EPIDEMIOLOGICAL TREND ANALYSIS OF HIV/STI IN FEMALE SEX WORKERS IN KATHMANDU AND POKHARA VALLEY, NEPAL, 2004-2011

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ABSTRACT

The objective of the research was to analyse the trend of general characteristics, sexual behaviour, health related risk behaviour, and HIV/STI among the female sex workers in Kathmandu and Pokhara valley, Nepal, in 2004, 2006, 2008, and 2011 and also to compare the female sex workers of Kathmandu and Pokhara in 2011. There is literature to suggest that female sex workers are mainly young, internal migrants, illiterate, and practice high risk sexual behaviour and health related risk behaviour, making them more vulnerable to HIV/STI. A total of 2800 participants were recruited in this study. A total of 700 participants (500 female sex workers from Kathmandu and 200 female sex workers from Pokhara) for each four two-yearperiod were recruited in this study.

The overall trend analysis of the female sex workers of Kathmandu and Pokhara shows that the female sex workers are mostly young, illiterate and migrants. The mean age at first sexual experience is low, and they have been increasingly exposed to multiple partner relationships. The overall condom use with clients and regular clients is increasing but still poor, and consistent condom use with non-paying partners is very poor and in fact decreasing. They are also increasingly involved with drug use. If the overall situation is not properly tackled in time, the burden of HIV/STI may further increase in the female sex workers of these two cities in the upcoming days and more in Pokhara than Kathmandu.

KEY WORDS: TREND ANALYSIS/ FEMALE SEX WORKERS OF KATHMANDU AND/OR POKHARA/ HIV/STI.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immuno - Deficiency Syndrome
FHI	Family Health International
FSWs	Female Sex Workers
HIV	Human Immuno – Deficiency Virus
IBBS	Integrated Biological and Behavioral Survey
IDUs	Injecting Drug Users
NCASC	National Center for AIDS and STD Control
NGOs	Non-Governmental Organizations
SACTS	STD/AIDS Counseling and Training Services
STIs	Sexually Transmitted Infections
VCT	Voluntary Counseling and Testing Centre
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1 Background and Significance

HIV/AIDS was first diagnosed in mankind in 1981.(1) In just around 3 decades, it became a global killer. It has been estimated that 34 million people are living with HIV/AIDS as of 2010 of which 50% are female and 3.4 million are children. It was estimated that around 2.7 million people were new victims to this global killer in 2010 alone and claimed 1.8 million lives.(2)

The adult prevalence of HIV/AIDS in Sub-Saharan Africa is 5%. 1.9 million adults and children were newly infected with HIV while AIDS related death claimed around 1.2 million lives in 2010 in Sub-Saharan Arica.(2)

Comparing with Sub-Saharan Africa, the situation of HIV/AIDS in Asia may only seem better. But, as half of the World's population live in Asia, the threat of HIV epidemic is very high in this part of the world. In this part of the world the epidemic of HIV has over spilled from the MARPS to the general population. Men having sex with men, injectable drug users, commercial sex workers and migrant workers are mainly the high risk group.(3)

In Nepal, the first HIV/AIDS case was detected in 1988, 7 years after the world's first case was detected.(4) National Centre for AIDS and STD control (NCASC) 2007 had estimated about 70,000 people living with HIV virus in Nepal.(5) NCASC reported 2103 confirmed AIDS cases and 12,746 confirmed HIV positive people living in Nepal in 2008(6) which went up to 17,058 in 2010.(7) The cumulative deaths related to HIV reached 4906 in 2010 out of which 872 people died in the same year [NCASC 2010]. In Nepal HIV/AIDS is most concentrated in MARPs.

Many global concerns are being raised regarding control of HIV/AIDS. One of the main aims of Millennium Development Goals (MDG) is to reverse HIV/AIDS by 2015(8). But it may only be an entity of lip service in context of Nepal.

Nepal is a developing country and HIV/AIDS is a growing problem in Nepal. Every new case of HIV infection adds up to the poverty of the nation.

Anyone can be infected with HIV and there is no cure to HIV infection. Early diagnosis and treatment helps only to prolong life.[9] One of the best approaches for prevention and control of HIV infection is Sentinel Surveillance. Sentinel Surveillance is an alternative to population-based surveillance for collection and analysis of individual data. It is less resource consuming and is helpful for documenting trend.[10]

There is an existing Sentinel Surveillance for HIV/AIDs in Nepal. It is conducted in high risk groups as sex workers, migrants, IV drug users and truck drivers. The Sentinel Surveillance are conducted in major cities such as Kathmandu and Pokhara, and along highway districts in every two year or so since 2004. The Sentinel Surveillance for HIV/AIDS is conducted in Kathmandu and Pokhara because they are the main tourist hub in Nepal with many entertainments like casino, bar, brothel etc. The migration is very high in the two cities.

HIV prevalence was as high as 51% in injecting drug users on 2003 which came down rapidly to 34.7 in 2007, then to 8% in 2010[11]. The prevalence in IDUs seems to have further decreased to 6.3% and 4.6% in Kathmandu and Pokhara valley as in Integrated Biological and Behavioral Survey V 2011 conducted by American Social Health Association/Nepal for Family Health International/Nepal[12].

The Prevalence of HIV infection in the female sex workers was found to be 2% in 2004, 1.4% in 2006, 2.2% in 2008 and 1.4% in 2011 IBBS[13,14,15,16] in Kathmandu. Integrated biological and behavioral survey among the female sex workers in Pokhara shows similar prevalence. Though the prevalence of HIV infection in the female sex workers is lower than that of IDUS, the slow decline of HIV infection is of major concern in the female sex workers. The clients of female sex workers can act as a bridge for HIV infection to enter the general population.

