

FACTORS ASSOCIATED WITH HIGH-RISK SEXUAL BEHAVIOR AMONG
KENYANS: IMPLICATIONS FOR PUBLIC HEALTH STRATEGIES AND POLICY
IN COMBATING HIV/AIDS

by

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A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Health Services Research

Charlotte

2010

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ABSTRACT

ELIJAH OGETO ONSOMU. Factors associated with high-risk sexual behavior among Kenyans: Implications for public health strategies and policy in combating HIV/AIDS. (Under the direction of DR. JAMES STUDNICKI)

Background: Sub-Saharan Africa, representing only 12% of the world population is home to nearly 23 million people, approximately 70% of all HIV positives worldwide. HIV/AIDS epidemic in Kenya is characterized by high-risk sexual behavior (HRSB) such as lack of condom use, multiple sexual partners, and prostitution. **Objective:** The study measures the associations between HRSB, HIV testing, and attitudes/stigma with variables measuring HIV/AIDS, psychosocial, demographic and, economic elements, and behaviors. **Methods:** Cross-sectional data from the Kenya Demographic and Health Survey-2003 were used for this study. Data were weighted for stratum and primary sampling units attaining *linearized standard errors* “robustness.” Parametric testing using univariate and multivariate logistic regression was performed. Stata version 11 was utilized for all analyses with statistical significance set at $p < 0.05$. A sample size of 11,746 [8,171 (70%) women and 3,575 (30%) men] was retained for the analysis. For analysis involving HIV, three datasets representing women, men and HIV test results were merged together with a sample size of 6,190 [3,273 (53%) women and 2,917 (47%) men]. Both included women aged between 15-49 years (reproductive age) and men aged 15-54 years. **Findings:** HIV prevalence was 7% in Kenya [women (9%) and men (5%)]. Prevalence of negative attitudes/stigma towards HIV/AIDS and alcohol consumption among women and men in urban areas was 6%, $p < 0.01$ and 30%, $p < 0.05$ respectively. Prevalence of STDs and HIV tests among women and men was 8%, $p < 0.01$ and 9%,

p<0.001 respectively. Furthermore, the prevalence of uncircumcised men and HIV positive test was 48%, p<0.001. Women who consumed alcohol and resided in urban areas were at lower odds (OR = 0.64, 95%CI: 0.39-1.05, p=0.079) of having negative attitudes/stigma towards sex education on condoms in schools. In addition, the odds of men who resided in rural areas and consumed alcohol were notably high for having negative attitudes/stigma towards HIV/AIDS (OR = 1.31, 95%CI: 1.05-1.63, p<0.05). Also, men had higher odds (OR = 1.68, 95%CI: 1.39-2.04, p<0.001) and (OR = 1.42, 95%CI: 1.19-1.69, p<0.001) of having negative attitudes towards women for husband controlling attitudes and sexual attitudes respectively compared to those who did not. For wealth, in unadjusted results, the odds of richest men reporting HRSB were greater (OR = 1.08, 95%CI: 1.00-1.15, p<0.05) compared to the poorest; however, for women, the odds were lower (OR = 0.94, 95%CI: 0.89-0.99, p<0.05). For both women and men, the odds of testing positive for HIV was notably higher for those with an STD(s) (OR = 3.05, 95%CI: 1.34-6.96, p<0.01) and (OR = 2.01, 95%CI: 0.92-4.40, p=0.082) respectively. This was (OR = 1.69, 95%CI: 1.00-2.86, p<0.05) among women who were physically abused with a weapon and (unadjusted OR = 1.63, 95%CI: 1.08-2.47, p<0.05) for emotional abuse respectively, and (OR = 4.23, 95%CI: 2.51-7.13, p<0.001) among men who were uncircumcised. Conclusion: The findings suggest that HIV is prevalent in Kenya with intertwined complexities mainly driven by cultural and socioeconomic diversity. Implications for policy: Integration of services and other intervention programs with HIV/AIDS testing can reduce HIV incidence in Kenya. Policy recommendations: Eliciting key stakeholder support as equal partners in HIV/AIDS programs is critical. HIV/AIDS program appropriateness will instill ownership for such programs.

DEDICATION

To my late grandmother “*Dr. Nyanchera*” Kerubo Ondieki who has passed on to heaven (1997), a well respected traditional village doctor who always mentioned the importance of education. Rest in peace baba (grandmother), your family loves and misses you dearly.

To my dear parents, mwalimu (teacher) Samuel Onsomu Ondieki and Dorikah Moraa Onsomu who have sacrificed and dedicated unselfishly all their life the best possible way they knew to their seven children. Even after retiring from teaching in primary school, military-aviation school, and a technical school as a principal, your love for education is evident by continuing to give so much through your school. Despite financial difficulties, you have managed to keep the school open with your own funds and still the best mathematics teacher! But most important, your students have come out strong in national exams. To you my parents, I have always respected and admired your life.

Lastly to all people living with HIV, those who have died from HIV complications or AIDS, and to all social, clinical, and biomedical researchers who continue to seek prevention efforts, strive to find a cure or inventions through treatment that can ensure quality of life to those infected with HIV/AIDS.

ACKNOWLEDGEMENT

First, I thank God for he has kept his promise and always faithfully provided for all of my needs. I also express my sincere gratitude to Dr. Studnicki for guiding and mentoring me through this tiring but rewarding experience as I worked through my dissertation. Also my gratitude goes to Dr. Ahmed Arif who tremendously assisted me with understanding and coding my datasets. Thank you both for accommodating me during my frequent unplanned appointments. I am also very grateful to my other committee members Dr. Judith Cornelius, Dr. James Laditka, Dr. Ayana Moore, and Dr. Noah Mark for their feedback and comments on my dissertation. To all of you, I appreciate your support, time, and expertise; I am honored to have worked with you.

I also express my gratitude to the College of Health and Human Services at The University of North Carolina at Charlotte for the countless opportunities that were made available to me and the four years of funding through the graduate school. I am also grateful to the support staffs at all levels who have been very helpful as well.

I would also like to acknowledge my dear siblings Josephine Onsomu, Dr. Elkana Onsomu, Irene Onsomu, Ezna Onsomu, Judith Onsomu, and Audrey Onsomu who have been very supportive and thank you for understanding my prolonged absence, three graduate programs thousands of miles away from home was quite a lengthy experience – now I will be more available. I would also like to say thank you to my wife Dr. DaKysha Moore-Onsomu. I appreciate your understanding and support during this time. Finally, to my PhD colleagues, you have been wonderful friends and a great support network throughout this entire process.

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LIST OF ABBREVIATIONS

ABC	Abstinence, Be Faithful, Use a Condom
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Treatment
BBC	British Broadcasting Corporation
CBS	Central Bureau for Statistics
CDC	Centers for Disease Control and Prevention
CIA	Central Intelligence Agency
DHS	Demographic and Health Surveys
ECA	Economic Commission for Africa
GOK	Government of Kenya
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IEC	Information-Education-Communication
KAIS	Kenya AIDS Indicator survey
KEMRI	Kenya Medical Research Institute
KDHS	Kenya Demographic Health Survey
KNASP	Kenya National HIV/AIDS Strategic Plan
MOH	Ministry of Health
MSM	Men Who Have Sex With Men
NASCOP	National AIDS and STIs Control Program
NACC	National AIDS Control Council

NCPD	National Council for Population and Development
NGOS	Non-Governmental Organizations
CFA	Common Factor Analysis
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PSU	Primary Sampling Unit
STDS	Sexually Transmitted Diseases
UNAIDS	The Joint United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

Kenya: Geography and Population

Kenya is located in the eastern part of the African continent. It lies between 5° north and south of the latitude and between 24° and 31° east longitudes with the equator almost bisecting the country into two parts. Kenya borders five countries and the Indian Ocean, with Tanzania in the south, Uganda in the west, Ethiopia and Sudan in the north, Somalia in the northeast, and the Indian Ocean in the southeast. Kenya has a total area of 582,646 square kilometers with a total land mass of 571,466 square kilometers with the remaining kilometers covered by water bodies – meaning almost 80% of the land is arid or semiarid with only 20% of the land being arable. The country is home to a diverse geographic and physical features that include: the great Rift Valley that runs from the north to the south of the county; Mount Kenya, which is the second highest mountain in Africa; Lake Victoria known to be the largest freshwater lake in the continent; Lake Nakuru which is a major tourist attraction for its flamingos population; Lake Magadi known for its natural occurring mineral (soda ash); and several rivers (Tana, Athi, Yala, Nzoia, and Mara) [Central Bureau of Statistics (CBS), 2004].

Kenya was formerly colonized by Britain in 1920. The country achieved its independence on December 12, 1963, and in 1964, it became a republic. There are 42 ethnic/tribal groups with the major tribes being Kikuyu, Luhya, Luo, Kalenjin, Kamba, Kisii, and Meru. African culture coupled with British colonization led to two official languages: English and Swahili. It is important to note that all tribes speak different first

languages. Christianity and Islam are the major religions. Kenya has also seen a steady increase in its population that currently has been increasing but at a slower rate mainly due to HIV/AIDS epidemic, family planning programs, poor and deteriorating health services, and increasing widespread poverty. In 1969 the population was 10.9 million, in 1999 the population was 28.7 million, and by the end of 2003 the total population of the country was estimated to be 32.2 million (CBS, 2004). As of 2008, this statistic has since grown and currently the population is estimated to be 38 million (CIA, 2008).

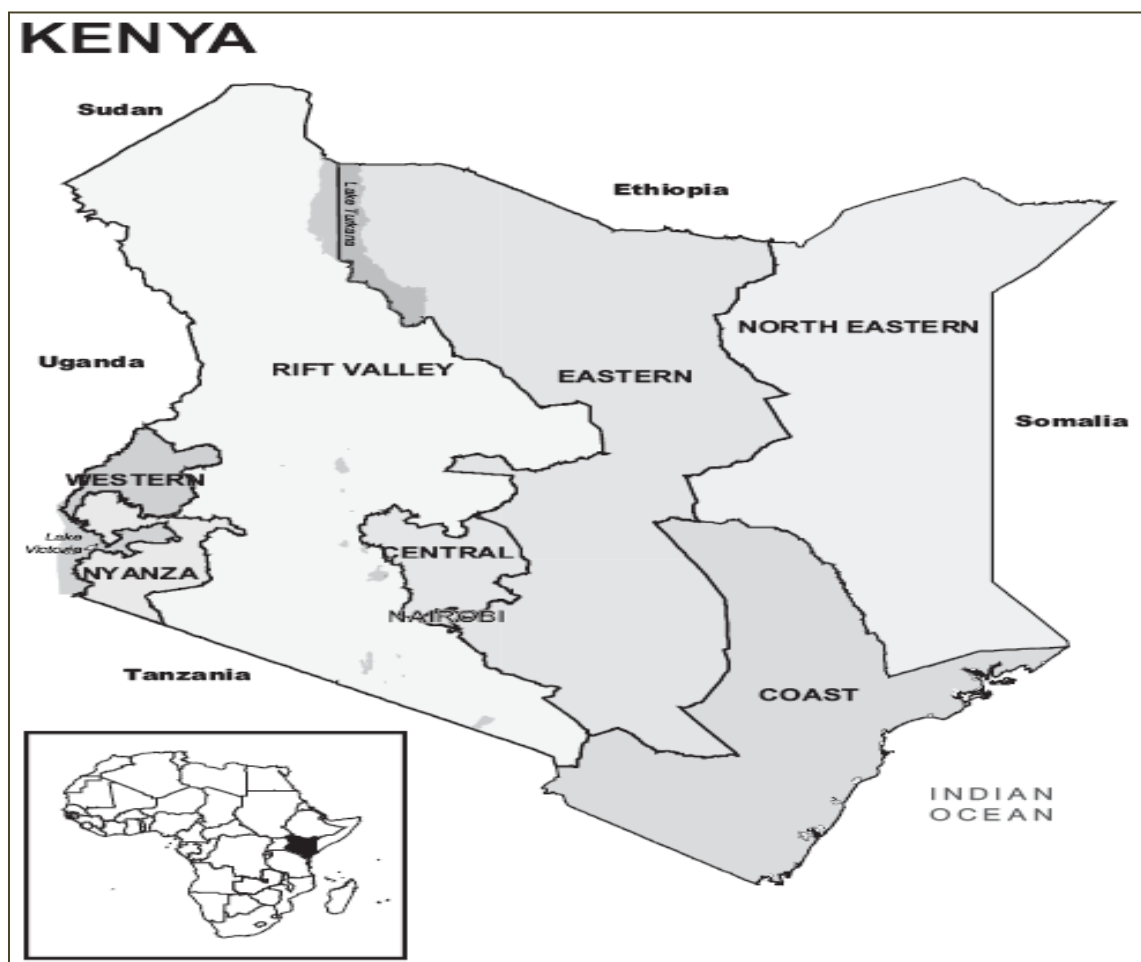


FIGURE 1: Map of Kenya, 2004¹

¹ Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Macro. 2004. *Kenya Demographic and Health Survey 2003*. Calverton, Maryland: CBS, MOH, and ORC Macro.

The country's population is characterized by a youthful population, with almost 44% of them being younger than 15 years and only 4% accounting for those who are 65 years and older. The proportion of the population residing in rural areas is higher compared to that residing in urban areas. However, there has been an increase in urban population since 1969 due to rural-urban migration as majority of Kenyans looked for better opportunities in the urban areas (CBS, 2004).

HIV/AIDS: Global

Human Immunodeficiency Virus (HIV) that causes the Acquired Immunodeficiency Syndrome (AIDS) for almost three decades has been the center for attention due to its devastating nature among those infected. The disease is characterized by biological and epidemiological features that require urgency from public health officials, political leaders, and the larger general public. AIDS was first identified and described in 1981 when the disease was commonly limited to homosexuals in the United States (WHO, 2008; Center for Disease Control and Prevention MMWR weekly, 2001a; Center for Disease Control and Prevention MMWR weekly, 2001b). However, this changed rapidly as more cases that fell under the AIDS criteria established by the Center for Disease and Prevention (CDC) were confirmed in Europe, Haiti, and Africa. The AIDS pandemic nature was evident by 1984 (De Cock, Mbori-Ngacha, & Marum, 2002; Nelson, 1993; WHO, 2008).

Worldwide by 2007, there were 33.2 million people estimated to be living with HIV representing a 16% reduction compared to the 2006 estimates (39.5 million). This reduction is mainly attributed to revisions in country's estimates in India and Sub-Saharan Africa (SSA), with 70% of the changes coming from six countries (Angola,

India, Kenya, Mozambique, Nigeria, and Zimbabwe). Among these six countries, 2.5 million people were newly infected with HIV which comprised of 2.1 million adults and 420,000 children. Deaths due to AIDS were 2.1 million comprised of 1.7 million adults and 330,000 children. Seventy six percent (≈ 1.6 million) of the deaths occurred in SSA (UNAIDS, 2007).

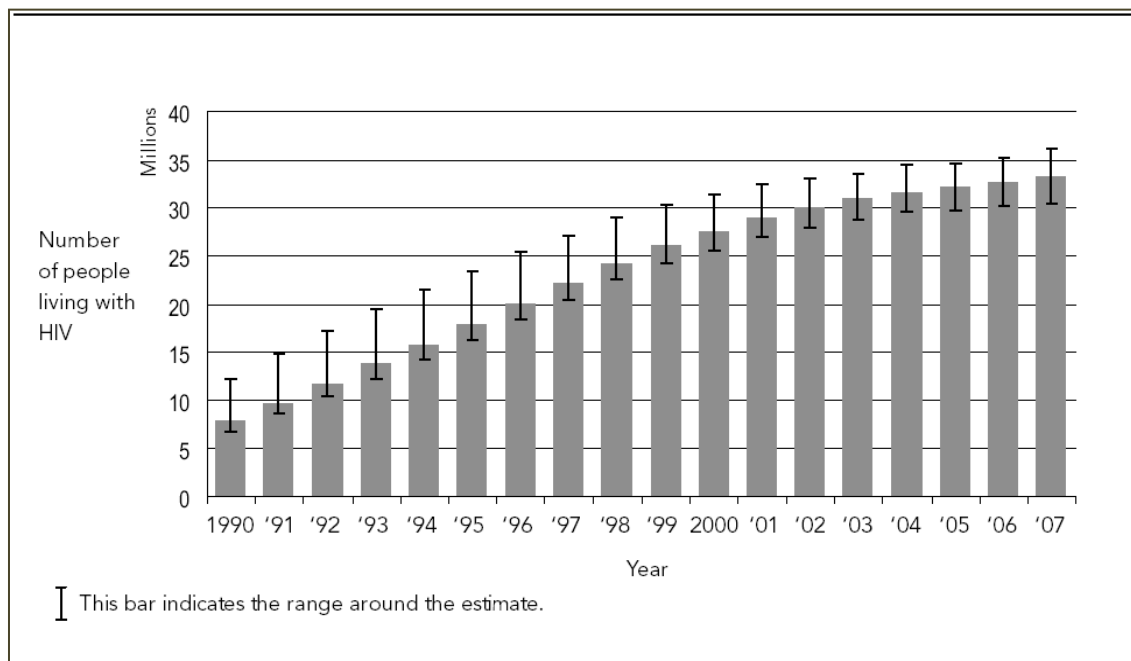


FIGURE 2: Estimated number of people living with HIV globally, 1990-2007²

HIV/AIDS epidemic over the years has seen some reduction in the number of those infected. However, a lot needs to be done in this effort since over 6,800 people become infected with HIV every single day and another 5,700 people die every day from AIDS due to inadequate HIV prevention and treatment services (UNAIDS, 2007).

² The Joint United Nations Program on HIV/AIDS and World Health Organization (UNAIDS). (2007). *AIDS epidemic update*. Retrieved July 23, 2008, from http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf

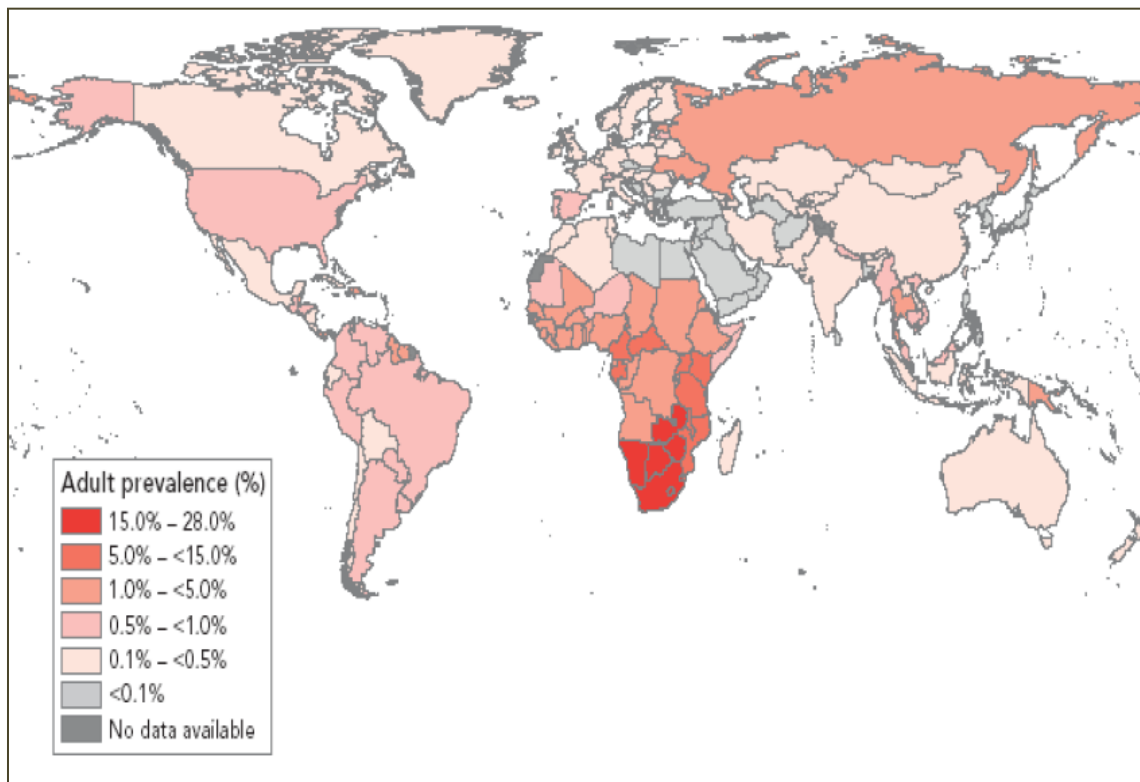


FIGURE 3: A global view of HIV infection, 33 million people [30-36 million] living with HIV, 2007³

Noteworthy to say about HIV/AIDS elements is that global HIV prevalence has remained at the same level and increasing number of people living with HIV is due to ongoing accumulation of new infections and increased survival time due to new medications and continued treatment access. In addition, there has been localized prevalence reductions in certain countries and overall global reduction in annual new HIV infections. HIV/AIDS regional trends also suggest that there is a generalized epidemic that is sustained in the general populations of SSA (Southern part), while in the rest of the world HIV/AIDS is concentrated in a population that is most at risk men who

³ The Joint United Nations Program on HIV/AIDS (UNAIDS). (2008). *Report on the global AIDS epidemic 2008: Executive summary*. Retrieved August 01, 2008, from http://data.unaids.org/pub/GlobalReport/2008/JC1511_GR08_ExecutiveSummary_en.pdf

have sex with men (MSM), injecting drug users, sex workers and their sexual partners).

Global HIV prevalence has also leveled off since 2001(UNAIDS, 2007).

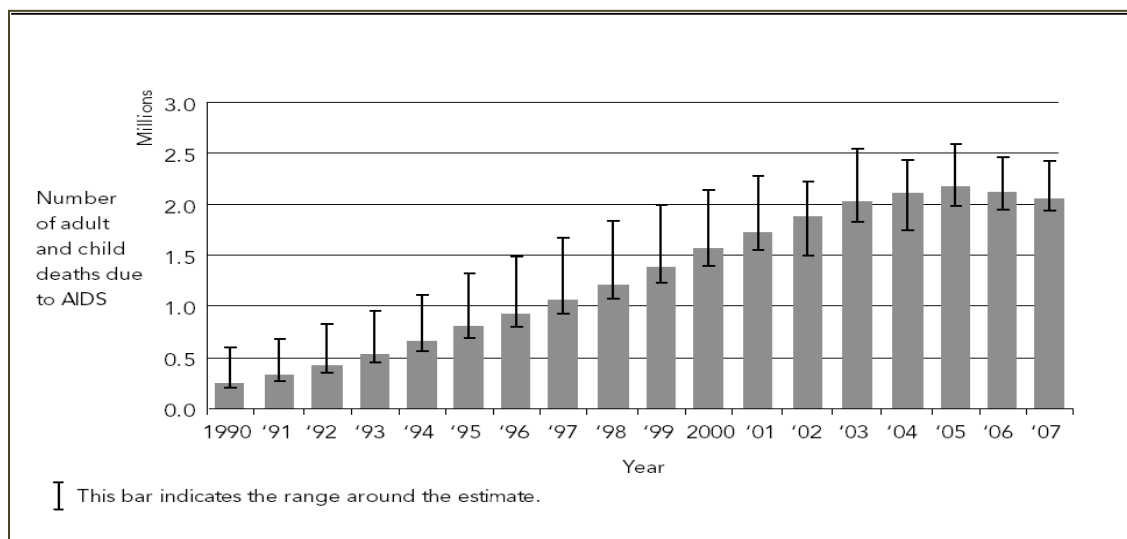


FIGURE 4: Estimated number of adult and child deaths due to AIDS globally, 1990-2007⁴

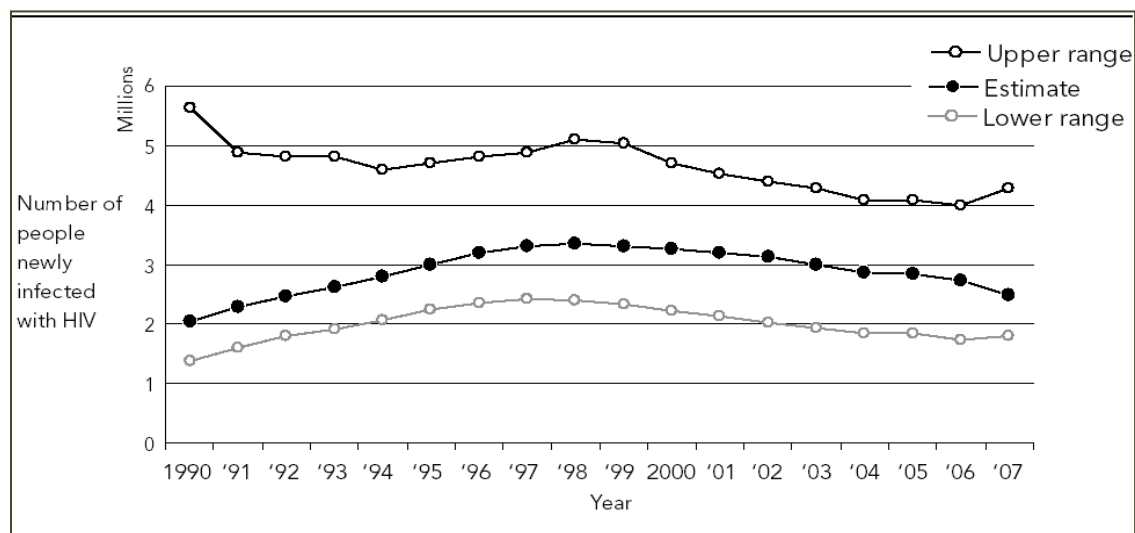


FIGURE 5: Estimated number of people newly infected with HIV globally, 1990-2007⁵

⁴ The Joint United Nations Program on HIV/AIDS and World Health Organization (UNAIDS). (2007). *AIDS epidemic update*. Retrieved July 23, 2008, from http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf

⁵ The Joint United Nations Program on HIV/AIDS and World Health Organization (UNAIDS). (2007). *AIDS epidemic update*. Retrieved July 23, 2008, from http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf

HIV/AIDS: Sub-Saharan Africa

“‘AIDS’, as stated by former Zambian President Kenneth Kaunda during the Economic Commission of Africa Conference in Addis Ababa, Ethiopia in December 2000, ‘is a disease that affects us silently, persistently and destroys us ruthlessly sucking away the life and vitality of our families’”(Amuyunzu-Nyamongo, 2001, p.1).

“We must openly declare the war on this killer disease, mostly caused by promiscuity, let us not feel shy to talk about it and look for means to solve the problem ...we must change our behaviour by leading decent lives and enhance public education on protection. This is likely to reduce new infections,”- Tanzanian President Mkapa (BBC, 2000).

The SSA region has been the most affected in the world by the AIDS epidemic. More than two thirds of all HIV positive individuals reside in this region. In 2007, more than three quarters of all deaths due to AIDS occurred in this region, with another 1.7 million people becoming newly infected and accounting for 22.5million of the total number of people living with HIV in the region of whom 61% are women (UNAIDS, 2007).

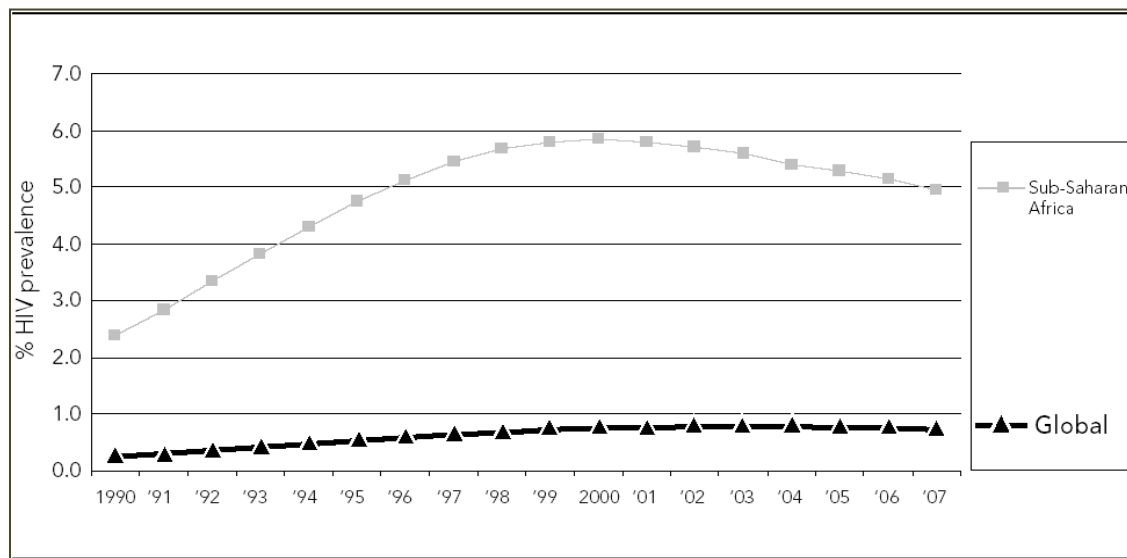


FIGURE 6: Estimated adult (15-49 years) HIV prevalence (%) globally and in Sub-Saharan Africa, 1990-2007⁶

⁶ The Joint United Nations Program on HIV/AIDS and World Health Organization (UNAIDS). (2007). *AIDS epidemic update*. Retrieved July 23, 2008, from http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf

Although HIV prevalence has declined from 5.8% in 2001 to 5.0% in 2007, AIDS still continue to be the largest cause of death with 1.6million of the 2.1million deaths from AIDS occurring in SSA. It is also estimated that there are 11.4million orphans in SSA due to AIDS (UNAIDS, 2007).

Southern African countries are the most affected with HIV/AIDS in the SSA. Globally, this region accounts for 35% of all people living with HIV. Approximately one-third of all new HIV infections and AIDS deaths occur in this region. HIV prevalence was above 15% in eight countries in 2005 comprised of Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe. HIV/AIDS epidemic continues to be a major problem in his southern region of Africa with HIV/AIDS prevalence toppling unimaginable and mind bothering numbers. For example, HIV prevalence in Zimbabwe was 18% in 2006 down from 26% among women attending antenatal clinics. In South Africa HIV prevalence was 29% in 2006 down from 30% in 2005, however, these figures vary widely between provinces with Western Cape registering 15% and KwaZulu-Natal 39% among women attending antenatal clinics. In Swaziland HIV prevalence was 26% among adults between 15-45 years, with 20% of men and 31% of women testing positive in 2007 (UNAIDS, 2007).

In Lesotho, HIV prevalence was very high among women attending antenatal clinic. HIV prevalence of 38% among women aged 25-29 years was noted in 2005. Namibia's HIV prevalence among women attending antenatal clinic was 20% in 2006 indicating to have stabilized. In Botswana, HIV prevalence has decreased among women attending antenatal clinic from 36% in 2001 to 31% in 2006. Among women attending antenatal clinic in Angola HIV prevalence was 25%, and in Mozambique HIV prevalence

was 9% in the north, 20% in central and southern zones and a high of 27% in capital cities in 2004. Malawi's HIV average prevalence was between 155 and 17% among women at sentinel surveillance sites in 2005. Zambia's HIV prevalence in urban areas is twice as that in rural areas (25% versus 12%) among women attending antenatal clinics, and in Madagascar national HIV prevalence of 0.2% was reported in 2005 (UNAIDS, 2007).



FIGURE 7: Map of Sub-Saharan Africa, 2007⁷

⁷ Canadian international development agency: Country A-Z index – Sub-Saharan Africa. (2007). Retrieved July 26, 2008 from <http://www.acdi-cida.gc.ca/CIDAWEB/acdicida.nsf/En/NIC-5595719-JDD>

In East Africa, Kenya has seen a decline in HIV prevalence from 14% in the 1990s to 5% in 2006. Uganda has also registered a drop in HIV prevalence. However, infections are still higher among women (7.5%) compared to men (5.0%). Tanzania has also seen a decline in HIV prevalence from 9.6% in 2001-2002 to 8.7% in 2003-2004 for women using antenatal services. In Zanzibar HIV prevalence ranged from 0.7% in Unguja to 1.4% in Pemba. In Burundi, among women attending antenatal clinic HIV prevalence declined starting in the late 1990s through 2005, and started to increase again. In Rwanda, HIV prevalence was 4.1% in 2005 among pregnant women attending antenatal clinic with Kigali registering HIV prevalence of 13%. On average urban areas had a HIV prevalence of 5%, and over 2% in rural areas. HIV prevalence declines were registered in Rwamagana from 13% to 4% and Gikondo 14% to 8% between 1998 and 2005. In Ethiopia, national HIV prevalence was about 1.4%. However, Gambela and Addis Ababa registered HIV prevalence rates of 6% and 4.7% respectively. In Eritrea, among antenatal clinic attendees HIV prevalence was 2.4% between 2003 and 2005. In 2005, urban areas had a higher HIV prevalence compared to rural areas 3% and 0.9% respectively. Other HIV prevalence recorded were 7.4% (port city of Assab), 4.2% (capital, Asmara), and 2.3% (port city of Massawa). In Somalia, HIV prevalence of 2.3% has been recorded among women attending antenatal clinics (UNAIDS, 2007).

In west and Central Africa, it has been difficult to track and have accurate data due to poor HIV/AIDS surveillance notably in Cameroon, Central African Republic, Liberia, and Sierra Leone. However, HIV/AIDS surveillance is improving in other countries such as Democratic Republic of the Congo, Gambia, and Togo. In this region, Nigeria registers the largest HIV/AIDS epidemic with 3.9% of the adults infected with

HIV in 2005. It is noteworthy that this prevalence even though much lower than most SSA countries still translates to almost three million individuals living with HIV in 2005 due to its large population. HIV prevalence in the country for pregnant women attending antenatal clinic is between 1.6% in Ekiti region in the west, 8% in Akwa Ibom region in the south, and 10% in Benue region in the south-east (UNAIDS, 2007).

In Cameroon, nearly half a million adults were living with HIV in 2005. In the same period HIV prevalence rate was 5.4%. However, HIV prevalence rates varied from 1.7% in the north, 2.0% in the extreme north, 8.3% in the capital (Yaoundé), 8% in the south-west, 8.6% in the east, and 8.7% in the north-west in 2005. More women aged between 15-49 years in urban areas had a high HIV prevalence with eight percent of them testing positive for HIV in the 2004 Demographic Health Survey. This number was nearly twice that of the infections reported among men in urban areas.

In the Democratic Republic of Congo, nearly one million people were infected with HIV in 2005. HIV prevalence was 3.2% during the same year. In the capital, Kinshasa HIV prevalence among pregnant women attending antenatal clinic has remained relatively stable 3.8% and 4.2% between 1995 and 2005. In Lubumbashi and Mikalayi, HIV prevalence had increased from 4.7% to 6.6% between 1997 and 2005 and 0.6% to 2.2% between 1999 and 2005 respectively. HIV prevalence among sex workers in five cities varied from a low 1.4% in Kikwit to a high 18% in Kananga in 2005 (UNAIDS, 2007).

HIV/AIDS: Kenya

The first HIV infection was identified and reported in Kenya in 1984 (Government of Kenya (GOK), 2006; K'Oyugi & Muita, 2002). Even though Kenya is a

diverse African country, it has been plagued with the same health issues as other African nations such as human immunodeficiency virus that causes acquired immunodeficiency syndrome (HIV/AIDS) and malaria. HIV/AIDS has become a major concern for Sub-Saharan Africa. The Kenyan government recognizes the effects of HIV/AIDS and one of its national objectives is to reduce HIV prevalence rates from 13-14% to 3-4% (CBS, 2004). In 1999, the prevalence rate for HIV was 13.1% up from 5.3% in 1990. This is even more disturbing considering that life expectancy had dropped from 60 years in 1990 to 45.5 years in 2002 (USAID, 2003). Currently, life expectancy is estimated to be 57 years (CIA, 2008).

In 2002, HIV prevalence rates were found to be high in urban areas (14.3%) compared to those in rural areas (6.3%). In 2000, the HIV prevalence rate in Kisumu district was 35% and in 2002, Suba district had a HIV prevalence rate of 35%. Also, in 1998 young women in Kisumu between 15-19 years had an HIV prevalence of 23% as opposed to 3.5% in young men in the same age group (UNAIDS, 2004). Similar findings in relation to these disparities have also been reported somewhere else (CBS, 2004; UNAIDS, 2002). Overall, Kenya's HIV/AIDS prevalence rate of 6.7% has been below that of sub-Saharan Africa (7.5%) (Cheluget et al., 2006; UNAIDS, 2004). A more recent prevalence rate of 5.1% is being reported for 2006 (NACC, 2008; UNAIDS, 2007). However, there is still a lot of controversy surrounding the actual prevalence rate, with the Kenya Aids Indicator Survey (KAIS) preliminary results showing the prevalence rate to be 7.4% for individuals aged between 15-64 years since the 2003 DHS excluded women aged between 50-64 years and men aged 55-64 years (East African Standard. July 30, 2008). In the current study, using the KDHS-2003, a HIV/AIDS prevalence rate of

7% was observed. These differences in HIV/AIDS prevalence rates only serve to suggest that behavioral, social and clinical nature of the disease desires a lot to be addressed in the country.

In 2000, an estimated 2.2 million Kenyans were living with HIV infection. About 200,000 had full-blown AIDS and over 300,000 were new cases. In addition, it is estimated that 200,000 Kenyans develop AIDS every year (MOH, 2001; UNAIDS/ECA, 2000). In 2003, there were 1.2 million individuals infected with HIV/AIDS (UNAIDS, 2004), currently 1.4 million people are infected with HIV/AIDS and 150,000 deaths occur per year from AIDS in Kenya. In total 1.5 million deaths have occurred with the devastation indicated by the 1.8 million orphans left behind (GOK, 2006).

Currently, Kenya is experiencing a slow decline in HIV prevalence due to behavior change and mortality of those previously infected. For example in a population based survey, notable decline in risky behaviors have been found with the proportion of sexually active unmarried young people (15-24 years) declining from 56% to 41% among males and 32% to 21% among females between 1998 and 2003. Among adults the decline was almost 50% in the same period, and condom use was more likely among those who had more than one sexual partner and engaging in high risk sex (CBS, 2004; UNAIDS, 2007). However, HIV incident rates are still high among young women aged between 15-24 years and men who are under thirty years (CBS, 2004; UNAIDS, 2002). Although a lot has been done in addressing the issue, the prevalence is unacceptable in the fight of HIV/AIDS epidemic in the country.

Background and Significance of the Study

Background

Research on HIV/AIDS has been ongoing for almost four decades. While initial studies tried to understand the biological mechanism of the disease, current studies are finding critical associations of the disease with other social/psychological variables. Addressing these social/psychosocial issues may help reduce the spread of HIV when considering that there is no known cure. For example voluntary counseling and testing (VCT) importance is well documented (Coates et al., 1998; Kamb et al., 1998; NASCOP, 2001; van der Straten, 1995) especially among couples (Painter, 2001; Sweat et al., 2000; Wambugu, Tegang, Namwebya, & Obiero, 2007). Furthermore, “scaling up” antiretroviral treatment (ART) in Kenya and other developing countries has been initiated (De Cook, Marum, & Mbori-Ngacha, 2003; Marum, Taegtmeyer, & Chebet, 2006; Jha et al., 2001; Simon, Ho, & Karim, 2006) which has seen an increase in VCT.

HIV/AIDS knowledge has also been studied extensively with the majority of people being aware and more knowledgeable of the disease (CBS, 2004). HIV/AIDS knowledge has increased over the years in Kenya and other SSA (Kalichman & Rompa, 2000; Li et al., 2004; Vaughan, Rogers, Singhal, & Swalehe, 2000). However, the relationship between sexual behaviors and HIV/AIDS knowledge is not well understood (Hawa, Munro, & Doherty-Poirier, 1998; Jemmott III, Jemmott, & Fong, 1992; Varga & Makubalo, 1996).

Condom use as a protective measure for controlling the spread of HIV/AIDS has also been studied with the application of different health behavior models such as the health belief model (HBM) in relation to knowledge, stigma (Volk & Koopman, 2001),

predictors of condom use (Nuwaha, Faxelid, & Höjer, 1999) and sexual behaviors, reported condom use, and patterns related to sexual partner mixing (Ndinya-Achola et al., 1997).

The association between wealth and HIV/AIDS has been documented in Cameroon among men (Kongnyuy et al., 2006) and in Tanzania among women (Shelton, Cassell, & Adetunji 2005). Wealth has also been associated with sexual networks, mobility, social interactions, and multiple partnerships. Therefore, wealth and economic disadvantage or advantage plays a huge role in HIV transmission, with the economic element being a huge factor as opposed to poverty (Shelton, Cassell, & Adetunji, 2005).

A study by the CDC found that those infected with STDs are two to five times more likely to be infected with HIV than those who are not infected. In addition, those infected with HIV and other STD or STDs are more likely to transmit HIV via sexual contact compared to those who are only infected with HIV. Therefore it is crucial to manage STDs and provide surveillance information in forecasting HIV rates and trends (CDC Fact Sheet: The role of STD prevention and treatment in HIV prevention, 2008).

While these studies have provided insight into HIV/AIDS transmission and certain behavioral aspects most of them have not considered recall bias on behaviors. The current study minimizes this by considering behaviors in the last twelve months or “the last time” statements. Also, since HIV test were conducted in the Kenya Demographic Health Survey (KDHS) 2003, this information was be considered in the analysis by eliminating those individuals who tested positive for HIV/AIDS from the study in order to reflect certain attitudes appropriately. In this analysis, it is assumed that individuals with HIV/AIDS harbored negative attitudes towards the disease compared to

those who did not have the disease. Also, the relationship between STD, domestic violence, and circumcision were examined. This study is going to utilize the KDHS-2003 for analyzing these variables since it is more representative of the country.

Furthermore, no study was found that has used attitudes as a main outcome measure studying HIV/AIDS in Kenya. Understanding individual attitudes towards a behavior or disease is very crucial since it can explain behavioral intention and subsequent behavior change (Glanz, Rimer, & Lewis, 2002). This variable is very crucial when trying to understand HIV/AIDS behaviors. While trying to understand HIV/AIDS in relation to HIV/AIDS knowledge, stigmatization, perceptions, and individual risk taking behaviors one needs to consider the effect of attitudes. To understand these attitudes better the following were analyzed separately: HIV/AIDS attitudes, condom use attitudes, condom advertisement attitudes, and attitudes towards women.

Another crucial element of this study was the use of multiple sexual risk behaviors in the definition of high-risk sexual behavior unlike other studies that have only used lack of condom use. This study used lack of condom use, sex with commercial sex workers, and multiple sexual partners to develop the variable high-risk sexual behavior. Another variable that has not been used in Kenya is cognitive involvement/awareness in relation to HIV/AIDS. This is important especially when considering human behavior because there are ongoing mental processes in relation to behavior and subsequent partaking of such behaviors. It is important to understand the association between high-risk sexual behavior, and cognitive involvement/awareness in relation to HIV/AIDS.

Significance of the Study

HIV/AIDS has claimed many lives worldwide, while others continue living with the disease and many more are infected with HIV every single day. In 2007, there were an estimated 33.2 million people living with HIV worldwide, 2.5 million people were newly infected with HIV, and 2.1 million deaths from AIDS was reported (UNAIDS, 2007). HIV/AIDS is the leading cause of death in Africa (De Cook, Mbori-Ngacha, & Marum, 2002; UNAIDS, 2007). In SSA the problem has had multiple implications in terms of economic development and social problems affecting every aspect of life and human dignity.

The findings from this research will serve to inform policymakers on whether the existing HIV/AIDS prevention initiatives such as information-education-communication and VCT programs are having any impact on high-risk sexual behaviors among Kenyan men and women. The findings will also aid in understanding the underlying causes of high-risk sexual behavior and its importance in the development of policy, innovative programmatic initiatives, and facilitation of different interventional public health strategies (health education, health policy, health communication, and HIV/AIDS programs) that are intentional and those that can influence pertinent psycho-social variables (perception, cognitive involvement and attitudes) and behavior changes to help in the efforts toward minimizing HIV/AIDS effects in different subgroups in Kenya. In addition, this study will provide information needed by governmental agencies, non-governmental organizations, public health, and other healthcare organizations in formulating programs that are tailored to curbing the spread of HIV and focusing treatment programs and resources to specific populations. Also, because HIV is

transmitted through distinct mechanisms and many communities share common social and environmental challenges in relation to HIV, other researchers worldwide in similar environments may benefit from the findings.

The findings will also inform the government whether their efforts to combat the HIV/AIDS epidemic, which involves prevention and control efforts, have been successful. These efforts are outlined in Sessional Paper No. 4⁸, which was approved in 1997 and will expire in late 2012 (CBS, 2004; MOH, 1997). Within these prevention and control efforts, the strategic framework also aims for the following objectives:

- Give direction on how to handle controversial issues while taking into account prevailing circumstances and the sociocultural environment.
- Enable the government to play the leadership role in AIDS prevention and control activities. Challenges posed by AIDS call for a multisectoral approach, necessitating involvement from a diversity of actors.
- Recommend an appropriate institutional framework for effective management and coordination of HIV/AIDS program activities.

(CBS, 2004 p.5)

Furthermore, recognition of the seriousness and urgency of HIV/AIDS prevention has seen the creation of other organizations such as the National AIDS Control Council (NACC) to manage and coordinate HIV/AIDS programs. Through NACC efforts, the Kenya National HIV/AIDS Strategic Plan (KNASP) for the periods 2000-2005 and 2005-2010 have been initiated (GOK, 2006; NACC, 2008). This study will also inform the NACC on whether their efforts in combating HIV/AIDS have been successful, specifically, on what factors to consider when developing such programs. Also of

⁸ Sessional Paper No. 4 of 1997 was an important document in the country that was approved by the act of parliament indicating the government recognition of the magnitude of HIV/AIDS in the country. The document is a strategic framework on how to combat HIV/AIDS epidemic. It created an environment in the country where needed organizational structure and other changes in policy were possible in creating different HIV/AIDS prevention programs. The political commitment in supporting HIV/AIDS programs was affirmed by this act of parliament. In addition, the creation of an autonomous body [National AIDS Control Council (NACC)] in expediting HIV/AIDS prevention and control activities irrespective of funding sources affirmed the government interest in accurate information and management within HIV/AIDS intervention programs (MOH, 1997).

importance are the strategic healthcare/public health issues and policy implications from the study that can be adopted for high impact HIV/AIDS interventions. Furthermore, future possibilities and what might be considered extreme interventions such as the administration of HIV vaccine if discovered or quarantine cannot be ignored. This study can provide initial information on high risk populations and locations. Although these topics can be controversial such interventions might be necessary in the fight of HIV/AIDS pandemic, specifically, in informing policy.

Therefore the importance of measuring and understanding the prevalence, risk factors including psycho-social factors such as cognitive involvement/awareness, perceptions and attitudes in relation to high-risk sexual behaviors is very crucial in addressing HIV/AIDS issues from a social and behavioral perspective.

Specific Objectives for the Study and Research Hypotheses

In 2007, there were an estimated 33.2 million people living with HIV worldwide. There were also 2.5 million people who were newly infected with HIV which comprised of 2.1 million adults and 420,000 children. Deaths due to AIDS were 2.1 million comprised of 1.7 million adults and 330,000 children. Seventy-six percent (≈ 1.6 million) of the deaths occurred in SSA. SSA represents only 12% of the world's population. However, more than two thirds (68% ≈ 22 million) of all HIV positive individuals reside in this region. In Kenya, a more recent prevalence rate of 5.1% is being reported for 2006 (NACC, 2008; UNAIDS, 2007). Currently 1.4 million Kenyans are infected with HIV/AIDS and 150,000 deaths occur per year from AIDS. In total 1.5 million deaths have occurred with the devastation indicated by the 1.8 million orphans left behind

(GOK, 2006). Furthermore, HIV incident rates are still high among young women aged between 15-24 years and men who are under thirty years (CBS, 2004; UNAIDS, 2002).

Many clinical and behavioral HIV/AIDS studies have been conducted in Kenya aiming to minimize the adverse consequences and broad implications associated with HIV/AIDS that the country has been struggling with for over three decades. Majority of the HIV/AIDS campaign programs have just served to make people aware of the disease, however, the majority of Kenyans are still vulnerable to this infectious disease. The use of media for social marketing campaigns has been a major source for HIV/AIDS and condom use information (Kalichman & Simbayi, 2003; Kennedy, Mizuno, Seals, Myllyluoma, & Weeks-Norton, 2000; Price, 2001). However, social marketing does not give individuals the practical information on how HIV/AIDS is transmitted, how to effectively use a condom, or specific behavior changes that are needed to avoid contracting HIV and subsequently AIDS. Such campaigns have also served to enhance stigmatization due to the way they portray those infected with HIV/AIDS. HIV/AIDS also threatens various Kenyan sectors (services, agriculture, and industry) that define its coexistence. Therefore, it is apparent that individualized programs should be targeted at specific populations such as the youth or married couples when addressing specific issues in relation to HIV/AIDS while enhancing the current existing programs. The proposed study focused on the following five specific aims and hypothesis:

Objective 1: To determine prevalence and risk factors for high-risk sexual behavior (prostitution, lack of condom use, and multiple sexual partners) among men and women in the general population.

RH_{1.1}: Participation in voluntary counseling and testing for HIV/AIDS is negatively associated with high-risk sexual behavior.

RH_{1.2}: Being more knowledgeable about HIV/AIDS is negatively associated with high-risk sexual behavior.

RH_{1.3}: Higher perceived risk of acquiring HIV is negatively related with high-risk sexual behavior.

RH_{1.4}: Women who have experienced domestic violence will be more likely to engage in high-risk sexual behavior.

Objective 2: To examine the effect of psychosocial (cognitive involvement/awareness) factors of HIV/AIDS, voluntary counseling and testing, and sexually transmitted diseases (STDs) on an individual high-risk sexual behavior in the general population.

RH_{2.1}: Higher cognitive involvement/awareness about HIV/AIDS will be negatively related to high-risk sexual behavior.

RH_{2.2}: Higher cognitive involvement/awareness about voluntary counseling and testing for HIV/AIDS will be negatively related to high-risk sexual behavior.

RH_{2.3}: Higher cognitive involvement/awareness about sexually transmitted diseases apart from HIV/AIDS will be negatively related to high-risk sexual behavior.

Objective 3: To determine factors associated with negative attitudes towards HIV/AIDS, women, condom use and condom advertisement among men and women in the general population.

RH_{3.1}: Increased consumption of alcohol is positively related to negative attitudes/stigma toward HIV/AIDS.

RH_{3.2}: Increased consumption of alcohol is positively related to negative attitudes toward women.

RH_{3.3}: There are regional differences in negative attitudes toward condom use among men.

RH_{3.4}: There are regional differences in negative attitudes toward condom advertisement.

Objective 4: To determine factors associated with socioeconomic status in relation to high-risk sexual behavior in a general population.

RH_{4.1}: Wealth index of an individual will be positively related to high-risk sexual behavior.

Objective 5: To determine if there is any relationship between STDs, domestic violence against women, circumcision, and HIV acquisition in a general population.

RH_{5.1}: Men and women who have had an STD(s) (last 12 months) are more likely to test positive for HIV.

RH_{5.2}: Women who have experienced domestic violence are more likely to test positive for HIV.

RH_{5.3}: Uncircumcised men are more likely to test positive for HIV.

Definition of Terms

High-risk sexual behaviors is defined as involvement in one or more of the three (prostitution, multiple sexual partners and lack of condom use) behaviors considered to be high-risk undertaking for sexual health among women and men.

Attitudes are presented in this study as values, and beliefs toward individuals' behaviors or thoughts of what is right or wrong in relation to an object (HIV/AIDS, sex

education, husband controlling attitudes, women and men sexual attitude in relation to women sexual rights, husband sexual attitudes in relation to men sexual rights, and condoms. These attitudes quite often produce stigma and discrimination among individuals in a particular setting of culture.

Voluntary counseling and testing in this study is the testing for HIV component itself. Pre-counseling and post-counseling services were not provided.

Cognitive involvement is the level of awareness an individual has about a health condition that can either have a positive or negative impact on their overall health. While individuals can be involved in a health issue the level of personal constructs that can contribute to a health condition based on cognitive involvement can vary from one person to the other.

Self-efficacy is the degree of confidence or beliefs on one's capability to partake an action to prevent a health condition or risky behaviors that can otherwise cause harm to their general wellbeing. Self-efficacy was measured by two questions: 1) if one knew a place where you could go to get AIDS test and 1) if they wanted to they could get a condom.

Perceived risk of acquiring HIV is the study is used as the perception of risk for contracting a certain condition (HIV). Individuals often partake certain behaviors based on the perception they associate a certain disease with. Quite often Perceived risk of acquiring HIV is underestimated by individuals.

Perceived severity is the perceived seriousness or the severity associated with a condition-HIV infection or partaking in a certain risky behavior.

Perceived threat is the perceived severity and susceptibility of acquiring a health condition (HIV/AIDS). Individuals weigh the seriousness/severity of a health condition and if it can actually happen to them.

Region is used here to refer to the eight provinces in Kenya.

Organization of the Dissertation

Chapter 2 covers a comprehensive review of the literature structured to the constructs of the hypotheses in this study. The importance of such constructs will be demonstrated.

Chapter 3 describes a comprehensive research materials, design and methods used in this study.

Chapter 4 describes and reports on the findings for the study as it relates to factor analysis, descriptive statistics, bivariate analysis, univariate logistic regression analysis-unadjusted results, and multivariate logistic regression analysis-adjusted for confounding of the data in this study in relation to the proposed hypotheses.

Chapter 5 concludes with a summary of the complete study. The findings and discussion of the importance of the current study are also reported. This chapter concludes with a discussion of the study findings implications on public health strategies and recommendations for health policy. Also covered are the strengths and limitations of the study.

CHAPTER 2: LITERATURE REVIEW

Voluntary Counseling and Testing

For decades, most countries including Kenya have focused on – the ABC model - abstinence, being faithful and condom use as a strategy for controlling the spread of HIV/AIDS (Cohen, Kaleebu, & Coates, 2008; Jefferis et al., 2007; Shelton et al., 2004; Timpson et al., 2006). Testing has been used as a tool to fight the spread of HIV/AIDS. The testing part for HIV/AIDS has been defined as voluntary counseling and testing (VCT); furthermore, adding VCT as another construct to ABC can be one effective way to curb the spread of HIV/AIDS. It is only through testing that an individual can know his or her HIV/AIDS status. In addition, 1998 Kenya Demographic Health Survey found that only 15% of Kenyans were aware of their HIV/AIDS status with another 67% indicating the desire to be tested for HIV/AIDS (NASCOP, 2001). VCT can be an effective way of dealing with HIV/AIDS in countries with a high HIV/AIDS prevalence.

VCT involves the initial counseling of individuals at high-risk, testing them for HIV/AIDS, and exit counseling after testing for HIV/AIDS whether positive or not. Information regarding HIV/AIDS, the process of testing, HIV/AIDS risk assessment, information about what to expect, how to deal with the situation after testing positive, and HIV/AIDS prevention and spreading is provided during counseling. Therefore, VCT is very important in the fight against HIV/AIDS in that it provides the initial point for preventing the spread of HIV, receiving support, and information on where to seek HIV/AIDS care and/or treatment if one tests positive for the disease.

VCT importance is well documented (Coates et al., 1998; De Cock, Marum, & Mbori-Ngacha, 2003; Kamb et al., 1998; Lauby et al., 2005; NASCOP, 2001; van der Straten, 1995) specifically among couples (Painter, 2001; Sweat et al., 2000; Wambugu, Tegang, Namwebya, & Obiero, 2007). Furthermore, VCT importance in the provision of care for those infected is very crucial considering the efforts and importance of HIV/AIDS treatment that has been recently expressed by the Kenyan government, international governments, and other NGOs in the fight and treatment of HIV/AIDS. While these efforts have been ongoing in the last decade, “scaling up” antiretroviral treatment (ART) in Kenya and other developing countries has been initiated (De Cook, Marum, & Mbori-Ngacha, 2003; Marum, Taegtmeier, & Chebet, 2006; Jha et al., 2001; Simon, Ho, & Karim, 2006).

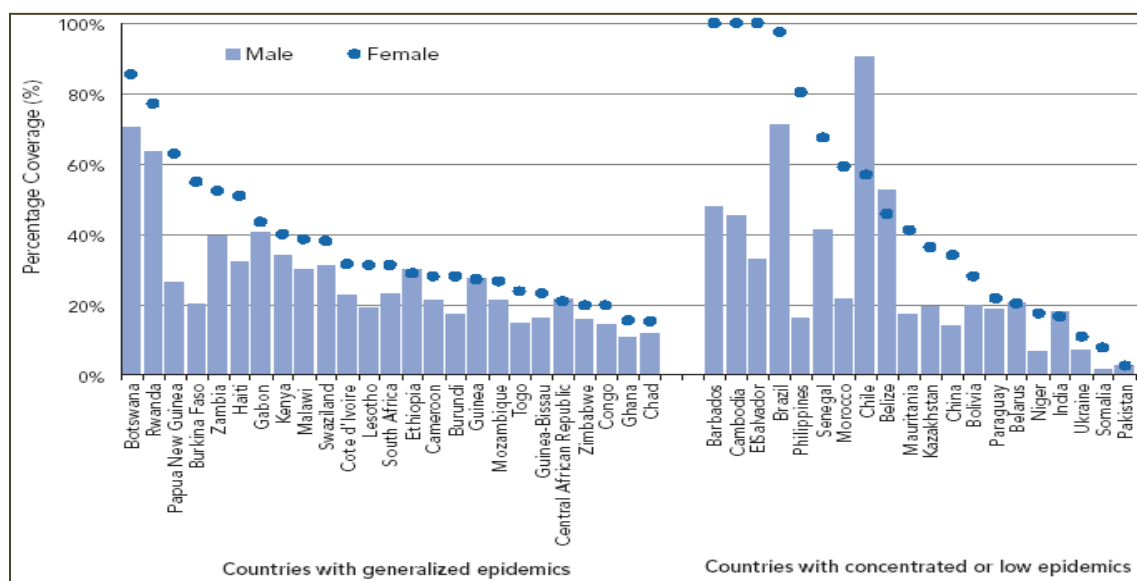


FIGURE 8: Comparison of antiretroviral therapy coverage in 2007 between males and females (for countries with reported data on the number of people on treatment for both sexes separately, 2008⁹)

⁹ UNAIDS, 2008 Report on the Global AIDS Epidemic Executive Summary, July 2008.

International donors have been very crucial in the fight against HIV/AIDS in Kenya and other African countries. As one of the 15 countries that benefit from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR)¹⁰, Kenya received nearly \$92.5 million in 2004, more than \$142.9 million in 2005, approximately \$208.3 million in 2006, \$368.1 million in 2007, with another \$534.8 million of funding expected in 2008 to support comprehensive HIV/AIDS prevention, treatment and care programs (PEPFAR, 2008). Through PEPFAR funding (\$229,700), Kenyans have received ART, and other benefits that include services directly related to HIV/AIDS. Furthermore, these efforts have seen an increase in VCT centers throughout Kenya (NASCO, 2001; Wambugu, Tegang, Namwebya, & Obiero, 2007).

HIV/AIDS Knowledge

Higher levels of HIV/AIDS knowledge can increase one's awareness of the disease, how it is transmitted, and subsequently reduces individual's risk behaviors that can expose them to the disease. Furthermore, those with incomplete HIV/AIDS knowledge might undertake certain behaviors that may put them at increased risk of contracting HIV. Stoskopf (2003) found the average knowledge score on HIV/AIDS transmission and prevention among rural villagers in the coastal region of Kenya to be 71.6%. The knowledge score indicated that the individuals interviewed had knowledge on HIV/AIDS (reading newspaper on HIV/AIDS issues or knowing someone who has AIDS). Furthermore, awareness of HIV/AIDS for both women (98%) and men (99%) is very high (CBS, 2004). While HIV/AIDS knowledge has increased over the years in

¹⁰ These countries represent approximately 50% of HIV infections worldwide.

Kenya and other SSA countries (Kalichman & Rompa, 2000; Li et al., 2004; Vaughan, Rogers, Singhal, & Swalehe, 2000), the relationship between sexual behaviors and HIV/AIDS knowledge is not well understood (Hawa, Munro, & Doherty-Poirier, 1998; Jemmott III, Jemmott, & Fong, 1992; Varga & Makubalo, 1996). Khachkalyan, Petrosyan, and Soghikian (2006) studied the relationship between risk behavior and health risk knowledge/perception in Armenia among medical students and residents. They found that knowledge/perception of health risk was not a satisfactory predictor of behavior. Furthermore, while HIV/AIDS knowledge might be common among most individuals, their decision making rationality and risk taking preferences might be different. In addition, those with limited HIV/AIDS knowledge might still be at an increased risk even if they have a low risk taking preference.

This study is going to look at the association between high-risk sexual behavior and HIV/AIDS knowledge. The findings will bring clarity on this issue and eliminate the existing controversy. In so doing, this will guide in the development of appropriate interventions and not only had those based on the presumption of HIV/AIDS knowledge levels.

Condom Use

Volk and Koopman (2001) used the health belief model constructs (perceived susceptibility, perceived severity, and perceived barriers) to determine condom use among Kenyans in Kisumu. Moreover, they also investigated how knowledge and cultural norms play a role in participants' use of condoms. It was hypothesized that knowledge would predict the frequency of condom use, and the second hypothesis stated that more stigma would also lead to less condom use among participants. Data for the

study were collected from clinics in Kisumu, Kenya where more than 220 people took part in anonymous interviews.

The study found a significant relationship between condom use and perceived barriers. Slightly less than half of the participants believed that there were difficulties when using condoms and more than half believed that their partners had negative opinions of condom use. Another variable that was significant predictor of condom use is knowledge. The study found that knowledge was significant in predicting condom use among men ($p < 0.05$); however, knowledge was not a significant predictor of condom use among women. Another important finding was that men in Kisumu who believed that HIV/AIDS originated in the U.S. were more likely to use condoms than those who did not share this belief. In terms of stigmatization, knowledge played a key role in determining fewer stigma towards HIV/AIDS, but there was no relationship between stigmatization and condom use among the participants.

Nuwaha, Faxelid, and Höjer (1999) studied condom use among patients with STDs in order to understand predictors of condom use. The study was conducted at the outpatient department of Mbarara University Teaching Hospital and at the STD clinic in old Mulango in Kampala, Uganda from October to December 1997. All patients that received treatment for one or more STD symptoms were included in the study and interviewed by trained male clinical officers, principle investigators, female clinical officers, and nurse/midwife. Local languages were used to collect information on socio-demographic, STD symptoms, sexual partners, and condom use. A total of 58 men and 80 women were interviewed. Of the 138 patients, they found that 42(72%) men and 45(56%) women knew how to use condom, 39(76%) men and 42(53%) women never

used a condom, 22(38%) men and 12(15%) women used condom in the last sexual intercourse, and 42(72%) men and 38(48%) women accepted free supply of condoms (Nuwaha, Faxelid, & Höjer, 1999).

The researchers also found a significant difference between women and men in relation to condom use in the last three months ($X^2=9.52$, $p=0.002$) and accepting free supply of condom ($X^2=8.39$, $p=0.004$). Those who did not use condoms ($n=57$) cited having a regular partner (49%), reduces pleasure (9%), and partner not approving (30%). Among the condom users ($n=81$), 46% indicated no change in sexual pleasure, 41% said sexual pleasure was reduced, and 13% said condoms increased sexual pleasure. Predictors for condom use among the study population was being a man, not having a regular partner, having sex with a casual partner, being able to read English, having at least secondary education, and having electricity at home (Nuwaha, Faxelid, & Höjer, 1999).

Ndinya-Achola et al. (1997) analyzed sexual behaviors, reported condom use and patterns related to sexual partner mixing associated with HIV infection in a primary health care (PHC) clinic in Nairobi, Kenya. Males and females 12 years of age or older who visited the PHC clinic during a 12 month period with a symptom of genital tract infection were recruited into the study. The researchers used a survey to collect data and translation services were used when needed. STDs were confirmed through evidence of urethral discharge in men, genital ulcer, genital warts, signs of pelvic inflammatory disease, and laboratory diagnosis of STDs excluding HIV.

Of the total individuals who attended the PHC clinic, there were 980 (462 men and 518 women) cases who presented with STD related complaints and with complete

data were included in the analysis. Furthermore, Ndinya-Achola et al. (1997) found that there was a high prevalence of HIV (15 percent men and 19 percent women) and 78 percent for STDs. Men were single or married and living separately from their spouse with a large number of sexual partners and frequent high-risk partners. Those men who were married but living separately from their spouse and who had sex with female sex workers (prostitutes) or a casual partner accounted for 60 percent while those living with a spouse accounted for 26 percent. They also found that women who were married and at the time living with their spouse reported only one partner (spouse or regular partner). Furthermore, the main reason for lack of condom use especially with a high-risk partner was lack of condom availability at the time (74 percent) with only 3 percent reporting condom use during the last sexual intercourse. Eighty-two percent of men and twenty-five percent of women reported having two or more sexual partners during the past year with 55 percent of men and 11 percent of women having sexual intercourse with last partner who was considered a high-risk (Ndinya-Achola et al., 1997).

Feldblum et al. (2000) designed a randomized community intervention trial to determine the effect of introducing female condom in Kenya among communities that have high prevalence of STDs. The aim of the study was to measure and compare STD prevalence among cohorts of Kenyan women who had or did not have access to the female condom. They specifically compared the incidence of STD symptoms, the impact of female condom introduction in the presence of male condom use, collect data from male and female users of female condoms, and collect data on the cost of female condom provisions.

Data were collected from six matched pairs of communities from central and western Kenya among coffee, tea, and flower plantations that offered primary health care, family planning services, and have a current active male condom promotion and distribution. Same agricultural product, geographical area, and permanent employees were used as matching criteria. The researchers used computerized random number algorithm to allocate intervention conditions. The distance between the sites ensured no contact between the intervention and the control groups.

A total of 160, 18-50 years old, permanent women employees were enrolled at each site for the study (total 1929). The study excluded pregnant women within 42 days, those desiring pregnancy within 12 months and those using spermicidal contraceptives. Information on STD prevalence, background and behavior were collected at baseline, 6 months, and 12 months after baseline visits. The findings provided in this study are only from the baseline. The mean age was 31.1 years, 60 percent were married, and 9 percent reporting multiple sexual partners in the past 3 months. Of the more than half who were using contraceptives, the preferred method was birth control taken through injection (38 percent) with 78 percent reporting never used a male condom. STD prevalence for concurrent infections was 23.9 percent (Feldblum et al., 2000).

Welsh et al. (2001) aimed to increase condom use among males and females to reduce sexually transmitted infection (STI) prevalence in a randomized community intervention trial in Kenya. The authors also described consistency of condom use among males and females, and correlates of condom use and forces that limit condom use among study participants.

Six pairs of communities unique to agricultural product, geographical area, and size were identified in western and central provinces in Kenya. Within these groups, they had the intervention and control arm, with the intervention arm receiving both female and male condoms while the control arm only received the male condom. Both groups also received information various different means ranging from small and large group meetings, individual counseling, to folk media. The study also involved a similar prevention program that did not receive any information about female condoms. Fulltime/permanent female employees who were between 18-50 years, sexually active, who were not pregnant, and who did not desire to be pregnant in the next year were recruited into the program. A cohort of nearly 160 women was identified from each site through random selection from the ordered employee rosters (total 1929). Study visits were made by these women at six and twelve months for interviews and STI specimens. STI prevalence was measured and compared among women with and without access to female condoms (Welsh et al., 2001).

