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Understanding the HIV Risk Behaviors in Haiti: A Rural-Urban Comparison

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by

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Understanding the HIV Risk Behaviors in Haiti: A Rural-Urban Comparison

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With much prayer in my endeavor to gain more knowledge in the United States, I realized how fortunate I am to have a family who believe in me and who have been very supportive during these past two years and nine months.
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This thesis is a statement of the long hours I have put in studying and the knowledge that I have obtained in order to better participate in strengthening the health care system of my country with the others who are already in the field. I have prospered in my education, my personal and spiritual life so I can be a blessing to others and none of this would have occurred without your trust and love.

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With all my love,

Your daughter and sister Alexandra

PS: Dad as you always say: the second after can change the course of your life for ever. My second after will be the last word you will read from this work for my life to go forward.

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ABSTRACT

Régine Alexandra Emilien
Understanding the HIV Risk Behaviors in Haiti: A Rural-Urban Comparison
(Under the direction of Richard Rothenberg MD, MPH, Faculty Member)

Purpose: The purpose of this study is to evaluate and compare the extent and potential correlates of sexual risk taking behaviors related to condom use and number of sexual partners among Haitians aged 15 to 49 years old living in the urban and rural areas.

Methods: Data were obtained from the 2005-2006 cross-sectional survey conducted by the Demographic Health survey. Our study population (15143) was analyzed based on the Health Belief Model (HBM) theory using a bivariate and multiple logistic regression analysis with SPSS for windows.

Results: In both rural and urban areas dwellers had an accurate knowledge of the disease. However, a small proportion in both areas used condoms during their last sexual intercourse. Perceiving the disease's severity was more likely associated with condom use in the urban (OR 1.36, $p \leq .01$) and in the rural areas (OR 1.45, $p \leq .05$). Strong associations have been found between some variables of the HBM and condom use but none have been found associated with zero or one sex partner. Findings were similar in both areas

Conclusion: Holistic approach should be considered in the prevention strategy conducted in Haiti to tackle other factors that may contribute in delaying responsible sexual behavior in that country.

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CHAPTER I

INTRODUCTION: From the incontestable burden of infectious diseases at the beginning of the 20th Century to the advent of chronic diseases in the 21st century, many strategies have been employed to contain the progression of these afflictions in human society. Throughout history, infectious diseases have been unquestionably the primary contributor to human morbidity and mortality .For example, the Influenza pandemic in 1920 followed by the plague in almost that same period have been both responsible for a considerable amount of deaths in the United States of America (US) (Marshall and Pearson 1972) (Armstrong, Conn et al. 1999). Since the last Century, health prevention strategies have been recognized as an important measure to prevent morbidity and mortality from specific infectious disease and now it is also recognized for the chronic disease. For instance, primary prevention such as 1- vaccination for Smallpox, Measles, Polio, Neonatal Tetanus, Meningococcal Meningitis, 2-vector control for Malaria, Dengue, Yellow Fever 3-Sanitation facilitate tremendously the decline of the morbidity-mortality attributable to infectious disease. It is also important to note that eating better; dropping weight, physical activity and quitting smoking are among the prevention methods that are being coined to reduce the incidence of the most prominent chronic disease such as diabetes, obesity, Cancer and cardiovascular diseases.

The industrialized countries achieved an outstanding decline in the incidence and prevalence of the infectious diseases. However, this decline has not been achieved in the low and middle income countries that are still facing the burden of this category of

disease. For instance, the United States has been free from Polio for over 20 yeas while in 2002 through 2004 in selected states in India and in northern Nigeria some cases have been identified (Roberts 2004). Until now the primary prevention strategies such as vaccination has not successfully covered the population in the low and middle countries as it can be observed in the developed countries. For example, the Mumps, Measles and Rubella immunization coverage in Haiti was estimated to be less than 80% while in the United States it was estimated to be above 90 % (MMWR 2007; PAHO 2007) and While humanity is advancing in the ages of disease epidemiology: Pestilence and famine, receding epidemics and chronic diseases some countries have not left the receding epidemics period but are experiencing just like the developed countries the chronic disease age. Thus, developing countries are suffering from a double burden of disease: Infectious and Chronic. For instance, in South Africa infectious diseases are responsible for 28% of years lost (YLLs), while chronic diseases are responsible for 25% (Steyn, Bradshaw et al. 2003).

This gap between the developing and developed countries has also been noticed with one of the most devastating infectious disease that we have happened to know about. The Human Immunodeficiency Virus (HIV) has been identified three decades ago and if this virus is not treated with the antiretroviral therapy available in the developed countries it will cause the Acquired Immunodeficiency Syndrome (AIDS). This disease became the leading infectious cause of adult death in the world. Untreated, AIDS has a case fatality rate that approximates 100% (WHO 2003). Worldwide, AIDS has been a burden for society and has claimed 2.9 million (2.5-3.5 million) of lives among which 2.6 million where adults in 2006. In that same year, the total of newly infected were estimated to be

4.3 million (3.6-6.6 million) and the number of people living with the disease was estimated to be 39.5 million (34.1-47.1 million)(UNAIDS 2006). However, the countries that are most affected are the developing countries where access to antiretroviral therapy has not yet reached the extent of the developed countries' accessibility. Although the antiretroviral therapy is not considered as a cure per se, but the provision of the therapy will prolong and improve the quality of life of those suffering with the disease. For instance, globally the Sub-Saharan Africa continues to be the region the most affected with the disease with an adult prevalence of 5.9 percent in 2006 compared to an estimated 0.8 percent seen among the adults in North America and 0.3 percent in Western and Central Europe (UNAIDS 2000a). The adult and children deaths was estimated to be 2.1 million [1.8-2.4 million] in the Sub-Saharan Africa compared to 18 thousands [11 000-26 000] in North America and in Western and Central Europe an estimated 12 thousands [<15,000] adults and children died of AIDS (UNAIDS 2006).

HIV/AIDS has been classified among the Sexually Transmitted Diseases (STDs).The virus is found in the fluid of the body but mostly in the blood and the semen. This explains that any interpersonal bodily fluid contact with an infected bodily fluid will conduct to the transmission of the disease. Sex intercourse, infected blood transfusion, Homosexuality, infected needle sharing; child bearing, delivery and breast feeding are the common routes of transmitting the virus. Thus, an uninfected person who is involved in any of these activities will transmit or will be contaminated with the virus if his or her partner is carrying the virus. HIV/AIDS has also been known to be preventable when appropriate prevention methods are adopted and continuously practiced. These practices

are as follow: Consistent Condom use, delayed sexual initiation, abstinence, faithfulness, avoiding needles sharing, transfusion with safe blood and avoiding blood contact (UNFPA 2007).

This disease, in many regions of the world has notably been identified among young people fifteen to twenty four years of age. In 2006, this population group accounted for forty percent (40%) of the newly infection found worldwide (UNAIDS 2000a). The people aged 15 to 24 years are considered as a potential vulnerable group of the population because they are at a stage of their life where experimentation and risks are common due to the critical phase of physical and psycho sociological development. At this stage of life many behaviors will start to be adopted and may consequently impact their life forever. Among the behaviors newly adopted many risky health behaviors may also be found in this particular group that underlies the rate of the pandemic among them. Being among the health behavior-related diseases, HIV/AIDS progression can be halted when people adopt responsible behaviors such as those previously cited.

The emergence of HIV/AIDS lead to the necessity of intervention tailored to contain risky sexual behaviors. AIDS prevention intervention required the application of many theories from the fields of psychology, sociology and anthropology. These theories have been employed about a decade before the advent of this STD to explain health beliefs, behaviors and behavior change in the society. Behavior change is the most important component in every HIV prevention program because this disease is based on behavioral intention of an individual and also a society. Understanding the reason why a

person changes their behavior and how he or she maintains the new healthy behavior adopted has been for years the most crucial purpose of many studies conducted in society and between cultures. Some of the behavioral change theories that were first developed for the United States population long before HIV/AIDS arise in humanity and later on they have been utilized in International work.

Among the behavioral change theories, the most commonly used in the HIV/AIDS prevention are:

1- The Health Belief Model (HBM) which was developed in 1950 to explain the lack of public participation in health screening and prevention program and have afterward been used for HIV prevention intervention (Rosenstock, Stretcher et al. 1994).

2- The AIDS Risk Reduction Model (ARRM) instigated in 1990 which encompasses variables from other behavior change theories including the Health belief Model, Efficacy theory, emotional influences and interpersonal processes(catania, Gibson et al. 1990) (catania, Gibson et al. 1990).

3- The Stages of Change, that was elaborated in 1982 to compare the attitudes of smokers in therapy and self –changers in a continuum behavior change pathway has also proved to be useful for the HIV prevention program (Prochaska, Diclemente et al. 1992) (Prochaska 1994).

4- The Theory of Reasoned Action (TRA) has been in use and has explained a number of human behaviors since 1967. Associating individual beliefs, attitudes, intentions and behavior, in 1994 some authors provided the construct that will be

used for the HIV prevention based on the fact that humans are cogent and that the behaviors are under the individual discretion (Fishbein 1990).

Many behavior change theories have been the support for HIV prevention programs worldwide and have tremendously facilitated their evaluation. However, differences in the prevalence and incidence of the disease between the developed and developing countries still exist and this discrepancy can also be observed within country. For instance, racial and ethnic minorities in the Unites States continue to be disproportionately affected by the HIV epidemic, while in Canada the Aboriginal people are the most affected (UNAIDS 2000a).

This discrepancy has also been noted in the Western Hemisphere where The Republic of Haiti, considered the poorest of that region (WorldBank 2007), has been and is still the most affected with HIV/AIDS. The estimated adult (15 to 49 years) prevalence is 3.8% [2.2-5.4%] compared to the rest of the Caribbean whose estimated prevalence was 1.2% [0.9%-1.7%] in 2006(UNAIDS 2000a). A difference in the HIV prevalence between the rural and urban areas of Haiti has also been noticed in a recent study. A statistically significant decline in HIV prevalence has been found among pregnant women 25 years and older and those living in the urban areas but not among those living in the rural areas or those who are 24 years and younger (Gaillard, Boulos et al. 2006). HIV prevalence among pregnant women is a proxy value use to estimate national HIV prevalence. Thus one might infer that in Haiti nationally, there has been a significant

decrease in HIV prevalence among urban dwellers and not among those who live in the rural areas.

To tackle this devastating epidemic, the 2002-2006 National Strategic Plan to prevent HIV/AIDS in Haiti focused on the reduction of three principal characteristics : -Risk, Impact and Vulnerability. For risk reduction, using condom and having fewer sexual partners are among the critical behaviors to be adopted by the population in order to achieve the objectives of reducing HIV Transmission (MSPP) 2002).

PURPOSE: Knowing that there is a lack of knowledge regarding the correlates of the risky sexual behaviors and the extent of the difference between the urban and rural areas in Haiti. Recognizing HIV/AIDS as a health behavior-related disease, and considering the inclusion of condom use and reduction of sexual partners in the Ministry of Health's strategy to reduce the burden of the disease in the country; the purpose of this study is to evaluate and compare the extent and potential correlates of risk- taking behaviors among Haitians aged 15 to 49 years old living in the urban and rural areas. This analysis has been conducted using the Perceived Susceptibility, Perceived Severity, Perceived Benefits and Cues to Action components of the Health Belief Model (Rosenstock, Stretcher et al. 1994).Based on the prominent heterosexual transmission of the virus in the country (Pape and Jonhson 1988), we define risk- taking behaviors in our study as not using a condom during the last sexual intercourse and having more than one sexual partner during the twelve months preceding the survey .We assess the association between condom use, number of sexual of partners during the last twelve months and the

four key variables of the Health Belief Model and observe differences that may exist between urban and rural areas. Following is a description of our four key variables for the purpose of that study:

1- **Perceived susceptibility** of contracting the disease is defined as a person's knowledge and beliefs about the disease (knows someone who has or died of AIDS, Ever been tested for AIDS, Ever heard of AIDS, know a place to get AIDS test, can get AIDS by Witchcraft, Seek protection from traditional healer for AIDS)

2- **Perceived severity** of the disease is characterize by a person's awareness of an infected person or someone who had died of the disease

3- **Perceived benefits** of the prevention methods refers to a person's beliefs about condom use and restricting number of sexual partners (Think they can reduce risk of getting AIDS by always using condoms during sex, by not having sex at all, by having one sex partner)

4- **Cues to Action** are determined as access to the media (Radio, Television and reading newspaper or magazine) and to condoms (Government Hospital, Private clinic, Non Governmental Organization –mobile clinic, Pharmacy)

Research Questions: In order to achieve our goals of appraising the differences between the urban and rural areas sexual behaviors based on these four variables of the Health Belief Model, we are going to answer to those following questions:

1- What are the associations between condom use and the variables of the Health Belief Model components among urban and rural dwellers aged fifteen (15) to forty- nine (49) years old?

2- What are the associations between number of sexual partners and the variables of the Health Belief Model components among urban and rural dwellers aged fifteen (15) to forty-nine (49) years old?

3- Do the urban and rural areas differ in the association of variables the Health Belief Model components with condom use and number of sexual partners?

To our knowledge the Health Belief Model variables chosen have not yet been tested on the Haitian population. We anticipate that our findings will explain factors that may contribute to a responsible sexual behavior conducive to a healthy state of life. Any eventual differences found between the rural and the urban areas may generate recommendations to reduce any gap that may exist between the sexual behaviors of rural and urban Haitian dwellers.

