5-7-2011

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An Examination of the Association between HIV Related Knowledge, Attitudes, and Behaviors and HIV Infection Status in Five High HIV Prevalence States in India.

by

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A Thesis Submitted to the Graduate Faculty of Georgia State University in Partial Fulfillment of the Requirements for the Degree

Master of Public Health

Atlanta, Georgia

2011

An Examination of the Association between HIV Related Knowledge, Attitudes, and Behaviors and HIV Infection Status in Five High HIV Prevalence States in India

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ACKNOWLEDGEMENTS

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ABSTRACT

An Examination of the Association between HIV Related Knowledge, Attitudes, and Behaviors and HIV Infection Status in Five High HIV Prevalence States in India

(Under the direction of Francis A. McCarty, Ph.D., FACULTY MEMBER)

Although data shows that the incidence of HIV in India is falling, it is still a prevailing disease in India. The lack of knowledge about HIV and risky behaviors greatly influence the role of HIV transmission among the Indian population. These factors also contribute to the numbers of new HIV infections caused by unprotected sex, which account for 90% of the new HIV infections. Knowledge, attitudes and behaviors among the people living with HIV/AIDS also play an important role in HIV transmission. This study was conducted to explore the association between selected demographic variables on HIV related knowledge, attitudes and behaviors among people living in five high HIV prevalence states in India (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu). This study also examined the association between HIV infection status and HIV related knowledge, attitudes, and behaviors in those five states. The data used in this study was from 2005-2006 Demographic and Health Surveys (DHS) collected for India. Univariate and multivariate analyses were conducted to study the association. The results showed that the proportion of people with "high HIV related knowledge" was greater than those who have "low HIV related Knowledge". However, the proportion of people with "comprehensive knowledge of HIV prevention and transmission" was less. Similarly, a higher proportion of the study population showed "HIV/AIDS related positive attitudes", however, the proportion of the study population with all 4 positive attitudes towards People Living with HIV/AIDS (PLHA) was lower. Increase in highest education level and wealth was found to be significantly associated with the "high HIV related knowledge", "have comprehensive knowledge", "have HIV related positive attitudes", "have accepting attitudes towards PLHA", and HIV related "less risky behaviors". The data has shown that HIV positive males were more likely to have comprehensive knowledge of HIV prevention and transmission compared to HIV positive female. The study also showed that HIV positive individuals were more likely to have all 4 positive attitudes towards PLHA and they were likely to have more risky behaviors, although not statistically significant.

KEY WORDS: AIDS, HIV, Knowledge, Attitude, Behavior, HIV Serostatus, India

CHAPTER I

INTRODUCTION

1.1 Background

In 2007, the estimated total number of People Living with HIV/AIDS (PLHA) in India was 2.31 million (1.8 – 2.9 million) and adults aged 15-49 years constituted 88.7% of the estimated number of PLHA. Though sexual transmission remains the major mode of HIV transmission in India, injection drug use is also an important and emerging mode of transmission in some parts of the country (UNGASS, 2008). The overall HIV prevalence among different population groups in India in the same year, continues to show a concentrated epidemic, with high prevalence among high risk groups including men who have sex with men- MSM (7.4%), injecting drug users- IDU (7.2%), female sex workers- FSW (5.1%), and sexually transmitted diseases clinic attendees - STD (3.6%) and low prevalence among Antenatal Care clinic attendees (ANC) with population adjusted prevalence of 0.48%. Nationally, the prevalence rate of HIV for males is 0.40% which continues to be higher than the prevalence among females which is 0.27% (National AIDS Control Organisation (NACO) - HIV Sentinel Surveillance and HIV Estimation, 2007).

To control the HIV epidemic, various prevention and antiretroviral treatment (ART) programs have been implemented. In addition, billions of dollars have been invested in the health care system. Although HIV is still a prevailing disease in India, the

UNAIDS report on the global AIDS epidemic 2010 described that in 2009, the incidence of HIV infection in India fell by more than 25% compared to 2001 (UNAIDS Global report, 2010). An estimate from 2007 shows that the number of people living with HIV in India was 2.31 million. Given these numbers, the total global burden of HIV can be reduced through continued containment of the HIV epidemic in India. Furthermore, the lack of knowledge and risky behaviors greatly influence the role of HIV transmission among the Indian population. These factors also contribute to the numbers of new HIV infections caused by unprotected sex, which account for 90% of the new HIV infections. In addition, the transmission among intravenous drug users is one of the main modes of HIV infection in the country's north-eastern states. Therefore, knowledge on mode of transmission, accessibility and behavior of using sterile needles, and the non-sharing of needles are significant for the containment of HIV infections in the north-eastern region of India.

A new theoretical strategy mentioned that universal voluntary HIV testing and immediate treatment with ART, combined with present prevention approaches could reduce the incidence of HIV dramatically (Granich, Gilks, Dye, K. M. De Cock, & Williams, 2009). To approach this proposed strategy, one must be aware of the risks of being infected and must be willing to get tested. In addition, proper behavior to prevent further transmission and adherence to treatment should be practiced. The knowledge, attitude and behavior among high risk groups and people living with HIV also play an important role in effectively controlling transmission of HIV. Therefore, prevention programs should have tailored activities for specific groups mainly on the basis of demographic characteristics and behavioral risk factors (Janssen et al., 2001). However,

there is limited data on the knowledge, attitudes and behaviors regarding AIDS and the association with HIV serostatus. Thus, further research on this association and the associations with other demographic factors among the five high prevalence states in India is needed (B. K. Ambati, J. Ambati, & A. M. Rao, 1997).

1.2 Purpose of Study

India has a population over one billion and is considered one of the largest and most populated countries in the world. According to 2006 estimates, about 2.5 million people are living with HIV and AIDS in India. In addition, HIV related knowledge, attitude and risk behaviors greatly vary among the different states of India (NACO, n.d.). There have been limited studies on the association between HIV serostatus and HIV related knowledge, attitude and behaviors. Therefore, it would be beneficial to explore this association as well as the associations with demographic factors in the five high HIV prevalence states in India.

1.3 Research Questions

This study is aimed at answering the following research questions and to explore the relationship between HIV related knowledge, attitudes, behavior and HIV serostatus:

1. Are there differences in HIV related knowledge, attitude and behavior by demographic characteristics including gender, age, type of place of residence, educational level, religion, marital status, wealth index, caste, and 5 highest HIV prevalence states in India (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu).

2. Are there differences in HIV related knowledge, attitude and behavior among the study population by their HIV serostatus.

1.4 Null Hypotheses

1. Ho: There are no differences in HIV related knowledge, attitudes, and behavior by demographic characteristic among the study population of India.

2. Ho: The level of HIV related knowledge, attitude and behavior of people living with HIV in the study population of India do not differ from those without HIV infection.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this study is to assess HIV Serostatus and HIV related Knowledge, Attitudes and Behaviors among men and women living in the five high HIV prevalence states in India and to determine the association with selected demographic factors (Benjamin, S. Singh, Sengupta, & Dhanoa, 2007).

2.1 Global HIV Epidemiology

According to the estimates from UNAIDS, 33.3 million people were living with HIV at the end of 2009 and 2.6 million people are newly infected worldwide. UNAIDS reported, the changes in incidence rate from 2001 to 2009 among selected countries. This report showed 33 countries with a declined incidence rate of HIV infection more than 25% including some of the most affected countries in Africa and some countries in South and South East Asia. The report also showed 23 countries with stable incidence and 7 countries with increasing incidence more than 25% which includes Eastern Europe and Central Asia. The rates of annual new HIV infections in Western, Central, and Eastern Europe, Central Asia, and North America have been stable for at least the past five years. In general, the annual numbers of new HIV infections have been declining since the late 1990s. The global number of new infections has fallen by 19% since 1999 which is also thought to be the epidemic peak year. In addition, it is estimated that 15 million people living with HIV are mostly from lower and middle income countries. However, several

high income countries have shown an increase in transmission among MSM. The proportion of women living with HIV has not varied and remains stable. Furthermore, the female population contributes slightly more than half of all people living with HIV. Although, there has been an increase in access to mother to child transmission prevention programs, the estimated number of children born with HIV in 2009 is 370,000. In addition, there was an increase in the number of children living with HIV in 2009, which is estimated to be 2.5 million, due to the decrease in the number of HIV related deaths among children younger than 15 years. The annual number of AIDS-related deaths globally has been decreasing due to the significant scaling up of ART over the past few years. The estimated number of people who died from HIV-related illness in 2009 was 1.8 million (UNAIDS, 2010).

Studies have shown a decrease in the evidence of incidence and safer sexual behavior among young people. Although the knowledge of the epidemic and how to prevent HIV infection has increased among young people, UNAIDS mentions that there is still a lack of knowledge, and the tools required for changing behaviors. For example, these tools include things like access to condoms and lubrication for safer sex practices and access to needles for IVDUs. Behaviors and major mode of transmission also varies among different countries (UNAIDS, 2010).

2.1.1 Sub-Saharan Africa

Although the rate of new HIV infections has decreased in Sub-Saharan Africa, it remains the most affected region. Sixty-eight percent of the global HIV burden is within the Sub-Saharan African region. The total number of people living with HIV in 2009 was 22.5 million and the estimated number of new HIV infections was 1.8 million.

Heterosexual transmission is the main mode of transmission in the general population of sub-Saharan Africa. In addition, the female populations, who have HIV, are the most affected compared to males. Specifically, women aged 15-24 years are the most affected and are about 8 times more likely than men to be HIV positive. Furthermore, in 2009, the number of people who died of HIV-related illness in Sub-Saharan Africa was 1.3 million, which is 72% of the global total death from HIV related illness (UNAIDS, 2010).

2.1.2 Asia

As of the last five years, the estimated number of people living with HIV in 2009 remains constant. The number includes 4.9 million with 360,000 as newly infected people. According to 2009 data, there were 300,000 AIDS-related deaths which is stable compared to 2001. The epidemic pattern in Asia varies between the countries as well as within the countries. No country in the region has a generalized epidemic. Although there is a reduced incidence more than 25% in India, Nepal, and Thailand, most of the nations appear to have a stabilized epidemic. Major transmission in Asia is found among injection drug users, sex workers and their clients and MSM. In addition, some studies conducted in south and south-east Asian countries show more than 15% HIV positive status among female sex workers. There is also an average of 16% prevalence among IVDUs in Asia and the prevalence among MSM varies from 5% to 29%. The estimated HIV infections among women are 35% in Asia. Lastly, the majority of women in Asia acquire HIV infections from their partners who are either IVDUs or the clients of sex workers (UNAIDS, 2010).

2.1.3 Eastern Europe and Central Asia

The total number of people living with HIV in Eastern Europe and Central Asia in 2009 is 1.4 million which is about 3 times the rate in 2001. This rapid rise is due to the increase in HIV infection among IVDUs in this region. The number of people newly infected with HIV is 130,000 and together, the Russian Federation and Ukraine account for almost 90% of this number. AIDS-related deaths among adults and children in this region in 2009 was 76,000 which is 4 times that of 2001. In addition, the transmission among the networks of IVDUs and their sexual partners is high. Furthermore, the incidence of HIV increased more than 25% from 2001 to 2009 (UNAIDS, 2010).

2.1.4 Caribbean

In the year 2009, the total number of people living with HIV in the Caribbean is 240,000, which is relatively small. However, the prevalence among adults is about 1%, which is higher than all regions apart from Sub-Saharan Africa. The number of people newly infected with HIV was 17,000 in 2009. In addition, the main mode of transmission is through unprotected sex between men. Women are also greatly affected through paid sex. Transmission through intravenous drug use also contributes significantly in Bermuda and Puerto Rico. There is also a decrease in the number of AIDS-related deaths in 2009, which is reported to be 12,000 (UNAIDS, 2010).

2.1.5 Central and South America

Due to the availability of ART in Central and South America, the number of people living with HIV in 2009 is 1.4 million. This number has increased compared to that of 2001. In 2009, an estimate of 92 000 people were newly infected with HIV. In addition, the number of HIV related deaths was 58,000. Although the mode of

transmission in this region varies, major transmission occurs among MSMs and their networks. Transmission among IVDUs is also found in the southern cone of South America. Lastly, transmission through paid sex work could be significantly controlled through the use of condoms and a low HIV prevalence rate among sex workers (UNAIDS, 2010).

2.1.6 North America and Western and Central Europe

The total number of people living with HIV in 2009 is 2.3 million, which is 30% more than that of 2001. In addition, the total number of new HIV infections is 100,000 and the AIDS-related deaths were 35,000. In 2009, the total number of people newly infected with HIV was 100,000 and the number of AIDS-related deaths was 35,000. Unprotected sex among MSMs is the main mode of transmission. Overall, the rates of incidences among IVDUs have been falling. However, in some parts of this region such as Mexico and the southern part of Europe, transmission of HIV is still common among injection drug users and clients of unprotected paid sex. Furthermore, in some countries such as the United States and Canada, higher HIV epidemics are found among racial and ethnic minorities including the aboriginal population (UNAIDS, 2010).

2.1.7 Middle East and North Africa

Within a decade, the HIV incidence, prevalence, and HIV-related deaths have been increasing in the Middle Eastern region and North Africa. For example, in 2009, the total number of people living with HIV was 460,000 and the number of people newly infected with HIV was 75,000. The AIDS-related deaths, in the same year, was 24,000. The mode of transmission also varies among different countries. Many countries of this

region highly stigmatize men who have sex with men. Although a sex network exists, HIV transmission among paid sex networks is limited (UNAIDS, 2010).

2.1.8 Oceania

In 2009, the total number of people living with HIV in Oceania was 57,000, which is twice that seen in 2001. However, the total number of people newly infected with HIV has declined to 4,500. In addition, the total number of AIDS-related deaths in the same year was 1,400. The only country of this region with a generalized epidemic, according to 2009 data, is Papua New Guinea, which has about 34,000 people living with HIV. Unprotected sex is the main mode of transmission in Oceania. Within the past decade, Australia and New Zealand shows an increase in transmission among MSMs (UNAIDS, 2010).

2.2 HIV Epidemiology in India

India is considered one of the largest and most populated countries in the world. According to 2001 census data, it has a population over one billion. About 72% of India's population live in rural areas and 28% live in the urban areas. It is estimated that there were around 2.5 million people living with HIV and AIDS (PLHA) in 2006 in rural and urban areas (NACO, n.d). There were 2.31 million PLHA in 2007, with an estimated adult HIV prevalence of 0.34%. Out of the estimated number of PLHA, 39% were females and 3.5% were children under the age of 15 years. The elderly, which includes the age above 49, constitute 7.8% of total PLHA. In addition, the prevalence of HIV is shown to be high among the 15-49 age group (88.7% of all infections), which indicates that HIV/AIDS is still a major problem within the age group. Nationally, the prevalence

rate of HIV for adult males is 0.40% and that of females is 0.27% (UNICEF India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007).

Most of the initial cases of HIV in India were found by the end of 1987 and occurred mostly through heterosexual transmission. However, at the end of the 1980s, a rapid spread of HIV was observed among injecting drug users in 3 north-eastern states in India, which include Mizoram, Nagaland and Manipur (AVERT- HIV and AIDS in India, n.d.).

To examine the effects of HIV in India as a whole would be difficult due to the large population and the various modes of transmission present in the country. The major mode of transmission varies in each state of the country. Therefore, a detailed picture of the effects can be observed through examination of each state individually. The 2010 UNGASS HIV country report mentioned that India's epidemic is concentrated within most-at-risk-populations, which results in a higher prevalence within those groups. Therefore, to plan programs, and to monitor the impact of HIV prevention and treatment interventions, India has used extensive HIV related data, such as the HIV sentinel surveillance data. In the year 2006, HIV Sentinel Surveillance was conducted at 628 ANC sites including those in urban and rural areas, 251 STD sites, (high risk group FSW, IDU, MSM) 138 FSW sites, 51 IDU sites and 31 MSM sites in the country. The surveillance data from these high-risk groups and sites provided a reasonable indication of the overall HIV prevalence of each region.

The ANC sites with greater number of HIV positive results were inform the six high HIV prevalence states of India. The six Indian states that are considered to have high

HIV/AIDS prevalence include – Manipur, Nagaland, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra. Thirty-six out of 49 STD sites have STD clinic attendees that have tested more than 5% HIV positivity. These STD sites are also from high HIV prevalence states. India's HIV/AIDS prevalence among adults is below 1% and is relatively low. However, because the population size of India is large, which is about 1 billion, a mere 0.1% increase in HIV prevalence would increase to half a million of people living with HIV.

HIV trends have shown a decline both at the national level and within the high prevalence states. This trend is due to the interventions that were in place for many years, In contrast, HIV trends in the low prevalence states among ANC clinic attendees are found to be increasing. In addition, prevalence of HIV among women and rural inhabitants is increasing and accounts for 39% and 67% of the total PLHA in 2009 (USAID Health: HIV/AIDS, Countries- India, n.d.).

2.2.1 Andhra Pradesh

Andhra Pradesh is located in the southeastern part of India. It is the fifth most populated state and has a total population of around 76 million. According to 2006 data, Andra Pradesh had the 3rd highest adult HIV prevalence rate. However, the estimated adult HIV prevalence was 1.05% and reduced to 0.97% in 2007. In addition, the state had the highest HIV prevalence rate at antenatal clinics, which was 1.26% in 2006 and 1% in 2007. The HIV prevalence rate for STD clinics attendees was 24.4% in 2006 and reduced to 17.2% in 2007. Furthermore, the HIV prevalence rate among high-risk groups, such as men who have sex with men (MSM) was 10.25% in 2006 and even increased to 17.04% in 2007. This prevalence rate was considered to be the second highest among reported

states in 2007. Prevalence rates among female sex workers were 7.32% in 2006 and increased to 9.74% in 2007. Prevalence among IDUs in 2007 was 3.71% (NACO-HIV_Fact_Sheets, 2006; AVERT - HIV and AIDS in India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007; Census of India, 2011).

2.2.2 Karnataka

Karnataka is located in the southwestern region of India. It is the ninth most populated state in India and has a population of around 53 million. The estimated adult HIV prevalence rate is the 4th highest of all states and was 0.81% in 2006 and 0.75% in 2007. The HIV prevalence among antenatal clinic attendees dropped from 1% in 2006 to 0.5% in 2007. In addition, the average HIV prevalence rate among female sex workers in Karnataka was 8.64% in 2006 and 5.3% in 2007. Furthermore, the mean prevalence among STD clinic attendees in 2006 was 7.57% and was 8.40% in 2007. Mean prevalence among IDUs was 3.6% in 2006 and 2.0% in 2007. Lastly, the prevalence among MSMs was found to be the highest among all the states which was 19.20% in 2006 and 17.6% in 2007 (NACO- HIV_Fact_Sheets, 2006; AVERT - HIV and AIDS in India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007; Census of India, 2011).

2.2.3 Maharashtra

Maharashtra is a very large state with an area of three hundred thousand square kilometers. It is considered to be the second most populous state in India with a total population of around 97 million. Most of the population, which is around 14 million, lives in the city of Mumbai (Bombay), the capital city of Maharashtra. The estimated

adult HIV prevalence is the 5th highest out of all states, which was 0.74% in 2006 and reduced to 0.67% in 2007. The HIV prevalence at antenatal clinics was 0.75% in 2006 and 0.5% in 2007. The reported rates of HIV prevalence among female sex workers were the highest among the states for both 2006 and 2007. For example, in 2006 the HIV prevalence was 19.57% and 17.91% in 2007. Maharashtra has the highest HIV prevalence among IDUs and FSWs. For example, in the year 2006, 20.4% of injecting drug users was found to be affected, while in 2007, 24.4% were infected. The prevalence among men who have sex with men in 2006 was 15.6% and was 11.8% in 2007. 10.0% of STD clinic attendees were infected in 2006 and 11.62% in 2007 (NACO-HIV_Fact_Sheets, 2006; AVERT - HIV and AIDS in India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007; Census of India, 2011).

2.2.4 Tamil Nadu

Tamil Nadu has a population over 66 million and is the sixth most populous state in India. The first HIV/AIDS case in India was identified in 1986 in Chennai, the capital of Tamil Nadu. The estimated adult HIV prevalence is the 6th highest out of all states, which was 0.58% in 2006 and 0.44% in 2007. HIV prevalence among antenatal clinic attendees and STD clinic attendees has remained the same for 2006 and 2007, which were 0.25% and 8.0% respectively. HIV prevalence among injecting drug users was the highest out of all reporting states which was 24.2% in 2006. However, the prevalence rate dropped in 2007 to 16.8% and later became the third highest out of all reporting states. Furthermore, the HIV prevalence among men who have sex with men was 5.6% in 2006 and 6.6% in 2007. Lastly, female sex workers had a prevalence rate of 4.62% in 2006 and 4.68% in 2007 respectively (NACO- HIV_Fact_Sheets, 2006; AVERT - HIV and AIDS in

India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007; Census of India, 2011).

2.2.5 Manipur

Manipur is a comparatively a small state located in the northeastern part of India. It has a population of around 2.4 million. The estimated adult HIV prevalence is the highest of all states, which was 1.67% in 2006 and 1.57% in 2007. In addition, the HIV prevalence at antenatal clinics was 1.25% in 2006, which later declined to 0.75% in 2007. Furthermore, HIV prevalence at STD clinics in 2006 was 4.8% in 2006 and declined to 4.08% in 2007. HIV prevalence among MSMs is the 3rd highest among reported states, which was 10.4% in 2006 and 16.4% in 2007. Similarly, high rates were found among FSWs which were considered the second highest among all states in 2007. For example, the prevalence rate was 11.6% in 2006 and 13.07% in 2007. HIV prevalence among IDUs in 2006 was 19.8% and 17.9% in 2007. The overall trends among IDUs are declining in Manipur, however, they are still considered the second highest after Maharashtra in 2007 (NACO- HIV_Fact_Sheets, 2006; AVERT - HIV and AIDS in India, n.d; NACO - HIV Sentinel Surveillance and HIV Estimation, 2007; Census of India, 2011).