It is estimated that 32,137 female sex workers live in Nepal. About 1/3rd of them are concentrated in Kathmandu and Pokhara , the main tourist hub of Nepal. [NCASC 2011][17]. In these two cities female sex workers sell sex through street and establishment centers as restaurants, bars, discos etc.[13,18] Overall poor literacy, lack of employment and female empowerment, inability to negotiate for condom use,

alcohol and drug misuse, decreased assess to HIV related programs, lack of concern of healthy behavior have all caused this population to be more vulnerable to HIV.[11,17]

At present there are many NGO's, INGO's and organizations working in Nepal with target to this group. The real challenge to these organizations is a rapid turnover of female sex workers. With their support the HIV infection seems to be stable in female sex workers in Nepal but much is yet to be achieved.

In this circumstance, it is necessary to take a closer look at the change in general characteristics, sexual and health related risk behavior of this group in an attempt to understand the slow decline of STI/HIV in them. The fruitful findings from this study will be used as a guideline for policy makers for effective plan to combat STI/HIV problem in Nepal in the nearby future.

Rationale and Justification:

- HIV/AIDS is a global killer; there is no cure to it and no effective vaccine against it.
- Female sex workers (FSWs) are high risk group and their clients are bridge for transmission of HIV infection.
- The study is being conducted in Kathmandu and Pokhara, Nepal as 1/3rd of the female sex workers in Nepal are concentrated in these two cities.
- In order to prevent HIV infection, it is very essential to understand the trend of general characteristics and risk behavior of the female sex workers.
- The fruitful findings from this study will be used as a guideline for policy makers for effective plan to combat STI/HIV problem in Nepal in the nearby future.

1.2Research Questions:

1.2.1 What is the trend of general characteristics, sexual and health related risk behavior, and STI/HIV status in female sex workers of Kathmandu and Pokhara, Nepal from 2004 to 2011?

1.2.2 Do female sex workers of Kathmandu and Pokhara differ in general characteristics, sexual behavior and health related risk behavior?

1.3 Research Objectives:

1.3.1 General Objective:

To access the STI/HIV prevalence in female sex workers and to study the trends of the factors associated with STI/HIV in the female sex workers of Kathmandu and Pokhara from 2004 to 2011.

1.3.2 Specific Objectives:

This study is attempted in the FSWs of Kathmandu and Pokhara valley, Nepal:

1.3.2.1 To analyze the trends of STI/HIV in female sex workers in Nepal using epidemiological trend by-

- Person - general characteristics, sexual behavior, health related risk behavior,
- Place- Kathmandu and Pokhara and
- Time- the four period of time 2004, 2006, 2008, 2011.

1.3.2.2 To compare general characteristics, sexual behavior and health related risk behaviors among FSWs between Kathmandu and Pokhara in 2011 survey.

1.4 Variables in the Study

1.4.1 General characteristics

- Age
- Marital status
- Educational status

- Ethnicity
- Internal migration

1.4.2 Sexual behavior

- Age at first sex
- Duration of sex work
- Number of sex partners
- Condom use.

1.4.3 Health related risk behavior

- Alcohol use
- Drug use

1.4.4 STI/HIV status

1.5 Operational Definitions:

- **Epidemiological trend**: In this study epidemiological trend refers to the study of person, place and time.

- **Female sex workers (FSWs)** refers to women aged 16 years and above who have reported to have been paid in cash or kind in exchange of sex within last 6 months.

- **Age:** Number of completed years after birth. It is classified as:

1) 15-19 years
2) 20-24 years
3) 25-29 years
4) 30 + years

- **Marital status:** It is classified as- currently married, ivorced/separated/ widow and never married.

- **Educational level:** It means the ability to read and write with or without formal educational attendance. It is classified as:

1) Illiterate: People 15 years and above who cannot read and write short sentences of daily life with understanding.
2) Primary level: Those studying in grade 1 to grade 5,
3) Secondary level: Those studying in grade 6 to grade 9,
4) Higher Education: Those studying in grade 10 and above.

- **Ethnicity:** Refers to group of people having similar cultural and racial background. As of census 2011, Nepal has 103 caste/ethnic groups[(19)]. In this study it will be classified into 7 ethnic groups as: Brahmin, Chhetri/Thakuri, Newar, Tamang/Lama, Magar/Gurung, Damai/Sarki/Kami and others.

- **Internal migrants:** Here it refers to female sex workers who were born in different district of Nepal and later shifted to Kathmandu/Pokhara , Nepal for sex work.

- **Age at first sex**: It means the number of completed years since birth when the female sex workers had her first experience of sexual intercourse.

- **Duration of sex work**: In this study it refers to the number of months completed after the FSWs had her first sex in exchange of cash or kind with a male partner.

- **Number of sex partners**: It refers to the total number of male partners [both paying and nonpaying] with whom the female sex workers have sex with.

- **Paying partners [clients]:** Clients of the female sex workers who paid in cash or kind in exchange of sex.

- **Non-paying [non-clients] partners:** Those persons having sex with the female sex workers other than paying partners as their male friends/husband etc.

- **Condom Use behavior:** Those having their male partner use condom during sex. It is measured as condom use during last sex and those using it consistently in the last 1 year with all their partners.

- **Health related risk behavior:** In this study, it means alcohol and drug use behavior of female sex workers.

- **Alcohol use**: It means intake of any form of alcohol or alcohol containing beverage for recreational purpose. It is classified as intake of alcohol every day, at least once a week, less than once a week, and never.

- **Drug abuse:** It relates to drug use of any form- oral or injectable drugs which are sedative, hypnotic or narcotic in nature as cannabis, bhang, nitroson, nitrovet, diazepam etc and injectable drugs except for purpose of medical illness, within 30 days for oral drugs and ever or within 12 months for injectable drugs.

- **Sexually Transmitted Infections:** It means the experience of symptoms of STIs during the time of survey.

- **Symptoms of Sexually Transmitted Infections:** It means lower abdominal pain, pain during urination, vaginal itching, vaginal odor, painful sex, genital ulcer or sore, genital warts, polyuria, unusual vaginal bleeding and foul smell vaginal discharge and others.

- **HIV status:** It is measured as HIV positive and HIV negative based on the laboratory findings and criteria of the existing survey.

