by all categories of economic status across the country.

4.6 Logistic regression

Table IV Coefficients of the logistic regression of the probability of being HIV positive among Ugandan men and women aged 15-49

	Hypothesized sign	Coefficient	S.E.	Odds ratios
15-19				
20-24	+	.542**	.183	1.719
25-29	+	.799***	.193	2.222
30-34	+	1.127***	.198	3.088
35-39	+	1.049***	.205	2.856
40-44	+	1.011***	.218	2.750
45-49	+	.664**	.242	1.943
No education				
Primary education		.077	.125	1.080
Secondary education		.081	.205	1.085
Post Secondary	_	-1.146*	.443	.318
West				
North		-.042	.121	.869
East	_	-.516***	.128	.633
Central		.092	.114	1.170
Never married				
Currently married	_	.284*	.148	1.329
Formerly married	+	1.173***	.171	3.233
Urban				
Rural	+	-.426***	.116	.653
Males				
Females		.040	.088	1.041
Poor				
Middle	_	.217*	.116	1.243
Rich	_	.659**	.131	1.933

Author's calculations

*** Significant $p< 0.001$

** Significant $p<0.01$

* Significant $p<0.05$

According to the analysis above, most of the predictor variables in the equation are related with HIV Sero status among the Ugandan men and women. For instance, the analysis confirms that age is a predictor to the odds of being HIV positive. As presented in the table, the odds of being HIV positive among men and women within the age group of 20-24 is 1.7 times more likely than those in the age group of 15-19. Similarly, those in the age group of 25-29 are 2.2 times more likely to be HIV positive than those in the reference age group. The odds of being HIV positive are indicated to be 3.0 among those in the age group of 30-34 which is the highest probability

across all age groups. The age group of 35-39 are 2.8 more likely to be HIV positive than those in 15-19 age group and those in the age group of 40-44 are 2.7 more likely to be HIV positive than those in the reference age group. Finally the odds of being HIV positive among those in the age group of 45-49 are 1.9 more likely than those in the reference age. To note is that the probability of being HIV positive among Ugandans increases with increasing age group and reaches its highest among those in the age group of 30-34, the it starts reducing marginally with subsequent higher age groups.

By educational level, it was hypothesized that the odds of being HIV positive reduces with increasing educational level. Where as the cross-tabulation shows higher HIV prevalence among less educated people, the findings above show that the odds of being HIV positive among men and women within the 'primary' and 'secondary' level education, are 1 times higher than those without education. None the less, those with 'post secondary' level of education are 0.3 less likely to be HIV positive than those without any education.

Across regions it was found out that people's Sero status does have a relationship with the regions where they live. Taking the 'Western' region as a reference category, a positive sign was hypothesized for people living in the 'Northern' and 'Central' regions respectively implying that people from these regions were more likely to be HIV positive than those from the 'Western region. In reality, a negative sign was reached for 'Northern' region implying that people from this region are actually less likely to be HIV positive than the people from the 'Western' region. However a positive sign was realized to confirm the hypothesis that people from the 'Central' region are more likely to be HIV positive than the people from the reference category and their odds ratio stands at 1.2 times.

Under marital status, it was anticipated that 'married couples' would be at a least risk of HIV infection than the rest of marital status categories. Thus a negative sign was hypothesized. In reality, their odds of being HIV positive are 1.3 times more likely than those that are never married. The highest odds of being HIV positive are recorded among the formerly married. They are 3.2 more likely to be HIV positive

than the singles. The regression confirms the previous analyses which found out that the formerly married are the most vulnerable to HIV infection as compared to the rest of demographic characteristics of Ugandans.

The regression further confirms that richer people are more at risk of HIV infection than the poor. As reflected above, the odds of being HIV positive are 1.2 times more likely for the 'middle' income earners than the poor. It follows that the 'rich' are 1.9 more likely to be HIV positive than the poor. In other wards, the rich are almost two times more likely to be HIV positive than the poor and looking at all income groups, the rich are at more risk than the lower income earners.