2.3 HIV Related Knowledge

Knowledge on HIV involves the correct identification of the modes of transmission and the methods needed to prevent further HIV infection. It also consists of rejecting myths and misconceptions associated with HIV transmission that are present in ones community. Studies show that the increase in HIV related knowledge is not a predictor of positive behavior change but is a prerequisite in the behavior change process. The degree of knowledge in the various areas regarding HIV/AIDS also varies among

different populations. However, the increase in knowledge may or may not be the predictor of the less risky behavior. For example, a study conducted among males in the rural community of Goa, India shows that although the awareness about sexual risk behavior and level of knowledge about HIV/ AIDS was very high, condom use was very low; resulting in high risk behavior related to HIV/ AIDS and STDs among males (Vaz, Ferreira, Kulkarni, & Motghare, 2006). Another study on condom use among heterosexual men and women living with HIV in India shows that knowledge is not sufficient to support safer sex, and that contextual factors play a role in their behavior practices. In this study, one third of the men and one fourth of the women reported inconsistent condom use with regular sexual partners. Furthermore, the contextual factors that facilitate whether a person uses a condom consistently with their regular partners include the personal responsibility of protecting the health of a partner, the desire to prevent acquisition and transmission of STIs, sexual satisfaction with proper condom use, the desire to have a child, and the belief that condoms are needed for effective antiretroviral therapy (V. Chakrapani, P. A Newman, M. Shunmugam, & R. Dubrow, 2010).

2.3.1 HIV Related Knowledge among PLHA

Although HIV related knowledge is not a predictor of positive behavior change, the initial knowledge of HIV status after infection can benefit in many ways. These benefits include the treatment of STIs, which can reduce the risk of HIV transmission, and the treatment of substance abuse and mental health problems, which can reduce HIV risk behaviors among PLHAs. Studies show that, although some people with HIV seropositive status continue to engage in transmission risk behaviors, most persons

refrain from sexual behavior that may transmit HIV infection to others (Benotsch, Kalichman, & Kelly, n.d.). Therefore, HIV related knowledge among PLHIV plays an important role in healthy living as well as preventing HIV transmission. People living with HIV should have adequate knowledge about HIV, mode of transmission of infection, and ways to prevent transmission, in order to reduce the risk of secondary infection and to prevent co-infection from other viruses such as, hepatitis B and to protect the uninfected persons (Mahalakshmy, Premarajan, & Abdoul, 2011).

Prevention programs by The Centers for Disease Control and Prevention, CDC, use the Serostaus Approach to Fighting the Epidemic (SAFE) to focus on the individual with HIV to reduce the risk of transmission of the virus (Janssen et al., 2001). Similarly, the concept of "positive prevention" recommended by UNAIDS provides an opportunity to highlight the prevention needs of individuals who know their seropositive status (UNAIDS, 2009). Therefore, it is also important to target HIV positive individuals in prevention programs, in addition to the HIV-negative persons, in order to achieve comprehensive HIV prevention. In addition to knowledge, transmission of HIV from PLHA depends on various factors such as the individual stage of infection and viral load, use of ART, host susceptibility and infectiousness, host genetics, co-infection with other STIs, presence of cervical ectopy, male circumcision, use of condom and individual sexual behaviors (Royce, Sena, Cates, & M. S. Cohen, 1997).

A person's sexual knowledge, attitude and behavior may be influenced by a myriad of demographic and cultural factors. These factors play an important role in a person's level of knowledge about HIV (Nattabi, Li, Thompson, Orach, & Earnest, 2009). Sixty-one percent of women have knowledge in regards to HIV, which is much less

compared to that of men, which is 84%. Even smaller percentages for example, 36% of men and 20% of women have comprehensive and correct knowledge about HIV. Furthermore, the comprehensive level of knowledge also varies with the place of residence in India. For example, young women from an urban area are two times more likely to have comprehensive knowledge than that of rural residence (USAID Health: HIV/AIDS, Countries- India, n.d.).

Since HIV is not a new infection and a variety of interventions have been implemented for many years, people now have better knowledge about HIV prevention and its mode of transmission. However, the level of knowledge is still inconsistent among different genders, and educational and marital status groups. For example, results from a study conducted in south India showed that higher HIV knowledge scores were significantly associated with higher education, male gender and, currently married couples among the general population (Meundi, Amma, A. Rao, S. Shetty, & A. K. Shetty, 2008). In contrast, another study conducted in Northeast India, showed that there was only a negligible difference in the percentage of complete knowledge in regards to HIV between the educated and non educated women in urban and rural areas (Bhattacharjee, D. C. Nath, K. K. Das, & Acharjee, 2010).

2.4 Attitudes

There are various programs that address the HIV/AIDS epidemic. However, these programs often face HIV-related stigma and discrimination as barriers to achieving their goals in HIV prevention, treatment, care and support. Stigma is associated with HIV because many believe that the acquisition of HIV is due to the failure to adhere to ethical or moral principles (Unnikrishnan, Mithra, T, & B, 2010). Prejudice, negative attitudes

and abuse and maltreatment of people living with HIV/AIDS are some of the most common AIDS-related stigma and discrimination (AVERT - Stigma, discrimination and attitudes to HIV & AIDS, n.d.). Stigma and discrimination of PLHA may lead to the ostracization and abandonment by family members and the community. Furthermore, PLHA may be poorly treated by healthcare and service providers which can cause them to lose rights in work related environments. In addition, maltreatment of PLHAs may cause severe psychological damage. Studies have shown that due to the stigma associated with HIV, people refuse to test for HIV. Therefore, they are unaware of their HIV serostatus, which can have a negative impact on their health and the health of others. Being unaware of one's HIV status can lead to the lack of effective preventive measures such as proper condom use and the use of disposable syringes and needles among IVDUs, which poses a risk for their partners and other needle sharers (Unnikrishnan, Mithra, T, & B, 2010).

2.4.1 Attitude of the Family and Friends towards PLHA

PLHAs have constant and daily interaction with their family members, friends and neighbors, who provide an important source of emotional and practical support. However, the family members also experience similar maltreatment, such as stigma and isolation. In addition, many people believe that an infected HIV individual may put their family members at risk. Therefore, implications are present towards the attitude of family members who provide care and support for the HIV infected individual (Premilla D'Cruz, 2003). A study conducted in an urban setting in Mumbai and Bengaluru, India showed that blame, transmission misconceptions, symbolic stigma and negative feelings toward PLHA were significantly associated with both stigma and discrimination (Ekstrand,

Bharat, Ramakrishna, & Heylen, 2011). Furthermore, comprehensive knowledge on HIV

transmission and attitudes toward PLHAs are significant factors related to deciding

whether PLHAs receive support and care from their immediate social environment.

People living with HIV face many psychological disorders such as depression, anxiety,

and suicidal ideation. Therefore, the attitudes of a PLHA's family members and friends

play an important role in the psychological status of the HIV infected individual

(Chandra, Ravi, Desai, & Subbakrishna, 1998). Lastly, the involvement of family

members in HIV care could result in proper adherence to ART and other HIV treatment

and prevention methods (Kumarasamy et al., 2005).

2.4.2 Attitude of the General Public towards HIV/AIDS

Inaccurate information on HIV transmission could lead to misperceptions about

the personal risks of disease transmission. These false perceptions can lead to stigma

associated with PLHAs and the general population (Unnikrishnan, Mithra, T, & B, 2010;

"HIV AIDS Stigma: Welcome to HIV AIDS Stigma," n.d.). In India, stigma is an

important factor in regards to HIV response. Furthermore, HIV interventions and policies

should promote an increase in positive opinions about the disease to ensure the

psychological well-being of PLWHs. In addition, it would increase the safety and security

of PLWHs to disclose their HIV serostatus. One study reported that although experiences

of discrimination were relatively infrequent, perceptions of high levels of stigma were

often shaped by stories of discrimination against other HIV-infected individuals.

Therefore, it led people to avoid the disclosure of their HIV serostatus (Steward et al.,

2008; Steward et al., 2008).

Due to the stigma and discrimination associated with HIV, HIV positive women in India are not only facing a life-threatening disease, but also embarrassment associated with the stigma (J. Cohen, 2004). Although there is HIV related education present in the country, the general public continues to discriminate by showing less empathy for people who acquire HIV infection through sexual routes such as married women and FSW and intravenous drug injection. The stigma can cause people to avoid HIV related services, such as counseling, testing, diagnosis, treatment and care, and dissemination of HIV related messages. Since the beginning of the HIV epidemic, which was 25 years ago, stigma continues to be a barrier to prevention and care ("HIV AIDS Stigma: Welcome to HIV AIDS Stigma," n.d; Granich et al., 2009). Although NACO provides free first-line ART at government centers for the PLHA, a study conducted in Chennai, India found that the attitude of people toward FSWs, who are seropositive, is a barrier to ART access for FSWs living with HIV. In addition, there are other attitude related barriers in HIV prevention and treatment efforts. For example, as a result of the stigma and discrimination associated with negative attitudes towards PLHA, people are afraid to disclose their HIV status. Other examples are lack of family support, negative experiences with healthcare providers and lack of adequate knowledge about ART. (Venkatesan Chakrapani, Peter A. Newman, Murali Shunmugam, Kurian, & Robert Dubrow, 2009) The attitude towards PLHA varies among different study groups. For example, a study conducted on the knowledge and attitude among auto-rickshaws drivers in Maharashtra showed that over 53% of them would not avoid a person with HIV and about 70% would remain friendly with PLHAs (Chaudhary, Nagargoje, Kubde, Bhardwaj, & R. Singh, 2011). Another study on the attitude regarding PLWAs among

pregnant women in New Delhi showed that 29% of the participants believed individuals with HIV shouldn't be allowed to get married, while 31% said that they should not be allowed to have children (Rahbar, Garg, Tripathi, Gupta, & M. M. Singh, 2007; Rahbar, Garg, Tripathi, Gupta, & M. M. Singh, 2007).

2.5 Behaviors

HIV transmission in India mainly occurs through the sexual route. In addition, 90% of the population that are newly infected with HIV is believed to be transmitted through unprotected sex. However, more than 90% of women are HIV infected through sexual transmission from their husbands or intimate partners who may be an IDU, FSW, or MSM (USAID Health: HIV/AIDS, Countries- India, n.d.). Therefore, safer sexual practices and proper behavior among people living with HIV are significant measures in containing the sexual transmission of HIV in India.

2.5.1 Condom Using Behavior

Many people living with HIV in developed countries adopted safer sex practices after discovering their HIV positive serostatus. To raise awareness, testing, and behavior change, such as the increase and consistent use of condoms, targeted program interventions have been implemented in India. As a result, prevalence trends have shown a decline in the areas where these programs have greater outreach and broader coverage. The 2009 Behavioral Surveillance Survey conducted in the 5 high prevalence states of India shows increasing trends of positive behavior change, such as consistent condom use, among MSMs and FSWs. In addition, the 2010 UNAIDS report shows a more than 75% increase in condom use among men and women during their last higher-risk sex (USAID Health: HIV/AIDS, Countries- India, n.d.). However, in a study conducted in

Mumbai, India, consistent condom use during receptive anal sex in the past six months was found to be low among MSMs. In addition, many MSMs were found to be married or were having sex with other females. The study also highlighted that many of the MSMs may act as a "bridge population" (Jerajani et al., 2006). Another study conducted in India, showed that one third of the studied men and one fourth of studied women did not consistently use condoms with their regular sexual partners. High- risk sexual behaviors among HIV positive injecting drug users and prisoners were also documented (V. Chakrapani et al., 2010). In addition, female sex workers are vulnerable to HIV because they may be subjected to violent sex and may not be able to negotiate for condom use. This mainly occurs through sex trafficking of females from Bangladesh and Nepal to India (USAID Health: HIV/AIDS, Countries- India, n.d.). Therefore, the awareness of the association between HIV serostatus and HIV related knowledge, attitude and behavior among populations living in the high prevalence states in India may aid in the formulation of HIV prevention strategies and policymaking.

2.5.2 Number of Sex Partners

The structure of social networks plays an important role in the dynamics of disease propagation. In addition, the number of sexual partners plays an important role in HIV transmission (Vieira, Cheng, Harper, & Senna, 2009). The mean number of sexual partners for men who ever had sex is highest among never married men which was 2.5 and men who have been married more than once was 2.3 ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.). Women in India account for about 39% of HIV infections. In addition, the majority of women in Asia acquire HIV infections from their partners who are either IVDUs or the clients of sex workers.

According to Indian government researchers, nearly 90% of those who tested positive at ANC were in a monogamous relationship (UNAIDS, 2010). In contrast, males have a higher number of sexual partners than females. Studies have shown that clients of FSWs have a large number and variety of sexual partners. Furthermore, they have infrequent condom use and act as a significant bridge group for transmitting HIV and other STIs to the general population (Subramanian et al., 2008). Another study, conducted among HIV-infected women in south India, also showed a similar result. For example, the majorities of women were having a heterosexual relationship and had a history of monogamy. Therefore, their risk of HIV infection is inextricably linked to the behavior of their husband (Newmann et al., 2000).

Conclusion

HIV related knowledge, attitudes and their behaviors among different states of India vary due to India's diverse languages, distinct caste system and various cultures and beliefs. These factors also have an influence over access to health information and services. Therefore, knowing the association between demographics factors, serostatus and HIV related knowledge, attitudes and behaviors among people living in high HIV prevalent states will be helpful in planning and monitoring HIV prevention and care programs.

Millennium Development Goals (MDGs) for HIV/AIDS are set as a global effort to halt and reverse the epidemic of HIV. To achieve these goals, different countries have initiated programs that are targeted to increase HIV awareness and to provide prevention services and care for people living with HIV. In 1987, India launched a National AIDS Control Programme to co-ordinate national responses. NACO (the National AIDS

Control Organization) was set up in 1992 to oversee the HIV/AIDS related policies

formulation, prevention work and control programmes. The government of India

launched a Strategic Plan, the National AIDS Control Programme (NACP) for HIV

prevention in 1992, the second phase (NACP II) in 1999 and third phase (NACP III) in

2007 (AVERT - HIV and AIDS in India, n.d.). Knowing the association between different

demographic characteristics and the HIV related knowledge, attitude, and behaviors of

the people would be helpful to tailor these programs to meet the needs of the community

and for more effective prevention and containment of the HIV epidemic.

CHAPTER III

METHODS AND PROCEDURES

3.1 Background

This study was conducted to examine the association between HIV related knowledge, attitudes, and behaviors and HIV infection status in five High HIV Prevalence States in India (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu). In addition, the association between HIV related knowledge, attitudes and behaviors and relevant demographic characteristics were also examined. The participants in this study were limited to men and women who had completed the survey interview and who were tested for their HIV serostatus. A total of 27,885 men and 29,697 women were included in this study. The independent variables used for this study were age, current marital status, type of place of residence, highest education level, religion, standard of living index, wealth index, type of caste or tribe, and HIV serostatus. HIV related knowledge, attitudes and behavior were the dependent variables. This study was approved by the Georgia State University Institutional Review Board (IRB) on March 16, 2011.

3.2 Data Source

The data used for this study was taken from Demographic and Health Surveys (DHS) phase V, collected for India 2005 – 2006. DHS provides assistance to government and private agencies in developing countries with efforts to conduct national sample surveys on population and maternal and child health, gender, HIV/AIDS, malaria, and

nutrition. Since the program was established in 1984, DHS has provided technical assistance in over 85 countries for the implementation of more than 240 surveys, including HIV testing in more than 30 countries ("MEASURE DHS : About Measure DHS - Overview," n.d.).

3.2.1 Sample Design

Within each state in India, the urban and rural samples were drawn separately and, the sample within each state was allocated proportionally to the size of the state's urban and rural populations. The sample design in all states was uniform. In each state, the rural samples were selected in two stages. The 2001 Census list of villages served as the sampling frame in rural areas. In the first stage, villages, the primary sampling units (PSUs), were selected with probability proportional to population size (PPS). In the second stage, the random selection of households within each PSU was done. The urban samples were selected with a three-stage procedure. The 2001 Census list of wards served as the sampling frame in urban areas. In the first stage, wards were selected with PPS sampling. In the second stage, one census enumeration block (CEB) was randomly selected from each sample ward. In the third stage, households were randomly selected within each selected CEB (DHS 2005-2005, National Family Health Survey – NFHS-3, 2005-2006). DHS used a representative probability sampling to select 109,041 households nationwide that covered all 29 states in India. Overall, 124,385 women age 15-49, and 74,369 men age 15-54 were included in the sample that covered 99 percent of India's population living in all 29 states. DHS India data 2005-2006 provides HIV prevalence estimates for adult men and women at the national level for five high HIV prevalence states (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu)

and Uttar Pradesh ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.).

The survey collected a wide range of demographic, knowledge, attitudinal, behavioral data, and HIV serostatus. There are three core questionnaires in DHS surveys: a household questionnaire, a women's questionnaire, and a male questionnaire. Variables used in this study were derived from various sections of these questionnaires, such as background characteristics (age, education, religion, etc.), reproductive history, marriage and recent sexual activity, knowledge about HIV/AIDS and other sexually transmitted diseases, and husband's background and respondent's work. After selecting variables of interest from the male and female datasets, the male recode dataset and the female recode dataset were merged with the HIV data set respectively and then restricted to the five high HIV prevalence states in India. Male files, female files and HIV files were merged finally and some of the analyses were conducted with gender stratification.

The DHS data files were in English language and contained non-identified standardized individual records for males and females, couples, households, births, children, and HIV status. The original female file, unrestricted to those who were tested for HIV and who reside in the 5 high prevalence states, contained information on 124,385 women of reproductive age (15 to 49 years old) interviewed from all 29 states and the male file contained records for 74,369 men age 15 to 54 years old. Overall, 102,946 women and men throughout India were tested for HIV serostatus ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.). For the purpose of this study, 46,484 men aged 15 to 54 years old and 94,688 women aged 15 to

49 years old were removed from the primary male and female files respectively and the completed merged data set consisted of 27,885 males and 29,697 females.

3.3 Independent Variables

DHS used standard model questionnaires to collect data. The participants were asked for the demographic information such as age, type of place of residence, highest education level, religion, current marital status, standard of living index, wealth index, and type of caste or tribe. These variables are used as independent variables in this study. HIV serostatus obtained from the HIV/Other Biomarkers dataset is also used as an independent variable.

3.3.1 Age

The data for age was collected with the questions "In what month and year were you born?" and "How old were you at your last birthday?" and the answers from these 2 questions were compared and corrected if there was any inconsistency. The age range of males in the study was 15 to 54 years and that of the range for females was 15 to 49 years. Age was categorized as "15 to 19 years", "20 to 24 years", "25 to 29 years", "30 to 39 years", "40 to 49 years" and "50 to 54 years" groups.

3.3.2 Marital Status

The data for marital status was collected with the question, "What is your marital status now?" The options for this question were, "Never married [includes: married gauna not performed]", "Married", "Living together", "Widowed", "Divorced", and "Not living together". This variable was recoded into 3 categories as "Never married [includes: married gauna not performed]", "Married/Living together", and "Widowed/Divorced/Not living together".

3.3.3 States

The DHS data for India provides national and state estimates of health related information (such as fertility, family planning), the quality of health and family welfare services, and socioeconomic conditions of 33 States in India. This study focuses on 5 States which include Manipur, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu. These 5 states were selected as these are states with the highest HIV prevalence in India ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.).

3.3.4 Education Level

Highest education level attended used by DHS is a standardized variable that provides level of education based on the following questions: "Have you ever attended school?" with the answers as "Yes" or "No" and "What is the highest level of school you attended". The categories were "No education", "Incomplete Primary", "Complete Primary", "Incomplete Secondary", "Complete Secondary", and "Higher". The education level used in this study was based on the following categories: "No Education", "Primary", "Secondary" and "Higher".

3.3.5 Wealth Index

"The Wealth Index is a composite measure of the cumulative living standard of a household. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities. Generated with a statistical procedure known as principal components analysis, the Wealth Index places individual households on a continuous scale of relative wealth" ("MEASURE DHS: Topics - Wealth/Socioeconomics: Methodology," n.d.). Wealth index is further

categorized into "Poorest", "Poorer", "Middle", "Richer", and "Richest" which is then recoded into three categories as "Poor", "Middle", and "Rich".

3.3.6 Religion

The religion of the participant was coded as "Hindu, Muslim, Christian, Sikh, Buddhist/Neo-Buddhist, Jain, Jewish, Parsi/Zoroastrian, No religion, Donyi polo, and other" and was recoded into the following 3 categories: "Muslim", "Hindu", and "Others (mainly Christian)".

3.3.7 Type of Caste or Tribe

The modern caste system of India is comprised of "Scheduled Castes", "Scheduled Tribes" and "Other Backward Classes (OBC)" and all of them are entitled to positive discrimination. That is, this caste system is officially documented by the Government of India to determine reservation for education and jobs for those considered deserving. "Schedule Castes" includes communities who were "untouchables" and called themselves "Dalit". "Scheduled tribes" generally consists of tribal groups who did not accept the caste system and prefer to reside in the mountains, forests or jungles of India. They are also known as Adivasi or Aboriginals. "Other Backward Classes" comprise about 50% of Indian population and includes varieties of different castes ("Caste system in modern India," n.d.). In DHS, the data on type of Caste or Tribe has been collected as "Scheduled Castes", "Scheduled Tribes", "Other Backward Classes", "None of them", and "Don't know". "None of them" and "Don't know" were recoded into "Others" in this study.

3.3.8 Standard of Living Index (SLI)

Standard of living index is a measure of socioeconomic characteristics of households developed based on household access to basic amenities and ownership of durable consumer goods. Basic amenities include floor materials, toilet facilities, drinking water, and electricity. Each of the amenities and goods are assigned values based on their economic value and how much benefit they are to health. Each household can be ranked from a minimum score of 0 to maximum assigned score of 12. Then the scores on the SLI can be classified in five categories as: Low SLI if the score is less than 3; Medium Low SLI if the score is between 3 and less than 6; Medium SLI if the score is between 6 and less than 8; Medium High SLI if the score is between 8 and less than 10; and High SLI if the score is equal to 10 or higher. DHS recoded SLI into Low, Medium and High (Ayad, Barrere, & Otto, 1997).

3.3.9 HIV Serostatus

The DHS HIV testing protocol provides for anonymous, informed, and voluntary testing of women and men, usually age 15-49. The educational materials and referral fee for testing and counseling were provided to all the respondents. The DHS testing protocol undergoes India ethical review before DHS conducts HIV testing. Health coordinators who supervise the data collection for bio-markers were also given training on different topics including ethical requirements and biohazard waste disposal.

Three to five blood spots from a finger prick were collected on filter paper cards. The blood spots on filter paper cards were dried overnight in special drying boxes and the packaged filter paper cards were delivered to SRL Ranbaxy blood collections centers (now known as "Super Religare Laboratories") throughout the country. They were then

shipped by courier from the blood collection centers to the SRL Ranbaxy laboratory in Mumbai for HIV testing. The laboratory protocol includes an initial ELISA test, and then retesting of all positive tests and 5-10 percent of the negative tests with a second ELISA. For those with discordant results on the tow ELISA tests, a new ELISA or a Western Blot is performed ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d; "MEASURE DHS: Topics - HIV Prevalence: HIV Prevalence Testing in Population-Based Surveys, HIV Testing Protocol," n.d.).