CHAPTER II

Literature Review

The Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS) have been recognized as a major threat for humankind. First classified as an epidemic, the disease became a pandemic about ten years after its first recognition in the early 1980's. The prevalence of HIV/AIDS in 2006 has been estimated at about 39.5 million [34.1 million -47.1 million]. In that year HIV/AIDS was responsible for 2.9 million [2.5 million -3.5 million] deaths worldwide (UNAIDS 2006) and the incidence was estimated at 4.3 million [3.6-6.6 million]. Both developed and developing countries suffered the affliction caused by this new chronic infectious disease. Furthermore, in some parts of the world HIV/AIDS had tremendous economic, social and psychological impact. A mere example is the number of orphaned infected children by the virus. It is estimated that by 2010 in Africa the number of orphans will be more than 18 million. Young infected persons have been dying before reaching the age of 40 in Africa. Professionals have been dying leaving empty positions in the African's workforce, contributing to an economic and social crises (UNAIDS 2004) . Until now, the most affected region in the world remains the Sub-Saharan Africa which in 2006 had 63 % of the people living with the virus and 72 percent of the adults and child deaths globally.

Similarly, in the Western Hemisphere, the Caribbean is the most affected and has been classified as the second most affected region in the world ((CAREC)-PAHO-WHO 2006; Kershaw, Small et al. 2006). In 2006, about 250 000 people have been estimated to be living with HIV in that region, for an adult prevalence estimated at 1.2 % [0.9%-1.7%]. The disease remains one of the leading causes of death among people aged 25 to 44 years old (UNAIDS 2006). Among the Caribbean countries, the Republic of Haiti, which occupies the western third of the Island of Hispaniola, is not only the poorest or the most densely populated in the region but is also the most affected with HIV/AIDS in the region (Holschneider and Alexander 2003; USAID 2003; Check 2004). In 2006, an estimated 190 000 [120 000-270 000] people were living with the virus in Haiti - a 3.8 % [2.2-5.4%] prevalence among those aged 15 to 49 years old. The death due to AIDS in that country for that same year of 2006 has been estimated to be 16 000 [9 500-24 000] (UNAIDS 2000a) ranking AIDS as the leading cause of death in the country (USAID 2003). Haiti has more HIV/AIDS patients per capita that any locale outside the Sub-Saharan Africa.

The Population is young in Haiti. In the last national survey conducted, 60 % of the overall population was less than 24 years of age and the population is predominantly female (52%). The country is also identified as being a rural nation since the majority of the population about 62 % lives in the rural areas(Cayemittes, Placide et al. 2007). Divided into ten departments with an estimated 8,528,000 people, the country is ranked 154 out of 177 countries on the United Nations Development Program Human Development Index (2006), with 54 percent of the population living on less than a dollar a day and 78 percent on less than two dollars ($2), with a life expectancy estimated at

fifty two years and an infant mortality rate of 76 out of 1000 live births , with nearly half the population illiterate and 97 percent of the country deforested (WorldBank 2007). Since the beginning of the 1980's, the currency has depreciated from 5 gourdes to the USD to 37 gourdes (UNGASS 2007; UNIBANK 2007) .

In 1988, a 20 % increase in infant and child mortality, a 10% increase in maternal mortality, a doubling of adult mortality , an increase in adult and child morbidity, a 20 % decrease in fertility and a change in population structure causing an increased in dependency ratio was exemplified by the US Census as a consequence of the epidemic in Haiti ((FHI/Impact) 2000). The disease has also destroyed the tourism industry in the beginning of 1980(Cohen 2006).

Until now, HIV/AIDS is impacting the Haitian community by increasing Tuberculosis incidence and the maternal mortality, by weakening the family structure and increasing the number of orphans. The cost of HIV care was estimated at 650 to 850 U.S. dollars ($) and the funeral cost was estimated to be 625 to 2 000 U.S.$ high far beyond the mean of most Haitian families (MSPP) 2002).

In Haiti, heterosexual intercourse has been known as the predominant mode of HIV transmission (Piot, Plummer et al. 1988; Quinn, Zaccharias et al. 1989; CentersforDiseasecontrolandPrevention 1996; Deschamps, Pape et al. 1996). It was stated that in 1982 there were five times more males living with AIDS than females but by 1992, the male to female ratio of AIDS cases was 1.5:1(Gaillard, Boulos et al. 2005) 1.2:1 in 1996 (PAHO 1998) and 1:1 in 2002(UNGASS 2007) identifying the epidemic as

generalized. It is also known that the first AIDS cases were reported in the Capital, Port-au-Prince, and subsequently extended to the rural areas(Gaillard, Boulos et al. 2004). Major migratory movements may have been responsible for the spread of the disease in the rural areas. Since the country is poor, people leave the rural areas for the urban areas in search of economic stability but return home if any illnesses occur. After the coup in September 1991, major internal migration to the rural areas took place, with a considerable number of people (about 200,000) escaping Port-au-Prince to seek protection in rural areas (PAHO 1998). Poverty and political instability are likely responsible for fueling the spread of AIDS, much like the situation in other developing countries that have been hard hit by the disease(Farmer, Raymonville et al. 1992; Farmer 1995; Check 2004; Fawzi, Lambert et al. 2005).

Like other countries, Haiti has discrepancies in the prevalence of its urban and rural areas. In most developing countries the prevalence of STD's has considerably been higher in the urban areas than the rural areas(Gentilini and Chieze 1990; Piot and Tezzo 1990). Historically seroprevalence has been higher in the urban areas than in the rural areas; 80 % of the AIDS patients were from Port-au-Prince, 10 % from other cities. By 1990, 65 % of the new AIDS cases came form Port-au-Prince (Desvarieux and pape 1991) and by 1996 the prevalence of the sexually active persons infected with HIV/AIDS was estimated to be 7-10 % in the urban areas and 3-5 % in the rural areas(PAHO 2001). In the past decade the HIV prevalence dropped from 5.96 % in 1996 to 3.8 % by the end of 2005. However, this decrease has only been noticed in the urban areas while in the rural areas no significant decrease of the HIV prevalence has been noticed (UNAIDS 2000a; MSPP 2002; Gaillard, Boulos et al. 2006).

It is agreed in the literature, that being in economically disadvantageous position put the individual at risk for Sexually Transmitted Diseases infection (Piot and Tezzo 1990; Farmer 1992; Farmer 1998). For example, in Haiti it is common to observe underprivileged women entering in a sexual relationship out of economic necessity. Thirty percent of women in rural Artibonite have been found to enter in such a relationship, thereby increasing there probability of HIV infection (Odds Ratio (OR) 6.3 ($P<0.001$) (FitzGerald, Behets et al. 2000).

It is also important to recognize the role of the Haitian culture in the spread of the infection. The patriarchal system devalues women's sexuality (FitzGerald, Behets et al. 2000). Polygamy is unofficially accepted, and the value placed on having children may impede the use of condoms (Pape and Jonhson 1988). In addition, the belief is widespread that condoms interfere with sexual pleasure (Malow, Cassagnol et al. 2000). In Haiti, families delay seeking care in the formal health sector owing to the beliefs that a problem was mystical rather than physical, forty-three percent of men affirmed HIV/AIDS could be transmitted by sorcery (Cayemittes, Placide et al. 2001). By the same token , 32 percent of women in 2005 believed that HIV could be contracted by witchcraft (Cayemittes, Placide et al. 2007).

In rural Haiti, there are two types of disease-- the natural (illness of GOD) and the supernatural (illnesses of Satan). The supernatural diseases are believed to be directed at a specific person and are not thought to be transmissible to others. Thus, illness is not always seen as being related to pathogenic factors; when someone becomes ill, the

problem is examined through divination and likely to be treated through spiritual processes.

Many prevention strategies were developed in the mid 80's in order to inform the population about prevention methods such as condoms use, delaying sexual initiation and fewer sexual partners that could protected individuals from contracting the viral infection (UNFPA 2007). Faithfulness to sexual partners, partner reduction, abstinence and condom use has been a longstanding component of primary prevention messages. By the 1990's, the major interventions tailored to reducing the risky behaviors used many psychosocial and anthropological theories that have been previously used in society for other situation but with the same purpose of changing risky health behavior to attain a better state of health. For the purpose of our study we will focus on the Health Belief Model (HBM) which has been used in numbers of intervention to reduce risky sexual behavior and is considered as the grandfather of all behavior change theory.

The HBM, an individual level of behavior change theory, was first introduced in society in the 1950's by social psychologists in the United States Public Health Service to explain the non participation of the public to the health screening and prevention programs, such as a free and accessible tuberculosis screening project, influenza vaccinations, Tay-Sachs carrier status screening, smoking cessation program (FamilyHealthInternational-AIDSCAP 2004). With the beginning of HIV/AIDS, this theory has been employed to understand the sexual risk behaviors(Rosenstock, Stretcher et al. 1994) and applied internationally to reduce risky activities that may lead to the transmission of HIV.

The essence of this theory remains on the following key variables that will trigger the adoption and the maintenance of a responsible behavior:

First, the person has to **Perceive** the **Threat** of the disease by recognizing the possibility that he/she may contract the disease, as well as perceiving the severity of that condition. For instance, the individual has to acknowledge the seriousness of the disease and that his or her life may be threatened by it.

Secondly, he or she has to **Perceive** the **Benefits** of the strategies that have been proven to reduce the risk of contracting the disease. For instance, he or she has to agree with the fact that condom use and limited sexual partners will reduce the risk of contracting the disease.

Thirdly, **Perceiving** the **Barriers** that can hamper an individual from adopting a healthy behavior is also an important factor of the theory.

Fourth the individual must recognize the **Cues to Actions**: events or environment that will stimulate him or her to take action and embrace the new behavior being promoted.

Finally, the person must have some measures of **Self Efficacy**, the belief that one can perform the action correctly to achieve his or her goal (introduced by Bandura in 1977)

All of these factors may by other demographic and socio-psychosocial affect the health-related behavior.

In our study, we will focus on the perception on the susceptibility to contracting HIV, the perception of the disease severity, perception of the benefits acquired with condom use and fewer sexual partners, and the effect some cues to action (mass media,

access to condoms) to understand the extent of the correlation between the safer sexual behaviors (consistent condom use, fewer sexual partners) in Haiti.

Previous studies in the field found important findings that have contributed in enhancing the battle against AIDS by understanding existing associations between sexual behaviors and some significant determinants. For instance, Knowledge about HIV, risks for STD's and about ways to avoid them have been found to have a small but significant association with condom use (Sheeran, Abraham et al. 1999). Besides this, it has also been found that perceived risks of acquiring STDs or HIV/AIDS are related to greater condom use(Hingson, Strunin et al. 1990; Basen-Engquist 1992; Adih and Alexander 1999). Hingson and Strunin found in a survey conducted among 16 to 19 year olds that those who believe the condoms were effective in preventing HIV transmission and worried to acquire the disease were 3.1 and 1.8 times, respectively more likely to use condoms all the time. In Uganda, strategies including 700 agencies from churches to Non Governmental Organization to the military aiming at encouraging Ugandans to openly speak about their HIV status brought remarkable results in their society. It has been found that knowing someone who is infected with the virus is a predictor for a more responsible sexual behavior(Macintyre, Brown et al. 2001).In addition, a significant drop in the number of sexual partners has been noticed, going from rates typical of the region to rates that are much lower (Kilian, Gregson et al. 1999; Green and Conde 2000). On the other hand, in Kenya it has been found that a lack of sense of personal vulnerability to HIV is common among men and women with multiple sexual partners. Only 30 percent of the respondents from an STD study engaging in an unsafe sexual

behavior knew they were at risk for AIDS even though almost 100% of them had heard of AIDS (Hunter 1993).

Even though some authors believe that knowing about the disease could lead to a more responsible behavior; some controversies have been found in the literature related to the knowledge about the disease and the adoption of a responsible sexual behavior. They strongly affirm that knowledge about the disease, or knowing the vulnerability or ways to prevent the infection on itself is not totally enough for engaging in a less risky sexual behavior. This finding has been found across different studies in different population (Durbin, Diclemente et al. 1993; Aggleton, Oreilly et al. 1994; Bandura 1994; Anarfi and Antwi 1995; Kishindo 1995; Reitman, Lawrence et al. 1996; Anarfi 1997; Adih and Alexander 1999; Walters, Simoni et al. 2000; Crosby, Diclemente et al. 2003).

Some authors also found that condom use among adolescents was more related to prevention of unplanned pregnancy than prevention of STD's. Condom use was 10 times more likely to happen for the prevention of unplanned pregnancy compared to those who use it to prevent STD's (OR=9.71 95% Confidence Interval 7.0-13.5) (Fleisher, Senie et al. 1994). Furthermore, in Haiti a study found that even though 99 percent of the men interviewed in low-income community in Port-au-Prince heard about condoms none had actually used them (Boulos, Boulos et al. 1991).

In the last national survey conducted in Haiti (Cayemittes, Placide et al. 2007) an increase in the knowledge of the disease has been observed in the population compared to the previous 2000 survey (Cayemittes, Barrere et al. 2002). It has been found that 99 percent of the women in 2005 knew about HIV compared to 97 percent in 2000 and

similarly among the men the same increase has been observed (100 percent vs. 98 percent).It has also been found that 81 percent of the women and 90 percent of the men knew that condom use and faithfulness to uninfected partners can reduce risk of HIV infection in the last survey in 2005. Likewise, in the urban and rural areas a high percentage about the knowledge of the disease and the two prevention methods has been noted. For instance, 99.9 percent of the men and women in the urban and rural areas know about the disease, and in the rural areas the percentage has been respectively 99.3 and 98.9 for the men and women.