A test of the model with the predictor variables against a constant-only model was statistically insignificant, x^2 (n=9981) =335.04, p>0.001

4.7 Intervening variable analysis

Table V: The logistic regression of the 'poverty' coefficients of the probability of being HIV positive across other explanatory variables

Variable	Hypothesized sign	Coefficients	S.E.	Odds Ratios
Never married * Poor				
Currently married by Middle	_	-1.145*	.477	.318
Currently married by Rich	_	-.635*	.310	.530
Formerly married by Middle	_	-1.347*	.549	.260
Formerly married by Rich	_	-.426	.368	.653
Males * Poor				
Females by Middle		.233	.276	1.262
Females by Rich		.288	.203	1.333
15 - 19 * Poor				
20-24 by Middle		.344	.470	1.410
20-24 by Rich	_	.678**	.247	1.971
25 - 29 by Middle	_	1.166*	.498	3.208
25 - 29 by Rich	_	1.098***	.258	2.997
30 - 34 by Middle	+	1.631**	.503	5.111
30 -34 by Rich	+	1.318***	.268	3.736
35 - 39 by Middle	+	1.366*	.534	3.922
35 - 39 by Rich	+	1.297***	.278	3.657
40 - 44 by Middle	+	1.237*	.547	3.446
40 - 44 by Rich	+	1.482***	.293	4.403
45 - 49 by Middle	+	.937	.611	2.553
45 - 49 by Rich	+	.979**	.331	2.661
Urban * Poor				
Rural by Middle	_	-.794*	.431	.452
Rural by Rich		.300	.364	1.350
West * Poor				
North by Middle		.292	.360	1.339
North by Rich		-.148	.268	.862
East by Middle		.374	.379	1.453
East by Rich		.104	.286	1.109
Central by Middle	+	.913*	.382	2.492
Central by Rich	+	.590*	.292	1.803
No Education * Poor				
Primary by Middle		-.402	.331	.669
Primary by Rich		-.415	.281	.660
Secondary by Middle		-19.221	.422	.000
Secondary by Rich		-.841	.804	.431
Post Secondary by Middle		-.535	.723	.585
Post Secondary by Rich		16.094	.079	.305

Author's calculations

*** Significant $p< 0.001$

** Significant $p<0.01$

* Significant $p<0.05$

The analysis above was done by interacting poverty with the other explanatory variables to ascertain the probability of being HIV positive while employing poverty as the intervening variable. Where as the interaction was found for poverty and all the explanatory variables which, in turn predict people's HIV status, the coefficients for the poverty-probability of being HIV positive was only determined along predictor variables of: marital status, age, place of residence and region. The unmarried-singles were taken as the reference. It follows that the probability of being HIV positive among the married-middle income earners is 0.3 times less likely than the reference category. The married-rich are 0.5 times less likely to be HIV positive than the unmarried-poor. On the other hand, those formerly married who fall within the middle income category, are 0.2 times less likely to be HIV positive than the unmarried-poor. In general, the unmarried-poor are more likely to HIV positive than the higher income groups among the married and the formerly married.

Under the various age groups, the 15 – 19yrs who are 'poor' were selected as the reference category. It follows that the rich of 20 – 24 are 1.4 more likely to be HIV positive than those of the reference category. A negative coefficient sign was hypothesized. The 25 - 29yrs who fall within the middle income earners are 3.2 times more likely to be HIV positive than those in the reference category. The rich of age group 25 – 29 are 2.9 times more likely to be HIV positive than the poor of 15 – 19yrs. On the other hand, the middle income earners of 30 – 34yrs are 5.1 times more likely to be HIV positive that those of reference category. The rich of the same age group are 3.7 more likely to be HIV positive than those in the reference category. The 35 – 39yrs who are middle income earners are 3.9 times more likely to be HIV positive than those in the reference group while the rich of the same age group are 3.6 times more likely to be HIV positive than those in the reference category. The middle income earners of 40 – 44yrs are 3.4 times more likely to be HIV positive than the poor of 15 – 19 yrs. Additionally the rich within the age group of 40 – 44yrs are 4.4 times more likely to be HIV positive than those in the reference category. Finally, the rich of 45 – 49yrs are 2.6 times more likely to be HV positive than those of reference category. In general, the interaction between poverty and age reveals that the wealthier of age groups higher than 15 – 19yrs are more susceptible to HIV infection. Under this predictor variable, the role of age to HIV infection seems more pronounced

than that of poverty. Perhaps, the findings would be much different if a reference age category of 30yrs and above was tagged with poverty.

Under place of residence, the middle income earners from rural areas are 0.4 times less likely to be HIV positive than the poor from urban population. In other wards, the poor from urban areas are more susceptible to HIV infection than middle income earners from rural areas. Under regions, the interaction was significant in the 'central region only. It follows that the middle income earners from the central region are 2.5 times more likely to be HIV positive than the poor from western region while the rich from central region are 1.8 times more likely to be HIV positive than the poor from western region.