- **Laboratory Tests**

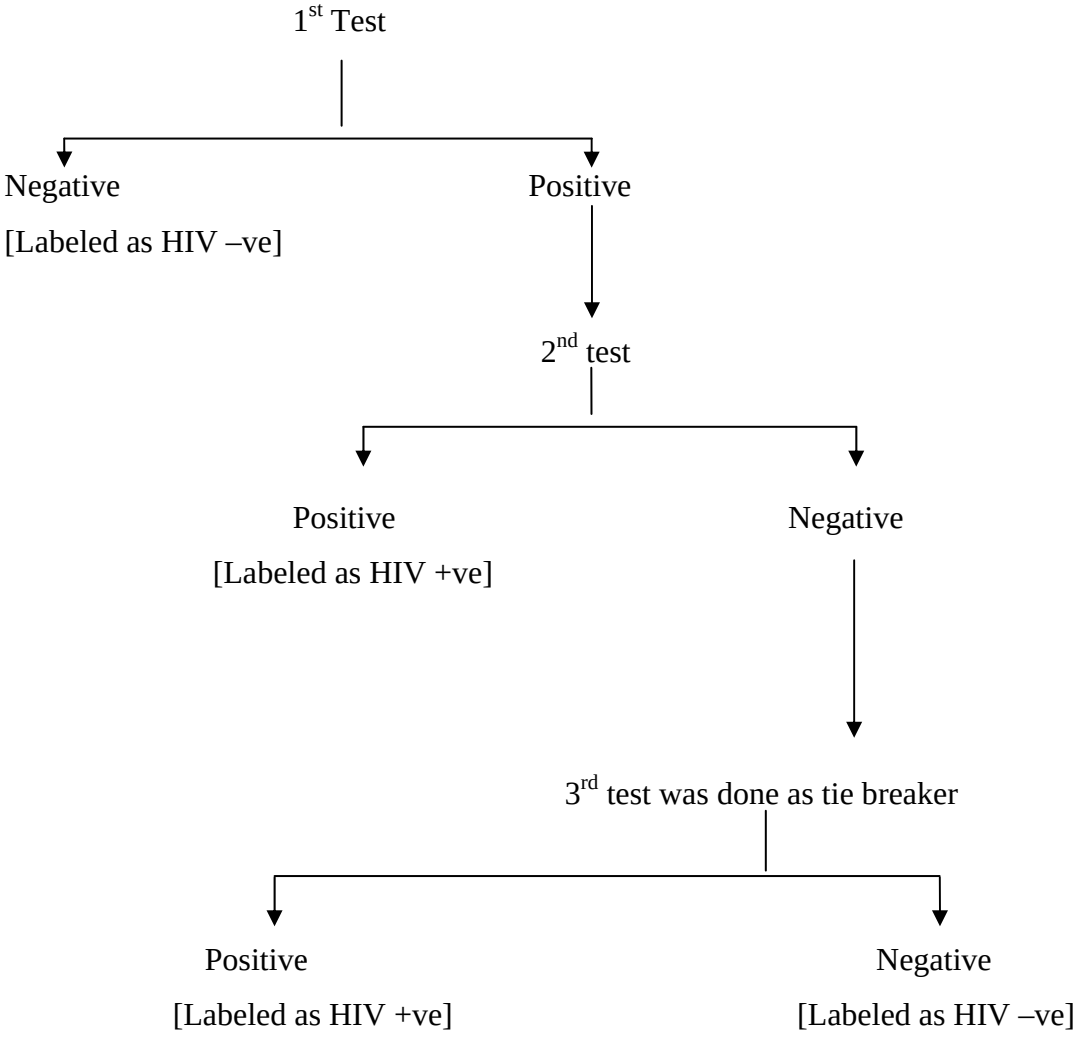
Three sequential testing were used to detect antibodies against HIV using:

1st test: Determine HIV 1/2 [Abbott Japan Co. Ltd]

2nd test: Uni-Gold [Trinity Biotech, Dublin, Ireland]

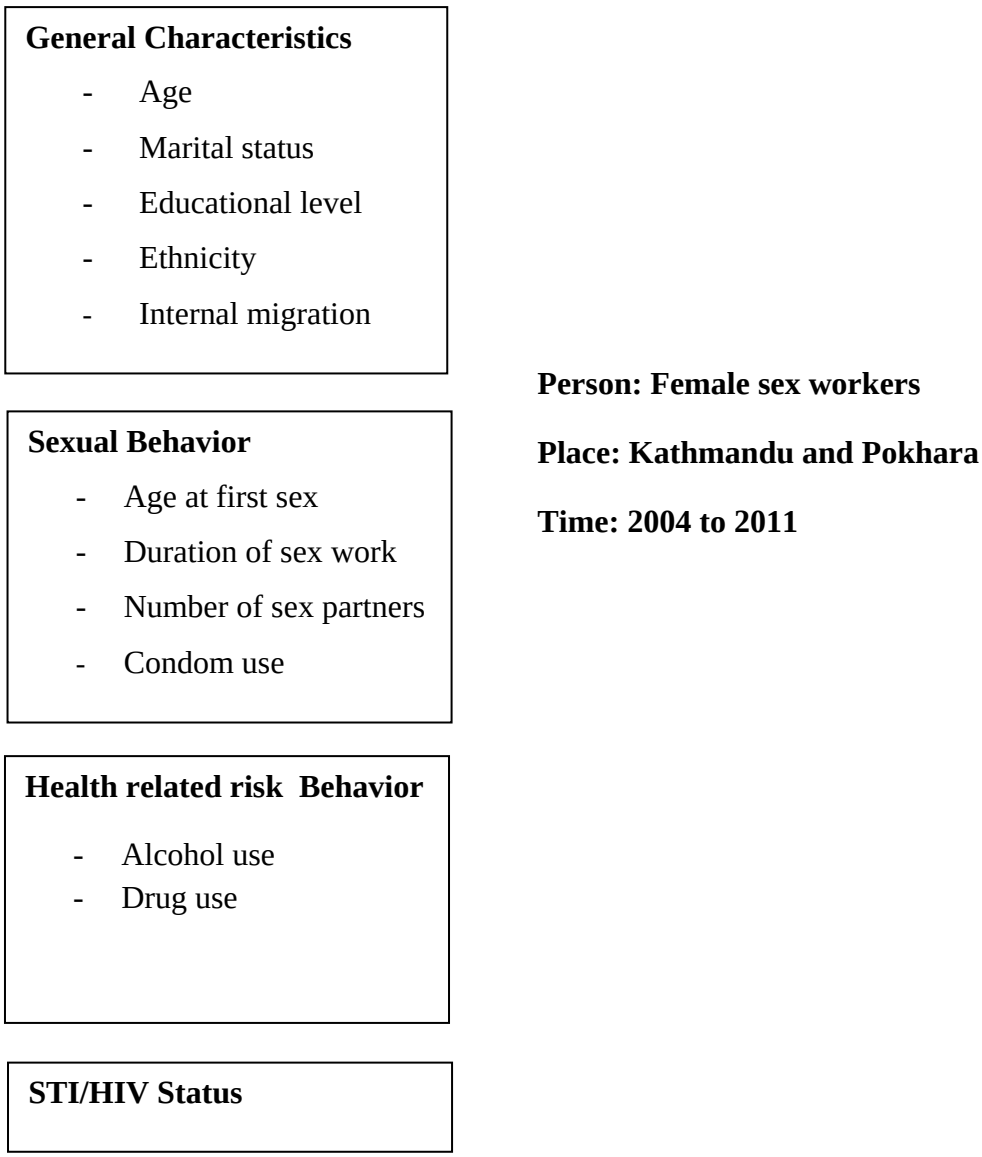
3rd test: SD Bioline HIV 1/2 [Standard Diagnostics, Inc, Kyonggi-do, South Korea]