The study found that crude STI prevalence at six and twelve months did not change much by the study arm. The intervention prevalence at six and twelve months was 17.1% and 18.2% while that of the control was 17.6% and 18.4% respectively. However, unmarried women had a higher total prevalence for infection. The proportion for consistent male condom use was 23% for the control arm and 14% for the intervention arm at six months and 24% vs. 22% at twelve months for the control and intervention arm respectively. Consistent condom use was found to be more prevalent among single women who were thirty years or less. Male condom use in the last coital act prior to the interview was found to have increased from 5 percent at baseline to 30%

at six months visit and 34% at twelve months visit in the control arm participants. For the intervention arm, 6% at baseline to 34% and 42% at six and twelve months visits respectively. At the intervention sites, 39% of women reported never using female condom at 6 months, while only 11% reported consistent use. However, at 12 months the percentages were 58% and 7% respectively. Partner objection was the main reason for not using female condom consistently, with 29% of the partners objecting at six months and 30% at twelve months. The female condom intervention was found not to reduce STI prevalence as opposed to the male condom promotion (Welsh et al., 2001).

Adih and Alexander (1999) studied psychological and behavioral factors among Ghanaian young males that could influence the use of condom. Health Belief Model (HBM) and Social Learning Theory (SLT) were used as a conceptual framework to predict condom use among sexually active Ghanaian young men.

Adih and Alexander (1999) adopted a simplified cluster sampling method from the World Health Organization (WHO) to enroll the subjects. A total of 601 young men aged 15-24 years and who were sexually active were enrolled from 31 enumeration areas (EAs) that were predominantly rural. Data were collected using a household survey instrument, behavioral factors that were investigated were lifetime condom use (“Have you ever used condom?”) and condom use at last sexual intercourse (“The last time you had sexual intercourse, did you use a condom?”). Also investigated were psychological factors: susceptibility to AIDS, benefits from condom use, barriers to condom use, self-efficacy to use condom, social support to use condom risk behaviors and problem behaviors (Adih & Alexander, 1999).

The study found that 65% of males who were sexually active had used a condom at least once while 25% indicated to have used a condom at last sexual intercourse. Perceived barriers to condom use, perceived social support, perceived self-efficacy to condom use, and perceived susceptibility to HIV infection were found to be significant predictors to condom use. Another finding was that perceived barriers significantly interacted with perceived susceptibility and self-efficacy. Specifically, perception of high level of being susceptible to HIV infection by individuals accompanied with low levels of barriers to condom acquisition and use indicated that they were almost six times more likely to use condoms during the last sexual intercourse. Young men were three times more likely to have used condom during the last sexual intercourse if they perceived high levels of self-efficacy towards condom use and low barriers towards condom use (Adih & Alexander, 1999).

Alcohol Use

Fritz et al. (2002) examined alcohol use among Zimbabwean men as a potential factor for HIV infection. They also examined the feasibility of using beer halls to disseminate HIV prevention programs tailored to men. They adopted a spatial-temporal methodology used in the United States to recruit subjects who attend drinking establishments and other venues. All individuals who were 18 years of age and older entering a beer hall were eligible cases. Due to the peak and non-peak attendance, recruitment event was 70% during the peak and 30% during the slow/moderate attendance periods. Those who volunteered to participate were considered ineligible. However, those who could not participate were provided with free condoms, HIV prevention educational materials, and discount vouchers for HIV testing.

All eligible participants were interviewed during a face-to-face structured interview in either Shona or English language. In addition, HIV pretesting counseling was given and blood drawn for HIV testing, which was anonymous and done at no cost to the participants. A total of 324 (64%) men were recruited in the study from the 507 men who were eligible. They also collected qualitative data from 23 men who participated in three focus group discussion and 30 in-depth interviews with study participants. HIV was determined through laboratory tests, HIV antibody by HIV ½ gO enzyme immunoassay (EIA), and HIV confirmation by Dipstick rapid HIV assay while indeterminate results were resolved by using Biotest EIA.

Of the 324 participants, 139 men (43%) received HIV test results. Of those men who refused to participate, eight percent cited being afraid of having an HIV test. The median age was 29 years, 46% had secondary education or more, 62% were currently married, 45% of the married lived at least six months of the preceding year away from their spouses and 33% of them reported at least one other sexual partner in the last six months. Twenty percent reported multiple sexual partners in the last six months, 84% of them identified themselves as alcohol drinkers, and 50% reported drinking to intoxication four of the last thirty days (Fritz et al., 2002).

HIV prevalence was 30% (96 subjects tested positive), among men 30-39 years HIV prevalence was 45%, those separated or divorced (54%), and widowed (50%) respectively. Those who reported an episode of sex while intoxicated in the last six months was 31%, of this 69% of them did so with casual or commercial sex partner without protection (condom use). They also found beer halls to be appropriate and

acceptable places for the delivery of HIV prevention programs mainly targeted at men (Fritz et al., 2002).

Sexually Transmitted Diseases and HIV/AIDS

People who are infected with STDs are two to five times more likely to be infected with HIV than those who are not infected. In addition, those infected with HIV and other STDs are more likely to transmit HIV via sexual contact compared to those who are only infected with HIV (CDC Fact Sheet: The role of STD prevention and treatment in HIV prevention, 2008). This is because of the increased susceptibility to HIV due to genital ulcerations that lead to increased concentration of cells in the genitals that serve as a target for HIV infection. There is also increased infectiousness for those infected with STDs and HIV to their sexual partners. It has also been found that men suffering from gonorrhea and HIV at the same time are twice more likely that their genital secretions have HIV. Their semen concentration of HIV can be as much as 10 times higher as opposed to those who are only infected with HIV (CDC Fact Sheet: The role of STD prevention and treatment in HIV prevention, 2008).

Treatment of STD among those infected with HIV can decrease the amount and frequency of HIV in genital secretions. The treatment of herpes can make people less susceptible to HIV infection and those infected with HIV less infectious. It is critical that STD prevention, testing, and treatment be enhanced due to the role it can play in reducing STD and HIV transmission. In addition, STD trends can give important insights to how and where HIV epidemic might present. Therefore, STD management and surveillance information can play a crucial role in forecasting HIV rates and trends (CDC Fact Sheet: The role of STD prevention and treatment in HIV prevention, 2008).

Following these discoveries, the CDC/HRSA Advisory Committee on HIV/AIDS and STD Prevention (CHAC) recommends that:

- Early detection and treatment of curable STDs should become a major, explicit component of comprehensive HIV prevention programs at national, state, and local levels.
- In areas where STDs that facilitate HIV transmission are prevalent, screening and treatment programs should be expanded.
- HIV testing should always be recommended for individuals who are diagnosed with or suspected to have and STD.
- HIV and STD prevention programs in the United States, together with private and public sector partners, should take joint responsibility for implementing these strategies.

To be included as a component of a comprehensive HIV prevention programs that include social, behavioral, and biomedical interventions (CDC Fact Sheet: The role of STD prevention and treatment in HIV prevention, 2008). This model should also be adopted with African countries especially those in the SSA in the fight of HIV/AIDS.

Moses et al. (1994) conducted a case-control study that was focused on finding out about individuals attending health centers for STD or non-STD related complaints sexual behaviors in Nairobi, Nakuru, and Korogocho, Kenya. The STD patients were the cases and non-STD patients were the controls. A total of 762 men and women were identified from two health centers in Nairobi and five health centers in Nakuru. This group was interviewed from April to June 1991; questionnaires both in English and Kiswahili were used to collect data. Another 427 men (187/427) and women (240/427) from Korogocho located in the northeastern part of Nairobi acted as community controls. Cluster sampling was used to identify households; this group was interviewed from November 1991 to January 1992.

For men, they found that the common presenting STD related complaints were urethral discharge (56%), dysuria/urinary frequency (49%), genital ulceration (35%), and genital-inguinal swelling (9%). Women complained of vaginal discharge (63%), lower abdominal pain (46%), genital ulceration (29%), genital pruritus (26%), and dysuria/urinary frequency (17%). They also found that both male and female patients who had an STD were younger compared to the clinic or community controls. Also male patients who had an STD were more likely to be unmarried, if married they were living apart from their spouses. They reported a higher mean number of sexual partners in the last three months for male cases compared to male clinic controls (Moses et al., 1994).

Sexual contact was reported to be 100% heterosexual and male patients with STD reported earlier sexual experience (coital debut), were unmarried, married but living apart from their spouse, had greater number of sexual partners in the last three months, had previous history of an STD compared to male clinic controls. Male and female clinic and community controls were more likely to report condom use in their last sexual exposure with a non spouse partner. Unmarried females who had an STD reported more sexual partners and were more likely to have sold sex in the last three months. They were also more likely to have reported a history of STD or an STD in the last six months. They also found that the number of reported sexual partners in the last three months for both men and women, marital status (unmarried, or married but living apart from spouse), and purchasing sex for men were important predictors for STD acquisition. Therefore commercial sex plays an important part in STD transmission and men play a bridging role between female sex workers and the general women population (Moses et al., 1994).

Wealth and HIV/AIDS

Kongnyuy et al. (2006) examined the association between wealth and sexual behavior among men in Cameroon. HIV prevalence in Cameroon is 5.5% and significantly higher in wealthy people than the poor. Those in the richest quintile had a HIV prevalence of 6.6% compared to 2.4% in the poorest quintile. This trend was also reflected in education with those who had a secondary or higher education having a HIV prevalence of 6.0% compared to their counterparts who have never been to school with a HIV prevalence of 3.2%.

The study was cross-sectional using 2004 DHS data; variables of interest from the dataset were sexual behavior, wealth, age, place of residence, marital status, and religion. The researchers analyzed 4,409 men who were 15-59 years. The mean age for the participants was 32.4 years, SD=11.4 years. Almost half of the participants were 15-29 years, 60.5% were married, 39.6% were divorced or were never married, 52.1% had a secondary education, and 56% had five or more lifetime sexual partners (Kongnyuy et al., 2006).

After controlling for confounding (marital status), religion, age, and residence, they found wealth and education to be significantly associated with unsafe sexual behavior. Wealthiest men were less likely to have used a condom in their last sex with non-spousal or non-cohabiting partner (OR=0.43, 95% CI: 0.30-0.56) and were also more likely to have had two concurrent partners in the last twelve months or more than five lifetime sexual partners (OR=1.38, 95% CI: 1.12-1.19 and OR=1.97, 95% CI: 1.60-2.43) respectively. No significant association was found between being wealthy and age of coital debut in the paying for sex. Men with secondary or higher education were more

likely to have started coital debut earlier, less likely to have used a condom in their last sexual activity with a non-spousal or non-cohabiting partner, and were also more likely to have had five or more lifetime sexual partners (OR=2.73, 95% CI: 2.10-3.56, OR=0.24, 95% CI: 0.16-0.38, and OR=2.59, 95% CI: 2.02-3.31) respectively. They were also more likely to have started being sexual active at seventeen years of age or less (OR=2.73, 95% CI: 2.10-3.56). In addition, there was no significant association between education and having multiple sexual partners in the last twelve months or paying for sex (Kongnyuy et al., 2006).

Shelton, Cassell, and Adetunji (2005) looked at the relationship between wealth and HIV by relating the reduction and prevention of AIDS by reducing poverty. In Tanzania, using 2003-04 HIV/AIDS indicators it was found that wealth was positively related to HIV prevalence. It was also four-fold among women between lowest and highest wealth quintile. However, the focus has been on poverty and poor women who have been exploited due to their economic situation. The question to be asked is who are exploiting these women and in certain instance men. Also, urban areas as opposed to rural areas are known to have high HIV prevalence and urban residence has also been associated with wealth. Wealthy individuals especially men have been known to attract women and they can afford to pay for sex at the same time maintain multiple sexual partners (Shelton, Cassell, & Adetunji 2005).

The authors also suggest that many sexual networks for men are associated with wealth due to mobility, time, and resources, which are all crucial in maintaining such concurrent partnerships. Thus, the economic element is a major factor as opposed to poverty. Wealth also increases opportunities for social interaction and might increase

opportunities for partnership to develop. In Tanzania and Kenya, a positive relation between HIV and wealth has been noted to be stronger among women suggesting that women also have concurrent relationships and sexual networks due to mobility and social interaction. Therefore, wealth and economic disadvantage or advantage plays a huge role in HIV transmission (Shelton, Cassell, & Adetunji 2005).

Fenton (2004) recognized that efforts towards combating HIV/AIDS not only need to focus on individual risk behaviors and prevention of new infections but also need to be carried out in the context of economic, social, and cultural perspectives or the efforts will fail. Specifically, poverty has been cited as a factor contributing to the spread of HIV/AIDS. In addition, HIV prevalence has been indicated to have an association with poverty whether measured in gross domestic product per person, income inequality, or human poverty index. This suggests that poverty increases susceptibility to HIV/AIDS due to lack of access to healthcare and malnutrition that can undermine immunity and increase other untreated sexually transmitted infections.

Poverty is also associated with lack of education and illiteracy, an individual not being able to afford condoms and other healthcare services, along with restriction of individual choices. HIV/AIDS for a long time has been characterized as a disease of the poor. However, studies have shown that in some countries those who are wealthy are at risk and susceptible to HIV infection as well. In South Africa and Botswana, a few of the wealthiest countries in Africa are also home to the highest HIV prevalence in the hard hit areas of SSA (Fenton, 2004).

During the earlier stages of the HIV/AIDS epidemic, most wealthy individuals were more vulnerable to HIV due to mobility and occupations that also served to increase

socioeconomic status. However, with awareness they have been able to access prevention messages shifting the pattern of infection to lower socioeconomic individuals. Of particular interest is the double dose effect HIV/AIDS has on individual and national economic stability. Its most impact is experienced among the working age group thus affecting their household income, the delivery of services such as education, and ultimately the nation's economy usually reflected by negative or declining gross domestic product. Other aspects that need to be considered and addressed in combating HIV/AIDS in most SSA countries include: income and gender inequalities, policy formulation especially in dealing with poverty reduction, and the political will that is needed to address and combat HIV/AIDS pandemic (Fenton, 2004).

Gillespie, Kadiyala, and Greener (2007) investigated whether HIV/AIDS was transitioning from an earlier phase where wealth acted as the main driver to a disease where poverty is increasingly implicated. They did this by examining key findings from African studies from 2004-2007 examining the relationship presented between economic status and the risk of HIV infection. The authors also recognize that HIV infection among those who were wealthier in the earlier stages of the epidemic was common due to lack of access to HIV/AIDS messages on the virus and ways to protect themselves. This happened despite the fact that those who were rich and wealthier were better educated and were more likely to have better access to reproductive healthcare. The results showed low condom usage in SSA. However, in later stages due to higher access to HIV/AIDS messages those of higher socioeconomic status have tended to adopt safer sexual practices.

Furthermore, poverty, food insecurity, and economic dependency put women at a greater risk of HIV/AIDS. Furthermore, the aforementioned variables increased women's risk taking behaviors in SSA as a means of trying to procure food for themselves and their children. This also reduces their power to insist or negotiate condom use. These hardships experienced by women often lead to malnutrition, which is associated with weakened immune system that leads to increased HIV transmission (Gillespie, Kadiyala, & Greener 2007).

In addition, Gillespie, Kadiyala and Greener (2007) recognize that there has been a weak positive relationship between national wealth and HIV prevalence in SSA. However, high HIV prevalence continues to be experienced in wealthier countries such as South Africa and Botswana. Moreover, good transportation and professional mobility can translate to higher incomes and increased HIV incidence rates. On the other hand, national poverty rates have not shown a strong association with HIV prevalence. However, an association between income inequality and HIV prevalence in different countries especially in SSA has been found. The researchers suggest that assuming poverty to be the main cause of HIV transmission is too simplistic and relative wealth has mixed influences on HIV risk depending on many contextual factors. In addition, poor individuals and households chances of being exposed to HIV are not much different from those of wealthier individuals or households. This underscores the need for HIV prevention efforts to cut across all socioeconomic strata with a focus of tailoring such efforts towards specific drivers of transmission in different subgroups.

Multiple Sexual Partners

Somsé, Chapko and Hawkins (1993) looked at the prevalence and characteristics of those individuals that reported having sex with individuals who were not their spouse or single regular sexual partners in Central African Republic. The researchers used a survey questionnaire developed earlier by the World Health Organization (WHO) Global Program on AIDS (GPA) with 157 questions and administered in Sango (national language) or French. A sample of 2589 men and women aged between 15-50 years were surveyed between September and December 1989.

HIV prevalence in Bangui (capital and largest city) was 2.1% in 1985 and by 1989 it was 9.3%. Thirty-four percent of men and 17% of women reported having more than one sexual partner. Fifty-four percent of men and 67% of women reported having only one partner. Of those men who reported being in a stable relationship, either married or having a regular sexual partner and who reported having other sexual partners (n=149), 55% had one, 21% had two, and 24% three or more sexual partners. On the other hand, women in a stable relationship who reported other sexual partners (n=53) were 68%, 13%, and 19% with one, two, and three or more respectively. They also found an association between multiple partners and having a profession other than agriculture (men and women), and greater reading ability (men). In addition, socioeconomic status had a positive relationship with HIV/AIDS prevalence. Another finding was the association between early rape and subsequent multiple sexual partners for both women (OR=1.77) and men (OR=2.47). In this study, seven percent of men and 22% of women reported their first sexual experience to have involved rape (Somsé, Chapko, & Hawkins, 1993).

Mitsunaga, Powell, Heard and Larsen (2005) examined cultural and risk factors associated with extramarital sex among Nigerian men with a focus on polygyny and postpartum abstinence. The authors posited that:

... it may not necessarily be the case that monogamous men are at greater risk than polygynous men of having extramarital sex, particularly during the periods of partner abstinence that may occur during or after pregnancy (p. 478)

The researchers used the 2003 NDHS data, 1,168 men matched with women were included in the analysis. Fourteen men had missing values for extramarital sex in the last twelve months, and one had missing value for paying for sex leaving a sample size of 1,153 men for the analysis. A total of 743 (64.4%) were monogamous, 322 (27.9%) had two wives, and 88 (7.6%) had three or more wives. Extramarital sex in the last twelve months was reported by 130 men (11.3%) of whom 12.9% were monogamous, 5.3% had two wives, and 19.3% had three or more wives. Majority of the men had less than a primary school education (66.2%), 66.3% resided in rural areas, 73.6% were from northern region, and 63.9% of them were of Muslim religion. Of the participants, 13.2% reported ever having paid for sex, only four percent used condom at last sexual intercourse, and three percent reported to have had an STD symptom. Although there was widespread media exposure (73%) and knowledge of HIV/AIDS (84%) i.e. prevention of HIV transmission by reducing the number of sexual partners, 13% of the men did not know of or were unsure of their risk to HIV (Mitsunaga, Powell, Heard, & Larsen, 2005).

Those who had three or more wives were at greatest risk of high-risk-sex as opposed to those who were monogamous (OR=4.77, 95% CI: 1.95-11.72) and (OR=2.25, 95% CI: 1.17-4.32) respectively compared to those who had two wives (referent). Peri-

and postpartum abstinence was found to be insignificant for both crude and adjusted models (OR=0.95, 95% CI: 0.56-1.63). Urban-rural residence was found not to be significant. However, men from the southwest region were seven times more at risk of reporting extramarital sexual activities and those in north-central region were three times more at risk compared to those men living in the northwest (referent) (OR=7.65, 95% CI: 2.08-28.22) and (OR=3.14, 95% CI: 1.10-9.00) respectively. Wealth was significant with poorer, middle, and richer men increasingly being at greater risk of extramarital sexual activities (OR=2.28, 95% CI: 1.05-4.98, OR=2.85, 95% CI: 1.23-6.63, and OR=3.56, 95% CI: 1.41-8.99) (Mitsunaga et al., 2005).

Furthermore, Mitsunaga et al. (2005) also found that Catholics and Protestant men engaged in extramarital sex more than their Muslim counterparts (OR=2.81, 95% CI: 1.12-7.06, and OR=3.78, 95% CI: 1.84-7.76) respectively. Men who were away from home one month or more and men younger than 19 years at their sexual debut were twice as likely to engage and have high-risk sexual activities (OR=2.11, 95% CI: 1.21-3.68, and OR=2.02, 95% CI: 1.02-4.02) respectively. In addition, the higher the perception of their HIV risk the greater their risk of engaging in extramarital sexual activities with low/moderate (OR=2.90, 95% CI: 1.62-5.18), and high/has AIDS (OR=8.14, 95% CI: 2.62-25.29). In the crude model, the Yoruba group were found to be seven times at greater risk of high-risk sex (OR=7.03, 95% CI: 3.73-13.23), this association was non-significant in the adjusted model. Also, a significant association was found to exist between the number of wives and education, marital status, age, residence, region, wealth, ethnic group, religion, peri-and postpartum abstinence, high-risk sex in the last year, condom use at last sexual intercourse, HIV risk perception, knowledge of partner

reduction as HIV prevention method, and media exposure. However, time away from home, ever paid for sex, and history of STD were not statistically significant (Mitsunaga, et al., 2005).

Migration and Sexual Behaviors

Brockerhoff and Biddlecom (1999) studied migration in urban and rural environments in relationship to HIV infection and AIDS in Kenya due to high-risk sexual behavior. It was hypothesized that migrants (male and female) both in rural and urban settings are more likely than nonmigrants to engage in sexual practices that increase their risk of getting HIV/AIDS. They chose Kenya due to its rapid growing numbers of HIV infection among its population, with approximately 24.6% for low-risk urban population and 85.5% for high-risk urban population in 1998. Nairobi, the capital city of Kenya also posted an annual growth of six percent between 1980 and 1995. This urban growth has been attributed to rural-urban migration.

Brockerhoff and Biddlecom (1999) used the 1993 Kenya Demographic and Health Survey (KDHS) which collected data on various items such as migration, AIDS knowledge, sexual activity, socio-demographic condition and family planning. A total of 7,540 women and 2,336 men of reproductive age were in the dataset. Since men were more likely to over report and women were more likely to underreport extramarital behavior influenced by cultural factors and response errors on frequency of sex due to recall time, they performed separate analysis for men and women controlling for marital status and age, which were more likely to influence reliability of reporting. Those who resided in a place for less than six months “visitors” were classified as migrants due to

the fact that they experienced geographical mobility and uncertainty of their residence in the future (Brockerhoff & Biddlecom, 1999).

They found that there was a relationship between migration and high-risk sexual behavior with variations depending on gender and direction of movement. They also found that women migrant between rural areas had high-risk sexual behavior with OR=1.71 than rural nonmigrant women. This was attributed to the removal of behavioral constraints commonly imposed by family and home community. Also, moving away from family members reduced a woman's leverage for sexual negotiation, reduced awareness, and access to condoms. Another finding was the opposite relationship depending on gender; women from other urban areas were less likely to practice high-risk sexual behavior as opposed to their nonmigrant counterparts. Men migrating between urban areas were more than twice likely to engage in high-risk sexual behavior as opposed to their urban nonmigrant counterparts. Twenty nine percent of urban migrants' men had two or more recent sexual partners as opposed to only six percent of urban migrant women with low levels of condom use. Another finding was that urban-rural women migrants were 47% more likely to engage in high-risk sexual behavior in rural areas than nonmigrants as opposed to 38% of men. Men and women in rural areas and men in urban areas who knew other means of preventing HIV contraction had reduced odds of risky sexual behaviors (Brockerhoff & Biddlecom, 1999).

Prostitution/Commercial Sex Workers

Ferguson et al. (2004) designed a multidimensional clinical and community initiative that recruited both female sex workers (FSWs) and their clients. The project began in 1997 approximately 50 kilometers north of Nairobi. The researchers recruited

four groups of informal sector workers comprised of hawkers, artisans, drivers, and loaders. With this group, they initiated peer education and HIV prevention activities. The authors reported from the survey of recent sexual behavior and sexual patterning male groups and the adoption of ABC (abstaining from sex, faithfulness to one uninfected partner, and condom use) strategies. Also examined is the group membership behavior.

A questionnaire that sought background information, sexuality and role, attitudes from men and women, sexual patterning, condom use, month of sexual activities, partner information, and sex with FSW was administered to a randomly selected group of 252 men (37 peer educators and 215 informal sector workers). The mean age for the group was 29 years. They reported that 471 of their sexual partners included 202 casual and FSWs. Abstinence was reported by eight percent of the participants in the group, 53% reported having only one partner, and 39% reported having two or more partners. The range of partners was 0-16 with an average of 1.9 partners, 7.9% reported abstinence from sex, 50.8% had only one regular partner, three percent used condom consistently with multiple partners, and 38.5% reported multiple partners and did not use condoms consistently. Seven percent of married men reported one regular partner other than wife and another 33% of married men reported at least one extramarital partner. In addition, 44% of unmarried men reported to have had at least one casual or FSW in the 12-month period. Condom use at last sexual contact with wives, regular partner, casual partner, and FSW was 6%, 40%, 49%, and 73% respectively with 15.9% of the respondents reporting to have had sex at least once with a FSW partner. They also found an association between duration of membership in self-help groups and exclusive use of condom with a

casual or FSW partner. Large gaps were found to exist between attitudes and practice from the data (Ferguson et al., 2004).

Treatment Seeking Behaviors

Morris and Ferguson (2007) assessed the sexual and treatment-seeking behaviors of long-distance transport workers in East-Africa who were infected with sexually transmitted infections (STIs). Four locations in Kenya (Mlolongo, Makindu, Naivasha and Malaba) were identified to be suitable for the study due to the frequent stops by major long-distance transport workers on the trans-Africa highway. Convenience sampling was used to identify 381 transport workers (9 truck drivers and assistants). A health-seeking behavior survey was administered, probing details of STI knowledge, symptoms and care-seeking behaviors. At Malaba, a sexual patterning matrix was used on 202 transport workers to elicit information on sexual behavior (frequency of liaisons, condom use and type of partner) before the interview.

They found that more than 50 percent of long-distance transport workers in the last 12 months had sex with a female sex worker averaging 2.8 sexual partners in a year. Overall condom use rate with non-spousal was 74 percent with 71 percent use at last liaison. One-third of the truck drivers had high-risk sexual behavior in the 12 months and 85 percent of those with STI had symptoms while on the road. Of those who sought treatment, only 28.9 percent adhered to and completed their course of medication as prescribed. These findings were consistent to those of Morris, and Ferguson (2007).

HIV/AIDS and Men Who Have Sex with Men (MSM)

Volk et al. (2006) studied risk factors for HIV seroconversion among homosexual men in Sydney and Melbourne Australia. Specifically, they investigated behavioral risk

factors in relation to HIV seroconversion among homosexual and bisexual men. Of the participants (145 men) enrolled in the Primary HIV and Early Disease Research: Australian Cohort (PHAEDRA) between January 2003 to October 2004, 103 (71%) completed a survey for behavioral risk factors in relation to HIV (nurse administered section and self-completed section). Of the 103 participants, 62% had acute HIV infection and 38% were newly infected.

The study revealed that recently seroconverted homosexual and bisexual men were highly sexual active and that they had high rates of unprotected anal intercourse and recreational drug use during a high-risk event. Ninety-two percent identified at least one high-risk event with the majority (102 men) indicating sexual exposure with 49% of them reporting sexual partners to have been involved in high-risk event. Sixty-five percent reported receptive unprotected anal intercourse, 45% reported insertive unprotected anal intercourse, and 24% reported receptive oral intercourse. Overall, nearly 70% reported receptive unprotected anal intercourse, insertive unprotected anal intercourse or both during a high-risk event.

Fifty-eight men reported a high-risk event with a casual partner compared to twenty-seven who reported a high-risk event with a regular partner. Ninety-two percent of men who reported receptive unprotected anal intercourse had positive perception (HIV-negative) on their partners compared to 53% who were certain that their partner was HIV-positive ($p=0.05$) six months before the high-risk event. Seventy-three percent of men reported more than five sexual partners. Forty-nine percent of the seroconverters had more than ten partners compared to the HIV-negative groups i.e. 40% in the 2003 Sydney Gay Community Periodic Survey (SGCPS) and 38% in the Health in Men (HIM).

Twenty-two percent of the seroconverters reported injecting drug use in the last six months compared to HIV-negative men in Sydney (3.55 in SGCPS and 4% in HIM). Sixty-two percent intoxicated with alcohol (≥ 5 drinks) or mood altering recreational drug use during a high-risk event.

Sharma et al. (2008) studied the characteristics and the context of HIV/STI risk behaviors among men who have sex with men (MSM) in Nairobi. Of the 486 men who were enrolled in a study of male genital hygiene and sexual behavior, 12 men (2%) self-identified themselves as MSM and using snowball sampling technique more MSM were recruited. Thirty-six men were recruited of whom thirty gave written consent for the study. They ranged from ages 19 to 35 years and from different ethnic groups with two of the men married.

Data were collected through a short questionnaire, focus group discussions and taping the discussions using Kiswahili one of the official languages of the country. They used independent transcribers who entered discussions in English and readers who identified and coded recurrent themes. Themes that cut across the tree focus group discussion and direct quotations that identified collective experiences were considered. This included emerging group identity, context of sexual risk taking, and low health utilization.

They found that MSM were from a diverse age, occupational, and socioeconomic backgrounds with different comforts about their sexuality. Some men preferred to hide themselves in marriage, while others were comfortable about their sexuality with no fear of disclosure. It was apparent that high-risk sexual behavior was mainly practiced by MSM mostly due to power differentials defined by age, wealth, perceived

marginalization, and nondisclosure. Although relationships between MSM varied by type and duration, it remained (contained) within a tight group of friends, acquaintances, and paying clients. MSM relationships were fueled by love and money; however, those who were poor and engaged in sex work got commission for introducing younger men who have never engaged in homosexual relationships to their paying clients. Those who were younger and poor had difficulty negotiating condom use and only left a relationship only when more-desirable romantic and financial gains presented themselves.

Of interest was that those of higher socioeconomic class led a double life often married with children and their relationships did not last long. MSM lacked information relating to their risk of HIV/STI acquisition and issues around condom negotiation. They also delayed seeking treatment for STI due to embarrassment and stigmatization even from health professionals due to non-normative sexual behavior. HIV counseling and testing were avoided due to the stigma, for their case homosexual stigma, HIV stigma, and lack of resources to treat the disease if tested positive for HIV. They also expressed psychological concerns, stress, and fear of family and employer rejection that comes with HIV/AIDS.

HIV/AIDS Epidemic and Estimates

Sokal, Seitz, Auvert, Stover and Naamara (1998) used deterministic and stochastic models [U.S Interagency Working Group AIDS Model (iwg-AIDS) and SimulAIDS] to simulate AIDS epidemic for a severely affected east African city by estimating demographic, biological, and behavioral parameters. They used these parameters in computing HIV spread under five scenarios: 1) baseline without intervention, 2) decreasing the number of sexual partner and rate of partner change with

single-intervention strategy, 3) increase condom use with single-intervention strategy, 4). improving the treatment of sexually transmitted diseases (STDs) with single-intervention strategy, and 5) using a combination of intervention scenarios.

The research question they were addressing was “how effective would such levels of change be at slowing the spread of HIV?” Sokal et al., 1999, pg. 104. Based on the assumption that the five scenarios actually reduced HIV transmission, they found that combined interventions had a greater impact than separate/single interventions for each model. Intervention that had immediate effect of decreasing partner change was the most effective. This reduced HIV prevalence by 25.6 percent (SimulAIDS) and 52 percent (iwg-AIDS) after 10 years. This was followed by condom use as an intervention and a reduced HIV prevalence by 21.9 percent and 25.6 percent respectively. STD treatment was the least effective with 6.9 percent and 12.9 percent respectively. Also of importance is that they found decreasing partner change, condom use, and STD treatment if done on a timely, targeted, and sustained manner can be very critical in slowing HIV transmission and epidemic.

In a study conducted in Kenya, Foglia et al. (2007) sought to determine HIV-1 prevalence and risk factors among rural plantation residents in Kericho, Kenya to aid in prevention programs and the development of HIV-1 vaccine research site.

Six clusters (estates) out of the 29 located in a tea plantation were selected and invited to participate in the study with recruitment running from June to December. Inclusion criteria was based on being between 18 and 55 years, informed consent, plans to live in the plantation for at least three years, and a passing score on a 10-question comprehension test. Participants underwent medical examination and risk assessment

interview. A standardized questionnaire was used for face-to-face confidential interviews by trained personnel in English and Kiswahili. A total of 2801 individuals enrolled, 62% (n=1720) were men and the rest female. Initially, serum samples were processed in the on-site laboratory then at the Walter Reed Project (WRP) laboratory. To confirm HIV-1, serum specimens were screened ELSA then confirmed by Western blot assay. χ^2 and Fisher's exact test was used for comparing differences in proportions and odds ratios (OR) was used to determine the association of risk factors.

Fifty-three percent of the participants were less than 30 years, 95% had finished at least primary education, 19% men and 7% women had been married more than twice, 85% of males were employed compared to women (51%), 25 ethnic groups (tribes) were represented with the most common ones being Kalenjin, Kisii, Luo, and Luhya. HIV-1 prevalence was 14.3% (n=401) [95% CI: 13.0-15.7], this was higher for women than men (19.1% vs. 11.3%, $p < 0.001$). For the six clusters (estates), the prevalence ranged from 9.6% to 19.9%. Risk factors for men in relation to HIV-1 included age (≥ 25 years), marital history (one or more marriages), age difference from spouse (≥ 5 years), those of Luo ethnicity, STI symptoms in the last 6 months, circumcision (acted as a protective factor), and sexual activity (≥ 7 years). For women, risk factors associated with HIV-1 were age (25-29 years, ≥ 35 years), one or more marriages, age difference from current spouse (≥ 10 years), those of Luo ethnicity, STI symptoms in the last 6 months, and STI history in the last 5 years. More than 98% men and 96% women reported willingness to participate in a HIV vaccine study, with 96% both men and women indicating that they would receive a HIV vaccine so long as it was proven to be safe and efficacious.

Gouws et al. (2006) described a model developed to calculate the expected number of new infections among adults in the future based on current distribution of prevalent infections and patterns of risk within different populations. They illustrate the model by applying it to Kenya, which is known to have generalized epidemic and Thailand, which has an epidemic that is concentrated in nature.

The model is now widely used and recognized as USAIDS/WHO set of methods:

...was developed with the UNAIDS Reference Group on Estimates, Modelling and Projections to calculate the expected short term incidence of HIV infections among the adult population by mode of transmission, using as input data the current prevalence of HIV infection, the number of individuals in particular risk groups, and the risk of exposure to infection within each group. (p. iii51)

Model variables that were used to generate data for the two countries are discussed somewhere else under “data requirement for application of the model” and “transmission probabilities” (Gouws, White, Stover, & Brown, 2006).

A total of 82,369 new infections in a population of 16.4 million of those aged 15-49 years were reported in the general population in 2005. For the low risk population (30.1%), 18.3% were involved in casual heterosexual sex with non-regular partners of whom 27.7% were involved in casual sex. Sex workers clients and sex workers, 10.5% and 1.3% respectively accounted for all new infections. Injecting drug accounted for 4.8% (n=3991) of new infections with men having sex with men (MSM) accounting for 4.5% (n=3697). Medical injections accounted for 0.6% and blood transfusions accounted for 0.2% of new infections.

In Thailand, a total of 17,811 new infections in a population of 35 million of those aged 15-49 years were reported in the adult population in 2005. Majority of new infections were reported among low risk population (43.4%) with MSM accounting for

20.9%, sex workers accounting for 3.9%, their clients accounting for 6.1%, partners of clients of sex workers accounting for 8.4%, injecting drug users accounted for 5.7%, casual heterosexual sex accounted for 3.4% and their partners 3.6%. Medical injections accounted for 0.6% and none for blood transfusion.

Female Empowerment

Ngugi et al. (1988) studied the epidemiology of sexually transmitted disease (STDs) in a large cohort of prostitutes who were from a lower socioeconomic area in Nairobi. The author used health education about STDS and AIDS as an intervention and then described the effects of the health education program, free condom distribution, and condom use among prostitutes. Health education was provided during community meetings and individual counseling sessions. The study also utilized community health workers who generally received more intensive health education than did the prostitutes. Their role was to act as informal health educators to the entire population.

The design they used was case-control with three arms. Five hundred and five prostitutes registered in the study. Of this 229 attended the clinic every two weeks for STD treatment, 266 attended the clinic when they had health problems. Every six months the prostitutes were examined for STDs including HIV infection. The control group consisted of 205 prostitutes who did not receive any health education. However, they were free to attend the general community meetings or meet with the community health workers. They could not receive any condoms unless they registered with the study.

The study found that condom use was rare before the introduction of health education program on AIDS as well as the distribution of condoms with only 10%, 7%, and 7% of the three arms reporting condom use before the onset of the project. There

was no difference in condom use among women who were seropositive for HIV and those who were seronegative before counseling. Prostitutes in the 1st and 2nd arm started using condoms earlier than prostitutes in the 3rd arm (81%, 70%, and 58% respectively). Also, 80% of prostitutes in the 1st arm indicated that they would refuse having sex without a condom as opposed to 51% and 52% of the 2nd and 3rd arm respectively.

Those prostitutes who attended community meetings were more likely to use condoms (OR=2.0, 95% CI 1.1-4.7, $p<0.05$). Prostitutes who were more knowledgeable about AIDS and who had access to condoms (1st and 2nd arm) were more likely to initiate and propose condom use or provide clients with condoms. Personal health and HIV/AIDS avoidance was the main reason for using condoms by the prostitutes in the three arms. Also another interesting finding was that 7% of the prostitutes in the 3rd arm reported clients' insistence as the main reason for condom use as opposed to only 3% of prostitutes in the 2nd arm and none in the 1st arm, indicating the importance of community health education in this study. Another finding was that "any condom use resulted in a 3-fold reduction in risk of seroconversion (OR=0.34, $P<0.05$, 95% CI=0.13-0.92)" p. 889. They also found a relationship between increased condom use and decreased risk of HIV seroconversion.

Stigmatization and Social Exclusion

Stigma can be defined as the process of devaluing someone in a social context. It is a very dynamic process that varies from one culture to the other, hence, making stigma an arbitrary process based on skin color, sexual preference, behaviors among others (Alonzo & Reynolds, 1995; Goffman, 1963; Link & Phelan, 2001; Parker et al., 2002).

Sympathy, compassion and support for most ailments to assist one through a difficult phase of nursing a medical condition is commonly accepted and viewed as the right thing to do socially either from a family member or the community. However, in most instances when HIV infection is identified or one is labeled to have the disease these social support elements in most African cultures can be withdrawn drastically because of the socially unacceptable behaviors associated with the HIV/AIDS. Hence, the stigma that comes with such an infection quite often leads to discrimination and social exclusion of those infected (Aliber & Walker, 2006; Luginnah et al., 2005).

When individuals exclude others from various social aspects of life based on/derived from stigma, then this can lead to discrimination which can be expressed at the family, community, institutional and national level as well. At the family and community level, at the onset of HIV signs whether perceived or suspected women have always been blamed for the disease and discriminated against even when the husbands have died from AIDS. Furthermore, women have also been sent back to their families because if they stay with the husband's family all forms of abuse is common. Moreover, the husband's family may not allow the wife to attend the funeral of the deceased. In some instances when the wife dies from the disease they are refused burial by the husbands family (Lampsey et al., 2002; UNAIDS, 2000; Parker et al., 2002).

Discrimination can continue to be experienced at the institutional levels as well. Quite often healthcare services if offered to those infected with HIV/AIDS and such services are compromised in several ways. The services can be inadequate and when available they may not be of poor quality coupled with lack of confidentiality. At schools, HIV/AIDS infected children are denied admission and teachers are abused,

shunned or dismissed from their employment. In Africa, including Kenya quite often employers demand a complete medical checkup which includes HIV testing.

Furthermore, individuals infected with HIV are denied employment irrespective of them matching job specifications and descriptions requirements. At the national level, discrimination is expressed in various ways particularly when it comes to international travel. These discrimination practices fuelled by HIV/AIDS stigma can create fear and feeling of hopelessness among those infected. Quite often such individuals have spread the disease intentionally to counter such discriminations especially so in Africa where laws related to HIV/AIDS, women abuse, and human rights have been lagging behind. Hence, intentional transmission behaviors among those infected are quite common (Donahue, Kabbucho, & Osinde, 2001; UNAIDS, 2000; Nyaga et al., 2004).

Hamra et al. (2006) sought to quantify expressed stigma and characterize the association between HIV/AIDS related stigma among families taking care of children from an outreach program in Nairobi, Kenya. A secondary cross-sectional data was used in the analysis. They utilized a validated survey questions to create a stigma index and indices for knowledge domains. The data were collected from families working with an outreach program “Lea Toto Kangemi to provide homes for children infected with HIV. Interviews were conducted on children and caretakers irrespective of their HIV status. Furthermore, HIV status was not asked. The stigma index used in the study excluded children who were under twelve years.

The study found that stigma was most expressed among adolescents aged between 12-20 years; there were no significant differences in gender. Furthermore, no differences were associated with tribal affiliations. Respondents’ from Dagoreti expressed more

stigma compared to those from Westland area. Stigma was also observed to be prevalent among individuals who had never been married compared to those who were married. Significant differences for stigma were observed among religions. Stigma was highest among Catholics compared to Protestants. Those with a primary education expressed more stigma towards HIV/AIDS compared to those with a University education. For occupation, students expressed lower stigma compared to business owners, casual workers, permanent employees and housewives.

Male Circumcision and HIV

The importance of circumcision as a protective factor for HIV acquisition has been underscored by other researchers (Agot, Ndinya-Achola, Kreiss, & Weiss, 2004; Auvert et al., 2001; Moses et al., 1994; Weiss et al., 2008; Weiss, Quigley, & Hayes, 2000). However, other researchers have not found or have found a very marginal relationship and/or association between circumcision and HIV acquisition (Van Howe, 1999; Moses et al., 1994; Jameson, Celum, Manhart, Menza, & Golden, 2010; Vermund, & Qian, 2008; Millett, Flores, Marks, Reed, & Herbst, 2008). The majority of these studies have been randomized controlled trials in nature (Auvert et al., 2005; Bailey et al., 2007; Williams et al., 2006). In this study the researcher seek to answer this question using a population based data with a random sample limited to men who were offered an HIV test and accepted (CBS, 2004).

Agot, Ndinya-Achola, Kreiss and Weiss (2004) conducted a comparison study of circumcised and uncircumcised men to find out their risk of HIV-1 in a rural Kenyan area. The study was cross-sectional and was conducted between April 1999 and May 2000 from time of subject selection to enrollment in the Luo community. Of the eligible

1,217 men only 845 who gave blood samples were studied [circumcised (n=398) and uncircumcised (n=447)]. An inclusion criterion was that one had to be from a Luo ethnicity and a member of an African-independent church. Furthermore, participants were to be between age 18-49 years, sexually active, and unaware of their HIV status. Informed consent was completed through Dholuo, a local language.

HIV-1 seroprevalence was higher among uncircumcised men (30%) compared to those who were circumcised (20%). In the unadjusted results, they found higher odds among uncircumcised men (POR=2.1, 95% CI: 1.5-3.0). After adjusting for confounding this was (POR=1.9, 95% CI: 1.3-2.6). HIV-1 seropositive was similar among men who were circumcised regardless of the time of circumcision either before or after the onset of sexual activity.

CHAPTER 3: RESEARCH MATERIALS, DESIGN, AND METHODS

Conceptual Framework

In this chapter, research materials, design, and methods are described.

Conceptual framework that guides the study is based on two models and one theory [Health Belief Model (HBM), Information-motivation-behavioral skill model and Theory of reasoned action and planned behavior] are discussed in detail. Data source and data collecting procedures for the KDHS-2003, sample selection, dependent variables and main independent variables, study analysis plan, confounding, common factor analysis, analysis utilizing survey commands, accounting for complex survey design, and power and sample size are discussed in this chapter.

Several HIV/AIDS studies have used different theories and models in trying to explain different behaviors. No one model or theory can fully explain human behaviors. For this study the following models and theory were used: (1) HBM, (2) Information-motivation-behavioral skill model, and (3) Theory of reasoned action and planned behavior. To understand the inter-relationship between health behaviors one needs an in-depth knowledge of health behavior models and theories. Specifically, for this research different constructs directly related to health behavior models and theories from the individual and community perspective were used. Health behavior models and theories are crucial in understanding the relationship between different behavioral constructs, for making assumptions with relationships, in organization of knowledge, and in predicting different outcomes. Furthermore, to increase the success of health campaigns theories are

used in understanding why individuals behave in certain ways and developing strategies on how to change behaviors that can cause harm to individuals and the society at large.

HIV/AIDS mistakes especially in policy implementation and evaluations have been common, partly due to the response and urgency by politicians to curb the spread of the disease. This has led to minimal impact of such programs due to poor planning and lack of health behavior models and theories use (Fisher & Fisher, 2002) and the focus on strategies rather than theory to guide programs (Hochbaum, Sorenson, & Lorig, 1992). It is crucial to implement and use theories to guide studies, specifically, in the study of HIV/AIDS in order to eliminate mistakes related to dogmas with the disease (Leviton, 1989). HIV/AIDS transcends the individual level. To understand its nature, and effects it is crucial to apply a socio-ecological model, since behavioral outcomes can be influenced at different levels in the socio-ecological continuum i.e. the individual, the interpersonal, the community, the organizational, and public policy (McLeroy, Bibeau, Steckler, & Glanz, 1988; Patrick, Intille, & Zabinski, 2005). The organizational, policy implications and recommendations are discussed in chapter five.

While the information in the dataset for this study can be inferred to Kenya as a country, different communities are represented. Furthermore, the information came from individuals. Therefore, individual theory will also be used. A review of different models and theory (health belief model, information-motivation-behavioral skill model, and theory of reasoned action and planned behavior), and concepts that guide the study are discussed below. These models and theory have also been widely used to understand behaviors in health education and psychology (DiClemente, Crosby, & Kegler, 2002; Glanz, Rimer, & Lewis, 2002).

Health Belief Model (HBM)

HBM was developed in the 1950s by a group of social psychologists at the U.S. Public Health Service who wanted to explain the widespread failure in program participation aimed to detect and subsequently prevent diseases such as tuberculosis and breast cancer screening (Glanz, Rimer, & Lewis, 2002; Hochbaum, Sorenson, & Lorig, 1992). The HBM aids in predicting and explaining individual behaviors that are based on perceived threats by an individual on contracting a disease. If the perceived threat is high, the probability of an individual to seek and adhere to the recommended health behavior change will be high (Rosenstock, Strecher, & Becker, 1994). According to Glanz, Rimer, and Lewis (2002):

... people will take action to prevent, to screen for, or to control ill-health conditions if they regard themselves as susceptible to the condition, if they believe it would have potentially serious consequences, if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to or the severity of the condition, and if they believe that the anticipated barriers to (or costs of) taking the action are outweighed by its benefits. (pp.47-48)

Later in the 1980's Bandura distinguished efficacy expectations from outcome expectations and his idea was added to the HBM as a separate construct to increase the model's explanatory power (Bandura, 1977; Bandura, 1997; Glanz, Rimer, & Lewis, 2002; Rosenstock, Strecher, & Becker, 1994). The four main sources of efficacy expectations were performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977; Maddux, 2002).

Compared to other theoretical frameworks, the HBM best explains behavior change and maintenance of health-related behaviors. It has also been widely used as a framework in the health behavior and intervention arena (i.e. condom use, cancer, and

mammography screening). Furthermore, HBM can also be adapted to different cultural setting and groups (Glanz, Rimer, & Lewis, 2002). This is important because perceived barriers, risks and experiences vary across different demographic, socioeconomic, and cultural groups (Byrd, Mullen, Selwyn, & Lorimor, 1996; Glanz, Rimer, & Lewis, 2002; Miller & Champion, 1997; Tang, Solomon, & McCracken, 2000).

Volk and Koopman (2001) used the HBM to study factors associated with condom use in Kenya. The study revealed that educational efforts need to address the underlying cultural beliefs that hinder people from adopting preventive behavior such as condom use. Therefore, the HBM will explain the high-risk sexual behavior, HIV/AIDS knowledge factors, HIV/AIDS counseling and testing, social and psychological factors, and other covariates that might influence them. Specifically the HBM cognitive constructs (attitudes, beliefs, perceived susceptibility, perceived vulnerability, efficacy, and social support) if understood well can be used to inform and change behavior. Another consideration for this model was that the main outcome measures for this study relates well to the variables in the HBM.

Information-Motivation-Behavioral Skill Model

This model was introduced in the 1980s by Jeffrey Fisher. The model is commonly implemented and used to evaluate the effectiveness of HIV risk behavior change interventions (DiClemente, Crosby, & Kegler, 2002). While the model can be used for various health conditions intervention, its importance towards HIV prevention cannot be underscored. This study and the model constructs relate well because the information regarding an object/disease, motivation to partake or avoid a certain behavioral intentions, and behavioral skills that are required to avoid high-risk activity

are major determinants of high-risk sexual behaviors. Also, the interrelationship between these variables can be used to formulate HIV prevention interventions that are very effective. The model points to HIV prevention behavioral skills as the main determinant of the HIV prevention behavior (high-risk sexual behavior). Other two major independent but complementary constructs in this model that can affect HIV prevention behavioral skills and behavior itself are HIV information and HIV prevention motivation (DiClemente, Crosby, & Kegler, 2002).

This model relates well to one of the predictor variables for this study (VCT). However, the model is not going to be looked in isolation since the socio-economic, demographic, HBM and theory of reasoned action and planned behavior constructs, and the socio-ecology of the individual needs are going to be considered in the this study. For the model to work well towards HIV prevention behavior, one needs to seek information on the current HIV/AIDS risk reduction knowledge, motivation towards the reduction of HIV/AIDS, and HIV/AIDS prevention behavioral skill (DiClemente, Crosby, & Kegler, 2002). While this study utilized information that has already been collected (DHS, n.d; CBS, 2004), numerous questions were used to probe for HIV/AIDS information, motivation and prevention behavioral skills to avoid infection. Designing and implementation of appropriate interventions that are based on information gathered through research, and the evaluation of the impact of such HIV/AIDS programs in terms of information, motivation, behavioral skills, and behaviors is crucial (DiClemente, Crosby, & Kegler, 2002).

Theory of Reasoned Action and Planned Behavior

Theory of reasoned action (TRA) was introduced in 1967 by Fishbein and Ajzen; later Ajzen introduced the theory of planned behavior (TPB). This theory will also be used to guide this study due to the various constructs that can directly be related to HIV/AIDS prevention. Furthermore the theory can guide research in unique environments when studying such constructs in different cultural settings, especially when trying to explain attitudes and behaviors. The theory is an attempt to address behaviors among individuals, specifically; the theory looks at the relationship between beliefs (behavioral and normative), attitudes, intentions, and behavior. Also addressed by the theory of planned behavior is that behavioral intention (defined as the perceived likelihood of behavior performance) is the most important determinant of behavior and will depend on perceived behavioral control (Glanz, Rimer, & Lewis, 2002).

Both theory of reasoned action and planned behavior recognize behavioral intention to be the main determinant of behavior and that it is influenced by attitudes towards behavior that can be determined by behavioral beliefs and evaluations of behavioral outcomes, subjective norms that can be determined by normative beliefs and motivation to comply and perceived behavioral control that involves control beliefs and perceived power. The main outcome measure (attitudes) and one covariate-self efficacy which can be determined by perceived behavioral control were examined in this study.

Figure 9 depicts the conceptual framework for the study, specifically how various variables relate to each other to produce a certain health behavior/condition, and other psychosocial attributes such as attitudes, perceptions, self efficacy, cognitive involvement/awareness among others. The health belief model, information-motivation-

behavioral skills model, and theory of reasoned action and planned behavior are crucial to behaviors that contribute to or that which might enable the acquisition of HIV/AIDS.

This conceptual framework was used to guide the various proposed concepts, specifically those that explain the various links. However, other methods such as forward stepwise logistic regression and manual variable selection were used.

In this study, the conceptual framework dashed lines are variables or paths considered in this study to complete the framework. However, these variables were not directly studied. These variables include: 1) likelihood of behavior change 2) program intervention 3) behavior/program maintenance and 4) formative, process, and impact evaluations.

Ethical Consideration

The study was approved by the University of North Carolina at Charlotte Institutional Review Board on 08/13/2009, protocol number 09-08-07 (see Appendix 5).

Data Source

The study utilizes data from the Demographic and Health Surveys (DHS) which are usually cross-sectional. The DHS are nationally representative household surveys that are usually administered in developing countries to collect data that can be used for monitoring and impact evaluation purposes in regard to population, health and nutrition. DHS usually have a large sample size ranging between 5,000-30,000 households. The surveys are usually conducted every 5 years to enable comparisons at different times. Information collected by the DHS include, anemia; child health; education; family planning; female genital cutting; fertility and fertility preferences; gender/domestic violence; HIV/AIDS knowledge, attitudes, and behavior; HIV prevalence; household and

respondent characteristics; infant and child mortality; malaria; maternal health; maternal mortality; nutrition; wealth/socioeconomics and women's empowerment (DHS, n.d). The DHS questionnaire is organized in two parts that include the household questionnaire and the women's questionnaire. The questionnaire was administered to both women (15-49 years) and men (15-54 years). The Kenya Demographic and Health Survey-2003 is one of the surveys administered by the DHS.

The Kenya Demographic Health Survey-2003

The 2003 Kenya Demographic and Health Survey (KDHS-2003) conducted by the Kenya Central Bureau of Statistics (CBS), now Kenya National Bureau of Statistics (KNBS) in collaboration with the Ministry of Health, National AIDS and STIs Control Program (NASCOP), Kenya Medical Research Institute, and National Council for Population and Development (NCPD) was used in this study. Technical support was provided by MEASURES/ DHS + program, sponsored by the United States Agency for International Development (USAID) and the Centers for Disease Control and Prevention (CDC). KDHS-2003 is the latest version that was conducted between April 18, 2003-September 15, 2003 and the only one that collected information on awareness and behavior in relation to HIV/AIDS and STDs, sexual activity, family planning methods and awareness, circumcision, domestic violence among women, fertility levels and preferences, marriage, malaria and use of mosquito nets, nutritional status of women and young children among others. Earlier survey information was reported in 1989, 1993 and 1998 (CBS, 2004). All four KDHSs are cross-sectional. The KDHS-2003 is unique in that HIV tests were conducted randomly unlike the previous surveys. Of the total 11,773 individuals who responded to the KDHS-2003, 8,800 were selected randomly for HIV

testing with 6,360 ($\approx 72\%$ response rate-unweighted) accepting and agreeing to be tested for HIV (CBS, 2004).

When studying psychosocial measures such as attitudes, perceptions, and cognition men and women especially in developing countries might under-report or over-report certain sensitive questions such as those dealing with sexuality and domestic abuse due to desirability that most often than not is influenced by culture, sex or gender roles. Because of this, separate analysis was conducted for men and women for the first, second, third, and fourth objectives. For the fifth objective, the individual recode data (female dataset), male recode data (male dataset) were merged together for study analysis. Only those individuals who were offered HIV testing and accepted were maintained in the analysis.

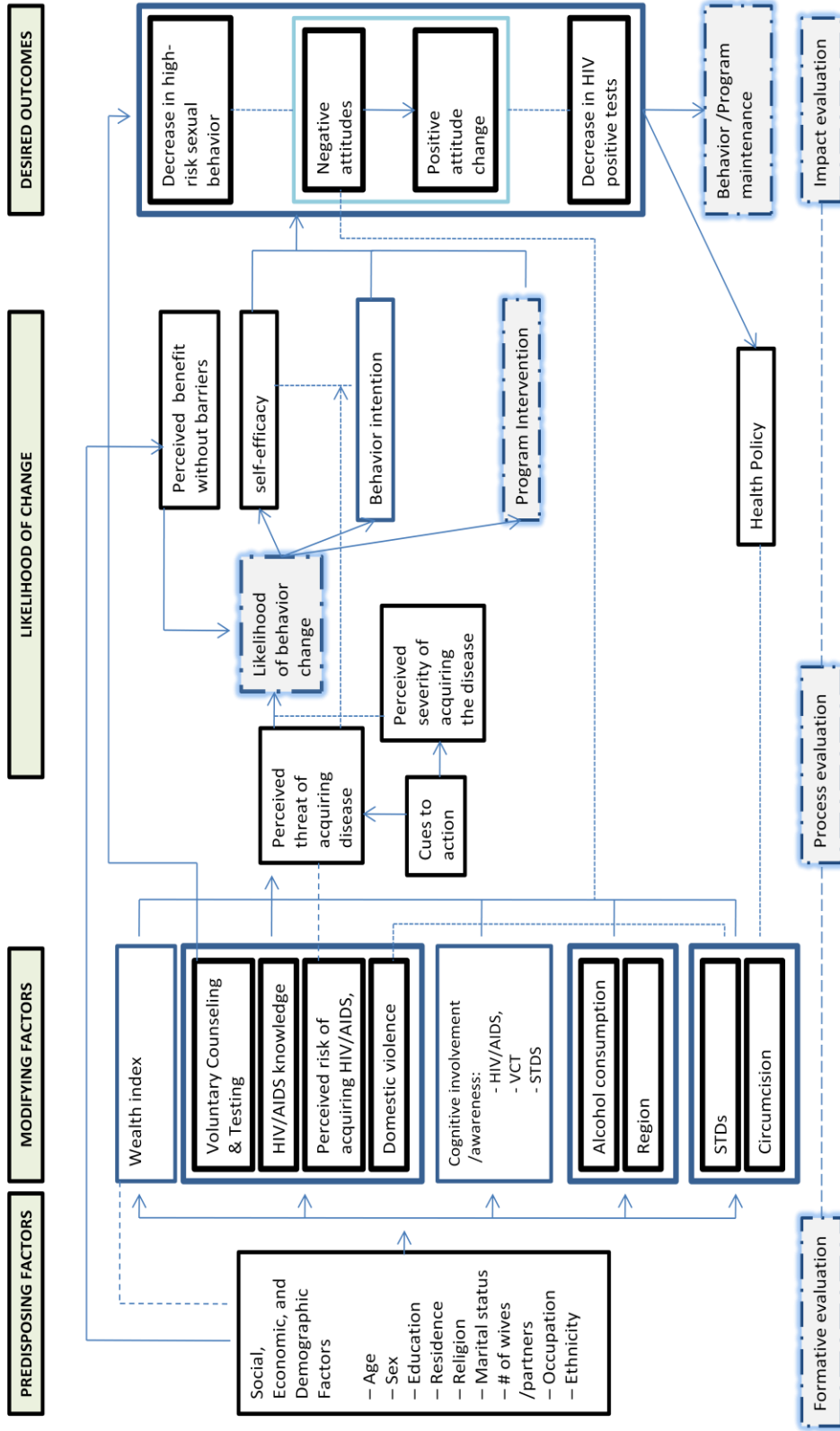


FIGURE 9: Conceptual framework

Sample Selection

KDHS-2003 only includes women and men aged between 15-49 years and 15-59 years respectively. The rationale for surveying only women between 15-49 years was because the reproductive age falls within this age category. Although KDHS-2003 is a national representative sample, originally it was designed so that it can provide representative data at the provincial and district level. The survey uses a complex design with two-stage clustered sampling derived from the 1999 Population and Housing Census Enumeration Areas (CBS, 2004). Two sampling stages were implemented, first stage involved stratification of the urban and rural areas followed by the selection of clusters. In total 400 clusters were selected from the sampling frame (271 rural and 129 urban). The second stage involved a systematic sampling of the households. For this specific survey, oversampling was done in urban areas due to high population and under sampling was specifically done in North Eastern Province because of the technicalities in interviewing residents of such areas (CBS, 2003).

The survey was administered to both women and men. Of the 9,865 households selected in the sample 8,889 were occupied and 8,561 (96% response rate) were successfully interviewed with 8,717 women identified as being eligible for interviews. Of the 8,717 eligible women 8,195 (94% response rate) completed the interview. For the male survey, 4,183 men were identified from the household subsample of which 3,578 (86% response rate) were successfully interviewed. Three questionnaires were used to collect data, household questionnaire, the women's questionnaire and the men's questionnaire (CBS, 2004), which are reported separately. This study only utilizes the women's questionnaire and the men's questionnaire.

The reason for choosing the data set was based on the rich variables that relate directly to the proposed hypotheses either as the main outcome measure, main independent variables, confounders, or as effect modifier.

Study Variable Coding

Dependent Variables

There were three main outcome measures of interest for the study, for a complete list of variables used, coding, and variable data set location see Table 1.

1. High-risk sexual behavior
2. HIV status, and
3. Attitudes
 - a. Negative attitudes/stigma,
 - b. Negative attitudes towards women,
 - c. Negative attitudes towards condom use among men, and
 - d. Negative attitudes towards condom advertisement

The study has five objectives with three main outcome measures: High-risk sexual behavior, HIV status, and negative attitudes. For negative attitudes there are four main categories that were looked at separately (negative attitudes towards HIV/AIDS, women, condom use among men, and condom advertisement).

- a. Negative attitudes/stigma: mostly defined HIV/AIDS and sex education about condoms to school children among women and HIV/AIDS among men.

- b. Negative attitudes towards women: mostly defined husband controlling attitudes, women sexual attitudes-husband among men and women; and husband sexual attitudes among men.
- c. Negative attitudes towards condom use: mostly defined condom perceptions, disease protection, and sexual pleasure among men.

TABLE 1: Dependent variables questions, coding, and dataset location KDHS-2003

Dependent Variable (Objective 1, 2 & 4.)				
Male and Female: High-Risk Sexual Behavior (sex with prostitutes/commercial sex workers, lack of condom use, and multiple sexual partners)				
Question	Male	Female	Dependent Variable Type	Variable Location/Dataset [Individual recode (females), male recode, and HIV/AIDS dataset]
1. Have you ever paid for sex? / In the last 12 months have you ever given or received money, gifts, or favors in return for sex?	0=no 1=yes	0=no 1=yes	Dichotomous	Individual recode (females), male recode
2. The last time you had sexual intercourse with a woman, did you use a condom? / The last time you had sexual intercourse, was a condom used?	0=no 1=yes	0=no 1=yes	Dichotomous	Individual recode (females), male recode
3. Have you had sex with any other woman/man in the last 12 months?	0=no 1=yes	0=no 1=yes	Dichotomous	Individual recode (females), male recode
Dependent Variable (Objective 3.)				
Male and Female: Negative attitude/Stigma towards HIV/AIDS; Male and Female: Negative attitude towards Women; Male and Female: Negative attitude towards Condom Advertisement				
Question	Male	Female	Dependent Variable Type	Variable Location/Dataset [Individual recode (females), male recode, and HIV/AIDS dataset]
Multiple questions (Appendix 4)	0=no 1=yes	0=no 1=yes	Dichotomous	Individual recode (females), male recode
Dependent Variable (Objective 3.)				
Male : Negative attitude towards Condom use				
Question	Male	Dependent Variable Type	Variable Location/Dataset [Individual recode (females), male recode, and HIV/AIDS dataset]	
Multiple questions (Appendix 4)	0=no 1=yes	Dichotomous	Individual recode (females), male recode	
Dependent Variable (Objective 5.)				
Male and Female: HIV test results				
Question	Male	Female	Dependent Variable Type	Variable Location/Dataset [Individual recode (females), male recode, and HIV/AIDS dataset]
1. HIV test results	0=negative 1=positive	0=negative 1=positives	Dichotomous	HIV/AIDS dataset

- *High-Risk Sexual Behavior*

High-risk sexual behavior was determined by three variables (lack of condom use, sex with prostitutes/commercial sex workers, and multiple sexual partners) on reported sexual behaviors (see Table 41). Specifically, if one reported not using a condom in the last sexual intercourse, and if one ever paid for sex or received money, gifts, or favors in return for sex, and if one had sex with more than one woman/man in the last 12 months. When studying behaviors, recall bias (Fenton, Johnson, McManus, & Erens, 2001; Graham et al., 2003; Upchurch et al., 1991) is possible, therefore last time or in the last 12 months was used in order to effectively capture and at the same time minimize recall bias.

While studies have indicated an association between STDs, and HIV/AIDS (Ghys et al., 1997; Royce, Seña, Cates, & Cohen, 1997; Wald & Link, 2002), in this study STDs was considered as a potential variable to be included in high-risk sexual behavior. However, this variable was used as a main independent variable in a separate hypothesis under objective five. Furthermore, it is more likely that those individuals who do not use or insist on condom use are the ones who get infected with STDs and HIV/AIDS; hence lack of condom use is an appropriate measure alone. All three variables, lack of condom use in the last sexual intercourse, paying or receiving money money/gifts/favors in return for sex, and having sex with multiple sexual partners were coded “1” if an individual said yes and “0” if an individual said no. High-risk sexual behavior was generated from these three variables. If one reported yes to either one of the three variables, they were

considered to have high-risk sexual behavior coded “1” and if they reported no to all three variables they were considered not to have high-risk sexual behavior coded as “0”.

- *HIV Status*

HIV test results are very crucial when studying behavioral issues, specifically, when considering constructs in the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self efficacy) and attitudes in predicting behavioral partaking (Glanz, Rimer, & Lewis, 2002). This is because such perceptions and attitudes will vary depending on HIV status of an individual. However, those individuals who agreed to be tested for HIV were not informed of their HIV status or given post counseling on how to manage the disease and/or behavioral changes they needed to partake in order to live a quality and productive life with the disease. This variable was obtained from women and men who participated in the KDHS-2003 and randomly selected to provide blood for HIV testing. Four hundred and twenty four individuals tested positive for HIV (unweighted). Therefore, HIV status variable was coded “1” if HIV test results were positive and “0” if HIV test results were negative. Two indeterminable results were coded as HIV negative.

- *Negative Attitudes and/or Stigma*

Attitude towards condom advertisement was determined by three questions on respondents’ opinions on whether it is acceptable or unacceptable to advertise condoms on radio, television, and newspaper. These three communication avenues are formal hence free from information bias from personal opinions and beliefs commonly

associated with informal channels of communication. A positive attitude towards condom advertisement was coded “0” and “1” if they reported negative attitudes towards condom advertisement. For attitudes towards women, fourteen questions directly related to decisions, opinions, and rights in relation to family matters were considered. Common factor analysis (CFA) was used to identify patterns and commonalities mostly explained by certain variables. All three themes mostly defined by factors/questions were coded to represent a dichotomous variable (see detailed procedures explanation above and common factor analysis in chapter 4). A positive attitude towards women was coded “0” and “1” if they reported negative attitudes towards women. Attitudes towards condom use, six questions directed to only men were used. CFA was applied appropriately; all three themes mostly defined by factors/questions were coded to represent a dichotomous variable. A positive attitude towards condom use was coded “0” and “1” if they reported negative attitudes towards women. Finally, for negative attitudes/stigma, five questions were considered. CFA was also applied appropriately; all two themes were coded to represent a dichotomous variable. Positive attitudes/stigma was coded “0” and “1” if they reported negative attitudes/stigma.

Main Independent Variables

This study has ten main independent variables:

1. VCT variable seeks to know if an individual has ever been tested for HIV. This variable was coded “1” if an individual has ever been tested for HIV and “0” if otherwise.