In addition to high levels of knowledge, access to condoms is a crucial factor for the long term individual commitment to use this form of protection. According to the UNAIDS a reliable distribution system should be in place to provide condoms to the person who will be sexually active (UNAIDS 2000a). Moreover, it is believed that condoms' availability and affordability can influence adolescents' intention to use them and to adopt a responsible sexual behavior (Neequaye, Neequaye et al. 1991; Mehryar 1995; Anarfi 1997)

Access to Media television, radio book and popular magazines increased throughout the developing world. The mass media are emerging as one of young people's most common and most important source of information about sex. For example, in 1990 many urban young men and women in a focus group discussion in Nigeria said that they learned about sexuality from popular magazines. Similarly, a meta-analysis on the effectiveness of mass media in the developing countries found a significant difference between five programs out of the eight programs reporting on condom use between

intervention and comparison groups(Bertrand and Anhang 2006) . It has been found in Ghana that the people who were highly exposed to the messages were several times more likely to use condoms during their last intercourse than those who were not exposed to the message (males 34% versus 10 %, females : 22% versus 4%). Similarly, remarkable differences have been found in another program with the same case-control study design (males cases 48% versus 24% of the control group; females cases 27% versus 3% of the control group) (Bertrand and Anhang 2006). In addition, in a systematic review of 24 mass media interventions published from 1990-2004 the authors found that the most frequently outcomes found after the interventions were: an increase in condom use during sexual act (17); increase in the Knowledge of transmission of the disease (15), reduction high risk sex behaviors (8), an increase in the perception of contracting the disease(6) , and abstaining from sex (3) (Bertrand, O'Reilly et al. 2006).Conversely, some authors have found no effect on condom use at last sexual intercourse with program aiming to increase use of family planning, child survival and HIV/AIDS services (Keating, Meekers et al. 2006).

Notwithstanding, socio-demographic factors may overshadow individual intentions. To illustrate, it is known that living in a poor neighborhood is greatly associated with risky sexual behaviors (Hogan, Astone et al. 1985; Hogan and kitagawa 1985; Brewster and L 1994; Ramirez-Valles, zimmerman et al. 1998). For example, it is known that in Haiti due to the economic hardship women would enter a sexual relationship to find economic security. A study conducted in rural region of the country found that nearly 30% of the women stated being in a sexual relationship to alleviate their mediocre economic situation (Odds Ratio 6.3, p-value,< 0.001) (FitzGerald, Behets et al. 2000). In contrast,

in Malawi it has also been found that people who are in a higher socio-economic status tend to have a high-risk sexual behavior(Liu, Xie et al. 1998).

The level of education also plays a role in the behavior in which one may decide to engage. In the United States it is known that individuals with less education may have less specific knowledge from which they will be able to make an educated choice about their health behavior (USDHHS 2000). It has been found in the literature that single women tend to have more sexual partners than married women but the latter tend not to use condoms for disease protection (Abel, Hilton et al. 1996; Abel 1998). On the other hand a study found a high risk of HIV infection in men (OR 6.51; 95% Confidence Interval (CI) 1.06-39.84) and women (OR, 4.75; 95% CI 1.26-17.9) who where unmarried and men who were divorced, separated or widowed (OR, 4.33; 95%CI, 1.32-14.25) compared with those who were married in rural Uganda(Quigley, Morgan et al. 2000).

Place of residence also play a role in the dynamic of the infection. In East Africa, large numbers of young women are having concurrent partnerships in urban and rural trading centers but not in rural villages. The implication is that an increase in the number of sexual partners and sexual risky behaviors in the most developed cities compared to the rural areas (Hudson 1993) that may lead to a substantial sexual network. It has also been discussed that people living in the urban areas are more at risk for HIV/AIDS risk because residents may be more exposed to more infected people, and to behavior norms correlated with greater HIV/AIDS risk. On the other hand, those urban dwellers may also have more access to HIV/AIDS knowledge and education than people living in other

settings that may assist them in developing a responsible sexual behavior (Mitchell and Kaufman 2002; Crosby, Diclemente et al. 2003; Greabell, Cordes et al. 2005).
In rural San Francisco, adolescents have been found to have higher level of HIV knowledge especially about risk reduction strategies. However, they reported higher rates of HIV sexual behaviors compared to the adolescents in the inner-city Risk Ratio (RR) 2.1 p=0.003. Thus rural adolescents may not recognize the importance of practicing risk reduction behaviors compared to those in the Inner-city(Becker and Joseph 1988; Diclemente, Brown et al. 1993).

The HBM provides a basis for understanding and appreciating decision making processes in the adoption of preventive health behaviors. Information on the association between knowledge and the intensity of risk behavior related to HIV/AIDS is essential for a better understanding of the dynamics of the epidemics. To our knowledge no research on these issues has described the extent of the correlates with condom use and the number of sexual partners with the variables of the theory. In addition, no study has compared the extent of the HIV risk behavior correlates in the urban and rural areas. Since Haiti is the poorest and most affected country in the region, a better understanding of the association between condom use, fewer sexual partners and some elements of the HBM variables may be valuable for the community. We intend to thoroughly assess the correlates of condom use and sexual partners in Haiti while grasping any differences or similarities that may exist between the urban and rural areas. Thus, we are anticipating

that we will add to the body of the Haitian literature on HIV/AIDS which may in turn lead to escalating the public prevention interventions.

CHAPTER III

METHODS

Procedures and Subject Population

Data for the present study were obtained from the Measure Demographic and Health Surveys (DHS), a worldwide recognized project initiated by the U.S. Agency for International Development (USAID). Since 1984, the Demographic Health and Surveys project has been providing nationally representative data, disseminating accurate information on population's characteristic, health and nutrition and has been providing technical assistance to more than 200 surveys in 75 developing countries. In 1997, DHS has been incorporated into the USAID Bureau for Global Health Measure project and has been labeled Measure DHS where Measure stands for "Monitoring and Evaluation to Assess and Use Results". Measure DHS provides the previous same services to the developing countries which include: Technical assistance, training, data collection and analysis, dissemination of information, capacity building services, systems development and use of data for decision making strategy. Measure DHS conducts surveys in developing countries to enhance a better understanding of international health. The nationally representative surveys are done on maternal and child health, malaria, nutrition, family planning, fertility, population's characteristics and HIV/AIDS while

collaborating and coordinating with local and international Organization, and strengthening the capacity building in those countries. Two types of surveys are performed by measure DHS, the standard DHS surveys which use a large sample size (between 5,000 to 30,000 households) and conducted every 5 years; the Interim DHS surveys which are conducted between rounds of standard DHS survey with smaller sample but remains representative(DHS 2006)

Our dataset is a nationally representative health survey conducted in Haiti from October 2005-June 2006. This third survey is the most recent and is representative of the country's ten departments and its urban and rural structure (DHS 2006).

The data received upon request were an English language data files containing non-identified standardized individual records. The data were in separated files containing information on 10 757 women of reproductive age (15 to 49 years old) and 4 958 men 15 to 59 years old respectively. Subjects were selected from a random sample of 9 998 households where eligible women and men were individually interviewed. The data were primarily collected by Haitian personnel, and then translated in English. The study was approved by the Georgia State University Institutional Review Board (IRB). For the purpose of our study, we included men and women aged 15 to 49 years old. Thus, 572 men were removed from the primary male file and the completed merged data set consisted of 15 143 individuals with 4 386 men.

Study Design and Measures

In this Cross-sectional survey, we have identified two outcome variables that will be used to appraise the sexual behaviors of rural and urban Haitian dwellers.

Outcome variables:

1- **Condom use at last sexual intercourse** were coded No =1 and Yes =

Condom use is known to be protective when used consistently. However, when conducting research it has been agreed in order to limit recall bias in asking whether condom is use sometimes , always or never, to rely on the sexual practice at last intercourse it is assumed that it will reflect the trend of condom use(UNGASS 2007). Therefore, we assumed that last condom use is representative of the sexual behavior of the Haitian population; other variables presented in the files were not sufficiently Reliable

2- **Number of sexual partners in the last twelve months.** That variable reported the number of sexual partners including their spouses if they are married during the twelve months preceding the survey including wife for the male or husband for the female. The numbers went from zero partner to 95 partners. We created four categorical dummy variables to appreciate the sexual behavior pertaining to sex partners. The variables were recoded as follow : a) **zero sex partner** : people who did not have any sexual partner were coded 1 = zero sex partner; and those who did have any number of partners were coded 0= not zero sex partner; b) **one sex partner**: for those who had one sex partner (Coded 1) and those who did not have one sex partner were coded 0 and the in the same fashion we carried on our recoded variables for c**) two sex partners**: 1= two sex partners and 0 = not two sex partners and lastly d) **three and more sex partners** where categorized as 1 = three sex partners and plus and 0 = not three sex partners and plus.

Independent variables

The independent variables used in this study could be in essence related to the Perceived susceptibility, Perceived severity, Perceived benefits and the cues to action of the Health Belief Model. Demographic factors such as gender, Educational level, marital status, Socio-economic status, working status and age have also been included in the analysis. See appendix A.

Perceived Susceptibility to HIV/AIDS will be assess through the knowledge that the individual has about the disease and for that category six different variables will be taken into account: if the individual has ever heard of AIDS, has he or she ever heard of STDs, if he or she thinks you can get AIDS by witchcraft or if he or she will consult a traditional healer for AIDS, if a healthy person can have AIDS or if he or she has ever been tested for the disease.

The **Perceived Severity** will be based on his or her knowledge of someone who has or died of AIDS.

The **Perceived Benefits** will depend on the answers given to the question: Do you think you can reduce AIDS by either a) not having sex at all b) using condom when having sex or c) having one sex partner and no other?.

The **Cues to Action** will evaluate the environmental situations that have been a support in encouraging him or her in maintaining a responsible sexual behavior. They are as follow: if he/she knows a place to get AIDS test, the frequency with which he/she listens to the radio, reads the newspaper or magazine and watches television .In addition, we also included the place they get their condoms. The different places identified in the

survey are: Governmental Hospital, Non government Organization and mobile clinic, private clinic and lastly the Pharmacy.

The different independent variables were coded 0 for No, 1 for yes and 8 don't know. Missing variables were coded 9 in the data sets. See appendix A

Data on each participant's demographic information considered important were assembled. They were reported as Marital Status "never married", "married", "living together", "widowed", "divorced", and " not living together" respectively coded as 1,2,3,4, and 5. In our study we eliminated the variables widowed and divorced because very few people were part of that category. Among our variables only age were giving in a continuous variable which has been used to compare the ages between urban and rural. However, we recoded this variable into age category in order to obtain two different age groups : the Younger aged 15 to 24 years old coded 0 and the Older coded 1.This will enable us to draw a parallel between our findings and other study conducted among this age group (Gaillard, Boulos et al. 2006).The socio economic status was described as wealth index into five categories (1 = poorest, 2 = poorer, 3 = middle, 4 = richer and 5 = richest); we also recoded this variable into wealth category containing three categories. They are as follow a) Poor = 1 obtained by combining poorest and poorer, Middle =2 from the previous third category and Rich = 3 by combining richer and richest of the previous variable Socio economic status. Education was reported as the highest educational level attained by the individual and four different categories were identified: No education, Primary, Secondary and Higher.

Place of residence has been described according to the DHS as "the type of place in which the respondent was interviewed. Urban areas coded 1 were classified into large cities (capital cities and cities with over 1 million population), small cities (population over 50,000) and towns (other urban areas) and all rural areas coded 2 are assumed to be countryside".

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 15.0 for Windows has been used to run the analysis. Descriptive univariate analyses of all the variables were obtained by place of residence. Frequencies were calculated for categorical variables with their p-value obtained to appreciate the distribution of the variables between the urban and rural areas. The differences were considered significant at p-value< .01. For the continuous variable an Independent T- test was computed to obtain the difference between the mean age of the urban and rural population. A significant difference was estimated at a p-value less than (<).05

For the Categorical variables, firstly, the Chi-square statistic and its corresponding odds ratio (OR) and 95% confidence Interval (CI) were used for a bivariate analysis between the independent variables and the dependent variables. The results were considered significant for a p-value of at least less or equal (≤) than .05. The bivariate analysis provided the strength of association between the pairs of dichotomous dependent and independent variables. Thus, an OR greater than 1 will show a positive association between the dependent and the independent variables and can be consider as a risk factor

for the dependent variable. Whereas, an OR that is less than 1 will show a negative association between the dependent and the independent variables and will regard as a protective factor for the dependent variables. Secondly, a logistic regression for the multivariate analysis usually useful for identifying the independent contributor of a variable while controlling for the simultaneous effects of other variables were performed using the variables found to have a significant association from the bivariate analysis. The significant associated variables were selected to perform a forward stepwise model was performed to identify the best fitted model using the Cox and Snell R square (R^2) as an indicator, the significant association were assumed for a p-value at least less or equal (≤) than .05 .The Frequency and bivariate analysis have been performed for urban and rural areas separately.

CHAPTER IV

RESULTS

Population Characteristics

Tables 1 through 4 in Appendix B describe the demographic characteristics and the sexual practices of our study population. Among the 15 143 cases included in the sample, females N= 10 757 accounted significantly for the majority of the population in both rural (73%) and urban areas (69%) compared to the male population. The older age group (25-49 years) both in the rural and urban areas appeared to be slightly predominant. The mean age of the rural areas was to some extent higher than the urban areas (see table 2 in Appendix B). The rural areas have the higher proportion of people with no education and the lower proportion of people who have achieved the highest level of education at the time of the survey. People in the rural areas tend to be more in a legitimate relationship compared to the urban dwellers (48.7% married in the rural vs. 36.9% in the urban areas). An inverse proportion regarding the wealth category of the Haitian population has been noticed. The proportion of rich people is higher in the urban areas compared to the poor in that same area (78.5% vs. 4.8%). While in the rural areas the proportion of poor people is much higher than the rich in that same area (64.2 % vs. 12.3% respectively). However, the greatest proportion of working citizens has been found among the people living in the rural areas (53.4% vs. 44.7% in the urban areas) at the time of the survey.