Interpretation of result [13, 14, 15, 16]



1.6 Conceptual Framework

The conceptual framework to study the epidemiological trend of general characteristics, sexual behavior and health related risk behavior, and STI/HIV in the female sex workers of Kathmandu and Pokhara from 2004 to 2011 is based on study of the variables as person, place and time.



CHA PTER II
LITERATURE REVIEW

Literature review has been done to provide and support evidences for the proposed research. This chapter covers the following topics related to HIV infection:

2.1 Epidemiology of HIV/AIDS
2.2 Surveillance system
2.3 Situation of HIV/AIDS in Nepal
2.4 Nepal response to HIV/AIDS
2.5 Global situation of HIV infection in the female sex workers
2.6 Situation of HIV infection in female sex workers in Nepal
2.7 Related studies

2.1 Epidemiology of HIV/AIDS

HIV infection is caused by HIV virus [Human Immunodeficiency virus]. The HIV virus is found in blood, vaginal fluid, semen and breast milk of the infected people. It can be transmitted to another person through these sources. HIV virus is also found but in small amount in saliva, sweat and tears of infected people which is not in adequate amount to transmit the virus to another person.[20]

There were just 8 million people living with HIV/AIDS as of 1990 which has reached to 34 million as of 2010.[2] UNAIDS in its report 2009 estimated about 33.3 million people living with HIV/AIDS with an increase of 27% as of 1999.The report also shows that 23% of victim to this global killer are people under 24 years of age while 35% of the newly infected cases were in the age group 15-24 years.[21]

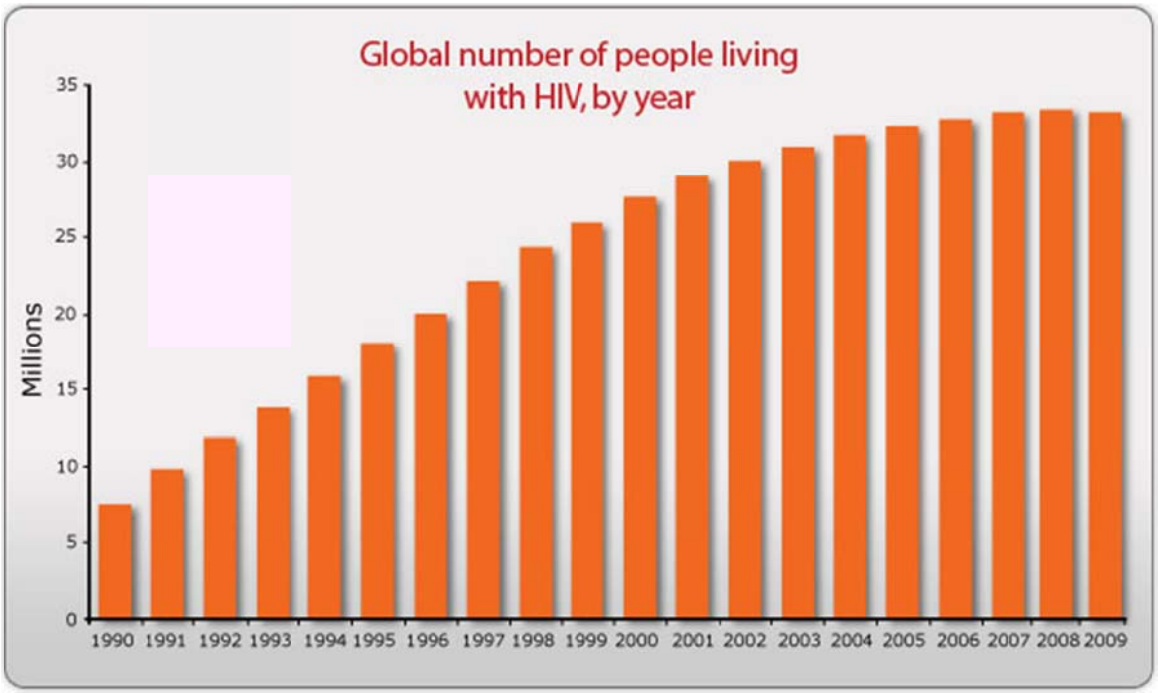


Figure 2.1: Global number of people living with HIV/AIDS, by year.
Source: UNAIDS 2010

As of 2010 it has been estimated 34 million are living with HIV/AIDS globally of which 50% were female and 3.4 million were children. About 2.7 million people were new victim to HIV in this last one year. HIV claimed 1.8 million lives in the year 2010 alone.[2]