2. HIV/AIDS knowledge, ten questions were used to determine if the respondents knew how HIV/AIDS was transmitted. CFA was used to identify patterns and reduce the number of these variables. This generated three themes that were mostly defined by factors/questions which were later coded to represent a dichotomous variable, a positive HIV/AIDS knowledge (sexually transmission behavior) was coded “1” and “0” if otherwise, a positive HIV/AIDS knowledge (mother to child transmission) was coded “1” and “0” if otherwise, and a positive HIV/AIDS knowledge (transmission beliefs) was coded “1” and “0” if otherwise.
3. Perceived risk of acquiring HIV, this variable seeks to find out what individuals think their chance of getting HIV/AIDS is. This variable was coded “0” if an individual thinks they have no risk at all, “1” for small risk, “2” for moderate risk, and “3” high risk. Those who have AIDS were considered as thinking of themselves to have high risk.
4. Domestic violence, eleven questions were used to determine the various forms of abuse women experienced in a marriage or in other relationships. CFA was used to identify patterns and reduce the number of these variables. This generated four themes that mostly defined physical abuse, physically abuse with a weapon, sexual abuse, and emotional abuse. These variables were later coded to represent a dichotomous variable. A detailed explanation on how these variables were generated is provided in the CFA section. A positive abuse (physical abuse) was coded “1” and “0” if otherwise, a positive abuse (physical abuse with a weapon) was coded “1” and “0” if otherwise, a positive abuse (sexual abuse) was coded “1” and “0” if otherwise, and a positive abuse (emotional abuse) was coded “1”

and “0” if otherwise. If a woman responded yes to either one question indicating abuse, then she was considered abused irrespective of the other questions outcome.

5. Cognitive involvement/awareness variable seeks to know if an individual has ever thought of or heard of issues related to HIV/AIDS, VCT, and STDs apart from AIDS. This variable was coded “1” if an individual has thought or heard of issues related to HIV/AIDS and “0” otherwise. Those who indicated don’t know were considered to have not thought of or heard issues related to HIV/AIDS. VCT was be coded “1” if an individual has thought or heard of issues related to VCT and “0” if otherwise. Likewise, STDs were be coded “1” if an individual has thought or heard of issues related to STDs and “0” if otherwise.
6. Consumption of alcohol variable seeks to find out how many days in the last month one consumed alcohol. Those individuals who consumed alcohol in the last month were coded as “1” and “0” if someone did not consume alcohol at all.
7. Regional differences: these are the eight provinces in Kenya. This variable was coded “0” if the province is Nairobi, “1” if the province is Central, “2” if the province is Coast, “3” if the province is Eastern, “4” if the province is Nyanza, “5” if the province is Rift Valley, “6” if the province is Western, and “7” if the province is North Eastern.
8. Wealth Index: this variable measures the socio-economic status of an individual. Wealth index was derived from total assets an individual/family owned indicative of sustaining a certain socio-economic status in the society. This variable was coded “0” if an individual is poorest, “1” if an individual is poorer, “2” if an

individual is middle, “3” if an individual is richer, and “4” if an individual is richest.

9. STD variable seeks to find out if an individual has had a STD, or showed symptoms related to STDs (genital discharge or ulcers). This variable was coded “1” if an individual has experienced STDs or symptoms of STDs and “0” if otherwise, and
10. Circumcision variable seeks to find out if individuals (women and men) are circumcised or not. For the purpose of the proposed study, data on circumcised men was analyzed because research has indicated the risks associated with circumcising women (Brady, 1999; Kun, 1997; Dorkenoo, 1999) and other moral and personal issues arise with this topic among women. This variable was coded “1” if an individual is uncircumcised and “0” otherwise. For a complete list of study variables coding and other covariates used to control for confounding, please see Table 2.

TABLE 2: Study variables and coding for analysis of high-risk sexual behavior, HIV testing and attitudes among Kenyans using KDHS-2003

Variable	Description	Type
<u>MAIN OUTCOME MEASURES</u>		
High-risk Sexual Behavior	Yes=1; No=0	Dichotomous
HIV Status	HIV positive=1; HIV negative=0	Dichotomous
<u>Attitudes:</u>		
Negative Attitudes/Stigma -HIV/AIDS -Sex Edu. Condoms	Yes=1; No=0	Dichotomous
Negative Attitudes Towards Women -Husband controlling attitudes -Women Sexual Attitudes- Husband -Husband Sexual Attitudes	Yes=1; No=0	Dichotomous
Negative Attitudes Towards Condom use among Men -Condom perception -Disease Protection -Sexual Pleasure	Yes=1; No=0	Dichotomous
Negative Attitudes Towards Condom Advertisement	Yes=1; No=0	Dichotomous
<u>PREDICTOR VARIABLES</u>		
Voluntary Counseling and Testing	Tested for HIV=0; Not tested for HIV=1	Dichotomous
HIV/AIDS knowledge -Sexual Transmission Behavior -Mother to Child Transmission -Transmission Beliefs	Not Knowledgeable=0; Knowledgeable=1	Dichotomous
Perceived Risk of Acquiring HIV	No risk at all=0; Small risk=1; Moderate risk=2; High risk=3	Categorical
Domestic Violence -Physical Abuse -Physical Abuse: Weapon -Sexual Abuse -Emotional Abuse	Abuse=1; No Abuse=0	Dichotomous
<u>Cognitive Involvement/Awareness:</u>		
Cognitive Involvement/Awareness about HIV/AIDS	Yes=1; No=0	Dichotomous
Cognitive Involvement/Awareness about VCT	Yes=1; No=0	Dichotomous
Cognitive Involvement/Awareness about STDs apart from AIDS	Yes=1; No=0	Dichotomous
Alcohol Consumption	Yes=1; No=0	Dichotomous

TABLE 2 (continued): Study variables and coding for analysis of high-risk sexual behavior, HIV testing and attitudes among Kenyans using KDHS-2003

Regions-Geographical/Provinces	Nairobi=0; Central=1; Coast=2; Eastern=3; Nyanza=4; Rift Valley=5; Western=6; North Eastern=7	Categorical
Wealth Index	Poorest=0; Poorer=1; Middle=2; Richer=3; Richest=4	Categorical
Sexually Transmitted Diseases	Has STD(s)=1; Does not have STD(s)=0	Dichotomous
Circumcision	Uncircumcised=1; Circumcised=0	Dichotomous
<u>COVARIATES</u>		
Age	Women: 15-19=0; 20-24=1; 25-29=2; 30-34=3; 35-39=4; 40-44=5; 45-49=6. Men: Include 50-54=7	Categorical
Sex (SEX) – Objective 5 Only	Male=0; Female=1	Dichotomous
Education	<Primary School=0; Primary School=1 Post Primary/Vocational/Secondary=2; College/University=3	Categorical
Ethnicity/Tribe	Kikuyu=0; Luhya=1; Luo=2; Kalenjin=3; Kamba=4; Kisii=5; Meru=6; Others=7	Categorical
Marital Status	Never Married=0; Currently Married=1; Formerly Married=2	Categorical
Religion	Protestants=0; Roman Catholic=1; Muslim=2; Other Religions=3	Categorical
Residence	Rural=1; Urban=0	Dichotomous
Occupation	Agricultural-Self Employment=0; Teaching and Management=1; Sales=2; Other Occupations=3; Not Working=4	Categorical
HIV Perceived Severity	High=1; Low=0	Dichotomous
Self-Efficacy	Not Present=1; Present=0	Dichotomous

Study Analysis Plan

Data analyses utilized Stata – statistical software package version 11 which is regarded to be highly appropriate due to its unique feature in accurate estimation of standard errors (SEs) when utilizing data collected through stratification and clusters, and

multiple weights procedure(s) (StataCorp, 2009). Pearson chi square goodness of fit and other diagnostic tests were conducted to see if the research models were good. Wald's statistics was used for statistical significance. Wald statistics was expected to follow a normal distribution with a mean of "0" and a variance of "1" when the sample is large (Hosmer & Lemeshow, 1989). STATA version 11 supports these tests when analyzing complex survey design, specifically in the estimation procedures which can be difficult when using other analytical software's to assess model fit in relation to complex survey design. These tests look at the maximum likelihood estimates to provide a good fit with the analytical model (Lehmann & Casella, 1998). The datasets to be used in this study are in three separate files (female, male and HIV datasets). For objective 5, these files were merged using the following three variables; cluster number, household number, and respondent's line number.

For descriptive statistics, sample size and frequencies are reported. For objectives 1, 2, and 4 among women; a total sample of 8,171 (99.7%) was retained for the analysis, for men this was 3,575 (99.9%) (see Figure 11a). For objective 3, research hypothesis 3.1 among women; negative attitudes/stigma towards HIV/AIDS a total sample of 8,036 (88.1%) was retained for the analysis, for men this was 3,532 (98.7%). For negative attitudes/stigma towards sex education in schools among women only, a total sample of 8,045 (98.2%) was retained for the analysis. Research hypothesis 3.2 among women; negative attitudes towards women: husband controlling attitudes a total sample of 8,179 (99.8%) was retained for the analysis, for men this was 3,568 (99.7%). For negative attitudes towards women: women sexual attitudes-husband among women only, a total sample of 8,173 (99.7%) was retained for the analysis, for men this was 3,552 (99.3%).

For negative attitudes towards women: husband sexual attitudes among men only, a total sample of 3,571 (99.8%) was retained for the analysis. Research hypothesis 3.3 among men; negative attitudes towards condoms (condom perception, disease protection, and sexual pleasure) a total sample of 3,565(99.6%), 3,571 (99.8%), and 3,573 (99.9%) respectively were retained for the analyses. Research hypothesis 3.4 among women; negative attitudes towards condom advertisement a total sample of 8,183 (99.9%) was retained for the analysis, for men this was 3,575 (99.9%). Lastly for objective 5 among women and men; HIV test results, a total sample 6,190 of those individuals who were offered and took a HIV test was retained in the analysis. Among women and men, a total sample of 3,273 (52.9%), and 2,917 (47.1%) respectively were retained for the main outcome measure (see Figure 11b).

Bivariate analysis was used to find the association between the independent variables and the main outcome measures of interest, sample size, and frequencies were reported (see Tables 4, 13-15, 20, 21, 26, 29 & 35). This analysis was initially used as an indicative tool as to whether the various predictors and covariates were to be considered as potential confounders in the final model based on the significance as measured by p-values . Furthermore, bivariate analysis reports Pearsons chi squares, design based F statistics, and p-values. Univariate analysis for logistic regression was also performed to obtain the unadjusted odds ratios (ORs), and 95% CIs for predictor variables with the main outcome measure, p-values are also be reported.

Multivariate logistic regression: while the conceptual framework, bivariate analysis, and univariate logistic regression analysis can give a quick idea on the various associations between variables, sometimes it can be difficult to select variables for

inclusion in the model or miss important variables altogether if only based on the p-values for these two procedures. Due to this dilemma, forward stepwise logistic regression for binary variables – with addition and removal was conducted. This procedure through STATA 11 software automatically identified which variables to include in the final model (all variables were included in the analysis for the different hypotheses). p_e – significance for any addition to the model was set at 0.15 [p-values < p_e (0.15)] and p_r – significance for any removal from the model was set at 0.20 [p-values > p_r (0.20)] with odds ratio specification (Hosmer & Lemeshow, 1989).

While forward stepwise variable selection procedure can be a quick way to identify variables to include in the final model, it was not considered as final due to the potential for noise with the method (Menard, 1995). Furthermore, other variable statistical procedures exist. Therefore, variable not selected and considered to be important were counterchecked using p-values with bivariate and univariate logistic regression analyses. If still no significance and considered the variable to be crucial, such a variable was added in the model as a confounder. With the variables selected for confounding, multivariate logistic regression was performed in order to identify independent predictors for the main outcome measure (Hosmer & Lemeshow, 1989). Multivariate logistic regression was possible because all main outcome measures for all the hypotheses in the first, second, third, fourth, and fifth objectives are binary variables. It is important to note that all results are based on estimates-fitted values and “svy” commands were used appropriately.

The analytical model used was:

$$\text{Logit} [\Pr (Y_x = 1)] = e^{(Z)} / 1 + e^{(Z)}$$

$$\text{Logit} [\Pr (Y_x = 1)] = e^{(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon)} / 1 + e^{(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon)}$$

where Y_x represents the outcome of interest for the five main outcome measures for having high-risk sexual behavior, negative attitudes/Stigma: HIV/AIDS, negative attitudes/Stigma: sex education about condoms (women), negative attitudes toward women: husband controlling attitudes, women sexual attitudes-husband, and husband sexual attitudes (men), negative attitudes toward condom use among men (condom perception, disease protection, and sexual pleasure), negative attitudes toward condom advertisement, or HIV test; [$Y_x = 1$] or otherwise (testing negative for HIV) [$Y_x = 0$]. X_1, X_2, \dots, X_k represents the different independent variables for each hypothesis, $\beta_0, \beta_1, \beta_2, \dots, \beta_k$ represent the corresponding regression coefficients to be estimated for each hypothesis, and ε represent the random error term that has a normal distribution with a mean that is zero [$E(\varepsilon | x) = 0$], standard deviations that are mutually independent and with the same (constant) variance/homoscedasticity [$\text{Var}(\varepsilon | x) = \sigma^2$] (Amemiya, 1985; Dupont, 2002; Johnson, 1998; Vittinghoff, Glidden, Shiboski, & McCulloch, 2005; Wooldridge, 2006).

Design based concept was used in this study to account for stratum where samples (collected by surveys) are clustered and primary sampling units (PSU) are identified. If dependence is not accounted for, standard errors will be affected (skewed); hence, influencing the significance levels and data analysis conclusions. Design based was considered to account for the complex nature of the 2003 Kenya Demographic and

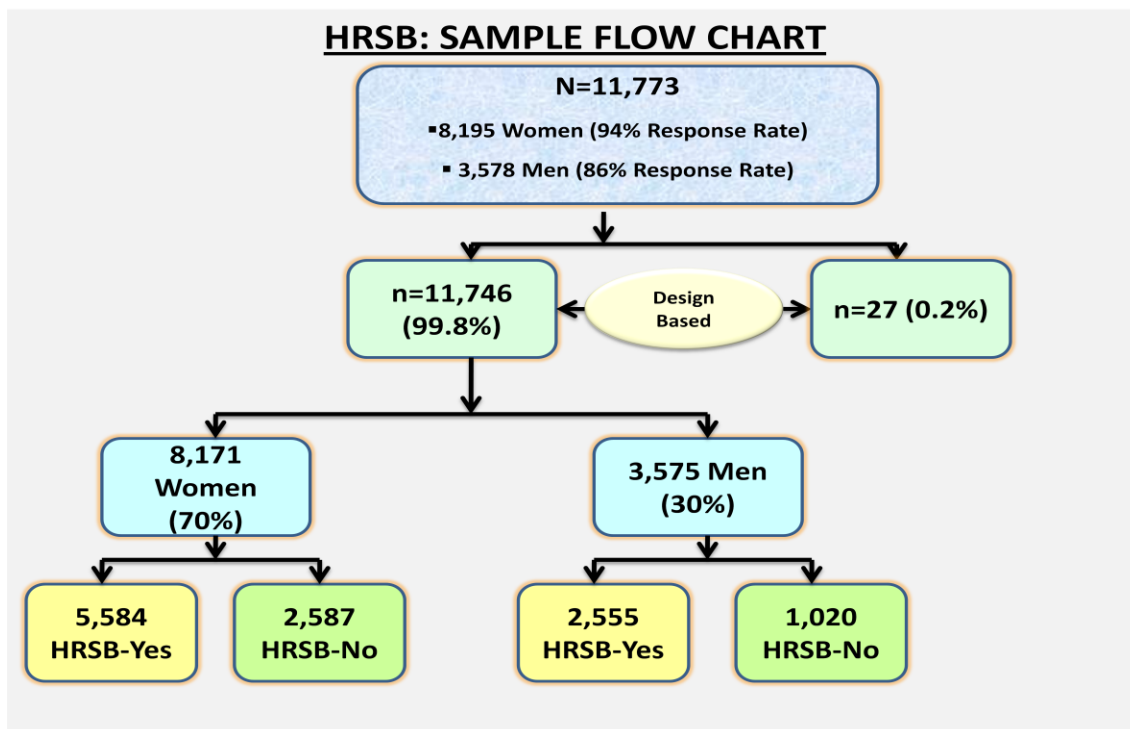


FIGURE 10a: High-risk sexual behavior flow chart

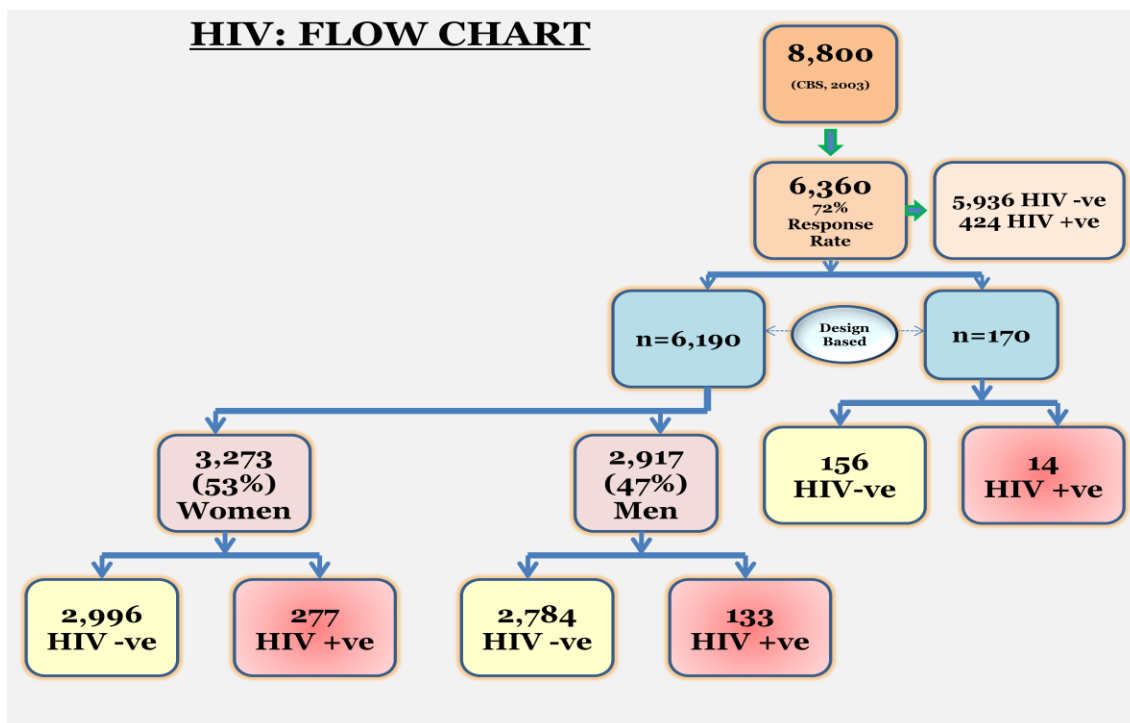


FIGURE 10b: HIV flow chart

Health Survey (KDHS-2003) to ensure accurate conclusions of the findings.

Furthermore, weighting was also used to account for over-sampling and under-sampling of certain regions. This reduced the sub-samples for high-risk sexual behavior by [n=27 (0.2%)] and HIV testing by [n=170 (2.67%) representing n=156 HIV negative and n=14 HIV positive individuals (see Figure 10a and 10b).

Confounding

The KDHS-2003 extensively covers and provides a rich source of information on demographic, economic, and social characteristics of individuals that was considered to control for confounding effect on the main outcome measure and predictor variables, these variables include education, age, residence, marital status, HIV perceived severity, occupation, religion, sex, ethnicity/tribe, education, and self-efficacy. For a complete list of confounders and effect modifier for each hypothesis please see appendix 1.

Common Factor Analysis Method

Since the dataset were derived from a complex survey design with many variables, CFA was used as a technique to identify patterns (similarities and differences) and reduce the number of variables (attitudes towards HIV/AIDS, attitudes towards condom use, attitudes towards women, HIV/AIDS knowledge, and abuse/domestic violence) i.e. reduce dimensionality while at the same time maintaining (with minimal loss) the needed information for final analysis by performing a covariance analysis (covariance matrix) between factors. These will give variables the same standard deviation with a variance of “1” and a mean of “0” (Johnson, 1998; Stevens, 1986). Furthermore, factor analysis can “identify new meaningful underlying variables”

(Johnson, 1998. p. 96). Factor analysis therefore gives a linear combination of optimally weighted observed variables (Johnson, 1998).

In this study, factor analysis was used to create two main explanatory/predictor variables (abuse/domestic violence, and HIV/AIDS knowledge) and three main outcome measure variables (negative attitudes towards/stigma towards HIV/AIDS, negative attitudes towards condom use among men, and negative attitudes towards women). Furthermore, scree plots were used to determine the number of factors to be loaded in the factor analysis. These factors corresponded with the point where the scree plot was almost flat, indicating that successive factors were contributing less to the total variance hence they were not included in the analysis. The retained factors were used for analysis; these factors mostly explained/measured a certain theme which was renamed for the same. For a complete list of questions utilizing factor analysis please see Appendix 2.

The retained factors were used to generate a dichotomous variable using the “if” command in STATA for the various questions for each factor. If an individual responded yes to one of the questions in each factor, then they were coded as yes “1” agreeing to a certain theme to have occurred and “0” if they responded no to all questions in each factor. The retained factors explained most of the total variance. Weights and correlations between each variable (factor loading) was determined at <0.3 (UCLA, n.d). Factor analysis helped to reduce the specific set of variable in the data set that was later used by the researchers to generate one variable that contained the information sought. The following defined areas were subjected to factor analysis: negative attitude towards HIV/AIDS, negative attitude towards condom use, negative attitude towards women, HIV/AIDS knowledge, and domestic violence.

Analysis Utilizing Survey Commands

Because the dataset to be utilized for the analysis in this study is of a complex survey design, a series of survey commands that have prefix “svy” were used; furthermore, STATA version 11 supports such commands (StataCorp, 2009). In order to use “svy” commands, the survey design variables in the KDHS-2003 were set using “svyset” command to account for weighting, cluster (PSU) and stratification in the dataset to be analyzed (Levy & Lemeshow, 1999; StataCorp, 2009). Univariate logistic regression analysis was used to explore unadjusted association between the main outcome measures and individual predictors and covariates variables. Multivariate logistic regression analysis was also used to explore the association between main outcome measures, individual predictors and covariates variables, other “svy” commands were used appropriately.

Accounting for Complex Survey Design

Since the KDHS-2003 used a complex design with two-stage clustered sampling. It is imperative to consider such a design in the survey analysis so as to generate representative population estimates. Under-sampling (North Eastern Province) and over-sampling (Urban areas) might lead to sampling errors, hence calling for weighting in order to account for cluster selection probability differentials that can affect the point estimates and standard errors [$SE^{\wedge}(\beta_1^{\wedge})$] (Hosmer & Lemeshow, 1989). Furthermore, since KDHS-2003 design used stratum and PSUs, it is possible that the SEs are going to be large (over estimation). For this reason, the data is going to be weighted for the stratum and the cluster (PSU) in order for the findings to be representative (unbiased - false positive) of all males’ aged 15-54 years and females’ aged 15-49 years in the

country. Performing this procedure also prevents serious underestimation of the SEs. However, before conducting the above described analytical procedures; and the mere fact that the KDHS-2003 reported SEs whole (no adjustments)-therefore the sampling weights initially were divided by 1,000,000 as recommended by the Demographic and Health Survey-MEASURE/ DHS + program (DHS, n.d).

Power and Sample Size

The dataset is from a complex survey that utilized cross-sectional design. Information for exposure and outcome came from the participants that the survey was administered to [n=11,773 (3,578 males and 8,195 females)] and informed by other studies where such information does not exist. The survey used was from the KDHS-2003 which is the latest survey to be administered in Kenya. Previous surveys were administered during the periods of 1989, 1993, and 1998. There are 15 hypotheses in this study; the main outcome measures were of more importance to the study, other information to calculate statistical sample and power analysis was sought and/or informed through available literature. Being knowledgeable about HIV/AIDS (dichotomous variable- not knowledgeable/low, and knowledgeable/high) is used here as proxy for objectives 1, 2, and 4 since it can explain high-risk sexual behavior appropriately. In this analysis, high and low is used i.e. those individuals who are more knowledgeable about HIV/AIDS as the “unexposed” and those individuals who are less knowledgeable about HIV/AIDS as the “exposed”. Less knowledgeable is used here arbitrary since it is expected that all individuals in the dataset (15-54 years) have heard and know something about HIV/AIDS considering the high prevalence of HIV in Kenya

(7.2%). Since there is high HIV/AIDS knowledge among Kenyans (Stoskopf, 2003; CBS, 2004), the ratio of exposed to unexposed individuals was set at 1:9.

Jackson et al. (1997) used an intervention of HIV serological testing, individual counseling, condom promotion, STD diagnosis and management among truck drivers in Kenya who are high-risk individuals in contracting HIV/AIDS from paying for sex. They found a decreased rate of men reporting any extramarital sex during the 3-month period prior to a follow-up from 49% to 36%. Since awareness on HIV/AIDS for both women (98%) and men (99%) is very high (CBS, 2004) the same rate was assumed for women as well. Therefore the expected frequency of disease in the unexposed group (prevalence on high-risk sexual behavior among more knowledgeable individuals about HIV/AIDS who paid for sex) was 36% (0.36). Using Epi InfoTM software, in order to detect a relative risk ratio of 3.38 with 80% power and 95% confidence interval, a total 11,753 subjects were needed for the study in relation to high-risk sexual behaviors.

Objective 3: Negative attitudes stigma continue to be a major part in the African culture, especially as it relates to HIV/AIDS (Hamra et al., 2005). Using Hamra et al. (2005) DichotStigma Scale, on average 31.4% of individuals indicated to have stigma/negative attitudes towards those infected with HIV/AIDS. Therefore, those individuals with less stigma/negative attitudes were considered to be the unexposed group and those with high stigma/negative attitudes were the exposed. Hence, the ratio of exposed to unexposed individuals to stigma/negative attitudes was 0.31:0.69. The expected disease among the unexposed was estimated to be 20% (0.2). Therefore, using Epi InfoTM software, in order to detect a relative risk ratio of 2.90 with 80% power and

95% confidence interval, a total 11,722 subjects were needed for the study in relation to negative attitudes/stigma.

Objective 5: HIV test results, HIV/AIDS prevalence in Kenya is 7.2%. Therefore, the ratio of exposed to unexposed individuals to HIV/AIDS is 0.07:0.93. The average incidence rates in Kenya (all transmission modes) were 12/100/years (Gouws, White, Stover, & Brown, 2006). Therefore, the expected disease among the unexposed was estimated to be very low 1% (0.01). Therefore, using Epi InfoTM software, in order to detect a relative risk ratio of 10.12 with 80% power and 95% confidence interval, a total 6,343 subjects were needed for the study in relation to HIV test results.

CHAPTER 4: RESULTS

Common factor, descriptive, bivariate, univariate logistic regression, and multivariate logistic regression analyses and data/statistics are presented in this chapter.

Common Factor Analysis

Negative Attitude/Stigma towards HIV/AIDS

To generate factors for attitudes towards HIV/AIDS (for both men and women) i.e. those that were more important in determining factors dimensionality, factor analysis (iterated principal factor) was applied. This retained five questions that mostly measured/explained negative attitude/stigma towards individuals who have HIV/AIDS-factor 1 for men and women and only one question that mostly measured/explained negative attitude/stigma towards sex education involving condom use-factor 2 for women. For men, question 1, 3, and 4 are retained since they defined factor 1 and for women, questions 1, 3, and 4 are retained as well indicating a higher negative attitude/stigma towards individuals who have HIV/AIDS. For both men and women, the first factor had a variance of 1.12 and 1.16 respectively. Furthermore, for men factor 1 accounted for 100% of the total variance for the five questions and for women factor 1 accounted for 86% of the total variance for the five questions.

There were no significant differences in negative attitudes/stigma towards HIV/AIDS among men and women. However, among men buying fresh vegetables from a vendor who has AIDS and allowing a female teacher who has AIDS to continue teaching in school contributed most to negative attitudes/stigma towards HIV/AIDS with

a factor loading of 0.71 and 0.59 respectively. For women, allowing a female teacher has AIDS to continue teaching in school and buying fresh vegetables from a vendor who has AIDS contributed most to negative attitudes towards HIV/AIDS with a factor loading of 0.68 and 0.65 respectively (see Appendix 3: A-1).

Negative Attitude towards Condom Use

For attitudes towards condom use among men, five questions were retained that measured/explained attitude towards condom use (condom perception-factor 1, disease protection-factor 2, and sexual pleasure-factor 9. The retained questions 2, 4, 5, and 6 defined factor 1 the most indicating a higher negative attitude towards condom use-condom perception, question 3 defined factor 2 the most indicating a higher negative attitude towards condom use-disease protection, and question 1 defined factor 3 the most indicating a higher negative attitude towards condom use-sexual pleasure. The first factor had a variance of 1.30 and accounted for 51% of the total variance for the six questions. Among men, question three – condom protect against disease contributed most to negative attitudes towards condom use followed by question two – it's okay to re-use a condom if you wash it with a factor loading of 0.78 and 0.61 respectively (see Appendix 3: A-2).

Negative Attitude towards Women

Attitudes towards women among men and women, fourteen questions were retained that mostly measured/explained attitude towards women among men and ten questions were retained that mostly measured/explained attitude towards women among women. For men and women, question 1-5 are retained since they defined husband controlling attitudes-factor 1, questions 6-10 are retained as well for men and women

indicating a higher negative attitude towards women (women sexual attitudes-husband; factor 3 for men and factor 2 for women). For both men and women, the first factor had a variance of 2.04 and 2.15 respectively. Also, for both men and women factor 1 accounted for 42% and 54% respectively of the total variance for the fourteen questions - men and ten questions-women.

There was a significant difference in factor loadings for men and women for three questions – if wife is justified in refusing to have sex with her husband if she is tired and not in the mood 0.35 and 0.46 respectively, she has recently given birth 0.51 and 0.68 respectively, and she knows her husband has sex with other women 0.52 and 0.70 respectively. This indicates that these three factors are important contributors to negative attitudes towards women among men. Furthermore, among men wife neglecting children and arguing with him contributed most to negative attitudes towards women with a factor loading of 0.70 and 0.70 respectively. For women, if wife argues with her husband and neglecting children contributed most to negative attitudes towards women with a factor loading of 0.74 and 0.706 respectively (see Appendix 3: A-3).

HIV/AIDS Knowledge

Analyzing HIV/AIDS knowledge among men and women, ten questions were retained that mostly measured/explained knowledge associated with HIV/AIDS among men and women. Question 2 and 4 were retained for men and women since they defined HIV/AIDS knowledge: transmission behavior-factor 1. Question 8 and 9 were retained for men and women since they defined HIV/AIDS knowledge: mother to child transmission-factor 2, and question 1 and 3 were retained for women and question 1 was retained for men since they defined HIV/AIDS transmission beliefs.

For both men and women, factor 1 had a variance of 0.64 and 0.63 respectively. Also, for both men and women factor 1 accounted for 39% and 42% of the total variance for the ten questions respectively. There was a significant difference in factor loadings for men and women for question nine – if the virus that causes AIDS can be transmitted from mother to child during breastfeeding 0.32 and 0.61 respectively. This indicates that this factor is an important contributor to HIV/AIDS knowledge among women. Furthermore, among women - can the virus that causes AIDS can be transmitted from mother to child during delivery contributed most to HIV/AIDS knowledge: mother to child with a factor loading of 0.56 and 0.31 respectively. For men, can people reduce their chance of getting AIDS virus by having just one sex partner who has no other partner contributed most to HIV/AIDS knowledge: transmission beliefs with a factor loading of 0.53 and 0.32 respectively (see Appendix 3: B-1).

Domestic Violence

Domestic violence among women, eleven questions were retained that mostly measured/explained domestic violence. Questions 1, 2-6 defined factor 1 the most indicating domestic violence/abuse against women: physical abuse. Questions 6-9 defined factor 2 the most indicating domestic violence/abuse against women: physical abuse with a weapon. Questions 1 and 2 defined factor 3 the most indicating domestic violence/abuse against women: emotional abuse. Questions 10 and 11 defined factor 4 the most indicating domestic violence/abuse against women: sexual abuse. The first factor had a variance of 1.97 and accounted for 38% of the total variance for the eleven questions. For factor 1, question five (punch you with his fist or with something that could hurt you) and question three (push you, shake you, or throw something at you)

contributed most to domestic abuse: physical abuse with a factor loading of 0.69 and 0.62 respectively. For factor 2, question eight (threaten you with a knife, gun, or other type of weapon) contributed most to domestic abuse: physical abuse-weapon with a factor loading of 0.69. For factor 3, question two (threaten you or someone close to you with harm) contributed most to domestic abuse: emotional abuse with a factor loading of 0.66. For factor 4, question ten (physically force you to perform other sexual acts you did not want to) contributed most to domestic abuse: sexual abuse with a factor loading of 0.71 (see Appendix 3: C-1).

Descriptive Statistics

In the Kenya Demographic and Health Survey, a sample of 11,746 [8,171 women (70%) and 3,575 men (30%)] were retained for high-risk sexual behavior and used in the analyses to address objectives 1, 2, and 4 (see Figure 11a). For objective 3, research hypothesis 3.1 a sample of 8,036 (69%) women and 3,532 (31%) men was used for negative attitudes/stigma towards HIV/AIDS. A sample of 8,045 was used for negative attitudes/stigma towards sex education in schools, this was only among women. Research hypothesis 3.2 a sample of 8,179 (70%) women and 3,568 (30%) men was used for negative attitudes towards women: husband controlling attitudes. A sample of 8,173 (70%) women was used for negative attitudes towards women: women sexual attitudes-husband among women only, for men this was 3,552 (30%). A sample of 3,571 was used for negative attitudes towards women: husband sexual attitudes, this was only among men. For research hypothesis 3.3 negative attitudes towards condoms, a sample of 3,565 was retained for condom perception, 3,571 for disease protection, and 3,573 for sexual pleasure among men only. For research hypothesis 3.4 a sample of 8,183 (70%) among

women and 3,575 (30%) among men was used for negative attitudes towards condom advertisement. Furthermore, a sample of 6,190 [3,273 women (53%) and 2,917men (47%)] was retained for analyses to address objective 5 (see Figure 11b).

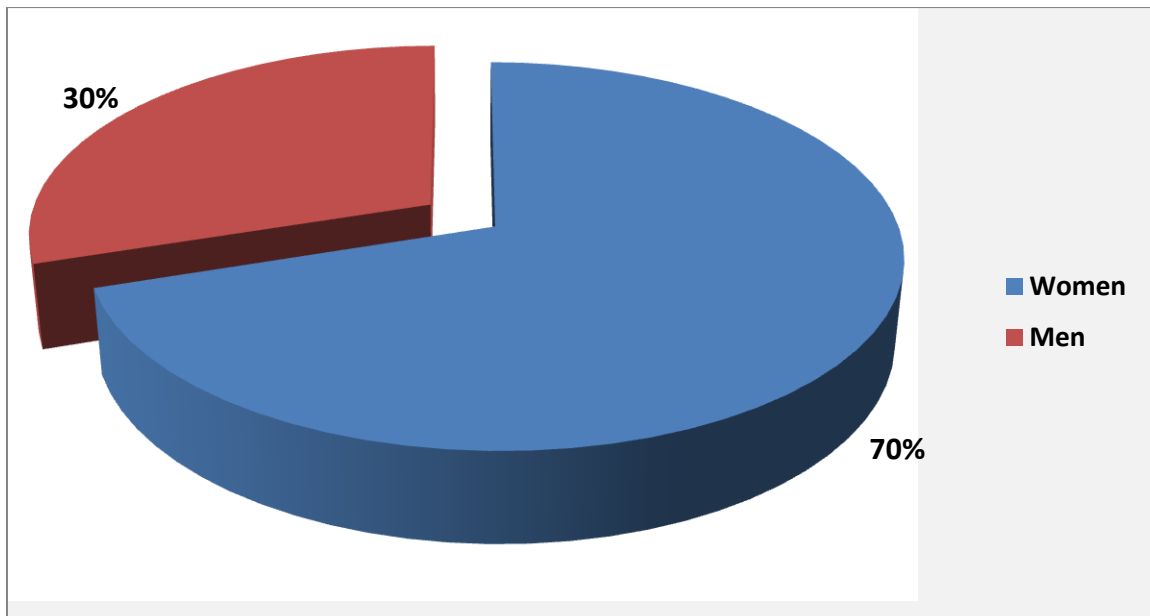


FIGURE 11a: Percentage of respondents sex, N=11,746-KDHS-2003

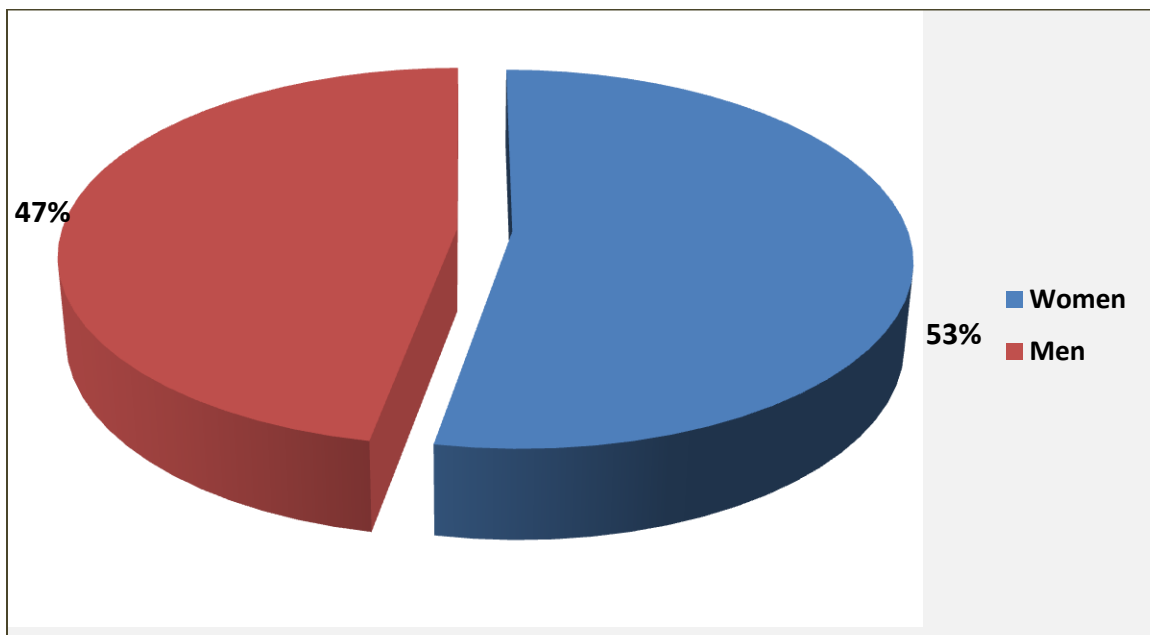


FIGURE 11b: Percentage of respondents sex, N=6,190-KDHS-2003

The descriptive statistics presented is for objective 1, 2, 3, and 4. Of the total sample in the KDHS-2003, 8,195 women (61%) were aged between 15-29 years. Among men (n=3,578), 57% were aged between 15-29 years. 69% of women and 72% of men indicated to have practiced high-risk behaviors related to sex (see Figure 12).

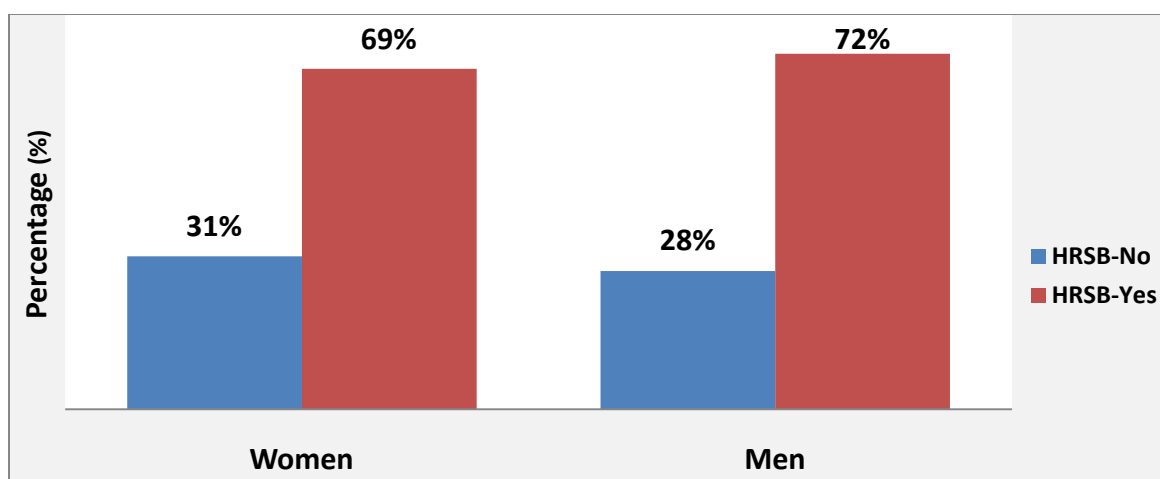


FIGURE 12: Percentage of high-risk sexual behavior among women and men, KDHS-2003

Voluntary counseling and testing (VCT), only 15% of women and 16% of men were tested for HIV despite the fact that 49% of women and 62% of men were aware of VCT. The difference in wealth across the five categories was not pronounced among women and men. This ranged from 17% for those who were poorest to 26% for those who were richest among women, among men this was 15% to 28% respectively. Men seemed to be well educated at higher levels of schooling than women, there were 13% of women who had less than a primary education, 56% who had at least a primary education, 25% who had a post primary/vocational/secondary education, and 6% who had a college or university education compared to 6%, 55%, 29%, and 10% of men respectively.

Marital status, 30% of women indicated that they had never married before, 60% currently married, and 10% formerly married compared to 45%, 51%, and 4% of men respectively. Sixteen percent of men indicated that they were uncircumcised compared to 84% of those who were circumcised. Among women, majority of the respondent's religion was Protestant (65%), followed by Roman Catholic (25%), Muslim (8%), and other religions (2%). Among men this was 60%, 27%, 6%, and 7% respectively. Among those who consumed alcohol, majority were men (30%) compared to 5% women. For residence, equal number of women and men resided in urban and rural areas (25% and 75%) respectively.

Both women and men had higher HIV/AIDS knowledge in relation to sexual transmission behavior (94% and 96%) respectively, mother to child transmission (93% and 91%) respectively, transmission beliefs (90% and 93%) respectively. However, 83% of men and 95% of women did not use a condom (see Table 41). Domestic abuse was reported among women with 43% of women reporting physical abuse, 41% physical abuse with a weapon, 16% sexual abuse, and 25% emotional abuse.

Negative attitudes/Stigma towards HIV/AIDS, 58% of women and 50% of men harbored such attitudes on the disease and those infected. This was 41% for sex education on condoms among women only. Negative attitudes towards women, 68% of women and 63% of men held such attitudes in relation to husband controlling attitudes. This was 57% for among women and 51% among men for women sexual attitudes-husband, and 39% among men for husband sexual attitudes. Negative attitudes towards condoms, 69% of men held negative attitudes in relation to condom perception and 79% for sexual pleasure. However, these negative attitudes were minimal for disease

protection (22%). 37% of women and 30% of men had negative attitudes towards condom advertisement. 99% of women and 99% of men indicated to have cognitive involvement/awareness about HIV/AIDS. This was 80% among women and 88% among men for sexually transmitted diseases respectively. Sexually transmitted disease (STD(s), only 3% of men and 4% of women indicated to have contracted or shown signs of a STD(s). Refer to Table 4 for hypotheses 1, 2, 3, and 4 descriptive data.

The descriptive statistics presented is for objective 5. Of the total sample in the KDHS-2003, of the 6,190 retained samples, 53% were women and 47% were men. These were those women and men who were offered an HIV test and accepted to taking the test. 9% of women and 5% of men who were tested for HIV tested positive, with a combined HIV prevalence of 7% (see Figure 13). 3% of women and men indicated to have contracted or shown signs of a STD(s). Seventeen percent of men indicated that they were uncircumcised.

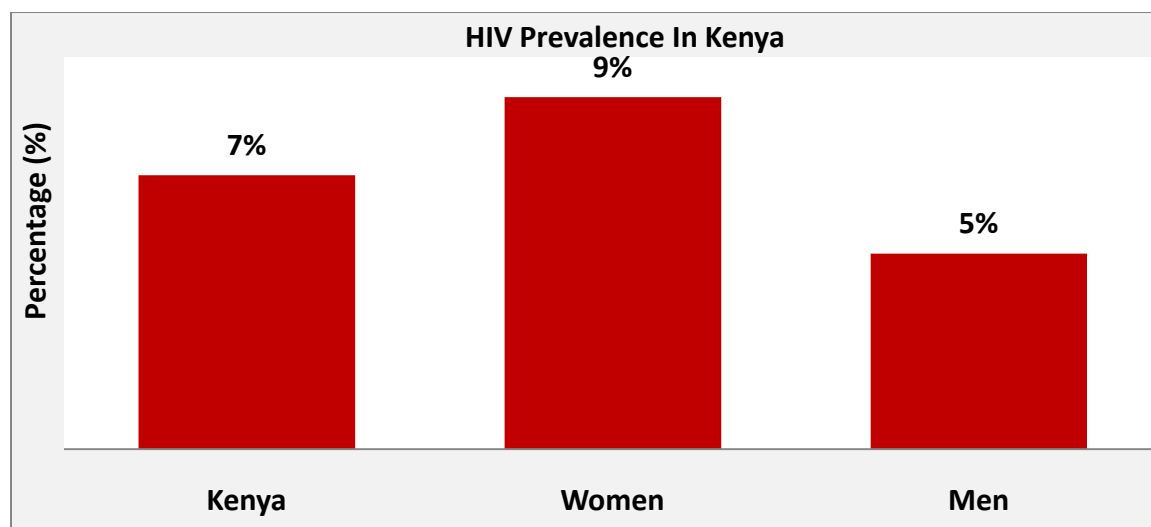


FIGURE 13: Percentage of HIV test results among women and men, objective 5, KDHS-2003

Among those individuals who were tested for HIV, majority of them indicated to have minimal risk of acquiring HIV. Among women, 35% thought they had no risk, 40% small risk, 16% moderate risk, and 9% high risk compared to men, 35% no risk, 50% small risk, 10% moderate risk, and 5% high risk respectively.

Domestic abuse was reported among women with 45% of women reporting physical abuse, 14% physical abuse with a weapon, 16% sexual abuse, and 26% emotional abuse. Differences in wealth status across the five categories were not pronounced among women and men. For women 17% were poorest, 19% poor, 20% middle, 21% richer, and 23% were richest. For men, this was 16%, 18%, 19%, 22%, and 25% respectively. Marital status, 29% of women indicated that they had never married before, 60% currently married, and 11% formerly married compared to 45%, 51%, and 4% of men respectively. Religion, majority of women respondent's religion was Protestant (67%), followed by Roman Catholic (25%), Muslim (6%), and other religions (2%). Among men this was 61%, 27%, 6%, and 6% respectively. Voluntary counseling and testing (VCT), only 14% of women and 15% of men were tested for HIV.

Majority of the respondents also indicated to have minimal risk of acquiring HIV, 35% of women indicated that they thought they had no risk, 40% small risk, 16% moderate risk, and 9% high risk compared to men, 35% no risk, 50% small risk, 10% moderate risk, and 5% high risk respectively. Of the total women and men who took an HIV test, 60% and 57% were aged between 15-29 years respectively. First sexual debut, 16% of women indicated that they have never had sex, 27% experienced first sexual debut between age 08-15 years, 39% experienced first sexual debut between age 16-21 years, 4% experienced first sexual debut between age 22-40 years, and 14% indicated

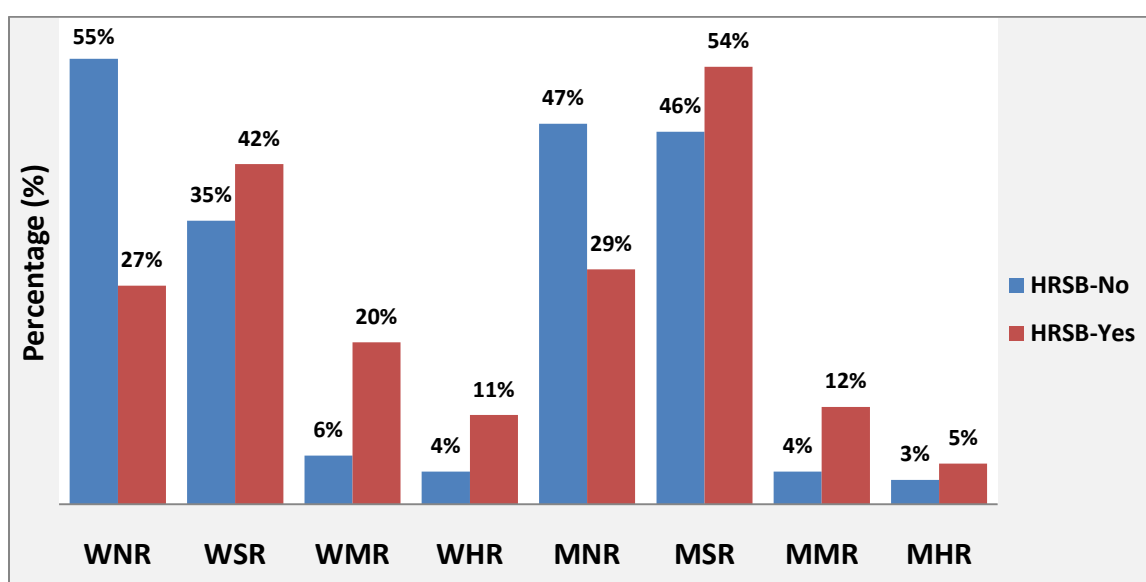
that they had their first sexual debut at union/marriage. Among men, this was 15%, 41%, 38%, 4%, and 2% respectively (see Table 35).

Bivariate Analyses

Statistics for bivariate analysis involved the main outcome measure and individual exposures (independent variables)-objective 1, 2, and 4. The main exposures that were significant for high-risk sexual behavior included: 1) Voluntary counseling and testing, 17% of women and 18% of men were tested for HIV, $p<0.001$; 2) HIV/AIDS knowledge on sexual transmission behavior, 94% of women and 97% of men were knowledgeable about HIV/AIDS transmission behaviors, $p<0.001$; 3) HIV/AIDS knowledge on mother to child transmission among women, 94% of women were knowledgeable about mother to child transmission, $p<0.001$; 4) Perceived risk of acquiring HIV, 27% of women indicated that they perceived themselves to have no risk at all of acquiring HIV compared to 11% of those who said they were at high-risk of acquiring HIV. Among men 29% indicated that they perceived themselves to have no risk at all of acquiring HIV compared to 5% of those who said they were at high-risk of acquiring HIV, $p<0.001$ (see Figure 14); 5) Domestic violence, 38% of women who indicated that they were physical abuse with a weapon, $p<0.001$, 16% indicated that they were sexually abused, $p=0.058$, and 24% of women indicated that they were emotionally abused, $p<0.01$; 6) Cognitive involvement/awareness (HIV/AIDS, VCT, STDs), 99% of women and 99% of men indicated to be aware of HIV/AIDS, $p<0.001$, 48% of women $p=0.069$ and 65% of men indicated to be aware of VCT, $p<0.001$, furthermore, 84% of women and 94% of men indicated to be aware of STD(s), $p<0.001$; and 7) Wealth, 17% of women indicated that they were poorest compared to 25% of those who were richest, $p<0.001$, among men

15% indicated that they were poorest compared to 30% of those who were richest, $p < 0.001$.

Other variables that were statistically significant included age, education, province, STD(s), occupation, religion (men), circumcision (men), self-efficacy, $p < 0.001$, residence, women, $p < 0.05$ and men, $p < 0.01$, HIV/AIDS perceived severity, women, $p < 0.05$, ethnic, women, $p < 0.001$ and men, $p < 0.05$, and alcohol consumption, women, $p < 0.01$, and men, $p < 0.001$ (see Table 5).



Key: WNR-Women no risk, WSR-Women small risk, WMR-Women moderate risk, WHR-Women high risk, MNR-Men no risk, MSR-Men small risk, MMR-Men moderate risk, MHR-Men high risk

FIGURE 14: Percentage of high-risk sexual behavior (HRSB) and perceived risk of acquiring HIV among women and men, KDHS-2003

For objective 3, the main outcome measures were negative attitude/stigma (HIV/AIDS among women and men, and sex education on condom use among women), negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband, and husband sexual attitudes), negative attitudes toward condoms among men (condom perception, disease protection, and sexual pleasure), and negative

attitudes toward condom advertisement. The main factors associated with negative attitude/stigma towards HIV/AIDS among women and men were alcohol consumption, 6% of women in urban areas, $p < 0.01$ and 30% of men in the urban areas, $p < 0.05$ (see Tables 14 and 15). Other variables that were statistically significant for urban and rural regions among women included, ethnicity, occupation, VCT, religion and perceived risk of acquiring HIV, $p < 0.001$, age, urban- $p < 0.01$, rural- $p < 0.001$, wealth, urban- $p < 0.01$, rural- $p < 0.001$. For men, the following were statistically significant, education, ethnicity, wealth, age, urban- $p < 0.05$, rural- $p < 0.001$, occupation, rural- $p < 0.001$, VCT, urban- $p < 0.01$, rural- $p < 0.001$, religion, urban- $p < 0.001$, rural- $p < 0.05$, and perceived risk of acquiring HIV, rural- $p < 0.01$.

For negative attitude/stigma towards sex education on condom use among women were alcohol consumption, 6% of women in urban areas, $p < 0.05$. Other variables that were statistically significant for urban and rural regions among women included, education, ethnicity, VCT, religion, perceived risk of acquiring HIV, $p < 0.001$, age, rural- $p < 0.001$, wealth, urban- $p < 0.001$, occupation, urban- $p < 0.01$, rural- $p < 0.001$, and marital status, rural- $p < 0.01$ (see Table 16).

Alcohol was not a significant predictor for negative attitude towards women for husband controlling attitudes, and women sexual attitudes-husband among women. However, the following factors were significant for husband controlling attitudes, and women sexual attitudes-husband, education, wealth, residence, ethnicity, province, $p < 0.001$. For husband controlling attitudes, there were several significant factors-religion, $p < 0.001$, STD(s), $p < 0.01$, VCT, $p < 0.001$, and for women sexual attitudes-husband, age, $p < 0.001$, religion, $p < 0.01$, and VCT, $p < 0.01$ (see Table 21).

For men, alcohol was significant main exposure for husband controlling attitudes, women sexual attitudes-husband, and husband sexual attitudes. 31% of men indicated to have negative attitude towards women for husband controlling attitudes, $p < 0.05$, 27% of men indicated to have negative attitude towards women for women sexual attitudes-husband, $p < 0.001$, and 33% of men indicated to have negative attitude towards women for husband sexual attitudes, $p < 0.01$. Other variables that were statistically significant included for the three main outcome variables were education, wealth, ethnicity, province, and occupation, $p < 0.001$. Significant variables for husband controlling attitudes and women sexual attitudes toward their husbands included, age, religion, and residence, $p < 0.001$. For husband controlling attitudes, VCT was significant at, $p < 0.001$, for husband controlling attitudes-husband, VCT was significant at, $p < 0.01$, and for husband sexual attitudes, residence was significant at, $p < 0.05$, and VCT, $p = 0.053$ (see Table 22).

For negative attitudes toward condoms among men, there was statistical significant between the eight administrative areas (province) and condom perception, disease protection, and sexual pleasure, 8% of men were from Nairobi, 15% of men were from Central, 14% of men were from Nyanza, and only 3% of men were from North Eastern, $p < 0.001$. 2) Disease protection, 8% of men were from Nairobi, 21% of men were from Central, 11% of men were from Nyanza, and only 7% of men were from North Eastern, $p < 0.001$. 3) Sexual pleasure, 10% of men were from Nairobi, 16% of men were from Central, 14% of men were from Nyanza, and only 2% of men were from North Eastern, $p < 0.001$.

Other variables that were statistically significant for condom perception included, age, education, occupation, wealth, ethnicity, perceived risk of acquiring HIV, residence, VCT, $p < 0.001$, and religion, $p < 0.01$. For disease protection, age, education, occupation, wealth, ethnicity, perceived risk of acquiring HIV, residence, religion, $p < 0.001$, marital status, $p < 0.01$, residence, $p < 0.05$, and VCT, $p < 0.05$. For sexual pleasure, age, education, religion, $p < 0.001$, occupation, $p < 0.01$, wealth, $p < 0.01$, perceived risk of acquiring HIV, $p < 0.01$, residence, $p < 0.05$, and VCT, $p = 0.076$ (see Table 27).

There was statistical significant between the eight administrative areas (province) and negative attitudes toward condom advertisement, 8% of women were from Nairobi, 17% of were from Central, 11% of were from Nyanza, and 5% were from North Eastern, $p < 0.001$. Among men, 10% of were from Nairobi, 18% of were from Central, 12% of were from Nyanza, and 6% were from North Eastern, $p < 0.001$. Other variables that were statistically significant for condom advertisement among women and men included, age, marital status, occupation, education, wealth, perceived risk of acquiring HIV, religion, VCT, ethnicity, residence among women, $p < 0.001$, and residence among men, $p < 0.01$ (see Table 30).

For objective 5, the main outcome measure was HIV test results. The main exposures that were significant: 1) STD(s), 8% of women, $p < 0.01$, and 9% of men had an STD(s), $p < 0.001$; 2) Circumcision, 48% of men were uncircumcised, $p < 0.001$ (see Figure 15); 3) Domestic violence, 20% of women who indicated that they were physically abused with a weapon, $p = 0.063$, and 35% of women indicated that they were emotionally abused, $p < 0.05$.

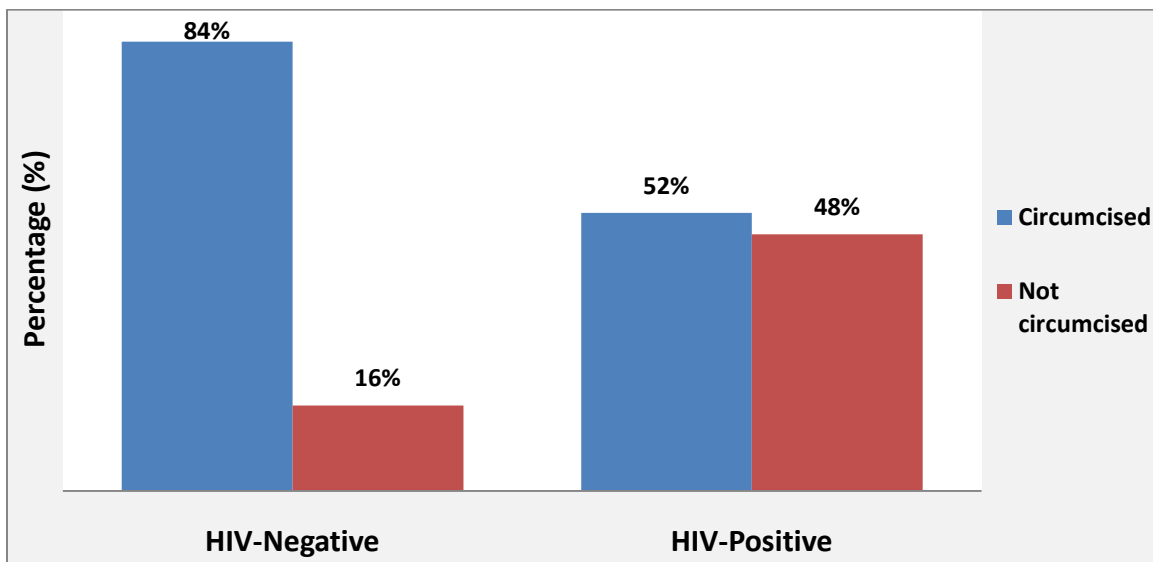
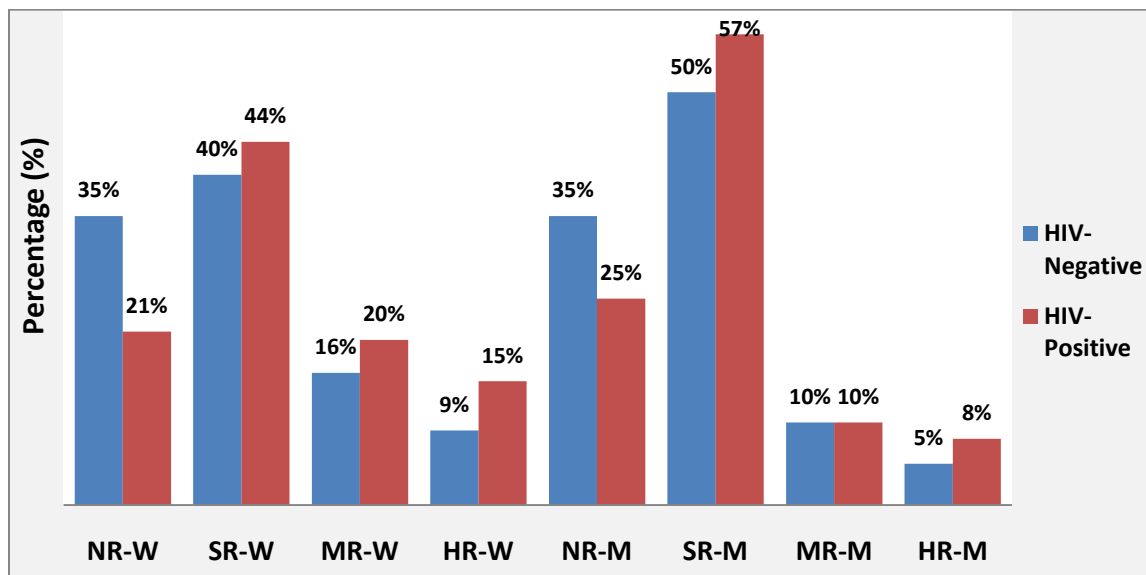


FIGURE 15: Percentage of HIV test results and circumcision among men, KDHS-2003

Perceived risk of acquiring HIV, 21% of women indicated that they perceived themselves to have no risk at all of acquiring HIV compared to 15% of those who said they were at high-risk of acquiring HIV, $p < 0.001$. Among men, 25% indicated that they perceived themselves to have no risk at all of acquiring HIV compared to 8% of those who said they were at high-risk of acquiring HIV, $p = 0.083$ (see Figure 16). Wealth, 8% of women indicated that they were poorest compared to 32% of those who were richest, $p < 0.001$, among men 15% indicated that they were poorest compared to 40% of those who were richest, $p < 0.05$. VCT, 80% of women were not tested for HIV, $p < 0.001$, compared to 76% of men, $p < 0.05$. Administrative areas (provinces), 11% of women were from Nairobi, 12% of men were from Central, 33% of men were from Nyanza, and 0% of men were from North Eastern. Among men, 15% of women were from Nairobi, 6% of men were from Central, 41% of men were from Nyanza, and 0% of men were from North Eastern, $p < 0.001$.



Key: NR-No risk, SR-Small risk, MR-Moderate risk, HR-High risk | W-Women, M-Men

FIGURE 16: Percentage of HIV test results and perceived risk of acquiring HIV among women and men, KDHS-2003

For marriage, 16% of women had never been married, 55% were married, and 29% were formerly married, among men 15% had never been married, 75% were married, and 10% were formerly married $p < 0.001$. First sexual debut, 3% of women have never had sex, 41% experienced first sexual debut between age 08-15 years, 46% experienced first sexual debut between age 16-21 years, 2% experienced first sexual debut between age 22-40 years, and 8% indicated that they had their first sexual debut at union/marriage. Among men, 3% of men have never had sex, 45% experienced first sexual debut between age 08-15 years, 49% experienced first sexual debut between age 16-21 years, 2% experienced first sexual debut between age 22-40 years, and 1% indicated that they had their first sexual debut at union/marriage. Residence, 70% of women resided in the rural region, $p < 0.01$, compared to 64% of men, $p < 0.001$ (see Table 36).

Univariate and Multivariate Logistic Regression Analyses

Research Objective 1: Hypothesis 1.1

For this analysis, the hypothesis tested stated that participation in voluntary counseling and testing for HIV/AIDS is negatively associated with high-risk sexual behavior. There was a counterintuitive association between high-risk sexual behavior and voluntary counseling and testing, hence the hypothesis was not supported by the KDHS-2003. Before any adjustment for confounding, however, women who have been tested for HIV were 1.69 times more likely to have practiced high-risk sexual behavior compared to those who were not tested for HIV (95% Confidence Interval [CI]: 1.47-1.97, $p < 0.001$). Similar findings were observed for men (OR=2.08, 95% CI: 1.64-2.63, $p < 0.001$) (see Table 6).

After adjusting for confounding, similar findings were observed with a slight reduction in the odds of practicing high-risk sexual behavior among both women and men. Women who have been tested for HIV were 1.51 times more likely to have practiced high-risk sexual behavior compared to those who were not tested for HIV (95% CI: 1.24-1.82, $p < 0.001$). On the other hand, men who have been tested for HIV were 1.33 times more likely to have practiced high-risk sexual behavior compared to those who were not tested for HIV (95% CI: 0.96-1.85, $p = 0.087$) (see Table 7).

Research Objective 1: Hypothesis 1.2

For this analysis, the hypothesis tested stated that being more knowledgeable about HIV/AIDS is negatively associated with high-risk sexual behavior. There was a counterintuitive association between high-risk sexual behavior and HIV/AIDS knowledge on sexual transmission behavior, and mother to child transmission. In the univariate

analysis (unadjusted results), HIV/AIDS knowledge on sexual transmission behavior, knowledgeable women were 1.71 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable (95% CI: 1.35-2.16, $p < 0.001$). Similar findings were observed for men (OR=2.87, 95% CI: 1.91-4.32, $p < 0.001$). HIV/AIDS knowledge on mother to child transmission, knowledgeable women were 1.48 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable (95% CI: 1.20-1.83, $p < 0.001$). For men, measures for HIV/AIDS knowledge on mother to child transmission, and women and men HIV/AIDS knowledge on transmission beliefs indicated a positive association with high-risk sexual behavior. However, there was no statistical significance (see Table 6).

After adjusting for confounding, knowledgeable women on sexual behavior were 1.29 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable on sexual behavior (95% CI: 0.96-1.72, $p = 0.087$). Knowledgeable women on mother to child transmission were 1.49 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable on mother to child transmission (95% CI: 1.16-1.92, $p < 0.01$). In addition, knowledgeable women on transmission beliefs were 1.28 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable on transmission beliefs (95% CI: 1.03-1.59, $p < 0.05$) (see Table 8).

For men, after adjusting for confounding only HIV/AIDS knowledge sexual behavior on transmission was significant, they were 1.76 times more likely to have practiced high-risk sexual behavior compared to those who were not knowledgeable on sexual behavior on transmission (95% CI: 1.01-3.06, $p < 0.05$). However, measures

HIV/AIDS knowledge on mother to child transmission, and HIV/AIDS knowledge on transmission beliefs indicated a positive association with high-risk sexual behavior despite lack of statistical significance (see Table 9).

Research Objective 1: Hypothesis 1.3

For this analysis, the hypothesis tested stated that higher perceived risk of acquiring HIV is negatively related with high-risk sexual behavior. Counterintuitive association between high-risk sexual behavior and perceived risk of acquiring HIV was also observed. However, there was a positive association between perceived risk of acquiring HIV and high-risk sexual behavior among women and men. While the association was positive, it declined with increasing perception of risk. In the univariate analysis, women who perceived themselves to have a small risk of acquiring HIV were 2.43 times more likely to have practiced high-risk sexual behavior compared to those who perceived themselves to have no risk at all of acquiring HIV (95% CI: 2.16-2.72, $p < 0.001$). In addition, women who perceived themselves to have a moderate risk of acquiring HIV were 2.48 times more likely to have practiced high-risk sexual behavior compared to those who perceived themselves to have no risk at all of acquiring HIV (95% CI: 2.21-2.77, $p < 0.001$). Furthermore, women who perceived themselves to have a high risk of acquiring HIV were 1.74 times more likely to have practiced high-risk sexual behavior compared to those who perceived themselves to have no risk at all of acquiring HIV (95% CI: 1.60-1.89, $p < 0.001$). For men, small risk was (OR=1.91, 95% CI: 1.59-2.31, $p < 0.001$), moderate risk was (OR=2.22, 95% CI: 1.83-2.70, $p < 0.001$), and high-risk was (OR=1.47, 95% CI: 1.25-1.74, $p < 0.001$) respectively (see Table 6).