Dependent variables

The proportion of people using condoms in both the urban and the rural areas remains tremendously low. In the urban areas, only 22% of the population have used condoms during their last intercourse; whereas in the rural areas the proportion is even lower (9.0 %). Interestingly, in both the urban and rural areas the proportion of the person who had zero sex partner and those who had one sex partner during the twelve months preceding the survey is higher than those who had two sex partners and those who had three and more sex partners. For instance, in the urban areas, 30.6% did not have any sex partner and similarly 28.0% in the rural areas. In the same fashion, respectively 61.3% and 65.4% of the urban and rural dwellers had one sex partner in the last 12 months. Those who have engaged a risky behavior i.e. having 2 sex partners accounted for 6.2% in the urban and 5.4% in the rural areas and for those who had 3 or more sex partners the proportion was respectively 1.8% in the urban and 1.2% in the rural. See table 4 Appendix B.

Independent variables

Findings from the four different Health Belief Model based categories were as follow. For the **Susceptibility** to the disease based on their accurate knowledge of the disease, we can assert that both in the rural areas and urban areas that the people are well informed about the disease (see table 3 Appendix B). The proportion of those who have heard of AIDS, of sexually transmitted diseases, who knows that a healthy person can

have AIDS, and that would not seek a traditional healer for AIDS are almost 100%. However, the proportion of those who know that you cannot catch the disease by witchcraft is not as high as the basic knowledge of the disease and similarly the proportion of those who have been tested for the disease remains at only 20%.

To test knowledge about the **Severity** of the disease, we use the variable of knowing someone who has AIDS or has died of the disease. The results showed that both in the rural and the urban areas this awareness is low, but less in rural areas 7.7% than in urban areas15.5%.

We also found a considerable proportion of people both in the rural and urban areas who had a positive perception about the different preventive methods being used by public health to halt the progression of the HIV epidemic. For our **Perceived Benefits** variable, more than 80 % of the population both in the urban and rural areas answered that using condoms during sex and not having sex at all would reduce their chance of contracting the disease. Likewise, more than 97% of the population both in the urban and rural areas agreed that having one or no other sex partners would reduce their chance of contracting the infection (see table 3 in Appendix B).

With regard to **Cues to Action,** more than 60 % of the population in both the rural and urban areas knew a place to get the HIV test. Regarding their access to the media, there are major discrepancies. In the urban areas, 70% of people listen to the radio almost everyday, in the rural areas only 46.1% do so; these differences were seen with regard to reading the newspaper or watching television, as well.

Both in the rural and the urban areas, the pharmacy appeared to be the place people would get condoms compared to the other facilities in place such as the Government Hospital, the Private clinic or hospital and the Non-Governmental Organization mobile-clinic. In the Urban areas 43.2% stated that they would get their condoms from the Pharmacy while only 16.1% would get them from the Governmental hospital. Similarly, in the rural areas the same difference has been noticed even though the proportion of people getting condoms in the rural areas in all categories is much lower. For instance, in the rural area 15.6 % would get their condoms from the pharmacy and only 5.9 % of the rural dwellers would get condoms from the governmental hospital (See table 3a Appendix B)

Bivariate Analysis

1st dependent variable, Condom use during last intercourse:

In both rural and urban areas, being a woman would lead to a decrease odds of using condoms during the last intercourse. In the urban areas, the decreased odds was found to be 60% (Odds Ratio (OR) (0.40; 95% confidence Interval (CI): 0.34-0.45) and about 75% (OR 0.26; 95% CI: 0.22-0.31) in the rural areas. On the other hand, being younger (15-24 years) has significantly shown to be strongly associated with condom use at the last sexual intercourse in both areas (OR 3.08; 95%CI 2.69-3.53 in the urban and OR 4.57; 95%CI: 3.79-5.51 in the rural areas) compared to the older (25-49 years)

individual. As far as the educational level achieved, the lower level a person has achieved in both the rural and the urban areas the higher the decreased odds of using condoms will be. For instance, when comparing no education with primary education; those who did not have a primary education in the urban areas have a 70% decrease odds of using condoms compared to those who have completed the primary school. In the rural areas, the decrease percentage is even 10 times higher; those who did not finish primary school are 80% less likely to have used condoms during their last sexual intercourse compared to those who have finished the primary school. The same findings have been noticed with the economic status; the poorer the individual is, the significantly less likely it is that he or she would have used condoms during their last sexual intercourse. In addition, a strong association prevails between the person who have never been married and condom use at last sexual intercourse compared to the people who are married. For instance, in the urban areas those who have never been married were 12.3 times more likely to have used condoms during their last sexual intercourse compared to those who were married. Similarly, not working at the time of the interview had a positive association with condom use compared to those who are working in both the rural and urban areas. See table 5 in Appendix B.

Perceived Susceptibility and condom use:

Those who knew that healthy person can contract AIDS were 3 times more likely to have used condoms during their last sexual intercourse compared to those who said they don't know (OR 3.36; 95%CI: 1.45-7.78) in the urban areas and 4 times more likely in the rural

areas (OR 4.42; 95% CI: 1.81-10.80).Those who answered “No” to whether on can get AIDS by witchcraft, were 56% more likely in the urban areas and 74% more likely in the rural areas to have used condoms during their last sexual intercourse compared to those who answered yes to that question. Similarly, the ones who said they would not seek a traditional healer for AIDS were 2 times more likely in the urban areas and 3 times more likely in the rural areas to have used condoms compared to those who answered that they did not know if they would seek traditional healer for the disease. On the other hand, those who have never been tested for the disease have a 60% decrease odds in the urban areas and 75% decrease odds in the rural areas of using condoms during their last sexual act (see table 6 Appendix B) .

Perceived Severity:

Not knowing someone who either has AIDS or has died from AIDS conferred significantly decreased the odds of using condoms in both regions. The different Odds Ratio (OR) were 0.61 for the urban areas and 0.43 for the rural areas (see table 7 in Appendix B).

Perceived benefits:

Compared to those who answered “Don’t Know” to the question of whether the risk of AIDS was reduced by not having sex at all, those who answered “Yes”, has an Odds Ratio for condom use of 4.04; 95% CI 1.46-11.18 in the urban and OR of 3.22; 95% CI 1.01-10.21 in the rural areas. In contrast, those who have answered “No” to the

question of whether using condoms reduced risk have a decreased OR of having used condoms during their last sexual intercourse both in the rural and the urban areas: OR 0.71; 95%CI 0.55-0.91 for the urban and OR 0.61; 95% CI 0.41-0.92 for the rural areas (see table 8 in Appendix B).

Cues to Action:

Radio is the media most used in Haiti. Comparing people who listen to it everyday to those who do not listen to it at all we have found that those who did not listen to it at all have about a 60% decrease odds to have used condoms during their last sexual intercourse compared to those who listen to it everyday in the urban areas. The corresponding decrease in the rural areas was about 80%.

Not knowing a place to get tested for HIV also showed a poor association with condom use during the last sexual intercourse both in the urban and the rural areas. Regarding the place where they get condoms from, those who did not get condoms from the pharmacy had a significantly 30% decrease odds to have used condoms during the last sexual intercourse in both regions (see table 9 Appendix B).

Multivariate Analysis for using condoms during last sexual intercourse

In the Urban areas, predictors of condom use at last sexual intercourse were: being educated; knowing a place to get tested for HIV; using the pharmacy as a source of condoms; and perceiving the severity of the disease (table 10 Appendix B). Thus, perception of disease and cues to action has important associations with condom use at last sexual intercourse.

Similarly, in the rural areas, education was a strong predictor of condom use with an OR that varied from 2.14 (95% CI: 2.26-6.41) for primary education to 9.95 (95%CI 3.99-24.78) for higher education, compared to less than primary education. Not being poor was also associated with condom use. Like the urban areas, those who perceived the severity of the disease were 45% more likely to have used condoms compared to those who did not know about it. Variables from the cues to action which had a positive association with condom use at last sexual intercourse were: watching television and reading magazine at least once a week and finally getting condoms from the private sector. However, in both residential areas being a woman, being married and living together have not proven to be protective for condom use (Table 10 and 11 in Appendix B).

2nd Dependent variable, Number of sexual partners:

A) Zero sex partners

Bivariate Analysis

Both in the urban and rural areas having zero sex partners were strongly associated with being a female, being younger, never married, and not working. Not perceiving susceptibility to the disease have also been found strongly associated with zero sex partners in the two different residential areas. For instance; those who have not heard of AIDS in the urban areas were 3 times more likely to have zero sex partners compared to those who have heard about the disease. Likewise, in the rural areas, dwellers who have not heard about the disease were 7 times more likely to have zero sex partners compared to the people who have heard about the disease (table 13 in Appendix B). In the same fashion, those who did not think that they could reduce their risk of contracting HIV by reducing the number of partner were positively associated with having zero sex partners (Table 15 Appendix B). Not knowing a place to get AIDS test and not getting condoms from a pharmacy, which are elements of the cues to action, were also associated with having zero sex partners in both the urban and rural areas. To illustrate, those who did not know the place to get the test were 71% more likely to have zero sex partners compared to those who did know where to go and get the screening exam (see table 16 in Appendix B).

Multivariate analysis

The multivariate analysis showed that in the urban areas only being a female was a predictor of having zero sex partners; while in the rural areas in addition to being a female being younger was also a predictor of having zero sex partners. The people who were working were less likely in both areas to have zero sex partners. In the urban the OR was 0.69 while in the rural the OR was 0.77. None of the Health Belief model variables have proven to be predictor of having zero sex partners in both localities. Knowing a place to get tested or ever been tested were less likely to be associated with having zero sex partner in the last 12 months (see tables 17 and 18 Appendix B).

A) One sex partner

Bivariate Analysis

Among the demographic variables being younger and not working are less likely to have had one sex partner in the last 12 months. However, women were 40 % more likely in the urban areas and 80% in the rural areas to have had one sex partner compared to the men in those same areas. Those who did not have any education were more likely to have one sex partner compared to those who have completed the primary, secondary or the higher education in both the rural and urban areas. In addition, those who are poor had an increase odd of having one sex partner compared to those who are rich in the urban areas OR 1.27 (95%CI 1.01-1.60) and the rural areas OR 1.22 (1.06-1.41) see table 19 Appendix B. Not knowing a person who have or had died of the disease was positively associated with having one sex partner than being aware of an afflicted person both in the

rural and the urban areas (Table 21 Appendix B). The positive association found with the cues to action was with not listening to radio and not reading the newspaper at all compared to those who performed those activities everyday. It is noteworthy to point that in the rural areas a significant robust association has been found between not reading the paper with having one sex partner compared to the urban areas (see Appendix B table 23).

Multivariate analysis

The logistic regression for having one sex partner indicated that women both in the urban and the rural areas were the only significant predictor of having one sex partner in the last months among all the significant variables that have been included in the analysis. However, we have to mention that being younger were not positively associated with having one sex partner both in the urban and rural areas as it had been with having zero sex partners. Education or access to the media respectively in the rural and urban areas has proven to be a negative factor for having one sex partner. See table 24 and 25 in Appendix B.

A) Two sex partners

Bivariate Analysis

Unlike the previous number of sexual partners (0 and 1), women this time both in the rural and urban areas were less likely to have two sex partners compare to the men. In the

urban areas the odds ratio (OR) was estimated to be 0.06 while in the rural areas it was estimated to be 0.04 table 26 in Appendix B. Perceiving the susceptibility to the infection was strongly associated with having two sex partners both in the rural and urban areas. Only in the urban areas, similar positive associations with having two sex partners in the last twelve months were noticed among the people who answered "No" to the following questions: Can you get AIDS by witchcraft?, Do you think you can reduce risk of getting HIV by having one or nor other partner?. Considering erroneous beliefs about the disease, the people who said that they would not go to the traditional healer for AIDS were significantly associated with having two sex partners compared to those who said that they don't know if they would seek traditional healer. This finding was similar in the two areas with ORs of 3.53 and 8.52 in the urban and rural areas. On that same topic, the people who believe that a healthy person can have AIDS were more likely to have two sex partners in the two localities see table 27 Appendix B. Those who did not know anyone who has AIDS or had died of the disease were less likely to have two sex partners in both the urban OR 0.69 and the rural areas OR 0.63 (Table 28 In Appendix B).

Multivariate analysis

Controlling for potential confounders, in the urban areas, the logistic regression showed that only reading magazine almost everyday, getting condoms from pharmacy and agreeing that you can reduce the risk of HIV by having one partner was less associated with having two sex partners. Being younger had a positive association with two sex partners OR 1.31; 95%CI 1.03-1.68. Having achieved the higher level of education was

highly associated with having two sex partners both in the rural and the urban areas. For instance, higher level of education attained was 3 times more likely to be associated with two sex partners in the urban areas. Answering "yes" to some of the variables included in our theories revealed a significant positive association with having two sex partners. For instance, in the urban areas, knowing a place to get AIDS test, knowing someone who has or AIDS, or in both areas acknowledging that a healthy person can have AIDS were all significantly associated with having two sex partners in the urban areas. Likewise, the rural areas showed the same results as far as answering "yes" to can a healthy person have AIDS? The OR found was 2.47; 95% CI 1.32-2.49 compared to the person who answered "No" to that question. See table 31 and 32 in Appendix B.

A) Three sex partners

Bivariate Analysis

In table 33, significant strong associations have been found both in the rural and urban areas between having three sex partners and answering "No" to the question can you get AIDS by witchcraft? compared to those who answered that they did not know if you could get it from witchcraft. That association was both in the urban and rural areas accounted for an OR equal to more than 5.

In both areas odds ratio of having three sex partners or more was significantly lower for persons who were not working or who were not educated. For instance, in the urban areas the person who have not been educated were 80% less likely to have three or more sex partners compared to those who have achieved the higher level of education.

Similarly, in the rural areas, the OR for having three sex partners when they are uneducated compared to the people who have achieved a higher education was OR 0.06; 95% CI 0.01-0.24. However, we need to underscore that unlike the women in the urban areas, women living in the rural areas had a slightly increase likelihood of having three or more sex partners in the last 12 months (OR 1.04;.95%CI : 1.03-1.08) compared to the men in that region. In the rural areas the dwellers who have never been married were 75 % more likely to have had three sex partners compared to those who were married while in the urban areas a non significant decreased odds of having three or more sex partners was observed.