With adult prevalence of 5%, Sub-Saharan Africa has an estimated 22.9 million people living with HIV/AIDS. 1.9 million adult and children were newly infected with HIV while AIDS related death claimed around 1.2 million lives in 2010.[3]

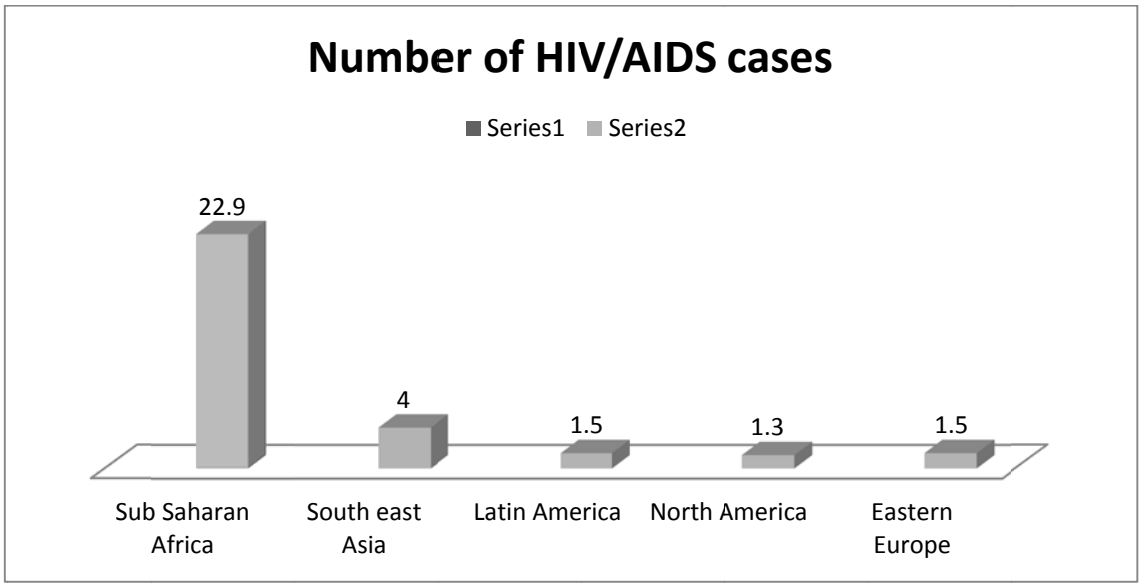


Figure 2.2: HIV/AIDS Cases in Million in different regions, 2010.
Source: UNAIDS 2010

Looking into this scenario of Africa the situation in Asia looks better. About 4.8 million people live in Asia with HIV/AIDS while India alone shares 50% [2.4 million] of the cases followed by 7,40,000 in China and 5,30,000 living in Thailand.(3)

As half of the World's population lives in Asia, the threat of HIV epidemic is very high in this part of the world. In this part of the world the epidemic of HIV has over spilled from the MARPS to the general population. Men having sex with men, injectable drug users, commercial sex workers and migrants are mainly the high risk group.

The most common mode of transmission of HIV virus is through unprotected sex [unprotected heterosexual or homosexual, vaginal, anal or oral sex], needle sharing, and transfusion of infected blood. Mother to child transmission of HIV virus occurs from infected mother during childbirth and also through breast milk. HIV virus is not transmitted through sneezing, shaking hands, mosquito bites, or from toilet seats.

Once the HIV virus enters the blood stream it attacks the CD4 lymphocytes. The HIV virus inserts its gene into the CD4 cells which in turn in

converted into factory to produce more HIV virus. Then the HIV virus slowly replaces the CD4 cells in the blood causing the CD4 cells to go down. Once the CD4 cells decrease in the body, the body's ability to fight off infection and other diseases decreases leading to AIDS [Acquired Immunodeficiency Syndrome].

AIDS do not occur immediately after the HIV virus enters the blood. The time from primary HIV infection to a full blown AIDS varies widely among persons depending upon many factors as source of infection [blood, sexual contact, mother to child], portal of entry, host resistance, viral pathogenicity and mutation. After the entry of HIV virus into the blood stream, it takes around 1 week to 3 months for the antibody of the virus to be detected and about 10 years for development of AIDS related illness.

Anyone can be infected with HIV. The best ways to prevent HIV infection are:

- Consistent use of condom during sex [vaginal, anal and oral sex],
- Having sex with fewer partners and
- Not sharing needles to take drugs.

HIV is treated with HAART [highly active anti-retroviral therapy]. It is a potent combination of anti-HIV medications. HAART is not a cure to HIV infection. It helps to reduce the number of virus in the blood, improves the immune system and also slows the progression of disease. At least 3 medications are taken as HAART. High cost of the treatment and increasing resistance to therapy is a growing problem. Resistance to the therapy occurs when intake of few medications, low dose or when a medication is stopped. Till date there is no effective vaccine against HIV/AIDS.[4,20]

2.2 Surveillance System of HIV/AIDS

Surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event. The goal of surveillance is to collect information from AIDS cases, to identify new HIV infection cases in a timely manner and gather information about the characteristics and behaviors of people at high risk to HIV infection.

In the US, Centre for Disease Control's [CDC's] surveillance for HIV/AIDS acts as the nation's source for timely information of HIV/AIDS case. HIV/AIDS surveillance observes records and disseminates reports about new cases of HIV and AIDS.

In most countries of the world, the surveillance of HIV/AIDS consists of two parts: tracking HIV trends and monitoring of HIV related risk behavior. At present, the United States has three types of surveillance system to track the risk behavior of HIV/AIDS.