After adjusting for confounding, similar associations were observed with a slight attenuation of the odds ratios for women only. Women who perceived themselves to have a small risk of acquiring HIV were 2.08 times (95% CI: 1.72-2.51, $p < 0.001$), moderate risk of acquiring HIV were 2.07 times (95% CI: 1.75-2.45, $p < 0.001$), and high-risk of acquiring HIV were 1.48 times (95% CI: 1.27-1.73, $p < 0.001$) more likely to have practiced high-risk sexual behavior compared to those who perceived themselves to have no risk at all of acquiring HIV. For men, small risk was (OR=2.90, 95% CI: 2.08-4.03, $p < 0.001$), moderate risk was (OR=2.58, 95% CI: 1.90-3.52, $p < 0.001$), and high-risk was (OR=1.66, 95% CI: 1.31-2.09, $p < 0.001$) respectively (see Table 10). These findings suggest that majority of Kenyans are underestimating their risk of contracting HIV.

Research Objective 1: Hypothesis 1.4

For this analysis, the hypothesis tested stated that women who have experienced domestic violence will be more likely to engage in high-risk sexual behavior. Findings did not support hypothesis 1.4. However, there was statistical significance between high-risk sexual behavior among women and physical abuse with a weapon, sexual abuse, and emotional abuse. There was no significant association between high-risk sexual behaviors and abuse. In the univariate analysis, those women who experienced physical abuse with a weapon were at 31% lower odds of high-risk sexual behavior (95% CI: 0.62-0.77, $p < 0.001$), compared to those who did not experience abuse with a weapon. Those women who experienced sexual abuse were at 28% lower odds (95% CI: 0.51-1.01, $p = 0.058$), and emotional abuse were at 33% lower odds (95% CI: 0.52-0.87, $p < 0.01$) of high-risk sexual behavior compared to those who did not experience sexual or emotional abuse respectively (see Table 6).

After adjusting for confounding, women who experienced physical abuse were at 28% lower odds of high-risk sexual behavior (95% CI: 0.54-0.97, $p < 0.05$), compared to those who did not experience physical abuse. Those women who experienced physical abuse with a weapon were at 18% lower odds (95% CI: 0.72-0.93, $p < 0.01$), sexual abuse were at 40% lower odds (95% CI: 0.42-0.85, $p < 0.01$), and emotional abuse were at 34% lower odds (95% CI: 0.50-0.87, $p < 0.01$) of high-risk sexual behavior compared to those who did not experience physical abuse with a weapon, sexual abuse, and emotional abuse respectively (see Table 11).

Research Objective 2: Hypothesis 2.1, 2.2, and 2.3

For this analysis, the three hypotheses tested stated that higher cognitive involvement/awareness about HIV/AIDS will be negatively related to high-risk sexual behavior; higher cognitive involvement/awareness about voluntary counseling and testing for HIV/AIDS will be negatively related to high-risk sexual behavior; and higher cognitive involvement/awareness about sexually transmitted diseases apart from HIV/AIDS will be negatively related to high-risk sexual behavior. Before adjusting for confounding, women who were mentally involved/aware of voluntary counseling and testing for HIV were at 11% lower odds of practicing high-risk sexual behaviors, (95% CI: 0.79-1.01, $p = 0.069$) compared to those who were not mentally involved/aware of voluntary counseling and testing for HIV. However, there was a counterintuitive association between high-risk sexual behavior and cognitive involvement/awareness for HIV/AIDS and STD(s), and voluntary counseling and testing among men.

Women involved/aware of voluntary counseling and testing for HIV/AIDS were 2.44 times more likely to have practiced high-risk sexual behavior compared to those who were not mentally involved/aware of voluntary counseling and testing for HIV/AIDS (95% CI: 1.64-3.63, $p < 0.001$). Likewise men who were mentally involved/aware of voluntary counseling and testing for HIV/AIDS were 5.27 times more likely to have practiced high-risk sexual behavior compared to those who were not mentally involved/aware of voluntary counseling and testing for HIV/AIDS (95% CI: 2.36-11.75, $p < 0.001$). For men who were mentally involved/aware of voluntary counseling and testing for HIV/AIDS, this was (OR=1.53, 95% CI: 1.29-1.82, $p < 0.001$). In addition, women involved/aware of sexually transmitted disease were 2.16 times more likely to have practiced high-risk sexual behavior compared to those who were not mentally involved/aware of sexually transmitted disease (95% CI: 1.86-2.52, $p < 0.001$). For men who were mentally involved/aware of sexually transmitted disease, this was (OR=5.47, 95% CI: 4.41-6.78, $p < 0.001$) (see Table 6).

After adjusting for confounding, counterintuitive results were also reported. However, there was significant attenuation in the odds ratios. Mentally involved/aware women on HIV/AIDS were 1.50 times more likely to practice high-risk sexual behaviors, (95% CI: 0.94-2.40, $p = 0.091$) compared to those who were not mentally involved/aware of HIV/AIDS. Women mentally involved/aware of sexually transmitted disease were 1.59 times more likely to have practiced high-risk sexual behavior compared to those who were not mentally involved/aware of sexually transmitted disease (95% CI: 1.29-1.96, $p < 0.001$). For mental involvement/awareness of voluntary counseling and testing

on HIV, measures for high-risk sexual behavior indicated a positive association; however, there was no statistical significance (see Table 12).

Among men, those involved/aware mentally on HIV/AIDS were 3.32 times more likely to engage in high-risk sexual behaviors, (95% CI: 1.18-9.40, $p < 0.05$) compared to those who were not involved/aware mentally on HIV/AIDS. Men who were mentally involved/aware of voluntary counseling and testing were 1.33 times more likely to have practiced high-risk sexual behavior (95% CI: 1.01-1.75, $p < 0.05$) compared to those who were not mentally involved/aware of sexually transmitted disease. In addition, those who were mentally involved/aware of sexually transmitted disease were 1.75 times more likely to have practiced high-risk sexual behavior (95% CI: 1.26-2.42, $p < 0.001$) compared to those who were not mentally involved/aware of sexually transmitted disease (see Table 13).

Research Objective 3: Hypothesis 3.1

For this analysis, the hypothesis tested stated that increased consumption of alcohol is positively related to negative attitudes/stigma toward HIV/AIDS. Hypothesis 3.1 was not supported by the KDHS-2003. However, in the univariate analysis (unadjusted results) women residing in the urban areas and who consumed alcohol were at 39% lower odds of harboring negative attitude/stigma towards HIV/AIDS, (95% CI: 0.43-0.87, $p < 0.01$) compared to those who did not consume alcohol. Among women who resided in the rural areas, measures for alcohol consumption indicated a positive association with negative attitudes/stigma for HIV/AIDS despite their being no statistical significance. Furthermore, women who consumed alcohol and resided in the urban areas were at 44% lower odds of harboring negative attitude/stigma towards sex education on

condoms at school, (95% CI: 0.35-0.90, $p < 0.05$) compared to those who did not consume alcohol (see Table 17).

After adjusting for confounding, women who consumed alcohol and resided in the urban areas were at 36% lower odds of harboring negative attitude/stigma towards sex education on condoms at school, (95% CI: 0.39-1.05, $p = 0.079$) compared to those who did not consume alcohol). After adjusting for confounding, there was no observed statistical significance between negative attitudes/stigma towards HIV/AIDS (urban and rural areas) and sex education on condoms (rural areas) (see Table 18).

Among men, those who resided in the urban areas and who consumed alcohol were at 30% lower odds of harboring negative attitude/stigma towards HIV/AIDS, (95% CI: 0.50-0.97, $p < 0.05$) compared to those who did not consume alcohol. However, measures for alcohol consumption among men in rural areas showed a positive association with negative attitudes/stigma for HIV/AIDS, no statistical significance was attained (see Table 19).

After adjusting for confounding, men who resided in the rural areas and who consumed alcohol were 1.31 times more likely to harbor negative attitude/stigma towards HIV/AIDS, (95% CI: 1.05-1.63, $p < 0.05$) compared to those who did not consume alcohol at all. For men who resided in urban areas, measures for alcohol consumption indicated a positive association with negative attitudes/stigma for HIV/AIDS with no statistical significance being attained (see Table 20).

Research Objective 3: Hypothesis 3.2

For this analysis, the hypothesis tested stated that increased consumption of alcohol is positively related to negative attitudes toward women. In the unadjusted

results, hypothesis 3.2 was not supported by the KDHS-2003. However, among women measures for alcohol consumption indicated a positive association with negative attitude towards women (women sexual attitudes in relation to men). No statistical significance was reached (OR=1.01, 95% CI: 0.80-1.27) (see Table 23). After adjusting for confounding, hypothesis 3.2 was not supported by KDHS-2003. However, among women measures for alcohol consumption indicated a positive association with negative attitude towards women (husband controlling attitudes and women sexual attitudes in relation to men/husband). No statistical significance was reached (OR=1.14, 95% CI: 0.87-1.48) and (OR=1.06, 95% CI: 0.84-1.32) respectively (see Table 24).

In the unadjusted results for the association between negative attitudes towards women, men who consumed alcohol were 1.21 times (95% CI: 1.03-1.43, $p<0.05$), and 1.29 times (95% CI: 1.09-1.52, $p<0.01$) more likely to harbor negative attitudes towards women (husband controlling attitudes and husband sexual attitudes) compared to those who did not consume alcohol respectively. However, men who consumed alcohol were at 24% lower odds of negative attitudes towards women (women sexual attitudes in relation to men/husband) (95% CI: 0.65-0.88, $p<0.001$), compared to those who did not consume alcohol (see Table 25).

After adjusting for confounding, men who consumed alcohol were 1.68 times (95% CI: 1.39-2.04, $p<0.001$) more likely to harbor negative attitudes towards women (husband controlling attitudes) compared to those who did not consume alcohol. Furthermore, they were also 1.42 times (95% CI: 1.19-1.69, $p<0.001$) more likely to harbor negative attitudes towards women (husband sexual attitudes) compared to those who did not consume alcohol. There was no association between alcohol among men

and negative attitudes towards women (women sexual attitudes in relation to men/husband) (see Table 26).

Research Objective 3: Hypothesis 3.3

For this analysis, the hypothesis tested stated that there are regional differences in negative attitudes toward condom use among men. There was a significant association between measures for men's province and negative attitudes towards condom use (condom perception, disease protection, and sexual pleasure). Unadjusted results indicated that men from Central province were 2.08 times (95% CI: 1.43-3.01, $p < 0.001$), Coast 1.38 times (95% CI: 1.11-1.73, $p < 0.01$), Eastern 1.71 times (95% CI: 1.49-1.96, $p < 0.001$), Nyanza 1.22 times (95% CI: 1.11-1.35, $p < 0.001$), Rift Valley 1.20 times (95% CI: 1.11-1.30, $p < 0.001$), and North Eastern 1.70 times (95% CI: 1.47-1.96, $p < 0.001$) more likely to harbor negative attitudes towards condom use-condom perception compared to those who were from Nairobi province. For negative attitudes toward condom use-disease protection, men from Central were 2.16 times (95% CI: 1.38-3.37, $p < 0.001$), Eastern 1.20 times (95% CI: 1.02-1.40, $p < 0.05$), and North Eastern 1.59 times (95% CI: 1.46-1.72, $p < 0.001$). Finally men, who harbored negative attitudes towards condom use-sexual pleasure, Central were 1.55 times (95% CI: 1.07-2.25, $p < 0.05$), Coast 1.73 times (95% CI: 1.73-2.19, $p < 0.001$), Eastern 1.20 times (95% CI: 1.06-1.35, $p < 0.01$), Western 1.07 times (95% CI: 1.01-1.13, $p < 0.05$), and North Eastern 1.39 times (95% CI: 1.20-1.59, $p < 0.001$) respectively (see Table 28).

After adjusting for confounding, there was attenuation in the odds ratio. However, men from Central province were 1.61 times (95% CI: 0.97-2.67, $p = 0.066$), Eastern province were 1.37 times (95% CI: 1.15-1.64, $p < 0.001$), Rift Valley province

were 1.13 times (95% CI: 1.04-1.22, $p<0.01$), and North Eastern 1.25 times (95% CI: 1.08-1.45, $p<0.01$) more likely to harbor negative attitudes towards condom use-condom perception compared to those who were from Nairobi province. Men who harbored negative attitudes towards condom use-disease protection and from Central were 2.24 times (95% CI: 1.29-3.89, $p<0.01$), and North Eastern 1.12 times (95% CI: 1.00-1.27, $p=0.056$). Lastly, men for Coast 1.41 times (95% CI: 1.06-1.88, $p<0.05$) more likely to harbor negative attitudes towards condom use-sexual pleasure compared to those who were from Nairobi province. Furthermore, measures for province indicated a positive association with negative attitudes towards condom use [(Nyanza-condom perception), (Eastern and Rift Valley-disease protection), and (Central, Eastern, Western, and North Eastern-sexual pleasure)]. However, neither had reached a statistical significance (see Table 29).

Research Objective 3: Hypothesis 3.4

For this analysis, the hypothesis tested stated that there are regional differences in negative attitudes toward condom advertisement. In the univariate analysis (unadjusted results), women from Central province were 2.14 times (95% CI: 1.66-2.76, $p<0.001$), Coast 1.27 times (95% CI: 1.08-1.49, $p<0.01$), Eastern 1.17 times (95% CI: 1.07-1.28, $p<0.001$), Rift Valley 1.11 times (95% CI: 1.04-1.19, $p<0.01$), and North Eastern 1.80 times (95% CI: 1.68-1.94, $p<0.001$) more likely to harbor negative attitudes towards condom advertisement compared to those who were from Nairobi province (see Table 31).

After adjusting for confounding, women from Central province were 1.36 times (95% CI: 1.00-1.84, $p<0.05$), and North Eastern 1.40 times (95% CI: 1.26-1.55, $p<0.001$)

more likely to harbor negative attitudes towards condom advertisement compared to those who were from Nairobi province. In addition, women from Coast were at 18% lower odds of negative attitude towards condom advertisement (95% CI: 0.66-1.01, $p=0.06$) compared to those from Nairobi province. Furthermore, among women from the Rift Valley, measures for province indicated a positive association with negative attitudes towards condom advertisement with no statistical significance being attained (see Table 32).

Among men, univariate analysis indicated that those from Central province were 1.61 times (95% CI: 1.13-2.28, $p<0.01$), Eastern 1.13 times (95% CI: 0.99-1.29, $p=0.064$), and North Eastern 2.03 times (95% CI: 1.78-2.30, $p<0.001$) more likely to harbor negative attitudes towards condom advertisement compared to those who were from Nairobi province. Also, among men from Nyanza, Rift Valley, and Western, measures for province indicated a positive association with negative attitudes towards condom advertisement although there was no statistical significance being attained (see Table 31).

After adjusting for confounding, men from Coast were at 33% lower odds of negative attitude towards condom advertisement (95% CI: 0.52-0.86, $p<0.05$) compared to those from Nairobi province. Those who were from North Eastern were 1.62 times (95% CI: 1.40-1.88, $p<0.001$) more likely to have negative attitudes towards condom advertisement compared to those who were from Nairobi province. Also, men from Eastern, Nyanza, and Western measures for province indicated a positive association with negative attitudes towards condom advertisement. However, there was no statistical significance being attained (see Table 32).

Research Objective 4: Hypothesis 4.1

For this analysis, the hypothesis tested stated that wealth index of an individual will be positively related to high-risk sexual behavior. In the univariate analysis (unadjusted results) richer women were at 6% lower odds of high-risk sexual behavior (95% CI: 0.88-1.01, $p=0.078$), wealthiest women were at 6% lower odds of high-risk sexual behavior (95% CI: 0.89-0.99, $p<0.05$), compared to those who were poorest respectively. On the other hand, poorer men were at 14% lower odds of high-risk sexual behavior (95% CI: 0.76-0.98, $p<0.05$), compared to those who were poorest. However, richest men were 1.08 times more likely to have practiced high-risk sexual behavior compared to those who were poorest (95% CI: 1.00-1.15, $p<0.05$) (see Table 6).

After adjusting for confounding, richest women were at 9% lower odds of high-risk sexual behavior (95% CI: 0.85-0.98, $p<0.05$) compared to those who were poorest respectively. For men, two measure of wealth (richer and richest) indicated a positive association with high-risk sexual behavior, however, none attained any statistical significance (see Tables 33 and 34).

Research Objective 5: Hypothesis 5.1

For this analysis, the hypothesis tested stated that men and women who have had an STD(s) (last 12 months) are more likely to test positive for HIV. In the unadjusted results for the association between HIV test results and STD(s) women who tested positive for/or showed symptoms of an STD(s) were 2.65 times more likely to test positive for HIV compared to those who did not test positive for/or indicated any symptoms of an STD(s) (95% CI: 1.40-5.02, $p<0.01$). Among men, those who tested positive for/or showed symptoms of an STD(s) were 3.95 times more likely to test

positive for HIV compared to those who did not test positive for/or indicated any symptoms of an STD(s) (95% CI: 2.01-7.73, $p < 0.001$) (see Table 41). After adjusting for confounding, STD(s) the odds for women increased while those of men decreased by almost two folds, (OR=3.05, 95% CI: 1.34-6.96, $p < 0.01$) and (OR=2.01, 95% CI: 0.92-4.40, $p = 0.082$) (see Table 38).

Research Objective 5: Hypothesis 5.2

For this analysis, the hypothesis tested stated that women who have experienced domestic violence are more likely to test positive for HIV. In the unadjusted results, the findings for women who were physically abused did not reach statistical significance. However, the measures for HIV test result indicated a positive association with physical abuse. Women who experienced physical abuse with a weapon were 1.54 times more likely to test positive for HIV compared to those who did not experience physical abused with a weapon (95% CI: 0.97-2.44, $p = 0.064$). Those who experienced emotional abused were 1.63 times more likely to test positive for HIV compared to those women who did not experience emotional abuse (95% CI: 1.08-2.47, $p < 0.05$) (see Table 37).

After adjusting for confounding, there was no statistical significance for physical abuse and emotional abuse; however, there was a positive association with the measures for HIV test result. Those women who experienced physical abuse with a weapon were 1.69 times more likely to test positive for HIV compared to those women who did not experience physical abuse with a weapon (95% CI: 1.00-2.86, $p < 0.05$) (see Table 39).

Research Objective 5: Hypothesis 5.3

For this analysis, the hypothesis tested stated that uncircumcised men are more likely to test positive for HIV. Circumcision among men, unadjusted results for the

association between HIV test results and circumcision indicated that uncircumcised men were 4.92 times more likely to test positive for HIV compared to those who were circumcised (95% CI: 3.20-7.54, $p < 0.001$) (see Table 37). After adjusting for confounding, uncircumcised men were 4.23 times more likely to have tested positive for HIV compared to those who were circumcised (95% CI: 2.51-7.13, $p < 0.001$) (see Table 40).

See Table 3 for a complete summary of main associations.

CHAPTER 5: DISCUSSION AND CONCLUSION

In this chapter, the researcher discusses the overall concept of the research, the major findings of the study, policy implications and recommendations related to the findings, strengths and limitations, recommendations for future research, and a concluding statement.

Research on high-risk sexual behaviors and psychosocial elements such as attitudes and/or stigma and HIV/AIDS cognition has been limited in the era when medical cure for HIV/AIDS continues to be elusive after several decades and millions of dollars have been invested towards the cure worldwide. Also, previous research has only looked at specific risk behaviors such as condom use, multiple sexual partners and prostitution (Glynn et al., 2001; Halperin & Epstein, 2004; Mali, Hunter, Maggwa, & Tukei, 1995; Ngugi et al., 1996; Simonse et al., 1990). In this study high-risk sexual behavior was constructed from three variables (prostitution, lack of condom use, and multiple sexual partners). We also did not find any study that has used the KDHS-2003 HIV dataset in determining the associations with STDs, domestic violence, and circumcision. Previous studies, especially those studying circumcision, have been randomized control studies in nature targeting specific populations/locations (Bailey et al., 2007; Foglia et al., 2007; Mehta et al., 2009). Until there is a cure for HIV/AIDS, public health care providers and academicians will need to continue addressing behaviors that contribute to the spread of the disease.

HIV/AIDS in Africa has been driven mostly by individual behaviors, rigid cultures, lack of education on how to protect oneself, and to some extent healthcare system mistakes. To understand the transmission of HIV and implement effective programs to counter the disease pandemic, it is very crucial to understand the psychosocial elements involved in order to link individual behaviors with appropriate interventions. The researcher seeks to address these issues by examining the predictors for high-risk sexual behaviors, negative attitudes and/or stigma, and HIV test. Furthermore, the researcher controlled for various social and demographic variables.

This study utilized the Theory of Reasoned Action and Planned Behavior, Health Belief Model, and Information-Motivation-Behavioral Skill Model because of the rich constructs from each model that can explain the various psychosocial elements involved in this study. All of the aforementioned theories help academics better understand why individuals behave the way they do and the various motivators involved in such behaviors as it relates to high-risk sexual behaviors. Individual perceptions of the consequences related to condition/disease in terms of susceptibility, consequences, its severity, beliefs and attitudes towards a behaviors, behavioral intentions, and motivation to partake or avoid a behavioral intention. These variables relate well with the various underlying psychosocial elements under this study and subsequent behavior changes. The researcher further seeks to examine the risk factors for high-risk sexual behavior, negative attitudes and/or stigma, and HIV testing among Kenyans.

The current study proposed the following hypotheses:

RH_{1.1}: That participation in voluntary counseling and testing for HIV/AIDS is negatively associated with high-risk sexual behavior

RH_{1.2}: That being more knowledgeable about HIV/AIDS is negatively associated with high-risk sexual behavior

RH_{1.3}: That higher perceived risk of acquiring HIV is negatively related with high-risk sexual behavior

RH_{1.4}: That woman who have experienced domestic violence will be more likely to engage in high-risk sexual behavior

RH_{2.1}: That higher cognitive involvement/awareness about HIV/AIDS will be negatively related to high-risk sexual behavior

RH_{2.2}: That higher cognitive involvement/awareness about voluntary counseling and testing for HIV/AIDS will be negatively related to high-risk sexual behavior

RH_{2.3}: That higher cognitive involvement/awareness about sexually transmitted diseases apart from HIV/AIDS will be negatively related to high-risk sexual behavior

RH_{3.1}: Increased consumption of alcohol is positively related to negative attitudes/stigma toward HIV/AIDS

RH_{3.2}: That increased consumption of alcohol is positively related to negative attitudes toward women

RH_{3.3}: That there are regional differences in negative attitudes toward condom use among men

RH_{3.4}: That there are regional differences in negative attitudes toward condom advertisement

RH_{4.1}: That wealth index of an individual will be positively related to high-risk sexual behavior

RH_{5.1}: That men and women who have had an STD(s) (last 12 months) are more likely to test positive for HIV

RH_{5.2}: That women who have experienced domestic violence are more likely to test positive for HIV, and

RH_{5.3}: That uncircumcised men are more likely to test positive for HIV.

To test the hypotheses, the researcher used data from The Demographic Health Survey (KDHS-2003) which is a cross-sectional survey. This survey is the fourth to be conducted in Kenya. It is a nationally representative household survey that collects data on population, health and nutrition domains. Because of its national representation, it allows for generalization of the findings to entire population. DHS has several data files generated from the main household survey for various analyses purposes. To test the various proposed hypotheses, we used multivariate logistic regression models. This was possible because all main outcome measures were dichotomous. Furthermore, a multivariate analysis (common factor analysis) was used extensively in identifying variability and covariance among variables to identify those variables that are closely related/common factors. The common factors explained/measured a certain theme, hence coded appropriately.

In Kenya, among people who participated in the survey, 69% of women and 72% of men had high-risk sexual behaviors. Furthermore, among those who had high-risk sexual behaviors only 17% of women and 18% of men had been tested for HIV. Moreover, approximately 90% of women and men had HIV/AIDS knowledge in relation to STDs, mother to child transmission and transmission beliefs; 43% of women had experienced physical abuse, 38% had experienced physical abuse with a weapon, 16% of

had experienced sexual abuse and 24% of had experienced emotional abuse, the results also show increased cognition/awareness among respondents, because 98% of women and men were aware of HIV/AIDS, 48% of women and 65% of men were aware of VCT and over 80% of women and men were aware of STDs. Also, majority of women and men in Kenya were on the higher scale of the wealth index – richer (20% and 22%) or richest (25% and 30%) respectively.

Notable differences were observed among women and men who consumed alcohol. Among those who consumed alcohol, 6% of women and 30% of men who resided in urban areas and 5% of women and 28% of men who resided in rural areas had negative attitudes/stigma towards HIV/AIDS. Five percent and 4% of women who resided in urban and rural areas respectively had negative attitudes/stigma for sex education about condoms. Furthermore, only 5% of women had negative attitudes in relation to husband control, and women sexual attitudes about their husbands. This was notably different from those of men which were 31% and 27% respectively, and 33% for husband sexual attitudes.

Men from Rift Valley and Eastern province had the highest negative attitudes towards condom use. 25%, 21%, and 22% of men from Rift Valley and 20%, 19%, and 17% of men from Eastern provinces had negative attitudes towards condom use in relation to perceptions, disease protection, and sexual pleasure respectively. This scenario was observed for negative attitudes towards condom advertisement among women and men. 24% of women and 21% of men from Rift Valley and 17% of women and 18% of men from Eastern provinces had negative attitudes toward condom advertisement.

For the analysis that involved HIV test, HIV prevalence was found to be 9% among women and 5% among men. Among the participants who tested positive for HIV/AIDS, 17% of men were uncircumcised and 3% of women and men indicated to have had or portrayed symptoms of STDs; among women, 45% indicated to have experienced physical abuse, 14% experienced physical abuse with a weapon, 16% experienced sexual abuse and 26% experienced emotional abuse.

These findings indicate the extent of high-risk sexual behaviors and various negative attitudes as it relates to high-risk behaviors. Despite this, a persistent HIV/AIDS pandemic situation continues to exist in Kenya. Because of this, the findings should be taken into consideration when planning various programs to combat/fight HIV/AIDS. Overall fifteen hypotheses were proposed, of which some counterintuitive associations were reported. However, these unexpected results provide some insight into what might have been assumed of certain behaviors from various groups based on HIV testing, HIV/AIDS knowledge, perception of acquiring HIV, domestic violence, cognitive and involvement/awareness.

Summary of the Main Findings

Effect of VCT on High-Risk Sexual Behavior

In 2003, VCT was low among women (15%) and men (16%). Furthermore, the majority of respondents practiced high-risk sexual behavior with women at 69% and men at 72%. Among those who were tested for HIV, only 17% of women and 18% of men had high-risk sexual behaviors. This indicates the need to increase (scale-up) VCT in Kenya to make individuals aware of HIV/AIDS and ways to avoid risky sexual behaviors. To determine risk factors for high-risk sexual behavior and to identify areas

of priority for programs targeting these behaviors, associations between high-risk sexual behavior and VCT was examined before and after controlling for confounding.

The construct of VCT demonstrated a strong association with high-risk sexual behaviors for both women and men in the unadjusted and adjusted results. Women and men who were tested for HIV were more likely to have had high-risk sexual behaviors. These findings were unexpected since individuals who have been tested for HIV often change their behaviors (Allen et al., 2003; Asimwe-Okiror et al., 1997; Cheluget et al., 2006; Green et al., 2006; Sweat et al., 2000). However, this also suggest that majority of women and men in Kenya at the time of seeking VCT are already practicing high-risk sexual behaviors, an indication that proactive programs are not initiated earlier enough or the existence of lack of communication between funders and program managers. Furthermore, such high-risk behaviors can only be identified and communicated during VCT. However, the main message is that VCT needs to be scaled-up and encouraged to deter high-risk sexual behaviors.

Besides VCT, other factors were associated with high-risk sexual behavior after controlling for confounding. Age, perceived risk of acquiring HIV, and STDs were highly associated with high-risk sexual behavior. Women between 15-34 years old and men aged between 15-39 years old of particular had notably high-risk sexual behaviors indicating the need of VCT programs targeting these age groups. Furthermore, unexpected results for perceived risk of acquiring HIV were noted. Women and men who indicated that they had small and moderate risk of acquiring HIV had notably high risk of sexual behaviors. The findings suggest that women and men in Kenya are underestimating their perceived risk of acquiring HIV. Also, women from Coast,

Nyanza, and North Eastern, and men from Coast, Rift Valley, and North Eastern had notably high-risk sexual behaviors.

Of recent, Kenya has experienced a flow of funds from the non-governmental organizations abroad such as the United States Agency for International Development (USAID), The President's Emergency Plan for AIDS Relief (PEPFAR) among others which has increased programs that target risk reduction for HIV transmission including VCT (PEPFAR, 2008). The extra funding has helped increase treatment options including antiretroviral drugs or highly active antiretroviral therapy for those infected. Kenyans receiving antiretroviral drugs through PEPFAR increased from 343 in 2003 to 70,000 in 2006 (The Body, 2006).

Effect of Knowledge on High-Risk Sexual Behavior

More than 90% of women and men were knowledgeable about HIV/AIDS as it relates to sexual transmission behavior, mother to child transmission, and transmission beliefs. However, the findings were unexpected because after controlling for confounding variables women who were knowledgeable about HIV/AIDS (mother to child transmission and transmission beliefs) were more likely to have practiced high-risk sexual behaviors. Other factors associated with high-risk sexual behaviors among women after controlling for confounding were age, and perceived risk of acquiring HIV. In addition, women who had a primary school education and those from Coast, Nyanza, and North Eastern provinces (sexual transmission behavior, mother to child transmission, and transmission beliefs) were predicted to have practiced high-risk sexual behavior. For men, these were age, perceived risk of acquiring HIV and STDs (sexual transmission

behavior). In addition, men who were from Coast, and Rift Valley provinces, and those of protestant religion were predicted to have practiced high-risk sexual behavior.

This indicates that HIV knowledge is not a good indicator of determining risk aversion as it relates to HIV/AIDS. This reflects the HIV/AIDS situation in Kenya since those who are knowledgeable are also infected. In addition, one can be knowledgeable about a disease; however, people have to be taught how effectively to prevent the disease itself. For example, how to use a condom properly, how the disease is transmitted and behaviors to avoid that can put one at risk of acquiring the disease. Lance (2001) found college students to be knowledgeable about HIV/AIDS; however, prevalence of unprotected sex was high. In addition, Winfield and Whaley (2002) studied African American students and found no association between HIV/AIDS knowledge and condom use. Therefore, it is imperative to develop and allocate funds towards educational programs that focus on prevention issues especially among those of all age groups and those residing in Coast, Nyanza, Rift Valley, and North Eastern provinces.

Effect of Perceived Risk of Acquiring HIV on High-Risk Sexual Behavior

More than 75% of women and 85% of men in Kenya perceived themselves to either have no risk or small risk of acquiring HIV in 2003. Furthermore, 69% of women and 83% of men who perceived themselves to either have no risk or small risk of acquiring HIV practiced high-risk sexual behaviors. The findings were unexpected because after controlling for confounding women and men who perceived themselves to have small risk of acquiring HIV were more likely to have practiced high-risk sexual behavior followed by moderate risk and high risk respectively. The findings indicated that the majority of Kenyans are underestimating their risk for HIV indicative of poor

understanding of transmission modes or how to protect oneself from being infected with the virus that cause HIV/AIDS. In addition, our findings add to the existing knowledge as it related to the health belief model constructs on perception specifically perceived susceptibility, perceived severity, and perceived benefits as it relates to sexual behaviors and HIV/AIDS.

Several factors associated with high-risk sexual behaviors were different among women and men. For example, amongst men, factors included protestant religion, HIV/AIDS perceived severity, and STDs. Byrnes et al. (1999) conducted a meta-analysis on various risk taking behaviors and found differences among women and men. Hence, the findings indicate that when targeting high-risk sexual behaviors program developers and healthcare professionals in Kenya need to be specific as it relates to sexuality. Other factors that contributed to high-risk sexual behavior were:

- Women, between ages 20-29 years
- Women from Coast and North Eastern provinces
- Women who were currently married and formerly married
- Men who were currently married
- Women and men who had a primary education

Moreover, married women and men had the highest likelihood of high-risk sexual behavior. This is because married individuals might not use any protection such as condoms during sexual intercourse since they are married and not expected to unless it is for family planning. This particularly puts those women and men whose partners have

concurrent multiple sexual partners at risk of contracting sexually transmitted diseases including HIV (Halperin & Epstein, 2004; Morris & Kretzschmar, 1997).

Effect of Domestic Violence on High-Risk Sexual Behavior

Our estimation was that women who experienced domestic violence were more likely to engage in high-risk sexual behavior. 43% of women who were physically abused, 38% of women who were physically abused with a weapon, 16% of women who were sexually abused, and 24% of women who were emotionally abused indicated to have engaged in high-risk sexual behaviors. The four constructs for domestic violence indicated an association with having high-risk sexual behavior. However, the findings from all four constructs were unexpected since the results were indicating less likely to engage in high-risk sexual behavior.

This contradicts Fonck et al. (2005) who found that women who had more risky sexual behaviors experienced more partner violence. It is important to note that risky behaviors occurred before partner violence as opposed to the current study where domestic violence leads to high-risk sexual behavior. Despite this, the percentage was notably low (8%) especially among women who experienced physical abuse with a weapon, physical abuse (18%), emotional abuse (34%), and sexual abuse (40%). However, Maman et al. (2002) found an association between HIV and violence (physical and sexual) among women attending a voluntary counseling and testing clinic in Dar es Salaam, Tanzania.

These findings might have been due to women fear to report domestic violence during the survey interview that their husbands would find out despite the assurance of confidentiality from the interviewer or if their husbands were within the vicinity at the

time of the interview. This can be evident particularly in rural areas (Karamagi et al., 2006), and where gender power inequities exist (Pettifor et al., 2004). In addition, women who are high-risk are afraid of practicing safe sex due to the stigma and sex power balance that exists. Tang et al. (2000) found that even after visiting a VCT in Kenya, women were less likely to use a condom or accept and take condoms at home compared to their male counterparts.

Also, some risk factors for high-risk sexual behavior were evident and notable among women who experienced physical abuse with a weapon. Abused younger women were more likely to experience high-risk sexual behaviors, had higher levels of perceived risk of acquiring HIV, tested positive for STDs, from Luo, and Luyha ethnic groups, from Central, and North Eastern provinces, and only a primary school education. Physical abuse is a factor among those with a primary education, from the Coast, and North Eastern provinces, and of Kamba ethnic group. Sexual abuse, those with a primary education, from Coast provinces, and from Kamba ethnic group and emotional abuse, those with a primary education, from Coast, and North Eastern Provinces, and from Kamba ethnic group.

Effect of Cognitive Involvement/Awareness about HIV/AIDS, VCT, and STDs on High-Risk Sexual Behavior

The current study seeks to find out the association between high-risk sexual behaviors and cognitive involvement and awareness for HIV/AIDS, VCT, and STDs. More than 95% of Kenyan women and men were cognitively involved and aware about HIV/AIDS. Additionally more than 50% of Kenyan women and more than 60% of men were mentally involved and aware about VCT, and over 80% of men and 90% of men

were mentally involved and aware about STDs. Despite this heightened cognition and awareness, the majority of Kenyans continue to be infected with HIV. Cognitive involvement and awareness about HIV/AIDS and STDs can lead individuals to abstain from behaviors that often put them at risk of acquiring a certain condition including HIV/AIDS. Furthermore, individuals who are more involved and aware of a certain health issue are more likely to seek more information (Bandura, 1986; Melkote, Muppidi, & Goswami, 2000).

A negative association between cognitive involvement/awareness for HIV/AIDS, VCT, and STDs was found hence unexpected. Among women, those who were more likely to practice high-risk sexual behaviors were those mentally involved and aware of STDs. Among men those who were mentally involved and aware of HIV/AIDS, VCT, and STDs were more likely to practice high-risk sexual behaviors.

Risk factors for high-risk sexual behavior identified among women were, age (between 20-29 years), perceived risk of acquiring HIV, marital status, alcohol consumption, those with a primary education, those from Nyanza, Rift Valley, and North Eastern provinces. For men, HIV/AIDS, VCT and STDs factors were age (between 20-24 and 30-34 years), perceived risk of acquiring HIV, being currently marital, alcohol consumption, those from Coast, and Rift Valley provinces, and those who practice Roman Catholic religion.

Effect of Alcohol Consumption on Negative Attitudes/Stigma towards HIV/AIDS and Negative Attitudes towards Women

Thirty percent of Kenyan men consume alcohol compared to 5% of women. Also, negative attitudes were higher in urban areas than rural areas among men and

women who consumed alcohol. These findings as they relate to differences in urban and rural areas for alcohol consumption and negative attitudes are a key finding since urban areas are normally associated with more educated individuals and diversity. Hence, one does not expect such negative attitudes to be more prevalent. However, negative attitudes towards women among women and men who consume alcohol seem to be higher in urban areas.

After controlling for confounding, there were positive association between negative attitudes/stigma for HIV/AIDS and alcohol use. Men who were more likely to harbor negative attitudes/stigma for HIV/AIDS were those who consumed alcohol and lived in rural areas. A positive association between negative attitudes towards women for husband controlling attitudes and husband sexual attitudes and alcohol use were observed. These findings point to the importance of alcohol use in addressing HIV/AIDS related problems in Kenya and the role men play.

Kalichman et al. (2007) found that alcohol consumption to be associated with risk of acquiring sexually transmitted infections including HIV/AIDS. Furthermore, they found greater quantities of alcohol consumed to be a predictor for sexual risk. Men were found to be more likely to engage in higher risk behaviors after drinking alcohol which also puts women (wives or intimate partners) at risk as well. Also, drinking venues, poverty, sexual harassment and coercion, lack of condom use, multiple sexual partners, prostitution, and HIV/AIDS stigma are some factors that have been associated with alcohol consumption (Abrahams, Jewkes, Hoffman, & Laubsher, 2004; Campbell, 2003; Cook & Clark, 2005; Erulkar, 2004; Kalichman et al., 2007; Voeten et al., 2002; Wojcicki & Malala, 2001). The results suggest that programs directed towards

controlling alcohol consumption among men can be crucial towards fighting HIV/AIDS in Kenya.

Risk factors for negative attitudes/stigma towards HIV/AIDS in rural areas among men were ethnicity, especially those individuals from the Luo, Kamba, and Meru ethnic tribes. For negative attitudes towards women (husband controlling attitudes) among men, risk factors were religion (Catholics), individuals from other ethnicities, and provinces (Central, Nyanza, Rift Valley, and North Eastern).

Effect of Regional Differences on Negative Attitudes towards Condom Use and Condom Advertisement

It was apparent that negative attitudes towards condom use among men as it related to condom perception, disease protection and sexual pleasure was prevalent especially in four provinces (Rift Valley, Eastern, Central, and Nyanza). Nearly a quarter of men from Eastern and Rift Valley provinces perceived condoms negatively, did not think condoms offer protection against diseases, and thought condoms diminished sexual pleasure. While this varied from province to province, it is evident that the majority of men have negative attitudes towards condom use. These findings were similar to those of condom advertisement among women and men. For men, this indicates that those who had negative attitudes towards condom use as it related to condom perception, disease protection and sexual pleasure are less likely to use media messages on condoms. For women, negative attitudes towards condom advertisement can deter media messages on condoms as well.

A positive association between negative attitudes towards condom use and provincial (main administrative areas in Kenya) was observed after controlling for

confounding. Men from Eastern, Rift Valley, and North Eastern were more likely to perceive condom use negatively, those from Central did not think condoms offered any protection from diseases, and those from Coast indicated that condoms diminished sexual pleasure. While significance was not attained in most of these provinces, the results point towards more men having negative attitudes towards condom use. These findings explain the low rates of condom use in Kenya; in this study, we found that only 5% of women and 17% of men used condoms in their last sexual intercourse (see Table 41). We observed a positive association between negative attitudes towards condom advertisement and province after controlling for confounding. Women from Central, and North Eastern and men from North Eastern provinces were more likely to perceive condom advertisement negatively.

Bauni and Jarabi (2000) studied family planning behaviors in Nakuru District in Kenya and found that despite the fact that married individuals may consider themselves to be at risk of acquiring HIV they still did not use condoms or refuse their partner sex. Also, a low acceptability of condoms among married individuals was common due to the fact that couples in a stable relationship do not expect their partners to ask them to use a condom unless they do not trust each other and the idea alone can strain relationships (Bauni & Jarabi, 2003). Gage (1998) studied decision-making process as it relates to contraception use. The findings indicate that lack of contraception use including condoms to be influenced by cultural values on sexuality and gender, power dimension and insufficient knowledge. Peltzer (2000) studied condom use in a South African university and found that nearly a third of the participants reported non condom use. Furthermore, he found total AIDS Health Belief was not associated with intentions to use

condoms. Perceived barriers to condom were high with increasing age and lack of condom use.

Risk factors for negative attitudes towards condom use among men (condom perception) were ethnicity (Kamba), and marital status (currently married and formerly married). For disease protection, risk factors were occupation (not working), and being from other religions. For sexual pleasure, risk factors were age (35-39 years, 40-44 years, 45-49 years, and 50-54 years), ethnicity (Kisii), and religion (Muslim). For negative attitudes towards condom advertisement among men, risk factors included age (45-49 years) and occupation (teaching and management). For women, risk factors were occupation (not working) and religion (Catholics).

Effect of Wealth Index on High-Risk Sexual Behavior

Individuals in all wealth categories were evenly distributed in Kenya. Over 20% of women and men in the richer category and over a quarter of those in the richest category practiced high-risk sexual behaviors. This deviates from the expectation of individuals in such wealth category. Ideally, individuals who are wealthier are also known to be well educated a means by which they acquired such wealth. Hence, this finding is counterintuitive for Kenya. Therefore, behaviors as they relate to sexuality in Kenya are complex.

In the unadjusted results, there was a positive association between wealth and high-risk sexual behavior among men. Men who were more likely to practice high-risk sexual behaviors were those from the richest wealth category. Among women, those from the richest wealth category were less likely to have high-risk behaviors. However, this was not significant since this was only 6% less. After adjusting for confounding,

there was a slight attenuation of the results. Men in the richer and richest wealth categories were 3% more likely to practice high-risk sexual behavior however significance was not reached. This might be explained by the small sub-sample size of men in the analysis who were richer or richest and practiced high-risk behaviors.

These findings are consistent with those of Kongnyuy et al. (2006) who studied wealth and sexual behavior in Cameroon. They found that wealthy men were less likely to use a condom with a non-spousal or non-cohabiting partner. Furthermore, they found no difference in purchasing sexual services/prostitution among individuals from the poorest and richest wealth categories. Also, they found higher education not to have any effect on condom use with a non-spousal or non-cohabiting partner. Shelton, Cassell, and Adetunji (2005) have also found an association between wealth and HIV in Tanzania. They also point that in SSA countries HIV/AIDS prevalence is highest among the richest countries.

Other scholars have also explored the issue of high-risk sexual behavior and found an association with wealth, HIV/AIDS, urban living, and education (Fenton, 2004; Gillespe, Kadiyala, & Greener, 2007; Kirunga & Ntozi, 1997; Shelton, Cassell, & Adetunji, 2005). In addition, ease of mobility and migration has been linked and considered to be a risk factor for high-risk sexual behavior (Brockhoff & Biddlecom, 1998; Brockhoff & Biddlecom, 1999; Hunt, 1989). Furthermore, men have been documented to migrate more to urban areas to seek employment while their wives are left behind in the rural areas. Most of these men end up engaging in extramarital affairs and when they go back to their wives in the rural areas end up infecting them with HIV virus

and other sexually transmitted diseases (Barongo et al., 1992). Rural-urban migration is also becoming prevalent among women in Africa as well (Dyson, 2003; Ulin, 1992).

Awusabo-Asare and Annim (2008) found a significant association between wealth status and risky sexual behavior in Ghana and Kenya for unadjusted model (both women and men in Kenya). However, these findings differed from the ones in this study in that the Awusabo-Asare and Annim found notably higher odds of wealth and risky sexual behavior for both women and men. The current study only shows a slight association in the unadjusted results among men. These differences might be due to coding of the main outcome measure. While high-risk sexual behavior in this study was generated from three variables (multiple sexual partners, prostitution, and lack of condom use); it is not clear how Awusabo-Asare and Annim coded their risky sexual behavior variable.

Risk factors for high-risk sexual behavior and wealth among women were all age categories, ethnicity (Luhya, Luo, Kamba, Kisii, and Meru), those with a primary school education, perceived risk of acquiring HIV (small risk, moderate risk and high risk), STDs. Among men these were all age categories, province (Central, Coast and Rift Valley), perceived risk of acquiring HIV (small risk, moderate risk and high risk), STDs, uncircumcised men, and religion (Catholics).

Effect of Sexually Transmitted Diseases on HIV Test

Overall, prevalence of sexually transmitted diseases was found to be small among individuals who practiced high-risk sexual behaviors (5% among women and 4% among men) and those who tested positive for HIV (8% among women and 9% among men). This trend was consistent with HIV trends (9% among women and 5% among men)

indicating a strong relationship between STDs and HIV. Recent findings have indicated an increased susceptibility to HIV by those infected with an STD and increased infectiousness among those infected with HIV if at the same time they have an STD (CDC Fact Sheet, 2008; Ghys et al., 1997; Grosskurth et al., 1995; Workowski & Berman, 2007). The Centers for Disease Control and Prevention has also found that individuals infected with STDs to be two to five times more likely to acquire HIV infection compared to those who are uninfected when exposed to the virus during sexual contact (CDC Fact Sheet, 2008). Furthermore, Wasserheit (1992) also found that individuals infected with HIV and another STD to be more likely to transmit the virus compared to those who are only infected with HIV.

In the adjusted results, there was a positive association between sexually transmitted diseases and HIV among men and women. Men and women who had an STD or signs of STDs were more likely to test positive for HIV compared to those who did not have an STD (3.05 and 2.01) respectively. These findings are consistent with those of Fleming and Wasserheit (1999) which reviewed various scientific contributions in order to determine the role of sexually transmitted diseases in the HIV transmission. They found that both ulcerative and non-ulcerative STDs promoted HIV transmission by promoting infectiousness among those infected by HIV and susceptibility among those infected by STDs apart from HIV through various biological mechanisms. Moreover, the study showed risk estimates ranging from 2.0 to 23.5 from three continents, with a clustering of between 2 and 5 consistent with our findings (Fleming & Wasserheit, 1999).

In two community level randomized controlled intervention trials in Africa Fleming and Wasserheit (1999) found the results to suggest timely provision of STDs

services in the reduction of HIV incidence rates. Therefore, program intervention for HIV/AIDS need to incorporate STDs testing as a major component in HIV transmission prevention. HIV testing should incorporate a comprehensive testing of STDs as well; this synergistic presentation of STDs and HIV should present an opportunity for healthcare programs with a focus on HIV testing particularly in this era of scaling-up such services. HIV testing in Kenya has increased tremendously between the years 2000 (3 sites) and 2005 (680 sites) (NASCO, 2005), taking advantage of such services to test for STDs can be crucial in fighting HIV/AIDS in Kenya.

Risk factors for positive HIV test among women infected with and STDs were age (20-24 years, 25-29 years 30-34 years, and 35-39 years), formerly married women, wealth (richer and richest category), and perceived risk of acquiring HIV (small risk and high risk). Among men, these were all age categories, and those who were formerly married.

Effect of Domestic Violence on HIV Test

The researcher estimated that women who experienced domestic violence were more likely to test positive for HIV. 49% of women who were physically abused, 20% of women who were physically abused with a weapon, 15% of women who were sexually abused, and 35% of women who were emotionally abused tested positive for HIV. Physical abuse, physical abuse with a weapon and emotional abuse indicated an association with testing positive for HIV. These findings are similar to those of other researchers who have found an association between domestic violence and HIV (Maman et al., 2001; Silverman et al., 2008) and among men (Choi et al., 1998). In addition, Fonck et al. (2005) found women who were HIV seropositive to have almost twofold

increase to experience lifetime partner violence, while those who practiced risky sexual behaviors to have experienced more partner violence compared to those who do not practice risky sexual behaviors. However, it was surprising that sexual abuse was not associated with a positive test for HIV contrary to findings from other researchers who have found domestic violence to expose women to various diseases including HIV (Fischbach & Herbert, 1997; Fonck et al., 2005; Maman et al., 2001; Silverman et al., 2008).

These findings suggest domestic abuse among sexual intimate partners to be a driver for HIV acquisition. Disparities in property ownership especially land which is considered to be a major source of livelihood and economic wellbeing can be critical in controlling HIV. The aforementioned factors also make women dependant on men for financial support, which has shown to change power balance and propagation of poor communication between intimate partners (Heise & Elias, 1995; Melkote, Muppidi, & Goswami, 2000; Pettifor et al., 2004; Wood & Jewkes, 1997). This also explains lack of power among women in such relationships to negotiate condom use, putting women in a vulnerable situation where their intimate partners can infect them with HIV.

Risk factors for positive HIV test among abused women (physical abuse, physical abuse with a weapon, sexual abuse, and emotional abuse) were STDs, occupation (not working and other occupations), perceived risk of acquiring HIV (high risk), and ethnicity (Luhya).

Effect of Circumcision on HIV Test

The researcher hypothesized that uncircumcised men were more likely to test positive for HIV. Nearly half (48%) of men who were uncircumcised tested positive for

HIV. Furthermore, not being circumcised indicated a notable association with testing positive for HIV. These findings are consistent with those of other researchers (Agot, Ndinya-Achola, Kreiss, & Weiss, 2004; Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007; Halperin & Bailey, 1999; Hunter et al., 1994); however, these studies only used a limited sample size (randomized controlled clinical trials or specific populations). Our study used a national representative data from the KDHS-2003.

These findings indicate that there is a protective effect against HIV infection among those individuals who are circumcised. There is no clear biological explanation to these findings; however, uncircumcised men might be exposed to the virus if present during sexual intercourse due to the foreskin, which might play a role due to prolonged conditions for such infections even after coitus. It is important that these findings not be interpreted that one cannot acquire HIV if they are circumcised and not use a condom with an infected sexual intimate partner. Rather, program managers and practitioners should continue to encourage condom use whether circumcised or not.

Risk factors for positive HIV test among uncircumcised men were formerly married, wealth (being richer and richest), those who had their sexual debut between ages 22-40 years, people from Nyanza province, and age (all ages). Among the various age categories, this was very pronounced among those aged 20-24 years.

Policy Implications and Recommendations

Over several decades, Kenya has seen an increase in HIV prevalence especially from 1990-1999 (5.3%-13.1%) (USAID, 2003). These rates have been declining steadily since 2000 partly attributed to HIV/AIDS programs that have mainly focused on awareness. However, of late there has been controversy in the reporting of HIV/AIDS

with various prevalence rates being reported. For example, a prevalence rate of 5.1% has been reported for 2006 (NACC, 2008; UNAIDS, 2007) and currently a prevalence of 7.4% has also been reported by the Kenya Aids Indicator Survey (KAIS) (NAS COP, 2008). Furthermore, HIV prevalence rates were found to be disproportional in urban (14.3%) and rural (6.3%) in 2002 (Cheluget et al., 2006; UNAIDS, 2004).

In Kenya, 1.4 million people are infected with HIV/AIDS with 150,000 deaths occur every year from AIDS related problems. To add to this problem, nearly two million orphans due to HIV/AIDS are left behind (GOK, 2006). While Kenya has experienced a tremendous decline in HIV/AIDS cases, there has been poor reporting and controversy on HIV prevalence. Furthermore, HIV incident rates continue to be high among young populations with women aged between 15-24 years and men under thirty years being the most affected (CBS, 2004; UNAIDS, 2002).

The government's efforts in regard to HIV/AIDS since the creation of Sessional Paper No. 4, which was a major act of parliament to intervene by spelling out the needed environment in the fight against HIV/AIDS, has seen many interventions and government support for independent organizations to address this devastating disease (CBS, 2004; MOH, 1997). The Kenyan government has also renewed its commitment towards HIV/AIDS programs mainly due to the recognition of the overwhelming effect of the disease on the population and economy. One such organization is the National AIDS Control Council (NACC), which has developed and currently implementing its second Kenya National HIV/AIDS Strategic Plan (KNASP) for the period 2009/10-2012/13 (GOK, 2006; NACC, 2009). NACC was conceived after 1999 when the government of Kenya recognized and declared HIV/AIDS to be a national disaster. The findings from

the current study address and provide direction of pertinent issues addressed in the KNASP through various policy implications and recommendations.

While some findings were counterintuitive, they were important in this study especially for the advancement of policy as it relates to the “unexpected” findings. For example, individuals participating in VCT (HIV testing) were found to have high-risk sexual behavior. This finding indicates that interventions for such behaviors have not been adequate or at the time HIV testing was initial for those agreeing to be tested; hence, the need for efforts to increase rapidly (scale-up) such services. Furthermore, it might be due to the cross-sectional nature of the data itself, these individuals were not followed to measure changes in behavior after HIV testing. Hence, while counterintuitive in nature, policy implications and recommendations pertinent to the findings have been reported.

Domestic Violence, High-Risk Sexual Behaviors and HIV Testing

The findings indicated a counterintuitive association between high-risk sexual behavior and voluntary counseling and testing. This is indicative of high-risk behaviors at the time of testing for HIV by either having multiple sexual partners, not using a condom, or engaging in prostitution. High-risk sexual behavior among women and men was more than half among women and men despite the fact that less than a quarter of women and men have been tested. Also, women and men who were tested for HIV were more likely to have high-risk sexual behaviors. This suggests that high-risk sexual behaviors are being identified at the initial time of VCT. Therefore, it seems that individuals are being aware of their high-risk sexual behaviors and how this is putting them at risk of acquiring HIV if they are not going to address these behaviors. In this case, VCT centers can act as a source of information on what behaviors need to be

changed to prevent the acquisition or spreading of STDs including HIV. Furthermore, another important finding was that domestic violence among intimate partners particularly physical abuse with a weapon and emotional abuse among women was also associated with testing positive for HIV.

These findings have several policy implications and recommendations.

Policy Implications:

- VCT is crucial in the fight against HIV.
- VCT plays a major role of communicating on HIV/AIDS related information.
- High-risk sexual behaviors in Kenya are the main driver for HIV acquisition.
- Addressing domestic violence can avert HIV infection among intimate partners.
- Exploring new funding opportunities for such programs is crucial on the part of governmental and non-profit agencies in Kenya.

Policy Recommendations:

- There is need to increase rapidly (scale-up) VCT in Kenya, with particular focus of integrating a variety of services with testing.
- It is imperative to secure and expand HIV treatment programs to accommodate and treat the newly identified cases through referrals.
- Intensification of VCT programs is crucial.
 - While VCT has increased in Kenya, other avenues such as door to door testing and counseling services need to be explored.
 - Tailored new media avenues that are appropriate and cultural sensitive should be explored.

- Legislation improvement on issues related to domestic violence need to be addressed by various stakeholders.
- Involving men particularly those in marriage or intimate partnerships in female oriented programs.
- Women empowerment educational programs need to be developed to address power differences among the sexes.
 - Economic wellbeing of women needs to be addressed especially property and land ownership.
 - Women should be provided with various options such as female condoms that can provide them with control and protection against STDs including HIV infection.
 - This will allow women to negotiate with their intimate partners on various issues including condom use.

HIV/AIDS Knowledge, Perceived Risk of Acquiring HIV and High-Risk Sexual Behavior

HIV/AIDS knowledge on sexual transmission behaviors, mother to child transmission, and transmission beliefs was very high among women and men in Kenya. However, high-risk sexual behavior was prevalent. This was counterintuitive and clearly indicates that behaviors can vary even among individuals who are knowledgeable about risky sexual behaviors. Over three quarters of Kenyan women and men either perceive themselves to have no risk or small risk of acquiring HIV. However, they also have high-risk sexual behaviors or tested positive for HIV.

These findings have several policy implications and recommendations.

Policy Implications:

- All Kenyans are at risk of acquiring HIV.
- Risky sexual behaviors are the main driver for the spread of HIV.
- There is underestimation of individual risk to HIV exposure and acquisition.
- Addressing risky sexual behaviors and helping individuals to identify their actual risk of HIV infection can reduce the disease pandemic in Kenya.
- Addressing cultural issues, being sensitive to their norms and tailoring programs before implementation can be helpful in improving perceptions on HIV risk.

Policy Recommendations:

- Intensification of education HIV/AIDS programs on ways that one can be exposed and acquire HIV.
 - Proper ways on how individuals can protect themselves need to be addressed.
- Integration of healthcare services, educational programs, including HIV testing with a focus on behaviors that put individuals at risk.
 - Such programs and services should have a focus of helping individuals to evaluate and understand their actual risk.
- Program developers and implementers need to incorporate demonstrations in HIV/AIDS programs.
- Initiation of new programs or integration of programs with sexual and/or gender differences as it relates to decision making.

Cognitive Involvement/Awareness (HIV/AIDS, VCT and STDs) and High-Risk Sexual Behavior

Cognitive involvement/awareness was high for both women and men, for HIV/AIDS it was nearly 100%, VCT was above 50% and STDs was over 75%. However, despite this both women and men were more likely to engage in high-risk sexual behaviors. This was counterintuitive and unexpected since individuals who are aware of a health condition and the consequences of acquiring it normally seek behaviors that can prevent the illness or disease from occurring.

These findings have several policy implications and recommendations.

Policy Implications:

- Individuals with a primary education and those who are currently married or formerly married are at most risk of practicing risky-sexual behaviors.
- There is a disjointed effort between awareness programs and risky sexual behaviors in Kenya.
 - Awareness does not translate to behavior change, but rather training on various health issues (for example how to effectively use a condom) need to be integrated in awareness programs.
 - Awareness programs that encourage memory such as edutainment need to be of focal interest for high-risk sexual behavior programs.
- Encouraging condom use among intimate partners can protect women from sexually transmitted disease.
 - This is crucial especially where concurrent sexual partners are involved.

Policy Recommendations:

- Identifying and involving key stakeholders in promoting condom use and identifying ways to encourage condom acceptability in Kenya.
 - Recognition of the influence of attitudes/stigma mainly influenced by culture on condoms.
 - Religious leaders especially Catholics can play a major role as a link to those that they serve-while condom use is discouraged and viewed as a way to encourage promiscuity and is against their teaching, HIV affects this religious congregation as well.
- Continuous gathering of data and evaluation of programs can direct on where information is lost.
 - This can help in directing resources especially in developing messages.
- Integration of education programs on HIV/AIDS and STDs that can deliver targeted information with VCT.
 - There is need to focus on the youths both in and out of schools.
 - There is need to focus on married couples.
- Extensive promotion of condoms including the female condom as an effective contraception needs to be the main focus as a tool for fighting HIV/AIDS and STDs as other alternatives to address behaviors are being explored.
 - This can help in directing resources especially in developing messages.

Alcohol Consumption and Negative Attitudes and/or Stigma towards HIV/AIDS and Women

The researchers found a higher percentage of men who consumed alcohol and portrayed negative attitudes/stigma towards HIV/AIDS in urban and rural areas compared to women. Furthermore, a positive association between alcohol consumption and negative attitudes/stigma towards HIV/AIDS among men in rural areas was observed. For women, those who consumed alcohol were only 39% and 44% less likely to have negative attitudes towards HIV/AIDS and negative attitudes towards sex education on condom use respectively. The association points to the detrimental effects alcohol can have on HIV/AIDS programs efforts. While alcohol can impair an individual's judgment about risky behaviors, negative attitudes particularly to HIV/AIDS can hinder efforts directed towards condom use, sexual communication, power imbalance among sexually intimate partners, which adversely influences condom negotiation and other sexual decisions.

These findings have several policy implications and recommendations.

Policy Implications:

- Alcohol consumption contributes to negative attitudes/stigma about HIV/AIDS.
- Reducing negative attitudes/stigma can reduce the spread of HIV/AIDS and act as crucial tool for program success in rural areas.
- Negative attitudes and stigma are still prevalent in rural areas.
- Sex education in urban areas is not well accepted particularly among parent.

Policy Recommendations:

- Commitment to and enforcement of alcohol laws by the government is critical especially in rural areas where traditional alcohol brewing is prevalent.
 - This is particularly crucial since the youth are the ones who are at a higher risk of alcohol related HIV infections.
- Intensification of alcohol education programs for parents and the youth. This should however be implemented with consideration of the following.
 - Alcohol treatment programs.
 - Alternative economic activities and strengthening of cooperatives as an avenue to the market.
 - Education should be made affordable to keep the youth in school.
- Integration of programs.
 - Alcohol intervention programs with HIV/AIDS testing.
 - Stigma and HIV testing.
- Increasing communication efforts through various media outlets to counter various stigma about HIV/AIDS.
 - Provision of HIV/AIDS services (counseling, referral, and treatment) to those identified as infected with the disease can alter and change mentality towards HIV/AIDS hence reducing stigma associated with the disease.
 - Continued funding sources for ART regimens needs to be a continuous effort from the government and non-governmental agencies.

Regional Differences and Negative Attitudes towards Condom Use and Condom Advertisement

Regional/provincial differences on negative attitudes towards condom use (condom perception, disease protection and sexual pleasure) were observed among men. Particularly men from Central, North Eastern, Rift Valley, and Nyanza showed negative perception about condoms; men from Central, North Eastern, and Eastern showed negative attitudes about condoms on disease protection; and men from Coast and Western-negative about condoms on sexual pleasure.

While media campaigns have been the main source of information on condom use, there are still some regions/provinces that have not embraced the idea of advertising and promoting condoms in media. Women still harbor negative attitudes towards condom advertisement in Central and North Eastern provinces. However, among men from North Eastern and from Coast province negative attitudes were less likely to be observed, but, majority of men still harbored negative attitudes towards condom advertisement. Condom use and advertisement programs from various sectors need to be strengthened based on this information.

Most of these regions are home to the highest HIV prevalence which can be attributed to these negative attitudes towards condoms and condom advertisement. For example, the following prevalence's have been observed for these regions/provinces. Central (3.8%), Rift Valley (7%), Nyanza (15.3%), Coast (7.9%), Western (5.1%), North Eastern (1%) (NASCO, 2008). While HIV prevalence in North Eastern is low compared to most other regions/provinces in Kenya, apparently negative attitudes towards condoms and condom advertisement do exist. This might be explained by the

sparsely distributed population that is mostly nomadic in nature. However, it is important to continue monitoring such a population since they are less likely to use condoms if they harbor negative attitudes towards condoms.

These findings have several policy implications and recommendations.

Policy Implications:

- Negative attitudes towards condom and condom advertisement can hinder HIV/AIDS prevention efforts.
- Program efforts need to be directed toward certain regions/provinces.
- Educational programs on condom need to be strengthened for these regions/provinces.
- Integration of cultural issues and normative structures with HIV/AIDS prevention programs can be crucial in promoting condoms and/or advertisement in certain regions/provinces in Kenya.

Policy Recommendations:

- Involving communities in such regions as stakeholders on condom promotion and advertisement campaigns needs to be considered by program developers and implementers.
 - Further, such programs need to be tailored to specific cultures.
- Intensification of educational programs on condoms for various age groups
 - Romantic and sexual intimate partner should be encouraged to attend such classes.

- Because of the stigma that might take some time to eliminate, door to door condom educational programs need to be promoted and strengthened.
- Integration of healthcare services such as maternal health with educational and condom information sessions.
 - Such programs should encourage both partners to attend.
- Use of other media avenues such as edutainment should be encouraged in HIV/AIDS prevention programs.

Wealth and High-Risk Sexual Behavior

Wealth was moderately associated with high-risk sexual behaviors in Kenya among men. However, for both richer and richest women, they were only 6% less likely to have high-risk sexual behaviors. While these findings were counterintuitive, they have several policy implications and recommendations. The findings also indicate that those who are wealthy might have high mobility either due to the nature of work; they might have enough disposable income to spend. Furthermore, they most likely have migrated to urban areas to seek opportunities that can afford them higher income, or the nature of their work demands them to be very mobile (truck drivers). For men, this sometime can happen when their wives are left in the rural areas only to be exposed to STDs including HIV when their husbands return. For women, probably they were well educated and targeted mostly young men who might be in need of money.

These findings have several policy implications and recommendations.

Policy Implications:

- Wealthy individuals in Kenya are also at high-risk of contracting HIV/AIDS.

- Encouraging rural-urban migration for both married partners can reduce risky sexual behaviors and HIV infection.
 - This might prove to be challenging since those who migrate usually have tangible assets in the rural areas and might intend for someone to be physically there. If they are married, this usually happens to be the wife.
- HIV/AIDS programs integration with financial institutions can be one solution in addressing the high-risk sexual behaviors among Kenya.

Policy Recommendations:

- Development of a migrant support network within urban areas can provide support for the new and returning urban dwellers
 - Recognizing them as equal partners in programs such as condom distribution or urban life that can constitute prostitution and new sexual networks can impact their health and behaviors is crucial.
- Creation of mini clinics or integration of HIV testing centers as crucial places to seek migration information.
 - Requirements by the government on employers to refer new employees to such programs can be crucial.
 - Subsidized/low cost or free condom distribution.
- Development of tailored HIV and high-risk sexual behavior programs for various wealth categories.

- Such programs should be integrated with financial institutions that also offer credit. Build in incentives can be a successful strategy to accomplish this.
- Explore how HIV testing and counseling can be integrated as well. The aim of this should not be a screening process but rather test and offer referral for treatment options. The government should have policies to ensure that no individuals are denied credit based on their HIV status.
- Enhancing women economic wellbeing on such issues as land ownership rights and access to subsidized credit needs to be addressed by various stakeholders such as the government, policy makers, program developers, and financial institutions.
 - This process should include married partners with a focus of men who already own or have control on such assets.
 - Women will be able to be financially independent, which comes with decision making responsibilities. This can translate to fertility control and power in sexual negotiation on condoms with their partners.

STDs, Circumcision and HIV Testing

The findings point to a notable association between STDs, circumcision (uncircumcised men) and HIV testing. This indicates that the presence of STDs among women and men exacerbates HIV infection during unprotected sexual intercourse. Also, uncircumcised men are at higher risk of HIV infection, meaning that circumcision provides a protective effect against HIV infection. The findings were consistent with those conducted under controlled clinical trials.

These findings have several policy implications and recommendations.

Policy Implications:

- Male circumcision can offer certain protective effect against HIV acquisition.
- Cost involved with circumcision.
- Uncircumcised male to female transmission of HIV.
- Circumcision can be increased in communities that do not circumcise through educational programs that convey the importance of being circumcised.
- Cultural and normative issues surrounding circumcision in such communities should be explored and addressed in a sensitive manner for programs focusing on circumcision to be successful.
- STDs are crucial in aiding HIV transmission subsequently STDs treatment can reduce HIV transmission.
- STDs can be identified and treated by testing.

Policy Recommendations:

- There is need to scale-up circumcision efforts in communities that do not practice male circumcision.
 - Key stakeholders (tribes that do not practice circumcision, political leaders, religious leaders, medical community) should be involved in designing such programs with extensive consultation-particularly as it relates to cultural sensitivity.
 - It should be made clear that male circumcision is not a guarantee from being infected with HIV but rather part of a comprehensive HIV transmission intervention.