In general, it has been revealed that poverty and HIV transmission are mutually reinforcing given one's marital status and their place of residence in terms of rural and urban. The study found out that unmarried-poor people who are most at risk of HIV infection than 'the married' and 'formerly married' who fall under higher economic status.

A test of the model with the predictor variables against a constant-only model was statistically insignificant, x^2 (n=9981) =343.297, p>0.000

5. RECOMMENDATIONS

i. Since this study took a one-way analysis looking at how poverty could to HIV/AIDS, further studies should be undertaken to establish the impact of HIV/AIDS on the micro and macro economy. This will help to establish the pathways of HIV/AIDS to poverty in Uganda.

ii. Development agencies and policymakers need to fully take into account the demographic changes of HIV and AIDS, although there is a growing awareness of the critical need to do this. Combined gender and age analysis is a necessary step to help development agencies and institutions to design policies and programs which decrease vulnerability of women and the general population that are within the age group of 30-34. These groups-categories recorded the highest HIV prevalence rates, thus, special attention should be paid to them in terms of addressing factors that make them susceptible to HIV infection.

iii. The rich-uneducated are far more vulnerable to HIV infection than their rich-educated counterparts. Therefore, anti AIDS actors should identify and target the "rich-uneducated" who suffer a considerable level of HIV infection. It can be inferred that this group tends to have multiple sexual partners taking advantage of their economic power; yet not empowered with proper life-skills. Thus, programs like condom promotion and 'Be Faithful' should be promoted targeting the rich-uneducated.

iv. Rigorous HIV testing should be promoted targeting the 'formerly married' in a bid to ascertain HIV prevalence alongside promoting Anti Retroviral Therapy among this group to reduce AIDS-related mortality. To note is that cross tabulation and the regression all confirmed that the HIV prevalence among the 'formerly married' was almost thrice as much when compared with the singles and married couples. Given the poverty situation in Uganda, a big proportion of people living with HIV cannot afford the ARV treatment. Therefore, special interest should be paid towards promotion affordable Voluntary Counseling and Testing (VCT) and subsequent treatment programs.

6. CONCLUSIONS

In Uganda, people's economic status underlines the risk with which they are susceptible to the risk of HIV infection. Overall, the study confirms that HIV infection is not mostly pronounced among poor individuals as it was earlier hypothesized. Instead, richer people are found to be more at risk of HIV infection and indeed, there is higher HIV prevalence among the rich than the poor. Demographic characteristics like 'gender', 'age' and 'economic status' show ways in which certain population groups are vulnerable to HIV infection and can be taken as the indicator for underlying normative support-need that could enable those infected and affected, overcome the economic and social strains of the epidemic. As literature suggests that women are more vulnerable to HIV infection, indeed, the study findings further confirmed that women are almost twice more at risk of HIV infection than their male counterparts by all demographic characteristics.

When comparing two extremes of 'education level' and 'economic status', the illiterate-poor have lower HIV prevalence rates than the illiterate-rich. The explanation cannot be offered by this study but it can be inferred that most illiterate-rich would be urban residents as opposed to rural. This is to take their economic and HIV status as a result of the nature of urban forms of economic activities and lifestyle. Going by this argument, the odds of being rich among rural-based population are plausibly slim. Therefore it can be inferred that the higher HIV prevalence rates among urban population is a result of the interaction between 'higher incomes' and the lifestyle in an urban setting.

BIBLIOGRAPHY

AVERT (2005). Fact sheet on the President's Emergency Plan for AIDS Relief. http://www.avert.org/pepfar.htm.

Bureau of Economic Research (2001). "The Macro Economic Impact of. HIV/AIDS", in Economic Research Note 10.

Chris Desmond and Jeff Gow (1998). The Current and Future Impact of the HIV/AIDS Epidemic on South Africa's Children; The economic impact of the HIV epidemic - HIV and Development Programme.

Desmond and Cohen (2000). Intensifying Action Against HIV/AIDS in Africa-Responding to a Development Crisis.: Poverty and HIV/AIDS in Sub-Saharan Africa. The World Bank - Africa Region.

Fleischman, J (2003). Fatal vulnerabilities: Reducing the acute risk of HIV/AIDS among women and girls. A report of the Group on women and girls.