HIV testing was made anonymous by using a bar code label with randomly generated numbers that was pasted on the filter paper sample and on the questionnaires. The information obtained from interviews and HIV results could still be linked. Then, the original cluster and household identifiers were replaced in the data set by randomly generated cluster and household numbers to preserve the anonymity. Respondents were not given the HIV test results since the protocol design was to keep the survey staff blinded to the HIV status of individual participants ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.). DHS coded the result of the blood test as "HIV negative", "HIV positive", "HIV2 positive", or "HIV1 & HIV2 positive" (DHS 2005-2006). In this study, the results are recoded into "HIV positive" and "HIV negative" irrespective of the type of the HIV strain.

3.4 Dependent Variables

HIV related knowledge, comprehensive knowledge of HIV prevention and transmission, HIV related attitudes, having accepting attitudes towards people living with HIV and HIV related risky behaviors were the dependent variables in this study. They are computed by including the relevant variables from the datasets.

The answers were recoded into "0" if a response reflected incorrect knowledge on a specific HIV related question and recoded into "1" if the response reflected correct knowledge. A total score based on all 10 questions was computed by adding the recoded responses to the ten items. The total score was recoded to reflect low HIV related knowledge if the total score was between 0 and 5, and high HIV related knowledge if the total score was between 6 and 10.

3.4.2 Comprehensive Knowledge of HIV Prevention and Transmission

Respondents with comprehensive knowledge say that "using condom for every act of sexual intercourse and having just one uninfected faithful partner can reduce the chance of getting HIV/AIDS", and say that "a healthy-looking person can have HIV/AIDS", and reject the two most common misconceptions about HIV transmission: "HIV can be transmitted by mosquito bites"; and "HIV can be transmitted by sharing foods."

The dependent variable "Comprehensive knowledge of HIV prevention and transmission" is computed by using the answers to the following 5 questions.

1. In your opinion, can people reduce their chances of getting HIV/AIDS by using a condom every time they have sex?

2. In your opinion, can people reduce their chances of getting HIV/AIDS by having just one uninfected sex partner who has no other sex partners?

3. Is it possible for a healthy-looking person to have HIV/AIDS?

4. In your opinion, can people get HIV/AIDS from mosquito bites?

5. In your opinion, can people get HIV/AIDS by sharing food with a person who has

AIDS?

The answers were recoded into "0" if they don't have correct knowledge on the specific HIV related question and recoded into "1" if they did have correct knowledge. The participant is considered as "having Comprehensive knowledge of HIV prevention and transmission" if the participant gave correct answers to all 5 questions. If not, it is recoded as "Not having Comprehensive knowledge of HIV prevention and transmission".

3.4.3 Attitude towards People Living with HIV and Other HIV related Attitudes

3.4.3.1 HIV related attitudes (Total attitudes composite score on 7 different attitudes related Indicators)

The variable on HIV related attitudes was created based on the responses to the following 7 questions from the DHS questionnaire.

1. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this

person had HIV/AIDS?

2. If a member of your family got infected with HIV/AIDS, would you want it to remain

a secret or not?

3. If a relative of yours became sick with the HIV/AIDS, would you be willing to care for

her or him in your own household?

4. In your opinion, if a female teacher has HIV/AIDS but is not sick, should she be

allowed to continue teaching in the school?

5. In your opinion, if a male teacher has HIV/AIDS but is not sick, should he be allowed

to continue teaching in the school?

6. Should boys be taught in school about HIV/AIDS?

7. Should girls be taught in school about HIV/AIDS?

For each variable, the answers that show a negative attitude are coded into "0" and those that show a positive attitude are coded into "1". The total score for attitude towards people living with HIV and other HIV related attitudes was then calculated. Then the variable is divided into 2 categories as "Negative attitude" if the total attitude score is at or below the 50th percentile (i.e., 0 to 3), and "Positive attitude" if the total attitude score is beyond the 50th percentile (i.e., 4 to 7).

3.4.3.2 Accepting Attitudes towards People Living with HIV/AIDS

The variable on accepting attitude towards people living with HIV is created based on the following 4 questions from the DHS questionnaire.

1. If a relative of yours became sick with the HIV/AIDS, would you be willing to care for her or him in your own household?

2. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV/AIDS?

3. In your opinion, if a female teacher has HIV/AIDS but is not sick, should she be allowed to continue teaching in the school?

4. If a member of your family got infected with HIV/AIDS, would you want it to remain a secret or not?

For each question, the answers that show a negative attitude are coded into "0" and those that show a positive attitude are coded into "1". The participant is considered as "Accepting attitudes towards those living with HIV/AIDS" if the participant gives answers that show positive attitudes to all 4 attitude related questions. If not, it is recoded as "Not having Accepting attitudes towards those living with HIV/AIDS".

3.4.4 HIV Related Risk Behaviors

HIV related risk behaviors in this study was assessed by combining the scores on different variables such as whether condom is used in the last sex or not, relationship with last sexual partner, number of sex partners in last 12 months, number of unions in last 12 months and age at first sex (age of sexual debut). Whether the person had sexually transmitted infection or ulcer or abnormal genital discharge in last 12 months is also included as a proxy indicator.

Data on age of sexual debut was derived from the question "How old were you when you had sexual intercourse for the very first time?". The variable is categorized into two groups. The median age of sexual debut is taken as the cut point for this category and it is 19 years for males and 16 years for females. Therefore, the categories for men are "age at first sex at age 19 and below" and "age of first sex over age of 19" and that of women are "age at first sex at age 16 and below" and "age of first sex over age of 16".

The proxy measure of the behavior, i.e., whether the person had STI in last 12 month is measured either if the person answer that s/he had an STI or abnormal genital discharge or ulcer. The behavior related questions asked for these are "During the last 12 months, have you had a disease which you got through sexual contact?", "Sometimes women experience a bad smelling abnormal genital discharge. During the last 12 months, have you had a bad smelling abnormal genital discharge?", "Sometimes women have a genital sore or ulcer. During the last 12 months, have you had a genital sore or ulcer?" Other questions used for this variable, HIV related risk behaviors, are:

1. The last time you had sexual intercourse (with this other person), was a condom used?

2. What was this person's relationship to you?

3. In total, with how many different people have you had sexual intercourse in the last 12 months?

4. Have you been married or lived with a man only once or more than once?

Each variable is recoded into "0" as risky HIV related behavior and "1" as less risky HIV related behavior. The total score for all 6 variable is then calculated and then recoded into "More risky behaviors" if they score 50% or less, and "Less risky behaviors" if they score more than 50%.

3.5 Statistical Analyses

The statistical software PASW (SPSS) version 18 was used to truncate the original data from DHS, organize and run the statistical analyses. Characteristics of the study population were compared between males and females. The dependent and independent variables used in this study are all categorical variables. Descriptive analyses were performed and the data presented in frequencies and percentage. The distribution of the dependent variables, HIV related knowledge, attitudes and behaviors, was examined according to the demographic variables via cross- tabulation tables and chi-square statistics. The degree of association among each individual independent variable and dependent variable was assessed by odds ratios which were obtained by using univariate and multivariate logistic regression analyses. A p-value of <0.05 and 95% confidence intervals were used to determine the presence of statistical significance in all the analyses performed. Multivariate logistic regression was conducted to control for confounders.

3.6 Human Subjects Consideration

This study was approved by the Georgia State Institutional Review Board (IRB) with   exempt status on March 16, 2011 and the IRB protocol number is H11400. The study involves secondary analysis of data collected through the measure Demographic

and Health Survey (DHS). DHS data are nationally-representative households surveys

that provide data for a wide range of monitoring and impact evaluation indicators in the

areas of population and maternal and child health, gender, HIV/AIDS, malaria, and

nutrition. All data sets made available have been de-identified.

CHAPTER IV

RESULTS

The male and female files were combined and descriptive analysis, and demographic distributions of knowledge of HIV, attitudes and behaviors were analyzed with gender stratification. Total sample size of the females was 52,853 after combining the females and HIV databases and that of males was 50,093 after combining the male and HIV databases. This study was further restricted to only those who were tested for HIV serostatus. In addition, the sample size was further reduced to 29,697 females and 27,885 males after restricting the data to 5 high prevalence states of India (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu). Mean age of the male respondents was 31 years and that of females was 30 years. The proportion of males according to different age groups and that of females did not vary much and were comparable. The majority of the sample, 69.8% of females and 60.3% of males, were Married/Living together. Of the entire study sample, 0.6% of females and 0.9% of males were HIV positive. The age group most affected was the 30-39 yrs. old group accounting for about 41.7% of HIV positive females and 44.8% of the HIV positive males. There was not much difference in urban and rural distributions of the study population with 55% and 56.6% of females and males, respectively, living in urban locations. Approximately 48.6% of females and 56.5% of the males have secondary education level. More than a quarter of females, 25.5%, have no education which is significantly higher than that of males which is 11.5%. The majority of the study sample reported

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Hindu as their religion, 77.3% of females and 78.2% of males. More than half (57.7% of

females and 59.1% of males) were rich in terms of wealth index and had a high standard

of living index. More than 2/5 (43.1% of females and 44.7% of males) were from "other

backward class (OBC)". OBC represents the highest proportion in the national data as

well. The study sample was more or less equally distributed in the five high prevalence

study states. Table 4.1 provides detailed information about the demographic

characteristics of the sample by gender.

Table 4.1: Demographic and descriptive characteristics of study population

Variables	Female		Male	
	n	Percentage (%)	n	Percentage (%)
Age	29,697		27,885	
15-19 Yr.	5,163	17.4	4,352	15.6
20-24 Yr.	5,449	18.3	4,833	17.3
25-29 Yr.	5,035	17.0	4,185	15.0
30-39 Yr.	8,362	28.2	7,230	25.9
40-49 Yr.	5,688	19.2	5,496	19.7
50-54 Yr.	NA	NA	1,789	6.4
Marital status	29,697		27,885	
Never married	7,184	24.2	10,787	38.7
Married/Living together	20,738	69.8	16,811	60.3
Widowed/Divorced/Not living together	1,775	6.0	287	1.0
HIV serostatus	29,697		27,885	
HIV negative	29,529	99.4	27,646	99.1
HIV positive	168	0.6	239	0.9
Residence	29,697		27,885	
Rural	13,365	45.0	12,109	43.4
Urban	16,332	55.0	15,776	56.6
Education level	29,696		27,877	
No education	7,580	25.5	3,201	11.5
Primary	4,314	14.5	4,299	15.4
Secondary	14,429	48.6	15,761	56.5
Higher	3,373	11.4	4,616	16.6

Table 4.1: Demographic and descriptive characteristics of study population (Cont.)

Variables	Female		Male	
	n	**Percentage (%)**	**n**	**Percentage (%)**
Religion	29,684		27,882	
Muslim	3,378	11.4	2,966	10.6
Hindu	22,950	77.3	21,809	78.2
Other (Mainly Christian)	3,356	11.3	3,107	11.1
Standard of living index	28,158		26,776	
Low standard of living index	4,467	15.9	3,794	14.2
Medium standard of living index	9,052	32.1	8,665	32.4
High standard of living index	14,639	52.0	14,317	53.5
Wealth index	29,697		27,885	
Poor	5,696	19.2	5,031	18.0
Middle	6,863	23.1	6,384	22.9
Rich	17,138	57.7	16,470	59.1
Caste	29,213		27,328	
Scheduled caste	5,002	17.1	4,736	17.3
Scheduled tribe	2,273	7.8	2,136	7.8
Other backward caste	12,595	43.1	12,202	44.7
Others	9,343	32.0	8,254	30.2
States	29,697		27,885	
[MN] Manipur	4,318	14.5	3,675	13.2
[MH] Maharashtra	7,841	26.4	7,691	27.6
[AP] Andhra Pradesh	6,502	21.9	6,432	23.1
[KA] Karnataka	5,367	18.1	4,753	17.0
[TN] Tamil Nadu	5,669	19.1	5,334	19.1

Table 4.2: Frequencies and percents for sexual activity variables by gender.

Variables	Females		Males	
	n	Percentage (%)	n	Percentage (%)
Number of unions	22,510		17,074	
More than once	317	1.4	711	4.2
Once	22,193	98.6	16,363	95.8
Recent sexual activity	29,654		27,844	
Never had intercourse	7,174	24.2	9,767	35.1
Active in last 4 weeks	15,207	51.3	13,141	47.2
Not active in last 4 weeks	7,273	24.5	4,936	17.7
Age of sexual debut	29,095		27,873	
Never had sex	7,174	24.7	9,767	35.0
Late sexual debut	13,408	46.1	14,287	51.3
Early sexual debut	8,513	29.3	3,819	13.7

Table 4.2 provides frequencies and percents for the sexual activity variables by gender. About 75% of the females and 65% of the males in the study sample were sexually active. About half of the study population (51.3% of the females and 47.2% of the males) had been sexually active in the last 4 weeks. The proportion of females who never had sex (24.7%) was significantly lower than that of the males (35%) and, in addition, a significantly higher proportion of females (29.3%) had early sexual debut compared to males (13.7%). The majority of the study sample (98.6% of females and 95.8% of males) indicated having had only one union in their life. The distributions of these variables across gender were significant at $p < 0.01$ level.

Table 4.3: Distributions of knowledge, attitudes, and behavior by gender

Variables	Females		Males	
	n	Percentage (%)	n	Percentage (%)
HIV related knowledge	20,855		21,337	
Low HIV related knowledge	4,912	23.6	1,910	9.0
High HIV related knowledge	15,943	76.4	19,427	91.0
Comprehensive knowledge*	25,411		26,309	
Doesn't have comprehensive knowledge	18,023	70.9	14,477	55.0
Have comprehensive knowledge	7,388	29.1	11,832	45.0
HIV/AIDS related attitudes	25,367		20,487	
Negative attitude	5,566	21.9	668	3.3
Positive attitude	19,801	78.1	19,819	96.7
Accepting attitudes towards PLHA**	25,404		26,318	
Doesn't have accepting attitudes towards PLHA	17,554	69.1	17,040	64.7
Have accepting attitudes towards PLHA	7,850	30.9	9,278	35.3
HIV related risk behaviors	18,968		15,975	
More risky behavior	476	2.5	391	2.4
Less risky behavior	18,492	97.5	15,584	97.6

* Comprehensive knowledge of HIV prevention and transmission
** People living with HIV/AIDS

Table 4.3 shows distributions of knowledge, attitude and behavior by gender. The majority of the study sample (76.4% of females and 91% of males) had high HIV related knowledge. In contrast, when analyzing the comprehensive knowledge on HIV prevention and transmission, the result was opposite with the higher proportion not having comprehensive knowledge on HIV prevention and transmission (70.9% of females and 55% of males). The proportion of males having higher related knowledge or

having comprehensive knowledge on HIV prevention and transmission was greater than that of the females. The results were statistically significant at a p< 0.01 level.

Similarly, majorities of the study sample (78.1% of females and 96.7% of males) show positive attitudes but a lower proportion of females (30.9%) and males (35.3%) show all 4 accepting attitudes towards people living with HIV. The proportion of males showing positive HIV related attitudes is higher than that of the females (p <0.01).

The proportion of males and females who show high risk behavior in the study population is very low 2.5% among females and 2.4% among males. In other words, about 97.5% of both females and males have shown the less risky behavior. Males and females do not statistically differ.

Table 4.4: Demographic distribution of HIV related knowledge by gender

Variables	Females		Males	
	Low HIV related knowledge	High HIV related knowledge	Low HIV related knowledge	High HIV related knowledge
Residence				
Rural	30.2	69.8	12.8	87.2
Urban	19.2	80.8	6.3	93.7
Education level				
No education	45.7	54.3	28.9	71.1
Primary	39.0	61.0	19.6	80.4
Secondary	18.7	81.3	6.8	93.2
Higher	4.4	95.6	1.1	98.9
Religion				
Muslim	22.4	77.6	8.0	92.0
Hindu	25.0	75.0	9.6	90.4
Other (Mainly Christian)	16.3	83.7	5.6	94.4
Marital status				
Never married	17.3	82.7	6.3	93.7
Married/Living together	25.3	74.7	10.7	89.3
Widowed/Divorced/Not living together	34.3	65.7	15.1	84.9
Standard of living index				
Low standard of living index	45.7	54.3	19.6	80.4
Medium standard of living index	30.7	69.3	12.4	87.6
High standard of living index	16.4	83.6	5.1	94.9
Wealth index				
Poor	45.3	54.7	18.9	81.1
Middle	31.2	68.8	12.8	87.2
Rich	16.9	83.1	5.4	94.6

Table 4.4: Demographic distribution of HIV related knowledge by gender (Cont.)

Variables	Females		Males	
	Low HIV related knowledge	High HIV related knowledge	Low HIV related knowledge	High HIV related knowledge
Caste				
Scheduled caste	29.1	70.9	11.5	88.5
Scheduled tribe	25.9	74.1	10.5	89.5
Other backward caste	28.7	71.3	10.5	89.5
Others	15.0	85.0	5.5	94.5
Age				
15-19 Yr	23.1	76.9	8.5	91.5
20-24 Yr	20.0	80.0	6.6	93.4
25-29 Yr	21.6	78.4	7.8	92.2
30-39 Yr	24.4	75.6	8.5	91.5
40-49 Yr	28.6	71.4	12.0	88.0
50-54 Yr	NA	NA	12.7	87.3
States				
[MN] Manipur	7.1	92.9	2.4	97.6
[MH] Maharashtra	15.4	84.6	4.6	95.4
[AP] Andhra Pradesh	28.3	71.7	12.1	87.9
[KA] Karnataka	27.2	72.8	11.6	88.4
[TN] Tamil Nadu	41.2	58.8	14.2	85.8

Table 4.4 shows the demographic distribution of HIV related knowledge by gender. The proportion of people who have higher HIV related knowledge increases as they have higher education. And the opposite is true. That is, the higher the educational level, the smaller the percentage of people with low HIV related knowledge. The proportion of people who have higher HIV related knowledge increases as they have higher standard of living index and wealth index and the opposites are true. Manipur has highest proportion of people with higher HIV related knowledge. The results in table 4.4 are statistically significant at $p < 0.01$ level.

Table 4.5: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender

Variables	Females		Males	
	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	Doesn't have comprehensive knowledge	Have comprehensive knowledge
Residence				
Rural	79.3	20.7	62.0	38.0
Urban	65.1	34.9	50.1	49.9
Education level				
No education	89.9	10.1	83.3	16.7
Primary	86.2	13.8	75.0	25.0
Secondary	67.4	32.6	52.7	47.3
Higher	41.3	58.7	30.8	69.2
Religion				
Muslim	67.9	32.1	61.7	38.3
Hindu	72.3	27.7	55.3	44.7
Other (Mainly Christian)	65.4	34.6	46.6	53.4
Marital status				
Never married	63.8	36.2	50.1	49.9
Married/Living together	72.9	27.1	58.3	41.7
Widowed/Divorced/Not living together	80.6	19.4	59.2	40.8
Standard of living index				
Low standard of living index	89.0	11.0	73.0	27.0
Medium standard of living index	80.5	19.5	63.0	37.0
High standard of living index	61.9	38.1	46.4	53.6
Wealth index				
Poor	88.9	11.1	73.0	27.0
Middle	80.2	19.8	63.7	36.3
Rich	63.5	36.5	47.1	52.9

* Comprehensive knowledge of HIV prevention and transmission

Table 4.5: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender (Cont.)

Variables	Females		Males	
	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	Doesn't have comprehensive knowledge	Have comprehensive knowledge
Caste				
Scheduled caste	75.7	24.3	59.2	40.8
Scheduled tribe	76.9	23.1	60.2	39.8
Other backward caste	77.7	22.3	57.3	42.7
Others	59.5	40.5	49.5	50.5
Age				
15-19 Yr	71.5	28.5	55.9	44.1
20-24 Yr	67.7	32.3	50.8	49.2
25-29 Yr	67.6	32.4	51.2	48.8
30-39 Yr	71.3	28.7	55.1	44.9
40-49 Yr	76.4	23.6	59.6	40.4
50-54 Yr	NA	NA	59.9	40.1
States				
[MN] Manipur	53.3	46.7	38.4	61.6
[MH] Maharashtra	60.0	40.0	41.6	58.4
[AP] Andhra Pradesh	74.5	25.5	66.1	33.9
[KA] Karnataka	84.1	15.9	68.2	31.8
[TN] Tamil Nadu	85.8	14.2	61.9	38.1

* Comprehensive knowledge of HIV prevention and transmission

Table 4.5 shows the demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender. The proportion of people who have comprehensive knowledge on HIV prevention and transmission increases as they have higher education. And the opposite is true. That is, the higher the educational level, the smaller the percentage of people with no comprehensive knowledge on HIV prevention and transmission. The majority of the people with comprehensive knowledge on HIV prevention and transmission are in the never married category. The proportion of people

who have comprehensive knowledge on HIV prevention and transmission increases as they have higher standard of living index and wealth index and the opposites are true. Similar to high HIV related knowledge, Manipur has the highest proportion of people with comprehensive knowledge on HIV prevention and transmission. The results in table 4.5 are statistically significant at $p < 0.01$ level.

Table 4.6: Demographic distribution of HIV related attitudes by gender

Variables	Female		Male	
	Negative attitude	Positive attitude	Negative attitude	Positive attitude
Residence				
Rural	28.7	71.3	4.3	95.7
Urban	17.2	82.8	2.6	97.4
Education level				
No education	43.6	56.4	13.2	86.8
Primary	33.2	66.8	7.2	92.8
Secondary	15.6	84.4	2.2	97.8
Higher	4.3	95.7	0.5	99.5
Religion				
Muslim	21.8	78.2	2.1	97.9
Hindu	22.3	77.7	3.5	96.5
Other (Mainly Christian)	20.0	80.0	2.9	97.1
Marital status				
Never married	12.0	88.0	2.5	97.5
Married/Living together	25.2	74.8	3.8	96.2
Widowed/Divorced/Not living together	29.3	70.7	4.2	95.8

Table 4.6: Demographic distribution of HIV related attitudes by gender (Cont.)