- Male circumcision programs should be voluntary.
- There is need for capacity building and support from the government in order to provide quality facilities and medical services.
- There is need to integrate maternal and child health programs with STDs testing and treatment.
 - These services should encourage equal women and men participation with women acting as the main link of communication.
- STDs testing should be made part of the normal medical checkup.
- STDs testing should be incorporated in HIV testing programs.

Strengths and Limitations

Data-KDHS 2003

The study utilized a cross-sectional data from the Kenya Demographic and Health Survey-2003. Because data from the survey only represent a onetime snapshot, variations can be expected if the data was collected at a different time. Furthermore, we are only left to conclude on associations of various variables of interest and cannot measure any relationships (or make causal inference) between the outcome of interest and the predictor variables.

Non-Differential Misclassification

Since all main outcome measures for the study are binary, it is easy to predict bias due to misclassification as opposed to categorical outcomes measures that normally create difficulty in predicting the direction of any bias due to misclassification (Birkett, 1992). Non-differential misclassification of HIV blood samples was highly unlikely to

have occurred. Handling of the blood specimens followed the set instructions that ensured quality control measures on handling the blood samples; this was made possible by the help of a health worker. The samples were later sent to the CDC laboratory at KEMRI headquarters in Nairobi to be tested for HIV. The method used to test the blood for HIV has been explained somewhere else extensively (CBS, 2004).

The survey language was in two national languages (English and Swahili) and eleven other local languages. However, going back to survey data collection non-misclassification could have still been possible since the data collected was self-reported. In addition, language barriers might have been experienced by those administering the survey; even with extensive training and communication information noise/distortion is a possibility. Also, the interviewee environment can cause bias in itself. For example, women might report desirable responses when their intimate partners are near or not sure if they will be told what they were interviewed about despite the signed consent forms - which in most cases they do not understand due to inadequate knowledge to comprehend what they are being told or reading. Furthermore, respondent to behavioral questions can give arbitrary answers or depending on their judgments or comfort level with the survey administrators whether they think they have high-risk sexual behaviors or not. These misclassifications might bias the relative risk towards the null (Birkett, 1992; Dosemeci, Wacholder, & Lubin, 1990).

Bias

Since the samples in the dataset were selected randomly, selection bias is unlikely. However endogeneity bias is possible since the dependent variables in the study can be observed for most or all the observation in the data (Amemiya, 1985). If

you take the case of high-risk sexual behavior, it might be due to lack of HIV/AIDS knowledge, lack of awareness, and alcohol consumption among other variables. Furthermore, high-risk sexual behavior might not be practiced due to the acquisition of HIV/AIDS knowledge, stopping and changing alcohol consumption behavior due to media exposure or a health condition related to alcohol and on knowing their HIV/AIDS test¹¹ results. In addition, motivations, attitudes, and perceptions which are unobserved might be related to avoidance of high-risk sexual behaviors.

As previously mentioned, selection bias was unlikely due to the random design. However, for HIV tests this might have been possible since not all of those selected randomly (n=8,800) gave blood to be tested for HIV (n=2,440 \approx 28%). Furthermore, in relation to the number of sexual partners and/or behaviors men are known to over-report the numbers, since it is considered desirable and as a form of expressing masculinity and machismo in most African countries and influenced by their cultural norms, values, and expectation of men-particularly from their peers. On the other hand, women are known to underreport due to the undesirability associated with sexuality/sexual behaviors and women in the African context. These over and under reporting of sexual behaviors, HIV status, and attitudes might lead to non-differential bias hence biasing the results towards the null.

Generalizability

The study examines factors associated with high-risk sexual behavior among Kenyans. Assuming internal validity, the findings can be generalized to other similar

¹¹ A sample (n=6,360) from randomly selected individuals voluntarily agreed to give some drops of blood for HIV testing. However, they did not receive their HIV test results. Approval was through the ORC Macro's institutional review board (later revised, enhanced, and approved by KEMRI and CDC institutional review boards).

countries especially those in Africa and other developing countries because of the shared social, economic, demographic, and political characteristics that also play a major role in the spread of HIV/AIDS besides personal behaviors. This has some truth in that SSA has a high HIV/AIDS prevalence compared to most other countries. However, one has to be careful due to the diversity of cultural factors which can make generalization more difficult.

While issues related to generalization of findings to various subgroups can vary across disciplines and generate scientific investigations. The researcher would like to note that HIV/AIDS issues are very diverse in terms of behaviors and mode of transmission. However, it is generally agreeable that behaviors are the major mode of transmission. Therefore, I posit that the findings from this study can be crucial when conducting comparative studies on HIV/AIDS even among the highly developed/industrialized countries, specifically, when evaluating high-risk sexual behaviors among subgroups such as African-Americans in the U.S.¹² (Minnesota Department of Health, 2008). Also, when considering immigration issues HIV/AIDS can create more questions and topics for various discourses particularly in disciplines like Sociology, Anthropology, and Geography as it relates to the diaspora and kaleidoscopic trends.

Behavior change as it relates to cultures and norms is a process which can take a long period of time. For resident immigrants, assimilation into other cultures can also be a lengthy process while it might not happen entirely for such a generation of first

¹² Statistics from Minnesota Department of Health indicate that 30% of African-Americans and 30% of African born women (n=1,367) and 19% of African-Americans and 8% African Born men (n=4,583) were living with HIV in 2007.

immigrants. A more recent discourse has been generated by President Obama's lifting the ban on travel for those infected with HIV/AIDS to the U.S. (CNN, 2009). I postulate this to be an area of major scientific investigation in the coming years. Because of this, study findings reported can be very crucial when studying recent immigrant subgroups from SSA countries in the U.S. This is a very important area that has not been well studied considering that these recent immigrants take long to adjust their behavioral patterns and cultures as well. Recent findings indicate an increasing number of HIV/AIDS cases among African born immigrants in the U.S. (Minnesota Department of Health, 2008; Sides et al., 2005; Silka, 2007).

Conceptual Framework Connection to the Findings and Policy

The conceptual framework guiding the study proposed various paths with four distinct points (predisposing factors, modifying factors, likelihood of change, and desired outcomes). The development of the conceptual framework was guided by two models (Health Belief Model and Information – Motivation – Behavioral Skill Model) and one theory (Theory of Reasoned Action and Planned Behavior). The majority of the predisposing factors, modifying factors, and likelihood of change in the conceptual model were supported by the findings.

There were several predisposing factors that may increase an individual's high-risk sexual behavior, negative attitudes and/or stigma, and HIV exposure risk: (a) age, education, residence, religion, marital status, occupation, ethnicity, wealth, for high-risk sexual behavior; (b) VCT, perceived risk of acquiring HIV, including all variables in (a) for negative attitudes/stigma towards HIV/AIDS, and sex education in rural and urban residence among women. This was true also for negative attitudes/stigma towards

HIV/AIDS in rural and urban residence among men; (c) STDs, region/province, VCT, including all variables in (a) for negative attitudes towards women (husband controlling attitudes and women sexual attitudes about their husbands). This was true also for negative attitudes towards women (husband controlling attitudes, women sexual attitudes, and husband sexual attitudes) among men; (d) perceived risk of acquiring HIV, marital status, VCT, including all variables in (a) for negative attitudes towards condom use (condom perception, disease protection, and sexual pleasure) among men; and (e) perceived risk of acquiring HIV, VCT, including all variables in (a) for negative attitudes towards condom advertisement among women and men.

Modifying factors, there were some associations between: (a) self-efficacy and high-risk sexual behavior among women; (b) perceived severity and high-risk sexual behavior among women; (c) self-efficacy and high-risk sexual behavior among women who were abused physically with a weapon; (d) self-efficacy and high-risk sexual behavior among women and men.

Furthermore, observed were findings contrary to the proposed hypotheses, several modifying factors (VCT, HIV/AIDS knowledge, perceived risk of acquiring HIV, and cognitive involvement/awareness for VCT, HIV/AIDS and STDs) indicated to be associated with high-risk sexual behaviors. These findings were unexpected; however, this can be explained by the fact that individuals behave differently and the level of HIV/AIDS knowledge, perceived risk of acquiring HIV, or cognitive involvement/awareness do not automatically translate to behavior change (DiClemente, Crosby, & Kegler, 2002). However, in instances where training is offered i.e. during VCT behavior can be changed because individual know how to protect themselves. This

was not the case in this study; those who received VCT (testing) also had high-risk sexual behavior, they might have indicated this at the time of VCT. This is clearly supported by the fact that the data used were cross-sectional in nature, hence, it was difficult to tell what changes occurred after they received the intervention if any – the researcher was limited by the data in this aspect and such information can be possible by using longitudinal data.

The desired outcomes (reduced high-risk sexual behavior, positive attitude change including reduced stigma, and reduced HIV prevalence) are directly related to the modifying factors. Hence, based on the findings of the current study, program managers and the government through various already established entities that focus on HI/AIDS such as the National AIDS and STIs Control Program (NASCOP) can use several policy implications and recommendations to strategically make a positive impact on the desired outcomes. Furthermore, improvements can also be made by expanding on those programs that work well by integrating services – for example, integrating VCT for HIV and STDs with the healthcare system or providing door to door VCT while integrating educational programs that address stigma and offer information where to seek accessible free or subsidized treatment that can improve the quality of life for those testing positive for HIV.

In the analysis, ethnicity was found to be associated with high-risk sexual behavior, negative attitudes/stigma, negative attitudes towards women, negative attitudes towards condom advertisement among women and men, and negative attitudes towards condom use among men HIV test among women. While ethnicity which defines culture to a larger extent was not studied as a predictor for the various outcomes that were

proposed in this study, its influence on normative behavior cannot be underscored since it is critical to behavior change. This is because we tend to grow into these norms that to a larger extent defines what we value and the time it might take to change certain behaviors. To be successful with HIV related behavior change as it relates to attitudes and/or stigma, elaboration likelihood model (ELM) of persuasion can be applied and is recommended with other HIV/AIDS programs. This model considers persuasion to be a function of attention, comprehension, acceptance, and retention. ELM posits that attitudes are an important construct for behavior (health behaviors) determination and their change (DiClemente, Crosby, & Kegler, 2002). A good example of HIV/AIDS program that can be related to the elaboration likelihood model of persuasion is edutainment – programs that educate at the same time entertain individuals; hence, increasing their attention and retention of the messages.

Conclusion

There was a counterintuitive association between high-risk sexual behavior and participation in VCT (testing), being knowledgeable about HIV/AIDS, perceived risk of acquiring HIV, cognitive involvement/awareness and wealth index in the proposed hypotheses. Hence, this suggests that these predictors are not reliable measures for risky-sexual behaviors in Kenya. These findings are troubling; however, they may point to why HIV/AIDS prevalence is high in the country. Furthermore, a counterintuitive association between domestic violence and high-risk sexual behavior was observed for the proposed hypothesis. However, this was 28% for physical abuse, 18% for physical abuse with a weapon, 40% for sexual abuse, and 34% for emotional abuse less likely to engage in high-risk sexual behaviors.

There was evidence of alcohol consumption and negative attitudes/stigma for HIV/AIDS among men, negative attitudes towards women among women in relation to their husband controlling attitudes and women sexual attitudes in relation to their husband. For men, husband controlling attitudes and husband sexual attitudes were evident among women and men who consumed alcohol. Also, there were negative attitudes towards condom use among men and region (province). For condom perception, association was evident among people from Central, Eastern, Rift Valley, and North Eastern provinces. For disease protection, association was evident among people from Central province, and finally, sexual pleasure association was evident among people from Coast province. For negative attitudes towards condom advertisements, among women the association was evident for those from Central, Rift Valley, and North Eastern provinces. Moreover, for men, association was evident among people from Central, Eastern, and North Eastern provinces. There was also evidence of an association between having STDs, abuse (physical abuse, physical abuse with a weapon, and emotional abuse), circumcision among men, and testing positive for HIV was also supported.

Until a cure or vaccine for HIV/AIDS is found no one is safe from contracting HIV. It seems that our own core values for existence are yet to be tested. Even with well documented behaviors that enable new HIV incidents, only a small number of individuals are not at risk. In Kenya, access to healthcare services for HIV/AIDS is limited; hence, most HIV deaths are from opportunistic infections.

The findings from this study indicated that high-risk sexual behaviors and attitudes and/or stigma to be the main contributors for HIV infection. Other variables

included alcohol consumption, domestic abuse among women, STDs, perceived risk of acquiring HIV, and circumcision among men. Furthermore, wealth, HIV/AIDS knowledge, and cognitive involvement/awareness (HIV/AIDS, VCT and STDs) did not have any effect on deterring high-risk sexual behaviors. The results point to the complexity HIV/AIDS presents especially due to stigma, judgment of risk, and cultural diversity. These issues need careful attention in the fight against HIV pandemic in Kenya.

Various challenges and opportunities for HIV/AIDS exist in Kenya. Challenges faced include religion particularly of the Catholic domination which opposes condom use, cultural diversity, and stigma that comes with HIV/AIDS or condom use which make it difficult for HIV/AIDS programs to function well, and if implemented without addressing these issues quite often have had little effect or have failed altogether on controlling HIV/AIDS through various preventive efforts.

HIV incident rates have been high, while death rates have decreased over the years due to ART treatments. The number of parents who have died from HIV/AIDS complications has resulted in an overwhelming number of orphans. The issue of HIV/AIDS orphans who might be infected themselves has proved challenging considering Kenya has nearly 1.4 million orphans. This has long-term social, psychological, and economic implications on Kenyans and their economic wellbeing. Also, while the government has been supportive of HIV/AIDS programs and eradication efforts by creating conducive environment, there are still major obstacles. Despite international monitoring, corruption of HIV/AIDS funds continues to present some problems. Moreover, poor to nonexistent laws on HIV/AIDS especially as it relates to

intentional transmission present a major challenge, while at the same time if effectively addressed could be a possible avenue in curbing the disease.

The findings present various opportunities for new areas of focal point for HIV/AIDS program managers who have to be strategic considering the diversity and areas of concerns — not to mention the diminishing funds that need to be well allocated. The notion that those who are knowledgeable on HIV/AIDS, aware of HIV/AIDS, STDs, and VCT, and wealth has been put to test and such groups of individuals might need equal HIV/AIDS intervention services. Therefore, the aforementioned measures should not be used to evaluate risky sexual behaviors in Kenya since they do not equate to being safe from HIV/AIDS exposure.

Niche HIV/AIDS programs drawing from research will be critical towards prevention efforts. However, program planners have to be considerate of the various cultural diversities that exist in Kenya. Furthermore, integration of such services with proven interventions such as HIV testing and maternal and child health will be crucial and needs to be scaled-up. HIV/AIDS program managers also need to identify the various stakeholders involved well in advance as equal partners for such efforts in order to increase a program success.

Recommendations for Future Research

The findings identified various approaches when using large complex survey datasets. In addition the researcher did not identify any study that has used the three datasets (women, men, and HIV) together to measure various predictor variables effect on HIV test. While some of the findings were counterintuitive, VCT (HIV testing), HIV/AIDS knowledge, perceived risk of acquiring HIV, domestic violence, cognitive

involvement/awareness, alcohol consumption, regional differences, wealth, STDs, and being uncircumcised (men) were associated with high-risk sexual behaviors, negative attitudes/stigma, and testing positive for HIV.

The findings point to future areas of research that are focused on various predictors that are population specific in nature. Possible areas include:

1) A focus on couples, HIV testing, contraception use, and mother to child transmission knowledge. Such a study will be interesting if couples are in a sero-discordant or sero-concordant situation. With ART, issues of desire to have children among couples can be measured. In addition, since HIV stigma is a major problem in Kenya, willingness to forgive, support and stay married among sero-discordant couples can be measured as well. This is in consideration of the intensified national and international efforts on scaling-up HIV testing.

2) Since the young (less than 34 years old) are at most risk of contracting HIV. Concurrent sexual partnerships and age at first sexual debut needs to be addressed when considering high-risk behaviors and HIV testing, and

3) The potential to study urban and rural HIV differences as it relates to domestic violence, religiosity, and perceived risk of acquiring HIV can be crucial. Urban and rural areas provide various challenges; hence, such findings can be crucial to HIV program developers and service providers. The current study also indicated that a notable number of Kenyans were underestimating their risk of acquiring HIV.

TABLE 3: Summary of main associations

Main Outcome Measures	Predictors	Agreement with Hypothesized Associations
<i>High-Risk Sexual Behavior</i>	<i>Voluntary Counseling and Testing</i>	<i>Counterintuitive</i>
<p>There was a strong association for both women and men in both unadjusted and adjusted results. Women and men who were tested for HIV were more likely to have had high-risk sexual behaviors (HRSB). These findings were unexpected; individuals who have been tested for HIV often change their behaviors. However, this suggests that majority of women and men at the time of seeking VCT are already practicing HRSB, an indication that proactive programs are not initiated earlier enough. Furthermore, such HRSB can only be identified and communicated during VCT. Another explanation for this scenario could be that of the dataset itself, since it is cross-sectional in nature we cannot follow up among those who were tested to see what behaviors have changed since the last testing. Furthermore, we are only capturing the risky behaviors at the time of VCT.</p>		
<i>High-Risk Sexual Behavior</i>	<i>Knowledge about HIV/AIDS</i>	<i>Counterintuitive</i>
<p>A counterintuitive association was observed between HRSB and being knowledgeable about HIV/AIDS in relation to sexual behavior, mother to child transmission and transmission beliefs for women and men. However, statistical significance was not attained for mother to child transmission and transmission beliefs among men. Therefore, HIV/AIDS knowledge is not a good indicator of determining risk aversion for the disease in Kenya. This reflects the HIV/AIDS situation in Kenya since those who are knowledgeable are also infected; hence, HIV is generalized and not specific in the population. Being knowledgeable about a disease is not enough, so people have to be taught how to effectively to prevent the disease itself. For example, how to use a condom properly, how the disease is transmitted and behaviors to avoid that can put one at risk of acquiring the disease.</p>		
<i>High-Risk Sexual Behavior</i>	<i>Perceived Risk of Acquiring HIV</i>	<i>Counterintuitive</i>
<p>There was a positive association between perceived risk of acquiring HIV and HRSB among women and men. This was counterintuitive to what was hypothesized in this study. Individuals who perceive themselves to be at high risk of acquiring HIV normally will engage in behaviors that will not expose them to the risk. While the association was significant for all levels, it declined with increasing perception of risk. The findings indicate that the majority of Kenyans are underestimating their risk of acquiring HIV, which is indicative of poor understanding of transmission modes or how to protect oneself from being infected with the virus that cause HIV/AIDS.</p>		

TABLE 3 (continued): Summary of main associations

<i>High-Risk Sexual Behavior</i>	<i>Domestic Violence</i>	<i>Counterintuitive</i>
<p>The findings did not support the hypothesis, which was unexpected. Women who experienced domestic violence were more likely to engage in HRSB. Furthermore, there was a statistical significance between HRSB among women who were physically abused, physically abused with a weapon, sexually abused, and emotionally abused with the rates ranging between 18%-40%. These findings might have been due to fear among women to report domestic violence during the survey interview. Prevalence of abuse might have scared women reporting such abuses thinking that their husbands might find out even with the assurance of confidentiality from the interviewer. Also, if their husbands were within the vicinity at the time of the interview the answers given by women could have been skewed due to fear of finding out.</p>		
<i>High-Risk Sexual Behavior</i>	<i>Cognitive Involvement/Awareness</i>	<i>Counterintuitive</i>
<p>Nearly all Kenyans were mentally involved and aware on issues of HIV/AIDS, almost 85% on sexually transmitted diseases, and 55% on VCT. After adjusting for confounding, the findings were counterintuitive, in that both women and men were more likely to engage into HRSB. However, statistical significance was not attained for VCT among women. The explanation for this scenario is true as that one for HIV/AIDS knowledge. Being involved/aware mentally of HIV/AIDS need to be supported by other interventions for individuals to abstain from risky behaviors. Furthermore, one can be aware of a risk of a certain disease, but they need to be equipped on ways to prevent themselves from acquiring such diseases.</p>		
<i>Negative Attitude/Stigma Towards HIV/AIDS</i>	<i>Alcohol Consumption</i>	<i>Counterintuitive (Women) Positive (Men)</i>
<p>Among women, only unadjusted results reached significant levels. We found that women who consumed alcohol in urban areas were 39% and 44% less likely to have negative attitudes/stigma for HIV/AIDS and sex education on condoms in schools compare to those who did not consume alcohol. Those in rural areas were more likely (22%) to have negative attitudes/stigma for HIV/AIDS compare to those who did not consume alcohol; however, there was no statistical significance. For men, those who consumed alcohol in rural areas were 31% more likely to have negative attitudes/stigma for HIV/AIDS compare to those who did not consume alcohol. For those in urban areas, they were only (22%) more likely to have negative attitudes/stigma for HIV/AIDS compare to those who did not consume alcohol; however, there was no statistical significance.</p>		

TABLE 3 (continued): Summary of main associations

<i>Negative Attitude Towards Women</i>	<i>Alcohol Consumption</i>	<i>Positive</i>
<p>Women who consumed alcohol were 14% and 06% more likely to have negative attitudes towards women for husband controlling attitudes and sexual attitudes about their husbands respectively compared to those who did not consume alcohol; however, there was no statistical significance. Among men, this negative attitude towards women was 68% and 42% more likely for husband controlling attitudes and husband sexual attitudes respectively.</p>		
<i>Negative Attitude Towards Condom Use</i>	<i>Region</i>	<i>Positive</i>
<p>Negative attitudes towards condom use among men were prevalent in most regions for condom perception and sexual pleasure. However, after controlling for confounding, men from Eastern, Rift Valley, and North Eastern provinces were more likely to have negative attitudes towards condom use for condom perception at 37%, 13%, and 25% respectively compared to those from Nairobi province. Also, men from Central province were 2.24 times more likely to have negative attitudes towards condom use for disease protection compared to those from Nairobi province. Furthermore, men from Coast province were more likely (41%) to have negative attitudes towards condom use for sexual pleasure compared to those from Nairobi province.</p>		
<i>Negative Attitude Towards Condom Advertisement</i>	<i>Region</i>	<i>Positive</i>
<p>Majority of women resisted condom advertisements. However, after controlling for confounding, women from central (36%) and North Eastern (40%) provinces and men from North Eastern province (62%) were more likely to have negative attitudes towards condom advertisements compared to those who were from Nairobi. Also, men from Coast province (33%) were less likely to have negative attitudes towards condom advertisements compared to those who were from Nairobi.</p>		
<i>High-Risk Sexual Behavior</i>	<i>Wealth Index</i>	<i>Positive</i>
<p>The researcher found a positive association between HRSB and wealth among richest men in Kenya. After adjusting for confounding, the results showed a slight association in that men in the richer and richest category were more likely to engage in HRSB. However, there was no statistical significance. Moreover, among these categories, women were 6% and 9% less likely to engage in HRSB compared to their poorest counterparts. This result suggests that both women and men in the richer and richest (wealthiest) categories are engaging in HRSB with the affinity being higher among men.</p>		

TABLE 3 (continued): Summary of main associations

<i>HIV Testing</i>	<i>Sexually Transmitted Diseases</i>	<i>Positive</i>
<p>There was a notable positive association between HIV positive test and sexually transmitted diseases (STDs) among women and men. This indicates how closely STDs are related to HIV mainly through the mode they are transmitted. Hence, aggressive treatment of STDs can also reduce HIV transmission. Incorporating services such as maternal and child health, STDs screening, and HIV testing can be crucial in reducing HIV transmission.</p>		
<i>HIV Testing</i>	<i>Domestic Abuse</i>	<i>Positive</i>
<p>The researcher found a positive association between HIV positive test and physical abuse with a weapon. Women who were physically abused with a weapon were more likely (69%) to test positive for HIV compared to those who were not abused. Also, women who were physically abused (13%) and emotionally abused (32%) were more likely to test positive for HIV compared to those who were not abused. However, there was no statistical significance.</p>		
<i>HIV Testing</i>	<i>Circumcision</i>	<i>Positive</i>
<p>A notable positive association between HIV positive test and circumcision was observed as well. Men who were uncircumcised 4.23 times more likely to test positive for HIV compared to those who were circumcised. The implication of this finding was that circumcision is protective factor for HIV infection. However, implementing massive circumcision efforts in Kenya has the dilemma of lack of enough resources (money and personnel) to accomplish such efforts.</p>		

TABLE 4: Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

	WOMEN		MEN	
	%	N	%	N
High-Risk Sexual Behavior				
No	31	2587	28	1020
Yes	69	5584	72	2555
Voluntary Counseling and Testing				
HIV: Not Tested	85	6811	84	2954
HIV: Tested	15	1239	16	585
HIV/AIDS Knowledge: Sexual Transmission Behavior				
Not Knowledgeable	06	448	04	144
Knowledgeable	94	6462	96	3115
HIV/AIDS Knowledge: Mother to Child Transmission				
Not Knowledgeable	07	498	09	263
Knowledgeable	93	6546	91	2859
HIV/AIDS Knowledge: Transmission Beliefs				
Not Knowledgeable	10	644	07	216
Knowledgeable	90	6264	93	3040
Perceived Risk of Acquiring HIV				
No Risk	36	3014	34	1243
Small Risk	40	3105	52	1815
Moderate Risk	15	1198	09	321
High Risk	09	715	05	159
Abuse: Physical Abuse				
No Abuse	57	2503	-	-
Abused	43	1805	-	-

TABLE 4 (continued): Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

	WOMEN		MEN	
	%	N	%	N
Abuse: Physical Abuse-Weapon				
No Abuse	59	4535	-	-
Abused	41	3510	-	-
Abuse: Sexual				
No Abuse	84	3703	-	-
Abused	16	606	-	-
Abuse: Emotional Abuse				
No Abuse	75	3274	-	-
Abused	25	1038	-	-
Negative Attitudes/Stigma: HIV/AIDS				
No	42	3376	50	1812
Yes	58	4660	50	1720
Negative Attitudes/Stigma: Sex Ed. Condoms				
No	59	4535	-	-
Yes	41	3510	-	-
Negative Attitudes Towards Women: Husband Controlling Attitudes				
No	32	2738	37	1333
Yes	68	5441	63	2235
Negative Attitudes Towards Women: Women Sexual Attitudes-Husband				
No	43	3461	49	1724
Yes	57	4712	51	1828

TABLE 4 (continued): Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

		WOMEN		MEN	
		%	N	%	N
Negative Attitudes Towards Women: Husband Sexual Attitudes					
No	-	-	-	61	2233
Yes	-	-	-	39	1338
Negative Attitudes Towards Condoms: Condom Perception					
No	-	-	-	31	1140
Yes	-	-	-	69	2425
Negative Attitudes Towards Condoms: Disease Protection					
No	-	-	-	78	2708
Yes	-	-	-	22	863
Negative Attitudes Towards Condoms: Sexual Pleasure					
No	-	-	-	21	712
Yes	-	-	-	79	2861
Negative attitudes Towards condom advertisement					
No	63	5009	70	2463	
Yes	37	3174	30	1112	
Cognitive Involvement and Awareness: HIV/AIDS					
No	01	129	01	35	
Yes	99	8052	99	3541	
Cognitive Involvement and Awareness: Voluntary Counseling and Testing					
No	51	4004	38	1300	
Yes	49	4042	62	2239	

TABLE 4 (continued): Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

	WOMEN		MEN	
	%	N	%	N
Cognitive Involvement and Awareness: Sexually Transmitted Diseases				
No	20	1845	12	448
Yes	80	6334	88	3091
Wealth				
Poorest	17	1376	15	540
Poorer	18	1306	17	556
Middle	18	1381	18	615
Richer	21	1568	22	752
Richest	26	2564	28	1115
Age				
15-19	23	1820	24	829
20-24	21	1710	19	674
25-29	17	1400	14	514
30-34	13	1116	12	421
35-39	11	859	11	390
40-44	09	780	09	314
45-49	06	510	05	206
50-54	-	-	06	230
Education				
<Primary School	13	1291	06	296
Primary School	56	4233	55	1853
Post Primary/Vocational/Secondary	25	2090	29	1043
College/University	06	581	10	386

TABLE 4 (continued): Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

	WOMEN		MEN	
	%	N	%	N
Province				
Nairobi	10	1169	11	493
Central	15	1314	16	621
Coast	08	938	07	375
Eastern	16	993	16	468
Nyanza	15	1025	13	434
Rift Valley	23	1328	24	586
Western	11	991	11	435
North Eastern	02	437	02	166
Occupation				
Agriculture/Self-Employed	30	2175	32	1050
Teaching and Management	04	374	08	277
Sales	15	1230	09	329
Other Occupations	13	1160	28	1025
Not Working	38	3247	23	885
Sexually Transmitted Diseases				
Does not have STD(s)	96	7885	97	3468
Has STD(s)	04	292	03	86
Religion				
Protestant	65	5045	60	2055
Roman Catholic	25	1919	27	913
Muslim	08	1025	06	381
Other Religions	02	196	07	228

TABLE 4 (continued): Study population characteristics, women and men percentage and number, objectives 1, 2, 3, and 4, KDHS-2003

	WOMEN		MEN	
	%	N	%	N
Residence				
Urban	25	2751	25	1150
Rural	75	5444	75	2428
HIV/AIDS Perceived Severity				
Low	33	2429	31	912
High	67	4376	69	2041
Circumcision				
Circumcised	32	2724	84	3052
Uncircumcised	68	5450	16	518
Self-Efficacy				
Present	71	5686	87	3050
Not Present	29	2370	13	490
Ethnicity				
Kikuyu	23	1977	22	845
Luhya	15	1229	15	520
Luo	12	853	12	390
Kalenjin	10	643	12	324
Kamba	11	786	12	371
Kisii	06	454	05	208
Meru	06	386	06	172
Others	17	1867	16	748
Marital Status				
Never Married	30	2466	45	1584
Currently Married	60	4876	51	1855
Formerly Married	10	853	04	139
Alcohol Consumption				
No	95	7753	70	2540
Yes	05	432	30	1033

TABLE 5: Bivariate analysis, women and men percentage and number of the association between selected characteristics and high-risk sexual behavior, objective 1, 2 and 4, KDHS-2003

Study Characteristics	WOMEN				MEN				
	No		Yes		No		Yes		
	%	N	%	N	%	N	%	N	
Voluntary Counseling and Testing									
HIV: Not Tested	89	2231	83	4567	90	895	82	2059	<0.001
HIV: Tested	11	285	17	951	10	105	18	479	
HIV/AIDS Knowledge: Sexual Transmission Behavior									
Not Knowledgeable	09	193	06	254	08	70	03	74	<0.001
Knowledgeable	91	1919	94	4530	92	806	97	2308	
HIV/AIDS Knowledge: Mother to Child Transmission									
Not Knowledgeable	09	196	06	302	09	80	08	183	0.348
Knowledgeable	91	1950	94	4583	91	749	92	2109	
HIV/AIDS Knowledge: Transmission Beliefs									
Not Knowledgeable	10	189	10	455	08	56	07	160	0.655
Knowledgeable	90	1922	90	4328	92	819	93	2220	
Perceived Risk of Acquiring HIV									
No Risk	55	1392	27	1617	47	484	29	759	
Small Risk	35	850	42	2249	46	445	54	1369	<0.001
Moderate Risk	06	156	20	1040	04	41	12	280	
High Risk	04	110	11	604	03	29	05	130	
Abuse: Physical Abuse									
No Abuse	51	184	57	2313	0.104	-	-	-	-
Abused	49	176	43	1628	-	-	-	-	-

TABLE 5 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and high-risk sexual behavior, objective 1, 2 and 4, KDHS-2003

Study Characteristics	WOMEN						MEN					
	No			Yes			No			Yes		
	%	N	P-values	%	N	P-values	%	N	P-values	%	N	P-values
Abuse: Physical Abuse-Weapon												
No Abuse	53	1275	<0.001	62	3252	<0.001	-	-	-	-	-	-
Abused	47	1238		38	2264		-	-	-	-	-	-
Abuse: Sexual												
No Abuse	80	300	0.058	84	3397	0.058	-	-	-	-	-	-
Abused	20	62		16	543		-	-	-	-	-	-
Abuse: Emotional Abuse												
No Abuse	67	246	0.002	76	3021	0.002	-	-	-	-	-	-
Abused	33	116		24	922		-	-	-	-	-	-
Cognitive Involvement and Awareness: HIV/AIDS												
No	02	68	<0.001	01	61	<0.001	01	20	01	15	<0.001	
Yes	98	2516		99	5520		99	1000	99	2540		
Cognitive Involvement and Awareness: Voluntary Counseling and Testing												
No	49	1209	0.069	52	2791	0.069	45	429	35	871	<0.001	
Yes	51	1306		48	2724		55	571	65	1667		
Cognitive Involvement and Awareness: Sexually Transmitted Diseases												
No	29	791	<0.001	16	1052	<0.001	26	264	06	184	<0.001	
Yes	71	1793		84	4527		74	736	94	2354		

TABLE 5 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and high-risk sexual behavior, objective 1, 2 and 4, KDHS-2003

Study Characteristics	WOMEN						MEN								
	No			Yes			High-Risk Sexual Behavior			No			Yes		
	%	N		%	N		P-values	%	N		%	N		P-values	
Wealth															
Poorest	15	396	17	979	15	157		15	157	15	383				
Poorer	17	384	19	920	20	178		20	178	16	378				
Middle	17	414	19	964	22	212	0.017	22	212	17	403			<0.001	
Richer	22	508	20	1056	21	207		21	207	22	544				
Richest	29	885	25	1665	22	266		22	266	30	847				
Age															
15-19	49	1222	11	597	60	590		60	590	10	239				
20-24	20	520	21	1189	22	231		22	231	18	443				
25-29	08	211	21	1180	09	98		09	98	16	416				
30-34	06	167	17	946	03	32	<0.001	03	32	15	388			<0.001	
35-39	05	138	13	719	02	23		02	23	15	367				
40-44	06	168	11	607	02	22		02	22	11	292				
45-49	06	161	06	346	01	11		01	11	07	194				
50-54	-	-	-	-	01	13		01	13	08	216				
Education															
<Primary School	13	384	13	904	05	69		05	69	07	227				
Primary School	51	1241	58	2984	59	571	<0.001	59	571	52	1281			<0.001	
Post Primary/Vocational/Secondary	29	755	23	1328	30	318		30	318	28	723				
College/University	07	207	06	368	06	62		06	62	13	324				

TABLE 5 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and high-risk sexual behavior, objective 1, 2 and 4, KDHS-2003

Study Characteristics	WOMEN						MEN					
	No			Yes			High-Risk Sexual Behavior			High-Risk Sexual Behavior		
	%	N	%	%	N	%	P-values	%	N	%	N	P-values
Province												
Nairobi	11	435	10	728	10	132		12	360			
Central	15	441	13	864	19	208		14	412			
Coast	08	270	09	666	06	82		08	293			
Eastern	14	282	17	709	19	157	<0.001	15	311	<0.001		
Nyanza	12	247	16	777	13	129		13	305			
Rift Valley	25	459	21	866	16	118		26	467			
Western	13	321	11	670	14	140		10	295			
North Eastern	02	132	03	304	03	54		02	112			
Sexually Transmitted Diseases												
Does not have STD(s)	98	2545	95	5324	99	1013	<0.001	96	2454	<0.001		
Has STD(s)	02	38	05	254	01	4		04	82			
Occupation												
Agriculture/Self-Employed	18	423	36	1748	19	195		37	854			
Teaching and Management	04	99	05	272	04	36		10	240			
Sales	10	263	16	963	05	48	<0.001	10	281	<0.001		
Other Occupations	15	407	13	751	13	132		34	892			
Not Working	53	1391	30	1845	59	605		09	280			
Residence												
Urban	28	956	24	1782	22	288	0.011	27	860	0.003		
Rural	72	1631	76	3802	78	732		73	1695			

TABLE 5 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and high-risk sexual behavior, objective 1, 2 and 4, KDHS-2003

Study Characteristics	WOMEN						MEN					
	No			Yes			No			Yes		
	%	N	P-values	%	N	P-values	%	N	P-values	%	N	P-values
Religion												
Protestant	64	1589	65	3438	66	640	57	1413				
Roman Catholic	26	618	25	1299	21	205	28	708				<0.001
Muslim	08	327	07	694	07	117	07	264				
Other Religions	02	51	03	145	06	58	08	169				
Circumcision												
Circumcised	26	687	36	2032	77	815	86	2237				<0.001
Uncircumcised	74	1895	64	3545	23	204	14	314				
HIV/AIDS Perceived Severity												
Low	35	835	32	1587	32	289	31	623				0.391
High	65	1394	68	2976	68	606	69	1435				
Self-Efficacy												
Present	63	1619	74	4055	74	757	91	2292				<0.001
Not Present	37	897	26	1469	26	243	09	247				
Ethnicity												
Kikuyu	25	684	21	1281	23	257	22	587				
Luhya	15	391	14	836	14	142	14	377				
Luo	10	221	13	630	10	98	12	292				
Kalenjin	11	214	10	428	10	83	12	241				0.037
Kamba	10	219	13	566	15	122	11	249				
Kisii	05	121	07	333	07	68	06	140				
Meru	05	107	06	279	05	39	07	133				
Others	19	630	16	1231	16	211	16	536				
Alcohol Consumption												
No	96	2484	94	5247	89	907	63	1633				<0.001
Yes	04	100	06	332	11	113	37	919				

TABLE 6: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior and study characteristics in a univariate logistic regression model, women and men, objective 1, 2 and 4, KDHS-2003

	WOMEN				MEN					
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	
High-Risk Sexual Behavior										
Voluntary Counseling and Testing										
HIV: Not Tested	Ref.†									
HIV: Tested	1.69	0.000	1.47	1.95	2.08	1.64	2.08	0.000	1.64	2.63
HIV/AIDS Knowledge: Sexual Transmission Behavior										
Not Knowledgeable	Ref.									
Knowledgeable	1.71	0.000	1.35	2.16	2.87	1.91	2.87	0.000	1.91	4.32
HIV/AIDS Knowledge: Mother to Child Transmission										
Not Knowledgeable	Ref.									
Knowledgeable	1.48	0.000	1.20	1.83	1.16	0.85	1.16	0.348	0.85	1.57
HIV/AIDS Knowledge: Transmission Beliefs										
Not Knowledgeable	Ref.									
Knowledgeable	1.00	0.979	0.81	1.22	1.09	0.73	1.09	0.655	0.73	1.63
Perceived Risk of Acquiring HIV										
No Risk	Ref.									
Small Risk	2.43	0.000	2.16	2.72	1.91	1.59	1.91	0.000	1.59	2.31
Moderate Risk	2.48	0.000	2.21	2.77	2.22	1.83	2.22	0.000	1.83	2.70
High Risk	1.74	0.000	1.60	1.89	1.47	1.24	1.47	0.000	1.24	1.74
Abuse: Physical Abuse										
No Abuse	Ref.									
Abused	0.80	0.105	0.61	1.05	-	-	-	-	-	
Abuse: Physical Abuse-Weapon										
No Abuse	Ref.									
Abused	0.69	0.000	0.62	0.77	-	-	-	-	-	
Abuse: Sexual										
No Abuse	Ref.									
Abused	0.72	0.058	0.51	1.01	-	-	-	-	-	
Abuse: Emotional Abuse										
No Abuse	Ref.									
Abused	0.67	0.002	0.52	0.87	-	-	-	-	-	

† Referent category

TABLE 6 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior and study characteristics in a univariate logistic regression model, women and men, objective 1, 2 and 4, KDHS-2003

	WOMEN			MEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
High-Risk Sexual Behavior						
Cognitive Involvement and Awareness: HIV/AIDS						
No	Ref.			Ref.		
Yes	2.44	0.000	1.64 3.63	5.27	0.000	2.36 11.75
Cognitive Involvement and Awareness: Voluntary Counseling and Testing						
No	Ref.			Ref.		
Yes	0.89	0.069	0.79 1.01	1.53	0.000	1.29 1.82
Cognitive Involvement and Awareness: Sexually Transmitted Diseases						
No	Ref.			Ref.		
Yes	2.16	0.000	1.86 2.52	5.47	0.000	4.41 6.78
Wealth						
Poorest	Ref.			Ref.		
Poorer	0.99	0.896	0.82 1.20	0.80	0.138	0.59 1.08
Middle	0.98	0.660	0.88 1.08	0.86	0.018	0.76 0.98
Richer	0.94	0.078	0.88 1.01	1.01	0.853	0.92 1.11
Richest	0.94	0.014	0.89 0.99	1.08	0.036	1.00 1.15
Age						
15-19	Ref.			Ref.		
20-24	4.82	0.000	4.05 5.74	4.73	0.000	3.66 6.12
25-29	3.44	0.000	3.12 3.78	3.20	0.000	2.78 3.69
30-34	2.29	0.000	2.11 2.48	3.10	0.000	2.67 3.60
35-39	1.81	0.000	1.70 1.93	2.62	0.000	2.31 2.97
40-44	1.50	0.000	1.43 1.58	1.99	0.000	1.77 2.23
45-49	1.31	0.000	1.26 1.36	1.81	0.000	1.62 2.02
50-54	-	-	-	1.75	0.000	1.59 1.93
Education						
<Primary School	Ref.			Ref.		
Primary School	1.07	0.540	0.86 1.32	0.63	0.027	0.41 0.95
Post Primary/Vocational/Secondary	0.87	0.015	0.77 0.97	0.82	0.070	0.67 1.02
College/University	0.92	0.071	0.84 1.01	1.16	0.050	1.00 1.35

TABLE 6 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior and study characteristics in a univariate logistic regression model, women and men, objective 1, 2 and 4, KDHS-2003

High-Risk Sexual Behavior Province	WOMEN				MEN				
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Nairobi	Ref.			Ref.			Ref.		
Central	1.12	0.337	0.89	1.40	0.004	0.51	0.67	0.004	0.51
Coast	1.19	0.005	1.06	1.35	0.179	0.95	1.11	0.179	0.95
Eastern	1.12	0.005	1.04	1.22	0.048	0.79	0.89	0.048	0.79
Nyanza	1.16	0.000	1.09	1.24	0.409	0.88	0.96	0.409	0.88
Rift Valley	1.00	0.836	0.96	1.05	0.027	1.01	1.08	0.027	1.01
Western	1.02	0.446	0.97	1.06	0.94	0.89	0.94	0.021	0.89
North Eastern	1.04	0.093	0.99	1.10	0.059	0.88	0.94	0.059	0.88
Occupation									
Agriculture/Self-Employed	Ref.			Ref.			Ref.		
Teaching and Management	0.77	0.089	0.57	1.04	0.115	0.91	1.46	0.115	0.91
Sales	0.96	0.540	0.86	1.08	0.414	0.89	1.08	0.414	0.89
Other Occupations	0.77	0.000	0.72	0.82	0.047	1.00	1.09	0.047	1.00
Not Working	0.74	0.000	0.72	0.77	0.000	0.50	0.54	0.000	0.50
Sexually Transmitted Diseases									
Does not have STD(s)	Ref.			Ref.			Ref.		
Has STD(s)	3.16	0.000	2.10	4.73	0.000	2.50	7.74	0.000	2.50
Religion									
Protestant	Ref.			Ref.			Ref.		
Roman Catholic	0.98	0.748	0.87	1.11	0.000	1.23	1.54	0.000	1.23
Muslim	0.98	0.668	0.87	1.09	0.848	0.87	1.01	0.848	0.87
Other Religions	1.11	0.167	0.96	1.28	0.045	1.00	1.13	0.045	1.00
Residence									
Urban	Ref.			Ref.			Ref.		
Rural	1.21	0.011	1.05	1.39	0.003	0.62	0.75	0.003	0.62
HIV/AIDS Perceived Severity									
Low	Ref.			Ref.			Ref.		
High	1.17	0.015	1.03	1.33	0.391	0.90	1.09	0.391	0.90

TABLE 6 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior and study characteristics in a univariate logistic regression model, women and men, objective 1, 2 and 4, KDHS-2003

High-Risk Sexual Behavior	WOMEN			MEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Circumcision						
Circumcised	Ref.			Ref.		
Uncircumcised	0.61	0.000	0.53 0.70	0.55	0.000	0.44 0.71
Self-Efficacy						
Present	Ref.			Ref.		
Not Present	0.59	0.000	0.52 0.67	0.28	0.000	0.23 0.35
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	1.11	0.290	0.91 1.36	1.09	0.527	0.83 1.44
Luo	1.29	0.000	1.15 1.44	1.15	0.099	0.97 1.37
Kalenjin	1.01	0.746	0.94 1.08	1.10	0.062	1.00 1.22
Kamba	1.08	0.003	1.03 1.14	0.94	0.137	0.86 1.02
Kisii	1.08	0.001	1.03 1.13	0.99	0.757	0.92 1.06
Meru	1.06	0.051	1.00 1.12	1.06	0.138	0.98 1.14
Others	1.00	0.882	0.97 1.03	1.02	0.394	0.98 1.06
Marital Status						
Never Married	Ref.			Ref.		
Currently Married	46.52	0.000	38.10 56.78	44.13	0.000	33.33 58.42
Formerly Married	1.77	0.000	1.60 1.95	1.95	0.000	1.56 2.43
Alcohol Consumption						
No	Ref.			Ref.		
Yes	1.49	0.005	1.13 1.97	4.37	0.000	3.43 5.57

TABLE 7: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, voluntary counseling and testing and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

High-Risk Sexual Behavior Voluntary Counseling and Testing	Women			Men		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	1.51	0.000	1.24 - 1.82	1.33	0.087	0.96 - 1.85
Age						
15-19	Ref.			Ref.		
20-24	4.74	0.000	3.91 - 5.75	2.50	0.000	1.84 - 3.41
25-29	3.37	0.000	3.03 - 3.75	2.19	0.000	1.85 - 2.59
30-34	2.17	0.000	1.98 - 2.38	2.44	0.000	2.06 - 2.90
35-39	1.71	0.000	1.60 - 1.84	2.21	0.000	1.92 - 2.54
40-44	1.45	0.000	1.38 - 1.53	1.77	0.000	1.58 - 2.00
45-49	1.27	0.000	1.21 - 1.33	1.63	0.000	1.43 - 1.84
50-54	-	-	-	1.66	0.000	1.50 - 1.84
Education						
<Primary School	Ref.			Ref.		
Primary School	1.62	0.002	1.19 - 2.19	1.49	0.098	0.93 - 2.40
Post Primary/Vocational/Secondary	0.95	0.549	0.80 - 1.12	1.11	0.397	0.87 - 1.42
College/University	0.80	0.001	0.71 - 0.91	1.16	0.150	0.95 - 1.42
Province						
Nairobi	Ref.			Ref.		
Central	0.93	0.679	0.68 - 1.29	0.58	0.031	0.35 - 0.95
Coast	1.32	0.003	1.10 - 1.58	1.42	0.002	1.14 - 1.77
Eastern	1.12	0.068	0.99 - 1.26	0.93	0.388	0.78 - 1.10
Nyanza	1.13	0.008	1.03 - 1.24	1.09	0.283	0.93 - 1.26
Rift Valley	0.96	0.180	0.90 - 1.02	1.21	0.001	1.09 - 1.34
Western	1.02	0.607	0.96 - 1.08	1.01	0.758	0.93 - 1.10
North Eastern	1.17	0.001	1.06 - 1.29	1.14	0.018	1.02 - 1.26

TABLE 7 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, voluntary counseling and testing and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

High-Risk Sexual Behavior	Women			Men		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	2.17	0.000	1.89	2.49	0.000	1.87
Moderate Risk	2.09	0.000	1.85	2.36	0.000	1.81
High Risk	1.57	0.000	1.43	1.72	0.000	1.22
Sexually Transmitted Diseases						
Does not have STD(s)	Ref.			Ref.		
Has STD(s)	1.87	0.023	1.09	3.22	0.015	1.34
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.06	0.786	0.71	1.57	0.135	0.37
Sales	0.93	0.330	0.81	1.07	0.370	0.89
Other Occupations	0.83	0.000	0.76	0.90	0.146	0.97
Not Working	0.88	0.000	0.85	0.92	0.000	0.67
Residence						
Urban	Ref.			Ref.		
Rural	1.17	0.300	0.87	1.58	0.534	0.78
Wealth						
Poorest	Ref.			-		-
Poorer	0.95	0.678	0.75	1.20	-	-
Middle	1.01	0.921	0.88	1.15	-	-
Richer	1.00	0.986	0.91	1.10	-	-
Richest	1.03	0.504	0.94	1.13	-	-
Religion						
Protestant	Ref.			-		-
Roman Catholic	1.02	0.769	0.87	1.20	-	-
Muslim	0.94	0.512	0.79	1.13	-	-
Other Religions	1.08	0.350	0.91	1.29	-	-
Circumcision						
Circumcised	Ref.			-		-
Uncircumcised	0.79	0.012	0.66	0.95	-	-

TABLE 8: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, HIV/AIDS knowledge and study characteristics in a multivariate logistic regression model, women, KDHS-2003

WOMEN											
High-Risk Sexual Behavior	Sexual Behavior Transmission			Mother to Child Transmission			Transmission Beliefs				
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs		
HIV/AIDS Knowledge											
Not Knowledgeable	Ref.			Ref.			Ref.				
Knowledgeable	1.29	0.087	0.96 1.72	1.49	0.002	1.16 1.92	1.28	0.026	1.03 1.59		
Age											
15-19	Ref.			Ref.			Ref.				
20-24	4.83	0.000	3.95 5.91	4.59	0.000	3.72 5.65	4.88	0.000	3.98 5.97		
25-29	3.41	0.000	3.05 3.82	3.38	0.000	3.03 3.77	3.43	0.000	3.07 3.84		
30-34	2.25	0.000	2.05 2.47	2.21	0.000	2.01 2.42	2.26	0.000	2.05 2.48		
35-39	1.71	0.000	1.59 1.83	1.70	0.000	1.58 1.83	1.72	0.000	1.60 1.84		
40-44	1.45	0.000	1.37 1.53	1.44	0.000	1.36 1.53	1.45	0.000	1.37 1.53		
45-49	1.27	0.000	1.21 1.33	1.27	0.000	1.21 1.33	1.28	0.000	1.22 1.34		
Education											
<Primary School	Ref.			Ref.			Ref.				
Primary School	1.54	0.005	1.15 2.08	1.61	0.003	1.18 2.21	1.50	0.007	1.12 2.01		
Post Primary/Vocational/Secondary	0.92	0.297	0.78 1.08	0.92	0.351	0.77 1.10	0.90	0.192	0.77 1.05		
College/University	0.79	0.000	0.70 0.89	0.80	0.001	0.70 0.91	0.78	0.000	0.69 0.88		
Province											
Nairobi	Ref.			Ref.			Ref.				
Central	0.97	0.870	0.71 1.34	0.97	0.833	0.71 1.31	0.97	0.877	0.71 1.35		
Coast	1.22	0.038	1.01 1.47	1.25	0.007	1.06 1.46	1.23	0.031	1.02 1.49		
Eastern	1.12	0.074	0.99 1.27	1.11	0.085	0.99 1.26	1.12	0.069	0.99 1.27		
Nyanza	1.13	0.015	1.02 1.24	1.12	0.022	1.02 1.23	1.13	0.011	1.03 1.25		
Rift Valley	0.97	0.364	0.90 1.04	0.97	0.288	0.91 1.03	0.96	0.316	0.90 1.04		
Western	0.99	0.719	0.92 1.06	1.01	0.841	0.95 1.07	0.99	0.786	0.93 1.06		
North Eastern	1.11	0.040	1.01 1.24	1.16	0.001	1.06 1.27	1.11	0.044	1.00 1.23		

TABLE 8 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, HIV/AIDS knowledge and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior	WOMEN														
	Sexual Behavior			Transmission			Mother to Child			Transmission			Beliefs		
Occupation	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Agriculture/Self-Employed	Ref.			Ref.			Ref.			Ref.			Ref.		
Teaching and Management	0.96	0.817	0.65	1.40	0.831	0.71	1.54	0.94	0.753	0.64	1.37				
Sales	0.94	0.337	0.81	1.07	0.763	0.86	1.12	0.93	0.315	0.81	1.07				
Other Occupations	0.80	0.000	0.74	0.87	0.000	0.76	0.90	0.80	0.000	0.74	0.87				
Not Working	0.85	0.000	0.82	0.89	0.000	0.84	0.92	0.85	0.000	0.82	0.89				
Perceived Risk of Acquiring HIV															
No Risk	Ref.			Ref.			Ref.			Ref.			Ref.		
Small Risk	2.20	0.000	1.90	2.54	0.000	1.87	2.53	2.20	0.000	1.90	2.55				
Moderate Risk	2.11	0.000	1.85	2.41	0.000	1.84	2.38	2.11	0.000	1.85	2.41				
High Risk	1.56	0.000	1.42	1.70	0.000	1.39	1.71	1.56	0.000	1.42	1.70				
Sexually Transmitted Diseases															
Does not have STD(s)	Ref.			Ref.			Ref.			Ref.			Ref.		
Has STD(s)	1.70	0.058	0.98	2.94	0.076	0.95	2.89	1.68	0.063	0.97	2.90				
Religion															
Protestant	Ref.			Ref.			Ref.			Ref.			Ref.		
Roman Catholic	1.01	0.936	0.86	1.18	0.918	0.84	1.18	1.01	0.898	0.86	1.19				
Muslim	0.96	0.712	0.79	1.17	0.309	0.76	1.09	0.96	0.694	0.79	1.17				
Other Religions	0.95	0.620	0.76	1.18	0.625	0.86	1.29	0.95	0.650	0.76	1.19				
Residence															
Urban	Ref.			Ref.			Ref.			Ref.			Ref.		
Rural	0.99	0.945	0.77	1.28	0.806	0.82	1.30	1.00	0.991	0.77	1.30				

TABLE 9: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, HIV/AIDS knowledge and study characteristics in a multivariate logistic regression model, men, KDHS-2003

High-Risk Sexual Behavior	MEN											
	Sexual Behavior Transmission				Mother to Child Transmission				Transmission Beliefs			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
HIV/AIDS Knowledge												
Not Knowledgeable	Ref.			Ref.			Ref.			Ref.		
Knowledgeable	1.76	0.046	1.01 3.06	1.39	0.134	0.90 2.13	1.26	0.335	0.79	2.01		
Age												
15-19	Ref.			Ref.			Ref.			Ref.		
20-24	2.41	0.000	1.70 3.41	2.21	0.000	1.56 3.12	2.46	0.000	1.74	3.48		
25-29	2.16	0.000	1.79 2.60	2.10	0.000	1.76 2.51	2.19	0.000	1.83	2.64		
30-34	2.37	0.000	1.98 2.83	2.28	0.000	1.91 2.73	2.40	0.000	2.01	2.87		
35-39	2.14	0.000	1.85 2.47	2.28	0.000	1.94 2.68	2.16	0.000	1.87	2.49		
40-44	1.77	0.000	1.55 2.01	1.73	0.000	1.52 1.97	1.78	0.000	1.56	2.03		
45-49	1.63	0.000	1.42 1.86	1.61	0.000	1.40 1.85	1.64	0.000	1.43	1.88		
50-54	1.64	0.000	1.46 1.83	1.69	0.000	1.48 1.92	1.64	0.000	1.47	1.84		
Education												
<Primary School	Ref.			Ref.			Ref.			Ref.		
Primary School	1.23	0.508	0.67 2.24	1.22	0.586	0.59 2.51	1.21	0.542	0.65	2.25		
Post Primary/Vocational/Secondary	0.98	0.904	0.72 1.34	0.98	0.896	0.68 1.41	0.97	0.862	0.71	1.34		
College/University	1.10	0.437	0.87 1.38	1.14	0.373	0.86 1.51	1.09	0.490	0.86	1.38		
Province												
Nairobi	Ref.			Ref.			Ref.			Ref.		
Central	0.57	0.028	0.34 0.94	0.49	0.008	0.28 0.83	0.57	0.033	0.34	0.95		
Coast	1.55	0.001	1.19 2.02	1.35	0.025	1.04 1.77	1.49	0.003	1.15	1.93		
Eastern	0.94	0.519	0.78 1.13	0.92	0.396	0.77 1.11	0.94	0.511	0.78	1.13		
Nyanza	1.09	0.298	0.93 1.27	1.07	0.384	0.91 1.26	1.09	0.263	0.93	1.28		
Rift Valley	1.21	0.000	1.09 1.34	1.20	0.001	1.07 1.33	1.21	0.000	1.09	1.35		
Western	1.01	0.851	0.93 1.10	1.01	0.872	0.92 1.10	1.01	0.879	0.92	1.10		
North Eastern	1.03	0.687	0.90 1.18	1.07	0.314	0.93 1.24	1.02	0.722	0.89	1.17		

TABLE 9 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, HIV/AIDS knowledge and study characteristics in a multivariate logistic regression model, men, KDHS-2003

High-Risk Sexual Behavior	MEN											
	Sexual Behavior Transmission				Mother to Child Transmission				Transmission Beliefs			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Occupation												
Agriculture/Self-Employed	Ref.			Ref.			Ref.			Ref.		
Teaching and Management	0.62	0.092	0.36 1.08	0.56	0.039	0.32 0.97	0.62	0.089	0.36 1.08	1.07	0.535	0.86 1.32
Sales	1.05	0.401	0.94 1.17	1.06	0.347	0.94 1.18	1.05	0.407	0.94 1.17	1.05	0.407	0.94 1.17
Other Occupations	0.73	0.000	0.67 0.79	0.71	0.000	0.65 0.77	0.73	0.000	0.67 0.79	0.73	0.000	0.67 0.79
Not Working												
Perceived Risk of Acquiring HIV												
No Risk	Ref.			Ref.			Ref.			Ref.		
Small Risk	2.38	0.000	1.81 3.13	2.41	0.000	1.83 3.16	2.43	0.000	1.85 3.18	2.25	0.000	1.70 2.98
Moderate Risk	2.25	0.000	1.70 2.98	2.18	0.000	1.66 2.87	2.27	0.000	1.72 2.99	1.41	0.000	1.17 1.72
High Risk	1.41	0.000	1.17 1.72	1.42	0.001	1.16 1.73	1.42	0.000	1.17 1.73	1.41	0.000	1.17 1.73
Sexually Transmitted Diseases												
Does not have STD(s)	Ref.			Ref.			Ref.			Ref.		
Has STD(s)	4.11	0.025	1.20 14.07	4.98	0.030	1.17 21.22	3.95	0.027	1.17 13.34	4.11	0.025	1.20 14.07
Religion												
Protestant	Ref.			Ref.			Ref.			Ref.		
Roman Catholic	1.54	0.003	1.17 2.04	1.49	0.006	1.12 1.97	1.55	0.002	1.17 2.05	1.07	0.653	0.79 1.45
Muslim	1.07	0.653	0.79 1.45	1.15	0.393	0.83 1.59	1.08	0.614	0.80 1.46	1.00	0.979	0.83 1.19
Other Religions	1.00	0.979	0.83 1.19	1.05	0.587	0.87 1.27	1.00	0.993	0.84 1.20	1.00	0.979	0.83 1.19
Residence												
Urban	Ref.			Ref.			Ref.			Ref.		
Rural	1.11	0.596	0.75 1.65	1.17	0.453	0.78 1.75	1.11	0.594	0.75 1.65	1.11	0.594	0.75 1.65

TABLE 10: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, perceived risk of acquiring HIV and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

High-Risk Sexual Behavior	Women			Men		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	2.08	0.000	1.72 2.51	2.90	0.000	2.08 4.03
Moderate Risk	2.07	0.000	1.75 2.45	2.58	0.000	1.90 3.52
High Risk	1.48	0.000	1.27 1.73	1.66	0.000	1.31 2.09
Age						
15-19	Ref.			Ref.		
20-24	1.94	0.000	1.50 2.51	2.01	0.000	1.42 2.85
25-29	1.60	0.000	1.34 1.90	1.11	0.360	0.89 1.38
30-34	1.13	0.074	0.99 1.28	1.27	0.051	1.00 1.62
35-39	1.04	0.485	0.94 1.14	1.14	0.193	0.93 1.40
40-44	0.97	0.391	0.89 1.05	0.98	0.812	0.82 1.16
45-49	0.90	0.003	0.84 0.97	1.01	0.853	0.87 1.19
50-54	-	-	-	1.10	0.175	0.96 1.25
Province						
Nairobi	Ref.			Ref.		
Central	0.96	0.853	0.66 1.42	0.65	0.178	0.34 1.22
Coast	1.42	0.001	1.16 1.73	1.43	0.056	0.99 2.06
Eastern	1.05	0.538	0.89 1.24	0.89	0.403	0.68 1.17
Nyanza	1.04	0.602	0.90 1.21	1.02	0.867	0.82 1.27
Rift Valley	0.89	0.018	0.80 0.98	1.27	0.000	1.11 1.46
Western	0.98	0.726	0.89 1.08	1.07	0.320	0.94 1.22
North Eastern	1.15	0.007	1.04 1.28	1.08	0.284	0.94 1.25

TABLE 10 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, perceived risk of acquiring HIV and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

High-Risk Sexual Behavior	Women			Men		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Sexually Transmitted Diseases						
Does not have STD(s)	Ref.			Ref.		
Has STD(s)	1.73	0.135	0.84	3.53	0.015	1.33
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.13	0.678	0.64	1.97	0.092	0.25
Sales	1.15	0.113	0.97	1.37	0.537	0.84
Other Occupations	1.11	0.054	1.00	1.24	0.098	0.98
Not Working	0.95	0.078	0.89	1.01	0.000	0.70
Marital Status						
Never Married	Ref.			Ref.		
Currently Married	67.39	0.000	51.28	88.56	0.000	20.49
Formerly Married	1.78	0.000	1.53	2.06	0.067	0.98
Circumcision						
Circumcised	Ref.			Ref.		
Uncircumcised	0.84	0.144	0.66	1.06	0.004	0.29
HIV/AIDS Perceived Severity						
Low	Ref.			Ref.		
High	1.34	0.012	1.07	1.68	0.001	1.23
Wealth						
Poorest	Ref.			Ref.		
Poorer	0.96	0.806	0.68	1.35	0.851	0.61
Middle	1.09	0.323	0.91	1.31	0.894	0.76
Richer	1.07	0.269	0.95	1.20	0.389	0.91
Richest	1.04	0.555	0.92	1.16	0.619	0.88

TABLE 10 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, perceived risk of acquiring HIV and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

High-Risk Sexual Behavior Ethnicity	Women			Men		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Kikuyu	Ref.			Ref.		
Luhya	1.09	0.739	0.66	1.81	0.386	0.37
Luo	1.22	0.118	0.95	1.56	0.079	0.96
Kalenjin	1.03	0.775	0.85	1.24	0.271	0.71
Kamba	1.07	0.167	0.97	1.19	0.920	0.81
Kisii	1.07	0.282	0.95	1.20	0.764	0.86
Meru	1.08	0.123	0.98	1.20	0.359	0.92
Others	0.90	0.001	0.84	0.96	0.730	0.92
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	1.18	0.171	0.93	1.50	0.005	1.15
Muslim	1.00	0.979	0.80	1.24	0.830	0.73
Other Religions	1.11	0.316	0.91	1.35	0.359	0.91
Education						
<Primary School	Ref.			Ref.		
Primary School	1.58	0.013	1.10	2.27	0.049	1.00
Post Primary/Vocational/Secondary	1.07	0.497	0.88	1.29	0.444	0.84
College/University	0.94	0.532	0.77	1.15	0.066	0.98
Residence						
Urban	Ref.			Ref.		
Rural	1.13	0.582	0.73	1.75	0.364	0.77
						2.01

TABLE 11: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior	WOMEN					
	Physical Abuse			Physical Abuse-Weapon		
Abuse	ORs	P-values	95% CIs	ORs	P-values	95% CIs
No Abuse	Ref.			Ref.		
Abused	0.72	0.032	0.54	0.97	0.82	0.72
Age						
15-19	Ref.			Ref.		
20-24	1.35	0.355	0.71	2.55	4.70	3.85
25-29	1.23	0.136	0.94	1.63	3.34	3.01
30-34	1.02	0.820	0.83	1.26	2.18	1.98
35-39	0.90	0.173	0.78	1.05	1.70	1.59
40-44	0.94	0.332	0.84	1.06	1.44	1.36
45-49	0.86	0.002	0.77	0.94	1.25	1.19
Education						
<Primary School	Ref.			Ref.		
Primary School	1.81	0.006	1.19	2.76	1.38	1.04
Post Primary/Vocational/Secondary	1.12	0.325	0.89	1.42	0.88	0.76
College/University	0.93	0.558	0.72	1.19	0.78	0.69
Province						
Nairobi	Ref.			Ref.		
Central	1.08	0.769	0.63	1.87	0.99	0.73
Coast	1.47	0.017	1.07	2.02	1.42	1.17
Eastern	1.13	0.423	0.84	1.53	1.09	0.94
Nyanza	1.08	0.508	0.86	1.34	1.05	0.94
Rift Valley	0.88	0.044	0.77	1.00	0.96	0.90
Western	0.95	0.473	0.83	1.09	0.97	0.91
North Eastern	1.17	0.028	1.02	1.35	1.19	1.08

TABLE 11 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

	WOMEN					
	Physical Abuse			Physical Abuse-Weapon		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
High-Risk Sexual Behavior						
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	1.18	0.276	0.88	1.58	0.000	1.84 2.43
Moderate Risk	1.20	0.081	0.98	1.48	0.000	1.82 2.31
High Risk	1.10	0.281	0.92	1.32	0.000	1.40 1.68
Sexually Transmitted Diseases						
Does not have STD(s)	Ref.			Ref.		
Has STD(s)	0.84	0.609	0.43	1.65	0.035	1.04 3.13
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.82	0.140	0.82	4.05	0.511	0.77 1.67
Sales	0.92	0.485	0.74	1.15	0.449	0.83 1.09
Other Occupations	0.96	0.657	0.80	1.15	0.000	0.77 0.90
Not Working	0.99	0.818	0.91	1.08	0.000	0.85 0.93
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	0.99	0.942	0.69	1.40	0.692	0.88 1.21
Muslim	0.93	0.541	0.74	1.17	0.890	0.85 1.21
Other Religions	0.94	0.675	0.72	1.23	0.161	0.95 1.36
Circumcision						
Circumcised	Ref.			Ref.		
Uncircumcised	1.00	0.982	0.71	1.40	0.000	0.57 0.85

TABLE 11 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior	WOMEN					
	ORs	P-values	Physical Abuse	95% CIs	ORs	Physical Abuse-Weapon
Residence						95% CIs
Urban	Ref.				Ref.	
Rural	1.34	0.221	0.84	2.13	1.14	0.91 1.42
Self-Efficacy						
Present	Ref.				Ref.	
Not Present	1.11	0.513	0.81	1.52	0.75	0.64 0.87
Ethnicity						
Kikuyu	Ref.				Ref.	
Luhya	1.26	0.499	0.64	2.46	1.38	0.98 1.94
Luo	1.07	0.724	0.75	1.52	1.25	1.06 1.49
Kalenjin	0.98	0.835	0.80	1.20	1.00	0.88 1.14
Kamba	1.34	0.017	1.05	1.70	1.04	0.94 1.15
Kisii	1.09	0.310	0.92	1.28	1.03	0.96 1.11
Meru	1.02	0.784	0.86	1.21	1.03	0.94 1.12
Others	0.89	0.006	0.82	0.97	0.97	0.92 1.02