Food Agriculture Organization of United Nations (2004). HIV/AIDS, gender inequality and rural livelihoods: The impact of HIV/AIDS on rural livelihoods in Northern Province, Zambia.

Food Agriculture Organization of United Nations (2004). Zambia: Helping AIDS orphans help themselves.

Food Agriculture Organization of United Nations (2003). The impact of HIV/AIDS on agricultural production and mainstreaming AIDS messages into agricultural extension in Uganda.

Food Agriculture Organization of United Nations (2004). HIV/AIDS and the Food Crises in Sub-Saharan Africa. Twenty-third regional Conference for Africa, Johannesburg, South Africa, 1-5 March 2004.

Gregson S. Nyamukapa (2002). Sexual mixing patterns and six differentials in teenage exporter to HIV infection in rural Zimbabwe', The Lancet, Vol 359: pp. 1896-1903.

Hallman Kelly (2004). "Socio-economic context of young people in Kwa-Zulu Natal," presented at South Africa Youth Symposium "Going from Context, to Services and Behavior Change," Johannesburg, South Africa.

Ingela Ternström (2004). HIV/AIDS – The True Tragedy of the Commons? Exploring the effects of HIV/AIDS on Management and Use of Local Natural Resources.

John P. Kirscht (1989). The Health Belief Model theory and personal health behavior. Health Behavior monographs. Vol. 2 No. 4.

Ministry of Health, (2006). Uganda HIV/Aids Sero-Behavioural Survey (UHSBS)

Ministry of Health (2001). Sexually Transmitted Diseases/HIV/AIDS Surveillance Report.

Mutangadura (2000). The impact of AIDS on people and societies; Report on the global AIDS epidemic.

Quattek Kristina (2000). The Economic Impact of AIDS in South Africa: a Dark Cloud on the Horizon.

Schubert Bernd (2003). Social Welfare Interventions for AIDS Affected Households in Zambia.

Thaxton (2005). In Coastal Tanzania, A Vicious Spiral of HIV/AIDS, Poverty, Gender Inequity, and Natural Resource Degradation.

The joint United Nations Programme on AIDS (2004). Financing the expanded response for AIDS.

The joint United Nations Programme on AIDS, Geneva (2004). Report on the global AIDS Epidemic.

Uganda AIDS Commission (1998). Uganda National Operational Plan for HIV/AIDS/STD Prevention, Care and Support.

Ugandan Ministry of Health (2003). Sexually Transmitted Diseases/HIV/AIDS Surveillance Report.

Ugandan Ministry of Health (2001). Sexually Transmitted Diseases/HIV/AIDS Surveillance Report.

UNAIDS (2004). A global view of HIV infection. Basic facts about the AIDS and table of country-specific HIV and AIDS estimates. Epidemiological Fact Sheets on HIV/AIDS and Sexually Transmitted infections in Uganda.

UNAIDS and Uganda AIDS Commission Secretariat (2001). Twenty years of HIV/AIDS in the World. Evolution of the Epidemic and Response in Uganda- Prevalence data.

UNAIDS, UNFPA, UNDP (2005). Basiline Assessment of HIV/AIDS Awareness and Service Provision in IDP camps, Northern Uganda.

United Nations 2002. The Uganda Comprehensive Country Proposal for Scaling up the National Response to HIV/AIDS, Tuberculosis and Malaria. Global Fund, AIDS & the demography of Africa-Publication, 1994.

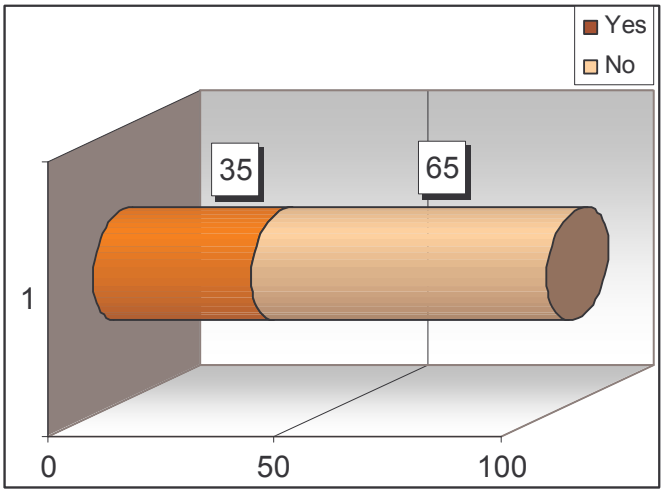
Whiteside Allan and Tony Barnett (2002). Poverty and HIV/AIDS: Impact, Coping and Mitigation Policy.