With regard to perceived susceptibility to the disease, those who answered "No" to the question Can you get AIDS by Witchcraft was strongly associated with having three or more sex partners in the urban OR 5.08 and the rural areas OR 5.26 compared to those who answered " Don't know" to that question see table 34 in Appendix B

Multivariate analysis

The logistic regression analysis found that having a higher education in the urban areas and the rural areas were strong predictors of having threes sex partners or more. For instance, the person who have attained the higher education in the urban areas were 3.62 times more likely to have three or more sex partners than the person who did not have any education. In the same fashion, in the rural areas those who have attained a higher level of education were 7.35 times more likely to have three or more sex partners compared to those who did not have any education. Knowing someone who has AIDS

has also been found positively associated with having three or more sex partners in the rural areas. In the urban areas another positive predictor was living together which showed increase odds of 6.14 to have three or more sex partners compared to the person who have never been married. Being female was very strongly associated with not having 3 or more sex partners in the urban areas (OR .01; 95% CI .006-.03) see table38 and 39 in Appendix B

CHAPTER V

DISCUSSION

The findings of our research bring critical information related to factors conducive to a more responsible sexual behavior for the Haitian population. We have found that most of the population is well informed about the disease. Giving the fact that in the Haitian culture people tend to see sickness as a punishment from God or sent from another person through spirits (Coriel 1983; DeSantis and Thomas 1990) it has been interesting to see that persons have accurate information about the disease. Based on our Health Belief Model theory which implies that a person will adopt a healthy behavior if he or she ever acknowledges his or her susceptibility to a particular disease, acknowledges the severity of that disease, perceives the benefits of adopting a behavior that will lead him or her to a better state of health and to say the least has an environment leading to the adoption of that behavior; we can claim that this theory has some explanatory value for the condom use in Haiti.

In both rural and urban areas, we have found that perceiving the benefits of at least using condom, knowing the severity of the disease, having the cues to action such as listening to radio and getting condoms from the pharmacy were positively related to condom use at last sexual intercourse. Even though some researchers have found the opposite association between knowledge and condom use (Diclemente, Brown et al. 1993; Fleisher, Senie et al. 1994; Bosompra 2001) our findings can correlate with other

research that have been conducted about that topic, where they have found that knowledge about the disease is associated with condom use (Sheeran, Abraham et al. 1999; Awad 2002; Mohammad, Farahani et al. 2007).

The percentage of people using condoms is still low in both localities but importantly we have found that all branches of the Health Belief model evaluated in our study were associated with condom use. However, it is important to note that women were less likely to use condom during their last sexual intercourse in both rural and urban areas compared to men. Knowing that Haiti is a country where people live in poverty, it has been found in other studies that gender inequality plays a role in the transmission of STDs (Farmer 1992; Fawzi, Lambert et al. 2005). It is also know that women may enter into sexual relationships to alleviate their economic vulnerability and may lack the decision making power in that relationship (Farmer 1995; FitzGerald, Behets et al. 2000; Kershaw, Small et al. 2006). This could also explain the increase odds of having 3 or more sex partners found among women living in the rural areas. In addition, it has been found that most Haitian women would let the man choose whether or not to use a condom (Adrien, Cayemittes et al. 1993), and confidence about proposing condoms to a sexual partner is lacking if their partners refused to use condoms (Malow, Cassagnol et al. 2000).In addition, it has been found that some Haitian women associate condom use with risk of genital disease or HIV infection and admission of infidelity (Ullin, Cayemittes et al. 1993). Furthermore, the fact that they believe that condom can interfere with pleasure can be a factor in not using condoms (Adrien, Cayemittes et al. 1991; Malow, Cassagnol et al. 2000). Besides this, Haitians put a great value on the number of children and this may be a source of economic security in women as demonstrated among Haitian women in

Miami (Malow, Cassagnol et al. 2000). More important, in the rural areas women tend to rely on men to decide on health matters because of economic dependence on the male (White, Small et al. 2006)

Being married has also been found associated with a decrease likelihood of using condoms in both urban and rural areas. This finding is similar to those of other studies (Abel, Hilton et al. 1996; Abel 1998) and would be realistic when both partners are monogamous. It is important to note that in Haiti men's infidelity is often condoned(Pape, Liautaud et al. 1986; Malow, Cassagnol et al. 2000), and is characterized the "rooster of the poultry-yard". This may in turn fuel the HIV epidemic in the female population.

It has been interesting to see that both localities shared only the perceived severity portion of the Health Belief model and the level of education as a predictor for condom use. However, we have to note that only 15.5% of the urban population and 7.7% of the rural population are aware of a person who has or had died of the disease and 30% of the rural population is not educated compared to 10% in the urban areas (see table 40 in Appendix B).

A positive association has been found between condom use and getting condoms from the pharmacy and the private sectors compared to the NGO and the Governmental Hospital. This supports the importance to the cues to action, because in order to promote a behavioral change, the cues to action (environment) must be in place to assist the

population in maintaining that behavior. Thus, condoms have to be accessible and affordable in order to be consistently used.

Overall, it has been appealing to found that the Health Belief Model can be applied in both localities in order to increase condom use. The urban and the rural did not differ in the types of associations between the different variables and condom use at last sexual intercourse, though they did differ in the strength of the association.

Conversely, regarding the effect of the HBM variables on the number of sexual partners; no positive association has been found between having zero sex partner or one sex partner in the last 12 months in both areas. For instance, listening to radio, knowing somebody who has the disease or even hearing about the disease did not increase the odds of having zero sex partners or one sex partners. Therefore, we conclude that the HBM variables did not influence the choice of having one or zero sex partner.

Furthermore, when analyzing the odds of having two sex partners or three and more sex partners in the last twelve months we found that regardless of their knowledge about the disease, the person had engaged in that risky behavior. In addition it is important to note that the higher the level of education or the socioeconomic status the more they tend to have multiple sex partners which is consistent with other studies (Liu, Xie et al. 1998). This is what we can classify as a knowledge behavior-gap.

This study brings concrete and useful information about the risk factors of condom use and number of sexual partners. By using this random sample data of the

Demographic Health survey, which is a nationally representative data set, our study can as a result being generalized. However, we have to acknowledge that it is a cross-sectional survey and we cannot draw conclusion about causation. It is also important to know that we have to be cautious about some answers given to some important questions because a person may have not provided the accurate answers if he or she was interviewed around people he or she would not want to know the answers. For instance, we found that a majority of the population (96.8% in the urban and 94.3% in the rural) said they would not seek a traditional healer for the disease. Knowing the health beliefs that prevail in that country, one would speculate that the proportion would have been less. Another limitation of our study would be with the size effect. For some analysis the size of the sample included was quiet small which could have flawed our findings. It is also important to notice that we should be cautious with the results related to our dummy variables number of sexual partners because some overlap may have happened with the category one sex partner and two sex partners. When creating those who had one sex partner and those who did not have one sex partner in the comparison group we included every individual who did not have one sex partner which from a statistical point may bias our findings. Another source of misclassification could be in place of residence since respondent may have been a visitor or an actual resident of that region. Moreover, it would have been important to evaluate the barriers to engaging in responsible sex behavior, such as the cost of condoms. Evaluating the interpersonal behavior related to condom use or number of sexual partners would be also an important factor that would need to be considered in other studies.

We know that the Ministry of Health included in its risk reduction strategy the promotion of responsible sex behaviors, and the promotion and distribution of condom (MSPP) 2002).However, it is critical to recognize that other factors such as poverty or gender inequality may contribute in preventing the people from adopting the behaviors. Thus, a more ecological approach needs to be adopted in the fight against AIDS in Haiti. We have seen that variables of the Health Belief Model are associated with condom use but when it comes to the decision of having zero sex partners or one partner this theory seemed not to work in the population. Thus, other investigation needs to be undertaken to estimate what could have engendered more responsible behavior with regard to sex partners. We have been able to notice that the cultural and economical factor in the country outweigh the benefits of knowing about the disease and even play an important role in the decision of having one or zero sex partner or using condoms.

The country experienced a feminization of the disease and this population appeared to be the vulnerable one in Haiti. Thus, we would recommend programs that could empower women to make decision in their sexual relationship. The media has been shown to be a great factor associated with condom use and this channel could be used to diffuse messages that will lead to the women's empowerment. More important, programs that could provide economic independence to the women both in the rural and urban areas would be an important factor to include in a HIV prevention program. Therefore, we believe that it will be important to have a holistic approach not concentrating solely on the individual responsibility to the disease, but including multiple sectors of the government such as the women affairs, cultural affairs, economic activity and education.

We would suggest that the program could continue strengthening the cooperation with all the actors already involve in this endeavor to distribute and make condoms more available for a population already hit by poverty.

The HIV/AIDS epidemic has been progressing in the country for about three decades. A decrease in the prevalence has been noticed more in the urban areas than the rural areas. However, the findings of our study showed that both in the urban and rural areas the accurate knowledge about the disease is widespread and have consistently showed a positive association with condom use. However, using the Health Belief Model theory we have also found that perceiving the benefits, the susceptibility, and the severity or even with the media, no positive associations have been found with having zero or one sex partner. Thus, we infer that there are other factors that need to be included in the prevention strategies because the decrease of the disease may have been attributed to the large number of people who have died with AIDS and the control with the blood transfusion and not to behavior change. We have to remember that a small portion of the population (22.7% in the urban and 9.0% in the rural areas) used condoms at last intercourse and more intervention need to take place to increase the use of that mechanical barrier to HIV. Further investigations are needed to find additional factors that could increase the adoption and maintenance of responsible sexual behavior.

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A) Variables Recoded Value

Demographic

Gender	0	female
	1	male
Residence	1	Urban
	2	Rural
Highest Educational level	0	No education
	1	Primary
	2	Secondary
	3	Higher
	9	missing
Current Marital Status	0	Never married
	1	Married
	2	Living Together
	3	Widowed
	4	Divorced
	5	Not living together
	9	Missing
Respondent currently working	0	No
	1	Yes
	9	missing
Wealth Index	1	poorest
	1	poorer
	2	Middle
	3	Richer
	4	Richest
Wealth Category	0	Poor
	1	Middle
	2	Rich
Age Category	0	younger (15-24)
	1	older (25-49)

Perceived Threat

A) Perceived Susceptibility

Heard of AIDS	0	No
	1	Yes
	9	missing
Heard of Sexually Transmitted Disease	0	No
	1	Yes
	8	Don't Know
	9	missing
Ever been Tested for AIDS	0	No
	1	Yes
	9	missing
Can a Healthy person have AIDS	0	No
	1	Yes
	8	Don't know
	9	missing
Can get AIDS by Witchcraft	0	No
	1	Yes
	8	Don't know
	9	missing

Respondent was asked about ways in which he or she thinks people can Avoid AIDS

Seek traditional healer for AIDS	0	No
	1	Yes
	8	Don't know
	9	missing

B) Perceived Severity

Knows someone who has or died of AIDS	0	No
	1	Yes
	8	Don't know
	9	missing

Perceived Benefits

Respondents were asked whether using condoms or having just one sexual partner or not having sex at all would reduce their chances of getting AIDS

Reduce risk AIDS/ not having sex at all	0	No
	1	Yes
	8	Don't know
	9	missing
Reduce risk AIDS/ condom during sex	0	No
	1	Yes
	8	Don't know
	9	missing
Reduce risk AIDS/ have one sex partner	0	No
	1	Yes
	8	Don't know
	9	Missing

Cues to Action

Know a place to get AIDS test	0	No
	1	Yes
	9	missing
Frequency of reading newspaper, magazine	0	Not at all
	1	Less than once a week
	2	At least once a week
	3	Almost everyday
	9	missing
Frequency of watching Television	0	Not at all
	1	Less than once a week
	2	At least once a week
	3	Almost everyday
	9	missing
Frequency of listening to radio	0	Not at all
	1	less than once a week
	2	At least once a week
	3	Almost everyday
	9	missing
Source for Condoms Government Hospital	0	No
	1	Yes
	8	don't know
	9	missing

Source for Condoms NGO Mobile clinic	0	No
	1	Yes
	8	Don't know
	9	Missing
Source for Condoms Pharmacy	0	No
	1	Yes
	8	Don't know
	9	missing
Source for Condoms Private Hosp, clinic	0	No
	1	Yes
	8	Don't know
	9	Missing

Dependent Variables

Condom use at last sexual intercourse	0	No
	1	Yes
	8	Don't know
	9	Missing
Zero sex partner in the last 12 months	0	Not zero sex partner
	1	Zero sex partner
One sex partner in the last 12 months	0	Not one sex partner
	1	One sex partner
Two sex partners in the last 12 months	0	Not two sex partners
	1	Two sex partners
≥ Three sex partners in the last 12 months	0	Not ≥ three sex partners
	1	≥ three sex partners

Source: Measure DHS + Demographic Health Survey (DHS), Description of the Demographic Health Surveys Individual Recode Data file, 2005-2006

B) TABLES

Table-1). Population Characteristics by place of residence

variable	Urban		Rural		p-value
	Number	%	Number	%	
Gender					
male	1921	27.0	2465	30.7	< .001
Female	5196	73.0	5561	69.3	
Age Category					
younger (15-24 years)	3369	47.3	3452	43.0	< .001
Older (25-49 years)	3748	52.7	4574	57.0	
Education					
No education	750	10.5	2506	31.2	
Primary	2418	34.0	3827	47.7	< .001
Secondary	3545	49.8	1641	20.4	
Higher	404	5.7	52	0.6	
Marital Status					
Never married	2913	41.6	2773	35.2	
Married	2584	36.9	3842	48.7	< .001
Living together	983	14.0	828	10.5	
Not living together	518	7.4	442	5.6	
Working status					
No	3920	55.3	3726	46.6	< .001
Yes	3175	44.7	4274	53.4	
Wealth Category					
Poor	345	4.8	5156	64.2	
Middle	1187	16.7	1884	23.5	< .001
Rich	5585	78.5	986	12.3	