They are:

- The Morbidity Monitoring Project/Medical Monitoring Project: to collect information from patients suffering from HIV/AIDS and currently under treatment.
- The HIV testing Survey: to collect information from adults at high risk but not infected with HIV.
- The National Behavioral Surveillance system: to gather information from high risk groups through surveys in cities with high levels of AIDS. It is done among IDUs, MSM, heterosexuals. The aim is to determine their risk behavior, knowledge about HIV/AIDS, testing behavior and use of the preventive services of HIV/AIDS. It began in 2003 in the United States.[(10)]

In Nepal the Integrated biological and behavioral surveillance survey started in the year 2004. It was first conducted in injectable drug users of Kathmandu and Pokhara. Then after, it has been conducted among female sex workers of Kathmandu, Pokhara and Terai highway districts since 2004. In the Kathmandu and Pokhara valley, the fourth round of IBBS among FSWs has been completed successfully in 2011. The IBBS collects data regarding socio-demographic characteristics, sexual behavior- sexual history, use of condoms, risk perception, awareness of HIV/AIDS/STIs, incidence of STI symptoms, participation in HIV/AIDS awareness programs, and alcohol/drug use habits.

National center of AIDS and STD control (NCASC) is responsible for Sentinel Surveillance of HIV/STI in Nepal. It conducts study in female sex workers,

injectable drug users and migrants in Nepal. The most recent study was conducted in these most at risk populations (MARPS) on 2011.

2.3 Situation of HIV/AIDS in Nepal

In Nepal HIV/AIDS was first seen in the year 1988[4], 7 year after the world's first case was detected. The adult prevalence [in age group 15-44 years] of HIV/AIDS in Nepal is 0.4%.[22] As of 2007, NCASC estimated about 70,000 people lived with HIV virus in Nepal.[6] In 2008, NCASC [National Centre for AIDS and STD Control] reported 2,103 confirmed AIDS cases and 12,746 confirmed HIV +ve people living in Nepal [NCASC,2008] which went up to 17,058 [NCASC 2010]. The deaths related to HIV tolled @ 4906 [Cumulative death] while 872 people died due to HIV infection in Nepal in 2010 [NCASC 2010].[7]

HIV is most concentrated in MARPs in Nepal. HIV prevalence was as high as 51% in Injecting drug users on 2003 coming down rapidly to 34.7 [2007] then to 8% [2010, report World Bank].[11] Prevalence of HIV in female sex workers was found to be 2% in 2004, 1.4% in 2006 and 2.2% in 2008 as per the IBBS conducted by New ERA for FHI/Nepal among the female sex workers in Kathmandu, Nepal.[13,14,15,16]

Women's trafficking to our neighbor country India is one of the main source of HIV spread in Nepal. It is estimated that over 1/3rd of female sex workers returning home from India are HIV +ve.[23]

2.4 Nepal Response to HIV/AIDS:

HIV/AIDs was first diagnosed in Nepal in 1988. The first National Policy on AIDS and STD Control was formulated in 1995. According to the guidelines provided by that policy three strategic plans were implemented for prevention and control of HIV/AIDS from 1997-2001, 2002-2006, and 2007-2011. The prevention and control program were being done with focus to MARPS. Looking at the present context, Nepal seems to have made considerable achievements at prevention and control of HIV/AIDS in MARPS.[24,25]

Trends in HIV & AIDS Prevention and Treatment Efforts in Nepal:

1986: Organization of STD/AIDS control committee was established.

1987-1988: The first short-term National AIDS prevention and control program was launched.

1988: First HIV case was recorded.

1990-1992: First medium term plan for AIDS/STD control was implemented.

1992: National center for AIDS and STD control (NCASC) was formed.

1993: Policy for 100% screening of donated blood was adopted.

1993-1997: The second medium term plan for AIDS/STD Control was implemented.

1995: National AIDS policy was formed.

1997-2001: The First Strategic Plan for HIV & AIDS/STD was adopted.

1999: Integrated Bio-Behavioral Survey was started.

2002: National AIDS Council was formed.

2002-2006: The Second National Strategic Plan for HIV/AID/STD was adopted.

2003-2007: Operational plan for HIV & AIDS control in place.

2003: A national Voluntary Counseling and Testing (VCT) guideline was adopted.

2004: An antiretroviral (ARV) treatment started/National ARV guideline was developed.

2004: Standard operating procedure on anti-retro viral therapy for Sukraraj Tropical Hospital was developed.

2004: A STI Case Management guideline was developed.

2007-2011: The Third National HIV & AIDS Strategy Plan was developed.

2006-2008: The National Action Plan was adopted in 2006-2008

2008-2011: Three year National Plan was formed in 2008 -2011.

2006: The National Monitoring and Evaluation Guidelines evolved in 2006

On December 21, 2007, the Supreme Court of Nepal ruled in favor of the LGBTI community ordering the Nepal government to (1) issue citizenship ID to third genders, (2) amend or scrap all discriminatory laws against LGBTI in Nepal and (3) introduce same sex marriage law in Nepal.

2009: The M&E Operational Plan 2008-2010 was drafted in 2009.

2011-2016: Implementation of the Fourth National Strategic Plan for HIV & AIDS.

Nepal has also shown its commitment at work for prevention and control of HIV/AIDS. It has recently shown its commitment in “Special session of United Nations General Assembly on HIV/AIDS [UNGASS].

People living with HIV/AIDS (PLWHA) in Nepal still are having to live a hateful life due to stigma and discrimination and are unable to access to healthcare. Looking at this situation, National Policy on HIV and STI, 2011 has been formed. The main core principles of this policy are universal access using a rights-based and multi sectorial approach. At present the national response to HIV/AIDS is guided by “National policy on HIV and STI, 2011” and “National HIV/AIDS strategy 2011-2016”. One of the target of Nepal for meeting the MDG is “reducing the new HIV infection rate by 50% by 2015”.