World Bank (2000). 'Thailand's Response to AIDS: Building on Success, Confronting the Future', Thailand social Monitor V, p.10-11.

World Population Data Sheet (2004). Population Reference Bureau-http://www.prb.org/.

APPENDIX

The percentage difference in HIV prevalence by circumcision status among Ugandan men (15 – 49yrs)



The graph shows the varying HIV prevalence levels among Ugandan men based on their circumcision status. Out of all the HIV positive men, 65% are none circumcised while 35% are circumcised. The regression further indicated that circumcised men are 64% less likely to contract HIV than uncircumcised men.

ECONOMIC POLICY RESEARCH CENTRE

Research Series

NUMBER	AUTHOR(S)	TITLE	DATE
52	Rudaheranwa N., Guloba M. & W. Nabiddo	Costs of Overcoming Market Entry Constraints to Uganda's Export-Led Growth Strategy	August 2007
51	Ibrahim Kasirye	Vulnerability and Poverty Dynamics in Uganda, 1992-1999	August 2007
50	Sebaggala Richard	Wage determination and wage Discrimination In Uganda	May 2007
49	J. Herbert Ainembabazi	Landlessness within the vicious cycle of poverty in Ugandan rural farm households: Why and how is it born?	May 2007
48	Marios Obwona & Sarah N. Ssewanyana	Development impact of higher education in Africa: *The case of Uganda*	January 2007
47	Charles A. Abuka, Kenneth A. Egesa, Imelda Atai & Marios Obwona	Firm Level Investment: Trends, determinants and constraints	March 2006
46	John Okidi, Sarah Ssewanyana, Lawrence Bategeka & Fred Muhumuza	Distributional and Poverty Impacts of Uganda's Growth: 1992 to 2003	December 2005
45	John Okidi, Sarah Ssewanyana, Lawrence Bategeka & Fred Muhumuza	Growth Stategies and Conditions for Pro-poor Growth: Uganda;s Experience	December 2005
44	Marios Obwona, Francis Wasswa and Victoria Nabwaayo	Taxation of the tobacco industry in Uganda:The Case for excise duty on cigarettes	November 2005
43	Marios Obwona & Stephen Ndhaye	Do the HIPC debt initiatives really achieve the debt sustainability objective? Uganda's experience	August 2005
42	Nichodemus Rudaheranwa	Trade costs relating to transport barriers on Uganda's trade	May 2004
41	Okurut Francis Nathan Banga Margaret & Mukungu Ashie	Microfinance and poverty reduction in Uganda: Achievements and challenges	April 2004
40	Ssewanyana Sarah, Nabyonga Orem Juliet, Kasirye Ibrahim, David Lawson	Demand for health care services in Uganda implications for poverty reduction	March 2004
39	Ssewanyana N.S., Okidi A.J., Angemi D., & Barungi V.	Understanding the determinants of income inequality in Uganda	March 2004
38	John A. Okidi	Trends in Ugandan household assets during the 1990s	March 2004
37	Nichodemus Rudaheranwa, Lawrence Bategeka and Margaret Banga	Beneficiaries of water service delivery in Uganda	October 2003
36	Nichodemus Rudaheranwa, Lawrence Bategeka, Margaret Banga & Ashie Mukungu	Supply Response of Selected Export Commodities in Uganda	October 2003