Table-2) means age of the urban and rural areas

	URBAN		RURAL		95%CI
	Mean	Std D	Mean	Std D	-1.68 - - 1.05**
AGE	27.29	± 9.44	28.67	±10.37	

Table-3) Independent variables distribution by place of residence

Variable	Urban		Rural		p-value
PERCEIVED SUSCEPTIBILITY	Number	%	Number	%	
Heard of AIDS					
No	14	0.2	75	0.9	< .001
Yes	7103	99.8	7951	99.1	
Heard of Sexually Transmitted Diseases					
No	12	0.2	71	0.9	
Yes	7105	99.8	7955	99.1	< .001
Ever been tested for AIDS					
No	5499	77.7	7105	89.7	
Yes	1576	22.3	816	10.3	< .001
Can a healthy person have AIDS					
No	506	7.1	1223	15.4	
Yes	6479	91.3	6410	80.7	< .001
Don't Know	113	1.6	308	3.9	
Can Get AIDS by Witchcraft					
No	5346	75.3	5610	70.6	
Yes	1273	17.9	1631	20.5	< .001
Don't know	481	6.8	703	8.8	
Seek Traditional Healer for AIDS					
No	6887	96.8	7568	94.3	
Yes	12	0.2	31	0.4	< .001
Don't know	212	3.0	425	5.3	
PERCEIVED SEVERITY					
Knows someone who has or died of AIDS					
No	5725	84.5	6933	92.3	< .001
Yes	1051	15.5	577	7.7	
PERCEIVED BENEFITS					
Reduce risk by not having sex at all					
No	874	12.3	828	10.4	
Yes	6135	86.4	6961	87.6	< .001
Don't Know	90	1.3	155	2.0	
Reduce risk by using condoms					
No	667	9.4	630	7.9	
Yes	6274	88.4	6953	87.5	< .001
Don't Know	155	2.2	360	4.5	
Reduce risk by having one or no other sex partner					
No	127	1.8	105	1.3	
Yes	6965	98.0	7817	98.1	< .001
Don't Know	17	0.2	48	0.6	

Table-3a) Independent variables distribution by place of residence

	Urban		**Rural**		p-value
Cues to Action	Number	%	Number	%	
know a place to get AIDS test					
No	1528	21.6	3027	38.1	< .001
Yes	5553	78.4	4909	61.9	
Frequency of reading newspaper or magazine					
Not at all	2937	41.3	5610	70.0	
Less than once a week	1821	25.6	1397	17.4	< .001
At least once a week	1281	18.0	603	7.5	
Almost everyday	1066	15.0	403	5.0	
Frequency of listening to radio					
Not at all	246	3.5	845	10.5	
Less than once a week	734	10.3	1708	21.3	< .001
At least once a week	1150	16.2	1773	22.1	
Almost everyday	4981	70.0	3698	46.1	
Frequency of watching television					
Not at all	1835	25.8	5157	64.3	
Less than once a week	1973	27.7	2232	27.8	< .001
At least once a week	1306	18.4	389	4.9	
Almost everyday	2000	28.1	240	3.0	
Source for Condoms					
Government Hospital					
No	5966	83.9	7549	94.1	< .001
Yes	1149	16.1	475	5.9	
Non Governmental Organization-mobile clinic					
No	7047	99.0	7975	99.4	.016
Yes	68	1.0	40	0.6	
Private Hospital, Clinic					
No	6855	96.3	7735	96.4	.863
Yes	260	3.7	289	3.6	
Pharmacy					
No	4043	56.8	6776	84.4	< .001
Yes	3072	43.2	1248	15.6	

Table-4) Dependent variables distribution by place of residence

Variable	**Urban**		**Rural**		p-value
Last Intercourse use condoms	Number	%	Number	%	
No	3814	77.3	5256	91.0	< .001
Yes	1123	22.7	520	9.0	
Number of sexual partners in the last 12 months					
Zero sex partner					
No	4933	69.4	5775	72.0	< .001
Yes	2179	30.6	2246	28.0	
One sex partner					
No	2751	38.7	2777	34.6	< .001
Yes	4361	61.3	5244	65.4	
Two sex partners					
No	6669	93.8	7585	94.6	.037
Yes	443	6.2	436	5.4	
Three sex partners and plus					
No	6983	98.2	7926	98.8	.001
Yes	129	1.8	95	1.2	

Table- 5) Associations between condom use at last sexual intercourse and Demographic variables by place of residence

	URBAN		RURAL	
Variables	OR	95%CI	OR	95%CI
Gender				
Male	1.00			
Female	0.40	0.34-0.45**	0.26	0.22-0.31**
Age				
Older	1.00			
Younger	3.08	2.69-3.53**	4.57	3.79-5.51**
Education				
Primary	1.00			
No Education	0 .36	0.24-0.53**	0.19	0.13-0.27**
Secondary	1.00			
No Education	0.11	0.08-0.17**	0.05	0.03-0.07**
Higher	1.00			
No Education	0.07	0.05-0.12**	0.02	0.01-0.05**
Wealth				
Middle	1.00			
Poor	0.72	0.46-1.14	0.40	0.32-0.50**
Rich	1.00			
Poor	0.34	0.22-0.51**	0 .25	0.20-0.32**
Marital Status				
Married	1.00			
Never married	12.30	10.21-14.87**	18.09	14.08-23.23**
Living together	1.00			
Never married	2.47	2.06-2.96**	3.21	2.4964-4.13**
Working Status				
Yes	1.00			
No	2.26	1.97-2.58**	1.79	1.50-2.15**

** p≤ .01

Table-6) Associations between condom use at last sexual intercourse and perceived susceptibility to the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Heard of AIDS				
Yes	1.00			
No	0.68	0.08-5.82	--------	
Heard of STDs				
Yes	1.00			
No	0.85	0.09-7.60	--------	
Ever been tested for AIDS				
Yes	1.00			
No	0.40	0.34-0.45**	0.26	0.22-0.31**
Healthy person has AIDS				
Yes	1.00			
No	0.64	0.47-0.87**	0.36	0.25-0.52**
Don't know	1.00			
Yes	3.36	1.45-7.78**	4.42	1.81-10.80**
AIDS by witchcraft				
Yes	1.00			
No	1.56	1.29-1.89**	1.74	1.34-2.25**
Don't know	1.00			
No	1.43	1.07-1.90*	3.09	1.91-5.00**
Don't know	1.00			
Yes	0.91	0.65-1.26	1.77	1.04-3.00**
Traditional Healer				
Don't know	1.00			
No	2.24	1.28-3.94**	3.97	1.86-8.47**

** $p \leq .01$; * $p \leq .05$

Table-7) Associations between condom use at last sexual intercourse and Perceived Severity of the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Knows someone who has or died from AIDS				
Yes	1.00			
No	0.61	0.51-0.73**	0.43	0.33-0.56**

** $p \leq .01$; * $p \leq .05$

Table-8) Associations between condom use at last sexual intercourse and Perceived Benefits by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95%CI	OR	95%CI
Reduce risk by no sex at all				
Yes	1.00			
No	0.95	0.77-1.17	1.09	0.82-1.46
Don't Know	1.00			
No	3.85	1.37-10.84**	3.53	1.08-11.50*
Don't Know	1.00			
Yes	4.04	1.46-11.18**	3.22	1.01-10.21*
Reduce risk by condom use				
Yes	1.00			
No	0.71	0.55-0.91**	0.61	0.41-0.92*
Don't Know	1.00			
No	----------		2.92	1.10-7.71*
Don't Know	1.00			
Yes	----------		4.73	1.94-11.53**
Reduce risk by one or no other partner				
Yes	1.00			
No	1.60	0.69-3.72	3.38	0.35-32.55

** $p \leq .01$; * $p \leq .05$

Table-9) Associations between condom use at last sexual intercourse and Cues to Action by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95% CI	OR	95% CI
Know a Place to get tested				
Yes	1.00			
No	0.56	0.46-0.68**	0.27	0.21-0.35**
Frequency of listening Radio				
Less than once a week	1.00			
Not at all	1.28	0.76-2.16	0.65	0.34-1.23
At least once a week	1.00			
Not at all	0.78	0.48-1.25	0.22	0.12-0.40**
Almost every day	1.00			
Not at all	0.42	0.27-0.65**	0.13	0.07-0.24**
Frequency of watching TV				
Less than once a week	1.00			
Not at all	0.67	0.54-0.82**	0.58	0.47-0.72**
At least once a week	1.00			
Not at all	0.44	0.35-0.54**	0.21	0.16-0.29**
Almost every day	1.00			
Not at all	0.38	0.31-0.46**	0.21	0.14-0.30**
Frequency of reading Newspaper, magazine				
Less than once a week	1.00			
Not at all	0.49	0.41-0.59**	0.24	0.19-0.29**
At least once a week	1.00			
Not at all	0.29	0.24 -0.35**	0.16	0.12-1.22**
Almost every day	1.00			
Not at all	0.33	0.27-0.40**	0.17	0.12-0.25**
Source for Condoms				
Government Hosp				
Yes	1.00			
No	0.95	0.79-1.13	0.90	0.63-1.29
NGO-Mobile Clinic				
Yes	1.00			
No	0.50	0.29-0.86*	0.63	0.24-1.62
Private Clinic				
Yes	1.00			
No	0.89	0.64-1.26	0.40	0.28-0.57**
Pharmacy				
Yes	1.00			
No	0.78	0.68-0.89**	0.70	0.56-0.88**

** p≤.01; * p ≤.05

Table-10) Logistic Regression of Condom use at last sexual intercourse for the urban areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	0.61	0.50-0.74**
Education		
No Education	1.00	
Primary	1.60	1.00-2.56*
Secondary	3.41	2.16-5.37**
Higher	5.26	3.13-8.84**
Matrimonial		
Never married	1.00	
Married	0.12	0.09-0.15**
Living together	0.54	0.43-0.67**
Working Status		
No	1.00	
Yes	0.78	0.65-0.93**
Know a place to get tested		
No	1.00	
Yes	1.23	1.02-1.50*
Know someone who has or died from AIDS		
No	1.00	
Yes	1.36	1.09-1.68**
Frequency of listening radio		
Not at all	1.00	
Less than once a week	0.37	0.20-0.69**
At least once a week	0.51	0.29-0.89**
Almost every day	0.69	0.40-1.17**
Source of Condoms – Pharmacy		
No	1.00	
Yes	1.19	1.00-1.41*

** p≤.01; * p ≤.05 Cox & Snell R^2 0.202; Constant β = -0.569

Table-11) Logistic Regression of Condom use at last sexual intercourse for the rural areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	0.41	0.31-0.53**
Age Category		
Older	1.00	
Younger	1.49	1.12-1.98**
Education		
No Education	1.00	
Primary	2.14	1.33-3.46**
Secondary	3.81	2.26-6.41**
Higher	9.95	3.99-24-78**
Wealth Category		
Poor	1.00	
Middle	1.69	1.29-2.22**
Rich	1.31	0.92-1.86
Matrimonial		
Never married	1.00	
Married	0.15	0.11-0.21**
Living together	0.64	0.47-0.88**
Knows someone who has or died from AIDS		
No	1.00	
Yes	1.45	1.02-2.03*
Frequency of listening to radio		
Not at all	1.00	
Less than once a week	0.79	0.37-1.66
At least once a week	1.14	0.56-2.28
Almost every day	1.53	0.78-2.99
Frequency of watching TV		
Not at all	1.00	
Less than once a week	1.00	0.76-1.31
At least once a week	1.89	1.24-2.89**
Almost every day	1.22	0.73-2.03
Frequency of reading newspaper,magazine		
Not at all	1.00	
Less than once a week	1.45	1.09-1.95*
At least once a week	1.87	1.30-2.70**
Almost every day	1.43	0.68-2.37
Source Condoms-Private		
No	1.00	
Yes	2.15	1.37-3.38**

** $p \leq .01$; * $p \leq .05$ Cox & Snell R^2 0.162; Constant $\beta = -2.720$

Table-12) Associations between having zero sex partner and the Demographic variables by place of residence

	URBAN		RURAL	
Variables	OR	95%CI	OR	95%CI
Gender				
Male	1.00			
Female	2.09	1.84-2.37*	1.25	1.12-1.39**
Age				
Older	1.00			
Younger	4.08	3.66-4.55**	8.17	7.29-9.16**
Education				
Primary	1.00			
No Education	0 .48	0.39-0.58**	0.30	0.26-0.34**
Secondary	1.00			
No Education	0.46	0.38-0.56**	0.33	0.28-0.39**
Higher	1.00			
No Education	0.82	0.61-1.11**	0.69	0.34-0.39**
Wealth				
Middle	1.00			
Poor	0.90	0.69-1.18	0.92	0.82-1.04
Rich	1.00			
Poor	0.85	0.67-1.09	0.96	0.83-1.12
Marital Status				
Married	1.00			
Never married	40.85	32.51-51.33**	84.89	67.45-106.84**
Living together	1.00			
Never married	31.92	23.15-44.01**	52.30	35.81-76.38**
Working Status				
Yes	1.00			
No	3.07	2.75-44.01**	3.52	3.17-3.90**