Variables	Female		Male	
	Negative attitude	Positive attitude	Negative attitude	Positive attitude
Standard of living index				
Low standard of living index	39.2	60.8	8.5	91.5
Medium standard of living index	27.7	72.3	4.1	95.9
High standard of living index	15.0	85.0	1.9	98.1
Wealth index				
Poor	39.4	60.6	7.8	92.2
Middle	28.3	71.7	4.3	95.7
Rich	15.7	84.3	2.0	98.0
Caste				
Scheduled caste	24.4	75.6	4.3	95.7
Scheduled tribe	30.4	69.6	5.5	94.5
Other backward caste	24.2	75.8	3.3	96.7
Others	16.8	83.2	2.3	97.7
Age				
15-19 Yr	15.7	84.3	3.4	96.6
20-24 Yr	18.4	81.6	2.2	97.8
25-29 Yr	21.0	79.0	2.4	97.6
30-39 Yr	24.6	75.4	3.2	96.8
40-49 Yr	28.6	71.4	4.8	95.2
50-54 Yr	NA	NA	4.3	95.7
States				
[MN] Manipur	13.7	86.3	1.0	99.0
[MH] Maharashtra	15.2	84.8	2.6	97.4
[AP] Andhra Pradesh	29.9	70.1	4.5	95.5
[KA] Karnataka	22.4	77.6	3.3	96.7
[TN] Tamil Nadu	28.7	71.3	4.7	95.3

Table 4.6 shows the demographic distribution of HIV related attitudes by gender. The proportion of people who have positive HIV related attitudes increases as they have higher education. And the opposite is true. That is, the higher the educational level, the smaller the percentage of people with negative HIV related attitudes. The majority of the people with HIV related positive attitudes are in the never married group. The proportion of people who have HIV related positive attitudes increases as with a higher standard of living index and wealth index and the opposites are true. Similar to high HIV related knowledge, and comprehensive knowledge on HIV prevention and transmission, Manipur has the highest proportion of people with HIV related positive attitudes. The results in table 4.6 are statistically significant at $p < 0.01$ level except the distribution of HIV related attitude by religion in females which is significant at $p < 0.05$ level.

Table 4.7 shows the demographic distribution of accepting attitudes towards PLHA by gender. The proportion of people who have accepting attitudes towards PLHA increases with higher education. And the opposite is true. That is, the higher the educational level, the smaller the percentage of people who don't have accepting attitudes towards PLHA. The majority of the people who have accepting attitudes towards PLHA are in the never married category. The proportion of people who have accepting attitudes towards PLHA increases with higher standard of living index and wealth index and the opposites are true. Similar to high HIV related knowledge, and comprehensive knowledge on HIV prevention and transmission, and HIV related attitudes, Manipur has the highest proportion of people who have accepting attitudes towards PLHA. The results in table 4.7 are statistically significant at $p < 0.01$.

Table 4.7: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender

Variables	Females		Males	
	Doesn't have accepting attitudes towards PLHA*	Have accepting attitudes towards PLHA	Doesn't have accepting attitudes towards PLHA	Have accepting attitudes towards PLHA
Residence				
Rural	72.7	27.3	68.3	31.7
Urban	66.6	33.4	62.2	37.8
Education level				
No education	82.3	17.7	84.9	15.1
Primary	79.9	20.1	78.1	21.9
Secondary	64.9	35.1	62.2	37.8
Higher	55.5	44.5	51.1	48.9
Religion				
Muslim	72.3	27.7	69.1	30.9
Hindu	69.3	30.7	66.1	33.9
Other (Mainly Christian)	64.7	35.3	51.6	48.4
Marital status				
Never married	60.4	39.6	61.7	38.3
Married/Living together	71.9	28.1	66.7	33.3
Widowed/Divorced/Not living together	76.2	23.8	71.6	28.4
Standard of living index				
Low standard of living index	82.2	17.8	76.7	23.3
Medium standard of living index	73.7	26.3	70.2	29.8
High standard of living index	64.1	35.9	59.2	40.8
Wealth index				
Poor	81.8	18.2	75.8	24.2
Middle	72.6	27.4	69.1	30.9
Rich	64.9	35.1	60.2	39.8

* People Living with HIV/AIDS

Table 4.7: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender (Cont.)

Variables	Females		Males	
	Doesn't have accepting attitudes towards PLHA*	Have accepting attitudes towards PLHA	Doesn't have accepting attitudes towards PLHA	Have accepting attitudes towards PLHA
Caste				
Scheduled caste	71.4	28.6	68.1	31.9
Scheduled tribe	73.5	26.5	60.7	39.3
Other backward caste	75.5	24.5	71.3	28.7
Others	60.6	39.4	56.7	43.3
Age				
15-19 Yr	65.5	34.5	65.9	34.1
20-24 Yr	66.3	33.7	62.5	37.5
25-29 Yr	67.0	33.0	62.3	37.7
30-39 Yr	70.8	29.2	63.8	36.2
40-49 Yr	75.0	25.0	68.0	32.0
50-54 Yr	NA	NA	68.4	31.6
States				
[MN] Manipur	41.6	58.4	29.2	70.8
[MH] Maharashtra	60.1	39.9	46.5	53.5
[AP] Andhra Pradesh	82.8	17.2	85.1	14.9
[KA] Karnataka	71.2	28.8	71.1	28.9
[TN] Tamil Nadu	87.1	12.9	85.9	14.1

* People Living with HIV/AIDS

Table 4.8: Demographic distribution of HIV related risk behavior by gender

Variables	Females		Males	
	More risky behavior	Less risky behavior	More risky behavior	Less risky behavior
Residence				
Rural	3.0	97.0	3.2	96.8
Urban	2.1	97.9	1.8	98.2
Education level				
No education	4.2	95.8	4.1	95.9
Primary	3.5	96.5	3.5	96.5
Secondary	1.5	98.5	2.1	97.9
Higher	0.3	99.7	0.5	99.5
Religion				
Muslim	3.6	96.4	2.3	97.7
Hindu	2.4	97.6	2.5	97.5
Other (Mainly Christian)	2.5	97.5	2.4	97.6
Marital status				
Married/Living together	2.4	97.6	2.4	97.6
Widowed/Divorced/Not living together	11.2	88.8	15.5	84.5
Standard of living index				
Low standard of living index	4.2	95.8	4.3	95.7
Medium standard of living index	3.1	96.9	3.0	97.0
High standard of living index	1.7	98.3	1.5	98.5
Wealth index				
Poor	4.0	96.0	4.6	95.4
Middle	3.2	96.8	3.1	96.9
Rich	1.7	98.3	1.4	98.6

Table 4.8: Demographic distribution of HIV related risk behavior by gender (Cont.)

Variables	Females		Males	
	More risky behavior	Less risky behavior	More risky behavior	Less risky behavior
Caste				
Scheduled caste	3.3	96.7	3.3	96.7
Scheduled tribe	3.7	96.3	3.8	96.2
Other backward caste	2.3	97.7	2.3	97.7
Others	2.1	97.9	1.8	98.2
Age				
15-19 Yr	2.7	97.3	3.7	96.3
20-24 Yr	1.9	98.1	3.0	97.0
25-29 Yr	2.2	97.8	2.0	98.0
30-39 Yr	2.8	97.2	2.2	97.8
40-49 Yr	2.8	97.2	2.9	97.1
50-54 Yr	NA	NA	2.3	97.7
States				
[MN] Manipur	3.2	96.8	2.3	97.7
[MH] Maharashtra	2.9	97.1	2.1	97.9
[AP] Andhra Pradesh	2.8	97.2	3.9	96.1
[KA] Karnataka	1.5	98.5	2.0	98.0
[TN] Tamil Nadu	2.1	97.9	1.7	98.3

Table 4.8 shows the demographic distribution of HIV related risk behavior by gender. The proportion of people who have HIV related less risky behavior increases as they have higher education. And the opposite is true. That is, the higher the educational level, the smaller the percentage of people who have HIV related more risky behavior. The majority of the people who have HIV related less risky behavior are never married. The proportion of people who have HIV related less risky behavior increases with a higher standard of living index and wealth index and the opposites are true. The results in

table 4.8 are statistically significant at p<0.01 except the distribution of the HIV related risk behavior by religion in males and the distribution of the HIV related risk behavior by age. However, the distribution of the HIV related risk behavior by age in females is statistically significant at p <0.05 level.

Tables 4.9 to 4.13 shows the results of the univariate analyses between the selected independent variables and the dependent variables—higher HIV related knowledge, having comprehensive knowledge on HIV prevention and transmission, having HIV related positive attitudes, having positive attitudes towards PLHA, and less risky behaviors. Having high HIV related knowledge and having comprehensive knowledge were found to be significantly associated with age, education level, type of place of residence, marital status, standard of living index, and wealth index.

People living in urban areas were more likely to have higher HIV related knowledge and have comprehensive knowledge on HIV prevention and transmission. The higher the education level of the person, the more likely to have higher HIV related knowledge and have comprehensive knowledge on HIV prevention and transmission (p<0.01). Compared to never married persons, ever married persons have decreased odds of having higher HIV related knowledge and having comprehensive knowledge on HIV prevention and transmission (p<0.01). Compared to poor, wealthier people, were more likely to have higher HIV related knowledge and have comprehensive knowledge on HIV prevention and transmission (p<0.01).Similarly, people living in urban areas were more likely to have HIV related positive attitudes and positive attitudes towards PLHA. The higher the education level of the person, the more likely to have HIV related positive attitudes and positive attitudes towards PLHA (p<0.01). Compared to never married persons, ever

married persons have decreased odds of having HIV related positive attitudes and positive attitudes towards PLHA (p< 0.01). Compared to poor, wealthier people were more likely to have HIV related positive attitudes and positive attitudes towards PLHA (p<0.01). A similar pattern of findings was seen for HIV related positive attitudes and positive attitudes towards people living with HIV. There was a significant increased odds of engaging in less risky behaviors if a person had higher education compared to no education. Those categorized as richer people were more likely to engage in less risky behaviors (p<0.01).

Table 4.9: Univariate analysis of the association between selected independent variables and higher HIV related knowledge

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.25	1.15	-	1.37	<0.001	**
25-29 Yr	1.11	1.01	-	1.21	0.031	*
30-39 Yr	0.99	0.91	-	1.07	0.731	
40-49 Yr	0.79	0.72	-	0.86	<0.001	**
50-54 Yr	1.34	1.13	-	1.60	0.001	**
Residence						
Rural	1.00	Reference			Reference	
Urban	1.85	1.75	-	1.95	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.63	1.50	-	1.77	<0.001	**
Secondary	4.73	4.42	-	5.06	<0.001	**
Higher	25.85	22.13	-	30.20	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	0.90	0.82	-	0.98	0.012	*
Other (Mainly Christian)	1.48	1.32	-	1.67	<0.001	**
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.53	0.50	-	0.57	<0.001	**
Widowed/Divorced/Not living together	0.26	0.23	-	0.30	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.9: Univariate analysis of the association between selected independent variables and higher HIV related knowledge (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Standard of living index						
Low standard of living index	1.00	Reference			Reference	
Medium standard of living index	1.74	1.61	-	1.88	<0.001	**
High standard of living index	3.89	3.61	-	4.19	<0.001	**
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.62	1.50	-	1.75	<0.001	**
Rich	3.58	3.34	-	3.83	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	1.14	1.02	-	1.28	0.022	*
Other backward caste	1.06	0.99	-	1.14	0.104	
Others	2.16	2.00	-	2.35	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.48	0.42	-	0.54	<0.001	**
[AP] Andhra Pradesh	0.21	0.19	-	0.24	<0.001	**
[KA] Karnataka	0.22	0.19	-	0.24	<0.001	**
[TN] Tamil Nadu	0.13	0.12	-	0.15	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.22	0.87	-	1.72	0.257	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.10: Univariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.22	1.15	-	1.29	<0.001	**
25-29 Yr	1.20	1.13	-	1.28	<0.001	**
30-39 Yr	1.03	0.98	-	1.09	0.241	
40-49 Yr	0.85	0.80	-	0.91	<0.001	**
50-54 Yr	1.20	1.07	-	1.33	0.001	**
Residence						
Rural	1.00	Reference			Reference	
Urban	1.76	1.69	-	1.83	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.74	1.59	-	1.90	<0.001	**
Secondary	4.82	4.48	-	5.19	<0.001	**
Higher	13.09	12.04	-	14.22	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.06	1.00	-	1.12	0.051	
Other (Mainly Christian)	1.44	1.34	-	1.55	<0.001	**
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.64	0.62	-	0.67	<0.001	**
Widowed/Divorced/Not living together	0.36	0.32	-	0.41	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.10: Univariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission (Cont.)

Variables	Odds Ratio	Confidence Interval	P Value	
Standard of living index				
Low standard of living index	1.00	Reference	Reference	
Medium standard of living index	1.67	1.56 - 1.80	<0.001	**
High standard of living index	3.55	3.32 - 3.80	<0.001	**
Wealth index				
Poor	1.00	Reference	Reference	
Middle	1.62	1.52 - 1.74	<0.001	**
Rich	3.33	3.14 - 3.54	<0.001	**
Caste				
Scheduled caste	1.00	Reference	Reference	
Scheduled tribe	0.96	0.88 - 1.04	0.295	
Other backward caste	1.01	0.96 - 1.06	0.771	
Others	1.71	1.62 - 1.80	<0.001	**
States				
[MN] Manipur	1.00	Reference	Reference	
[MH] Maharashtra	0.85	0.81 - 0.90	<0.001	**
[AP] Andhra Pradesh	0.37	0.35 - 0.39	<0.001	**
[KA] Karnataka	0.28	0.26 - 0.30	<0.001	**
[TN] Tamil Nadu	0.30	0.29 - 0.32	<0.001	**
HIV Serostatus				
HIV Negative	1.00	Reference	Reference	
HIV Positive	1.14	0.92 - 1.40	0.233	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.11: Univariate analysis of the association between selected independent variables and having positive HIV related attitudes

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	0.93	0.84	-	1.03	0.143	
25-29 Yr	0.79	0.71	-	0.87	<0.001	**
30-39 Yr	0.65	0.59	-	0.71	<0.001	**
40-49 Yr	0.54	0.49	-	0.59	<0.001	**
50-54 Yr	2.60	1.94	-	3.48	<0.001	**
Residence						
Rural	1.00	Reference			Reference	
Urban	1.88	1.78	-	1.99	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.99	1.83	-	2.15	<0.001	**
Secondary	5.64	5.28	-	6.03	<0.001	**
Higher	25.99	22.09	-	30.57	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	0.99	0.91	-	1.08	0.781	
Other (Mainly Christian)	1.09	0.98	-	1.23	0.115	
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.36	0.34	-	0.39	<0.001	**
Widowed/Divorced/Not living together	0.20	0.17	-	0.22	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.11: Univariate analysis of the association between selected independent variables and having positive HIV related attitudes (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Standard of living index						
Low standard of living index	1.00	Reference			Reference	
Medium standard of living index	1.72	1.60	-	1.86	<0.001	**
High standard of living index	3.67	3.40	-	3.95	<0.001	**
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.61	1.50	-	1.74	<0.001	**
Rich	3.38	3.16	-	3.62	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.76	0.68	-	0.85	<0.001	**
Other backward caste	1.06	0.99	-	1.15	0.093	
Others	1.55	1.43	-	1.69	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.89	0.80	-	0.98	0.021	*
[AP] Andhra Pradesh	0.40	0.36	-	0.44	<0.001	**
[KA] Karnataka	0.59	0.53	-	0.65	<0.001	**
[TN] Tamil Nadu	0.39	0.35	-	0.43	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.04	0.75	-	1.43	0.814	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.12: Univariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA)

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.06	1.00	-	1.13	0.068	
25-29 Yr	1.04	0.98	-	1.11	0.182	
30-39 Yr	0.93	0.88	-	0.98	0.012	*
40-49 Yr	0.77	0.72	-	0.82	<0.001	**
50-54 Yr	0.89	0.79	-	0.99	0.040	*
Residence						
Rural	1.00	Reference			Reference	
Urban	1.32	1.27	-	1.37	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.32	1.21	-	1.43	<0.001	**
Secondary	2.85	2.67	-	3.05	<0.001	**
Higher	4.40	4.09	-	4.75	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.15	1.08	-	1.22	<0.001	**
Other (Mainly Christian)	1.73	1.60	-	1.86	<0.001	**
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.70	0.67	-	0.72	<0.001	**
Widowed/Divorced/Not living together	0.51	0.45	-	0.57	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.12: Univariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Standard of living index						
Low standard of living index	1.00	Reference			Reference	
Medium standard of living index	1.50	1.40	-	1.61	<0.001	**
High standard of living index	2.39	2.24	-	2.56	<0.001	**
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.51	1.41	-	1.62	<0.001	**
Rich	2.20	2.07	-	2.33	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	1.14	1.05	-	1.24	0.002	**
Other backward caste	0.84	0.79	-	0.89	<0.001	**
Others	1.62	1.53	-	1.71	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.50	0.47	-	0.52	<0.001	**
[AP] Andhra Pradesh	0.11	0.10	-	0.11	<0.001	**
[KA] Karnataka	0.23	0.21	-	0.24	<0.001	**
[TN] Tamil Nadu	0.09	0.08	-	0.09	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.31	1.06	-	1.62	0.011	*

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.13: Univariate analysis of the association between selected independent variables and having HIV related less risky behaviors

Variables	Odds Ratio	Confidence Interval		P Value	
Age					
15-19 Yr	1.00	Reference		Reference	
20-24 Yr	1.30	0.83 -	2.03	0.246	
25-29 Yr	1.31	0.86 -	2.01	0.210	
30-39 Yr	1.09	0.73 -	1.63	0.686	
40-49 Yr	0.96	0.63 -	1.44	0.829	
50-54 Yr	1.17	0.70 -	1.97	0.547	
Residence					
Rural	1.00	Reference		Reference	
Urban	1.62	1.42 -	1.86	<0.001	**
Education level					
No education	1.00	Reference		Reference	
Primary	1.21	1.01 -	1.43	0.035	*
Secondary	2.36	2.01 -	2.76	<0.001	**
Higher	11.33	6.86 -	18.74	<0.001	**
Religion					
Muslim	1.00	Reference		Reference	
Hindu	1.25	1.01 -	1.53	0.037	*
Other (Mainly Christian)	1.22	0.92 -	1.62	0.160	
Marital status					
Never married	1.00	Reference		Reference	
Married/Living together Widowed/Divorced/Not living together	0.17	0.12 -	0.26	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.13: Univariate analysis of the association between selected independent variables and having HIV related less risky behaviors (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Standard of living index						
Low standard of living index	1.00	Reference			Reference	
Medium standard of living index	1.40	1.18	-	1.66	<0.001	**
High standard of living index	2.75	2.30	-	3.29	<0.001	**
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.38	1.16	-	1.63	<0.001	**
Rich	2.80	2.39	-	3.29	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.87	0.68	-	1.11	0.260	
Other backward caste	1.45	1.22	-	1.74	<0.001	**
Others	1.74	1.42	-	2.13	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	1.10	0.88	-	1.37	0.395	
[AP] Andhra Pradesh	0.83	0.67	-	1.03	0.092	
[KA] Karnataka	1.61	1.24	-	2.08	<0.001	**
[TN] Tamil Nadu	1.45	1.13	-	1.86	0.004	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	0.55	0.30	-	0.98	0.042	*

** Significant at 0.01 level   * Significant at 0.05 level

When controlling for confounders, the results still indicate significant increased odds of having higher HIV related knowledge, having comprehensive knowledge on HIV prevention and transmission, having HIV related positive attitudes, having positive

attitudes towards PLHA, and less risky behaviors if the person has higher education or wealthier in terms of the wealth index. Table 4.14 to 4.18 shows the results of the multivariate logistic regression analysis. An overview of the trends of association can clearly be observed in tables presented in Appendix, Table: A1.

Table 4.14: Multivariate analysis of the association between selected independent variables and higher HIV related knowledge

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.59	1.43	-	1.77	<0.001	**
25-29 Yr	1.98	1.75	-	2.23	<0.001	**
30-39 Yr	2.30	2.04	-	2.60	<0.001	**
40-49 Yr	2.11	1.86	-	2.40	<0.001	**
50-54 Yr	3.11	2.53	-	3.82	<0.001	**
Residence						
Rural	1.00	Reference			Reference	
Urban	1.14	1.07	-	1.22	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.66	1.52	-	1.81	<0.001	**
Secondary	3.91	3.61	-	4.24	<0.001	**
Higher	16.83	14.24	-	19.88	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.12	1.02	-	1.24	0.023	*
Other (Mainly Christian)	1.04	0.91	-	1.20	0.550	
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.56	0.51	-	0.62	<0.001	**
Widowed/Divorced/Not living together	0.37	0.31	-	0.43	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.14: Multivariate analysis of the association between selected independent variables and higher HIV related knowledge (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.22	1.12	-	1.33	<0.001	**
Rich	1.58	1.45	-	1.72	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.67	0.58	-	0.76	<0.001	**
Other backward caste	1.03	0.95	-	1.11	0.496	
Others	1.01	0.92	-	1.12	0.819	
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.33	0.29	-	0.38	<0.001	**
[AP] Andhra Pradesh	0.19	0.17	-	0.22	<0.001	**
[KA] Karnataka	0.21	0.18	-	0.24	<0.001	**
[TN] Tamil Nadu	0.11	0.09	-	0.13	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.29	0.88	-	1.87	0.188	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.15: Multivariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission

Variables	Odds Ratio	Confidence Interval	P Value	
Age				
15-19 Yr	1.00	Reference	Reference	
20-24 Yr	1.24	1.16 - 1.33	<0.001	**
25-29 Yr	1.53	1.41 - 1.65	<0.001	**
30-39 Yr	1.62	1.49 - 1.76	<0.001	**
40-49 Yr	1.51	1.38 - 1.65	<0.001	**
50-54 Yr	1.91	1.67 - 2.19	<0.001	**
Residence				
Rural	1.00	Reference	Reference	
Urban	1.10	1.04 - 1.15	<0.001	**
Education level				
No education	1.00	Reference	Reference	
Primary	1.65	1.50 - 1.81	<0.001	**
Secondary	3.75	3.46 - 4.07	<0.001	**
Higher	8.78	8.00 - 9.64	<0.001	**
Religion				
Muslim	1.00	Reference	Reference	
Hindu	1.11	1.04 - 1.18	0.003	**
Other (Mainly Christian)	1.08	0.99 - 1.19	0.090	
Marital status				
Never married	1.00	Reference	Reference	
Married/Living together	0.70	0.66 - 0.74	<0.001	**
Widowed/Divorced/Not living together	0.52	0.45 - 0.60	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.15: Multivariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.19	1.10	-	1.28	<0.001	**
Rich	1.55	1.44	-	1.66	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.72	0.65	-	0.80	<0.001	**
Other backward caste	1.05	0.99	-	1.11	0.126	
Others	1.05	0.98	-	1.12	0.147	
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.74	0.69	-	0.79	<0.001	**
[AP] Andhra Pradesh	0.35	0.33	-	0.38	<0.001	**
[KA] Karnataka	0.27	0.25	-	0.30	<0.001	**
[TN] Tamil Nadu	0.28	0.26	-	0.31	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.27	1.00	-	1.62	0.049	*