TABLE 11 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior Abuse	WOMEN					
	Sexual Abuse			Emotional Abuse		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
No Abuse	Ref.			Ref.		
Abused	0.60	0.005	0.42 0.85	0.66	0.003	0.50 0.87
Age						
15-19	Ref.			Ref.		
20-24	1.31	0.396	0.70 2.48	1.33	0.377	0.71 2.50
25-29	1.21	0.163	0.92 1.60	1.24	0.125	0.94 1.63
30-34	1.01	0.918	0.83 1.24	1.02	0.857	0.83 1.25
35-39	0.90	0.136	0.77 1.04	0.90	0.163	0.78 1.04
40-44	0.93	0.259	0.83 1.05	0.94	0.319	0.84 1.06
45-49	0.85	0.001	0.77 0.94	0.86	0.003	0.78 0.95
Education						
<Primary School	Ref.			Ref.		
Primary School	1.85	0.004	1.22 2.82	1.79	0.007	1.18 2.72
Post Primary/Vocational/Secondary	1.15	0.235	0.91 1.45	1.12	0.331	0.89 1.41
College/University	0.95	0.667	0.74 1.22	0.92	0.521	0.72 1.18
Province						
Nairobi	Ref.			Ref.		
Central	1.11	0.701	0.65 1.91	1.06	0.843	0.61 1.82
Coast	1.46	0.020	1.06 2.02	1.47	0.016	1.07 2.01
Eastern	1.15	0.368	0.85 1.56	1.14	0.400	0.84 1.53
Nyanza	1.08	0.483	0.87 1.36	1.08	0.499	0.87 1.34
Rift Valley	0.87	0.047	0.77 1.00	0.87	0.039	0.77 0.99
Western	0.94	0.371	0.82 1.08	0.95	0.473	0.83 1.09
North Eastern	1.15	0.059	0.99 1.33	1.15	0.054	1.00 1.34

TABLE 11 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior	WOMEN					
	ORs	P-values	Sexual Abuse 95% CIs	ORs	P-values	Emotional Abuse 95% CIs
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	1.13	0.421	0.84	1.52	0.340	0.86
Moderate Risk	1.19	0.109	0.96	1.46	0.085	0.97
High Risk	1.08	0.357	0.91	1.29	0.315	0.92
Sexually Transmitted Diseases						
Does not have STD(s)	Ref.			Ref.		
Has STD(s)	0.83	0.579	0.43	1.60	0.577	0.43
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.78	0.151	0.81	3.91	0.115	0.85
Sales	0.93	0.515	0.75	1.16	0.548	0.75
Other Occupations	0.95	0.621	0.79	1.15	0.739	0.81
Not Working	0.98	0.703	0.90	1.07	0.859	0.91
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	1.00	0.989	0.71	1.42	0.906	0.69
Muslim	0.96	0.715	0.77	1.20	0.577	0.74
Other Religions	0.96	0.728	0.74	1.24	0.724	0.73
Circumcision						
Circumcised	Ref.			Ref.		
Uncircumcised	1.02	0.890	0.73	1.44	0.948	0.72
						1.42

TABLE 11 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

High-Risk Sexual Behavior	WOMEN					
	ORs	P-values	Sexual Abuse 95% CIs	ORs	P-values	Emotional Abuse 95% CIs
Residence						
Urban	Ref.			Ref.		
Rural	1.35	0.210	0.84 2.16	1.34	0.205	0.85 2.12
Self-Efficacy						
Present	Ref.			Ref.		
Not Present	1.11	0.521	0.81 1.52	1.11	0.520	0.81 1.51
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	1.31	0.434	0.66 2.58	1.23	0.543	0.63 2.40
Luo	1.08	0.663	0.76 1.55	1.06	0.762	0.74 1.51
Kalenjin	1.00	0.995	0.82 1.23	0.98	0.812	0.80 1.19
Kamba	1.34	0.016	1.06 1.71	1.33	0.018	1.05 1.69
Kisii	1.09	0.308	0.92 1.29	1.08	0.352	0.92 1.27
Meru	1.04	0.631	0.88 1.24	1.02	0.824	0.86 1.21
Others	0.89	0.009	0.82 0.97	0.89	0.004	0.82 0.96

TABLE 12: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, cognitive involvement and awareness (HIV/AIDS, voluntary counseling and testing, sexually transmitted diseases) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

	WOMEN											
	High-Risk Sexual Behavior	HIV/AIDS	Voluntary Counseling and Testing	Sexually Transmitted Diseases	ORs	95% CIs						
Cognitive Involvement and Awareness	ORs	P-values	95% CIs	ORs	P-values	95% CIs						
Age												
No	Ref.			Ref.								
Yes	1.50	0.091	0.94	2.40	1.08	0.421	0.90	1.29	1.59	0.000	1.29	1.96
15-19	Ref.											
20-24	1.70	0.000	1.35	2.13	1.71	0.000	1.37	2.15	1.61	0.000	1.29	2.02
25-29	1.44	0.000	1.24	1.66	1.49	0.000	1.29	1.72	1.39	0.000	1.20	1.61
30-34	1.07	0.206	0.96	1.20	1.09	0.152	0.97	1.22	1.06	0.326	0.95	1.18
35-39	1.02	0.699	0.93	1.11	1.02	0.587	0.94	1.12	1.00	0.997	0.92	1.09
40-44	0.96	0.238	0.89	1.03	0.96	0.297	0.90	1.03	0.95	0.135	0.88	1.02
45-49	0.89	0.000	0.83	0.94	0.89	0.000	0.84	0.95	0.88	0.000	0.82	0.93
Education												
<Primary School	Ref.											
Primary School	1.91	0.001	1.33	2.75	1.94	0.000	1.34	2.79	1.75	0.002	1.24	2.47
Post Primary/Vocational/Secondary	1.20	0.056	1.00	1.45	1.19	0.070	0.99	1.44	1.10	0.261	0.93	1.31
College/University	1.06	0.447	0.91	1.24	1.05	0.516	0.90	1.23	1.00	0.958	0.87	1.16
Province												
Nairobi	Ref.											
Central	1.02	0.909	0.72	1.44	1.02	0.905	0.72	1.44	0.99	0.950	0.70	1.39
Coast	1.15	0.075	0.99	1.34	1.16	0.058	1.00	1.36	1.16	0.056	1.00	1.35
Eastern	1.12	0.070	0.99	1.27	1.13	0.060	0.99	1.28	1.12	0.084	0.98	1.27
Nyanza	1.12	0.017	1.02	1.23	1.12	0.017	1.02	1.23	1.11	0.033	1.01	1.21
Rift Valley	0.90	0.010	0.83	0.97	0.90	0.011	0.83	0.98	0.90	0.008	0.83	0.97
Western	0.98	0.505	0.91	1.05	0.98	0.516	0.91	1.05	0.97	0.345	0.90	1.04
North Eastern	1.09	0.081	0.99	1.20	1.10	0.058	1.00	1.22	1.12	0.029	1.01	1.23
Residence												
Urban	Ref.											
Rural	1.13	0.550	0.76	1.69	1.12	0.576	0.75	1.68	1.14	0.533	0.76	1.71

TABLE 13: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, cognitive involvement and awareness (HIV/AIDS, voluntary counseling and testing, sexually transmitted diseases) and study characteristics in a multivariate logistic regression model, men, KDHS-2003

High-Risk Sexual Behavior Cognitive Involvement and Awareness	MEN						
	HIV/AIDS		Voluntary Counseling and Testing		Sexually Transmitted Diseases		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	
No	Ref.			Ref.			
Yes	3.32	0.024	1.18 9.40	1.33	0.041	1.01 1.75	1.75 2.42
Age							
15-19	Ref.			Ref.			
20-24	1.85	0.000	1.37 2.51	1.78	0.000	1.31 2.42	1.25 2.31
25-29	1.14	0.206	0.93 1.40	1.12	0.285	0.91 1.37	0.89 1.34
30-34	1.28	0.028	1.03 1.59	1.26	0.036	1.02 1.57	1.00 1.55
35-39	1.16	0.131	0.96 1.41	1.16	0.139	0.95 1.40	0.95 1.39
40-44	1.02	0.831	0.86 1.20	1.02	0.775	0.87 1.21	0.86 1.20
45-49	1.04	0.609	0.89 1.22	1.05	0.578	0.89 1.22	0.88 1.20
50-54	1.11	0.110	0.98 1.27	1.10	0.135	0.97 1.26	0.96 1.25
Education							
<Primary School	Ref.			Ref.			
Primary School	1.53	0.116	0.90 2.61	1.43	0.205	0.82 2.47	0.78 2.34
Post Primary/Vocational/Secondary	1.10	0.499	0.84 1.44	1.02	0.912	0.76 1.35	0.75 1.30
College/University	1.19	0.119	0.96 1.49	1.13	0.278	0.90 1.41	0.89 1.40
Province							
Nairobi	Ref.			Ref.			
Central	0.67	0.120	0.41 1.11	0.67	0.106	0.41 1.09	0.41 1.11
Coast	1.48	0.002	1.16 1.89	1.46	0.003	1.14 1.86	1.16 1.91
Eastern	0.93	0.461	0.78 1.12	0.95	0.550	0.79 1.14	0.77 1.12
Nyanza	1.12	0.147	0.96 1.32	1.12	0.150	0.96 1.32	0.94 1.29
Rift Valley	1.21	0.000	1.09 1.35	1.22	0.000	1.09 1.35	1.08 1.34
Western	1.02	0.606	0.94 1.12	1.02	0.700	0.93 1.11	0.93 1.12
North Eastern	1.09	0.142	0.97 1.23	1.08	0.213	0.96 1.21	0.96 1.23
Residence							
Urban	Ref.			Ref.			
Rural	1.19	0.420	0.78 1.83	1.19	0.416	0.78 1.83	0.77 1.83
Circumcision							
Circumcised	Ref.			Ref.			
Uncircumcised	0.71	0.069	0.49 1.03	0.72	0.082	0.49 1.04	0.49 1.04

TABLE 14: Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes/stigma towards HIV/AIDS, KDHS-2003

Study Characteristics	WOMEN										P-values
	Negative Attitudes/Stigma: HIV/AIDS										
	Urban					Rural					
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values	
Alcohol Consumption											
No	91	1306	94	1204	0.007	96	1857	95	3236	0.244	
Yes	08	135	06	73		04	72	05	145		
Age											
15-19	15	218	22	294		20	401	25	858		
20-24	24	368	26	314		22	419	17	577		
25-29	20	290	17	225		16	316	15	540		
30-34	15	233	12	167	0.002	14	272	13	430	<0.001	
35-39	12	148	09	123		12	218	11	355		
40-44	08	112	09	99		10	192	11	366		
45-49	06	74	05	55		06	115	08	257		
Education											
<Primary School	03	35	14	238		05	88	18	825		
Primary School	33	451	53	639	<0.001	53	1022	66	2079	<0.001	
Post Primary/Vocational/Secondary	44	641	25	304		35	694	14	441		
College/University	20	316	08	96		07	129	02	38		
Ethnicity											
Kikuyu	36	467	27	271		28	657	15	573		
Luhya	16	251	13	178		16	319	14	474		
Luo	12	202	16	190		12	184	11	274		
Kalenjin	03	29	03	25	<0.001	12	207	13	356	<0.001	
Kamba	11	146	10	117		10	162	13	354		
Kisii	04	70	04	53		07	124	07	205		
Meru	05	56	03	31		06	99	07	198		
Others	13	222	24	412		09	181	20	949		

TABLE 14 (continued): Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes/stigma towards HIV/AIDS, KDHS-2003

Study Characteristics	WOMEN									
	Urban					Rural				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Wealth										
Poorest	01	6	03	60		13	221	26	1006	
Poorer	02	23	03	50		19	380	25	825	
Middle	02	37	04	76	0.003	24	475	24	777	<0.001
Richer	09	128	14	171		32	627	20	632	
Richest	86	1249	76	920		12	230	05	143	
Occupation										
Agriculture/Self-Employed	05	67	10	106		36	710	39	1275	
Teaching and Management	11	173	04	42		06	106	02	51	
Sales	22	332	20	263	<0.001	12	241	12	386	<0.001
Other Occupations	31	422	25	306		12	213	07	212	
Not Working	31	448	41	558		34	661	40	1456	
Voluntary Counseling and Testing										
HIV: Not Tested	72	1027	80	1056	<0.001	85	1648	90	3068	<0.001
HIV: Tested	28	416	20	221		15	285	10	314	
Religion										
Protestant	69	990	56	662		69	1347	63	2000	
Roman Catholic	22	321	22	278	<0.001	27	496	26	771	<0.001
Muslim	07	108	19	309		03	67	08	503	
Other Religions	02	19	03	27		01	21	03	107	
Perceived Risk of Acquiring HIV										
No Risk	32	457	42	554		30	605	38	1393	
Small Risk	42	612	34	447	<0.001	43	822	37	1218	<0.001
Moderate Risk	15	215	13	147		17	325	16	509	
High Risk	11	152	11	127		10	179	09	255	

TABLE 15: Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes/stigma towards HIV/AIDS, KDHHS-2003

Study Characteristics	MEN									
	Negative Attitudes/Stigma : HIV/AIDS					Rural				
	Urban		Rural		P-values	Urban		Rural		P-values
No %	Yes %	No %	Yes %	No %		Yes %	No %	Yes %		
Alcohol Consumption										
No	61	70	426	326	0.035	72	72	816	933	0.896
Yes	39	30	263	125		28	28	304	336	
Age										
15-19	12	20	89	99		18	33	212	412	
20-24	22	24	149	103		18	17	204	215	
25-29	18	17	123	76		14	11	155	154	
30-34	17	10	113	48	0.020	13	8	148	110	<0.001
35-39	12	11	80	45		14	9	152	108	
40-44	09	07	65	31		10	8	113	102	
45-49	05	04	37	20		06	07	64	80	
50-54	05	07	35	29		07	07	73	88	
Education										
<Primary School	01	10	7	57		03	10	35	172	
Primary School	28	48	200	217	<0.001	48	71	546	876	<0.001
Post Primary/Vocational/Secondary	43	29	292	129		37	16	423	194	
College/University	28	13	192	48		12	03	117	27	
Ethnicity										
Kikuyu	31	25	186	82		27	14	354	219	
Luhya	16	13	113	55		15	13	177	172	
Luo	18	17	120	81		09	12	77	111	
Kalenjin	02	02	11	7	<0.001	15	15	139	160	<0.001
Kamba	12	09	85	32		08	16	76	176	
Kisii	04	06	37	28		07	06	72	71	
Meru	03	01	18	4		07	08	65	85	
Others	14	27	121	162		12	16	161	275	

TABLE 15 (continued): Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes/stigma towards HIV/AIDS, KDHS-2003

Study Characteristics	MEN									
	Urban					Rural				
	No %	Yes %	N	P-values	No %	Yes %	N	P-values		
Wealth										
Poorest	01	02	7	15	13	26	146	342		
Poorer	01	04	12	17	19	24	219	307		
Middle	03	02	23	21	23	24	272	296	<0.001	
Richer	10	17	73	72	32	20	348	254		
Richest	85	75	576	326	13	06	136	70		
Occupation										
Agriculture/Self-Employed	05	07	33	26	40	42	444	529		
Teaching and Management	14	08	101	32	12	02	123	20		
Sales	15	17	108	65	07	06	77	78	0.165	<0.001
Other Occupations	48	49	314	222	22	21	240	242		
Not Working	18	19	132	103	19	29	233	396		
Voluntary Counseling and Testing										
HIV: Not Tested	73	80	495	363	85	90	949	1142	0.003	0.012
HIV: Tested	27	20	196	88	15	10	172	127		
Religion										
Protestant	59	53	402	226	64	58	707	711		
Roman Catholic	28	24	191	103	26	26	288	325	<0.001	0.012
Muslim	07	19	63	108	04	06	65	121		
Other Religions	06	04	35	13	06	10	61	112		
Perceived Risk of Acquiring HIV										
No Risk	30	35	208	183	30	38	335	514		
Small Risk	55	49	375	206	55	47	635	597	0.386	0.003
Moderate Risk	11	10	78	38	10	09	100	103		
High Risk	04	06	29	24	05	06	51	55		

TABLE 16: Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes/stigma towards sex education on condom, KDHS-2003

WOMEN										
Negative Attitudes/Stigma : Sex Education on Condom										
Study Characteristics	Urban					Rural				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Alcohol Consumption										
No	91	1437	94	1078	0.016	95	2806	96	2291	0.306
Yes	09	154	06	54		05	133	04	84	
Age										
15-19	18	293	19	221		22	668	25	595	
20-24	27	419	23	263		20	588	17	408	
25-29	19	301	18	214		17	516	13	341	
30-34	13	232	14	169	0.368	12	384	14	317	<0.001
35-39	10	165	11	107		12	320	11	253	
40-44	08	116	09	96		10	277	12	281	
45-49	05	66	06	63		07	190	08	182	
Education										
<Primary School	05	75	12	198		09	302	19	611	
Primary School	44	685	39	407	<0.001	67	1937	53	1166	<0.001
Post Primary/Vocational/Secondary	36	582	34	364		21	626	24	511	
College/University	15	250	15	164		03	78	04	89	
Wealth										
Poorest	01	14	03	52		20	589	22	639	
Poorer	02	38	02	36		24	718	22	488	
Middle	03	56	03	57	<0.001	24	730	23	523	0.11
Richer	10	161	13	140		24	696	25	564	
Richest	84	1323	79	848		08	210	08	163	

TABLE 16 (continued): Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes/stigma towards sex education on condom, KDHS-2003

WOMEN										
Negative Attitudes/Stigma : Sex Education on Condom										
Study Characteristics	Urban					Rural				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Ethnicity										
Kikuyu	31	435	34	304		17	606	24	623	
Luhya	16	289	12	143		18	553	11	241	
Luo	16	264	11	128		14	347	07	111	
Kalenjin	03	33	02	21	<0.001	12	335	12	228	<0.001
Kamba	13	182	09	82		12	292	11	225	
Kisii	04	72	04	51		07	180	08	149	
Meru	04	50	04	37		07	215	05	82	
Others	13	267	24	367		12	415	22	718	
Occupation										
Agriculture/Self-Employed	08	111	07	62		41	1218	34	765	
Teaching and Management	07	120	09	97		03	73	04	84	
Sales	24	385	18	211	0.003	12	370	11	259	<0.001
Other Occupations	29	456	26	272		10	274	07	151	
Not Working	32	518	40	490		34	1005	44	1116	
Religion										
Protestant	67	1038	58	616		68	1985	62	1363	
Roman Catholic	22	377	22	224	<0.001	26	723	26	544	<0.001
Muslim	09	143	18	275		04	164	09	409	
Other Religions	02	29	02	17		02	69	03	59	

TABLE 16 (continued): Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes/stigma towards sex education on condom, KDHS-2003

WOMEN										
Negative Attitudes/Stigma : Sex Education on Condom										
Study Characteristics	Urban					Rural				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Voluntary Counseling and Testing										
HIV: Not Tested	73	1160	79	927	<0.001	86	2563	89	2155	<0.001
HIV: Tested	27	432	21	206		14	379	11	222	
Perceived Risk of Acquiring HIV										
No Risk	32	514	43	498		32	955	40	1046	
Small Risk	41	651	36	410	<0.001	39	1151	39	889	<0.001
Moderate Risk	15	238	12	125		18	525	14	309	
High Risk	12	186	09	94		11	306	07	129	
Marital Status										
Never Married	34	555	35	401		26	787	30	677	
Currently Married	53	833	53	598	0.712	63	1857	61	1495	0.004
Formerly Married	13	204	12	134		11	299	09	205	

TABLE 17: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS, sex education on condoms), alcohol consumption and study characteristics in a univariate logistic regression model, women, KDHS-2003

	WOMEN												
	Urban				Rural				HIV/AIDS				
	ORs	P-values	95% CIs	Sex Education on condoms	ORs	P-values	95% CIs	Sex Education on condoms	ORs	P-values	95% CIs	Sex Education on condoms	
Negative Attitudes/Stigma													
Alcohol Consumption													
No	Ref.			Ref.			Ref.			Ref.		Ref.	
Yes	0.61	0.007	0.43 0.87	0.56	0.017	0.35 0.90	1.22	0.244	0.87	1.70	0.85	0.306	0.63 1.16
Age													
15-19	Ref.			Ref.			Ref.			Ref.		Ref.	
20-24	0.75	0.055	0.57 1.01	0.83	0.068	0.68 1.01	0.63	0.000	0.52	0.76	0.78	0.008	0.64 0.93
25-29	0.76	0.000	0.65 0.88	0.96	0.510	0.84 1.09	0.88	0.011	0.80	0.97	0.83	0.000	0.76 0.91
30-34	0.81	0.001	0.72 0.91	1.00	0.968	0.92 1.09	0.92	0.015	0.87	0.98	0.97	0.340	0.91 1.03
35-39	0.86	0.002	0.78 0.95	1.02	0.677	0.94 1.10	0.94	0.017	0.89	0.99	0.96	0.094	0.91 1.01
40-44	0.95	0.109	0.89 1.01	1.03	0.463	0.95 1.12	0.98	0.284	0.93	1.02	1.02	0.414	0.97 1.06
45-49	0.91	0.039	0.84 1.00	1.03	0.514	0.95 1.11	1.01	0.562	0.97	1.05	1.01	0.523	0.98 1.05
Education													
<Primary School	Ref.			Ref.			Ref.			Ref.		Ref.	
Primary School	0.27	0.000	0.16 0.45	0.35	0.000	0.23 0.53	0.28	0.000	0.21	0.39	0.38	0.000	0.31 0.47
Post Primary/Vocational/Secondary	0.31	0.000	0.24 0.40	0.61	0.000	0.50 0.74	0.30	0.000	0.25	0.35	0.73	0.000	0.64 0.82
College/University	0.40	0.000	0.33 0.48	0.74	0.000	0.64 0.85	0.33	0.000	0.28	0.39	0.87	0.048	0.76 1.00
Ethnicity													
Kikuyu	Ref.			Ref.			Ref.			Ref.		Ref.	
Luhya	1.05	0.747	0.78 1.40	0.66	0.000	0.53 0.82	1.70	0.000	1.30	2.21	0.45	0.000	0.36 0.56
Luo	1.29	0.004	1.09 1.52	0.79	0.000	0.69 0.89	1.31	0.000	1.18	1.44	0.58	0.000	0.51 0.66
Kalenjin	1.09	0.455	0.86 1.39	0.96	0.681	0.79 1.17	1.22	0.000	1.10	1.35	0.87	0.016	0.78 0.97
Kamba	1.04	0.346	0.96 1.13	0.87	0.001	0.80 0.94	1.27	0.000	1.17	1.38	0.92	0.018	0.87 0.99
Kisii	1.06	0.265	0.95 1.18	0.98	0.655	0.91 1.06	1.12	0.000	1.06	1.19	0.96	0.100	0.91 1.01
Meru	0.98	0.674	0.91 1.06	1.00	0.999	0.88 1.14	1.14	0.000	1.07	1.21	0.85	0.000	0.81 0.89
Others	1.14	0.000	1.09 1.20	1.07	0.005	1.02 1.11	1.24	0.000	1.19	1.29	1.05	0.002	1.02 1.08
Wealth													
Poorest	Ref.			Ref.			Ref.			Ref.		Ref.	
Poorer	0.51	0.505	0.07 3.82	0.35	0.032	0.14 0.91	0.61	0.000	0.47	0.78	0.77	0.007	0.64 0.93
Middle	0.70	0.507	0.25 2.02	0.56	0.026	0.33 0.93	0.66	0.000	0.58	0.76	0.92	0.121	0.83 1.02
Richer	0.70	0.292	0.36 1.37	0.68	0.007	0.52 0.90	0.65	0.000	0.60	0.70	0.97	0.465	0.90 1.05
Richest	0.67	0.095	0.42 1.07	0.70	0.001	0.57 0.86	0.65	0.000	0.58	0.72	0.98	0.471	0.91 1.04

TABLE 17 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS, sex education on condoms), alcohol consumption and study characteristics in a univariate logistic regression model, women, KDHS-2003

Negative Attitudes/Stigma	WOMEN																
	Urban				Rural				Sex Education on condoms								
	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs					
Occupation																	
Agriculture/Self-Employed	Ref.			Ref.			Ref.			Ref.			Ref.				
Teaching and Management	0.16	0.000	0.09	0.26	1.47	0.128	0.89	2.41	0.25	0.000	0.16	0.38	1.84	0.001	1.29	2.63	
Sales	0.66	0.000	0.56	0.79	0.99	0.950	0.79	1.25	0.92	0.174	0.82	1.04	1.02	0.647	0.92	1.14	
Other Occupations	0.73	0.000	0.67	0.80	1.03	0.642	0.90	1.18	0.79	0.000	0.72	0.86	0.95	0.147	0.88	1.02	
Not Working	0.89	0.008	0.82	0.97	1.12	0.021	1.02	1.23	1.02	0.377	0.98	1.06	1.12	0.000	1.08	1.17	
Voluntary Counseling and Testing																	
HIV: Not Tested	Ref.			Ref.			Ref.			Ref.			Ref.				
HIV: Tested	0.65	0.000	0.52	0.80	0.70	0.000	0.59	0.83	0.64	0.000	0.53	0.76	0.74	0.001	0.62	0.88	
Religion																	
Protestant	Ref.			Ref.			Ref.			Ref.			Ref.				
Roman Catholic	1.26	0.034	1.02	1.55	1.14	0.284	0.89	1.46	1.07	0.458	0.90	1.27	1.13	0.142	0.96	1.32	
Muslim	1.87	0.000	1.54	2.26	1.57	0.000	1.30	1.89	1.70	0.000	1.42	2.04	1.62	0.000	1.40	1.87	
Other Religions	1.33	0.000	1.15	1.55	1.09	0.377	0.90	1.31	1.47	0.000	1.21	1.78	1.07	0.371	0.92	1.24	
Perceived Risk of Acquiring HIV																	
No Risk	Ref.			Ref.			Ref.			Ref.			Ref.				
Small Risk	0.62	0.000	0.49	0.79	0.63	0.000	0.52	0.78	0.68	0.000	0.58	0.79	0.77	0.001	0.67	0.90	
Moderate Risk	0.81	0.012	0.68	0.95	0.77	0.006	0.64	0.92	0.87	0.004	0.78	0.96	0.77	0.000	0.70	0.85	
High Risk	0.92	0.158	0.82	1.03	0.84	0.002	0.76	0.94	0.89	0.002	0.82	0.95	0.78	0.000	0.72	0.85	
Marital Status																	
Never Married	Ref.			Ref.			Ref.			Ref.			Ref.				
Currently Married	-	-	-	-	0.98	0.822	0.81	1.18	-	-	-	-	-	0.84	0.012	0.73	0.96
Formerly Married	-	--	-	-	0.94	0.385	0.83	1.08	-	-	-	-	-	0.85	0.002	0.77	0.94

TABLE 18: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS, sex education on condoms), alcohol consumption and study characteristics in a multivariate logistic regression model, women, KDHS-2003

	WOMEN															
	Urban				Rural				HIV/AIDS							
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs				
Negative Attitudes/Stigma																
Alcohol Consumption																
No	Ref.			Ref.			Ref.			Ref.			Ref.			
Yes	0.78	0.221	0.52	1.16	0.64	0.079	0.39	1.05	0.96	0.836	0.65	1.42	0.83	0.286	0.59	1.17
Age																
15-19	Ref.			Ref.			Ref.			Ref.			Ref.			
20-24	1.05	0.718	0.79	1.41	1.00	0.975	0.79	1.28	0.72	0.004	0.58	0.90	0.93	0.525	0.74	1.17
25-29	0.91	0.248	0.78	1.07	1.11	0.209	0.94	1.31	0.91	0.078	0.81	1.01	0.92	0.167	0.82	1.04
30-34	0.91	0.120	0.81	1.03	1.12	0.046	1.00	1.25	0.95	0.215	0.87	1.03	1.05	0.299	0.96	1.15
35-39	0.88	0.028	0.78	0.99	1.11	0.068	0.99	1.24	0.96	0.190	0.91	1.02	1.01	0.810	0.94	1.08
40-44	0.98	0.706	0.91	1.07	1.08	0.083	0.99	1.18	0.97	0.255	0.92	1.02	1.05	0.115	0.99	1.11
45-49	0.91	0.042	0.83	1.00	1.06	0.175	0.97	1.16	0.97	0.243	0.93	1.02	1.03	0.202	0.98	1.08
Education																
<Primary School	Ref.			Ref.			Ref.			Ref.			Ref.			
Primary School	0.33	0.000	0.20	0.54	0.51	0.001	0.34	0.76	0.42	0.000	0.29	0.60	0.50	0.000	0.39	0.65
Post Primary/Vocational/Secondary	0.36	0.000	0.28	0.46	0.75	0.003	0.62	0.90	0.40	0.000	0.33	0.49	0.79	0.004	0.68	0.93
College/University	0.47	0.000	0.39	0.56	0.82	0.015	0.70	0.96	0.44	0.000	0.36	0.53	0.89	0.200	0.75	1.06
Ethnicity																
Kikuyu	Ref.			Ref.			Ref.			Ref.			Ref.			
Luhya	0.91	0.576	0.66	1.26	0.66	0.001	0.52	0.84	1.14	0.353	0.86	1.50	0.43	0.000	0.34	0.55
Luo	1.29	0.002	1.10	1.52	0.79	0.002	0.69	0.92	1.07	0.196	0.96	1.20	0.59	0.000	0.53	0.67
Kalenjin	1.20	0.161	0.93	1.54	0.97	0.806	0.79	1.20	1.08	0.096	0.99	1.18	0.87	0.015	0.78	0.97
Kamba	1.06	0.188	0.97	1.16	0.87	0.002	0.80	0.95	1.20	0.000	1.10	1.30	0.91	0.003	0.85	0.97
Kisii	1.08	0.163	0.97	1.21	0.99	0.788	0.92	1.06	1.08	0.002	1.03	1.14	0.96	0.145	0.92	1.01
Meru	1.01	0.839	0.93	1.09	1.00	0.947	0.90	1.10	1.14	0.000	1.08	1.19	0.84	0.000	0.80	0.89
Others	1.05	0.050	1.00	1.10	0.99	0.781	0.95	1.04	1.10	0.000	1.05	1.16	0.99	0.684	0.95	1.03
Wealth																
Poorest	Ref.			Ref.			Ref.			Ref.			Ref.			
Poorer	1.03	0.976	0.20	5.21	0.50	0.110	0.22	1.17	0.82	0.169	0.62	1.09	0.94	0.516	0.76	1.15
Middle	1.11	0.836	0.42	2.89	0.72	0.164	0.45	1.15	0.81	0.002	0.71	0.92	0.99	0.797	0.90	1.09
Richer	0.98	0.942	0.56	1.71	0.83	0.128	0.66	1.06	0.79	0.000	0.73	0.86	0.99	0.838	0.92	1.07
Richest	0.96	0.823	0.65	1.40	0.83	0.059	0.68	1.01	0.81	0.000	0.74	0.89	1.00	0.890	0.93	1.07

TABLE 18 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS, sex education on condoms), alcohol consumption and study characteristics in a multivariate logistic regression model, women, KDHS-2003

Negative Attitudes/Stigma	WOMEN											
	Urban				Rural				Sex Education on condoms			
	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs	ORs	HIV/AIDS P-values	95% CIs
Occupation												
Agriculture/Self-Employed	Ref.			Ref.			Ref.			Ref.		
Teaching and Management	0.38	0.001	0.22 0.67	1.72	0.089	0.92 3.22	0.92	0.746	0.55 1.53	1.52	0.028	1.05 2.22
Sales	0.69	0.000	0.59 0.81	1.02	0.895	0.78 1.33	0.97	0.645	0.86 1.09	1.04	0.476	0.93 1.16
Other Occupations	0.78	0.000	0.71 0.86	1.09	0.282	0.93 1.29	0.86	0.001	0.79 0.94	0.94	0.158	0.86 1.02
Not Working	0.87	0.002	0.79 0.95	1.14	0.018	1.02 1.27	1.01	0.540	0.97 1.06	1.08	0.000	1.04 1.13
Voluntary Counseling and Testing												
HIV: Not Tested	Ref.			Ref.			Ref.			Ref.		
HIV: Tested	0.88	0.257	0.71 1.10	0.77	0.008	0.63 0.93	0.99	0.884	0.81 1.20	0.78	0.007	0.65 0.93
Religion												
Protestant	Ref.			Ref.			Ref.			Ref.		
Roman Catholic	1.23	0.037	1.01 1.49	1.23	0.077	0.98 1.54	0.91	0.302	0.77 1.08	1.08	0.345	0.92 1.26
Muslim	1.26	0.022	1.04 1.53	1.21	0.077	0.98 1.49	0.99	0.888	0.82 1.19	1.15	0.069	0.99 1.35
Other Religions	1.27	0.009	1.06 1.52	1.06	0.600	0.85 1.31	1.15	0.113	0.97 1.37	0.91	0.251	0.78 1.07
Perceived Risk of Acquiring HIV												
No Risk	Ref.			Ref.			Ref.			Ref.		
Small Risk	0.69	0.005	0.53 0.89	0.71	0.002	0.57 0.87	0.69	0.000	0.58 0.83	0.86	0.048	0.74 1.00
Moderate Risk	0.89	0.184	0.74 1.06	0.81	0.021	0.68 0.97	0.93	0.185	0.83 1.04	0.83	0.000	0.75 0.92
High Risk	0.97	0.632	0.87 1.09	0.89	0.047	0.80 1.00	0.89	0.005	0.82 0.96	0.87	0.001	0.80 0.94
Marital Status												
Never Married	Ref.			Ref.			Ref.			Ref.		
Currently Married	-	-	-	0.92	0.479	0.72 1.17	-	-	-	0.88	0.253	0.71 1.09
Formerly Married	-	-	-	0.86	0.130	0.71 1.05	-	-	-	0.85	0.021	0.73 0.98

TABLE 19: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS), alcohol consumption and study characteristics in a univariate logistic regression model, men, KDHS-2003

	MEN					
	Urban HIV/AIDS			Rural HIV/AIDS		
Negative Attitudes/Stigma	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Alcohol Consumption						
No	Ref.			Ref.		
Yes	0.70	0.035	0.50 0.97	1.01	0.896	0.83 1.24
Age						
15-19	Ref.			Ref.		
20-24	0.69	0.082	0.45 1.05	0.51	0.000	0.38 0.70
25-29	0.77	0.052	0.59 1.00	0.69	0.000	0.60 0.79
30-34	0.70	0.000	0.60 0.83	0.72	0.000	0.65 0.79
35-39	0.88	0.088	0.75 1.02	0.75	0.000	0.68 0.82
40-44	0.86	0.023	0.76 0.98	0.85	0.000	0.79 0.91
45-49	0.89	0.077	0.78 1.01	0.93	0.022	0.87 0.99
50-54	0.98	0.713	0.89 1.09	0.92	0.012	0.87 0.98
Education						
<Primary School	Ref.			Ref.		
Primary School	0.13	0.001	0.04 0.41	0.35	0.000	0.23 0.55
Post Primary/Vocational/Secondary	0.23	0.000	0.13 0.41	0.32	0.000	0.25 0.40
College/University	0.33	0.000	0.23 0.47	0.36	0.000	0.28 0.45
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	0.96	0.870	0.56 1.65	1.56	0.011	1.11 2.20
Luo	1.11	0.385	0.88 1.40	1.56	0.000	1.32 1.84
Kalenjin	1.12	0.523	0.79 1.56	1.21	0.002	1.07 1.37
Kamba	0.96	0.566	0.82 1.12	1.41	0.000	1.28 1.55
Kisii	1.13	0.101	0.98 1.31	1.08	0.153	0.97 1.19
Meru	0.88	0.151	0.74 1.05	1.13	0.000	1.06 1.20
Others	1.15	0.000	1.08 1.23	1.15	0.000	1.10 1.20

TABLE 19 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS), alcohol consumption and study characteristics in a univariate logistic regression model, men, KDHS-2003

Negative Attitudes/Stigma Wealth	MEN					
	Urban HIV/AIDS			Rural HIV/AIDS		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Poorest	Ref.			Ref.		
Poorer	0.93	0.931	0.17	4.98	0.001	0.44
Middle	0.52	0.151	0.22	1.27	0.000	0.58
Richer	0.77	0.324	0.46	1.30	0.000	0.60
Richest	0.69	0.067	0.47	1.03	0.000	0.60
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	0.41	0.027	0.19	0.90	0.000	0.07
Sales	0.91	0.513	0.67	1.22	0.468	0.77
Other Occupations	0.91	0.376	0.73	1.13	0.308	0.87
Not Working	0.95	0.535	0.80	1.13	0.005	1.03
Voluntary Counseling and Testing						
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	0.67	0.003	0.51	0.87	0.000	0.48
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	0.95	0.769	0.65	1.38	0.217	0.92
Muslim	1.76	0.000	1.42	2.19	0.179	0.92
Other Religions	0.93	0.524	0.73	1.18	0.003	1.07
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	0.77	0.156	0.54	1.11	0.001	0.53
Moderate Risk	0.87	0.362	0.65	1.17	0.084	0.71
High Risk	1.04	0.710	0.84	1.29	0.95	0.81

TABLE 20: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS), alcohol consumption and study characteristics in a multivariate logistic regression model, men, KDHS-2003

	MEN					
	Urban HIV/AIDS			Rural HIV/AIDS		
Negative Attitudes/Stigma	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Alcohol Consumption						
No	Ref.			Ref.		
Yes	1.03	0.872	0.71 1.49	1.31	0.018	1.05 1.63
Age						
15-19	Ref.			Ref.		
20-24	0.87	0.596	0.51 1.48	0.65	0.020	0.45 0.93
25-29	0.81	0.170	0.60 1.10	0.71	0.000	0.59 0.85
30-34	0.75	0.005	0.62 0.91	0.76	0.000	0.67 0.87
35-39	0.95	0.606	0.79 1.15	0.78	0.000	0.70 0.87
40-44	0.85	0.048	0.73 1.00	0.88	0.010	0.80 0.97
45-49	0.92	0.218	0.80 1.05	0.93	0.094	0.86 1.01
50-54	0.99	0.914	0.89 1.11	0.91	0.028	0.84 0.99
Education						
<Primary School	Ref.			Ref.		
Primary School	0.20	0.005	0.07 0.59	0.30	0.000	0.18 0.51
Post Primary/Vocational/Secondary	0.28	0.000	0.16 0.49	0.33	0.000	0.25 0.44
College/University	0.39	0.000	0.27 0.55	0.47	0.000	0.36 0.62
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	0.85	0.571	0.47 1.52	1.13	0.482	0.81 1.57
Luo	1.17	0.206	0.92 1.48	1.38	0.000	1.17 1.63
Kalenjin	1.15	0.483	0.77 1.71	1.03	0.590	0.92 1.15
Kamba	0.97	0.662	0.84 1.12	1.35	0.000	1.23 1.48
Kisii	1.12	0.156	0.96 1.32	1.07	0.208	0.96 1.19
Meru	0.89	0.297	0.72 1.11	1.12	0.004	1.04 1.21
Others	1.07	0.064	1.00 1.15	1.04	0.122	0.99 1.09

TABLE 20 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes/stigma (HIV/AIDS), alcohol consumption and study characteristics in a multivariate logistic regression model, men, KDHS-2003

Negative Attitudes/Stigma Wealth	MEN					
	Urban HIV/AIDS			Rural HIV/AIDS		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Poorest	Ref.			Ref.		
Poorer	1.97	0.518	0.25 15.79	0.69	0.022	0.51 0.95
Middle	0.62	0.329	0.23 1.64	0.76	0.001	0.65 0.89
Richer	1.01	0.976	0.56 1.80	0.77	0.000	0.69 0.86
Richest	0.91	0.664	0.59 1.40	0.81	0.000	0.73 0.90
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.32	0.545	0.53 3.29	0.32	0.000	0.18 0.56
Sales	1.13	0.434	0.82 1.56	1.09	0.419	0.88 1.35
Other Occupations	1.04	0.752	0.82 1.32	1.01	0.906	0.92 1.09
Not Working	0.99	0.915	0.82 1.20	1.00	0.946	0.93 1.09
Voluntary Counseling and Testing						
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	0.83	0.135	0.64 1.06	0.87	0.383	0.65 1.18
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	0.92	0.667	0.61 1.38	1.02	0.842	0.81 1.30
Muslim	1.13	0.307	0.89 1.45	0.85	0.303	0.63 1.16
Other Religions	0.82	0.207	0.61 1.12	1.09	0.227	0.95 1.25
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	1.02	0.929	0.68 1.52	0.76	0.030	0.60 0.97
Moderate Risk	1.07	0.686	0.77 1.49	0.95	0.621	0.79 1.15
High Risk	1.13	0.269	0.91 1.39	0.92	0.302	0.78 1.08

TABLE 21: Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes towards women, KDHS-2003

Study Characteristics	WOMEN										P-values	
	Husband Controlling Attitudes					Women Sexual Attitudes-Husband						
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values		
Alcohol Consumption												
No	95	2570	95	5169	0.83	95	3251	95	4482	0.93		
Yes	05	165	05	267		05	205	05	227			
Age												
15-19	21	582	23	1236		20	709	24	1109			
20-24	21	599	20	1109		22	778	19	930			
25-29	17	468	16	926		18	619	15	775			
30-34	14	389	13	724	0.34	13	489	13	621	<0.001		
35-39	10	271	11	586		11	360	11	496			
40-44	10	264	10	515		09	296	11	483			
45-49	07	165	07	345		07	210	07	298			
Education												
<Primary School	09	282	15	1007		08	344	17	943			
Primary School	44	1071	62	3152	<0.001	56	1787	56	2436	<0.001		
Post Primary/Vocational/Secondary	34	964	20	1122		28	1011	22	1071			
College/University	13	421	03	160		08	319	05	262			
Wealth												
Poorest	11	295	20	1079		15	474	19	897			
Poorer	14	307	20	998		16	488	20	815			
Middle	15	356	20	1024	<0.001	18	542	19	837	<0.001		
Richer	20	490	21	1073		21	671	20	893			
Richest	40	1290	19	1267		30	1286	22	1270			
Religion												
Protestant	67	1795	63	3238		65	2200	64	2831			
Roman Catholic	25	635	25	1284	<0.001	26	857	24	1059	0.009		
Muslim	06	245	09	776		07	321	09	700			
Other Religions	02	60	03	136		02	78	03	117			
Residence												
Urban	36	1255	20	1489	<0.001	30	1344	22	1400	<0.001		
Rural	64	1483	80	3952		70	2117	78	3312			

TABLE 21 (continued): Bivariate analysis, women percentage and number of the association between selected characteristics and negative attitudes towards women, KDHS-2003

Study Characteristics	WOMEN									
	Husband Controlling Attitudes					Women Sexual Attitudes-Husband				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Sexually Transmitted Diseases										
Does not have STD(s)	97	2665	96	5216	0.002	97	3336	96	4538	0.4
Has STD(s)	03	72	04	220		03	121	04	171	
Ethnicity										
Kikuyu	29	845	20	1127		20	769	24	1202	
Luhya	13	376	16	853		16	595	14	633	
Luo	11	254	13	597		14	466	10	386	
Kalenjin	09	175	11	467	<0.001	10	279	10	363	<0.001
Kamba	12	300	10	484		14	389	10	394	
Kisii	04	94	07	360		04	131	08	322	
Meru	08	171	05	215		08	214	05	171	
Others	14	523	18	1338		14	618	19	1241	
Province										
Nairobi	18	678	07	488		15	614	09	553	
Central	17	508	12	803		12	464	16	846	
Coast	08	285	09	651		09	411	09	523	
Eastern	17	351	15	639	<0.001	19	507	13	481	<0.001
Nyanza	10	202	17	822		14	418	15	605	
Rift Valley	19	347	24	978		20	499	24	826	
Western	09	264	13	727		13	471	11	519	
North Eastern	02	103	03	333		01	77	03	359	
Voluntary Counseling and Testing										
HIV: Not Tested	81	2150	87	4658	<0.001	83	2829	86	3973	0.003
HIV: Tested	19	536	13	703		17	619	14	619	
Occupation										
Agriculture/Self-Employed	19	451	35	1724		30	919	30	1252	
Teaching and Management	09	258	03	116		04	196	03	178	
Sales	15	418	14	812	<0.001	16	590	13	639	<0.001
Other Occupations	19	528	11	630		15	528	12	632	
Not Working	38	1080	37	2153		34	1226	40	2004	

TABLE 22: Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes towards women, KDHS-2003

Study Characteristics	MEN												P-values		
	Husband Controlling Attitudes				Women Sexual Attitudes-Husband				Husband Sexual Attitudes						
	No %	Yes %	N	P-values	No %	Yes %	N	P-values	No %	Yes %	N	P-values			
Alcohol Consumption															
No	73	69	965	1572	0.02	67	1174	73	1349	<0.001	72	1644	67	894	0.003
Yes	27	31	366	662		33	550	27	477		28	588	33	442	
Age															
15-19	17	28	233	595		17	302	307	524		22	499	25	329	
20-24	19	19	250	423		21	350	18	323		20	427	19	247	
25-29	15	13	204	308		16	287	12	221		15	332	12	181	
30-34	13	10	189	231	<0.001	13	231	10	187	<0.001	12	276	10	144	0.281
35-39	13	10	169	221		11	187	10	200		11	242	11	147	
40-44	10	9	119	194		9	152	9	160		9	189	10	125	
45-49	6	5	80	124		6	101	5	102		5	126	6	78	
50-54	7	6	89	139		7	114	6	112		6	142	7	87	
Education															
<Primary School	3	8	47	249		4	95	9	119		6	179	8	117	
Primary School	39	64	492	1355	<0.001	47	765	62	1075	<0.001	48	1012	64	837	<0.001
Post Primary/Vocational/Secondary	40	23	527	514		35	602	23	435		33	740	22	301	
College/University	18	5	267	117		14	262	6	119		13	302	6	83	
Wealth															
Poorest	10	19	118	422		11	184	20	352		11	284	21	255	
Poorer	15	18	170	385		17	270	17	285		16	311	20	245	
Middle	18	19	218	397	<0.001	17	278	19	331	<0.001	18	374	19	241	<0.001
Richer	20	23	257	491		22	355	22	391		24	501	19	250	
Richest	37	21	570	540		33	637	22	469		31	763	21	347	
Religion															
Protestant	65	57	854	1194		63	1039	57	1002		61	1310	58	740	
Roman Catholic	25	28	317	595	<0.001	28	455	26	454	<0.001	26	552	27	361	0.426
Muslim	6	7	108	273		5	158	8	220		7	256	7	125	
Other Religions	4	8	53	173		4	71	9	152		6	115	8	111	
Residence															
Urban	33	21	552	594	<0.001	29	637	21	502	<0.001	28	757	22	389	0.020
Rural	67	79	781	1641		71	1087	79	1326		72	1476	78	949	

TABLE 22 (continued): Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes towards women, KDHS-2003

Study Characteristics	MEN												P-values			
	Husband Controlling Attitudes				Women Sexual Attitudes-Husband				Husband Sexual Attitudes							
	No %	Yes %	N	P-values	No %	Yes %	N	P-values	No %	Yes %	N	P-values				
Sexually Transmitted Diseases																
Does not have STD(s)	99	01	1308	97	2154	0.116	98	1688	97	1758	0.06	98	2177	98	1288	0.350
Has STD(s)																
Ethnicity																
Kikuyu	24	16	340	21	500		21	366	24	469		26	597	17	245	
Luhya	16	11	224	13	294		17	289	13	230		16	334	14	185	
Luo	11	09	139	12	251		13	211	11	177		10	214	16	176	
Kalenjin	09	15	87	14	237	<0.001	11	153	12	170	<0.001	10	173	14	150	<0.001
Kamba	15	06	176	10	195		10	157	14	213		11	230	11	141	
Kisii	06	08	76	06	132		07	129	04	78		06	124	06	84	
Meru	08	11	88	06	84		08	108	04	61		07	125	03	47	
Others	11	17	203	18	542		13	311	18	430		14	436	19	310	
Province																
Nairobi	17	15	290	08	201		14	300	09	189		13	336	09	155	
Central	15	07	215	16	402		12	227	19	389		18	445	11	174	
Coast	07	20	133	07	242		07	161	08	213		05	180	10	195	
Eastern	20	10	210	14	257	<0.001	15	220	17	243	<0.001	17	294	15	174	<0.001
Nyanza	10	18	125	16	309		15	235	12	196		10	218	19	216	
Rift Valley	18	12	150	27	434		24	278	23	303		23	339	25	245	
Western	12	01	186	10	248		12	238	10	195		11	275	10	159	
North Eastern	01	24	24	02	142		01	65	02	100		03	146	01	20	
Voluntary Counseling and Testing																
HIV: Not Tested	81	19	1056	86	1895	<0.001	83	1393	86	1547	0.005	83	1827	86	1125	0.053
HIV: Tested																
Occupation																
Agriculture/Self-Employed	26	13	318	36	729		31	471	33	569		29	607	36	442	
Teaching and Management	10	29	179	04	97		10	178	05	96		10	215	04	60	
Sales	10	29	140	08	188	<0.001	09	180	07	147	<0.001	09	201	09	127	<0.001
Other Occupations	29	22	383	28	638		30	521	27	496		28	612	29	410	
Not Working	22	305	305	24	579		20	367	28	515		24	590	22	294	

TABLE 23: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband) and study characteristics in a univariate logistic regression model, women, KDHS-2003

		Husband Controlling Attitudes			WOMEN			Women Sexual Attitudes-Husband		
Negative Attitudes Towards Women		ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Alcohol Consumption										
No		Ref.			Ref.			Ref.		
Yes		0.97	0.830	0.76	1.25	1.01	1.27	0.80	0.925	1.27
Age										
15-19		Ref.			Ref.			Ref.		
20-24		0.87	0.065	0.74	1.01	0.70	0.83	0.59	0.000	0.83
25-29		0.98	0.585	0.90	1.06	0.85	0.91	0.79	0.000	0.91
30-34		0.96	0.140	0.91	1.01	0.91	0.96	0.86	0.000	0.96
35-39		1.01	0.610	0.97	1.06	0.95	1.00	0.91	0.040	1.00
40-44		0.98	0.445	0.94	1.03	1.00	1.04	0.97	0.953	1.04
45-49		1.00	0.913	0.96	1.04	0.98	1.01	0.95	0.147	1.01
Education										
<Primary School		Ref.			Ref.			Ref.		
Primary School		0.78	0.034	0.62	0.98	0.52	0.63	0.43	0.000	0.63
Post Primary/Vocational/Secondary		0.57	0.000	0.50	0.65	0.64	0.71	0.58	0.000	0.71
College/University		0.48	0.000	0.43	0.53	0.70	0.76	0.64	0.000	0.76
Wealth										
Poorest		Ref.			Ref.			Ref.		
Poorer		0.78	0.030	0.62	0.98	0.99	1.19	0.83	0.938	1.19
Middle		0.82	0.001	0.73	0.92	0.95	1.05	0.86	0.289	1.05
Richer		0.82	0.000	0.77	0.89	0.92	0.98	0.86	0.012	0.98
Richest		0.71	0.000	0.67	0.75	0.88	0.92	0.84	0.000	0.92
Religion										
Protestant		Ref.			Ref.			Ref.		
Roman Catholic		1.09	0.270	0.94	1.26	0.97	1.12	0.84	0.653	1.12
Muslim		1.32	0.000	1.20	1.45	1.19	1.31	1.08	0.000	1.31
Other Religions		1.13	0.132	0.96	1.32	1.07	1.23	0.94	0.312	1.23
Residence										
Urban		Ref.			Ref.			Ref.		
Rural		2.24	0.000	1.91	2.64	1.49	1.74	1.28	0.000	1.74

TABLE 23 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband) and study characteristics in a univariate logistic regression model, women, KDHS-2003

	Husband Controlling Attitudes			WOMEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative Attitudes Towards Women						
Does not have STD(s)	Ref.			Ref.		
Has STD(s)	1.58	0.003	1.18	2.13	0.397	0.85
Sexually Transmitted Diseases						
Kikuyu	Ref.			Ref.		
Luhya	1.67	0.000	1.39	2.01	0.000	0.61
Luo	1.31	0.000	1.16	1.47	0.000	0.69
Kalenjin	1.26	0.000	1.14	1.39	0.134	0.86
Kamba	1.06	0.038	1.00	1.12	0.000	0.85
Kisii	1.24	0.000	1.17	1.32	0.000	1.08
Meru	0.98	0.401	0.94	1.03	0.000	0.86
Others	1.09	0.000	1.06	1.13	0.008	1.01
Province						
Nairobi	Ref.			Ref.		
Central	2.11	0.000	1.60	2.78	0.000	1.70
Coast	1.76	0.000	1.55	2.00	0.001	1.09
Eastern	1.37	0.000	1.26	1.49	0.634	0.95
Nyanza	1.51	0.000	1.40	1.62	0.000	1.07
Rift Valley	1.30	0.000	1.23	1.37	0.000	1.06
Western	1.26	0.000	1.20	1.31	0.005	1.01
North Eastern	1.24	0.000	1.18	1.31	0.000	1.20
Voluntary Counseling and Testing						
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	0.64	0.000	0.54	0.75	0.000	0.66
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	0.13	0.000	0.10	0.18	0.022	0.58
Sales	0.71	0.000	0.65	0.77	0.015	0.84
Other Occupations	0.67	0.000	0.63	0.71	0.042	0.89
Not Working	0.86	0.000	0.83	0.89	0.008	1.01

TABLE 24: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

		HUSBAND CONTROLLING ATTITUDES			WOMEN SEXUAL ATTITUDES-HUSBAND		
		ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative Attitudes Towards Women							
Alcohol Consumption							
	No	Ref.			Ref.		
	Yes	1.14	0.333	0.87	1.48	0.636	0.84
Age							
	15-19	Ref.			Ref.		
	20-24	1.05	0.565	0.88	1.26	0.004	0.67
	25-29	1.08	0.100	0.99	1.18	0.010	0.83
	30-34	1.00	0.962	0.94	1.07	0.078	0.89
	35-39	1.03	0.268	0.98	1.09	0.290	0.92
	40-44	0.98	0.384	0.93	1.03	0.963	0.96
	45-49	0.98	0.487	0.94	1.03	0.214	0.94
Education							
	<Primary School	Ref.			Ref.		
	Primary School	0.86	0.239	0.67	1.10	0.000	0.53
	Post Primary/Vocational/Secondary	0.66	0.000	0.58	0.75	0.000	0.80
	College/University	0.60	0.000	0.54	0.68	0.000	0.86
Wealth							
	Poorest	Ref.			Ref.		
	Poorer	0.91	0.465	0.69	1.18	0.271	0.93
	Middle	0.96	0.571	0.85	1.10	0.469	0.94
	Richer	0.99	0.773	0.91	1.07	0.666	0.93
	Richest	0.89	0.001	0.83	0.95	0.152	0.90
Religion							
	Protestant	Ref.			Ref.		
	Roman Catholic	1.05	0.508	0.90	1.23	0.108	0.79
	Muslim	1.35	0.000	1.17	1.57	0.198	0.79
	Other Religions	1.05	0.595	0.88	1.26	0.095	0.80
Residence							
	Urban	Ref.			Ref.		
	Rural	0.90	0.402	0.71	1.15	0.201	0.91
							1.54

TABLE 24 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

	Husband Controlling Attitudes			WOMEN		
	Husband Controlling Attitudes P-values	ORs	95% CIs	ORs	Women Sexual Attitudes-Husband P-values	95% CIs
Negative Attitudes Towards Women						
Sexually Transmitted Diseases						
Does not have STD(s)		Ref.		Ref.		
Has STD(s)	0.044	1.37	1.01	1.87	0.170	0.91
Ethnicity						
Kikuyu		Ref.		Ref.		
Luhya	0.237	1.16	0.91	1.47	0.007	0.55
Luo	0.497	1.05	0.91	1.21	0.000	0.61
Kalenjin	0.365	1.05	0.94	1.17	0.011	0.81
Kamba	0.444	1.03	0.95	1.12	0.535	0.91
Kisii	0.002	1.12	1.04	1.21	0.007	1.02
Meru	0.112	0.94	0.88	1.01	0.142	0.91
Others	0.469	1.02	0.97	1.07	0.147	1.07
Province						
Nairobi		Ref.		Ref.		
Central	0.028	1.41	1.04	1.92	0.017	1.05
Coast	0.082	1.15	0.98	1.34	0.097	0.77
Eastern	0.033	1.16	1.01	1.32	0.003	0.77
Nyanza	0.000	1.23	1.13	1.34	0.063	1.00
Rift Valley	0.000	1.15	1.08	1.22	0.316	0.97
Western	0.001	1.10	1.04	1.16	0.872	0.95
North Eastern	0.820	0.99	0.92	1.07	0.039	1.00
Voluntary Counseling and Testing						
HIV: Not Tested		Ref.		Ref.		
HIV: Tested	0.598	0.95	0.80	1.14	0.228	0.79
Occupation						
Agriculture/Self-Employed		Ref.		Ref.		
Teaching and Management	0.000	0.44	0.32	0.62	0.158	0.91
Sales	0.000	0.81	0.73	0.89	0.474	0.95
Other Occupations	0.000	0.81	0.75	0.87	0.024	1.01
Not Working	0.000	0.90	0.87	0.94	0.000	1.04

TABLE 25: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband, husband sexual attitudes) and study characteristics in a univariate logistic regression model, men, KDHS-2003

	Husband Controlling Attitudes			MEN			Husband Sexual Attitudes		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative Attitudes Towards Women									
Alcohol Consumption									
No	Ref.			Ref.			Ref.		
Yes	1.21	0.020	1.03 1.43	0.76	0.000	0.65 0.88	1.29	0.003	1.09 1.52
Age									
15-19	Ref.			Ref.			Ref.		
20-24	0.65	0.005	0.48 0.88	0.52	0.000	0.42 0.65	0.82	0.131	0.63 1.06
25-29	0.73	0.000	0.63 0.85	0.67	0.000	0.60 0.75	0.87	0.038	0.76 0.99
30-34	0.79	0.000	0.71 0.87	0.75	0.000	0.68 0.81	0.91	0.035	0.83 0.99
35-39	0.82	0.000	0.77 0.88	0.87	0.000	0.81 0.93	0.97	0.452	0.91 1.04
40-44	0.90	0.004	0.84 0.97	0.92	0.003	0.87 0.97	1.00	0.939	0.94 1.06
45-49	0.92	0.005	0.86 0.97	0.92	0.001	0.87 0.97	0.99	0.638	0.93 1.05
50-54	0.93	0.011	0.89 0.98	0.92	0.000	0.88 0.96	0.99	0.655	0.94 1.04
Education									
<Primary School	Ref.			Ref.			Ref.		
Primary School	0.56	0.017	0.35 0.90	0.59	0.005	0.41 0.85	0.96	0.824	0.68 1.36
Post Primary/Vocational/Secondary	0.44	0.000	0.35 0.55	0.55	0.000	0.45 0.67	0.69	0.000	0.57 0.83
College/University	0.46	0.000	0.39 0.54	0.58	0.000	0.49 0.67	0.66	0.000	0.57 0.76
Wealth									
Poorest	Ref.			Ref.			Ref.		
poorer	0.68	0.005	0.51 0.89	0.59	0.000	0.46 0.76	0.71	0.004	0.56 0.90
Middle	0.75	0.000	0.65 0.86	0.78	0.000	0.68 0.89	0.76	0.000	0.67 0.86
Richer	0.84	0.001	0.76 0.93	0.82	0.000	0.74 0.90	0.76	0.000	0.69 0.83
Richest	0.75	0.000	0.70 0.80	0.78	0.000	0.73 0.84	0.79	0.000	0.73 0.84
Religion									
Protestant	Ref.			Ref.			Ref.		
Roman Catholic	1.28	0.021	1.04 1.58	1.04	0.665	0.88 1.23	1.11	0.343	0.90 1.36
Muslim	1.21	0.028	1.02 1.43	1.27	0.004	1.08 1.49	1.01	0.958	0.83 1.21
Other Religions	1.27	0.000	1.14 1.41	1.28	0.000	1.14 1.44	1.10	0.162	0.96 1.25
Residence									
Urban	Ref.			Ref.			Ref.		
Rural	1.88	0.000	1.55 2.28	1.52	0.000	1.25 1.85	1.31	0.020	1.04 1.66

TABLE 25 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards women (husband controlling attitudes, women sexual attitudes-husband, husband sexual attitudes) and study characteristics in a univariate logistic regression model, men, KDHS-2003

	Husband Controlling Attitudes			MEN Women Sexual Attitudes-Husband			Husband Sexual Attitudes		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative Attitudes Towards Women									
Sexually Transmitted Diseases									
Does not have STD(s)	Ref.			Ref.			Ref.		
Has STD(s)	1.70	0.120	0.87 3.33	1.70	0.063	0.97 2.98	1.29	0.347	0.76 2.21
Ethnicity									
Kikuyu	Ref.			Ref.			Ref.		
Luhya	0.95	0.745	0.70 1.29	0.66	0.003	0.50 0.87	1.36	0.070	0.97 1.90
Luo	1.14	0.128	0.96 1.35	0.84	0.024	0.72 0.98	1.56	0.000	1.30 1.87
Kalenjin	1.21	0.001	1.08 1.36	0.98	0.738	0.85 1.12	1.30	0.001	1.12 1.51
Kamba	0.94	0.098	0.87 1.01	1.06	0.061	1.00 1.13	1.13	0.001	1.05 1.21
Kisii	1.02	0.690	0.94 1.10	0.87	0.000	0.81 0.94	1.10	0.044	1.00 1.21
Meru	0.93	0.024	0.87 0.99	0.87	0.000	0.82 0.93	0.98	0.555	0.93 1.04
Others	1.09	0.000	1.05 1.13	1.03	0.223	0.98 1.07	1.11	0.000	1.06 1.16
Province									
Nairobi	Ref.			Ref.			Ref.		
Central	2.50	0.000	1.80 3.46	2.50	0.000	1.79 3.49	0.87	0.454	0.59 1.26
Coast	1.60	0.000	1.36 1.87	1.43	0.000	1.19 1.73	1.57	0.000	1.26 1.95
Eastern	1.18	0.001	1.07 1.30	1.20	0.004	1.06 1.35	1.11	0.085	0.99 1.25
Nyanza	1.36	0.000	1.25 1.48	1.08	0.112	0.98 1.18	1.27	0.000	1.15 1.39
Rift Valley	1.29	0.000	1.21 1.37	1.09	0.023	1.01 1.17	1.09	0.029	1.01 1.18
Western	1.11	0.001	1.05 1.18	1.04	0.188	0.98 1.11	1.05	0.134	0.98 1.13
North Eastern	1.37	0.000	1.25 1.51	1.17	0.000	1.09 1.26	0.86	0.008	0.77 0.96
Voluntary Counseling and Testing									
HIV: Not Tested	Ref.			Ref.			Ref.		
HIV: Tested	0.69	0.000	0.57 0.84	0.76	0.005	0.63 0.92	0.82	0.053	0.67 1.00
Occupation									
Agriculture/Self-Employed	Ref.			Ref.			Ref.		
Teaching and Management	0.25	0.000	0.19 0.34	0.47	0.000	0.34 0.65	0.40	0.000	0.29 0.56
Sales	0.80	0.002	0.69 0.92	0.88	0.105	0.76 1.03	0.94	0.399	0.82 1.08
Other Occupations	0.91	0.006	0.85 0.97	0.93	0.061	0.86 1.00	0.95	0.152	0.88 1.02
Not Working	0.95	0.078	0.90 1.01	1.07	0.023	1.01 1.13	0.93	0.012	0.88 0.98

TABLE 26: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards (husband controlling attitudes, women sexual attitudes-husband, husband sexual attitudes) women and study characteristics in a multivariate logistic regression model, men, KDHS-2003

	Husband Controlling Attitudes			Women Sexual Attitudes-Husband			Husband Sexual Attitudes				
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs		
MEN											
Negative Attitudes Towards Women											
Alcohol Consumption											
	Ref.			Ref.			Ref.				
No	1.68	0.000	1.39	2.04	0.183	0.76	1.05	1.42	0.000	1.19	1.69
Yes											
Age											
	Ref.			Ref.			Ref.				
15-19	0.67	0.028	0.47	0.96	0.006	0.51	0.89	0.91	0.541	0.66	1.25
20-24	0.68	0.000	0.58	0.79	0.000	0.64	0.86	0.86	0.077	0.73	1.02
25-29	0.76	0.000	0.67	0.86	0.001	0.73	0.93	0.91	0.111	0.81	1.02
30-34	0.80	0.000	0.73	0.87	0.155	0.86	1.02	1.00	0.932	0.91	1.09
35-39	0.86	0.001	0.80	0.94	0.252	0.88	1.03	0.99	0.811	0.92	1.07
40-44	0.87	0.000	0.82	0.93	0.95	0.89	1.01	0.97	0.455	0.90	1.05
45-49	0.91	0.003	0.85	0.97	0.94	0.89	1.00	0.98	0.485	0.92	1.04
50-54											
Education											
	Ref.			Ref.			Ref.				
<Primary School	0.76	0.264	0.47	1.23	0.023	0.41	0.94	0.83	0.369	0.56	1.24
Primary School	0.54	0.000	0.42	0.68	0.000	0.48	0.74	0.67	0.000	0.54	0.84
Post Primary/Vocational/Secondary	0.56	0.000	0.46	0.67	0.000	0.53	0.77	0.68	0.000	0.57	0.81
College/University											
Wealth											
	Ref.			Ref.			Ref.				
Poorest	0.95	0.751	0.70	1.30	0.001	0.49	0.83	0.77	0.064	0.59	1.02
Poorer	0.95	0.521	0.80	1.12	0.002	0.70	0.92	0.83	0.014	0.72	0.96
Middle	1.01	0.894	0.90	1.13	0.003	0.76	0.95	0.82	0.001	0.73	0.92
Richer	0.95	0.337	0.85	1.06	0.000	0.77	0.92	0.81	0.000	0.73	0.91
Richest											
Religion											
	Ref.			Ref.			Ref.				
Protestant	1.22	0.072	0.98	1.52	0.788	0.86	1.22	1.03	0.814	0.83	1.27
Roman Catholic	0.86	0.182	0.69	1.07	0.538	0.86	1.35	0.98	0.891	0.75	1.29
Muslim	1.07	0.232	0.96	1.21	0.002	1.06	1.31	0.99	0.860	0.86	1.13
Other Religions											
Residence											
	Ref.			Ref.			Ref.				
Urban	1.18	0.393	0.81	1.71	0.479	0.64	1.24	0.78	0.210	0.53	1.15
Rural											

TABLE 26 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards (husband controlling attitudes, women sexual attitudes-husband, husband sexual attitudes) women and study characteristics in a multivariate logistic regression model, men, KDHS-2003