The main concern for HIV infection in Nepal lately is an increasing in HIV infection in the general population. Out of the total infected with HIV/AIDS in 2011, 58% were male at reproductive age, 28% were female of reproductive age and 8% were children of less than 15 years. Out of the estimated new infections in adults in 2011, 58% were MARPS while 42% were adults of general low risk population.[24,25]

2.5 Global situation of HIV infection in female sex workers:

Female Sex workers are the groups with high risk to HIV infection. Global data available for 50 countries in 2012 revealed that the female sex workers had 14 times more risk of HIV infection than women of similar age of the general population. The risk for the female sex workers to contract HIV infection was different for

different countries. In Sub-Saharan Africa, data available from 16 countries revealed HIV prevalence among women in the general population to be 7.4% while it was 36.9% in the female sex workers making them 12 times more at risk of HIV infection. Data available from 12 countries in Latin America and the Caribbean revealed the HIV prevalence in the female sex workers was 6.1% making them 12 times more at risk to HIV infection than female of general population. HIV prevalence in the female sex workers in Middle East and North America was 1.7% which was 10.9% in the female sex workers of Eastern Europe.[26] Data from 14 Asian countries showed the female sex workers posed 29 times more at risk to HIV infection with prevalence of 5.2%.[26]

In 2009, it was estimated that there were around 67,200 female sex workers in Thailand and 1/3rd of them were concentrated in Bangkok. There has been a significant drop of HIV prevalence in them from around 28% to 2.8% in Brothel based and 10% to 2.4% in other venue based female sex workers from 1995 to 2009. 36% of them had reported to have received a HIV test and knew the result, 41.3% of them were found to be able to correctly identify ways of preventing the sexual transmission of HIV and rejected major misconceptions about HIV transmission. This could be attributed to 100% condom use program targeted at the female sex workers. Condom use during last sex was only 30% in 1989 which was found to be as high as 92.2% in 2009 among them.[27]

In Thailand, IBBS 2011 have shown the prevalence of HIV have gone down to 1.8%, lower than previous surveys. But there was a decline in the knowledge and understanding of HIV [<30% in every subgroup youth on Surveillance]. 95.5% of them had used condom during their last sex with their client while it was only 45.4% with non-paying partners [husbands and lovers].[28,29]

2.6 Situation of HIV Infection in female sex workers in Nepal

NCASC 2010 estimated 32,137 females engaged as sex workers in Nepal. Most of them live along the east-west highway but are highly concentrated in the capital city (Kathmandu) and Pokhara valley. The prevalence of HIV in this group differs from place to place. The prevalence of HIV along the east west highway is 2.3

[ASHA-2009][30], in Pokhara valley is 1.2 % in 2011[29] while in Kathmandu valley the prevalence is 1.4 %, New Era for FHI/Nepal 2011.[16]

The female sex workers differ in various traits from the general population. They mainly come from marginalized society and have migrated from outside the valley. Report of FHI/Nepal, New ERA 2008 shows:

85.5% of the female sex workers were migrants to the valley, only 5% of them had passed SLC/above. Above 1/3rd of the female sex workers working in establishment based center were below 20 years while more than 70% of them had married at least once. Above 2/3rd of them had their first sexual contact at age 15-19 years while 20% of them had their first sexual experience at age 11-14 years. Only 75% had used condom during their last Sex while consistent use of condom was as low as 3.9%. Though 92.2% had heard about HIV only 27.5% of street based and 42.3% of establishment based Sex workers were aware of BCDEF of preventive measures. This was despite many health programs working with target to reach this group. Only 33% of them had visited VCT center in the last 1 year. Above 1/3rd of them consumed alcohol on regular basis and around 7% of the respondent claimed to have tried drugs in last one month.[15]

Integrated biological and behavioral survey 2009 among the female sex workers in East West Highway Nepal found that 56% of them were married, the mean age at first sex was 15.5, 15.2% reported to have had unprotected sex [during last contact] with regular client while the same was as high as 74.2% with non-paying partners. 61.2% of them had tested for HIV in last one year while only 26% had comprehensive knowledge about HIV. 22.5% of them reported to have consumed alcohol on regular basis in the last one month of survey. The prevalence of HIV in them was 2.3%. [Asha Nepal, IBBS 2009][30]

IBBS Survey 2011 in Pokhara valley showed that the median age of the female sex workers was 20 and 41.7% of them were less than 20 years of age. With median age at 1st marriage of 16 years, 58.3% of them were married at least once while 1/3rd of them were currently married. Only 1/4th of the female sex workers were born in the same district. The median age at first sex was 16 years while around 20% of the female sex workers had their first sex at age less than 15 years. The duration of sex work ranged from 6 months to 16 years with the mean duration of 25 months. The

mean number of paying partners served per day was found to be 2.1. About ½ [47%] of the female sex workers had joined the trade in last 6 months to 1 year. Almost all them had heard about male condom and about 80% were using it as a family planning method. Consistent condom use with regular client was 68.4% while it was only 8.4% with non-paying partner. About 60% of them had tested for HIV in the last one year. Just Over 40% of them had visited a STD Clinic in the previous year. Though 2/3rd of the female sex workers had been exposed to HIV/AIDS related program, only 17% had participated in such programs. The prevalence of HIV/AIDS was found to be 1.2% while 3.2% had H/O syphilis but only 0.6% had active syphilis at present.(31)

National Council for AIDS and STD control, Nepal [NCASC] conducted a study in MARPS in Nepal in 2011. It recruited about 10% [2901] of the female sex workers from different part of Nepal. The study shows the following characteristics among them:

Near about 1/3rd had experienced STI symptoms in the last one year. Only 79% had ever tested for HIV and 34% of them had tested it over 1 year back. The general characteristics of the female sex workers showed almost 1/4th (23%) were below the age of 20 and over ½ of them were illiterate. Near about 3/4th [74%] were ever married.