** p≤.01; * p ≤.05

Table -13) Associations between having zero sex partner and Perceived Susceptibility to the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Heard of AIDS				
Yes	1.00			
No	3.02	1.04-8.73**	7.74	4.59-13.06**
Heard of STDs				
Yes	1.00			
No	3.17	1.00-10.01*	7.73	4.51-13.22**
Ever been tested for AIDS				
Yes	1.00			
No	3.19	2.74-3.70**	3.47	2.76-4.36**
Healthy person has AIDS				
Yes				
No	1.00			
	1.55	1.29-1.87**	1.34	1.17-1.52**
Don't know	1.00			
Yes	0.74	0.50-1.09	0.66	0.52-0.84**
Don't know	1.00			
No	1.15	0.75-1.76	0.88	0.68-1.15
AIDS by witchcraft				
Yes	1.00			
No	0.91	0.80-1.04	0.97	0.85-1.09
Don't know	1.00			
No	1.01	0.82-1.24	0.89	0.74-1.05
Don't know	1.00			
Yes	1.11	0.88-1.39	0.91	0.75-1.11
Traditional Healer				
Don't know	1.00			
No	0.55	0.42-0.73**	0.71	0.58-0.87**
Yes	1.00			
No	1.30	0.35-4.81	0.93	0.42-2.02

** p≤.01; * p ≤.05

Table -14) Associations between having zero sex partner and Perceived Severity of the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Knows someone who has or died from AIDS				
Yes	1.00			
No	0.88	0.76-1.01	1.14	0.93-1.38

Table-15) Associations between having zero sex partner and Perceived Benefits by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Reduce risk by no sex at all				
Yes	1.00			
No	0.97	0.83-1.13	1.07	0.91-1.26
Don't Know	1.00			
No	0.76	0.48-1.20	0.73	0.51-1.05
Don't Know	1.00			
Yes	0.78	0.50-1.21	0.68	0.48-0.95*
Reduce risk by condom use				
Yes	1.00			
No	1.29	1.09-1.52**	1.33	1.12-1.59**
Don't Know	1.00			
No	0.80	0.55-1.14	0.84	0.64-1.10
Don't Know	1.00			
Yes	0.62	0.44-0.85**	0.63	0.50-0.78**
Reduce risk by one or no other partner				
Yes	1.00			
No	9.75	6.28-15.15**	71.34	26.23-194.03**
Don't know	1.00			
No	0.80	0.73-0.87**	0.98	0.92-1.03

** $p \leq .01$; * $p \leq .05$

Table-16) Associations between having zero sex partner and Cues to Action by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95% CI	OR	95% CI
Know a Place to get tested				
Yes	1.00			
No	1.71	1.52-1.92**	1.35	1.22-1.49**
Frequency of listening Radio				
Less than once a week	1.00			
Not at all	0.86	0.62-1.18	1.01	0.84-1.22
At least once a week	1.00			
Not at all	0.97	0.72-1.32	1.00	0.83-1.21
Almost every day	1.00			
Not at all	0.97	0.72-1.32	0.92	0.77-1.08
Frequency of watching TV				
Less than once a week	1.00			
Not at all	1.02	0.89-1.18	0.86	0.77-0.97**
At least once a week	1.00			
Not at all	1.09	0.93-1.27	0.77	0.62-0.97**
Almost every day	1.00			
Not at all	0.90	0.78-1.03	0.97	0.72-1.29
Frequency of reading Newspaper, magazine				
Less than once a week	1.00			
Not at all	0.76	0.67-0.87**	0.68	0.60-0.77**
At least once a week	1.00			
Not at all	0.73	0.63-0.84**	0.57	0.47-0.68**
Almost every day	1.00			
Not at all	0.52	0.45-0.61**	0.29	0.24-0.36**
Source for Condoms				
Government Hosp				
Yes	1.00			
No	1.08	0.94-1.24	1.18	0.96-1.47
NGO-Mobile Clinic				
Yes	1.00			
No	2.30	1.20-4.40**	1.20	0.62-2.30
Private Clinic				
Yes	1.00			
No	1.136	0.86-1.49	1.22	0.92-1.60
Pharmacy				
Yes	1.00			
No	1.20	1.08-1.33**	1.15	1.00-1.32*

** p≤.01; * p ≤.05

Table-17) Logistic Regression of having Zero sex partner in the urban areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	4.70	3.97-5.57**
Matrimonial		
Never married	1.00	
Married	0.02	0.01-0.03**
Living together	0.02	0.01-0.03**
Working Status		
No	1.00	
Yes	0.69	0.58-0.83**
Know a place to get tested		
No	1.00	
Yes	0.75	0.62-0.90**
Ever been tested for AIDS		
No	1.00	
Yes	0.56	0.45-0.71**
Reduce risk by having one partner		
No	1.00	
Yes	0.14	0.07-0.27**
Source of Condoms – NGO		
No	1.00	
Yes	0.33	0.14-0.78**
Source of Condoms – Pharmacy		
No	1.00	
Yes	0.72	0.62-0.84**

** $p \leq .01$; * $p \leq .05$ Cox & Snell R^2 0.381; Constant $\beta = 1.722$

Table-18) Logistic Regression of having Zero sex partner in the rural areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	4.15	3.45-4.98**
Age category		
Older	1.00	
younger	1.52	1.20-1.93**
Matrimonial		
Never married	1.00	
Married	0.01	0.009-0.01**
Living together	0.01	0.09-0.02**
Working Status		
No	1.00	
Yes	0.77	0.64-0.92**
Know a place to get tested		
No	1.00	
Yes	0.79	0.67-0.94**
Can a healthy person has AIDS		
No	1.00	
Yes	0.76	0.60-0.96**
Ever been tested for AIDS		
No	1.00	
Yes	0.02	0.006-0.09

** $p \leq .01$; * $p \leq .05$ Cox & Snell R^2 0.430; Constant $\beta = 3.634$

Table-19) Associations between having one sex partner and the Demographic variables by place of residence

	URBAN		RURAL	
Variables	OR	95%CI	OR	95%CI
Gender				
Male	1.00			
Female	1.47	1.32-1.64**	1.88	1.70-2.07**
Age				
Older	1.00			
Younger	0.29	0.27-0.33**	0.17	0.15-0.19**
Education				
Primary	1.00			
No Education	2.07	1.71-2.50**	3.06	2.71-3.45**
Secondary	1.00			
No Education	2.40	2.00-2.88**	3.30	2.87-3.80**
Higher	1.00			
No Education	1.79	1.37-2.34**	2.10	1.17-3.79**
Wealth				
Middle	1.00			
Poor	1.18	0.91-1.52	1.19	1.06-1.33**
Rich	1.00			
Poor	1.27	1.01-1.60*	1.22	1.06-1.41**
Marital Status				
Married	1.00			
Never married	0.60	0.05-0.07**	0.35	0.03-0.04**
Living together	1.00			
Never married	0.09	0.07-0.11	0.04	0.03-0.05**
Working Status				
Yes	1.00			
No	0.46	0.42-0.51**	0.43	0.39-0.48**

** $p \leq .01$; * $p \leq .05$

Table-20) Associations between having one sex partner and Perceived Susceptibility to the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Heard of AIDS				
Yes	1.00			
No	0.47	0.16-1.36	0.17	0.10-0.29**
Heard of STDs				
Yes	1.00			
No	0.45	0.14-1.41	0.17	0.10—0.30**
Ever been tested for AIDS				
Yes	1.00			
No	0.40	0.35-0.46**	0.33	0.27-0.40**
Healthy person has AIDS				
Yes				
No	1.00			
	0.80	0.66-0.96**	0.95	0.84-1.08
Don't know	1.00			
Yes	0.95	0.64-1.40	1.10	0.87-1.40
Don't know	1.00			
No	0.76	0.50-1.16	1.05	0.81-1.37
AIDS by witchcraft				
Yes	1.00			
No	0.96	0.84-1.09	0.94	0.84-1.06
Don't know	1.00			
No	0.95	0.78-1.15	0.93	0.78-1.09
Don't know	1.00			
Yes	0.99	0.80-1.23	0.98	0.81-1.18
Traditional Healer				
Don't know	1.00			
No	1,34	1.02-1.77*	1.05	0.85-1.29
Yes	1.00			
No	0.79	0.24-2.65	0.90	0.43-1.91
Don't know	1.00			
Yes	1.68	0.49-5.77	1.16	0.53-2.54

** p≤.01; * p ≤.05

Table-21) Associations between having one sex partner and Perceived Severity of the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Knows someone who has or died from AIDS				
Yes	1.00			
No	1.26	1.10-1.44**	1.07	0.90-1.28

** p≤.01; * p ≤.05

Table-22) Associations between having one sex partner and Perceived Benefits by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95%CI	OR	95%CI
Reduce risk by no sex at all				
Yes	1.00			
No	1.03	0.89-1.20	0.97	0.83-1.13
Don't Know	1.00			
No	1.06	0.68-1.66	1.12	0.79-1.60
Don't Know	1.00			
Yes	1.02	0.66-1.57	1.15	0.83-1.60
Reduce risk by condom use				
Yes	1.00			
No	0.94	0.80-1.11	0.92	0.78-1.09
Don't Know	1.00			
No	1.06	0.74-1.52	1.08	0.82-1.41
Don't Know	1.00			
Yes	1.26	0.81-1.55	1.17	0.94-1.46
Reduce risk by one or no other partner				
Yes	……..	…….	……..	………..
No				

** p≤.01; * p ≤.05

Table-23) Associations between having one sex partner and Cues to Action by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95% CI	OR	95% CI
Know a Place to get tested				
Yes	1.00			
No	0.72	0.64-0.80**	0.86	0.78-0.95**
Frequency of listening Radio				
Less than once a week	1.00			
Not at all	1.13	0.83-1.54	1.16	0.97-1.39
At least once a week	1.00			
Not at all	1.20	0.889-1.61	1.34	1.12-1.60**
Almost every day	1.00			
Not at all	1.41	1.07-1.85**	1.48	1.26-1.75**
Frequency of watching TV				
Less than once a week	1.00			
Not at all	0.84	0.74-0.96**	0.84	0.76-0.93**
At least once a week	1.00			
Not at all	0.98	0.85-1.14	0.74	0.60-0.91**
Almost every day	1.00			
Not at all	0.81	0.71-0.92**	0.75	0.57-0.98**
Frequency of reading Newspaper, magazine				
Less than once a week	1.00			
Not at all	1.38	1.22-1.56**	1.65	1.46-1.86**
At least once a week	1.00			
Not at all	1.40	1.22-1.60**	1.78	1.50-2.11**
Almost every day	1.00			
Not at all	1.72	1.49-1.99**	3.04	2.47-3.73**
Source for Condoms				
Government Hosp				
Yes	1.00			
No	0.99	0.87-1.12	0.89	0.73-1.08
NGO-Mobile Clinic				
Yes	1.00			
No	0.86	0.52-1.42	0.91	0.50-1.66
Private Clinic				
Yes	1.00			
No	0.81	0.63-1.06	0.89	0.69-1.15
Pharmacy				
Yes	1.00			
No	0.77	0.70-0.85**	0.81	0.71-0.92**

** $p \leq .01$; * $p \leq .05$

Table-24) Logistic Regression of having one sex partner in the urban areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	1.40	1.24-1.58**
Age category		
Older	1.00	
younger	0.31	0.28-0.34**
Seek traditional Healer		
No	1.00	
Yes	1.34	0.38-4.65
Don't know	0.65	0.46-0.91**
Frequency of reading Mag		
Not at all	1.00	
Less than once a week	0.82	0.72-0.94**
At least once a week	0.85	0.73-0.99**
Almost every day	0.67	0.57-0.78**

** p≤.01; * p ≤.05 Cox & Snell R^2 0.087; Constant β = 1.007

Table-25) Logistic Regression of having one sex partner in the rural areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	1.92	1.70-2.16**
Age category		
Older	1.00	
younger	0.20	0.18-0.22**
Education		
No education	1.00	
Primary	0.70	0.60-0.82*
Secondary	0.76	0.62-0.92*
Higher	0.59	0.30-1.17
Frequency of reading Mag		
Not at all	1.00	
Less than once a week	0.91	0.78-1.07
At least once a week	0.83	0.67-1.03
Almost every day	0.49	0.38-0.63**

** p≤.01; * p ≤.05 Cox & Snell R^2 0.163; Constant β = 1.339

Table-26) Associations between having 2 sex partners and the Demographic variables by place of residence

	URBAN		RURAL	
Variables	OR	95%CI	OR	95%CI
Gender				
Male	1.00			
Female	0.06	0.05-0.08**	0.04	0.03-0.05**
Age				
Older	1.00			
Younger	0.95	0.78-1.15	0.70	0.57-0.86**
Education				
Primary	1.00			
No Education	0 .59	0.38-0.93*	0.79	0.62-1.01
Secondary	1.00			
No Education	0.42	0.27-0.64**	0.50	0.38-0.65**
Higher	1.00			
No Education	0.34	0.20-0.59**	0.52	0.18-1.46
Wealth				
Middle	1.00			
Poor	0.85	0.50-1.44	0.72	0.57-0.90**
Rich	1.00			
Poor	0.81	0.50-1.32	0.60	0.46-0.79**
Marital Status				
Married	1.00			
Never married	1.19	0.95-1.49	0.98	0.78-1.22
Living together	1.00			
Never married	0.80	0.61-1.06	0.81	0.58-1.12
Working Status				
Yes	1.00			
No	0.56	0.46-0.68**	0.33	0.26-0.41**