NUMBER	AUTHOR(S)	TITLE	DATE
35	Godfrey Bahiigwa, Frank Ellis, Odd-Helge Fjeldstad & Vegard Iversen	Rural Taxation in Uganda: Implications for Growth, Income Distribution, Local Government Revenue and Poverty Reduction	January 2004
34	David Lawson, Andy McKay & John Okidi	Poverty Persistence and Transitions in Uganda: A Combined Qualitative and Quantitative Analysis	December 2003
33	Michael Atingi Ego & Rachel Kaggwa Sebudde	Measuring Efficiency of a Market in Transition: The Ugandan Foreign Exchange Market	September 2003
32	John A. Okidi & Andrew McKay	Poverty Dynamics in Uganda: 1992 to 2000	May 2003
31	Rosetti Nabbumba & Godfrey Bahiigwa	Agricultural Productivity Constraints in Uganda: Implications for Investment	May 2003
30	M.D. Sajjabi	Capital Account Liberalization in Uganda: An assessment of the early warning indicators and policy response	July 2003
29	Klaus Deininge, Gloria Kempaka, & Anja Crommelynck	Long-term welfare and investment impact of AIDS-related changes in family composition: Evidence from Uganda	December 2002
28	Klaus Deininger & John Okidi	Growth and Poverty reduction in Uganda, 1992-2000: panel data evidence	March 2002
27	Marios Obwona & Adam Mugume	Credit Accessibility and Investment Decisions in Uganda's Manufacturing Sector: An empirical investigation	June 2001
26	Charles A. Abuka & Augustine Wandera	Determinants of Price Level Dynamics in Uganda: Some Stylized Facts and Empirical Evidence	June 2001
25	Godfrey B.A. Bahiigwa	Household Food Security in Uganda: An Empirical Analysis	December 1999
24	Bruno R.M. Ocaya	The Economic Performance of Highly Indebted African Countries	October 1999
23	Torgny Holmgren, Louis Kasekende Michael Atingi-Ego & Daniel Ddamulira	Aid and Reform in Uganda – Country Case Study	September 1999
22	Paul Okiira Okwi	Poverty in Uganda: A Multivariate Analysis	October 1999
21	Godfrey Bahiigwa	The Impact of Trade and Investment Policies on the Environment: The Case of the Fisheries Industry in Uganda	September 1999
20	Peter Mijumbi	Estimation of Regional Staple Food Demand Elasticities using 1993-4 Uganda National Survey Data	September 1999
19	John Alphonse Okidi	The Degree of Socially Sub-optimal Individual Behaviour in Collective Resource Management	September 1999

NUMBER	AUTHOR(S)	TITLE	DATE
18	John Alphonse Okidi	The Potential for Community-based Management of Forest Resources in Uganda	September 1999
17	John Alphonse Okidi	Regional Growth Disparities and Household Economic Performance in Uganda	September 1999
16	Gloria Kempaka	Exchange Rate Movements and Their Effect on Industrial Production in Uganda	September 1999
15	Marios Obwona	Foreign Direct Investment: Leader of Follower	September 1999
14	Marilyn Kamanyire	External Financing and Economic Performance: The Case of Uganda	September 1999
13	Darlison Kaija	Community and Economic Impact of Export Diversification: The Cut-Flower Industry in Uganda	September 1999
12	Klaus Deininger & John Okidi	Capital Market Access, Factor Demand, and Agricultural Development in Rural Areas of Developing Countries: The case of Uganda	June 1999
11	Fred Kakongoro Muhumuza	How Responsive is Tax Revenue to Growth in Uganda	June 1999
10	Charles A. Abuka & David M. Sajjabi	The Importance of Domestic and External Factors in the Appreciation of the Real Exchange Rate in Uganda	March 1999
9	Marios Obwona	Estimating Unreported Income of the Self-Employed and Tax Evasion in Uganda: An Expenditure-Based Approach	March 1999
8	Francis Nathan Okurut, Jonathan J.A.O. Odwee & Asaf Adebua	Determinants of Regional Poverty in Uganda	February 1999
7	Adam Mugume & Marios Obwona	Public Sector Deficit and Macroeconomic Performance in Uganda	August 1998
6	Michael Atingi-Ego & Winnie Rwebeyanga	The Effectiveness of the Treasury Bill as an Instrument of Monetary Policy in Uganda	October 1998
5	Marios Obwona	Savings Mobilisation and Credit Conduits: Formal and Informal Financial Sector Linkages	January 1998
4	Marios Obwona	Determinants of Foreign Direct Investments and their Impact on Economic Growth in Uganda	December 1998
3	Fred Opio	The Impact of Structural Adjustment Programme on Poverty and Income Distribution in Uganda	September 1997
2	Marios Obwona & John Ddumba-Ssentamu	Nature and Determinants of Domestic Savings in Uganda	August 1997
1	John Matovu & Luke Okumu	Credit Accessibility to the Rural Poor in Uganda	May 1997

Economic Policy Research Centre (EPRC)
51 Pool Road Makerere University Campus P. O. Box 7841 Kampala, Uganda
Tel: 256-41-541023 Fax: 256-41-541022 Email: eprc@eprc.or.ug