	Husband Controlling Attitudes			Women Sexual Attitudes-Husband			Husband Sexual Attitudes		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative Attitudes Towards Women	Ref.			Ref.			Ref.		
Does not have STD(s)	1.14	0.717	0.55 2.36	1.79	0.035	1.04 3.06	0.78	0.349	0.45 1.32
Has STD(s)									
Sexually Transmitted Diseases									
Does not have STD(s)	Ref.			Ref.			Ref.		
Has STD(s)	1.27	0.317	0.80 2.01	0.92	0.681	0.62 1.37	1.02	0.929	0.67 1.55
Ethnicity									
Kikuyu	1.23	0.113	0.95 1.59	0.99	0.901	0.81 1.21	1.20	0.176	0.92 1.55
Luhya	1.06	0.505	0.89 1.25	1.01	0.871	0.86 1.20	1.15	0.130	0.96 1.39
Luo	1.03	0.649	0.91 1.16	1.09	0.150	0.97 1.22	0.98	0.818	0.86 1.13
Kalenjin	1.05	0.371	0.94 1.18	0.95	0.309	0.85 1.05	0.99	0.918	0.86 1.14
Kamba	0.99	0.749	0.90 1.08	0.90	0.057	0.81 1.00	0.90	0.062	0.81 1.01
Kisii	1.10	0.003	1.03 1.17	1.00	0.884	0.95 1.06	1.04	0.307	0.97 1.12
Meru									
Others									
Province									
Nairobi	Ref.			Ref.			Ref.		
Central	1.85	0.003	1.24 2.77	1.95	0.002	1.28 2.97	0.70	0.173	0.42 1.17
Coast	1.08	0.460	0.88 1.33	1.12	0.311	0.90 1.40	1.21	0.176	0.92 1.58
Eastern	0.95	0.487	0.82 1.10	1.06	0.512	0.89 1.28	1.05	0.655	0.85 1.30
Nyanza	1.13	0.039	1.01 1.27	0.97	0.599	0.85 1.10	1.10	0.181	0.96 1.27
Rift Valley	1.15	0.005	1.04 1.26	0.99	0.769	0.91 1.07	0.96	0.454	0.87 1.07
Western	0.98	0.717	0.89 1.08	0.97	0.422	0.90 1.05	0.97	0.546	0.88 1.07
North Eastern	1.24	0.002	1.09 1.42	0.95	0.428	0.85 1.07	0.74	0.002	0.61 0.89
Voluntary Counseling and Testing									
HIV: Not Tested	Ref.			Ref.			Ref.		
HIV: Tested	0.98	0.827	0.78 1.22	1.05	0.655	0.85 1.30	0.97	0.782	0.77 1.21
Occupation									
Agriculture/Self-Employed	Ref.			Ref.			Ref.		
Teaching and Management	0.85	0.392	0.58 1.24	1.12	0.554	0.78 1.60	0.90	0.637	0.59 1.38
Sales	1.02	0.790	0.88 1.19	1.00	0.959	0.86 1.17	1.11	0.223	0.94 1.31
Other Occupations	1.03	0.381	0.96 1.12	0.99	0.816	0.92 1.07	1.00	0.921	0.92 1.08
Not Working	0.92	0.022	0.86 0.99	1.04	0.309	0.96 1.12	0.95	0.149	0.89 1.02

TABLE 27: Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes towards condom use (condom perception, disease protection, and sexual pleasure), KDHS-2003

Study Characteristics	MEN											
	Condom Perception				Disease Protection				Sexual Pleasure			
	No %	Yes %	N	P-values	No %	Yes %	N	P-values	No %	Yes %	N	P-values
Province												
Nairobi	17	08	239		12	08	411		13	10	134	
Central	16	15	196		14	21	434		14	16	118	
Coast	07	07	127		07	05	296		04	08	41	
Eastern	08	20	75	<0.001	15	19	347	<0.001	13	17	79	<0.001
Nyanza	13	14	133		14	11	353		14	14	95	
Rift Valley	21	25	151		25	21	460		31	22	151	
Western	17	08	215		12	07	374		10	11	88	
North Eastern	01	03	4		01	07	33		01	02	6	
Age												
15-19	16	27	188		20	35	547		23	24	157	
20-24	25	16	280		20	12	565		23	17	169	
25-29	16	13	191		14	12	407		15	13	115	
30-34	15	10	170	<0.001	14	06	361	<0.001	13	12	93	<0.001
35-39	12	10	124		12	10	299		10	12	68	
40-44	08	09	94		09	09	235		08	09	54	
45-49	04	07	49		05	08	141		05	06	32	
50-54	04	08	44		06	08	153		03	07	24	
Education												
<Primary School	02	08	20		04	16	99		03	08	16	
Primary School	42	60	453	<0.001	53	58	1393	<0.001	47	56	316	<0.001
Post Primary/Vocational/Secondary	39	24	462		31	20	878		32	27	246	
College/University	17	08	205		12	06	338		18	09	134	
Occupation												
Agriculture/Self-Employed	27	35	276		32	30	809		28	33	181	
Teaching and Management	11	06	130		09	05	234		11	07	77	
Sales	12	08	131	<0.001	09	08	261	<0.001	11	09	78	0.005
Other Occupations	31	26	366		30	21	848		27	28	203	
Not Working	19	25	231		20	36	547		23	23	170	
Residence												
Urban	34	22	479	<0.001	27	22	920	0.031	30	25	265	0.025
Rural	66	78	661		73	78	1788		70	75	447	

TABLE 27 (continued): Bivariate analysis, men percentage and number of the association between selected characteristics and negative attitudes towards condom use (condom perception, disease protection, and sexual pleasure), KDHS-2003

Study Characteristics	MEN											
	Condom Perception				Disease Protection				Sexual Pleasure			
	No %	Yes %	N	P-values	No %	Yes %	N	P-values	No %	Yes %	N	P-values
Wealth												
Poorest	10	18	93	443	14	21	324	216	14	16	83	457
Poorer	15	19	149	405	18	16	432	123	14	18	88	468
Middle	17	18	172	442	17	22	444	171	16	19	110	505
Richer	20	23	228	522	22	20	597	154	23	22	152	598
Richest	38	42	498	613	29	21	911	199	33	25	279	833
Ethnicity												
Kikuyu	24	21	292	550	21	26	616	226	23	22	182	660
Luhya	22	12	252	263	16	8	454	65	15	14	118	401
Luo	14	11	154	235	13	8	335	55	15	10	106	284
Kalenjin	11	11	103	219	12	9	271	53	16	11	86	238
Kamba	07	14	78	293	12	13	286	85	09	13	58	313
Kisii	06	06	74	134	06	06	164	44	04	07	30	178
Meru	05	07	42	130	06	05	137	35	06	06	37	135
Others	11	18	145	601	14	25	445	300	12	17	95	652
Perceived Risk of Acquiring HIV												
No Risk	25	37	288	951	29	48	805	435	27	35	197	1046
Small Risk	59	48	687	1125	54	41	1490	324	56	50	408	1405
Moderate Risk	12	09	123	196	11	07	279	42	10	10	66	255
High Risk	04	06	41	117	06	04	131	28	07	05	39	120
Religion												
Protestant	63	58	716	1332	62	53	1641	411	64	59	455	1598
Roman Catholic	26	26	301	610	27	23	739	174	27	26	190	722
Muslim	05	08	67	314	05	13	182	198	03	08	26	355
Other Religions	06	08	56	168	06	11	145	80	06	07	41	185
Marital Status												
Never Married	46	45	517	1064	43	51	1170	413	48	44	335	1249
Currently Married	50	50	582	1263	52	46	1422	427	48	51	349	1501
Formerly Married	04	05	41	98	05	03	116	23	04	05	28	111
Voluntary Counseling and Testing												
HIV: Not Tested	77	87	878	2070	83	87	2220	731	82	85	576	2377
HIV: Tested	23	13	262	319	17	13	486	98	18	15	135	449

TABLE 28: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom use (condom perception, disease protection, sexual pleasure) and study characteristics in a univariate logistic regression model, men, KDHS-2003

Province	Condom perception				Disease Protection				Sexual Pleasure			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Nairobi	Ref.			Ref.			Ref.			Ref.		
Central	2.08	0.000	1.43	3.01	0.001	1.38	3.37	1.55	0.022	1.07	2.25	
Coast	1.38	0.005	1.11	1.73	0.282	0.89	1.51	1.73	0.000	1.37	2.19	
Eastern	1.71	0.000	1.49	1.96	0.026	1.02	1.40	1.20	0.004	1.06	1.35	
Nyanza	1.22	0.000	1.11	1.35	0.726	0.90	1.15	1.07	0.182	0.97	1.18	
Rift Valley	1.20	0.000	1.11	1.30	0.408	0.94	1.16	0.99	0.807	0.93	1.06	
Western	0.99	0.787	0.94	1.05	0.287	0.88	1.04	1.07	0.027	1.01	1.13	
North Eastern	1.70	0.000	1.47	1.96	0.000	1.46	1.72	1.39	0.000	1.20	1.59	
Age												
15-19	Ref.							Ref.				
20-24	0.39	0.000	0.31	0.49	0.37	0.000	0.28	0.48	0.73	0.025	0.56	0.96
25-29	0.69	0.000	0.60	0.80	0.71	0.000	0.61	0.81	0.93	0.341	0.79	1.08
30-34	0.76	0.000	0.69	0.84	0.66	0.000	0.58	0.74	0.92	0.102	0.83	1.02
35-39	0.86	0.000	0.79	0.93	0.84	0.000	0.78	0.91	1.03	0.522	0.94	1.13
40-44	0.93	0.039	0.87	1.00	0.91	0.004	0.85	0.97	1.03	0.448	0.96	1.11
45-49	0.99	0.734	0.93	1.06	0.98	0.520	0.92	1.05	1.05	0.207	0.97	1.13
50-54	1.02	0.526	0.96	1.08	0.96	0.112	0.91	1.01	1.13	0.002	1.05	1.21
Education												
<Primary School	Ref.							Ref.				
Primary School	0.29	0.000	0.18	0.49	0.25	0.000	0.17	0.36	0.37	0.011	0.17	0.79
Post Primary/Vocational/Secondary	0.36	0.000	0.27	0.46	0.38	0.000	0.31	0.47	0.51	0.001	0.35	0.76
College/University	0.44	0.000	0.37	0.54	0.48	0.000	0.40	0.56	0.53	0.000	0.41	0.68
Occupation												
Agriculture/Self-Employed	Ref.							Ref.				
Teaching and Management	0.44	0.000	0.31	0.62	0.62	0.041	0.40	0.98	0.53	0.001	0.36	0.78
Sales	0.74	0.000	0.64	0.87	0.99	0.937	0.85	1.17	0.85	0.085	0.70	1.02
Other Occupations	0.89	0.001	0.82	0.95	0.91	0.061	0.83	1.00	0.96	0.270	0.89	1.03
Not Working	1.01	0.683	0.95	1.08	1.20	0.000	1.13	1.28	0.97	0.367	0.92	1.03
Residence												
Urban	Ref.							Ref.				
Rural	1.83	0.000	1.47	2.28	1.32	0.032	1.03	1.70	1.27	0.025	1.03	1.57

TABLE 28 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom use (condom perception, disease protection, sexual pleasure) and study characteristics in a univariate logistic regression model, men, KDHS-2003

Negative attitudes towards condom use	Condom perception				Disease Protection				Sexual Pleasure			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Wealth												
Poorest	Ref.			Ref.			Ref.			Ref.		
poorer	0.68	0.080	0.44	1.05	0.58	0.007	0.39	0.86	1.02	0.915	0.68	1.54
Middle	0.79	0.027	0.64	0.97	0.89	0.185	0.75	1.06	0.98	0.844	0.81	1.18
Richer	0.85	0.020	0.75	0.97	0.81	0.001	0.72	0.92	0.92	0.133	0.82	1.03
Richest	0.75	0.000	0.68	0.83	0.82	0.000	0.74	0.91	0.89	0.014	0.82	0.98
Ethnicity												
Kikuyu	Ref.			Ref.			Ref.			Ref.		
Luhya	0.56	0.000	0.41	0.76	0.42	0.000	0.28	0.61	0.99	0.929	0.72	1.36
Luo	0.94	0.499	0.77	1.13	0.67	0.000	0.55	0.81	0.87	0.105	0.73	1.03
Kalenjin	1.04	0.551	0.91	1.20	0.80	0.045	0.65	0.99	0.91	0.211	0.79	1.05
Kamba	1.25	0.000	1.14	1.38	0.98	0.632	0.89	1.07	1.14	0.002	1.05	1.24
Kisii	1.01	0.744	0.94	1.09	0.95	0.291	0.88	1.04	1.14	0.012	1.03	1.26
Meru	1.09	0.059	1.00	1.19	0.95	0.198	0.89	1.03	1.01	0.854	0.93	1.09
Others	1.11	0.000	1.06	1.15	1.06	0.003	1.02	1.11	1.06	0.050	1.00	1.13
Perceived Risk of Acquiring HIV												
No Risk	Ref.			Ref.			Ref.			Ref.		
Small Risk	0.53	0.000	0.44	0.63	0.44	0.000	0.35	0.55	0.70	0.002	0.57	0.87
Moderate Risk	0.72	0.000	0.63	0.81	0.59	0.000	0.48	0.71	0.87	0.117	0.74	1.03
High Risk	0.98	0.760	0.85	1.13	0.74	0.000	0.63	0.87	0.81	0.005	0.70	0.94
Religion												
Protestant	Ref.			Ref.			Ref.			Ref.		
Roman Catholic	1.11	0.281	0.92	1.35	1.01	0.957	0.79	1.29	1.02	0.820	0.84	1.25
Muslim	1.33	0.003	1.10	1.60	1.86	0.000	1.57	2.21	1.84	0.000	1.42	2.38
Other Religions	1.15	0.023	1.02	1.30	1.29	0.000	1.13	1.47	1.10	0.183	0.96	1.26
Marital Status												
Never Married	Ref.			Ref.			Ref.			Ref.		
Currently Married	1.03	0.750	0.87	1.21	0.75	0.002	0.62	0.90	1.11	0.236	0.93	1.32
Formerly Married	1.14	0.261	0.91	1.43	0.74	0.017	0.57	0.95	1.06	0.634	0.82	1.38
Voluntary Counseling and Testing												
HIV: Not Tested	Ref.			Ref.			Ref.			Ref.		
HIV: Tested	0.49	0.000	0.40	0.61	0.69	0.005	0.53	0.89	0.81	0.076	0.64	1.02

TABLE 29: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom use (condom perception, disease protection, sexual pleasure) in a multivariate logistic regression model, men, KDHS-2003

Province	MEN									
	Condom perception		Disease Protection		Sexual Pleasure					
Negative attitudes towards condom use	ORs	95% CIs	ORs	95% CIs	ORs	95% CIs				
Nairobi	Ref.		Ref.		Ref.					
Central	1.61	0.066	0.97	2.67	1.29	3.89	1.27	0.389	0.74	2.18
Coast	0.91	0.459	0.72	1.16	0.60	1.11	1.41	0.018	1.06	1.88
Eastern	1.37	0.000	1.15	1.64	0.95	1.47	1.02	0.847	0.82	1.27
Nyanza	1.05	0.460	0.92	1.20	0.588	0.78	1.15	0.741	0.85	1.12
Rift Valley	1.13	0.004	1.04	1.22	0.561	0.92	1.16	0.95	0.87	1.02
Western	0.94	0.104	0.87	1.01	0.424	0.87	1.06	0.214	0.97	1.14
North Eastern	1.25	0.002	1.08	1.45	0.056	1.00	1.27	0.327	0.92	1.29
Age										
15-19	Ref.		Ref.		Ref.		Ref.		Ref.	
20-24	0.50	0.000	0.37	0.67	0.008	0.43	0.88	0.943	0.71	1.45
25-29	0.70	0.001	0.57	0.87	0.467	0.75	1.14	0.377	0.87	1.45
30-34	0.77	0.001	0.66	0.90	0.027	0.69	0.98	0.329	0.92	1.28
35-39	0.84	0.004	0.75	0.94	0.489	0.85	1.08	0.17	1.02	1.34
40-44	0.92	0.093	0.83	1.01	0.884	0.91	1.12	0.041	1.01	1.26
45-49	0.98	0.684	0.89	1.08	0.127	0.98	1.19	0.032	1.01	1.26
50-54	0.99	0.793	0.91	1.08	0.912	0.92	1.10	0.001	1.08	1.31
Education										
<Primary School	Ref.		Ref.		Ref.		Ref.		Ref.	
Primary School	0.47	0.010	0.27	0.84	0.000	0.27	0.62	0.069	0.24	1.06
Post Primary/Vocational/Secondary	0.49	0.000	0.36	0.66	0.000	0.40	0.64	0.007	0.40	0.86
College/University	0.59	0.000	0.48	0.73	0.000	0.47	0.73	0.000	0.43	0.77
Occupation										
Agriculture/Self-Employed	Ref.		Ref.		Ref.		Ref.		Ref.	
Teaching and Management	0.97	0.869	0.63	1.47	0.266	0.79	2.33	0.789	0.57	1.54
Sales	0.93	0.408	0.78	1.11	0.132	0.96	1.36	0.367	0.75	1.12
Other Occupations	0.99	0.797	0.91	1.08	0.767	0.92	1.12	0.884	0.92	1.11
Not Working	1.03	0.475	0.95	1.11	0.000	1.12	1.33	0.885	0.93	1.09
Residence										
Urban	Ref.		Ref.		Ref.		Ref.		Ref.	
Rural	0.83	0.220	0.61	1.12	0.331	0.56	1.22	0.963	0.71	1.38

TABLE 30: Bivariate analysis, women and men percentage and number of the association between selected characteristics and negative attitudes towards condom advertisement, KDHS-2003

Study Characteristics	Condom Advertisement									
	Women					Men				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Province										
Nairobi	12	843	08	326		12	371	10	121	
Central	13	724	17	586		14	405	18	215	
Coast	07	597	08	339		07	304	05	71	
Eastern	16	616	17	376	<0.001	16	317	18	151	<0.001
Nyanza	17	742	11	282		14	323	12	111	
Rift Valley	22	774	24	551		25	423	21	162	
Western	12	688	10	303		11	316	10	119	
North Eastern	01	25	05	411		01	4	06	162	
Age										
15-19	19	967	28	853		21	518	29	311	
20-24	22	1140	17	569		21	525	14	149	
25-29	18	929	14	466		15	378	12	136	
30-34	14	723	11	390	<0.001	12	318	09	102	<0.001
35-39	12	538	10	319		11	269	10	121	
40-44	09	439	12	340		09	204	10	110	
45-49	06	273	08	237		05	119	08	86	
50-54						06	132	08	97	
Marital Status										
Never Married	27	1441	34	1021		44	1088	47	496	
Currently Married	61	3001	57	1869	<0.001	51	1278	48	574	<0.001
Formerly Married	12	567	09	284		05	97	05	42	
Occupation										
Agriculture/Self-Employed	31	1382	28	793		31	718	32	331	
Teaching and Management	05	251	04	121		08	193	08	83	
Sales	16	841	13	389	<0.001	10	244	08	85	<0.001
Other Occupations	15	824	10	336		30	778	23	246	
Not Working	33	1705	45	1532		21	520	29	365	
Education										
<Primary School	08	392	21	897		04	87	14	209	
Primary School	58	2759	52	1470	<0.001	53	1283	55	569	<0.001
Post Primary/Vocational/Secondary	27	1457	21	628		32	799	22	242	
College/University	07	401	06	179		11	294	09	92	

TABLE 30 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and negative attitudes towards condom advertisement, KDHS-2003

Study Characteristics	Condom Advertisement									
	Women					Men				
	No %	N	Yes %	N	P-values	No %	N	Yes %	N	P-values
Wealth										
Poorest	15	617	21	758		14	294	20	246	
Poorer	18	773	19	532		17	372	18	184	
Middle	17	803	20	577	<0.001	18	424	19	191	<0.001
Richer	21	982	20	582		22	538	20	213	
Richest	29	1834	20	725		29	835	23	278	
Perceived Risk of Acquiring HIV										
No Risk	31	1601	43	1411		31	746	41	497	
Small Risk	40	2007	37	1098	<0.001	53	1333	47	481	<0.001
Moderate Risk	18	849	13	349		11	261	07	60	
High Risk	11	526	07	189		05	120	05	39	
Religion										
Protestant	68	3375	58	1662		62	1495	55	558	
Roman Catholic	25	1184	27	735	<0.001	27	669	24	244	<0.001
Muslim	05	350	12	671		05	153	12	228	
Other Religions	02	93	03	103		06	145	09	82	
Voluntary Counseling and Testing										
HIV: Not Tested	82	4076	89	2734	<0.001	82	2008	88	946	<0.001
HIV: Tested	18	915	11	323		18	453	12	131	
Ethnicity										
Kikuyu	21	1168	25	804		21	572	24	272	
Luhya	16	867	12	362		15	395	11	124	
Luo	14	657	08	195		12	295	09	95	
Kalenjin	11	447	09	195	<0.001	12	233	10	91	<0.001
Kamba	12	528	10	257		12	259	13	112	
Kisii	07	306	05	148		07	163	05	45	
Meru	06	253	06	133		07	130	05	42	
Others	13	783	25	1080		14	416	21	331	
Residence										
Urban	28	1896	20	851	<0.001	27	848	21	300	0.003
Rural	72	3113	80	2323		73	1615	79	812	

TABLE 31: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom advertisement, region/province and study characteristics in a univariate logistic regression model, women and men, KDHS-2003

Province	WOMEN				MEN			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	95% CIs
Nairobi	Ref.			Ref.				
Central	2.14	0.000	1.66	2.76	0.009	1.13	2.28	
Coast	1.27	0.004	1.08	1.49	0.143	0.69	1.06	
Eastern	1.17	0.001	1.07	1.28	0.064	0.99	1.29	
Nyanza	1.00	0.938	0.93	1.07	0.758	0.91	1.14	
Rift Valley	1.11	0.002	1.04	1.19	0.842	0.93	1.09	
Western	1.04	0.096	0.99	1.10	0.557	0.96	1.08	
North Eastern	1.80	0.000	1.68	1.94	0.000	1.78	2.30	
Age								
15-19	Ref.							
20-24	0.54	0.000	0.46	0.62	0.000	0.35	0.58	
25-29	0.73	0.000	0.68	0.79	0.000	0.67	0.86	
30-34	0.83	0.000	0.79	0.88	0.000	0.72	0.88	
35-39	0.89	0.000	0.85	0.93	0.011	0.85	0.98	
40-44	0.97	0.124	0.94	1.01	0.207	0.90	1.02	
45-49	1.00	0.813	0.96	1.03	0.460	0.96	1.09	
50-54	0.99	0.793	0.91	1.08	0.524	0.97	1.07	
Marital Status								
Never Married	Ref.							
Currently Married	0.78	0.000	0.70	0.87	0.145	0.76	1.04	
Formerly Married	0.80	0.000	0.72	0.89	0.980	0.82	1.22	
Occupation								
Agriculture/Self-Employed	Ref.							
Teaching and Management	0.96	0.768	0.71	1.28	0.712	0.76	1.49	
Sales	0.91	0.092	0.82	1.01	0.087	0.75	1.02	
Other Occupations	0.91	0.008	0.86	0.98	0.003	0.82	0.96	
Not Working	1.10	0.000	1.07	1.14	0.007	1.02	1.15	
Education								
<Primary School	Ref.							
Primary School	0.31	0.000	0.25	0.38	0.000	0.20	0.41	
Post Primary/Vocational/Secondary	0.51	0.000	0.45	0.57	0.000	0.37	0.53	
College/University	0.66	0.000	0.60	0.73	0.000	0.52	0.71	

TABLE 31 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom advertisement, region/province and study characteristics in a univariate logistic regression model, women and men, KDHS-2003

	WOMEN			MEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative attitudes towards condom advertisement						
Wealth						
Poorest	Ref.			Ref.		
Poorer	0.67	0.000	0.54	0.82	0.020	0.55
Middle	0.87	0.020	0.78	0.98	0.018	0.71
Richer	0.86	0.000	0.79	0.93	0.001	0.77
Richest	0.82	0.000	0.77	0.87	0.000	0.79
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	0.63	0.000	0.56	0.72	0.000	0.53
Moderate Risk	0.69	0.000	0.64	0.76	0.000	0.58
High Risk	0.77	0.000	0.72	0.82	0.038	0.74
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	1.29	0.000	1.13	1.47	0.842	0.84
Muslim	1.68	0.000	1.49	1.90	0.000	1.42
Other Religions	1.26	0.003	1.08	1.47	0.019	1.02
Voluntary Counseling and Testing						
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	0.57	0.000	0.48	0.67	0.000	0.49
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	0.62	0.000	0.53	0.74	0.000	0.53
Luo	0.65	0.000	0.58	0.73	0.085	0.66
Kalenjin	0.84	0.008	0.74	0.96	0.226	0.78
Kamba	0.93	0.001	0.89	0.97	0.910	0.92
Kisii	0.92	0.001	0.88	0.96	0.001	0.83
Meru	0.96	0.064	0.92	1.00	0.038	0.88
Others	1.08	0.000	1.05	1.11	0.015	1.01
Residence						
Urban	Ref.			Ref.		
Rural	1.50	0.000	1.25	1.80	0.003	1.11
						1.67

TABLE 32: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom advertisement, region/province and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

Province	WOMEN			MEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Nairobi	Ref.			Ref.		
Central	1.36	0.050	1.00	1.84	0.199	0.87
Coast	0.82	0.060	0.66	1.01	0.002	0.52
Eastern	1.00	0.971	0.87	1.15	0.152	0.95
Nyanza	0.94	0.210	0.85	1.04	0.704	0.89
Rift Valley	1.05	0.158	0.98	1.13	0.360	0.87
Western	0.99	0.790	0.93	1.06	0.627	0.94
North Eastern	1.40	0.000	1.26	1.55	0.000	1.40
Age						
15-19	Ref.			Ref.		
20-24	0.65	0.000	0.54	0.78	0.002	0.46
25-29	0.82	0.000	0.74	0.90	0.312	0.77
30-34	0.90	0.008	0.83	0.97	0.491	0.82
35-39	0.93	0.030	0.88	0.99	0.550	0.93
40-44	1.00	0.861	0.95	1.04	0.382	0.95
45-49	1.01	0.623	0.97	1.06	0.026	1.01
50-54	-	-	-	1.06	0.151	0.98
Marital Status						
Never Married	Ref.			Ref.		
Currently Married	0.85	0.045	0.72	1.00	0.093	0.57
Formerly Married	0.79	0.000	0.70	0.90	0.860	0.77
Occupation						
Agriculture/Self-Employed	Ref.			Ref.		
Teaching and Management	1.19	0.310	0.85	1.69	0.030	1.05
Sales	0.98	0.783	0.88	1.10	0.794	0.83
Other Occupations	0.98	0.532	0.91	1.05	0.287	0.87
Not Working	1.04	0.043	1.00	1.08	0.261	0.97
Education						
<Primary School	Ref.			Ref.		
Primary School	0.54	0.000	0.43	0.68	0.000	0.32
Post Primary/Vocational/Secondary	0.70	0.000	0.61	0.79	0.000	0.47
College/University	0.87	0.014	0.77	0.97	0.000	0.59

TABLE 32 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of negative attitudes towards condom advertisement, region/province and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

	WOMEN			MEN		
	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Negative attitudes towards condom advertisement						
Wealth						
Poorest	Ref.			Ref.		
Poorer	0.86	0.166	0.69	1.07	0.538	0.68
Middle	0.96	0.498	0.86	1.08	0.399	0.79
Richer	0.91	0.012	0.84	0.98	0.219	0.83
Richest	0.89	0.001	0.83	0.95	0.852	0.89
Perceived Risk of Acquiring HIV						
No Risk	Ref.			Ref.		
Small Risk	0.82	0.002	0.72	0.93	0.001	0.59
Moderate Risk	0.81	0.000	0.74	0.89	0.007	0.64
High Risk	0.89	0.000	0.83	0.95	0.187	0.77
Religion						
Protestant	Ref.			Ref.		
Roman Catholic	1.18	0.026	1.02	1.35	0.637	0.78
Muslim	1.13	0.191	0.94	1.37	0.122	0.95
Other Religions	1.04	0.599	0.89	1.22	0.093	0.98
Voluntary Counseling and Testing						
HIV: Not Tested	Ref.			Ref.		
HIV: Tested	0.71	0.000	0.60	0.84	0.049	0.58
Ethnicity						
Kikuyu	Ref.			Ref.		
Luhya	0.64	0.002	0.48	0.85	0.019	0.45
Luo	0.76	0.000	0.65	0.88	0.149	0.65
Kalenjin	0.74	0.000	0.65	0.84	0.294	0.78
Kamba	0.94	0.118	0.87	1.02	0.434	0.83
Kisii	0.96	0.251	0.90	1.03	0.025	0.78
Meru	0.96	0.291	0.90	1.03	0.014	0.79
Others	1.02	0.309	0.98	1.07	0.631	0.92
Residence						
Urban	Ref.			Ref.		
Rural	1.10	0.445	0.86	1.41	0.842	0.77
						1.37

TABLE 33: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, wealth and study characteristics in a multivariate logistic regression model, women, KDHS-2003

		Women			
High-Risk Sexual Behavior		ORs	P-values	95% CIs	
Wealth					
	Poorest	Ref.			
	Poorer	0.85	0.228	0.66	1.10
	Middle	0.96	0.534	0.84	1.09
	Richer	0.94	0.191	0.85	1.03
	Richest	0.91	0.014	0.85	0.98
Age					
	15-19	Ref.			
	20-24	5.41	0.000	4.42	6.63
	25-29	3.78	0.000	3.37	4.24
	30-34	2.45	0.000	2.22	2.71
	35-39	1.85	0.000	1.72	1.99
	40-44	1.52	0.000	1.44	1.60
	45-49	1.33	0.000	1.26	1.39
Ethnicity					
	Kikuyu	Ref.			
	Luhya	1.46	0.009	1.10	1.94
	Luo	1.50	0.000	1.30	1.75
	Kalenjin	0.99	0.792	0.89	1.09
	Kamba	1.12	0.001	1.04	1.19
	Kisii	1.10	0.006	1.03	1.18
	Meru	1.10	0.008	1.03	1.18
	Others	1.03	0.115	0.99	1.07
Education					
	<Primary School	Ref.			
	Primary School	1.33	0.043	1.01	1.75
	Post Primary/Vocational/Secondary	0.84	0.023	0.73	0.98
	College/University	0.79	0.000	0.69	0.90
Perceived Risk of Acquiring HIV					
	No Risk	Ref.			
	Small Risk	2.16	0.000	1.85	2.52
	Moderate Risk	2.11	0.000	1.84	2.42
	High Risk	1.55	0.000	1.40	1.71
Circumcision					
	Circumcised	Ref.			
	Uncircumcised	0.66	0.000	0.54	0.81
Sexually Transmitted Diseases					
	Does not have STD(s)	Ref.			
	Has STD(s)	2.72	0.003	1.41	5.25
Perceived Severity					
	Low	Ref.			
	High	1.14	0.087	0.98	1.33
Self-Efficacy					
	Present	Ref.			
	Not Present	0.76	0.001	0.65	0.89

TABLE 34: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, wealth and study characteristics in a multivariate logistic regression model, men, KDHS-2003

High-Risk Sexual Behavior	ORs	P-values	Men	
			95% CIs	
Wealth				
Poorest	Ref.			
Poorer	0.87	0.456	0.59	1.27
Middle	0.94	0.531	0.78	1.13
Richer	1.03	0.701	0.90	1.17
Richest	1.03	0.657	0.90	1.18
Age				
15-19	Ref.			
20-24	2.48	0.000	1.82	3.37
25-29	2.18	0.000	1.85	2.57
30-34	2.47	0.000	2.08	2.94
35-39	2.21	0.000	1.92	2.55
40-44	1.77	0.000	1.58	2.00
45-49	1.68	0.000	1.47	1.91
50-54	1.66	0.000	1.50	1.84
Province				
Nairobi	Ref.			
Central	0.53	0.018	0.31	0.90
Coast	1.40	0.008	1.09	1.80
Eastern	0.89	0.214	0.74	1.07
Nyanza	1.14	0.135	0.96	1.34
Rift Valley	1.20	0.001	1.08	1.34
Western	1.02	0.706	0.93	1.11
North Eastern	1.11	0.087	0.98	1.25
Perceived Risk of Acquiring HIV				
No Risk	Ref.			
Small Risk	2.49	0.000	1.92	3.23
Moderate Risk	2.35	0.000	1.81	3.06
High Risk	1.50	0.000	1.23	1.82
Education				
<Primary School	Ref.			
Primary School	1.59	0.066	0.97	2.62
Post Primary/Vocational/Secondary	1.11	0.426	0.86	1.43
College/University	1.17	0.148	0.95	1.44
Occupation				
Agriculture/Self-Employed	Ref.			
Teaching and Management	0.65	0.138	0.37	1.15
Sales	1.11	0.323	0.90	1.37
Other Occupations	1.09	0.118	0.98	1.22
Not Working	0.73	0.000	0.67	0.80

TABLE 34 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of high-risk sexual behavior, wealth and study characteristics in a multivariate logistic regression model, men, KDHS-2003

High-Risk Sexual Behavior		Men			
		ORs	P-values	95% CIs	
Sexually Transmitted Diseases					
Does not have STD(s)		Ref.			
Has STD(s)		4.48	0.013	1.37	14.66
Circumcision					
Circumcised		Ref.			
Uncircumcised		0.66	0.019	0.47	0.93
Religion					
Protestant		Ref.			
Roman Catholic		1.56	0.001	1.21	2.02
Muslim		1.02	0.862	0.79	1.32
Other Religions		1.02	0.844	0.86	1.20
Residence					
Urban		Ref.			
Rural		1.24	0.318	0.81	1.90

TABLE 35: Study population characteristics, women and men percentage and number, objectives 5, KDHS-2003

Characteristics	WOMEN		MEN	
	%	N	%	N
HIV Test Results				
Negative	91	2996	95	2784
Positive	09	277	05	133
Circumcision				
Circumcised	33	1115	83	2455
Uncircumcised	67	2155	17	459
Sexually Transmitted Diseases				
Does not have STD(s)	97	3153	97	2820
Has STD(s)	03	118	03	77
Abuse: Physical Abuse				
No Abuse	55	990	-	-
Abused	45	772	-	-
Abuse: Physical Abuse-Weapon				
No Abuse	86	1514	-	-
Abused	14	247	-	-
Abuse: Sexual				
No Abuse	84	1510	-	-
Abused	16	253	-	-
Abuse: Emotional Abuse				
No Abuse	74	1315	-	-
Abused	26	449	-	-
Wealth				
Poorest	17	557	16	474
Poorer	19	586	18	495
Middle	20	598	19	521
Richer	21	640	22	611
Richest	23	892	25	816
Occupation				
Agriculture/Self-Employed	31	930	34	904
Teaching and Management	04	145	07	223
Sales	14	466	08	243
Other Occupations	13	442	27	798
Not Working	38	1286	24	740
Perceived Risk of Acquiring HIV				
No Risk	35	1159	35	1047
Small Risk	40	1259	50	1434
Moderate Risk	16	510	10	273
High Risk	09	285	05	131
Religion				
Protestant	67	2076	61	1686
Roman Catholic	25	776	27	749
Muslim	06	357	06	301
Other Religions	02	60	06	180

TABLE 35 (continued): Study population characteristics, women and men percentage and number, objectives 5, KDHS-2003

Characteristics	WOMEN		MEN	
	%	N	%	N
Province				
Nairobi	08	355	09	328
Central	14	522	14	465
Coast	08	384	06	290
Eastern	15	382	16	376
Nyanza	16	465	16	417
Rift Valley	24	568	25	510
Western	13	445	12	385
North Eastern	02	152	02	146
Age				
15-19	23	732	25	701
20-24	21	684	18	533
25-29	16	536	14	409
30-34	14	470	12	353
35-39	11	356	11	308
40-44	09	293	09	253
45-49	06	202	05	166
50-54	-	-	06	194
Marital Status				
Never Married	29	941	45	1296
Currently Married	60	1985	51	1507
Formerly Married	11	347	04	114
First Sexual Debut				
Not Had Sex	16	539	15	457
08-15	27	795	41	1083
16-21	39	1238	38	1115
22-40	04	125	04	151
At Union	14	571	02	101
Ethnicity				
Kikuyu	22	752	20	617
Luhya	16	532	16	460
Luo	12	357	13	338
Kalenjin	11	288	13	293
Kamba	12	314	11	279
Kisii	06	208	06	191
Meru	05	143	06	147
Others	16	679	15	592
Residence				
Urban	22	981	23	847
Rural	78	2292	77	2070
Voluntary Counseling and Testing				
HIV: Not Tested	86	2737	85	2425
HIV: Tested	14	486	15	461

TABLE 36: Bivariate analysis, women and men percentage and number of the association between selected characteristics and HIV test results, KDHS-2003

	WOMEN					MEN					
	HIV Test Results					HIV Test Results					
	%	N	%	Positive	N	P-values	%	Negative	N	Positive	P-values
Sexually Transmitted Diseases											
Does not have STD(s)	97	2897	92	256	256	0.002	98	2700	91	120	<0.001
Has STD(s)	03	97	08	21	21		02	64	09	13	
Physical Abuse											
No Abuse	56	906	51	84	84	0.315	-	-	-	-	-
Abused	44	701	49	71	71		-	-	-	-	
Physical Abuse-Weapon											
No Abuse	86	1386	80	128	128	0.063	-	-	-	-	-
Abused	14	220	20	27	27		-	-	-	-	
Sexual Abuse											
No Abuse	84	1374	85	136	136	0.763	-	-	-	-	-
Abused	16	234	15	19	19		-	-	-	-	
Emotional Abuse											
No Abuse	75	1210	65	105	105	0.02	-	-	-	-	-
Abused	25	399	35	50	50		-	-	-	-	
Wealth											
Poorest	18	538	08	19	19		16	459	15	15	
Poorer	19	540	20	46	46		19	475	16	20	
Middle	20	556	16	42	42	<0.001	19	510	10	11	0.015
Richer	21	575	24	65	65		22	584	19	27	
Richest	22	787	32	105	105		24	756	40	60	
Occupation											
Agriculture/Self-Employed	32	864	26	66	66		34	871	28	33	
Teaching and Management	04	131	04	14	14		07	204	13	19	
Sales	14	408	21	58	58	<0.001	08	228	11	15	<0.001
Other Occupations	12	385	21	57	57		26	743	41	55	
Not Working	38	1204	28	82	82		25	730	07	10	

TABLE 36 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and HIV test results, KDHS-2003

	WOMEN						MEN					
	Negative			Positive			HIV Test Results			Positive		
	%	N	%	%	N	P-values	%	N	%	N	P-values	
Circumcision												
Circumcised	34	1054	22	61	2380	<0.001	84	2380	52	75	<0.001	
Uncircumcised	66	1939	78	216	402		16	402	48	57		
Perceived Risk of Acquiring HIV												
No Risk	36	1099	21	60	1014		35	1014	25	33		
Small Risk	40	1136	44	123	1355	<0.001	50	1355	57	79	0.083	
Moderate Risk	16	455	20	55	261		10	261	10	12		
High Risk	08	247	15	38	122		05	122	08	9		
Province												
Nairobi	08	316	11	39	305		09	305	15	23		
Central	14	483	12	39	455		14	455	06	10		
Coast	08	358	06	26	278		06	278	06	12		
Eastern	16	358	10	24	369	<0.001	17	369	05	7	<0.001	
Nyanza	15	385	33	80	367		15	367	41	50		
Rift Valley	24	531	19	37	493		25	493	18	17		
Western	13	413	09	32	371		12	371	09	14		
North Eastern	02	152	00	0	146		02	146	00	0		
Age												
15-19	24	707	08	25	697		26	697	02	4		
20-24	20	626	23	58	519		18	519	10	14		
25-29	15	473	23	63	378		13	378	22	31		
30-34	14	414	18	56	331	<0.001	11	331	16	22	<0.001	
35-39	11	316	15	40	284		10	284	18	24		
40-44	09	267	10	26	231		09	231	17	22		
45-49	07	193	03	9	159		06	159	07	7		
50-54	-	-	-	-	185		07	185	08	9		

TABLE 36 (continued): Bivariate analysis, women and men percentage and number of the association between selected characteristics and HIV test results, KDHS-2003

	WOMEN				MEN			
	Negative		Positive		Negative		Positive	
	%	N	%	N	%	N	%	N
Religion								
Protestant	66	1883	71	193	60	1606	61	80
Roman Catholic	25	705	24	71	26	712	28	37
Muslim	07	348	02	9	07	294	04	7
Other Religions	02	56	03	4	07	171	07	9
Marital Status								
Never Married	30	899	16	42	47	1272	15	24
Currently Married	61	1830	55	155	49	1409	75	98
Formerly Married	09	267	29	80	04	103	10	11
First Sexual Debut								
Not Had Sex	17	530	03	9	16	451	03	6
08-15	26	693	41	102	40	1030	45	53
16-21	38	1111	46	127	38	1047	49	68
22-40	04	118	02	7	04	148	02	3
At Union	15	541	08	30	02	99	01	2
Ethnicity								
Kikuyu	22	701	16	51	20	601	11	16
Luhya	16	490	14	42	15	439	16	21
Luo	10	263	35	94	10	276	51	62
Kalenjin	11	274	07	14	13	288	05	5
Kamba	11	287	11	27	12	273	04	6
Kisii	07	194	05	14	07	189	01	2
Meru	06	135	04	8	07	145	02	2
Others	17	652	08	27	16	573	10	19
Residence								
Urban	21	865	30	116	22	785	36	62
Rural	79	2131	70	161	78	1999	64	71
Voluntary Counseling and Testing								
HIV: Not Tested	86	2519	80	218	85	2320	76	105
HIV: Tested	14	427	20	59	15	433	24	28

TABLE 37: Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results and study characteristics in a univariate logistic regression model, women and men, KDHS-2003

HIV Test Results	WOMEN				MEN			
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	95% CIs
Sexually Transmitted Diseases								
Does not have STD(s)	Ref.			Ref.				
Has STD(s)	2.65	0.003	1.40	5.02	0.000	2.01	7.73	
Physical Abuse								
No Abuse	Ref.			-				
Abused	1.21	0.316	0.84	1.74	-	-	-	
Physical Abuse-Weapon								
No Abuse	Ref.			-				
Abused	1.54	0.064	0.97	2.44	-	-	-	
Sexual Abuse								
No Abuse	Ref.			-				
Abused	0.91	0.763	0.51	1.65	-	-	-	
Emotional Abuse								
No Abuse	Ref.			-				
Abused	1.63	0.021	1.08	2.47	-	-	-	
Wealth								
Poorest	Ref.			Ref.				
Poorer	2.37	0.014	1.19	4.72	0.994	0.47	2.11	
Middle	1.36	0.051	1.00	1.84	0.366	0.46	1.33	
Richer	1.39	0.000	1.16	1.66	0.991	0.80	1.24	
Richest	1.35	0.000	1.17	1.57	0.039	1.01	1.37	
Occupation								
Agriculture/Self-Employed	Ref.			Ref.				
Teaching and Management	1.14	0.707	0.58	2.24	0.009	1.23	4.25	
Sales	1.36	0.004	1.11	1.68	0.184	0.90	1.76	
Other Occupations	1.27	0.001	1.10	1.47	0.014	1.04	1.45	
Not Working	0.97	0.576	0.89	1.07	0.012	0.60	0.94	

TABLE 37 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results and study characteristics in a univariate logistic regression model, women and men, KDHS-2003

HIV Test Results	WOMEN				MEN					
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	
Circumcision										
Circumcised	Ref.									
Uncircumcised	1.86	0.000	1.34	2.59	4.92	3.20	7.54			
Perceived Risk of Acquiring HIV										
No Risk	Ref.									
Small Risk	1.93	0.000	1.37	2.74	1.60	1.00	2.56	0.051		
Moderate Risk	1.47	0.001	1.17	1.84	1.16	0.83	1.63	0.384		
High Risk	1.46	0.000	1.22	1.74	1.35	1.03	1.77	0.032		
Province										
Nairobi	Ref.									
Central	0.61	0.059	0.37	1.02	0.25	0.12	0.52	0.000		
Coast	0.72	0.059	0.52	1.01	0.72	0.50	1.04	0.082		
Eastern	0.78	0.010	0.64	0.94	0.57	0.42	0.77	0.000		
Nyanza	1.13	0.048	1.00	1.28	1.13	0.97	1.31	0.105		
Rift Valley	0.89	0.049	0.79	1.00	0.84	0.73	0.96	0.010		
Western	0.88	0.014	0.80	0.97	0.87	0.76	0.99	0.029		
North Eastern										
Age										
15-19	Ref.									
20-24	3.45	0.000	1.97	6.02	1.68	0.77	3.66	0.188		
25-29	2.19	0.000	1.68	2.87	2.35	1.65	3.33	0.000		
30-34	1.65	0.000	1.36	2.00	1.69	1.34	2.12	0.000		
35-39	1.44	0.000	1.25	1.66	1.58	1.27	1.96	0.000		
40-44	1.29	0.000	1.12	1.48	1.47	1.26	1.72	0.000		
45-49	1.05	0.502	0.90	1.23	1.26	1.07	1.49	0.007		

TABLE 37 (continued): Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results and study characteristics in a univariate logistic regression model, women and men, KDHS-2003

HIV Test Results	WOMEN				MEN				
	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Religion									
Protestant	Ref.			Ref.			Ref.		
Roman Catholic	0.91	0.533	0.66	1.24	0.891	0.67	1.03	0.891	1.58
Muslim	0.53	0.000	0.39	0.74	0.135	0.47	0.72	0.135	1.11
Other Religions	1.02	0.901	0.70	1.51	0.826	0.81	1.03	0.826	1.31
Marital Status									
Never Married	Ref.						Ref.		
Currently Married	1.75	0.004	1.20	2.55	0.000	2.87	4.78	0.000	7.96
Formerly Married	2.53	0.000	1.97	3.24	0.000	1.91	2.84	0.000	4.21
First Sexual Debut									
Not Had Sex	Ref.						Ref.		
08-15	7.97	0.000	3.74	16.99	0.000	2.06	5.05	0.000	12.37
16-21	2.47	0.000	1.70	3.59	0.000	1.56	2.44	0.000	3.80
22-40	1.39	0.078	0.96	2.00	0.318	0.79	1.28	0.318	2.10
At Union	1.31	0.010	1.07	1.61	0.187	0.87	1.33	0.187	2.02
Ethnicity									
Kikuyu	Ref.						-		
Luhya	1.23	0.412	0.75	1.99	-	-	-	-	-
Luo	2.21	0.000	1.77	2.76	-	-	-	-	-
Kalenjin	0.92	0.563	0.70	1.22	-	-	-	-	-
Kamba	1.06	0.476	0.91	1.23	-	-	-	-	-
Kisii	1.02	0.819	0.88	1.17	-	-	-	-	-
Meru	0.98	0.819	0.85	1.14	-	-	-	-	-
Others	0.93	0.068	0.86	1.01	-	-	-	-	-
Residence									
Urban	Ref.						-		
Rural	0.60	0.002	0.44	0.83	-	-	-	-	-
Voluntary Counseling and Testing-									
HIV: Not Tested	Ref.						-		
HIV: Tested	1.61	0.016	1.10	2.35	-	-	-	-	-

TABLE 38: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results, sexually transmitted diseases and study characteristics in a multivariate logistic regression model, women and men, KDHS-2003

HIV Test Results	MEN				WOMEN			
	ORs	P-values	95% CIs		ORs	P-values	95% CIs	
Sexually Transmitted Diseases								
Does not have STD(s)	Ref.				Ref.			
Has STD(s)	3.05	0.008	1.34	6.96	2.01	0.082	0.92	4.40
Age								
15-19	Ref.				Ref.			
20-24	5.39	0.007	1.61	18.07	2.49	0.004	1.34	4.63
25-29	3.78	0.000	2.02	7.08	1.82	0.001	1.29	2.58
30-34	2.23	0.000	1.49	3.36	1.45	0.003	1.14	1.85
35-39	1.98	0.000	1.43	2.74	1.26	0.016	1.04	1.52
40-44	1.75	0.000	1.35	2.28	1.17	0.072	0.99	1.39
45-49	1.47	0.002	1.16	1.86	0.96	0.631	0.80	1.15
50-54	1.41	0.001	1.15	1.72	-	-	-	-
Marital Status								
Never Married	Ref.				Ref.			
Currently Married	1.61	0.189	0.79	3.29	1.12	0.682	0.65	1.92
Formerly married	1.60	0.046	1.01	2.55	2.16	0.000	1.53	3.07
Wealth								
Poorest	Ref.				Ref.			
Poorer	1.00	0.998	0.47	2.14	1.92	0.057	0.98	3.76
Middle	0.79	0.374	0.46	1.34	1.33	0.070	0.98	1.82
Richer	0.98	0.841	0.77	1.23	1.29	0.010	1.06	1.55
Richest	1.04	0.715	0.84	1.29	1.26	0.009	1.06	1.49
Perceived Risk of Acquiring HIV								
No Risk	Ref.				Ref.			
Small Risk	1.45	0.129	0.90	2.34	1.57	0.016	1.09	2.26
Moderate Risk	1.04	0.836	0.74	1.44	1.25	0.061	0.99	1.59
High Risk	1.24	0.174	0.91	1.71	1.31	0.004	1.09	1.57
Residence								
Urban	Ref.				Ref.			
Rural	0.63	0.182	0.32	1.25	0.85	0.483	0.54	1.34
Religion								
Protestant	Ref.				Ref.			
Roman Catholic	0.88	0.532	0.58	1.33	0.94	0.730	0.67	1.32
Muslim	0.70	0.103	0.46	1.07	0.50	0.000	0.34	0.74
Other Religions	0.99	0.931	0.78	1.26	1.05	0.807	0.71	1.54
Voluntary Counseling and Testing								
Not Tested for HIV	Ref.				Ref.			
Tested for HIV	1.22	0.433	0.74	1.99	1.13	0.552	0.76	1.67

TABLE 39: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

HIV Test Results	WOMEN															
	Physical Abuse			Physical Abuse-Weapon			Sexual Abuse			Emotional Abuse						
Abuse	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs				
No Abuse	Ref.			Ref.			Ref.			Ref.						
Abused	1.13	0.557	0.75	1.71	1.69	0.049	1.00	2.86	0.76	0.420	0.39	1.48	1.32	0.232	0.84	2.08
Circumcision																
Circumcised	Ref.			Ref.			Ref.			Ref.			Ref.			
Uncircumcised	1.07	0.813	0.59	1.95	1.09	0.783	0.60	1.96	1.05	0.867	0.58	1.92	1.06	0.848	0.58	1.93
Wealth																
Poorest	Ref.			Ref.			Ref.			Ref.			Ref.			
Poorer	1.50	0.355	0.63	3.57	1.47	0.378	0.62	3.47	1.50	0.352	0.64	3.51	1.54	0.331	0.64	3.70
Middle	1.37	0.150	0.89	2.11	1.37	0.153	0.89	2.13	1.37	0.136	0.90	2.08	1.37	0.158	0.88	2.13
Richer	1.27	0.098	0.96	1.68	1.26	0.101	0.95	1.67	1.26	0.096	0.96	1.66	1.28	0.088	0.96	1.69
Richest	1.14	0.246	0.91	1.43	1.13	0.273	0.91	1.41	1.13	0.262	0.91	1.41	1.15	0.223	0.92	1.45
Sexually Transmitted Diseases																
Does not have STD(s)	Ref.			Ref.			Ref.			Ref.			Ref.			
Has STD(s)	3.24	0.003	1.50	7.01	3.14	0.003	1.47	6.72	3.37	0.003	1.54	7.40	3.20	0.003	1.49	6.89
Occupation																
Agriculture/Self-Employed	Ref.			Ref.			Ref.			Ref.			Ref.			
Teaching and Management	1.54	0.380	0.58	4.06	1.60	0.342	0.60	4.23	1.49	0.419	0.56	3.97	1.52	0.393	0.58	4.00
Sales	1.09	0.599	0.79	1.50	1.08	0.641	0.78	1.48	1.10	0.557	0.80	1.51	1.07	0.651	0.79	1.46
Other Occupations	1.45	0.000	1.20	1.75	1.45	0.000	1.19	1.75	1.46	0.000	1.22	1.76	1.43	0.000	1.18	1.74
Not Working	1.21	0.005	1.06	1.38	1.21	0.005	1.06	1.38	1.21	0.005	1.06	1.37	1.20	0.006	1.06	1.37
Perceived Risk of Acquiring HIV																
No Risk	Ref.			Ref.			Ref.			Ref.			Ref.			
Small Risk	1.70	0.062	0.97	2.98	1.68	0.068	0.96	2.93	1.71	0.060	0.98	2.99	1.70	0.064	0.97	2.98
Moderate Risk	1.12	0.552	0.77	1.62	1.09	0.635	0.76	1.58	1.13	0.497	0.79	1.64	1.11	0.587	0.77	1.60
High Risk	1.32	0.022	1.04	1.68	1.31	0.026	1.03	1.67	1.33	0.019	1.05	1.70	1.31	0.027	1.03	1.66

TABLE 39 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results, abuse (physical abuse, physical abuse with weapon, sexual abuse, emotional abuse) and study characteristics in a multivariate logistic regression model, women, KDHS-2003

HIV Test Results	WOMEN								
	Physical Abuse		Physical Abuse-Weapon		Sexual Abuse		Emotional Abuse		
Region	ORs	P-values	95% CIs	ORs	P-values	95% CIs	ORs	P-values	95% CIs
Protestant	Ref.			Ref.			Ref.		
Roman Catholic	0.73	0.198	0.45	1.18	0.70	0.165	0.43	1.16	0.74
Muslim	0.77	0.342	0.46	1.32	0.78	0.352	0.45	1.33	0.79
Other Religions	1.02	0.939	0.61	1.70	1.03	0.909	0.62	1.71	1.02
Ethnicity									
Kikuyu	Ref.			Ref.			Ref.		
Luhya	1.07	0.866	0.51	2.25	1.05	0.897	0.50	2.20	1.14
Luo	1.86	0.005	1.21	2.86	1.91	0.004	1.23	2.97	1.90
Kalenjin	1.16	0.381	0.83	1.61	1.16	0.373	0.84	1.61	1.16
Kamba	0.99	0.967	0.76	1.30	1.01	0.969	0.77	1.32	0.99
Kisii	0.90	0.386	0.70	1.15	0.91	0.430	0.71	1.16	0.90
Meru	1.02	0.891	0.82	1.26	1.02	0.850	0.82	1.27	1.02
Others	0.98	0.840	0.84	1.15	0.98	0.796	0.84	1.15	0.98
Province									
Nairobi	Ref.			Ref.			Ref.		
Central	0.62	0.284	0.26	1.49	0.61	0.264	0.26	1.45	0.64
Coast	1.02	0.932	0.59	1.79	1.03	0.918	0.59	1.79	1.01
Eastern	0.83	0.367	0.55	1.25	0.82	0.350	0.55	1.24	0.84
Nyanza	1.04	0.766	0.81	1.33	1.02	0.873	0.80	1.29	1.04
Rift Valley	0.88	0.170	0.74	1.06	0.87	0.144	0.73	1.05	0.88
Western	0.90	0.220	0.77	1.06	0.90	0.211	0.77	1.06	0.90
North Eastern									
Age									
15-19	Ref.			Ref.			Ref.		
20-24	1.78	0.183	0.76	4.19	1.77	0.187	0.76	4.14	1.83
25-29	1.53	0.047	1.01	2.34	1.51	0.054	0.99	2.31	1.57
30-34	1.11	0.465	0.84	1.47	1.10	0.506	0.83	1.46	1.13
35-39	1.03	0.806	0.81	1.32	1.02	0.871	0.80	1.31	1.04
40-44	1.14	0.200	0.93	1.40	1.13	0.225	0.93	1.39	1.16
45-49	0.84	0.113	0.67	1.04	0.83	0.090	0.67	1.03	0.85

TABLE 40: Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results, circumcision and study characteristics in a multivariate logistic regression model, men, KDHS-2003

HIV Test Results	ORs	MEN		
		P-values	95% CIs	
Circumcision				
Circumcised	Ref.			
Uncircumcised	4.23	0.000	2.51	7.13
Marital Status				
Never Married	Ref.			
Currently Married	1.48	0.315	0.69	3.21
Formerly married	1.80	0.014	1.13	2.87
Wealth				
Poorest	Ref.			
Poorer	1.41	0.376	0.66	3.02
Middle	1.03	0.891	0.63	1.69
Richer	1.27	0.057	0.99	1.62
Richest	1.26	0.008	1.06	1.50
First Sexual Debut				
Not Had Sex	Ref.			
08-15	0.70	0.464	0.27	1.82
16-21	0.78	0.308	0.49	1.26
22-40	0.56	0.026	0.34	0.93
At Union	0.84	0.449	0.53	1.32
Sexually Transmitted Diseases				
Does not have STD(s)	Ref.			
Has STD(s)	1.42	0.412	0.62	3.26
Occupation				
Agriculture/Self-Employed	Ref.			
Teaching and Management	1.35	0.411	0.66	2.74
Sales	1.15	0.473	0.78	1.68
Other Occupations	1.04	0.703	0.84	1.29
Not Working	1.10	0.457	0.85	1.43
Perceived Risk of Acquiring HIV				
No Risk	Ref.			
Small Risk	1.37	0.215	0.83	2.27
Moderate Risk	0.97	0.839	0.69	1.35
High Risk	1.01	0.939	0.70	1.47
Religion				
Protestant	Ref.			
Roman Catholic	0.86	0.526	0.54	1.37
Muslim	1.13	0.596	0.71	1.80
Other Religions	1.24	0.087	0.97	1.60

TABLE 40 (continued): Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of HIV test results, circumcision and study characteristics in a multivariate logistic regression model, men, KDHS-2003

HIV Test Results		MEN			
		ORs	P-values	95% CIs	
Province					
	Nairobi	Ref.			
	Central	0.51	0.115	0.22	1.18
	Coast	1.02	0.906	0.70	1.51
	Eastern	0.80	0.205	0.57	1.13
	Nyanza	1.26	0.008	1.06	1.50
	Rift Valley	0.96	0.561	0.82	1.11
	Western	1.03	0.696	0.89	1.19
	North Eastern	-	-	-	-
Age					
	15-19	Ref.			
	20-24	12.97	0.000	3.70	45.53
	25-29	6.05	0.000	3.07	11.92
	30-34	3.38	0.000	2.15	5.31
	35-39	2.66	0.000	1.87	3.78
	40-44	2.13	0.000	1.60	2.83
	45-49	1.68	0.000	1.31	2.15
	50-54	1.59	0.000	1.30	1.95

TABLE 41: High-risk sexual behavior, women and men percentage and number, KDHS-2003

High-Risk Sexual Behaviors		WOMEN		MEN	
		%	N	%	N
Prostitution					
	No	95	5369	85	2555
	Yes	05	310	15	448
Condom Use Last Intercourse^β					
	No	05	337	17	432
	Yes	95	5341	83	2143
Multiple Sex Partners Last 12 Months					
	No	88	7168	73	2656
	Yes	12	1002	27	917

^β - Variable was reverse coded | Yes - indicates that condom was not used during the last sexual intercourse

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APPENDIX 1: CONFOUNDERS AND EFFECT MODIFIERS

Objective 1: To determine prevalence and risk factors for high-risk sexual behavior (prostitution, lack of condom use, and multiple sexual partners) among men and women in the general population.	
RH_{1.1}: Participation in voluntary counseling and testing for HIV/AIDS is negatively associated with high-risk sexual behavior.	
Confounders	Effect modifier
Age, Education, Religion, Residence, Occupation, Wealth index, Perceived risk of acquiring HIV/AIDS, Province, STDs, and Circumcision.	None
RH_{1.2}: Being more knowledgeable about HIV/AIDS is negatively associated with high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{1.1} , but <i>excluding</i> Wealth index and Circumcision.	None
RH_{1.3}: Higher perceived risk of acquiring HIV/AIDS is negatively related with high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{1.1} , but <i>including</i> Marital status, HIV perceived severity, Ethnicity and <i>excluding</i> Perceived risk of acquiring HIV/AIDS.	None
RH_{1.4}: Women who have experienced domestic violence will be more likely to engage in high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{1.1} , but <i>including</i> Self efficacy and Ethnicity.	None
Objective 2: To examine the effect of psychological (cognitive involvement/awareness) factors of HIV/AIDS, voluntary counseling and testing, and sexually transmitted diseases (STDs) on an individual high-risk sexual behavior in the general population.	
RH_{2.1}: Higher cognitive involvement/awareness about HIV/AIDS will be negatively related to high-risk sexual behavior.	
Confounders	Effect modifier
Age, Education, Province, Marital status, Religion, Residence, Occupation, Wealth index, Perceived risk of acquiring HIV/AIDS, Alcohol consumption. Add Circumcision for men, but <i>excluding</i> CI/A for VCT and CI/A for STDS	None
RH_{2.2}: Higher cognitive involvement/awareness about voluntary counseling and testing for HIV/AIDS will be negatively related to high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{2.1} , but <i>excluding</i> CI/A for HIV/AIDS and CI/A for STDS.	None
RH_{2.3}: Higher cognitive involvement/awareness about sexually transmitted diseases apart from HIV/AIDS will be negatively related to high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{2.1} , but <i>excluding</i> CI/A for HIV/AIDS and CI/A for VCT.	None
Objective 3: To determine factors associated with negative attitudes towards HIV/AIDS, women, condom use and condom advertisement among men and women in the general population.	
RH_{3.1}: Increased consumption of alcohol is positively related to negative attitudes toward HIV/AIDS.	
Confounders	Effect modifier
Women-Sex Education: Age, Education, Ethnicity, Wealth index,	None

Occupation, VCT, Religion, Perceived risk of acquiring HIV/AIDS, and Marital status and <i>excluding</i> Marital status for Women-HIV/AIDS	
Men-HIV/AIDS: Age, Education, Ethnicity, Wealth index, Occupation, VCT, Religion, Perceived risk of acquiring HIV/AIDS	
RH_{3,2}: Increased consumption of alcohol is positively related to negative attitudes toward women.	
Confounders	Effect modifier
Same as RH_{3,1} , Women-Husband controlling attitudes and women sexual attitudes-husband: but <i>including</i> Residence, STDs, Province and <i>excluding</i> Perceived risk of acquiring HIV/AIDS, and Marital status	None
Same as RH_{3,1} , Men-Husband controlling attitudes, women sexual attitudes-husband, and husband sexual attitudes: but <i>including</i> Residence, STDs, Province and <i>excluding</i> Perceived risk of acquiring HIV/AIDS	
RH_{3,3}: There are regional differences in negative attitudes toward condom use among men.	
Confounders	Effect modifier
Same as RH_{3,1} , Condom perception, disease protection and sexual pleasure: but <i>including</i> Marital status and residence.	None
RH_{3,4}: There are regional differences in negative attitudes toward condom advertisement.	
Confounders	Effect modifier
Same as RH_{3,1} , Women and Men but <i>including</i> Residence.	None
Objective 4: To determine factors associated with socioeconomic status in relation to high-risk sexual behavior in a general population.	
RH_{4,1}: Wealth index of an individual will be positively related to high-risk sexual behavior.	
Confounders	Effect modifier
Same as RH_{1,1} , Women: but <i>including</i> Ethnicity, Perceived severity and Self-efficacy and <i>excluding</i> Wealth Index, Religion, Residence, Occupation, and Province.	None
Men: but <i>excluding</i> Wealth Index	
Objective 5: To determine if there is any relationship between STDs, domestic violence against women, circumcision, and HIV acquisition.	
RH_{5,1}: Men and women who have had an STD (last 12 months) are more likely to test positive for HIV.	
Confounder	Effect modifier
Same as RH_{1,1} , but <i>including</i> Marital status and VCT and <i>excluding</i> STDs, education, Occupation, Province, and Circumcision.	None
RH_{5,2}: Women who have experienced domestic violence are more likely to test positive for HIV.	
Confounders	Effect modifier
Same as RH_{1,1} , but <i>including</i> Ethnicity and <i>excluding</i> Abuse, Education, and Residence.	None
RH_{5,3}: Uncircumcised men are more likely to test positive for HIV.	
Confounders	Effect modifier
Same as RH_{1,1} , but <i>including</i> Marital status and First sexual debut and <i>excluding</i> Circumcision, Education, and Residence.	None

APPENDIX 2: QUESTIONS UTILIZED IN CFA

Variable	Question	Variable	Question
Domestic Violence			
Now I need to ask you some questions about your relationship with your (last) husband/partner. (Does/did) your (last) husband/partner ever:			
		d103a	Say or do something to humiliate you in front of others?
		d103c	Threaten you or someone close to you with harm?
		d105a	Push you, shake you, or throw something at you?
		d105b	Slap you or twist your arm?
		d105c	Punch you with his fist or with something that could hurt you?
		d105d	Kick you or drag you?
		d105e	Try to strangle you or burn you?
		d105f	Threaten you with a knife, gun, or other type of weapon?
		d105g	Attack you with a knife, gun, or other type of weapon?
		d105h	Physically force you to have sexual intercourse with him even when you did not want to?
		d105i	Force you to perform other sexual acts you did not want to?
Cognitive Involvement/Awareness			
Cognitive Involvement/Awareness-HIV/AIDS			
mv782	Would you want to be tested for the AIDS virus?	v782	Would you want to be tested for the AIDS virus?
mv783	Do you know a place where you could go to get an AIDS test?	v783	Do you know a place where you could go to get an AIDS test?
mv751	Now I would like to talk about something else. Have you ever heard of an illness called AIDS?	v751	Now I would like to talk about something else. Have you ever heard of an illness called AIDS?
mv753	Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS?	v753	Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS?
mv775	Do you know someone personally who has the virus that causes AIDS or someone who died of AID?	v775	Do you know someone personally who has the virus that causes AIDS or someone who died of AIDS?
Attitudes			
(1) Attitudes towards HIV/AIDS			
mv825	Would you buy fresh vegetables from a vendor who has the AIDS	v825	Would you buy fresh vegetables from a vendor who has the AIDS

	virus?			virus?
mv777	If a member of your family got infected with the virus that causes AIDS, would you want it to remain a secret or not?		v777	If a member of your family got infected with the virus that causes AIDS, would you want it to remain a secret or not?
mv778	If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household?		v778	If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household?
mv779	If a female teacher has the AIDS virus, should she be allowed to continue teaching in school?		v779	If a female teacher has the AIDS virus, should she be allowed to continue teaching in school?
mv780	Should children aged 12-14 be taught about using a condom to avoid AIDS?		v780	Should children aged 12-14 be taught about using a condom to avoid AIDS?
(2) Attitudes towards Condom use				
I will now read you some statements about condom use. Please tell me if you agree or disagree with each (only men)				
mv3b21a	Condom diminishes a man's sexual pleasure			
mv3b21c	It's okay to re-use a condom if you wash it			
mv3b21d	Condoms protect against disease			
sm460d	Buying condoms is embarrassing			
mv3b21e	A woman has no right to tell a man to use a condom			
sm460f	Condoms contain HIV			
(3) Attitudes towards Women				
Sometime a husband is annoyed or angered by things that his wife/partner does. In your opinion, is a husband justified in hitting or beating his wife in the following situations...				
mv744a	If she goes out without telling him?		v744a	If she goes out without telling him?
mv744b	If she neglects the children?		v744b	If she neglects the children?
mv744c	If she argues with him?		v744c	If she argues with him?
mv744d	If she refuses to have sex with him?		v744d	If she refuses to have sex with him?
mv744e	If she burns food?		v744e	If she burns food?
mv822	When a wife knows her husband has a sexually transmitted disease, is she justified in asking her husband to use a condom?		v822	When a wife knows her husband has a sexually transmitted disease, is she justified in asking her husband to use a condom?
Husbands and wives do not always agree on everything. Please tell me if you think a wife is justified in refusing to have sex with her husband if...				
mv633d	She is tired and not in the mood?		v633d	She is tired and not in the mood?
mv633c	She has recently given birth?		v633c	She has recently given birth?
mv633b	She knows her husband has sex with other women?		v633b	She knows her husband has sex with other women?

mv633a	She knows her husband has a sexually transmitted disease?		v633a	She knows her husband has a sexually transmitted disease?
Do you think that if a woman refuses to have sex with her husband when he wants her to, he has the right to...				
mv634a	Get angry and reprimand her?			
mv634b	Refuse to give her money or other means of financial support?			
mv634c	Use force and have sex with her even if she does not want to?		d105h	Physically forced sex when not wanted
mv634d	Go and have sex with another women?			
HIV/AIDS Knowledge				
mv754dp	Can people reduce their chances of getting the AIDS virus by having just one sex partner who has no other partner?		v754dp	Can people reduce their chances of getting the AIDS virus by having just one sex partner who has no other partner?
mv754jp	Can a people get AIDS virus from mosquito or other insect bites?		v754jp	Can a people get AIDS virus from mosquito or other insect bites?
mv754cp	Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex?		v754cp	Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex?
mv754wp	Can a person get the AIDS virus by sharing utensils with a person who has AIDS?		v754wp	Can a person get the AIDS virus by sharing utensils with a person who has AIDS?
mv754bp	Can people reduce their chances of getting the AIDS virus by not having sex at all?		v754bp	Can people reduce their chances of getting the AIDS virus by not having sex at all?
mv756	Is it possible for a healthy-looking person to have the AIDS virus?		v756	Is it possible for a healthy-looking person to have the AIDS virus?
mv774	Can the virus that causes AIDS be transmitted from a mother to a child?		v774	Can the virus that causes AIDS be transmitted from a mother to a child?
mv774a	Can the virus that causes AIDS be transmitted from a mother to her child: during pregnancy?		v774a	Can the virus that causes AIDS be transmitted from a mother to her child: during pregnancy?
mv 774b	Can the virus that causes AIDS be transmitted from a mother to her child: during delivery?		v774b	Can the virus that causes AIDS be transmitted from a mother to her child: during delivery?
mv774c	Can the virus that causes AIDS be transmitted from a mother to her child: by breastfeeding?		v774c	Can the virus that causes AIDS be transmitted from a mother to her child: by breastfeeding?
mv824	Can a mother who is infected with the AIDS virus reduce the risk of giving the virus to the baby by taking certain drugs during pregnancy?		v824	Can a mother who is infected with the AIDS virus reduce the risk of giving the virus to the baby by taking certain drugs during pregnancy?