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.16: Multivariate analysis of the association between selected independent variables and having positive HIV related attitudes

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.37	1.22	-	1.54	<0.001	**
25-29 Yr	1.72	1.51	-	1.96	<0.001	**
30-39 Yr	1.90	1.68	-	2.16	<0.001	**
40-49 Yr	1.83	1.61	-	2.09	<0.001	**
50-54 Yr	6.95	5.09	-	9.49	<0.001	**
Residence						
Rural	1.00	Reference			Reference	
Urban	1.18	1.10	-	1.27	<0.001	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.85	1.70	-	2.01	<0.001	**
Secondary	4.07	3.76	-	4.40	<0.001	**
Higher	15.26	12.84	-	18.12	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.05	0.95	-	1.16	0.342	
Other (Mainly Christian)	0.78	0.68	-	0.90	<0.001	**
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.41	0.37	-	0.45	<0.001	**
Widowed/Divorced/Not living together	0.32	0.27	-	0.37	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.16: Multivariate analysis of the association between selected independent variables and having positive HIV related attitudes (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.20	1.10	-	1.30	<0.001	**
Rich	1.44	1.32	-	1.57	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.66	0.58	-	0.75	<0.001	**
Other backward caste	0.94	0.87	-	1.03	0.173	
Others	0.85	0.77	-	0.94	0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.69	0.62	-	0.78	<0.001	**
[AP] Andhra Pradesh	0.39	0.35	-	0.44	<0.001	**
[KA] Karnataka	0.61	0.54	-	0.70	<0.001	**
[TN] Tamil Nadu	0.34	0.30	-	0.39	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.42	1.01	-	2.00	0.045	*

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.17: Multivariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA)

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.09	1.02	-	1.18	0.013	*
25-29 Yr	1.19	1.09	-	1.29	<0.001	**
30-39 Yr	1.15	1.05	-	1.25	0.002	**
40-49 Yr	1.04	0.94	-	1.14	0.460	
50-54 Yr	1.08	0.94	-	1.25	0.270	
Residence						
Rural	1.00	Reference			Reference	
Urban	1.08	1.03	-	1.14	0.002	**
Education level						
No education	1.00	Reference			Reference	
Primary	1.33	1.21	-	1.45	<0.001	**
Secondary	2.18	2.02	-	2.35	<0.001	**
Higher	3.19	2.91	-	3.49	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.24	1.16	-	1.33	<0.001	**
Other (Mainly Christian)	0.92	0.83	-	1.01	0.096	
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together	0.86	0.81	-	0.92	<0.001	**
Widowed/Divorced/Not living together	0.79	0.68	-	0.91	0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.17: Multivariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.19	1.10	-	1.28	<0.001	**
Rich	1.47	1.36	-	1.58	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	0.53	0.48	-	0.58	<0.001	**
Other backward caste	0.86	0.81	-	0.92	<0.001	**
Others	0.83	0.77	-	0.89	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	0.39	0.37	-	0.42	<0.001	**
[AP] Andhra Pradesh	0.09	0.08	-	0.09	<0.001	**
[KA] Karnataka	0.20	0.19	-	0.22	<0.001	**
[TN] Tamil Nadu	0.07	0.06	-	0.08	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	1.23	0.97	-	1.57	0.094	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.18: Multivariate analysis of the association between selected independent variables and having HIV related less risky behaviors

Variables	Odds Ratio	Confidence Interval			P Value	
Age						
15-19 Yr	1.00	Reference			Reference	
20-24 Yr	1.09	0.69	-	1.71	0.713	
25-29 Yr	1.04	0.68	-	1.61	0.847	
30-39 Yr	0.83	0.55	-	1.26	0.385	
40-49 Yr	0.75	0.49	-	1.13	0.168	
50-54 Yr	0.81	0.48	-	1.37	0.431	
Residence						
Rural	1.00	Reference			Reference	
Urban	1.07	0.91	-	1.27	0.417	
Education level						
No education	1.00	Reference			Reference	
Primary	1.03	0.86	-	1.23	0.749	
Secondary	1.69	1.41	-	2.02	<0.001	**
Higher	7.77	4.47	-	13.49	<0.001	**
Religion						
Muslim	1.00	Reference			Reference	
Hindu	1.50	1.20	-	1.89	<0.001	**
Other (Mainly Christian)	1.94	1.37	-	2.73	<0.001	**
Marital status						
Never married	1.00	Reference			Reference	
Married/Living together Widowed/Divorced/Not living together	0.20	0.14	-	0.31	<0.001	**

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.18: Multivariate analysis of the association between selected independent variables and having HIV related less risky behaviors (Cont.)

Variables	Odds Ratio	Confidence Interval			P Value	
Wealth index						
Poor	1.00	Reference			Reference	
Middle	1.26	1.06	-	1.51	0.010	**
Rich	1.93	1.57	-	2.37	<0.001	**
Caste						
Scheduled caste	1.00	Reference			Reference	
Scheduled tribe	1.21	0.93	-	1.56	0.160	
Other backward caste	1.36	1.13	-	1.64	0.001	**
Others	1.84	1.46	-	2.31	<0.001	**
States						
[MN] Manipur	1.00	Reference			Reference	
[MH] Maharashtra	1.16	0.90	-	1.48	0.248	
[AP] Andhra Pradesh	1.08	0.84	-	1.40	0.529	
[KA] Karnataka	2.47	1.84	-	3.32	<0.001	**
[TN] Tamil Nadu	2.02	1.50	-	2.71	<0.001	**
HIV Serostatus						
HIV Negative	1.00	Reference			Reference	
HIV Positive	0.72	0.39	-	1.32	0.286	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.19: Bivariate analysis of higher HIV related knowledge and HIV serostatus

Variables	Odds Ratio	Confidence Interval	P Value
HIV Serostatus (Unadjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	1.22	0.87 - 1.72	0.257
HIV Serostatus (Adjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	1.29	0.88 - 1.87	0.188

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.20: Bivariate analysis of having comprehensive knowledge on HIV prevention and transmission and HIV serostatus

Variables	Odds Ratio	Confidence Interval	P Value
HIV Serostatus (Unadjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	1.14	0.92 - 1.40	0.233
HIV Serostatus (Adjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	1.27	1.00 - 1.62	0.049 *

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.21: Bivariate analysis of having positive HIV related attitudes and HIV serostatus

Variables	Odds Ratio	Confidence Interval	P Value	
HIV Serostatus (Unadjusted)				
HIV Negative	1.00	Reference	Reference	
HIV Positive	1.04	0.75 - 1.43	0.814	
HIV Serostatus (Adjusted)				
HIV Negative	1.00	Reference	Reference	
HIV Positive	1.42	1.01 - 2.00	0.045	*

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.22: Bivariate analysis of having positive attitudes towards people living with HIV/AIDS (PLHA) and HIV serostatus

Variables	Odds Ratio	Confidence Interval	P Value	
HIV Serostatus (Unadjusted)				
HIV Negative	1.00	Reference	Reference	
HIV Positive	1.31	1.06 - 1.62	0.011	*
HIV Serostatus (Adjusted)				
HIV Negative	1.00	Reference	Reference	
HIV Positive	1.23	0.97 - 1.57	0.094	

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.23: Bivariate analysis of having HIV related less risky behaviors and HIV serostatus

Variables	Odds Ratio	Confidence Interval	P Value
HIV Serostatus (Unadjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	0.55	0.30 - 0.98	0.042 *
HIV Serostatus (Adjusted)			
HIV Negative	1.00	Reference	Reference
HIV Positive	0.72	0.39 - 1.32	0.286

** Significant at 0.01 level   * Significant at 0.05 level

Table 4.19 shows the results of bivariate analysis between higher HIV related knowledge with HIV serostatus. Table 4.20 shows the results of bivariate analysis between having comprehensive knowledge on HIV prevention and transmission and HIV serostatus. In univariate logistic regression analysis, HIV positive people have increased odds of having higher HIV related knowledge and having comprehensive knowledge on HIV prevention and transmission. When controlling for confounders, the odds are still increased but only having comprehensive knowledge on HIV prevention and transmission is statistically significant. Table 4.21 shows the results of bivariate analysis of positive HIV related attitudes and HIV serostatus. The odd of having positive HIV related attitude is 4% more than that of HIV negative and when controlling for confounders there is a 42% increase in odds of having positive HIV related attitudes (p<0.05). People who were HIV seropositive had significant increased odds of having positive attitudes towards People living with HIV but after adjusting for age, type of

place of residence, highest education level, religion, marital status, wealth index, caste and state, the odds reduced by 8% and the association was no longer statistically significant. Compared to HIV negative people, HIV positive people were significantly less likely to engage in less risky behaviors and the odds increased when controlling for confounders but the result was no longer statistically significant. In conclusion, both in univariate and multivariate analyses, the results show that HIV positive people have higher HIV related knowledge, comprehensive knowledge on HIV prevention and transmission, positive attitudes, show positive attitudes towards people living with HIV, and engaged in risky behaviors. However, only some of the results were statistically significant.

CHAPTER V

DISCUSSION AND CONCLUSION

5.1 Discussion

India's HIV prevalence is under 1% and is considered to have a low incidence of HIV. Because it is one of the highest populous countries in the world, the number of people living with HIV is high. It is counted under most serious public health problems in the country. After South Africa and Nigeria, India has the largest burden of HIV. In this study, we found significant variation in the level of HIV related knowledge, attitudes and risk behaviors between the five high prevalence states selected for this study (UNGASS, 2010).

5.1.1 Differences in HIV related knowledge, positive attitudes and less risky behaviors by selected demographic characteristics

Although results of the sexual activity variables indicate that overall the study sample tended to have only one union and late sexual debut, there is still room for some concerns regarding HIV related knowledge, attitudes and behaviors. The HIV related knowledge, comprehensive knowledge, HIV related attitudes, attitudes towards people living with HIV, and behaviors were found to be statistically significantly associated with most of the demographic variables especially education, wealth index, and type of place of residence. These results are also consistent with previous studies (Chauhan, Lal, Vijay Kumar, Malhotra, & Ingle, 2008; B. K. Ambati, J. Ambati, & Rao, 1997). It suggests that, HIV prevention intervention should focus to reach less educated people, poorer people

and people from the rural areas. Programs such as life skills based HIV education may reach the in-school youth but drop-outs and out-of-school youth would not benefit from these programs. Therefore, additional programs that focus on drop-outs and out-of-school youth and people with less education would be beneficial to increase the HIV related knowledge, attitudes and less risky behaviors. Moreover, the percentage of schools that provide life skills based HIV education should continue and extend to give HIV related information to in-school youth. In this study, males have higher HIV related knowledge, comprehensive knowledge on HIV prevention and transmission, positive HIV related attitudes and show positive attitudes toward people living with HIV. This shows that knowledge plays some role in having positive attitudes.

5.1.1.1 Educational level and knowledge

In this study, although the HIV related knowledge is high among males and females, the comprehensive knowledge is low. HIV related knowledge is a composite measure and comprehensive knowledge is achieved only if the participant provides correct responses to all 5 HIV comprehensive knowledge related questions mentioned in methodology section. These results reflect that HIV awareness programs have succeeded in disseminating knowledge about modes of transmission, non-mode of transmission (how HIV cannot be transmitted), and ways to prevent infection transmission but people still   lack awareness of certain facts. The study results show that higher proportion of people has certain knowledge about HIV but smaller proportion of them has comprehensive knowledge on HIV prevention and transmission. Although efforts to increase HIV knowledge seem to be effective, a greater emphasis on helping individuals achieve a more comprehensive knowledge of HIV may be important. The study results

show that higher educational levels are significantly associated with high HIV related knowledge and comprehensive knowledge. It is quite obvious that people who are literate can get information through various informational, educational and communicational materials (IEC materials) developed by various programs. Moreover, they may be able to get information through the internet. People with education are more likely to understand the dynamics of HIV transmission as well. They may also get information through radio which doesn't require being literate. However a study conducted in Pune, a city located in western India, in the state of Maharashtra, shows that TV and written material were more strongly related to knowledge than access to conversations with individuals or radio messages (Shrotri et al., 2003). Another study found television as the most effective medium compared to radio and print media (Pallikadavath, Sreedharan, & Stones, 2006). Therefore, proper delivery of the HIV information to people with lower literacy and education levels through relevant media is important in achieving higher HIV related knowledge, and positive attitudes towards people living with HIV.

5.1.1.2 Educational level and attitude

The score on the composite measure of HIV related attitude was high. However, the attitude towards people living with HIV measured by having all accepting attitudes towards people living with HIV was low. People generally have positive attitude related to HIV but regarding PLHA, they may be afraid of being infected by taking care of the patients. About 26.5% of females and 22.9% of males were not willing to take care of a relative with AIDS. Approximately, 25.8% of females and 24.3% of males in the study sample did not want to allow the female teachers with AIDS to continue teaching. Furthermore, 40.3% of females and 33.8% of males in the study population wouldn't buy

vegetables from a vendor with AIDS. Moreover, 42.4% of females and 42.9% of males would want to keep an AIDS infection secret. Therefore, in this study, people with all positive attitudes towards people living with HIV/AIDS are lower in contrast to HIV related attitude measured by composite score. These results show that there is still stigma associated with HIV/AIDS. People with HIV/AIDS are still not well accepted by their communities despite various intervention programs.

Higher educational level is significantly associated with HIV related positive attitudes and positive attitudes towards people living with HIV/AIDS. This finding is consistent with previous finding (B. K. Ambati, J. Ambati, & Rao, 1997). Similarly, a study conducted on awareness and attitude of the general public toward HIV/AIDS in coastal Karnataka showed a significant association between education level and discriminatory attitude toward people living with HIV/AIDS (Unnikrishnan, Mithra, T, & B, 2010). The higher the educational level of the person, the lower their discriminatory attitude toward PLHA. Although people may know the mode of transmission and ways by which HIV cannot be transmitted, there is fear of contracting the illness. This may result in the negative attitudes towards PLHA. Therefore, providing information regarding the non-modes of transmission and ways to correct the myths among the population may play a role in developing more positive attitude towards PLHAs. In addition, negative attitudes towards people living with HIV leads to stigma and discrimination. Stigma and discrimination affects PLHA's life in many ways such as access to medical and other services. People are afraid to test for HIV due to the stigma and discrimination attached to it. Therefore, early detection is hindered and proper medical care is delayed. Information on HIV should also be made available to the people

living in rural areas, people with less education and poorer people, more than is currently available. AIDS-related stigma and discrimination remain widespread problems among health care providers and institutions worldwide. There are studies suggesting that the ability of PLHA to access healthcare and the quality of care they received is influenced by the level of knowledge about HIV and attitudes of the health care providers. In contrast, a study conducted in 7 rural north Indian health settings shows that HIV transmission knowledge and risk perception were not associated with health care worker's willingness to provide care but having previously cared for patients with HIV was strongly associated with health care worker's willingness to provide care for patients with HIV (Kermode, Holmes, Langkham, M. S. Thomas, & Gifford, 2005). Therefore, providing special trainings to the health care providers for having positive and non-discriminating attitudes towards PLHA also will be beneficial.

5.1.1.3 Educational level and behaviors

In this study, there were no responses on the behavioral related questions by the never married people. These behavior-related questions may be skipped for some reason. However, a population based representative study conducted in Andhra Pradesh showed that there was premarital sex among adolescent males and females and among them very few had used condoms consistently (G. A. Kumar, R. Dandona, S. G. P. Kumar, & L. Dandona, 2011). The association between never married people and less risky behavior may give some significant information for HIV prevention programs.

In this study, higher education was significantly associated with less risky behaviors. A cross-sectional survey conducted on HIV, sexually transmitted infections and sexual behavior of male clients of female sex workers in Andhra Pradesh, Tamil

Nadu and Maharashtra also showed significant higher inconsistent condom use among people with illiteracy (Subramanian et al., 2008). Another study conducted in Bagalkot district, a large rural district in the southern Indian state of Karnataka showed a significant association between lower education level and multiple sexual partners, a high risk behavior. Education level has been defined as a significant risk factor for HIV infection. Higher level of education was significantly associated with lower risk for HIV infection (Becker et al., 2007; Mukhopadhyay, Nath, Gulati, & Mohapatra, 2001; Mehta et al., 2006).

Studies have shown that people who have higher levels of knowledge on HIV modes of transmission and HIV preventative practices were more likely to have less risky behaviors such as condom use (Dude, Oruganti, et al., 2009). However, knowledge is not always the predictor of positive behavior change. In this study, the proportion of higher HIV related knowledge, comprehensive knowledge, HIV related positive attitude and having positive attitude towards people living with HIV were higher in Manipur compared to the other 4 states in this study. However, the percentage of less risky behavior was lowest. This is consistent with previous studies done (S. Sarkar, Mookerjee, Roy, et al., 1991). According to 2005-2006, India, NFHS – 3 final report, Manipur had the highest HIV prevalence (1.13%) among all states. Similarly, the percent of HIV positive people in Manipur is also the highest in this study compared to the other 4 states. This reflects that people in Manipur have higher proportion of HIV related risky behaviors. In addition to the behaviors that were measured in this study, Manipur has high risk behavior of injecting drug use. According to census 2011, Manipur has a population over 2.7 million, 0.22% of the national population ("Census of India:

Provisional Population Tables - Census 2011," n.d.). It is estimated that the number of

people who inject drug is 15,000 and over 50% seropositivity among them. The HIV

epidemic among injecting drug users in Manipur is reported to be high (S. Sarkar,

Mookerjee, A. Roy, et al., 1991; S. Sarkar, N. Das, et al., 1994). According to the 2006

annual sentinel surveillance country report, HIV prevalence among injecting drug users

in Manipur was 20.67% in 2006 (NACO, 2007) . This may be contributing to Manipur's

HIV prevalence leading to the country's highest HIV concentration state. The infection

may therefore, quickly spread to the population at large. Prevention programs should

target HIV positive people as well as high risk groups such as injecting drug users in

controlling transmission in such states. Prevention strategies in states with high risk

behavior and high HIV prevalence despite high HIV related knowledge and positive

attitudes should be tailored to the specific target populations. It would be useful if the

DHS data included IDU related data.

5.1.1.4 Type of place of residence and knowledge, attitude and, behaviors

The study results show that people living in the urban areas are engaged in less

risky behaviors compared to those living in the rural areas but the difference is not

statistically significant. The results on association between type of place of residence and

less risky behaviors is consistent with a study conducted among never married young

adults in Guntur district of Andhra Pradesh state in India. In that study, higher condom

non-use during last sex was found among rural residents and the result was significant for

males and not significant for females (G. A. Kumar et al., 2011). The study results

showed a statistically significant association between living at urban residence and

having high HIV related knowledge, having comprehensive knowledge, having positive

HIV related attitudes and attitudes towards PLHA. This may be due to the higher percentage (76.5%) of the study population in the urban area, compared to 53.5% in the rural area, who have secondary or higher education. In addition, information is often lacking in rural area. Some services are mostly available at the urban area compared to rural area, such as services for male heterosexual behaviors (Sivaram, Saluja, M. Das, Reddy, & Yeldandi, 2008). All these factors may lead to the significantly higher knowledge and positive attitudes among the urban residents.

5.1.1.5 Wealth index and knowledge, attitude and, behaviors

Increase in wealth index is significantly associated with all the dependent variables, high knowledge, positive attitudes and less risky behaviors. This is consistent with previous studies (Aggarwal & Rous, 2006). This is reasonable and may be explained by the availability and accessibility of information from different media including internet access.

5.1.2 Relationship between HIV serostatus and HIV related knowledge, positive attitudes and less risky behaviors among study population

Knowledge, attitude, and behavior among PLHA are also very important in containing the HIV transmission. A study conducted in Pune, a city located in western India, in the state of Maharashtra didn't find a relation between HIV status and knowledge among pregnant women (Shrotri et al., 2003). In this study, associations between HIV serostatus and high knowledge, positive attitudes and less risky behaviors were found but only some of them were statistically significant. HIV positive people have high HIV knowledge and positive attitudes towards PLHA but the results were not statistically significant. HIV positive people are likely to have more comprehensive

knowledge and positive HIV related attitudes which were statistically significant. HIV positive people in this study were likely to engage in more risky behaviors but the results was not statistically significant. Because this study is a cross sectional study, temporality could not be described. It cannot be said whether they gain HIV related knowledge before becoming infected or after they were infected and accessed more information on HIV. The HIV testing was anonymous and the results of the testing were not given to the respondents. The protocol was designed to make it impossible for the survey staff to know the HIV status of individual participants ("National Family Health Survey (NFHS-3), India: DHS, 2005-06 - Final Report," n.d.). Therefore, HIV positive people in this study may not know their HIV infection status during the study and may have negative attitude towards PLHA. HIV positive people in this study may have had more risky behaviors before they were infected by HIV and still they may not know the HIV status by the time of the study. Studies show that HIV positive people are likely to engage in less risky behaviors after they know their serostatus. In studies conducted by Kumarasamy et al (2010) among couples at risk for HIV infection in Southern India, it was found that HIV sero-discordant patients were more likely to use condoms with their spouses than HIV sero-concordant patients, a statistically significant finding (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Murugavel, et al., 2010; Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010). Therefore, cohort studies on the changes of HIV knowledge, attitudes and behavior among PLHA will be useful for formulating HIV prevention program targeted to PLHA.

5.2 Limitations

There are several limitations associated with the present study. The survey questionnaire used for the dataset was a generalized questionnaire which was translated in 18 Indian languages. It was not developed with these specific study questions in mind. Although the interviews were confidential, there is potential for bias due to the fact that the data are self-reported. There may be recall bias or participants may give socially acceptable answers to the sensitive questions. For instance, we found that a majority of the study population (98.6% of females and 95.8% of males) answered the number of union as once.

As it is a cross-sectional study, cause and effect could not be determined between the knowledge, attitude and behavior and the HIV serostatus. Only association could be concluded from the analysis in this study. As the nature of the cross-sectional study, the results could not reflect any temporal changes. Although, it is statistically more efficient to use continuous variable without categorizing, some continuous variables in this study were categorized. This may lead to loss of precision of estimated means and odds. There may be   variation and interpretation problems depending on the choice of cut point used which may lead to biased effect estimates. The composite scores of the three dependent variables were calculated with the assumptions that the variables used to derive the composite scores are equally and unit weighted. This may not be necessarily true for the secondary data used.

There are six high-prevalence states mentioned in the literature but only data for five high-prevalence States (Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu) was available in the DHS dataset. Data for another high prevalence state

"Nagaland" was not available to include in the study. The latest available dataset for India with HIV test results is for 2005-2006 and the current trend may have been changed somewhat, which may not be reflected in this study.