** p≤.01; * p ≤.05

Table-27) Associations between having 2 sex partners and Perceived Susceptibility to the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Heard of AIDS				
Yes	1.00			
No	------	----------	--------	
Heard of STDs				
Yes	1.00			
No	--------	----------	--------	
Ever been tested for AIDS				
Yes	1.00			
No	0.92	0.73-1.16	1.29	0.91-1.83
Healthy person has AIDS				
Yes				
No	1.00			
	0.49	0.30-0.81**	0.34	0.23-0.51**
Don't know	1.00			
Yes	7.86	1.09-56.49**	6.86	2.19-21.49**
Don't Know	1.00			
No	3.89	0.51-29.56	2.38	0.71-7.88
AIDS by witchcraft				
Yes	1.00			
No	1.49	1.12-1.99**	1.18	0.92-1.52
Don't know	1.00			
No	0.86	0.60-1.23	1.94	1.25-3.01**
Don't know	1.00			
Yes	0.58	0.37-0.89**	1.63	1.01-2.64**
Traditional Healer				
Don't know	1.00			
No	3.53	1.30-9.55**	8.52	2.72-26.63**
Don't know	1.00			
Yes	4.72	0.48-45.92	4.68	0.47-46.45

** p≤.01; * p ≤.05

Table-28) Associations between having 2 sex partners and Perceived Severity of the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Knows someone who has or died from AIDS				
Yes	1.00			
No	0.69	0.53-0.89**	0.63	0.45-0.87**

** p≤.01; * p ≤.05

Table-29) Associations between having 2 sex partners and Perceived Benefits by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95%CI	OR	95%CI
Reduce risk by no sex at all				
Yes	1.00			
No	1.02	0.76-1.36	0.75	0.53-1.06
Don't Know	1.00			
No	1.96	0.60-6.40	2.30	0.70-7.57
Don't Know	1.00			
Yes	1.91	0.60-6.08	3.05	0.97-9.63
Reduce risk by condom use				
Yes	1.00			
No	0.42	0.27-0.67**	0.32	0.18-0.57**
Don't Know	1.00			
No	0.97	0.95-0.98*	0.99	0.97-1.00
Don't Know	1.00			
Yes	----------		5.69	2.11-15.33**
Reduce risk by one or no other partner				
Yes	1.00			
No	2.37	1.40-3.98**	0.33	0.08-1.34

** $p \leq .01$; * $p \leq .05$

Table-30) Associations between having 2 sex partners and Cues to Action by place of residence

	URBAN		RURAL	
VARIABLES	OR	95% CI	OR	95% CI
Know a Place to get tested				
Yes	1.00			
No	0.53	0.39-0.70**	0.61	0.49-0.76**
Frequency of listening Radio				
Less than once a week	1.00			
Not at all	1.41	0.60-3.32	0.26	0.13-0.53**
At least once a week	1.00			
Not at all	0.55	0.26-1.16	0.15	0.07-0.30**
Almost every day	1.00			
Not at all	0.44	0.21-0.90*	0.15	0.07-0.29**
Frequency of watching TV				
Less than once a week	1.00			
Not at all	0.61	0.46-0.80**	0.84	0.68-1.05
At least once a week	1.00			
Not at all	0.79	0.58-1.08	0.92	0.58-1.46
Almost every day	1.00			
Not at all	0.77	0.58-1.03	0.47	0.30-0.73**
Frequency of reading Newspaper, magazine				
Less than once a week	1.00			
Not at all	0.75	0.59-0.94**	0.59	0.47-0.75**
At least once a week	1.00			
Not at all	0.81	0.62-1.06	0.81	0.56-1.16
Almost every day	1.00			
Not at all	1.29	0.93-1.80	1.54	0.87-2.72
Source for Condoms				
Government Hosp				
Yes	1.00			
No	0.77	0.60-0.98*	0.91	0.61-1.35
NGO-Mobile Clinic				
Yes	1.00			
No	0.38	0.19-0.74**	0.88	0.27-2.84
Private Clinic				
Yes	1.00			
No	1.174	0.67-2.02	0.76	0.47-1.21
Pharmacy				
Yes	1.00			
No	1.28	1.05-1.57**	1.41	1.04-1.90*

** p≤.01; * p ≤.05

Table 31) Logistic Regression of having two sex partners in the urban areas

Models	OR	95%CI
Age category		
Older	1.00	
Younger	1.31	1.03-1.68**
Education		
No education	1.00	
Primary	1.64	1.00-2.69**
Secondary	2.45	1.47-4.08**
Higher	3.21	1.69-6.08**
Work		
No	1.00	
Yes	2.08	1.63-2.66**
Know a place to get tested		
No	1.00	
Yes	1.41	1.03-1.94**
Know someone who has AIDS		
No		
Yes	1.00	
	1.36	1.04-1.78*
Can get AIDS by witchcraft		
No	1.00	
Yes	0.74	0.54-1.02
Don't know	1.59	1.05-2.41**
Can healthy person has AIDS		
No	1.00	
yes	2.43	1.27-4.63**
Reduce risk by condom use		
No	1.00	
Yes	2.55	1.52-4.29**
Reduce risk by having one partner		
No	1.00	
Yes	0.34	0.18-0.65**
Frequency of listening radio		
Not at all	1.00	
Less than once a week	0.54	0.22-1.31
At least once a week	1.27	0.59-2.76
Almost every day	1.44	0.69-3.00
Frequency of reading Mag		
Not at all	1.00	
Less than once a week	0.87	0.65-1.15
At least once a week	0.74	0.53-1.02
Almost every day	0.41	0.27-0.62**
Source of Condoms-pharmacy		
No	1.00	
Yes	0.67	0.53-0.84**

** $p \leq .01$; * $p \leq .05$ Cox & Snell R^2 0.025; Constant $\beta = -4.945$

Table-32) Logistic Regression of having two sex partners in the rural areas

Models	OR	95%CI
Work		
No	1.00	
Yes	2.94	2.29-3.78**
Education		
No education	1.00	
Primary	1.28	0.97-1.68
Secondary	1.81	1.32-2.49**
Higher	2.00	0.68-5.87
Can Healthy person has AIDS		
No	1.00	
Yes	2.47	1.57-3.87*
Don't know	0.57	0.13-2.49
Seek traditional healer		
No	1.00	
yes	0.74	0.09-5.59
Reduce risk by condom use		
No	1.00	
Yes	2.96	1.56-5.60**
Source condom-pharmacy		
No	1.00	
yes	0.50	0.35-0.71**
Frequency of listening to radio		
Not at all		
Less than once a week	1.00	
At least once a week	2.60	1.22-5.52**
Almost every day	4.29	2.06-8.94**
	3.26	1.92-8.14**

** $p \leq .01$; * $p \leq .05$ Cox & Snell R^2 0.030; Constant $\beta = -6.829$

Table-33) Associations between having 3 or more sex partners and the Demographic variables by place of residence

	URBAN		RURAL	
Variables	OR	95%CI	OR	95%CI
Gender				
Male	1.00			
Female	0.20	0.009-0.43**	1.04	1.03-1.04**
Age				
Older	1.00			
Younger	0.77	0.54-1.09	1.19	0.79-1.79
Education				
Primary	1.00			
No Education	1.32	0.65-2.67	0.35	0.17-0.70**
Secondary	1.00			
No Education	0.72	0.38-1.38	0.16	0.08-0.33**
Higher	1.00			
No Education	0.28	0.13-0.60**	0.06	0.01-0.24**
Wealth				
Middle	1.00			
Poor	0.37	0.08-1.63	0.51	0.32-0.81**
Rich	1.00			
Poor	0.29	0.07-1.19	0.41	0.24-0.70**
Marital Status				
Married	1.00			
Never married	0.90	0.59-1.37	1.75	1.12-2.74**
Living together	1.00			
Never married	0.47	0.30-0.75**	1.65	0.77-3.52
Working Status				
Yes	1.00			
No	0.45	0.31-0.65**	0.42	0.27-0.67**

** $p \leq .01$; * $p \leq .05$

Table-34) Associations between having 3 or more sex partners and Perceived Susceptibility to the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Heard of AIDS				
Yes	1.00			
No	-------		--------	
Heard of STDs				
Yes	1.00			
No	-------		--------	
Ever been tested for AIDS				
Yes	1.00			
No	0.73	0.49-1.08	1.25	0.60-2.59
Healthy person has AIDS				
Yes				
No	1.00			
	0.30	0.09-0.94**	0.29	0.11-0.71**
Don't know	1.00			
Yes	------		0.98	0.98-0.99
AIDS by witchcraft				
Yes	1.00			
No	1.66	0.98-2.82	2.43	1.26-4.70**
Don't know	1.00			
No	5.08	1.25-20.36**	5.26	1.29-21.43**
Don't know	1.00			
Yes	3.05	0.69-13.31	2.15	0.47-9.88
Traditional Healer				
Don't know	1.00			
No	-----		---------	

** p≤.01; * p ≤.05

Table-35) Associations between having 3 or more sex partners and Perceived Severity of the disease by place of residence

	URBAN		RURAL	
VARIABLES	OR	95%CI	OR	95%CI
Knows someone who has or died from AIDS				
Yes	1.00			
No	0.63	0.40-1.00*	0.36	0.20-0.64**

** p≤.01; * p ≤.05

Table-36) Associations between having 3 or more sex partners and Perceived Benefits by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95%CI	OR	95%CI
Reduce risk by no sex at all				
Yes	1.00			
No	0.78	0.43-1.39	1.33	0.74-2.41
Reduce risk by condom use				
Yes	1.00			
No	0.70	0.35-1.39	0.74	0.32-1.70
Don't Know	1.00			
No	2.10	0.26-16.75	----------	
Don't Know	1.00			
Yes	2.98	0.41-21.46	----------	
Reduce risk by one or no other partner				
Yes	1.00			
No	3.80	1.81-7.94**	1.61	0.39-6.62

** p≤.01; * p ≤.05

Table-37) Associations between having 3 or more sex partners and Cues to Action by place of residence

	URBAN		**RURAL**	
VARIABLES	OR	95% CI	OR	95% CI
Know a Place to get tested				
Yes	1.00			
No	0.50	0.30-0.86**	0.67	0.43-1.05
Frequency of listening Radio				
Less than once a week	1.00			
Not at all	---------		0.13	0.01-1.01*
At least once a week	1.00			
Not at all	---------		1.01	1.00-1.001*
Almost every day	1.00			
Not at all	---------		0.07	0.01-0.53**
Frequency of watching TV				
Less than once a week	1.00			
Not at all	0.32	0.18-0.57**	0.91	0.57-1.46
At least once a week	1.00			
Not at all	0.46	0.23-0.88**	0.45	0.22-0.92*
Almost every day	1.00			
Not at all	0.38	0.21-0.69**	0.50	0.20-1.27
Frequency of reading Newspaper, magazine				
Less than once a week	1.00			
Not at all	0.82	0.53-1.27	0.53	0.33-0.85**
At least once a week	1.00			
Not at all	0.87	0.53-1.42	0.57	0.29-1.13
Almost every day	1.00			
Not at all	0.82	0.49-1.38	0.64	0.27-1.50
Source for Condoms				
Government Hosp				
Yes	1.00			
No	1.05	0.64-1.69	0.78	0.36-1.70
NGO-Mobile Clinic				
Yes	1.00			
No	0.39	0.12-1.27	0.57	0.07-4.19
Private Clinic				
Yes	1.00			
No	2.43	0.60-9.90	1.14	0.36-3.63
Pharmacy				
Yes	1.00			
No	1.47	1.02-2.13**	1.16	0.64-2.09

** $p \leq .01$; * $p \leq .05$

Table-38) Logistic Regression of having 3 or more sex partners in the urban areas

Models	OR	95%CI
Gender		
Male	1.00	
Female	0.01	0.006-0.03**
Education		
No education	1.00	
Primary	1.38	0.46-4.13
Secondary	1.70	0.59-4.92
Higher	3.62	1.17-11.18*
Matrimonial		
Never married	1.00	
Married	1.70	1.06-2.74*
Living together	6.14	3.59-10.48**

** p≤.01; * p ≤.05 Cox & Snell R^2 0.046; Constant β = -3.686

Table-39) Logistic Regression of having 3or more sex partners in the rural areas

Models	OR	95%CI
Education		
No education	1.00	
Primary	1.72	0.79-3.74
Secondary	2.97	1.34-6.58**
Higher	7.35	1.72-31.46**
Knows someone who has AIDS		
No	1.00	
Yes	1.99	1.03-3.84*

** p≤.01; * p ≤.05 Cox & Snell R^2 0.031; Constant β = -3.911

Table 40) Summary of the association's tables with the Dependent variables by place of residence

		Condom use		Zero sex partner		One sex partner		Two sex partners		Three or more sex partners	
		U	**R**	**U**	**R**	**U**	**R**	**U**	**R**	**U**	**R**
General	**Gender** Male Female	----	----	+++	+++	+	+	+	----	----	----
	Age Younger older	-----	+	----	+	----	----	----	----	----	-----
	Education No Primary Secondary Higher	 + +++ ++++	 ++ +++ ++++	 ---- 	 --- 	 ---- 	 ---- 	 + ++ +++	 + 	 +++	 ++ ++++
	Marital stat Never married Married	------	------	----	----	---	----	----	----	+	-----
	SES Poor Middle Rich	------	 + +	----	----	---	----	---	----	----	----
	Work Yes No	------	-----	----	----	----	----	++	++	----	-----
Perceived Susceptibility	Can healthy person has AIDS	------	-----	----	----	---	----	++	++	----	-----
Perceived Severity	Know someone who has or died of AIDS	+	+	----	----	----	----	+	----	----	+
Perceived Benefits	Reduce risk by using condoms	----	-----	-----	----	---	----	++	++	----	----
Cues to Action	Know place to get AIDS test	+	-----	-----	-----	----	----	+	----	----	-----
	Read Magazine	-----	+	----	----	----	----	---	----	----	----
	Listen to radio	----	+	----	----	----	----	++	----	----	----
	Watch TV	----	+	----	----	----	----	----	----	----	----
	Private	----	++	----	----	----	----	----	----	----	----
	Pharmacy	+	----	----	----	----	---	----	----	----	----

+ OR 1.01-1.99
++ OR 2.00-2.99
+++ OR 3.00-4.99
++++ OR 5.00 and more

U = urban
R = rural