APPENDIX 3: COMMON FACTOR ANALYSIS

TABLE A-1: Common factor analysis output for attitude towards HIV/AIDS among men and women, KDHS-2003

Questions/Variables	MALE		FEMALE		
	F1	Uniqueness Proportion	F1	F2	Uniqueness Proportion
Q1. Would you buy fresh vegetables from a vendor who has the AIDS virus?	0.71	0.50	0.65		0.57
Q3. If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household?	0.42	0.82	0.49		0.70
Q4. If a female teacher has the AIDS virus, should she be allowed to continue teaching in school?	0.59	0.65	0.68		0.54
Q5. Should children aged 12-14 be taught about using a condom to avoid AIDS?				0.32	0.87
Observations in factor analysis			3529		8029
Variance of the first factor			1.12		1.16
Proportion of variance associated with first factor			1.00		0.86

Male: $X^2=1356.73$, $df=10$, $p=0.0000$ | Female: $X^2=3223.39$, $df=10$, $p=0.0000$

F1, and F2: Factor loading - weights and correlations between each variable and the factor, determined at $<.3$

Uniqueness proportions: Variance unique to the variable not shared by other variable(s) – the higher the uniqueness the lower the importance of the question/variable in the factor model

TABLE A-2: Common factor analysis output for attitude towards condom use among men, KDHS-2003

Questions/Variables				MALE
	F1	F2	F3	Uniqueness Proportion
I will now read you some statements about condom use. Please tell me if you agree or disagree with each (only men)				
Q1. Condom diminishes a man's sexual pleasure			0.45	0.91
Q2. It's okay to re-use a condom if you wash it	0.61			0.51
Q3. Condoms protect against disease		0.78		0.64
Q4. Buying condoms is embarrassing	0.45			0.67
Q5. A woman has no right to tell a man to use a condom	0.53			0.70
Q6. Condoms contain HIV	0.56			0.55
Observations in factor analysis				3563
Variance of the first factor				1.30
Proportion of variance associated with first factor				0.51

Male: $X^2=3954.10$, $df=10$, $p=0.0000$

F1, F2, and F3: Factor loading - weights and correlations between each variable and the factor, determined at $<.3$

Uniqueness proportions: Variance unique to the variable not shared by other variable(s) – the higher the uniqueness the lower the importance of the question/variable in the factor model

TABLE A-3: Common factor analysis output for attitude towards women among men and women, KDHS-2003

Questions/Variables	MALE			FEMALE			
	F1	F2	F3	Uniqueness Proportion	F1	F2	Uniqueness Proportion
Sometime a husband is annoyed or angered by things that his wife/partner does. In your opinion, is a husband justified in hitting or beating his wife in the following situations...							
Q1. If she goes out without telling him?	0.63			0.58	0.67		0.55
Q2. If she neglects the children?	0.70			0.50	0.70		0.52
Q3. If she argues with him?	0.70			0.51	0.74		0.45
Q4. If she refuses to have sex with him?	0.58			0.59	0.63		0.60
Q5. If she burns food?	0.48			0.74	0.51		0.74
Q6. When a wife knows her husband has a sexually transmitted disease, is she justified in asking her husband to use a condom?				0.35	0.87	0.33	0.89
Husbands and wives do not always agree on everything. Please tell me if you think a wife is justified in refusing to have sex with her husband if...							
Q7. She is tired and not in the mood?				0.35	0.84	0.46	0.79
Q8. She has recently given birth?				0.51	0.74	0.68	0.54
Q9. She knows her husband has sex with other women?				0.52	0.71	0.70	0.51
Q10. She knows her husband has a sexually transmitted disease?				0.73	0.47	0.72	0.48
Do you think that if a woman refuses to have sex with her husband when he wants her to, he has the right to...							
Q11. Get angry and reprimand her?				0.61	0.59		-
Q12. Refuse to give her money or other means of financial support?				0.69	0.51		-
Q13. Use force and have sex with her even if she does not want to?				0.52	0.70		-
Q14. Go and have sex with another woman?				0.45	0.78		-
Observations in factor analysis					3548		8169
Variance of the first factor					2.04		2.15
Proportion of variance associated with first factor					0.42		0.54

Male: $X^2=9052.04$, $df=91$, $p=0.0000$ | Female: $X^2=1.9e+04$, $df=45$, $p=0.0000$

F1, F2 and F3: Factor loading - weights and correlations between each variable and the factor, determined at $<.3$

Uniqueness proportions: Variance unique to the variable not shared by other variable(s) – the higher the uniqueness the lower the importance of the question/variable in the factor model

TABLE B-1: Common factor analysis output for HIV/AIDS knowledge among men and women, KDHS-2003

Questions/Variables					MALE			FEMALE	
	F1	F2	F3	Uniqueness Proportion	F1	F2	F3	Uniqueness Proportion	
Q1. Can people reduce their chances of getting the AIDS virus by having just one sex partner who has no other partner?			0.53	0.71			0.32	0.9	
Q2. Can a people get AIDS virus from mosquito or other insect bites?	0.57			0.66	0.53		0.33	0.71	
Q3. Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex?								0.88	
Q4. Can a person get the AIDS virus by sharing utensils with a person who has AIDS?	0.49			0.74	0.5			0.75	
Q8. Can the virus that causes AIDS be transmitted from a mother to her child: during delivery?		0.31		0.9		0.56		0.69	
Q9. Can the virus that causes AIDS be transmitted from a mother to her child: by breastfeeding?		0.61		0.61		0.32		0.89	
Observations in factor analysis					2963			6330	
Variance of the first factor					0.64			0.63	
Proportion of variance associated with first factor					0.39			0.42	

Male: $X^2=765.98$, $df=45$, $p=0.0000$ | Female: $X^2=1596.07$, $df=45$, $p=0.0000$

F1, F2 and F3: Factor loading - weights and correlations between each variable and the factor, determined at $<.3$

Uniqueness proportions: Variance unique to the variable not shared by other variable(s) – the higher the uniqueness the lower the importance of the question/variable in the factor model

TABLE C-1: Common factor analysis output for domestic violence among women, KDHS-2003

Questions/Variables	FEMALE				Uniqueness Proportion
	F1	F2	F3	F4	
Now I need to ask you some questions about your relationship with your (last) husband/partner. (Does/did) your (last) husband/partner ever:					
Q1. Say or do something to humiliate you in front of others?	0.36		0.48		0.59
Q2. Threaten you or someone close to you with harm?			0.66		0.42
Q3. Push you, shake you, or throw something at you?	0.62				0.48
Q4. Slap you or twist your arm?	0.61				0.51
Q5. Punch you with his fist or with something that could hurt you?	0.69				0.42
Q6. Kick you or drag you?	0.59	0.34			0.52
Q7. Try to strangle you or burn you?		0.56			0.58
Q8. Threaten you with a knife, gun, or other type of weapon?		0.69			0.42
Q9. Attack you with a knife, gun, or other type of weapon?		0.50			0.71
Q10. Physically force you to have sexual intercourse with him even when you did not want to				0.71	0.42
Q11. Force you to perform other sexual acts you did not want to?				0.47	0.72
Observations in factor analysis					4301
Variance of the first factor					1.97
Proportion of variance associated with first factor					0.38
Female: $X^2= 1.3e+04$, $df=55$, $p=0.0000$					

F1, F2, F3, and F4: Factor loading - weights and correlations between each variable and the factor, determined at $<.3$

Uniqueness proportions: Variance unique to the variable not shared by other variable(s) – the higher the uniqueness the lower the importance of the question/variable in the factor model

APPENDIX 4: SURVEY QUESTIONS AND VARIABLES UTILIZED

Variable	Questions & Codes (Men)	HYP., MOM, MIV, & CON	Variable	Questions & Codes (Women)
High-Risk Sexual Behavior				
(1) Sex with prostitutes/Commercial sex workers				
mv791	Have you ever paid for sex? 0:No: (2,555) 1:Yes: (448) 9: Missing (575)	RH _{1.1} MOM RH _{1.2} MOM RH _{1.3} MOM RH _{1.4} MOM RH _{2.1} RH _{2.2} RH _{2.3} MOM RH _{4.1} MOM	s524	In the last 12 months have you ever given or received money, gifts, or favors in return for sex? 0:No: (5,369) 1:Yes: (310) 9: Missing (2,516)
(2) Lack of condom use				
mv761	The last time you had sexual intercourse with a woman, did you use a condom? 0:No: (2,143) 1:Yes: (432) 9: Missing (1,003)	RH _{1.1} MOM RH _{1.2} MOM RH _{1.3} MOM RH _{1.4} MOM RH _{2.1} RH _{2.2} RH _{2.3} MOM RH _{4.1} MOM	v761	The last time you had sexual intercourse, was a condom used? 0:No: (5,341) 1:Yes: (337) 9: Missing (2,517)
(3) Multiple sexual partners				
mv766a	Have you had sex with any other woman in the last 12 months? 0: (2,656) 1: (700) 2: (152) 3: (30) 4: (15) 5: (5) 6: (4) 7: (1) 8: (2) 10: (2) 12: (2) 15: (3)	RH _{1.1} MOM RH _{1.2} MOM RH _{1.3} MOM RH _{1.4} MOM RH _{2.1} RH _{2.2} RH _{2.3} MOM RH _{4.1} MOM	v766a	Have you had sex with any other man in the last 12 months? 0: 0 (7,168) 1: 1 (933) 2: 2 (58) 3: 3 (7) 4: 4 (1) 5: 5 (1) 90: 90+ (2) 99: Missing (25)

	18: (1) 99: Missing (5)			
Attitudes				
(1) Attitudes towards HIV/AIDS				
mv825	Would you buy fresh vegetables from a vendor who has the AIDS virus? 0: No (887) 1: Yes (2,592) 8: Don't know (58) 9: Missing (41)	RH _{3.1} MOM	v825	Would you buy fresh vegetables from a vendor who has the AIDS virus? 0: No (3,193) 1: Yes (4,734) 8: Don't know (115) 9: Missing (153)
mv777	If a member of your family got infected with the virus that causes AIDS, would you want it to remain a secret or not? 0: No (2,457) 1: Yes (1,006) 8: Don't know (74) 9: Missing (41)	RH _{3.1} MOM	v777	If a member of your family got infected with the virus that causes AIDS, would you want it to remain a secret or not? 0: No (4,838) 1: Yes (2,990) 8: Don't know (218) 9: Missing (149)
mv778	If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household? 0: No (377) 1: Yes (3,111) 8: Don't know (50) 9: Missing (40)	RH _{3.1} MOM	v778	If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household? 0: No (1,248) 1: Yes (6,602) 8: Don't know (195) 9: Missing (150)
mv779	If a female teacher has the AIDS virus, should she be allowed to continue teaching in school? 0: No (1,259) 1: Yes (2,148) 8: Don't know (129) 9: Missing (42)	RH _{3.1} MOM	v779	If a female teacher has the AIDS virus, should she be allowed to continue teaching in school? 0: No (3,131) 1: Yes (4,602) 8: Don't know (315) 9: Missing (147)
mv780	Should children aged 12-14 be taught about using a condom to avoid AIDS? 0: No (1,293) 1: Yes (2,111) 8: Don't know (134) 9: Missing (40)	RH _{3.1} MOM	v780	Should children aged 12-14 be taught about using a condom to avoid AIDS? 0: No (2,997) 1: Yes (4,535) 8: Don't know (513) 9: Missing (150)
(2) Attitudes towards Condom use				
I will now read you some statements about condom use. Please tell me if you agree or disagree with each (only men)				
mv3b21a	Condom diminishes a	RH _{3.3}		

	man's sexual pleasure 0: Disagree (712) 1: Agree (1,639) 8: Don't know (1,222) 9: Missing (5)	MOM		
mv3b21c	It's okay to re-use a condom if you wash it 0: Disagree (2,786) 1: Agree (166) 8: Don't know (621) 9: Missing (5)	RH _{3,3} MOM		
mv3b21d	Condoms protect against disease 0: Disagree (351) 1: Agree (2,708) 8: Don't know (512) 9: Missing (7)	RH _{3,3} MOM		
sm460d	Buying condoms is embarrassing 0: Disagree (1,970) 1: Agree (1,221) 8: Don't know (380) 9: Missing (7)	RH _{3,3} MOM		
mv3b21e	A woman has no right to tell a man to use a condom 0: Disagree (2,113) 1: Agree (960) 8: Don't know (496) 9: Missing (9)	RH _{3,3} MOM		
sm460f	Condoms contain HIV 0: Disagree (2,230) 1: Agree (284) 8: Don't know (1,057) 9: Missing (7)	RH _{3,3} MOM		
(3) Attitudes towards Condom advertisement				
In your opinion, is it acceptable or unacceptable for condoms to be advertised?				
sm461a	On the radio? 1: Acceptable (2,622) 2: Not acceptable (722) 8: Don't know (181) 9: Missing (3)	RH _{3,4} MOM	s532a	On the radio? 1: Acceptable (5,318) 2: Not acceptable (2,174) 8: Don't know/Unsure (691) 9: Missing (12)
sm461b	On the TV? 1: Acceptable (2,496) 2: Not acceptable (878) 8: Don't know (201) 9: Missing (3)	RH _{3,4} MOM	s532b	On the TV? 1: Acceptable (5,059) 2: Not acceptable (2,338) 8: Don't know/Unsure (786) 9: Missing (12)
sm461c	In newspaper? 1: Acceptable (2,651) 2: Not acceptable (729)	RH _{3,4} MOM	s532c	In newspaper? 1: Acceptable (5,238) 2: Not acceptable (2,152)

	8: Don't know (195) 9: Missing (3)			8: Don't know/Unsure (793) 9: Missing (12)
(4) Attitudes towards Women				
Sometime a husband is annoyed or angered by things that his wife/partner does. In your opinion, is a husband justified in hitting or beating his wife in the following situations...				
mv744a	If she goes out without telling him? 0: No (2,025) 1: Yes (1,277) 8: Don't know (271) 9: Missing (5)	RH _{3.2} MOM	v744a	If she goes out without telling him? 0: No (4,737) 1: Yes (3,246) 8: Don't know (200) 9: Missing (12)
mv744b	If she neglects the children? 0: No (1,628) 1: Yes (1,765) 8: Don't know (180) 9: Missing (5)	RH _{3.2} MOM	v744b	If she neglects the children? 0: No (3,594) 1: Yes (4,408) 8: Don't know (180) 9: Missing (13)
mv744c	If she argues with him? 0: No (1,818) 1: Yes (1,464) 8: Don't know (290) 9: Missing (6)	RH _{3.2} MOM	v744c	If she argues with him? 0: No (4,195) 1: Yes (3,751) 8: Don't know (236) 9: Missing (13)
mv744d	If she refuses to have sex with him? 0: No (2,282) 1: Yes (894) 8: Don't know (394) 9: Missing (4)	RH _{3.2} MOM	v744d	If she refuses to have sex with him? 0: No (5,301) 1: Yes (2,433) 8: Don't know (448) 9: Missing (13)
mv744e	If she burns food? 0: No (2,899) 1: Yes (476) 8: Don't know (196) 9: Missing (7)	RH _{3.2} MOM	v744e	If she burns food? 0: No (6,648) 1: Yes (1,302) 8: Don't know (231) 9: Missing (14)
mv822	When a wife knows her husband has a sexually transmitted disease, is she justified in asking her husband to use a condom? 0: No (455) 1: Yes (2,865) 8: Don't know (234) 9: Missing (24)	RH _{3.2} MOM	v822	When a wife knows her husband has a sexually transmitted disease, is she justified in asking her husband to use a condom? 0: No (1,028) 1: Yes (6,315) 8: Don't know (837) 9: Missing (15)
Husbands and wives do not always agree on everything. Please tell me if you think a wife is justified in refusing to have sex with her husband if...				
mv633d	She is tired and not in the mood? 0: No (933) 1: Yes (2,397) 8: Don't know (242)	RH _{3.2} MOM	v633d	She is tired and not in the mood? 0: No (2,730) 1: Yes (4,841) 8: Don't know (604) 9: Missing (20)

	9: Missing (6)			
mv633c	She has recently given birth? 0: No (126) 1: Yes (3,372) 8: Don't know (74) 9: Missing (6)	RH _{3.2} MOM	v633c	She has recently given birth? 0: No (920) 1: Yes (6,842) 8: Don't know (418) 9: Missing (15)
mv633b	She knows her husband has sex with other women? 0: No (641) 1: Yes (2,793) 8: Don't know (138) 9: Missing (6)	RH _{3.2} MOM	v633b	She knows her husband has sex with other women? 0: No (1,363) 1: Yes (6,442) 8: Don't know (376) 9: Missing (14)
mv633a	She knows her husband has a sexually transmitted disease? 0: No (148) 1: Yes (3,321) 8: Don't know (102) 9: Missing (7)	RH _{3.2} MOM	v633a	She knows her husband has a sexually transmitted disease? 0: No (728) 1: Yes (7,130) 8: Don't know (323) 9: Missing (14)
Do you think that if a woman refuses to have sex with her husband when he wants her to, he has the right to...				
mv634a	Get angry and reprimand her? 0: No (2,168) 1: Yes (1,127) 8: Don't know , depends (276) 9: Missing (7)	RH _{3.2} MOM		
mv634b	Refuse to give her money or other means of financial support? 0: No (3,002) 1: Yes (464) 8: Don't know , depends (106) 9: Missing (6)	RH _{3.2} MOM		
mv634c	Use force and have sex with her even if she does not want to? 0: No (3,162) 1: Yes (321) 8: Don't know , depends (89) 9: Missing (6)	RH _{3.2} MOM	d105h	Physically forced sex when not wanted 0: No (3,730) 1: Yes (579) 8: Don't know (0) 9: Missing (3,886)
mv634d	Go and have sex with another woman? 0: No (3,015) 1: Yes (411)	RH _{3.2} MOM		

	8: Don't know , depends (146)			
	9: Missing (6)			
HIV/AIDS test results				
hiv03: RH _{5,1} RH _{5,2} RH _{5,3} MOM				
Blood test result				
0: HIV negative (5,936)				
1: HIV positive (422)				
7: Indeterminant (2)				
9: Missing (2,440)				
HIV/AIDS Knowledge				
mv754dp	Can people reduce their chances of getting the AIDS virus by having just one sex partner who has no other partner? 0: No (111) 1: Reduce chance of aids: have 1 sex partner: (3,115) 8: Don't know: (33) 9: Missing (319)	RH _{1,2} MIV	v754dp	Can people reduce their chances of getting the AIDS virus by having just one sex partner who has no other partner? 0: No (355) 1: Reduce chance of aids: have 1 sex partner: (6,462) 8: Don't know: (93) 9: Missing (1,285)
mv754jp	Can a people get AIDS virus from mosquito or other insect bites? 0: No (2,620) 1: Get aids from mosquito bites (415) 8: Don't know (224) 9: Missing (319)	RH _{1,2} MIV	v754jp	Can a people get AIDS virus from mosquito or other insect bites? 0: No (5,003) 1: Get aids from mosquito bites (1,151) 8: Don't know (756) 9: Missing (1,285)
mv754cp	Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex? 0: No (493) 1: Reduce chances of aids by always using condoms during sex (2,510) 8: Don't know (255) 9: Missing (320)	RH _{1,2} MIV	v754cp	Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex? 0: No (1,311) 1: Reduce chances of aids by always using condoms during sex (4,899) 8: Don't know (695) 9: Missing (1,290)
mv754wp	Can a person get the AIDS virus by sharing utensils with a person who has AIDS? 0: No (2,838) 1: Get aids by sharing food/utensils With person who has AIDS (289)	RH _{1,2} MIV	v754wp	Can a person get the AIDS virus by sharing utensils with a person who has AIDS? 0: No (5,750) 1: Get aids by sharing food/utensils With person who has AIDS (765) 8: Don't know (383) 9: Missing (1,297)

	8: Don't know (129) 9: Missing (322)			
mv754bp	Can people reduce their chances of getting the AIDS virus by not having sex at all? 0: No (121) 1: Yes (3,124) 8: Don't know (11) 9: Missing (322)	RH _{1,2} MIV	v754bp	Can people reduce their chances of getting the AIDS virus by not having sex at all? 0: No (464) 1: Yes (6,375) 8: Don't know (63) 9: Missing (1293)
mv756	Is it possible for a healthy-looking person to have the AIDS virus? 0: No (236) 1: Yes (3,178) 8: Don't know (124) 9: Missing (40)	RH _{1,2} MIV	v756	Is it possible for a healthy-looking person to have the AIDS virus? 0: No (719) 1: Yes (6,854) 8: Don't know (467) 9: Missing (155)
mv774	Can the virus that causes AIDS be transmitted from a mother to a child? 0: No (176) 1: Yes (3,122) 8: Don't know (243) 9: Missing (37)	RH _{1,2} MIV	v774	Can the virus that causes AIDS be transmitted from a mother to a child? 0: No (335) 1: Yes (7,044) 8: Don't know (671) 9: Missing (145)
mv774a	Can the virus that causes AIDS be transmitted from a mother to her child: during pregnancy? 0: No (384) 1: Yes (2,622) 8: Don't know (115) 9: Missing (457)	RH _{1,2} MIV	v744a	Can the virus that causes AIDS be transmitted from a mother to her child: during pregnancy? 0: No (4,737) 1: Yes (3,246) 8: Don't know (200) 9: Missing (12)
mv 774b	Can the virus that causes AIDS be transmitted from a mother to her child: during delivery? 0: No (441) 1: Yes (2,451) 8: Don't know (229) 9: Missing (457)	RH _{1,2} MIV	v774b	Can the virus that causes AIDS be transmitted from a mother to her child: during delivery? 0: No (827) 1: Yes (5,429) 8: Don't know (787) 9: Missing (1,152)
mv774c	Can the virus that causes AIDS be transmitted from a mother to her child: by breastfeeding? 0: No (443) 1: Yes (2,388) 8: Don't know (291) 9: Missing (456)	RH _{1,2} MIV	v774c	Can the virus that causes AIDS be transmitted from a mother to her child: by breastfeeding? 0: No (618) 1: Yes (5,826) 8: Don't know (599) 9: Missing (1,152)
mv824	Can a mother who is	RH _{1,2} MIV	v824	Can a mother who is infected with

	infected with the AIDS virus reduce the risk of giving the virus to the baby by taking certain drugs during pregnancy? 0: No (771) 1: Yes (1,322) 8: Don't know (1,018) 9: Missing (467)			the AIDS virus reduce the risk of giving the virus to the baby by taking certain drugs during pregnancy? 0: No (1,992) 1: Yes (2,665) 8: Don't know (2,385) 9: Missing (1,153)
Wealth Index				
mv190	Wealth index 1: Poorest (540) 2: Poorer (556) 3: Middle (615) 4: Richer (752) 5: Richest (1,115)	RH _{4.1} MIV CON	v190	Wealth index 1: Poorest (1,376) 2: Poorer (1,306) 3: Middle (1,381) 4: Richer (1,568) 5: Richest (2,564)
Voluntary Counseling and Testing (VCT)				
mv781	I do not want to know the results, but have you ever been tested to see if you have the AIDS virus? 0: No (2,954) 1: Yes (585) 9: Missing (39)	RH _{1.1} MIV CON	v781	I do not want to know the results, but have you ever been tested to see if you have the AIDS virus? 0: No (6,811) 1: Yes (1,239) 9: Missing (145)
Perceived Risk of Acquiring AIDS				
sm716b1	Do you think your chances of getting AIDS are small, moderate, great, or no risk at all? 0: No risk at all (1,243) 1: Small (1,815) 2: Moderate (321) 3: Great (157) 4: Has aids (2) 9: Missing (40)	RH _{1.3} MIV CON	s816b1	Do you think your chances of getting AIDS are small, moderate, great, or no risk at all? 0: No risk at all (3,014) 1: Small (3,105) 2: Moderate (1,198) 3: Great (713) 4: Has aids (2) 9: Missing (163)
Education				
sm110	What is the highest level of school you attended; primary, vocational, secondary, or higher? 0: Nursery/kindergarten (296) 1: Primary (1,853) 2: Post primary/vocational (70) 3: Secondary/"a" level (973) 4: College (middle level) (290)	CON	s108	What is the highest level of school you attended; primary, vocational, secondary, or higher? 0: Nursery/kindergarten (1,291) 1: Primary (4,233) 2: Post primary/vocational (115) 3: Secondary/"a" level (1,975) 4: College (middle level) (438) 5: University (143)

	5: University	(96)			
<u>Age</u>					
mv013	How old were you at last birthday?		CON	v013	How old were you at last birthday?
	1: 15-19	(829)			1: 15-19 (1,820)
	2: 20-24	(674)			2: 20-24 (1,710)
	3: 25-29	(514)			3: 25-29 (1,400)
	4: 30-34	(421)			4: 30-34 (1,116)
	5: 35-39	(390)			5: 35-39 (859)
	6: 40-44	(314)			6: 40-44 (780)
	7: 45-49	(206)			7: 45-49 (510)
	8: 50-54	(230)			
<u>Age at first sexual intercourse</u>					
mv525	Not had intercourse	(571)	CON	v525	Not had intercourse (1,398)
	8	(28)			8 (14)
	9	(29)			9 (11)
	10	(118)			10 (52)
	11	(47)			11 (31)
	12	(197)			12 (161)
	.				.
	.				.
	.				.
	99: Missing	(12)			99: Missing (19)
<u>Region</u>					
mv024	Region		RH _{3.3} RH _{3.4} MIV CON	v024	Region
	1: Nairobi	(493)			1: Nairobi (1,169)
	2: Central	(621)			2: Central (1,314)
	3: Coast	(375)			3: Coast (938)
	4: Eastern	(468)			4: Eastern (993)
	5: Nyanza	(434)			5: Nyanza (1,025)
	6: Rift valley	(586)			6: Rift valley (1,328)
	7: Western	(435)			7: Western (991)
	8: North eastern	(166)			8: North eastern (437)
<u>Residence</u>					
mv025	Type of Place of Residence		CON	v025	Type of Place of Residence
	1: Urban	(1,150)			1: Urban (2,751)
	2: Rural	(2,428)			2: Rural (5,444)
<u>Ethnicity (Ethnic Groups/tribes)</u>					
mv131	Ethnic group		CON	v131	Ethnic group
	1: Embu	(46)			1: Embu (101)
	2: Kalenjin	(324)			2: Kalenjin (643)
	3: Kamba	(371)			3: Kamba (786)
	4: Kikuyu	(845)			4: Kikuyu (1,977)
	5: Kisii	(208)			5: Kisii (454)
	6: Luhya	(520)			6: Luhya (1,229)
	7: Luo	(390)			7: Luo (853)
	8: Masai	(68)			8: Masai (162)
	9: Meru	(172)			9: Meru (386)
	10: Mijikenda/Swahili				10: Mijikenda/Swahili (566)

	11: Somali (214) 12: Taita/Taveta (223) 13: Turkana (51) 14: Kuria (51) 96: Other (27) 99: Missing (68) (0)			11: Somali (602) 12: Taita/Taveta (135) 13: Turkana (121) 14: Kuria (47) 96: Other (133) 99: Missing (0)
<u>Marital Status</u>				
mv502	Marital status 0: Never married (1,584) 1: Currently married (1,855) 2: Formerly married (139) 9: Missing (0)	CON	v502	Marital status 0: Never married (2,466) 1: Currently married (4,876) 2: Formerly married (853) 9: Missing (0)
<u>Occupation</u>				
mv717	Occupation 0: Not working (885) 1: Prof., Tech.,Mng. (277) 2: Clerical (41) 3: Sales (329) 4: Agric-self employed (1,050) 6: Household & domestic (89) 7: Services (181) 8: Skilled manual (129) 9: Unskilled manual (585) 99: Missing (12)	CON	v717	Occupation 0: Not working (3,247) 1: Prof., Tech., Manag. (374) 2: Clerical (129) 3: Sales (1,230) 4: Agric-self employed (2,175) 6: Household & domestic (471) 7: Services (179) 8: Skilled manual (7) 9: Unskilled manual (374) 99: Missing (9)
<u>Number of wives/partners</u>				
mv035	Number of wives 0: no wives/partners (1,723) 1: 1 (1,665) 2: 2 (166) 3: 3 (16) 4: 4 (5) 5: 5 (3) 9: Missing (0)	CON	v505	How many other wives does he have? 0: no other wives (3,939) 1: 1 (602) 2: 2 (164) 3: 3 (38) 4: 4 (15) 5: 5 (4) 98: Don't know (107) 99: Missing (3,326)
<u>Religion</u>				
mv130	Religion 1: Roman catholic (913) 2: Protestant/other Christian (2055) 3: Muslim (381) 4: No religion (219) 6: Other (9) 9: Missing (1)	CON	v130	Religion 1: Roman catholic (1919) 2: Protestant/other Christian (5,045) 3: Muslim (1,025) 4: No religion (167) 6: Other (29) 9: Missing (10)

<u>Sex</u>				
Male	N = 3,578		Female	N = 8,195
<u>Domestic Violence</u>				
Now I need to ask you some questions about your relationship with your (last) husband/partner. (Does/did) your (last) husband/partner ever:				
		RH _{1.4} RH _{5.2} MIV CON	d103a	Say or do something to humiliate you in front of others? 0: No (3,519) 1: Yes (793) 9: Missing (3,883)
		RH _{1.4} RH _{5.2} MIV CON	d103c	Threaten you or someone close to you with harm? 0: No (3,655) 1: Yes (657) 9: Missing (3,883)
		RH _{1.4} RH _{5.2} MIV CON	d105a	Push you, shake you, or throw something at you? 0: No (3,377) 1: Yes (735) 9: Missing (3,883)
		RH _{1.4} RH _{5.2} MIV CON	d105b	Slap you or twist your arm? 0: No (2,936) 1: Yes (1,374) 9: Missing (3,885)
		RH _{1.4} RH _{5.2} MIV CON	d105c	Punch you with his fist or with something that could hurt you? 0: No (3,610) 1: Yes (701) 9: Missing (3,884)
		RH _{1.4} RH _{5.2} MIV CON	d105d	Kick you or drag you? 0: No (3,860) 1: Yes (451) 9: Missing (3,884)
		RH _{1.4} RH _{5.2} MIV CON	d105e	Try to strangle you or burn you? 0: No (4,142) 1: Yes (167) 9: Missing (3,886)
		RH _{1.4} RH _{5.2} MIV CON	d105f	Threaten you with a knife, gun, or other type of weapon? 0: No (4,081) 1: Yes (231) 9: Missing (3,883)
		RH _{1.4} RH _{5.2} MIV CON	d105g	Attack you with a knife, gun, or other type of weapon? 0: No (4,211) 1: Yes (99) 9: Missing (3,885)

		RH _{1.4} RH _{5.2} MIV CON	d105h	Physically force you to have sexual intercourse with him even when you did not want to? 0: No (3,730) 1: Yes (579) 9: Missing (3,886)
		RH _{1.4} RH _{5.2} MIV CON	d105i	Force you to perform other sexual acts you did not want to? 0: No (4,158) 1: Yes (150) 9: Missing (3,887)
Alcohol Consumption				
sm607	In the last month, on how many days did you drink any alcohol-containing beverage? none: (678) 1 (198) 2 (157) 99: Missing (5)	RH _{3.1} RH _{3.2} MIV	s499a	In the last month, on how many days did you drink any alcohol-containing beverage? none: (562) 1 (118) 2 (78) 99: Missing (10)
Cognitive Involvement/Awareness				
(1) Cognitive Involvement/Awareness-HIV/AIDS				
mv751	Now I would like to talk about something else. Have you ever heard of an illness called AIDS? 0: No (35) 1: Yes (3,541) 9: Missing (2)	RH _{2.1} MIV	v751	Now I would like to talk about something else. Have you ever heard of an illness called AIDS? 0: No (129) 1: Yes (8,052) 9: Missing (14)
mv753	Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS? 0: No (154) 1: Yes (3,259) 8: Don't know (128) 9: Missing (37)	RH _{2.1} MIV	v753	Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS? 0: No (388) 1: Yes (6,912) 8: Don't know (751) 9: Missing (144)
mv775	Do you know someone personally who has the virus that causes AIDS or someone who died of AIDS? 0: No (881) 1: Yes (2,652) 9: Missing (45)	RH _{2.1} MIV	v775	Do you know someone personally who has the virus that causes AIDS or someone who died of AIDS? 0: No (2,118) 1: Yes (5,902) 9: Missing (175)

(2) Cognitive Involvement/Awareness-Heard about VCT				
sm716b4	Have you heard of VCT? 0: No (1,300) 1: Yes (2,239) 9: Missing (39)	RH _{2,2} MIV	s816b4	Have you heard of VCT? 0: No (4,004) 1: Yes (4,042) 9: Missing (149)
(3) Cognitive Involvement/Awareness-Heard about Sexually Transmitted Diseases				
mv785	(Apart for AIDS), have you heard about (other) infections that can be transmitted through sexual contact? 0: No (448) 1: Yes (3,091) 9: Missing (39)	RH _{2,3} MIV	v785	(Apart for AIDS), have you heard about (other) infections that can be transmitted through sexual contact? 0: No (1,845) 1: Yes (6,334) 9: Missing (16)
Circumcision				
sm720	Are you circumcised? 0: No (518) 1: Yes (3,052) 9: Missing (8)	RH _{5,3} MIV CON	s821	Are you circumcised? 0: No (5,450) 1: Yes (2,724) 9: Missing (21)
Sexually Transmitted Diseases				
mv763a	Now I would like to ask you some questions about your health. During the last 12 months, have you had a sexually-transmitted disease? 0: No (3,494) 1: Yes (59) 8: Don't Know (1) 9: Missing (24)	RH _{5,1} MIV CON	v763a	Now I would like to ask you some questions about your health. During the last 12 months, have you had a sexually-transmitted disease? 0: No (8,034) 1: Yes (108) 8: Don't Know (34) 9: Missing (19)
mv763c	Sometimes, men experience an abnormal discharge from their penis. During the last 12 months, have you had an abnormal discharge from your penis? 0: No (3,497) 1: Yes (57) 8: Don't Know (0) 9: Missing (24)	RH _{5,1} MIV CON	v763c	Sometimes, women experience an abnormal vaginal discharge. During the last 12 months, have you had a bad-smelling unusual discharge from your vagina? 0: No (7,934) 1: Yes (223) 8: Don't Know (19) 9: Missing (19)
mv763b	Sometimes, men have a sore or ulcer on or near their penis. During the last 12 months, have you had a sore or ulcer on or near your penis? 0: No (3,502) 1: Yes (47) 8: Don't Know (3)	RH _{5,1} MIV CON	v763b	Sometimes women have a genital sore or ulcer. During the last 12 months, have you had a genital sore or ulcer? 0: No (8,002) 1: Yes (152) 8: Don't Know (21) 9: Missing (20)

	9: Missing (26)			
Perceived Severity				
mv782	Would you want to be tested for AIDS virus? 0: No (804) 1: Yes (2,041) 8: Don't Know (108) 9: Missing (625)	CON	v782	Would you want to be tested for AIDS virus? 0: No (2,222) 1: Yes (4,376) 8: Don't Know (207) 9: Missing (1,390)
Self-Efficacy				
mv783	Do you know a place where you could go to get AIDS test? 0: No (995) 1: Yes (2,541) 9: Missing (625)	CON	v783	Do you know a place where you could go to get AIDS test? 0: No (2,898) 1: Yes (5,151) 9: Missing (146)
mv769	If you wanted to, could you yourself get a condom? 0: No (164) 1: Yes (2,586) 8: Don't know (20) 9: Missing (808)	CON	v769	If you wanted to, could you yourself get a condom? 0: No (1,465) 1: Yes (2,925) 8: Don't know (188) 9: Missing (3,617)

Key

HYP: Hypothesis

MOM: Main Outcome Measure

MIV: Main Independent Variable

CON: Confounder

RH: Research Hypothesis

APPENDIX 5: ETHICAL CONSIDERATION

**Compliance Office / Office of Research Services**

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Institutional Review Board (IRB) for Research with Human Subjects*Approval of Exemption*

Protocol # 09-08-07

Title: **Factors Associated with High-Risk Sexual Behavior among Kenyans: Implications for Public Health Strategies and Policy in Combating HIV/AIDS**

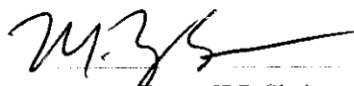
Date: 8/13/2009

Investigator	Mr. Elijah	Onsomu	Public Health Sciences
Co-investigator	Dr. James	Studnicki	Public Health Sciences

The Institutional Review Board (IRB) certifies that the protocol listed above is exempt under category 4 .

Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please note that it is the investigator's responsibility to promptly inform the committee of any changes in the proposed research, as well as any unanticipated problems that may arise involving risks to subjects. Amendment and Event Reporting forms are available on our web site: <http://www.research.uncc.edu/comp/human.cfm>


 Dr. M. Lynn Exum, IRB Chair

8/25/09
 Date

VITA

CURRICULUM VITAE
ELIJAH O. ONSOMU, MS, MPH, PhD, CHES

The University of North Carolina at Charlotte
College of Health and Human Services | Department of Public Health Sciences
9201 University City Blvd. | Charlotte, NC 28223-0001
Phone: (704) 649-6240 | E-mail: oonsomu@gmail.com

EDUCATION

2006-2010	PhD	Health Services Research (Healthcare Organization/Administration and Health Disparities), College of Health and Human Services, University of North Carolina at Charlotte (UNC Charlotte)
2005-2006	MPH	Public Health (Administration), Northwest Ohio Consortium for Public Health-NOCPH [Department of Public and Allied Health & Department of Public Health & Preventive Medicine, Bowling Green State University (BGSU) & College of Medicine - University of Toledo (UT)]
2002-2003	MS	Human Resource Development (Training-Education & Industry), Industrial Technology Education, Indiana State University (ISU)
2000-2001		Graduate Studies in Master of Business Administration (MBA-Human Resource Management) – 48 credit hours equivalent, School of Business, University of Nairobi
1995-1999	BA (Hons)	Economics and Sociology, University of Nairobi Second Class Honours/Honors-Upper Division (<i>Magna Cum Laude</i>)
1990-1993	KCSE	Kenya Certificate of Secondary Education, Moi Forces Academy

CERTIFICATIONS

2009		Advanced Grant Proposal Writing – Ohio State University
2008-Present		Certified Health Education Specialist (CHES) #15114 – <i>The National Commission For Health Education Credentialing (NCHEC)</i>
2006-2010		Basic Disaster Life Support (BDLS) – AMA

EXPERIENCE

2010-Present		Social/Clinical Research Specialist: School of Health Sciences, Winston Salem State University (Summer-)
2010		Co-Instructor of Record, Liberal Studies (Issues of Health and Quality of Life), College of Health and Human Services, UNC Charlotte (Spring), Charlotte, NC.
2009		Instructor of Record, Health Behavior (Behavior Change Theories and Practice), Department of Public Health Sciences, UNC Charlotte (Spring), Charlotte, NC.
2007 & 2009		Teaching Assistant/Associate, Health Behavior (Behavior Change Theories and Practice); Kinesiology (Fall, Fall), Charlotte, NC.
2006-2009		Graduate Research Assistant: College of Health and Human Services UNC Charlotte (Fall; Summer; Spring; Summer; Spring; Summer; Fall; Spring), Charlotte, NC.
2005-2006		Graduate Research Assistant: Department of Public Health, BGSU (Fall, Spring), Bowling Green, OH

OTHER EXPERIENCE

2009-2010 Population Reference Bureau-Policy Communication Fellowship
 2006 Blanchard Valley Health Association, Findlay-Hospital Administrator Intern – Paid
 2002 Indiana State University, Human Resource Development (HRD) Department - Intern
 1999-2001 Saon Academy, Kisii, Kenya-School Administrator/Manger, Taught Grade eight Math

TOOLS

Stata versions 10.1 and 11-Data Analysis and Statistical Software (proficient) | SAS-Statistical Analysis Software (used) | SPSS-Statistical Package for the Social Sciences (used) | CDC *Epi Info*TM | Microsoft Office (Word, Excel, PowerPoint)

RESEARCH SUPPORT

Funding Agency: Population Reference Bureau (PRB)

Role: Project Investigator

Purpose: Proposed Topic 1. *Importance of the media in scaling-up HIV testing in Kenya* and Proposed Topic 2. *Sex education: Delaying sexual debut as a strategy for reducing HIV prevalence in Kenya*

Expectations: Present findings with a focus on several policy briefs (peer reviewed) with the experience culminating in PRB's 2010 Population Association of America (PAA) pre-conference workshop presentation – Third draft.

Funds: \$2,000 (\$1,000, \$500 & \$500)

Duration: 2009-2010

Research Status: Proposal 1-Completed. 2 -Completed

Policy Communication Briefs Status: Completed

RESEARCH

Manuscripts Accepted with Revisions

Abuya, B.A., Kimani, J.K., **Onsomu, E.O.**, & Moore, D. (*Revised and submitted*). Influence of maternal education on child immunization and stunting in Kenya. (*Maternal and Child Health Journal*)

Moore, D., **Onsomu, E.O.**, Timmons, S., Abuya, B.A., & Moore, C. (*Revised and submitted*). Communicating HIV/AIDS through African American churches in North Carolina: Implications and recommendations for HIV/AIDS faith-based programs. (*Journal of Religion and Health*)

Policy Brief – A Fellowship Compendium

Onsomu, E.O. [2010-Policy Communication]. Sex education: Delaying sexual debut as a strategy for reducing HIV prevalence in Kenya. *Population Reference Bureau (PRB)*

Dissertation/Projects

Onsomu, E.O. [2010-Health Services Research (PhD)]. Factors Associated with High-Risk Sexual Behavior among Kenyans: Implications for Public Health Strategies and Policy in Combating HIV/AIDS. *Under James Studnicki, ScD, MBA, MPH (Chair)*

Onsomu, E.O. [2006-Administration (MPH)]. Selected Topics on Management Issues and Associate Survey Follow-up Recommendations for Improvement: An In-depth Look at Departmental Management Concerns and Views *Under Fleming Fallon Jr.MD, PhD, DrPH, and William Koss, MD, JD (Blanchard Valley Health System)*

Onsomu, E.O. [2003-Human Resource Development (MS)]. Managerial use of Worker/Employee Participation in Decision-Making (WPD) to Increase Productivity: A Case Study of Bemis Co. Inc, in Terre Haute *Under Anthony Gilberti, PhD*

Manuscripts under peer review

Onsomu, E.O., Moore, D. & Abuya, B.A. (*Under External Review*). Importance of the media in scaling-up HIV testing in Kenya (*Journal of Health Communication*)

Moore, D., **Onsomu, E.O.**, & Harden, R. (*Under Review*). Identities of HIV/AIDS positive African American women through interpersonal relationships: A framing of HIV/AIDS in the film *Life Support*. (*Kentucky Journal of Communication*)

Piper, C.N., Glover, S.H., Williams, E., Olatosi, B., Charlemagne, S.A., Campbell, D.A., Ogbuano, C., Annang, L., Lee, W., & **Onsomu, E.O.** (*Under Review*). Beliefs and perception of risks among women that have never been tested for HIV in the United States. (*Women's Health Issues*)

Manuscripts in Advanced Preparation for Submission

Onsomu, E.O., Tait, E., Ferguson, B., Studnicki, J., & Fisher, J. (*To be Sub*). Medicare health plan type and admission pathway? (*Academic Emergency Medicine*)

Onsomu, E.O., Kimani, J.K., Abuya, B.A., Arif, A.A., Moore, D., & Piper, C.N. (*To be Sub*). Sex education: Delaying sexual debut as a strategy for reducing HIV prevalence in Kenya. (*AIDS Education and Prevention*)

Piper, C., Glover, S. H., Olatosi, B., Charlemagne, S.A., Campbell, D.A., Ogbuano, C., Williams, E., Annang, L., Wilson, S., Lee, W., & **Onsomu, E.O.** (*To be Sub*). Attitudes, perception of risks, and the utilization of HIV testing services among women in the United States. (*The Open AIDS Journals*)

Onsomu, E.O., Abuya, B.A., & Kimani, J.K. (*To be Sub*). Age variation and abuse among women: Urban and rural differences in Kenya. (*Journal of Interpersonal Violence*)

Abuya, B.A., **Onsomu, E.O.**, & Moore, D. (*To be Sub*). Education and abuse prevalence: Differences among women in urban and rural areas in Kenya. (*Violence Against Women*)

PROFESSIONAL CONFERENCE PARTICIPATION (Peer Reviewed)**Submitted**

Moore, D., **Onsomu, E.O.**, & Harden, R. (2010). *The way forward: HIV/AIDS and new media in Kenya*. 28th Association of Third World Studies (ATWS) 2010: 28th Annual Conference of the ATWS Annual Meeting, Savannah, Georgia, GA, October 7-9-National Conference. (Presentation- Submitted)

Accepted

Onsomu, E.O., Piper, C., Moore, D., & Timmons, S. (2010). *Underestimating HIV acquisition perceived risk in Kenya: Sexual-risk taking in urban and rural areas*. 138th American Public Health Association (APHA) Annual Meeting and Exposition, Social Justice: Public Health Imperative, Denver, CO, November, 06-10-National Conference. (Poster Session- Accepted) <http://apha.confex.com/apha/138am/webprogram/Session29988.html>

Piper, C., Glover, S., Williams, E.M., Olatosi, B.A., Charlemagne, S., Campbell, D.N., Ogbuano, C.A., Annang, L., Lee, M., & **Onsomu, E.O.** (2010). *Beliefs and perception of risks among women that have never been tested for HIV in the United States*. 138th American Public Health Association (APHA) Annual Meeting and Exposition, Social Justice: Public Health Imperative, Denver, CO, November, 06-10-National Conference. (Poster Session- Accepted) <http://apha.confex.com/apha/138am/webprogram/Session30340.html>

Abuya, B. A., Kornhaber, M., & **Onsomu, E.O.** (2010). *Taking Girls beyond the Bridge in the urban slums of Nairobi: The Role of the Family in Girls' Secondary Education*. Pan African Family Strength International Conference in Africa, Mombasa, Kenya, July 20-24-National Conference. (Presentation Session- Accepted)

- Onsomu, E.O.,** Moore, D., Kimani, J.K., Arif, A., & Studnicki, J. (2010). *Correlates of perceived risk of acquiring HIV in a high HIV/AIDS prevalence population: Does age at first sexual debut matter?* 27th AcademyHealth Annual Research Meeting, Boston, Massachusetts, MA, June 27-29-National Conference Proceedings, Poster Session, #65: <http://academyhealth.org/files/ARM/PosterAbstracts.pdf>
- Onsomu, E.O.,** Arif, A., Studnicki, J. Cornelius, J., Moore, A., & Laditka, J. (2010). *Sexually transmitted diseases and circumcision in Kenya: What role do they play in HIV transmission?* 27th AcademyHealth Annual Research Meeting, Boston, Massachusetts, MA, June 27-29-National Conference Proceedings, Poster Session, #66: <http://academyhealth.org/files/ARM/PosterAbstracts.pdf>
- Piper, C., Glover, S., Williams, E., Olatosi, B., Ogbuano, C., **Onsomu, E.** (2010). Beliefs and Perception of Risks among Women that Have Never Been Tested for HIV in the United States. 27th AcademyHealth Annual Research Meeting, Boston, Massachusetts, MA, June 27-29-National Conference Proceedings, Poster Session, #847: <http://academyhealth.org/files/ARM/PosterAbstracts.pdf>

Presented

- Moore, D., **Onsomu, E.O.,** & Moore, C. (2010). *Communicating HIV/AIDS through African American churches in North Carolina: Implications and recommendations for HIV/AIDS faith-based programs.* 11th Biannual Kentucky Conference on Health Communication, Lexington, Kentucky, KY, April, 22-24-National Conference Proceedings, Poster Session # 24, pg19: <http://comm.uky.edu/kchc/program.html>.
- Abuya, B.A., Kimani, J.K., & **Onsomu, E.O.** (2010). *Influence of maternal education on child health in Kenya.* 75th Population Association of America (PAA) Annual Conference, Dallas, TX, April 15 -17-National Conference Proceedings, Presentation # 86, pg317: <http://paa2010.princeton.edu/abstractViewer.aspx?SubmissionId=100182>
- Onsomu, E.O.** (2010). *Sex education: Delaying sexual debut as a strategy for reducing HIV prevalence in Kenya.* 75th Population Reference Bureau's (PRB's) 2010 Population Association of America (PAA) pre-conference workshop as part of the Annual Conference, Emphasis on policy communication (Implications and Recommendations), Dallas, TX, April 15 -17-National Conference. (Presentation Session-Part of PRB's Fellowship requirements)
- Onsomu, E.O.,** Moore, D., Arif, A.A., & Studnicki, J. (2010). *Is there a counterintuitive association between wealth index and high-risk sexual behavior among Kenyan men and women?* 10th Annual Graduate Research Fair, Charlotte, North Carolina, NC, March 20-Local Conference. (Presentation Session)
- Onsomu, E.O.,** Kimani, J.K., Moore, D., Abuya, B.A., & Keengwe, J.S. (2010). *Age variation and extent of Sexual-risk taking among Kenyan women: Does residence (urban or rural) matter?* 31st Annual Minority Health Conference, Building Community in the Age of Information: Fighting Health Inequality in the Modern World, University of North Carolina at Chapel Hill-Gillings School of Global Public Health, NC, February 26-National Conference Proceedings, Poster Session, pg25-26: http://www.minority.unc.edu/sph/minconf/2010/materials/program_2010.pdf
- Onsomu, E.O.,** Salandy, S.W., & Studnicki, J. (2009). *Association between age and insurance type among the elderly: Does co-morbidity matter?* 62nd Gerontological Society of America (GSA) Annual Meeting, Atlanta, Georgia, GA, November, 18-22-National Conference Proceedings-Late Breaker Poster Session # LB11, pg8.

- Onsomu, E.O.,** Tait, E., Tsulukidze, M.M., Arif, A., & Studnicki, J. (2009). *Are there racial/ethnic disparities based on elderly hospital admission source?* 62nd Gerontological Society of America (GSA) Annual Meeting, Atlanta, Georgia, GA, November, 18-22- National Conference Proceedings, Poster Session, Minority Aging # 970-CD-ROM: <http://www.geron.org/programbook2009.pdf>
- Moore, D., **Onsomu, E.O.,** & Moore, C. (2009). *HIV/AIDS stigma and testing discourse: African American churches in a Southeastern city and its environs.* Faces of a Healthy Future: National Conference to end Health Disparities II, Winston Salem, North Carolina, NC, November, 03-06-National Conference Proceedings, Poster Session # 39: http://www.ccehd.com/poster_abstracts.pdf
- Onsomu, E.O.,** Salandy, S.W., & Studnicki, J. (2009). *Exploring racial/ethnic disparities in Medicare advantage plans (FFS vs. HMO): Measuring the differences due to co-morbidities in Florida.* Faces of a Healthy Future: National Conference to end Health Disparities II, Winston Salem, North Carolina, NC, November, 03-06-National Conference Proceedings, Poster Session # 40: http://www.ccehd.com/poster_abstracts.pdf
- Onsomu, E.O.,** & Moore, D. (2009). *The HIV/AIDS pandemic in Kenya: Importance of the media in scaling-up voluntary counseling and testing.* 100th North Carolina Public Health Association (NCPHA) Annual Meeting, Asheville, North Carolina, NC, September, 29 - October, 2-National Conference. (Poster Session)
- Tait, E., **Onsomu, E.O.,** Tsulukidze, M.M., Studnicki, J., & Arif, A. (2009). *Are there differences in hospital admission source among the elderly and number of co-morbidities?.* 100th North Carolina Public Health Association (NCPHA) Annual Meeting, Asheville, North Carolina, NC, September, 29 - October, 2-National Conference. (Poster Session)
- Onsomu, E.O.,** Tait, E., Ekezue, B., Bushelle-Edghill, J., Tsulukidze, M.M., & Studnicki, J. (2009). *It is the insurance type and their practices - not race, age, or co-morbidity: Exploring the association between payer-source (FFS vs. HMO) and hospital admission source (Physician and ER) among the elderly?.* 100th North Carolina Public Health Association (NCPHA) Annual Meeting, Asheville, North Carolina, NC, September, 29 - October, 2-National Conference. (Poster Session)
- Onsomu, E.O.,** Tait, E., Ferguson, B., Studnicki, J., & Fisher, J. (2009). *Is the likelihood of a Patient Admission through the Emergency Room Reduced by Participation in a Medicare HMO?* 26th AcademyHealth Annual Research Meeting, Chicago, Illinois, IL, June 28-30- National Conference Proceedings, Poster Session: <http://www.academyhealth.org/files/arm/ARM-2009-Posters.pdf>
- Tait, E., **Onsomu, E.O.,** Ferguson, B., Studnicki, J., & Fisher, J. (2009). *Factors and participation in a Medicare insurance plan: Likelihood of an admission through the emergency room (ER).* 9th Annual Graduate Research Fair, Charlotte, North Carolina, NC, March 21-Local Conference. (Poster Session)
- Moore, D., & **Onsomu, E.O.** (2008). *Identities of HIV/AIDS positive African American women through interpersonal relationships: A framing of HIV/AIDS in the film Life Support.* 2008 African Diaspora Studies Symposium "The Diasporic Kaleidoscope: New Approaches to African Diaspora Studies", North Carolina Central University, North Carolina, NC, November 8-9-National Conference. (Presentation Session)
- Moore, D., & **Onsomu, E.O.** (2008). *The framing of HIV/AIDS in the Bahamas: A textual analysis of an online newspaper.* 26th Annual International Conference of The Association of Third World Studies, Pennsylvania, PA, October 26-28-International Conference. (Presentation Session)

INVITED PRESENTATIONS (Non-Peer Reviewed)

Academic

Onsomu, E.O. (2009). *The case for a comprehensive sexual education in Kenya: Importance of delayed sexual debut in fighting HIV prevalence epidemic*. Initial findings presented at the 2009 International Education Week: Sponsored by The College of Health and Human Services, University of North Carolina at Charlotte, North Carolina, NC, November 16th-20th. (Non-Peer Reviewed Presentation-Presented). **NOTE:** This paper final findings will be presented at the PRB's 2010 Population Association of America (PAA) pre-conference workshop as part of the Annual Conference, Dallas, TX, April 15 -17.

Onsomu, E.O. (2008). *Sub-Saharan Africa HIV/AIDS perspective: Understanding the problem and variables relationship that promote HIV/AIDS*. Paper presented at the Mu Chapter of the Phi Beta Delta Society for International Scholars: 6th Annual Global Perspective Series, University of North Carolina at Charlotte, North Carolina, NC, October 8-Local. (Non-Peer Reviewed Presentation)

Panel Presentation

SOWK 3181. Practice Methods I. (2009-Fall): Primary Instructor - Dr. John Doherty. Three member panel representing three countries (Australia, Kenya, and India). Provided non-professional perspectives on Kenya's social work environment in regard to the profession and challenges on areas of:

1. Child welfare (homelessness, poverty, abuse, foster care, adoption, disabilities, family preservation, and negligence) and the effect of HIV/AIDS
2. Domestic violence on women and the effect on women and children, government interventions if any (financial, housing, employment, and protection on women's rights) and their successes or failures, and
3. Mental illness in the society (how it's perceived, and availability of social support programs for the family and government)

OTHER ABSTRACTS/PAPERS IN PREPARATION

Conference Abstracts Completed: Awaiting Submission

Onsomu, E.O., (2011). *Counterintuitive association between marriage and HIV in Kenya*

Onsomu, E.O., Abuya, B.A., & Kimani, J.K. (2011). *Age variation and abuse among women: Urban and rural differences in Kenya*

Abuya, B.A., **Onsomu, E.O.**, & Moore, D. (2011). *Education and abuse prevalence: Differences among women in urban and rural areas in Kenya*. Under preparation for the 76th Population Association of America (PAA) Annual Conference, Washington, DC, March 31st-April 2nd - National Conference

RESEARCH INTEREST

1. Health Services Research
2. Global/International delivery of healthcare services, HIV/AIDS research, epidemiology and programs
3. Health Disparities
 - Access to healthcare from a structural, organizational and systematic perspective
 - Health Services Outcome Research
4. Research Methods
5. HIV/AIDS from a Public Health Policy Perspective
 - HIV/AIDS Social, Economic, and Healthcare Policy
 - Policy Communication
6. Health education, HIV/AIDS and employee productivity

FELLOWSHIPS AND RESEARCH AWARDS

- 2010 Health Services Research Academy (HSRA): Student Paper Award – University of North Carolina at Charlotte, April 22, 2010
- Best PhD Student Paper – *Importance of the media in scaling-up HIV testing in Kenya*
 - Blind Peer Reviewed
 - \$150 cash reward and certificate
- 2009-2010 Population Reference Bureau (PRB), Washington, DC
- 2009-2010 Policy Fellow (Population Policy Communication)
 - Awarded \$2,000 for research support
 - Two weeks workshop in DC
 - Preparation of three policy briefs based on research
 - Presentation of the final policy brief at the Population Association of America (PAA) conference – 2010
 - Conferences support during doctoral studies and up to three years after graduation.

TEACHING ACTIVITIES

Co-Teaching Activities

- Co-Instructor: LBST 2214 Issues of Health and Quality of Life, UNCC, Department of Public Health Sciences-3 credit hours, Spring 2010.
- Instructor of Record: HLTH 3103 Behavior Change Theories and Practice, UNCC, Department of Public Health Sciences-3 credit hours, Spring 2009.

Guest Lecturer

- COM 406 Senior seminar (research project course-data coding, analysis and interpretation-4hours). Johnson C. Smith University, Department of Communication Arts-4 hours, Fall-one session 2009.
- SOWK 3100: Introduction to research methods and skills used in social work. UNCC, Department of Social Work, Spring-one session 2007.

SCHOLARSHIPS

- 2006-2010 University of North Carolina at Charlotte
- Graduate Assistant Support Plan (GASP)¹³-Competitive Scholarship, Doctorate Program-Health Services Research: Full Tuition, Stipend and Health Insurance in Recognition of Teaching and Research Excellence, UNC Charlotte Graduate School
- 2007 University of North Carolina at Charlotte
- *The John and Alice Harney Scholar Award* recipient May 11, 2007: Awarded \$3,345.75, Doctorate Program-Health Services Research, UNC Charlotte College of Health and Human Services
- 2005-2006 Bowling Green State University
- Received Graduate Scholarship (tuition and fees), Master of Public Health: Awarded \$15,380, BGSU Graduate School
 - Research Assistant

¹³ “The Assistant Support Plan is a highly competitive multi-year support package used to attract and retain top quality doctoral students to UNC Charlotte. Students Graduate enrolled in this plan are eligible to receive full payment of in-state tuition, non-resident tuition (if required), and health insurance. To be eligible a student must be a doctoral student who holds a graduate assistantship or appropriate fellowship and must be enrolled full-time (at least 9 credit hours) for each term of support. Nominations: Students must be nominated for this award by their graduate program. Since this is a very competitive financial support plan not every eligible student may be enrolled.” Retrieved February 20, 2009, from http://www.uncc.edu/gradmiss/gfunding_and_fellowships.html

- 2002-2003 Indiana State University
- Graduate Tuition Waiver Support, Master of Science: Awarded \$3,096.00, ISU Graduate School
 - In recognition of academic excellence

TRAVEL AWARDS

- 2010 University of North Carolina at Charlotte
- Conference Travel Award (Biannual Kentucky Conference on Health Communication, Lexington, Kentucky, KY, April, 22nd -24th), Awarded \$533, College of Health and Human Services.
- 2010 USAID through Population Reference Bureau's BRIDGE Project
- Conference Travel Award (Population Association of America, Dallas, Texas, April 15th-17th): All expenses covered
- 2009 University of North Carolina at Charlotte
- Conference Travel Award (Gerontological Society of America (GSA) Annual Meeting, Atlanta, Georgia, GA, November, 18th-22nd) Awarded \$779.32, College of Health and Human Services.
- 2009 University of North Carolina at Charlotte
- Conference Travel Award (Faces of a Healthy Future: National Conference to end Health Disparities II, Winston Salem, NC, November, 03rd-06th): Awarded \$400, Department of Public Health Sciences-Dr. Studnicki's Grant Funds.
- 2009 USAID through Population Reference Bureau's BRIDGE Project
- Conference Travel Award (North Carolina Public Health Association, Ashville, North Carolina, September 29th-October 2nd): Awarded \$228.70
- 2009 University of North Carolina at Charlotte
- Conference Travel Award (AcademyHealth Annual Research Meeting, Chicago, Illinois, June 28th-30th): Awarded \$1,611.32 for all expenses, Department of Public Health Sciences-Dr. Studnicki's Grant Funds.
- 2009 USAID through Population Reference Bureau's BRIDGE Project
- Washington DC Training Workshop (PRB, Washington, DC, June 1st-12th): All expenses covered.
- 2008 University of North Carolina at Charlotte
- Conference Travel Award (The Association of Third World Studies, Millersville, Pennsylvania, October 26th-28th): Awarded \$872.08, College of Health and Human Services.

HONORS

- 2009 The National Scholars Honor Society, Carpentersville, IL
- Elected to The National Scholars Honor Society as a member
- 2007 University of North Carolina at Charlotte
- Elected to Phi Beta Delta Honor Society for International Scholars - Mu Chapter: UNC Charlotte
- 2003 Indiana State University
- Elected to Epsilon Pi Tau - Mu Chapter Honorary Society: ISU
- 1999 University of Nairobi
- Graduated with Honors-Upper Division (*Magna Cum Laude*)

PROFESSIONAL MEMBERSHIP

Academic Affiliations

- 2009-Present North Carolina Public Health Association, Student Associate
 2009-Present Gerontological Society of America, Student Associate
 2009-Present Population Association of America, Student Associate
 2008-Present Association of Third World Studies, Student Associate
 2008-2010 American Journal of Health Studies, Student Associate
 2007-Present AcademyHealth, Student Associate
 2006-2007 National Association of Local Boards of Health (NALBOH)
 2005-2007 American College of Healthcare Executives (ACHE)

University Affiliations

- 2009-2010 UNC Charlotte-AcademyHealth Graduate Student Chapter (UNCC-AHGSC):
 UNC Charlotte-Active
 2008-2010 Graduate Public Health Association (GPHA): UNC Charlotte-Active
 2007 Phi Beta Delta/Mu Chapter, Honor Society for International Scholars UNC
 Charlotte-Active
 2006- Graduate and Professional Student Government (GPSG): UNC Charlotte-Active
 2006- Organization of African Students (OAS): UNC Charlotte-Active
 2005- The African American Graduate Students Association: BGSU
 2005-2006 Graduate Students' Senate (GSS)-Public Health: BGSU
 2005-2006 Public Health Student Organization (NOCPH): BGSU & UT
 2002-2003 African Student Organization: ISU
 2003- Epsilon Pi Tau/Mu Chapter, The International Honor Society for Professions in
 Technology-ISU: Active
 2002- Wabash Valley Collegiate National Society for Human Resource Management
 Chapter (SHRM)-ISU

SERVICE ACTIVITIES

Abstract Review Committee

- 2010 63rd Gerontological Society of America (GSA) Annual Scientific Meeting, April.
 2010 138th American Public Health Association (APHA) Annual Meeting, March.
 2010 10th Annual Graduate Research Fair-Graduate and Professional Student Government
 (GPSG)
 meeting, University of North Carolina at Charlotte, North Carolina, February.
 2009 137th American Public Health Association (APHA) Annual Meeting, March.

Organization and University Committees

- 2009-2010 UNC Charlotte School of Public Health Planning and Steering Committee Member
 -Health Services Research PhD student representative
 2009 Vice Chairman of the Board Members/Board Member: Metrolina AIDS Project
 (MAP)-6 months
 2008-2009 Vice President of the Phi Beta Delta Honor Society for International Scholars-Mu
 Chapter, UNC Charlotte

Community and University Service

- 2009-2010 UNC Charlotte Graduate Student Professional Government, Treasurer,
 AcademyHealth Graduate Student Chapter (UNCC-AHGSC)-Active
 2009-2010 UNC Charlotte Graduate Student Professional Government, Senator, Graduate
 Public Health Association (GPHA)-Active
 2009 Provided 2 ½ hours service to Salvation Army Center of Hope (women and children
 shelter) through St. Thomas Aquinas: Prepared dinner, Prepared the dining room

- 2009 ready, and Served dinner to the residents, Charlotte, North Carolina
Metrolina AIDS Project's 15th Annual NANDI Conference: A Wellness
Conference for Women of Color
- 2008-2009 Phi Beta Delta Honor Society for International Scholars - Mu Chapter: UNC
Charlotte
- 2005-2006 BGSU Graduate Student Senate (GSS) Public Health Administration Major Officer
/Representative for North West Ohio Consortium for Public Health
- 1998-1999 University of Nairobi Economics Student Association (ECOSA)
- 1998-1999 University of Nairobi Sociological Student Association (NUSSA)
- 1998 Clean Up The World: United Nations Environmental Program, Kenya Campaign
–Awarded Certificate

Media Interviews

- 2010 1Q 2010 UNC Charlotte magazine:
http://issuu.com/unc_charlotte/docs/unc_charlotte_magazine_q1_2010
- 2009 Smokers' dilemma: Better to light or quit? Charlotte Post –
http://findarticles.com/p/news-articles/charlotte-post-the/mi_8093/is_20090409/smokers-dilemma-light-quit/ai_n50875626/

LANGUAGES (Fluent in Reading, Writing and Speaking)

English | Kiswahili (Swahili Language) | Ekegusii (Kisii Language)

REFERENCES

Provided upon request