Despite these limitations, this study has some strength. The study is based on a nationally representative dataset with large sample size with the HIV test results of the adult population from 29 States of the urban and rural residence of India. The results therefore are generalizable to Indian population. The analyses were robust and provide significant insight into the population and issues being discussed.

5.3 Conclusion

The results of the study show that although people of India have knowledge, they lack comprehensive knowledge. Similarly, although they have certain attitudes, they don't have all the accepting attitudes towards people living with HIV/AIDS. People with less education, poor wealth index and rural residence have comparatively less knowledge and less positive attitude towards PLHA. There is a need for greater attempts toward making HIV/AIDS related information available to every individual in the community regardless of their education level, wealth, and where they live. Therefore, intervention programs should focus on delivering targeted, tailored approaches, reaching the less educated, poor and rural residents in addition to the current intervention efforts. Demographic and health survey provides useful health related national level data with HIV test results. The latest data available in DHS is for 2005-2006. More frequent surveys could provide useful information for formulating intervention strategies appropriate to the contemporary needs of the population. Since education is significantly associated with one's high knowledge, positive attitudes toward people living with

HIV/AIDS, and less risky behavior, it is essential for the Ministry of Education to continue the life skills based HIV education in currently implementing schools. Moreover, the percentage of schools that provided life skills based HIV education should further extend to schools especially in rural areas. Attention must be focused on development of innovative IEC materials in different local languages with easily understandable information for less educated persons that is culturally appropriate for the target population. Different IEC materials addressing stigma and discriminatory attitudes toward people living with HIV/AIDS should also be developed with the involvement of the target audience. Further research is required to understand the individual and community-level factors behind high HIV related knowledge, positive attitudes and less risky behaviors, so that preventive interventions can be tailored to the target populations and directed to where they are most needed.

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Table A1: Overview of univariate and multivariate regression results

	UNIVARIATE ANALYSIS					MULTIVARIATE ANALYSIS				
	High K	Comp K	HIV Attitude	Att to PLHA	<Risky B	High K	Comp K	HIV Attitude	Att to PLHA	<Risky B
15-19 Yr	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24 Yr	1.25	1.22	0.93	1.06	1.30	1.59	1.24	1.37	1.09	1.09
25-29 Yr	1.11	1.20	0.79	1.04	1.31	1.98	1.53	1.72	1.19	1.04
30-39 Yr	0.99	1.03	0.65	0.93	1.09	2.30	1.62	1.90	1.15	0.83
40-49 Yr	0.79	0.85	0.54	0.77	0.96	2.11	1.51	1.83	1.04	0.75
50-54 Yr	1.34	1.20	2.60	0.89	1.17	3.11	1.91	6.95	1.08	0.81
Residence										
Rural	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	1.85	1.76	1.88	1.32	1.62	1.14	1.10	1.18	1.08	1.07
Education level										
No education	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	1.63	1.74	1.99	1.32	1.21	1.66	1.65	1.85	1.33	1.03
Secondary	4.73	4.82	5.64	2.85	2.36	3.91	3.75	4.07	2.18	1.69
Higher	25.85	13.09	25.99	4.40	11.33	16.83	8.78	15.26	3.19	7.77
Religion										
Muslim	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hindu	0.90	1.06	0.99	1.15	1.25	1.12	1.11	1.05	1.24	1.50
Other (Mainly Christian)	1.48	1.44	1.09	1.73	1.22	1.04	1.08	0.78	0.92	1.94
Marital status										
Never married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Married/Living together	0.53	0.64	0.36	0.70	0.17	0.56	0.70	0.41	0.86	0.20
Widowed/Divorced/Nlt	0.26	0.36	0.20	0.51		0.37	0.52	0.32	0.79	

12.34 Odds Ratio   Significant at 0.01 level   Significant at 0.05 level   Trend

Table A1: Overview of univariate and multivariate regression results (Cont.)

	UNIVARIATE ANALYSIS						MULTIVARIATE ANALYSIS				
	High K	Comp K	HIV Attitude	Att to PLHA	<Risky B		High K	Comp K	HIV Attitude	Att to PLHA	<Risky B
Standard of living index											
Low	1.00	1.00	1.00	1.00	1.00						
Medium	1.74	1.67	1.72	1.50	1.40						
High	3.89	3.55	3.67	2.39	2.75						
Wealth index											
Poor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Middle	1.62	1.62	1.61	1.51	1.38		1.22	1.19	1.20	1.19	1.26
Rich	3.58	3.33	3.38	2.20	2.80		1.58	1.55	1.44	1.47	1.93
Caste											
Scheduled caste	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Scheduled tribe	1.14	0.96	0.76	1.14	0.87		0.67	0.72	0.66	0.53	1.21
OBC	1.06	1.01	1.06	0.84	1.45		1.03	1.05	0.94	0.86	1.36
Others	2.16	1.71	1.55	1.62	1.74		1.01	1.05	0.85	0.83	1.84
States											
Manipur	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Maharashtra	0.48	0.85	0.89	0.50	1.10		0.33	0.74	0.69	0.39	1.16
[AP]	0.21	0.37	0.40	0.11	0.83		0.19	0.35	0.39	0.09	1.08
Karnataka	0.22	0.28	0.59	0.23	1.61		0.21	0.27	0.61	0.20	2.47
Tamil Nadu	0.13	0.30	0.39	0.09	1.45		0.11	0.28	0.34	0.07	2.02
HIV Serostatus											
HIV Negative	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
HIV Positive	1.22	1.14	1.04	1.31	0.55		1.29	1.27	1.42	1.23	0.72

| 12.34 | Odds Ratio | | Significant at 0.01 level | | Significant at 0.05 level | | Trend |

Table A 2: Independent variables and recoded values

Independent variables	Recoded value	Categories
Age	0	15-19 Yr.
	1	20-24 Yr.
	2	25-29 Yr.
	3	30-39 Yr.
	4	40-49 Yr.
	5	50-54 Yr.
Residence	0	Rural
	1	Urban
Education level	0	No education
	1	Primary
	2	Secondary
	3	Higher
Religion	0	Muslim
	1	Hindu
	2	Other (Mainly Christian)
Marital status	0	Never married
	1	Married/Living together
	2	Widowed/Divorced/Not living together

Table A 2: Independent variables and recoded values (Cont.)

Independent variables	Recoded value	Categories
Standard of living index	0	Low standard of living index
	1	Medium standard of living index
	2	High standard of living index
Wealth index	0	Poor
	1	Middle
	2	Rich
Caste	0	Scheduled caste
	1	Scheduled tribe
	2	Other backward caste
	3	Others
States	0	[MN] Manipur
	1	[MH] Maharashtra
	2	[AP] Andhra Pradesh
	3	[KA] Karnataka
	4	[TN] Tamil Nadu
HIV serostatus	0	HIV negative
	1	HIV positive

Table A 3: Dependent variables and recoded values

Dependent variables	Recoded value	Categories
HIV related knowledge	0	Low HIV related knowledge
	1	High HIV related knowledge
Comprehensive knowledge*	0	Doesn't have comprehensive knowledge
	1	Have comprehensive knowledge
Accepting attitudes towards PLHA**	0	Doesn't have accepting attitudes towards PLHA
	1	Have accepting attitudes towards PLHA
HIV/AIDS related attitudes	0	Negative attitude
	1	Positive attitude
HIV related risk behaviors	0	More risky behavior
	1	Less risky behavior

* Comprehensive knowledge of HIV prevention and transmission
** People living with HIV/AIDS

Table A 4: Demographic distribution of HIV related knowledge by gender

Variables	Low HIV related knowledge	High HIV related knowledge	P-Value	
Residence			<0.001	**
Rural	21.3	78.7		
Urban	12.8	87.2		
Education level			<0.001	**
No education	40.2	59.8		
Primary	29.3	70.7		
Secondary	12.5	87.5		
Higher	2.5	97.5		
Religion			<0.001	**
Muslim	15.6	84.4		
Hindu	17.1	82.9		
Other (Mainly Christian)	11.1	88.9		
Marital status			<0.001	**
Never married	10.7	89.3		
Married/Living together	18.4	81.6		
Widowed/Divorced/Not living together	31.4	68.6		
Standard of living index			<0.001	**
Low standard of living index	31.9	68.1		
Medium standard of living index	21.2	78.8		
High standard of living index	10.8	89.2		
Wealth index			<0.001	**
Poor	31.1	68.9		
Middle	21.8	78.2		
Rich	11.2	88.8		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 4: Demographic distribution of HIV related knowledge by gender (Cont.)

Variables	Low HIV related knowledge	High HIV related knowledge	P-Value	
Caste			<0.001	**
Scheduled caste	20.1	79.9		
Scheduled tribe	18.1	81.9		
Other backward caste	19.2	80.8		
Others	10.4	89.6		
Age			<0.001	**
15-19 Yr.	16.3	83.7		
20-24 Yr.	13.5	86.5		
25-29 Yr.	15.0	85.0		
30-39 Yr.	16.5	83.5		
40-49 Yr.	19.9	80.1		
50-54 Yr.	12.7	87.3		
States			<0.001	**
[MN] Manipur	4.9	95.1		
[MH] Maharashtra	9.8	90.2		
[AP] Andhra Pradesh	19.7	80.3		
[KA] Karnataka	19.3	80.7		
[TN] Tamil Nadu	27.8	72.2		
Gender			<0.001	**
Female	23.6	76.4		
Male	9.0	91.0		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 5: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender

Variables	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	P-Value	
Residence			<0.001	**
Rural	70.4	29.6		
Urban	57.5	42.5		
Education level			<0.001	**
No education	87.7	12.3		
Primary	80.4	19.6		
Secondary	59.6	40.4		
Higher	35.2	64.8		
Religion			<0.001	**
Muslim	64.9	35.1		
Hindu	63.6	36.4		
Other (Mainly Christian)	56.2	43.8		
Marital status			<0.001	**
Never married	55.5	44.5		
Married/Living together	65.9	34.1		
Widowed/Divorced/Not living together	77.4	22.6		
Standard of living index			<0.001	**
Low standard of living index	80.7	19.3		
Medium standard of living index	71.4	28.6		
High standard of living index	54.0	46.0		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 5: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender (Cont.)

Variables	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	P-Value	
Wealth index			<0.001	**
Poor	80.5	19.5		
Middle	71.7	28.3		
Rich	55.3	44.7		
Caste			<0.001	**
Scheduled caste	67.3	32.7		
Scheduled tribe	68.2	31.8		
Other backward caste	67.1	32.9		
Others	54.6	45.4		
Age			<0.001	**
15-19 Yr.	64.1	35.9		
20-24 Yr.	59.4	40.6		
25-29 Yr.	59.7	40.3		
30-39 Yr.	63.3	36.7		
40-49 Yr.	67.6	32.4		
50-54 Yr.	59.9	40.1		
States			<0.001	**
[MN] Manipur	46.4	53.6		
[MH] Maharashtra	50.4	49.6		
[AP] Andhra Pradesh	70.0	30.0		
[KA] Karnataka	75.8	24.2		
[TN] Tamil Nadu	74.0	26.0		
Gender			<0.001	**
Female	70.9	29.1		
Male	55.0	45.0		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 6: Demographic distribution of HIV related attitudes by gender

Variables	Negative Attitude	Positive Attitude	P-Value	
Residence			<0.001	**
Rural	18.2	81.8		
Urban	10.5	89.5		
Education level			<0.001	**
No education	36.5	63.5		
Primary	22.5	77.5		
Secondary	9.3	90.7		
Higher	2.2	97.8		
Religion			0.059	
Muslim	13.6	86.4		
Hindu	13.8	86.2		
Other (Mainly Christian)	12.6	87.4		
Marital status			<0.001	**
Never married	6.7	93.3		
Married/Living together	16.6	83.4		
Widowed/Divorced/Not living together	26.7	73.3		
Standard of living index			<0.001	**
Low standard of living index	26.5	73.5		
Medium standard of living index	17.3	82.7		
High standard of living index	9.0	91.0		
Wealth index			<0.001	**
Poor	26.0	74.0		
Middle	17.9	82.1		
Rich	9.4	90.6		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 6: Demographic distribution of HIV related attitudes by gender (Cont.)

Variables	Negative Attitude	Positive Attitude	P-Value	
Caste			<0.001	**
Scheduled caste	15.5	84.5		
Scheduled tribe	19.4	80.6		
Other backward caste	14.6	85.4		
Others	10.5	89.5		
Age			<0.001	**
15-19 Yr.	10.6	89.4		
20-24 Yr.	11.3	88.7		
25-29 Yr.	13.0	87.0		
30-39 Yr.	15.4	84.6		
40-49 Yr.	18.0	82.0		
50-54 Yr.	4.3	95.7		
States			<0.001	**
[MN] Manipur	8.3	91.7		
[MH] Maharashtra	9.3	90.7		
[AP] Andhra Pradesh	18.4	81.6		
[KA] Karnataka	13.4	86.6		
[TN] Tamil Nadu	18.9	81.1		
Gender			<0.001	**
Female	21.9	78.1		
Male	3.3	96.7		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 7: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender

Variables	Doesn't have accepting attitudes towards PLHA*	Have accepting attitudes towards PLHA	P-Value	
Residence			<0.001	**
Rural	70.4	29.6		
Urban	64.4	35.6		
Education level			<0.001	**
No education	83.2	16.8		
Primary	79.0	21.0		
Secondary	63.5	36.5		
Higher	53.0	47.0		
Religion			<0.001	**
Muslim	70.7	29.3		
Hindu	67.7	32.3		
Other (Mainly Christian)	58.3	41.7		
Marital status			<0.001	**
Never married	61.2	38.8		
Married/Living together	69.4	30.6		
Widowed/Divorced/Not living together	75.5	24.5		
Standard of living index			<0.001	**
Low standard of living index	79.4	20.6		
Medium standard of living index	71.9	28.1		
High standard of living index	61.6	38.4		
Wealth index			<0.001	**
Poor	78.6	21.4		
Middle	70.8	29.2		
Rich	62.6	37.4		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 7: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender (Cont.)

Variables	Doesn't have accepting attitudes towards PLHA*	Have accepting attitudes towards PLHA	P-Value	
Caste			<0.001	**
Scheduled caste	69.7	30.3		
Scheduled tribe	66.8	33.2		
Other backward caste	73.3	26.7		
Others	58.7	41.3		
Age			<0.001	**
15-19 Yr.	65.7	34.3		
20-24 Yr.	64.4	35.6		
25-29 Yr.	64.8	35.2		
30-39 Yr.	67.3	32.7		
40-49 Yr.	71.3	28.7		
50-54 Yr.	68.4	31.6		
States			<0.001	**
[MN] Manipur	35.9	64.1		
[MH] Maharashtra	53.0	47.0		
[AP] Andhra Pradesh	84.1	15.9		
[KA] Karnataka	71.2	28.8		
[TN] Tamil Nadu	86.5	13.5		
Gender			<0.001	**
Female	69.1	30.9		
Male	64.7	35.3		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 8: Demographic distribution of HIV related risk behavior by gender

Variables	More risky behavior	Less risky behavior	P-Value	
Residence			<0.001	**
Rural	3.1	96.9		
Urban	1.9	98.1		
Education level			<0.001	**
No education	4.1	95.9		
Primary	3.5	96.5		
Secondary	1.8	98.2		
Higher	0.4	99.6		
Religion			0.111	
Muslim	3.0	97.0		
Hindu	2.4	97.6		
Other (Mainly Christian)	2.5	97.5		
Marital status			<0.001	**
Never married				
Married/Living together	2.4	97.6		
Widowed/Divorced/Not living together	12.5	87.5		
Standard of living index			<0.001	**
Low standard of living index	4.2	95.8		
Medium standard of living index	3.1	96.9		
High standard of living index	1.6	98.4		
Wealth index			<0.001	**
Poor	4.3	95.7		
Middle	3.1	96.9		
Rich	1.6	98.4		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 8: Demographic distribution of HIV related risk behavior by gender (Cont.)

Variables	More risky behavior	Less risky behavior	P-Value	
Caste			<0.001	**
Scheduled caste	3.3	96.7		
Scheduled tribe	3.8	96.2		
Other backward caste	2.3	97.7		
Others	1.9	98.1		
Age			0.039	*
15-19 Yr.	2.7	97.3		
20-24 Yr.	2.1	97.9		
25-29 Yr.	2.1	97.9		
30-39 Yr.	2.5	97.5		
40-49 Yr.	2.9	97.1		
50-54 Yr.	2.3	97.7		
States			<0.001	**
[MN] Manipur	2.8	97.2		
[MH] Maharashtra	2.5	97.5		
[AP] Andhra Pradesh	3.3	96.7		
[KA] Karnataka	1.7	98.3		
[TN] Tamil Nadu	1.9	98.1		
Gender			0.711	
Female	2.5	97.5		
Male	2.4	97.6		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 9: Demographic distribution of HIV related knowledge by gender (Column percents presented)

Variables	Female		Male	
	Low HIV related knowledge	High HIV related knowledge	Low HIV related knowledge	High HIV related knowledge
Residence				
Rural	50.7	36.1	58.1	39.1
Urban	49.3	63.9	41.9	60.9
Education level				
No education	31.5	11.6	24.5	5.9
Primary	21.4	10.3	27.7	11.2
Secondary	44.2	59.1	45.3	61.3
Higher	2.9	19.0	2.5	21.6
Religion				
Muslim	10.9	11.6	9.0	10.2
Hindu	80.2	74.2	83.4	77.3
Other (Mainly Christian)	9.0	14.2	7.6	12.5
Marital status				
Never married	20.2	29.7	27.9	41.0
Married/Living together	72.5	65.9	70.6	58.1
Widowed/Divorced/Not living together	7.4	4.3	1.5	0.8

Table A 9: Demographic distribution of HIV related knowledge by gender (Cont.)
(Column percents presented)

Variables	Female		Male	
	Low HIV related knowledge	High HIV related knowledge	Low HIV related knowledge	High HIV related knowledge
Standard of living index				
Low standard of living index	20.8	7.7	25.2	10.3
Medium standard of living index	38.0	26.8	41.9	29.3
High standard of living index	41.2	65.5	32.9	60.4
Wealth index				
Poor	24.1	9.0	30.2	12.7
Middle	28.4	19.3	31.5	21.1
Rich	47.5	71.7	38.3	66.2
Caste				
Scheduled caste	20.3	15.5	21.6	16.6
Scheduled tribe	7.4	6.7	7.9	6.7
Other backward caste	51.0	39.8	52.0	44.6
Others	21.4	38.0	18.5	32.1
Age				
15-19 Yr.	17.8	18.2	14.3	15.2
20-24 Yr.	16.5	20.3	13.1	18.4
25-29 Yr.	16.1	18.1	13.8	15.9
30-39 Yr.	28.6	27.3	25.0	26.5
40-49 Yr.	21.0	16.1	25.1	18.1
50-54 Yr.	NA	NA	8.6	5.8
States				
[MN] Manipur	5.7	22.9	4.1	16.7
[MH] Maharashtra	16.3	27.6	13.8	27.9
[AP] Andhra Pradesh	24.3	19.0	30.6	21.8
[KA] Karnataka	17.8	14.7	19.8	14.8
[TN] Tamil Nadu	36.0	15.8	31.7	18.8

Table A 10: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender (Column percents presented)

Variables	Female		Male	
	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	Doesn't have comprehensive knowledge	Have comprehensive knowledge
Residence				
Rural	45.8	29.2	46.9	35.2
Urban	54.2	70.8	53.1	64.8
Education level				
No education	24.4	6.7	14.5	3.6
Primary	16.9	6.6	19.8	8.1
Secondary	51.0	60.0	55.9	61.4
Higher	7.7	26.8	9.8	26.9
Religion				
Muslim	11.2	12.9	12.2	9.2
Hindu	77.3	72.3	78.1	77.1
Other (Mainly Christian)	11.5	14.8	9.7	13.6
Marital status				
Never married	23.7	32.8	36.0	43.9
Married/Living together	70.1	63.6	63.0	55.2
Widowed/Divorced/Not living together	6.2	3.6	1.0	0.9

* Comprehensive knowledge of HIV prevention and transmission

Table A 10: Demographic distribution of comprehensive knowledge on HIV prevention and transmission by gender (Cont.) (Column percents presented)

Variables	Female		Male	
	Doesn't have comprehensive knowledge*	Have comprehensive knowledge	Doesn't have comprehensive knowledge	Have comprehensive knowledge
Standard of living index				
Low standard of living index	15.7	4.7	17.1	7.8
Medium standard of living index	35.0	20.8	36.3	26.2
High standard of living index	49.4	74.5	46.6	66.1
Wealth index				
Poor	18.4	5.6	21.3	9.6
Middle	25.1	15.1	26.2	18.3
Rich	56.5	79.3	52.4	72.1
Caste				
Scheduled caste	18.2	14.5	18.4	15.8
Scheduled tribe	7.5	5.6	7.9	6.5
Other backward caste	46.7	33.2	46.4	43.1
Others	27.7	46.8	27.3	34.7
Age				
15-19 Yr.	18.1	17.6	16.0	15.5
20-24 Yr.	18.1	21.1	16.4	19.4
25-29 Yr.	16.4	19.1	14.3	16.6
30-39 Yr.	27.9	27.4	26.0	25.9
40-49 Yr.	19.5	14.7	20.7	17.1
50-54 Yr.	NA	NA	6.7	5.5
States				
[MN] Manipur	12.6	26.9	9.7	19.0
[MH] Maharashtra	22.3	36.3	20.7	35.7
[AP] Andhra Pradesh	21.9	18.4	27.9	17.5
[KA] Karnataka	17.6	8.1	19.4	11.1
[TN] Tamil Nadu	25.6	10.3	22.3	16.8

* Comprehensive knowledge of HIV prevention and transmission

Table A 11: Demographic distribution of HIV related attitudes by gender (Column percents presented)

Variables	Female		Male	
	Negative attitude	Positive attitude	Negative attitude	Positive attitude
Residence				
Rural	53.7	37.5	51.2	38.4
Urban	46.3	62.5	48.8	61.6
Education level				
No education	38.2	13.9	29.1	6.4
Primary	21.0	11.9	26.8	11.6
Secondary	38.2	57.9	40.9	60.6
Higher	2.6	16.2	3.1	21.4
Religion				
Muslim	11.6	11.7	6.7	10.4
Hindu	77.0	75.5	82.8	77.7
Other (Mainly Christian)	11.4	12.8	10.5	11.9
Marital status				
Never married	14.4	29.7	32.8	42.5
Married/Living together	78.3	65.4	66.2	56.7
Widowed/Divorced/Not living together	7.3	5.0	1.0	0.8

Table A 11: Demographic distribution of HIV related attitudes by gender (Cont.) (Column percents presented)

Variables	Female		Male	
	Negative attitude	Positive attitude	Negative attitude	Positive attitude
Standard of living index				
Low standard of living index	22.4	9.8	28.2	10.2
Medium standard of living index	38.9	28.6	36.8	29.3
High standard of living index	38.8	61.7	34.9	60.5
Wealth index				
Poor	26.4	11.4	31.6	12.7
Middle	28.6	20.4	27.7	20.8
Rich	45.0	68.2	40.7	66.5
Caste				
Scheduled caste	18.8	16.6	22.2	16.8
Scheduled tribe	9.5	6.2	11.5	6.7
Other backward caste	46.6	41.7	44.6	44.6
Others	25.1	35.4	21.8	31.8
Age				
15-19 Yr.	12.9	19.4	16.8	16.1
20-24 Yr.	16.0	19.8	12.9	18.9
25-29 Yr.	16.5	17.4	11.5	16.0
30-39 Yr.	31.1	26.8	25.0	25.8
40-49 Yr.	23.6	16.5	26.3	17.7
50-54 Yr.	NA	NA	7.5	5.6
States				
[MN] Manipur	10.5	18.6	4.8	15.6
[MH] Maharashtra	18.2	28.6	22.8	28.8
[AP] Andhra Pradesh	28.5	18.8	29.5	21.1
[KA] Karnataka	15.1	14.7	16.5	16.4
[TN] Tamil Nadu	27.7	19.4	26.5	18.0

Table A 12: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender (Column percents presented)

Variables	Female Doesn't have accepting attitudes towards PLHA*	Female Have accepting attitudes towards PLHA	Male Doesn't have accepting attitudes towards PLHA	Male Have accepting attitudes towards PLHA
Residence				
Rural	43.2	36.2	43.9	37.5
Urban	56.8	63.8	56.1	62.5
Education level				
No education	22.9	11.0	12.5	4.1
Primary	16.1	9.1	17.5	9.0
Secondary	50.3	60.9	56.1	62.6
Higher	10.6	19.1	13.8	24.3
Religion				
Muslim	12.2	10.5	11.6	9.5
Hindu	76.1	75.3	79.3	74.7
Other (Mainly Christian)	11.7	14.2	9.2	15.8
Marital status				
Never married	23.0	33.7	37.7	43.0
Married/Living together	70.9	62.1	61.2	56.3
Widowed/Divorced/Not living together	6.0	4.2	1.1	0.8
Standard of living index				
Low standard of living index	14.8	7.2	15.2	8.6
Medium standard of living index	32.8	26.5	34.3	27.0
High standard of living index	52.4	66.3	50.5	64.4
Wealth index				
Poor	17.4	8.7	18.8	11.0
Middle	23.3	19.6	24.2	19.9
Rich	59.3	71.7	57.0	69.1

* People Living with HIV/AIDS

Table A 12: Demographic distribution of accepting attitudes towards people living with HIV/AIDS (PLHA) by gender (Cont.) (Column percents presented)

	Female		Male	
Variables	Doesn't have accepting attitudes towards PLHA*	Have accepting attitudes towards PLHA	Doesn't have accepting attitudes towards PLHA	Have accepting attitudes towards PLHA
Caste				
Scheduled caste	17.5	16.2	17.9	15.9
Scheduled tribe	7.3	6.1	6.7	8.3
Other backward caste	46.3	34.6	48.9	37.4
Others	28.8	43.1	26.5	38.4
Age				
15-19 Yr.	17.1	20.1	16.1	15.2
20-24 Yr.	18.2	20.7	17.1	18.9
25-29 Yr.	16.7	18.4	14.8	16.4
30-39 Yr.	28.4	26.2	25.6	26.7
40-49 Yr.	19.6	14.7	20.0	17.3
50-54 Yr.	NA	NA	6.5	5.5
States				
[MN] Manipur	10.1	31.7	6.2	27.8
[MH] Maharashtra	22.9	34.1	19.7	41.7
[AP] Andhra Pradesh	25.1	11.6	30.5	9.8
[KA] Karnataka	15.3	13.8	17.2	12.8
[TN] Tamil Nadu	26.7	8.8	26.3	7.9

* People Living with HIV/AIDS

Table A 13: Demographic distribution of HIV related risk behavior by gender (Column percents presented)

Variables	Female		Male	
	More risky behavior	Less risky behavior	More risky behavior	Less risky behavior
Residence				
Rural	56.1	46.5	61.6	46.6
Urban	43.9	53.5	38.4	53.4
Education level				
No education	50.0	29.5	26.9	15.9
Primary	22.5	16.1	27.9	19.5
Secondary	26.5	44.3	42.5	49.6
Higher	1.1	10.0	2.8	15.0
Religion				
Muslim	15.3	10.7	9.0	9.7
Hindu	74.2	78.8	80.6	79.5
Other (Mainly Christian)	10.5	10.5	10.5	10.7
Marital status				
Married/Living together	96.2	99.2	97.2	99.6
Widowed/Divorced/Not living together	3.8	0.8	2.8	0.4

Table A 13: Demographic distribution of HIV related risk behavior by gender (Cont.) (Column percents presented)

Variables	Female		Male	
	More risky behavior	Less risky behavior	More risky behavior	Less risky behavior
Standard of living index				
Low standard of living index	26.8	16.1	28.8	16.0
Medium standard of living index	39.6	32.2	40.9	33.1
High standard of living index	33.6	51.7	30.3	50.9
Wealth index				
Poor	32.6	20.0	38.1	20.0
Middle	29.2	22.9	29.7	23.5
Rich	38.2	57.1	32.2	56.5
Caste				
Scheduled caste	21.7	16.3	23.2	17.0
Scheduled tribe	11.7	7.8	13.1	8.2
Other backward caste	40.6	44.3	42.6	45.3
Others	26.0	31.7	21.1	29.5
Age				
15-19 Yr.	5.3	4.9	0.3	0.2
20-24 Yr.	12.6	16.8	6.1	5.0
25-29 Yr.	18.3	21.3	11.8	14.5
30-39 Yr.	41.0	36.5	36.1	40.0
40-49 Yr.	22.9	20.5	37.1	31.1
50-54 Yr.	NA	NA	8.7	9.1
States				
[MN] Manipur	16.0	12.6	11.8	12.6
[MH] Maharashtra	31.1	26.8	22.5	26.8
[AP] Andhra Pradesh	25.8	23.0	37.9	23.4
[KA] Karnataka	11.6	19.0	14.3	17.7
[TN] Tamil Nadu	15.5	18.6	13.6	19.4

Table A 14: Univariate analysis of the association between selected independent variables and higher HIV related knowledge by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.20	1.08 - 1.33	0.001 **	1.32	1.10 - 1.57	0.002 **
25-29 Yr.	1.09	0.98 - 1.22	0.114	1.09	0.91 - 1.30	0.351
30-39 Yr.	0.93	0.84 - 1.02	0.129	1.00	0.86 - 1.17	0.994
40-49 Yr.	0.75	0.67 - 0.83	<0.001 **	0.68	0.58 - 0.79	<0.001 **
50-54 Yr.	NA			0.64	0.52 - 0.78	<0.001 **
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.83	1.71 - 1.95	<0.001 **	2.16	1.96 - 2.38	<0.001 **
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.31	1.19 - 1.46	<0.001 **	1.67	1.45 - 1.93	<0.001 **
Secondary	3.64	3.36 - 3.96	<0.001 **	5.59	4.92 - 6.35	<0.001 **
Higher	18.06	15.06 - 21.67	<0.001 **	36.20	26.63 - 49.20	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	0.87	0.78 - 0.96	0.006 **	0.82	0.70 - 0.97	0.020 *
Other (Mainly Christian)	1.48	1.29 - 1.71	<0.001 **	1.46	1.16 - 1.84	0.001 **
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.62	0.57 - 0.67	<0.001 **	0.56	0.50 - 0.62	<0.001 **
Widowed/Divorced/Not living together	0.40	0.35 - 0.46	<0.001 **	0.38	0.25 - 0.56	<0.001 **

** Significant at 0.01 level   * Significant at 0.05 level

Table A 14: Univariate analysis of the association between selected independent variables and higher HIV related knowledge by gender (Cont.)

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Standard of living index						
Low standard of living index	1.00	Reference	Reference	1.00	Reference	Reference
Medium standard of living index	1.90	1.72 - 2.10	<0.001 **	1.71	1.51 - 1.94	<0.001 **
High standard of living index	4.28	3.88 - 4.72	<0.001 **	4.49	3.94 - 5.11	<0.001 **
Wealth index						
Poor	1.00	Reference	Reference	1.00	Reference	Reference
Middle	1.83	1.65 - 2.02	<0.001 **	1.59	1.40 - 1.80	<0.001 **
Rich	4.06	3.72 - 4.44	<0.001 **	4.10	3.64 - 4.61	<0.001 **
Caste						
Scheduled caste	1.00	Reference	Reference	1.00	Reference	Reference
Scheduled tribe	1.18	1.02 - 1.36	0.022 *	1.11	0.91 - 1.35	0.302
Other backward caste	1.02	0.93 - 1.11	0.684	1.11	0.99 - 1.26	0.086
Others	2.32	2.10 - 2.57	<0.001 **	2.25	1.94 - 2.61	<0.001 **
States						
[MN] Manipur	1.00	Reference	Reference	1.00	Reference	Reference
[MH] Maharashtra	0.42	0.36 - 0.48	<0.001 **	0.50	0.39 - 0.65	<0.001 **
[AP] Andhra Pradesh	0.19	0.17 - 0.22	<0.001 **	0.18	0.14 - 0.22	<0.001 **
[KA] Karnataka	0.20	0.18 - 0.24	<0.001 **	0.19	0.14 - 0.24	<0.001 **
[TN] Tamil Nadu	0.11	0.09 - 0.12	<0.001 **	0.15	0.12 - 0.19	<0.001 **
HIV Serostatus						
HIV Negative	1.00	Reference	Reference	1.00	Reference	Reference
HIV Positive	0.99	0.63 - 1.55	0.951	1.21	0.69 - 2.14	0.507

** Significant at 0.01 level   * Significant at 0.05 level

Table A 15: Univariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.20	1.10 - 1.31	<0.001 **	1.23	1.13 - 1.33	<0.001 **
25-29 Yr.	1.20	1.10 - 1.32	<0.001 **	1.21	1.11 - 1.32	<0.001 **
30-39 Yr.	1.01	0.93 - 1.10	0.749	1.03	0.95 - 1.12	0.428
40-49 Yr.	0.78	0.71 - 0.85	<0.001 **	0.86	0.79 - 0.93	<0.001 **
50-54 Yr.	NA			0.85	0.76 - 0.95	0.006 **
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	2.05	1.93 - 2.17	<0.001 **	1.63	1.55 - 1.71	<0.001 **
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.43	1.25 - 1.63	<0.001 **	1.67	1.47 - 1.89	<0.001 **
Secondary	4.32	3.91 - 4.77	<0.001 **	4.48	4.02 - 5.00	<0.001 **
Higher	12.73	11.34 - 14.29	<0.001 **	11.19	9.90 - 12.64	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	0.81	0.75 - 0.88	<0.001 **	1.30	1.20 - 1.41	<0.001 **
Other (Mainly Christian)	1.12	1.01 - 1.25	0.037 *	1.85	1.67 - 2.05	<0.001 **
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.66	0.62 - 0.70	<0.001 **	0.72	0.68 - 0.76	<0.001 **
Widowed/Divorced/Not living together	0.42	0.37 - 0.49	<0.001 **	0.69	0.54 - 0.89	0.005 **

** Significant at 0.01 level   * Significant at 0.05 level

Table A 15: Univariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission by gender (Cont.)

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Standard of living index						
Low standard of living index	1.00	Reference	Reference	1.00	Reference	Reference
Medium standard of living index	1.97	1.73 - 2.24	<0.001 **	1.59	1.45 - 1.73	<0.001 **
High standard of living index	5.00	4.43 - 5.63	<0.001 **	3.12	2.87 - 3.39	<0.001 **
Wealth index						
Poor	1.00	Reference	Reference	1.00	Reference	Reference
Middle	1.97	1.75 - 2.22	<0.001 **	1.54	1.42 - 1.68	<0.001 **
Rich	4.58	4.12 - 5.10	<0.001 **	3.04	2.82 - 3.28	<0.001 **
Caste						
Scheduled caste	1.00	Reference	Reference	1.00	Reference	Reference
Scheduled tribe	0.93	0.82 - 1.07	0.309	0.96	0.86 - 1.07	0.431
Other backward caste	0.89	0.82 - 0.97	0.007 **	1.08	1.01 - 1.16	0.029 *
Others	2.12	1.95 - 2.30	<0.001 **	1.48	1.37 - 1.59	<0.001 **
States						
[MN] Manipur	1.00	Reference	Reference	1.00	Reference	Reference
[MH] Maharashtra	0.76	0.70 - 0.82	<0.001 **	0.88	0.81 - 0.95	0.001 **
[AP] Andhra Pradesh	0.39	0.36 - 0.43	<0.001 **	0.32	0.29 - 0.35	<0.001 **
[KA] Karnataka	0.22	0.19 - 0.24	<0.001 **	0.29	0.27 - 0.32	<0.001 **
[TN] Tamil Nadu	0.19	0.17 - 0.21	<0.001 **	0.38	0.35 - 0.42	<0.001 **
HIV Serostatus						
HIV Negative	1.00	Reference	Reference	1.00	Reference	Reference
HIV Positive	0.80	0.55 - 1.19	0.272	1.19	0.92 - 1.55	0.182

** Significant at 0.01 level   * Significant at 0.05 level

Table A 16: Univariate analysis of the association between selected independent variables and having positive HIV related attitudes by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	0.83	0.74 - 0.92	0.001 **	1.53	1.15 - 2.03	0.003 **
25-29 Yr.	0.70	0.63 - 0.78	<0.001 **	1.45	1.08 - 1.94	0.014 *
30-39 Yr.	0.57	0.52 - 0.63	<0.001 **	1.08	0.84 - 1.37	0.549
40-49 Yr.	0.47	0.42 - 0.52	<0.001 **	0.70	0.55 - 0.89	0.004 **
50-54 Yr.	NA			0.77	0.55 - 1.09	0.139
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.94	1.83 - 2.06	<0.001 **	1.69	1.45 - 1.97	<0.001 **
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.56	1.42 - 1.70	<0.001 **	1.95	1.57 - 2.42	<0.001 **
Secondary	4.17	3.87 - 4.48	<0.001 **	6.70	5.53 - 8.13	<0.001 **
Higher	17.22	14.44 - 20.54	<0.001 **	30.69	19.48 - 48.35	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	0.97	0.89 - 1.07	0.568	0.61	0.45 - 0.82	0.001 **
Other (Mainly Christian)	1.12	0.99 - 1.26	0.081	0.73	0.50 - 1.07	0.105
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.41	0.37 - 0.44	<0.001 **	0.66	0.56 - 0.78	<0.001 **
Widowed/Divorced/Not living together	0.33	0.29 - 0.38	<0.001 **	0.59	0.27 - 1.27	0.174

** Significant at 0.01 level   * Significant at 0.05 level

Table A 16: Univariate analysis of the association between selected independent variables and having positive HIV related attitudes by gender (Cont.)

Variables	Female						Male					
	Odds Ratio	Confidence Interval			P Value		Odds Ratio	Confidence Interval			P Value	
Standard of living index												
Low standard of living index	1.00	Reference			Reference		1.00	Reference			Reference	
Medium standard of living index	1.68	1.54	-	1.84	<0.001	**	2.20	1.80	-	2.69	<0.001	**
High standard of living index	3.64	3.34	-	3.98	<0.001	**	4.78	3.91	-	5.85	<0.001	**
Wealth index												
Poor	1.00	Reference			Reference		1.00	Reference			Reference	
Middle	1.64	1.50	-	1.79	<0.001	**	1.87	1.53	-	2.30	<0.001	**
Rich	3.50	3.23	-	3.78	<0.001	**	4.07	3.39	-	4.90	<0.001	**
Caste												
Scheduled caste	1.00	Reference			Reference		1.00	Reference			Reference	
Scheduled tribe	0.74	0.65	-	0.84	<0.001	**	0.77	0.58	-	1.02	0.070	
Other backward caste	1.01	0.93	-	1.10	0.787		1.32	1.08	-	1.62	0.007	**
Others	1.59	1.46	-	1.75	<0.001	**	1.93	1.53	-	2.44	<0.001	**
States												
[MN] Manipur	1.00	Reference			Reference		1.00	Reference			Reference	
[MH] Maharashtra	0.89	0.79	-	0.99	0.033	*	0.39	0.26	-	0.57	<0.001	**
[AP] Andhra Pradesh	0.37	0.33	-	0.41	<0.001	**	0.22	0.15	-	0.32	<0.001	**
[KA] Karnataka	0.55	0.49	-	0.62	<0.001	**	0.30	0.21	-	0.45	<0.001	**
[TN] Tamil Nadu	0.39	0.35	-	0.44	<0.001	**	0.21	0.14	-	0.30	<0.001	**
HIV Serostatus												
HIV Negative	1.00	Reference			Reference		1.00	Reference			Reference	
HIV Positive	0.92	0.62	-	1.37	0.688		0.54	0.29	-	1.01	0.052	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 17: Univariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	0.97	0.89 - 1.05	0.414	1.16	1.07 - 1.27	0.001 **
25-29 Yr.	0.94	0.86 - 1.02	0.143	1.17	1.07 - 1.28	0.001 **
30-39 Yr.	0.78	0.72 - 0.85	<0.001 **	1.10	1.01 - 1.19	0.023 *
40-49 Yr.	0.64	0.58 - 0.70	<0.001 **	0.91	0.83 - 0.99	0.037 *
50-54 Yr.	NA			0.90	0.79 - 1.01	0.078
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.34	1.27 - 1.42	<0.001 **	1.30	1.24 - 1.37	<0.001 **
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.17	1.05 - 1.31	0.005 **	1.58	1.38 - 1.80	<0.001 **
Secondary	2.52	2.32 - 2.73	<0.001 **	3.43	3.06 - 3.84	<0.001 **
Higher	3.74	3.38 - 4.13	<0.001 **	5.39	4.76 - 6.10	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	1.15	1.06 - 1.26	0.001 **	1.14	1.05 - 1.25	0.002 **
Other (Mainly Christian)	1.42	1.28 - 1.58	<0.001 **	2.10	1.88 - 2.33	<0.001 **
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.60	0.56 - 0.63	<0.001 **	0.81	0.77 - 0.85	<0.001 **
Widowed/Divorced/ Not living together	0.48	0.42 - 0.54	<0.001 **	0.64	0.48 - 0.84	0.002 **

** Significant at 0.01 level   * Significant at 0.05 level

Table A 17: Univariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) by gender (Cont.)

Variables	Female				Male			
	Odds Ratio	Confidence Interval	P Value		Odds Ratio	Confidence Interval	P Value	
Standard of living index								
Low standard of living index	1.00	Reference	Reference		1.00	Reference	Reference	
Medium standard of living index	1.65	1.49 - 1.84	<0.001	**	1.40	1.27 - 1.54	<0.001	**
High standard of living index	2.59	2.35 - 2.86	<0.001	**	2.27	2.08 - 2.48	<0.001	**
Wealth index								
Poor	1.00	Reference	Reference		1.00	Reference	Reference	
Middle	1.69	1.52 - 1.87	<0.001	**	1.40	1.28 - 1.53	<0.001	**
Rich	2.42	2.22 - 2.65	<0.001	**	2.07	1.92 - 2.24	<0.001	**
Caste								
Scheduled caste	1.00	Reference	Reference		1.00	Reference	Reference	
Scheduled tribe	0.90	0.79 - 1.02	0.100		1.38	1.24 - 1.55	<0.001	**
Other backward caste	0.81	0.75 - 0.88	<0.001	**	0.86	0.80 - 0.93	<0.001	**
Others	1.63	1.50 - 1.76	<0.001	**	1.63	1.51 - 1.76	<0.001	**
States								
[MN] Manipur	1.00	Reference	Reference		1.00	Reference	Reference	
[MH] Maharashtra	0.47	0.44 - 0.51	<0.001	**	0.47	0.43 - 0.51	<0.001	**
[AP] Andhra Pradesh	0.15	0.13 - 0.16	<0.001	**	0.07	0.06 - 0.08	<0.001	**
[KA] Karnataka	0.29	0.26 - 0.32	<0.001	**	0.17	0.15 - 0.18	<0.001	**
[TN] Tamil Nadu	0.11	0.10 - 0.12	<0.001	**	0.07	0.06 - 0.07	<0.001	**
HIV Serostatus								
HIV Negative	1.00	Reference	Reference		1.00	Reference	Reference	
HIV Positive	1.17	0.82 - 1.66	0.387		1.35	1.04 - 1.76	0.024	*

** Significant at 0.01 level   * Significant at 0.05 level

Table A 18: Univariate analysis of the association between selected independent variables and having HIV related less risky behaviors by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.44	0.90 - 2.31	0.131	1.26	0.16 - 9.64	0.826
25-29 Yr.	1.26	0.80 - 1.98	0.313	1.89	0.25 - 14.26	0.535
30-39 Yr.	0.96	0.63 - 1.47	0.861	1.70	0.23 - 12.63	0.603
40-49 Yr.	0.97	0.62 - 1.50	0.879	1.29	0.17 - 9.55	0.805
50-54 Yr.	NA			1.60	0.21 - 12.17	0.648
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.47	1.22 - 1.76	<0.001 **	1.84	1.50 - 2.26	<0.001 **
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.21	0.96 - 1.53	0.103	1.19	0.90 - 1.56	0.222
Secondary	2.83	2.28 - 3.53	<0.001 **	1.97	1.54 - 2.53	<0.001 **
Higher	16.17	6.66 - 39.27	<0.001 **	9.03	4.84 - 16.85	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	1.52	1.18 - 1.96	0.001 **	0.91	0.64 - 1.29	0.591
Other (Mainly Christian)	1.43	0.99 - 2.06	0.056	0.94	0.60 - 1.49	0.794
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.20	0.12 - 0.33	<0.001 **	0.13	0.07 - 0.26	<0.001 **

** Significant at 0.01 level   * Significant at 0.05 level

Table A 18: Univariate analysis of the association between selected independent variables and having HIV related less risky behaviors by gender (Cont.)

Variables	Female				Male			
	Odds Ratio	Confidence Interval		P Value	Odds Ratio	Confidence Interval		P Value
Standard of living index								
Low standard of living index	1.00	Reference		Reference	1.00	Reference		Reference
Medium standard of living index	1.36	1.07 - 1.72		0.011 *	1.45	1.13 - 1.87		0.003 **
High standard of living index	2.56	2.01 - 3.26		<0.001 **	3.01	2.31 - 3.93		<0.001 **
Wealth index								
Poor	1.00	Reference		Reference	1.00	Reference		Reference
Middle	1.27	1.01 - 1.61		0.041 *	1.51	1.18 - 1.93		0.001 **
Rich	2.43	1.96 - 3.02		<0.001 **	3.34	2.62 - 4.25		<0.001 **
Caste								
Scheduled caste	1.00	Reference		Reference	1.00	Reference		Reference
Scheduled tribe	0.88	0.63 - 1.23		0.461	0.86	0.60 - 1.22		0.390
Other backward caste	1.45	1.14 - 1.85		0.003 **	1.46	1.12 - 1.89		0.005 **
Others	1.62	1.24 - 2.12		<0.001 **	1.91	1.41 - 2.59		<0.001 **
States								
[MN] Manipur	1.00	Reference		Reference	1.00	Reference		Reference
[MH] Maharashtra	1.10	0.83 - 1.45		0.524	1.11	0.77 - 1.59		0.567
[AP] Andhra Pradesh	1.13	0.85 - 1.52		0.397	0.58	0.41 - 0.81		0.001 **
[KA] Karnataka	2.09	1.47 - 2.97		<0.001 **	1.15	0.78 - 1.71		0.481
[TN] Tamil Nadu	1.52	1.10 - 2.11		0.011 *	1.33	0.89 - 1.99		0.158
HIV Serostatus								
HIV Negative	1.00	Reference		Reference	1.00	Reference		Reference
HIV Positive	0.51	0.21 - 1.26		0.146	0.57	0.26 - 1.21		0.143

** Significant at 0.01 level   * Significant at 0.05 level

Table A 19: Multivariate analysis of the association between selected independent variables and higher HIV related knowledge by gender

Variables	Female				Male			
	Odds Ratio	Confidence Interval	P Value		Odds Ratio	Confidence Interval	P Value	
Age								
15-19 Yr.	1.00	Reference	Reference		1.00	Reference	Reference	
20-24 Yr.	1.23	1.07 - 1.40	0.003	**	1.34	1.11 - 1.63	0.003	**
25-29 Yr.	1.30	1.12 - 1.52	0.001	**	1.43	1.13 - 1.80	0.002	**
30-39 Yr.	1.28	1.10 - 1.49	0.001	**	1.66	1.30 - 2.12	<0.001	**
40-49 Yr.	1.14	0.97 - 1.33	0.117		1.26	0.98 - 1.62	0.070	
50-54 Yr.	NA				1.07	0.80 - 1.42	0.667	
Residence								
Rural	1.00	Reference	Reference		1.00	Reference	Reference	
Urban	1.11	1.02 - 1.21	0.015	*	1.25	1.10 - 1.40	<0.001	**
Education level								
No education	1.00	Reference	Reference		1.00	Reference	Reference	
Primary	1.39	1.24 - 1.56	<0.001	**	1.42	1.22 - 1.65	<0.001	**
Secondary	3.19	2.87 - 3.53	<0.001	**	3.56	3.07 - 4.12	<0.001	**
Higher	13.69	11.19 - 16.75	<0.001	**	17.83	12.91 - 24.61	<0.001	**
Religion								
Muslim	1.00	Reference	Reference		1.00	Reference	Reference	
Hindu	1.14	1.01 - 1.28	0.037	*	1.08	0.89 - 1.30	0.434	
Other (Mainly Christian)	1.15	0.97 - 1.37	0.108		1.02	0.78 - 1.34	0.857	
Marital status								
Never married	1.00	Reference	Reference		1.00	Reference	Reference	
Married/Living together	0.99	0.87 - 1.12	0.853		0.79	0.65 - 0.96	0.020	*
Widowed/Divorced/ Not living together	0.95	0.78 - 1.16	0.628		0.58	0.36 - 0.92	0.022	*

** Significant at 0.01 level   * Significant at 0.05 level

Table A 19: Multivariate analysis of the association between selected independent variables and higher HIV related knowledge by gender (Cont.)

Variables	Female						Male					
	Odds Ratio	Confidence Interval			P Value		Odds Ratio	Confidence Interval			P Value	
Wealth index												
Poor	1.00	Reference			Reference		1.00	Reference			Reference	
Middle	1.45	1.29	-	1.62	<0.001	**	1.19	1.04	-	1.36	0.013	*
Rich	2.06	1.84	-	2.31	<0.001	**	1.76	1.51	-	2.04	<0.001	**
Caste												
Scheduled caste	1.00	Reference			Reference		1.00	Reference			Reference	
Scheduled tribe	0.57	0.48	-	0.68	<0.001	**	0.76	0.61	-	0.96	0.020	*
Other backward caste	1.02	0.92	-	1.13	0.702		1.07	0.93	-	1.22	0.337	
Others	1.04	0.92	-	1.18	0.487		1.11	0.93	-	1.32	0.257	
States												
[MN] Manipur	1.00	Reference			Reference		1.00	Reference			Reference	
[MH] Maharashtra	0.26	0.22	-	0.30	<0.001	**	0.38	0.29	-	0.51	<0.001	**
[AP] Andhra Pradesh	0.15	0.13	-	0.18	<0.001	**	0.18	0.14	-	0.24	<0.001	**
[KA] Karnataka	0.17	0.15	-	0.21	<0.001	**	0.22	0.16	-	0.29	<0.001	**
[TN] Tamil Nadu	0.08	0.07	-	0.09	<0.001	**	0.15	0.11	-	0.20	<0.001	**
HIV Serostatus												
HIV Negative	1.00	Reference			Reference		1.00	Reference			Reference	
HIV Positive	1.09	0.65	-	1.81	0.744		1.16	0.63	-	2.11	0.635	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 20: Multivariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission by gender

Variables	Female Odds Ratio	Confidence Interval		P Value		Male Odds Ratio	Confidence Interval		P Value	
Age										
15-19 Yr.	1.00	Reference		Reference		1.00	Reference		Reference	
20-24 Yr.	1.12	1.01 -	1.25	0.039	*	1.13	1.03 -	1.23	0.012	*
25-29 Yr.	1.28	1.13 -	1.45	<0.001	**	1.21	1.09 -	1.35	<0.001	**
30-39 Yr.	1.24	1.09 -	1.40	0.001	**	1.17	1.03 -	1.32	0.013	*
40-49 Yr.	1.06	0.93 -	1.22	0.393		1.05	0.92 -	1.19	0.482	
50-54 Yr.	NA					0.99	0.84 -	1.15	0.854	
Residence										
Rural	1.00	Reference		Reference		1.00	Reference		Reference	
Urban	1.20	1.11 -	1.29	<0.001	**	1.04	0.98 -	1.11	0.197	
Education level										
No education	1.00	Reference		Reference		1.00	Reference		Reference	
Primary	1.43	1.24 -	1.65	<0.001	**	1.36	1.19 -	1.56	<0.001	**
Secondary	3.57	3.19 -	4.00	<0.001	**	2.87	2.55 -	3.23	<0.001	**
Higher	9.40	8.20 -	10.77	<0.001	**	6.46	5.65 -	7.38	<0.001	**
Religion										
Muslim	1.00	Reference		Reference		1.00	Reference		Reference	
Hindu	0.89	0.81 -	0.98	0.017	*	1.36	1.24 -	1.49	<0.001	**
Other (Mainly Christian)	0.93	0.80 -	1.06	0.276		1.39	1.22 -	1.58	<0.001	**
Marital status										
Never married	1.00	Reference		Reference		1.00	Reference		Reference	
Married/Living together	0.96	0.87 -	1.06	0.404		0.91	0.83 -	1.00	0.055	
Widowed/Divorced/Not living together	0.90	0.75 -	1.08	0.256		1.00	0.74 -	1.33	0.977	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 20: Multivariate analysis of the association between selected independent variables and having comprehensive knowledge on HIV prevention and transmission by gender (Cont.)

Variables	Female				Male			
	Odds Ratio	Confidence Interval	P Value		Odds Ratio	Confidence Interval	P Value	
Wealth index								
Poor	1.00	Reference	Reference		1.00	Reference	Reference	
Middle	1.36	1.19 - 1.55	<0.001	**	1.22	1.11 - 1.34	<0.001	**
Rich	1.88	1.66 - 2.14	<0.001	**	1.72	1.56 - 1.88	<0.001	**
Caste								
Scheduled caste	1.00	Reference	Reference		1.00	Reference	Reference	
Scheduled tribe	0.63	0.54 - 0.73	<0.001	**	0.75	0.66 - 0.85	<0.001	**
Other backward caste	0.94	0.86 - 1.04	0.249		1.14	1.05 - 1.24	0.001	**
Others	1.14	1.03 - 1.26	0.013	*	1.02	0.94 - 1.12	0.593	
States								
[MN] Manipur	1.00	Reference	Reference		1.00	Reference	Reference	
[MH] Maharashtra	0.58	0.53 - 0.64	<0.001	**	0.80	0.73 - 0.88	<0.001	**
[AP] Andhra Pradesh	0.33	0.30 - 0.37	<0.001	**	0.31	0.28 - 0.35	<0.001	**
[KA] Karnataka	0.20	0.18 - 0.23	<0.001	**	0.30	0.27 - 0.34	<0.001	**
[TN] Tamil Nadu	0.17	0.15 - 0.19	<0.001	**	0.36	0.33 - 0.41	<0.001	**
HIV Serostatus								
HIV Negative	1.00	Reference	Reference		1.00	Reference	Reference	
HIV Positive	0.98	0.63 - 1.52	0.919		1.23	0.92 - 1.65	0.165	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 21: Multivariate analysis of the association between selected independent variables and having positive HIV related attitudes by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.00	0.87 - 1.13	0.947	1.41	1.04 - 1.91	0.025 *
25-29 Yr.	1.04	0.90 - 1.20	0.628	1.35	0.95 - 1.94	0.097
30-39 Yr.	0.99	0.86 - 1.14	0.873	1.13	0.77 - 1.66	0.523
40-49 Yr.	0.87	0.75 - 1.01	0.063	0.84	0.57 - 1.25	0.393
50-54 Yr.	NA			0.82	0.51 - 1.30	0.400
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.20	1.11 - 1.29	<0.001 **	0.99	0.82 - 1.20	0.902
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.42	1.29 - 1.56	<0.001 **	1.78	1.42 - 2.23	<0.001 **
Secondary	2.82	2.58 - 3.07	<0.001 **	5.29	4.20 - 6.67	<0.001 **
Higher	9.89	8.18 - 11.95	<0.001 **	20.45	12.61 - 33.17	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	1.11	1.00 - 1.24	0.049 *	0.60	0.42 - 0.84	0.003 **
Other (Mainly Christian)	0.91	0.78 - 1.06	0.206	0.43	0.28 - 0.67	<0.001 **
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.68	0.60 - 0.77	<0.001 **	1.37	1.00 - 1.86	0.048 *
Widowed/Divorced/ Not living together	0.79	0.66 - 0.94	0.008 **	1.55	0.67 - 3.60	0.309

** Significant at 0.01 level   * Significant at 0.05 level

Table A 21: Multivariate analysis of the association between selected independent variables and having positive HIV related attitudes by gender (Cont.)

Variables	Female					Male				
	Odds Ratio	Confidence Interval		P Value		Odds Ratio	Confidence Interval		P Value	
Wealth index										
Poor	1.00	Reference		Reference		1.00	Reference		Reference	
Middle	1.30	1.18 -	1.43	<0.001	**	1.37	1.10 -	1.70	0.005	**
Rich	1.78	1.61 -	1.96	<0.001	**	1.91	1.50 -	2.42	<0.001	**
Caste										
Scheduled caste	1.00	Reference		Reference		1.00	Reference		Reference	
Scheduled tribe	0.59	0.51 -	0.68	<0.001	**	0.65	0.48 -	0.89	0.008	**
Other backward caste	0.92	0.84 -	1.01	0.089		1.13	0.91 -	1.40	0.268	
Others	0.91	0.81 -	1.01	0.086		0.94	0.72 -	1.23	0.663	
States										
[MN] Manipur	1.00	Reference		Reference		1.00	Reference		Reference	
[MH] Maharashtra	0.65	0.57 -	0.74	<0.001	**	0.33	0.22 -	0.49	<0.001	**
[AP] Andhra Pradesh	0.31	0.28 -	0.36	<0.001	**	0.23	0.15 -	0.36	<0.001	**
[KA] Karnataka	0.52	0.45 -	0.60	<0.001	**	0.38	0.24 -	0.59	<0.001	**
[TN] Tamil Nadu	0.34	0.30 -	0.39	<0.001	**	0.20	0.13 -	0.31	<0.001	**
HIV Serostatus										
HIV Negative	1.00	Reference		Reference		1.00	Reference		Reference	
HIV Positive	1.23	0.80 -	1.89	0.335		0.67	0.35 -	1.28	0.226	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 22: Multivariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.01	0.91 - 1.12	0.917	1.19	1.07 - 1.31	0.001 **
25-29 Yr.	1.05	0.93 - 1.18	0.446	1.29	1.15 - 1.46	<0.001 **
30-39 Yr.	0.92	0.82 - 1.04	0.167	1.31	1.15 - 1.50	<0.001 **
40-49 Yr.	0.82	0.72 - 0.93	0.003 **	1.14	0.99 - 1.32	0.070
50-54 Yr.	NA			1.03	0.86 - 1.22	0.775
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.10	1.03 - 1.18	0.008 **	1.07	1.00 - 1.15	0.052
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.23	1.09 - 1.38	0.001 **	1.29	1.12 - 1.50	0.001 **
Secondary	1.94	1.76 - 2.14	<0.001 **	2.10	1.85 - 2.40	<0.001 **
Higher	2.65	2.34 - 3.00	<0.001 **	3.25	2.81 - 3.76	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	1.27	1.15 - 1.39	<0.001 **	1.25	1.13 - 1.38	<0.001 **
Other (Mainly Christian)	0.90	0.78 - 1.03	0.121	0.99	0.86 - 1.14	0.931
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.87	0.79 - 0.96	0.004 **	0.93	0.84 - 1.03	0.162
Widowed/Divorced/Not living together	0.93	0.79 - 1.10	0.411	0.71	0.51 - 0.99	0.041 *

** Significant at 0.01 level   * Significant at 0.05 level

Table A 22: Multivariate analysis of the association between selected independent variables and having positive attitudes towards people living with HIV/AIDS (PLHA) by gender (Cont.)

Variables	Female				Male			
	Odds Ratio	Confidence Interval	P Value		Odds Ratio	Confidence Interval	P Value	
Wealth index								
Poor	1.00	Reference	Reference		1.00	Reference	Reference	
Middle	1.33	1.19 - 1.49	<0.001	**	1.11	1.00 - 1.24	0.041	*
Rich	1.65	1.47 - 1.84	<0.001	**	1.44	1.30 - 1.60	<0.001	**
Caste								
Scheduled caste	1.00	Reference	Reference		1.00	Reference	Reference	
Scheduled tribe	0.43	0.37 - 0.50	<0.001	**	0.60	0.53 - 0.69	<0.001	**
Other backward caste	0.82	0.75 - 0.90	<0.001	**	0.91	0.83 - 0.99	0.032	*
Others	0.82	0.75 - 0.91	<0.001	**	0.85	0.77 - 0.93	0.001	**
States								
[MN] Manipur	1.00	Reference	Reference		1.00	Reference	Reference	
[MH] Maharashtra	0.36	0.33 - 0.39	<0.001	**	0.40	0.36 - 0.44	<0.001	**
[AP] Andhra Pradesh	0.12	0.11 - 0.13	<0.001	**	0.06	0.05 - 0.07	<0.001	**
[KA] Karnataka	0.24	0.22 - 0.27	<0.001	**	0.16	0.14 - 0.18	<0.001	**
[TN] Tamil Nadu	0.08	0.07 - 0.09	<0.001	**	0.06	0.05 - 0.06	<0.001	**
HIV Serostatus								
HIV Negative	1.00	Reference	Reference		1.00	Reference	Reference	
HIV Positive	1.20	0.80 - 1.80	0.367		1.12	0.82 - 1.53	0.489	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 23: Multivariate analysis of the association between selected independent variables and having HIV related less risky behaviors by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
Age						
15-19 Yr.	1.00	Reference	Reference	1.00	Reference	Reference
20-24 Yr.	1.22	0.75 - 1.96	0.425	0.84	0.10 - 6.97	0.875
25-29 Yr.	1.09	0.69 - 1.72	0.716	1.05	0.13 - 8.48	0.966
30-39 Yr.	0.90	0.58 - 1.39	0.629	0.79	0.10 - 6.32	0.824
40-49 Yr.	0.94	0.59 - 1.48	0.775	0.60	0.08 - 4.81	0.631
50-54 Yr.	NA			0.71	0.09 - 5.80	0.749
Residence						
Rural	1.00	Reference	Reference	1.00	Reference	Reference
Urban	1.00	0.80 - 1.25	0.978	1.14	0.88 - 1.46	0.314
Education level						
No education	1.00	Reference	Reference	1.00	Reference	Reference
Primary	1.12	0.88 - 1.43	0.358	0.91	0.68 - 1.20	0.493
Secondary	2.36	1.83 - 3.04	<0.001 **	1.13	0.85 - 1.50	0.395
Higher	11.68	4.72 - 28.90	<0.001 **	4.90	2.40 - 10.00	<0.001 **
Religion						
Muslim	1.00	Reference	Reference	1.00	Reference	Reference
Hindu	1.83	1.38 - 2.44	<0.001 **	1.08	0.73 - 1.60	0.688
Other (Mainly Christian)	2.51	1.60 - 3.93	<0.001 **	1.22	0.71 - 2.10	0.476
Marital status						
Never married	1.00	Reference	Reference	1.00	Reference	Reference
Married/Living together	0.24	0.15 - 0.41	<0.001 **	0.13	0.06 - 0.25	<0.001 **

** Significant at 0.01 level   * Significant at 0.05 level

Table A 23: Multivariate analysis of the association between selected independent variables and having HIV related less risky behaviors by gender (Cont.)

Variables	Female				Male			
	Odds Ratio	Confidence Interval	P Value		Odds Ratio	Confidence Interval	P Value	
Wealth index								
Poor	1.00	Reference	Reference		1.00	Reference	Reference	
Middle	1.16	0.90 - 1.48	0.248		1.40	1.08 - 1.82	0.012	*
Rich	1.56	1.18 - 2.06	0.002	**	2.50	1.83 - 3.42	<0.001	**
Caste								
Scheduled caste	1.00	Reference	Reference		1.00	Reference	Reference	
Scheduled tribe	1.23	0.86 - 1.76	0.259		1.12	0.76 - 1.63	0.575	
Other backward caste	1.36	1.05 - 1.75	0.020	*	1.34	1.02 - 1.76	0.039	*
Others	1.89	1.39 - 2.58	<0.001	**	1.68	1.19 - 2.38	0.003	**
States								
[MN] Manipur	1.00	Reference	Reference		1.00	Reference	Reference	
[MH] Maharashtra	1.13	0.83 - 1.54	0.439		1.11	0.74 - 1.67	0.618	
[AP] Andhra Pradesh	1.58	1.13 - 2.19	0.007	**	0.63	0.42 - 0.95	0.027	*
[KA] Karnataka	3.15	2.13 - 4.65	<0.001	**	1.63	1.02 - 2.59	0.039	*
[TN] Tamil Nadu	2.05	1.40 - 3.00	<0.001	**	1.73	1.07 - 2.79	0.025	*
HIV Serostatus								
HIV Negative	1.00	Reference	Reference		1.00	Reference	Reference	
HIV Positive	0.76	0.30 - 1.95	0.569		0.71	0.32 - 1.56	0.393	

** Significant at 0.01 level   * Significant at 0.05 level

Table A 24: Bivariate analysis of higher HIV related knowledge and HIV serostatus by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
HIV Serostatus (Unadjusted)						
HIV Negative						
HIV Positive	0.99	0.63 - 1.55	0.951	1.21	0.69 - 2.14	0.507
HIV Serostatus (Adjusted)						
HIV Negative						
HIV Positive	1.09	0.65 - 1.81	0.744	1.16	0.63 - 2.11	0.635

** Significant at 0.01 level   * Significant at 0.05 level

Table A 25: Bivariate analysis of having comprehensive knowledge on HIV prevention and transmission and HIV serostatus by gender

Variables	Female			Male		
	Odds Ratio	Confidence Interval	P Value	Odds Ratio	Confidence Interval	P Value
HIV Serostatus (Unadjusted)						
HIV Negative						
HIV Positive	0.80	0.55 - 1.19	0.272	1.19	0.92 - 1.55	0.182
HIV Serostatus (Adjusted)						
HIV Negative						
HIV Positive	0.98	0.63 - 1.52	0.919	1.23	0.92 - 1.65	0.165

** Significant at 0.01 level   * Significant at 0.05 level

Table A 26: Bivariate analysis of having positive HIV related attitudes and HIV serostatus by gender

Variables	Female							Male						
	Odds Ratio	Confidence Interval			P Value			Odds Ratio	Confidence Interval			P Value		
HIV Serostatus (Unadjusted)														
HIV Negative														
HIV Positive	0.92	0.62	-	1.37	0.688			0.54	0.29	-	1.01	0.052		
HIV Serostatus (Adjusted)														
HIV Negative														
HIV Positive	1.23	0.80	-	1.89	0.335			0.67	0.35	-	1.28	0.226		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 27: Bivariate analysis of having positive attitudes towards people living with HIV/AIDS (PLHA) and HIV serostatus by gender

Variables	Female							Male						
	Odds Ratio	Confidence Interval			P Value			Odds Ratio	Confidence Interval			P Value		
HIV Serostatus (Unadjusted)														
HIV Negative														
HIV Positive	1.17	0.82	-	1.66	0.387			1.35	1.04	-	1.76	0.024	*	
HIV Serostatus (Adjusted)														
HIV Negative														
HIV Positive	1.20	0.80	-	1.80	0.367			1.12	0.82	-	1.53	0.489		

** Significant at 0.01 level   * Significant at 0.05 level

Table A 28: Bivariate analysis of having HIV related less risky behaviors and HIV serostatus by gender

Variables	Female						Male					
	Odds Ratio	Confidence Interval			P Value		Odds Ratio	Confidence Interval			P Value	
HIV Serostatus (Unadjusted)												
HIV Negative												
HIV Positive	0.51	0.21	-	1.26	0.146		0.57	0.26	-	1.21	0.143	
HIV Serostatus (Adjusted)												
HIV Negative												
HIV Positive	0.76	0.30	-	1.95	0.569		0.71	0.32	-	1.56	0.393	

** Significant at 0.01 level   * Significant at 0.05 level