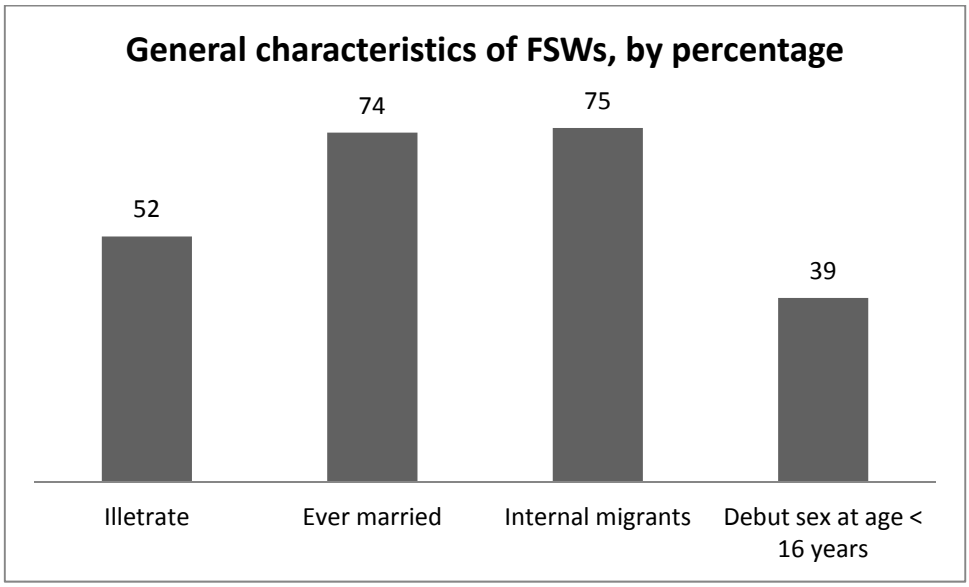


Figure 2.3: General Characteristics of FSWs, MARPS 2011

Source: MARPS 2011, NCASC.

Approximately 75% were internal migrants. The sexual behavior showed that 39% had experienced first sex at the age of below 16 years. The number of clients served in last 1 week was 5-9 clients in 30% of them while 17.5% reported to serve over 10 clients per week. Condom use during last sex with regular client was 86% which was only 48% with husband or friend. [NCASC 2011][17]

2.7 Related studies:

The following related literatures are summarized according to the variables in the analytical framework as follows:

2.7.1 General Characteristics

2.7.1.1 Age/age at first sex

Studies have suggested that entering into Sex trade at younger age have made the female sex workers more vulnerable to HIV. A study in the female sex workers in Thailand have shown that HIV prevalence was as high as 36% in them who started commercial sex work at age 12-15 years while the same was only 11% in them who joined the trade after 21 years of age.[27] Study conducted in West Bengal, India have shown that HIV infection was higher in the female sex workers with age group less than 20 years [12.5%] as compared to older age group [5.4%].[32] IBBS survey 2010 in the female sex workers in Chiang Mai, Phuket and Chonburi also have found that HIV infection was highest [2.6%] in age group under 25 years of age.[33]

2.7.1.2 Literacy

Literacy is a determinant of health. Illiteracy decreases people's ability to make choices and limit them to be employed which in turn leads to poverty. Poverty is a risk for HIV infection. Due to illiteracy people can't access accurate information and preventive services because most of the health educations are distributed through printed materials. So, illiterate are rendered vulnerable to HIV.[34]

HIV/AIDS is behavioral related disease. In the female sex

workers behavioral change is possible and is related with educational status.[35] Proportion of STI, multiple partners and non-condom use has been significantly high among illiterate FSWs.[36] Illiteracy in the female sex workers has been found to be associated with higher risk to HIV infection.[37]

2.7.1.3 Marriage

Tendency of marriage among female sex workers is low. Studies have found prevalence of HIV to be lower in the married female sex workers than their counter part.[38] But the danger of married female sex workers being infected with HIV is in transmitting to their non-paying partners as studies have shown very low condom use with non-paying partners.Women are more at risk than men for heterosexual transmission of HIV, the main reason being that they are twice more biologically susceptible than man and in many countries women are unable to negotiate for condom.[39,40]

Married couples tend to use condom less with their partner, the main reason being “trust toward the partner”[41].Tendency of unprotected sex among married couples make them more vulnerable to HIV if one partner is infected. So marriage can be a bridge for transmission of HIV.

2.7.1.4 Ethnicity

Ethnic minority are usually challenged in various ways as poverty, unequal access to health care, illiteracy, and problems of substance abuse making them more vulnerable to HIV. Even in these groups women are more affected[42]. HIV/AIDS is 9 times more common in African American than the whites.[43] Different ethnic groups are vulnerable to join sex work in different countries. In India, scheduled caste and scheduled tribes are more common in Sex Industry though they are viewed as untouchables by the forward caste.[44] Ethnicity has also been linked as independent predictors to HIV in the commercial sex workers[37,45].

2.7.1.5 Migration

Internal migrants tend to practice high risk behaviors which make them more vulnerable to HIV. Majority of the female sex workers in Nepal are

poor internal migrants. Sexual risk behavior is found to be very high in the poor internal migrants[46]. A study conducted in Beijing China in 2008 revealed that 47% of internal migrants were engaged in extra-marital sex.[47] Female sex workers who are internal migrants have been found to practice very high risk behavior. As high as 95% of the female sex workers were found to be migrants in a study in Hainan Province in South China with median stay at a site of 2-3 months. Consistent condom use was 15% with clients and only 8% with non-paying partners, 30% of them used alcohol prior to sex and STD was found to be 19%[48].

2.7.2 Sexual behaviour:

2.7.2.1 Duration of sex work

The more the sex workers stay in sex trade the more vulnerable they become to HIV infection. A study in Andhra Pradesh, India revealed that the mean duration of sex work by female sex workers was 4.21 years. It is also seen that the female sex workers in establishment centres tend to remain in sex trade longer than street based. Illiterate, younger entrants and those from rural area tend to stay in sex trade for longer period, >5 years.[49] IBBS 2008 in the female sex workers in Kathmandu has revealed that HIV prevalence was <1% in them who worked for <2 years while the same was >3.5% in them having worked for >2 years.[15]

2.7.2.2 Multiple sex partners

Having sex with multiple partners is a risk for HIV infection. Increase in sex partner increases the risk to HIV because with each partner, a new route to HIV is created. A study conducted in general population in Sub-Saharan Africa for age 15-44 years revealed that there was a significant relation between multiple partners and HIV infection with an OR 3.32 for female and 2.87 for male after adjusting for other factors as literacy, residence, condom use.[50]

A report from Uganda suggests that that HIV infection of 5.4% in 2005 has increased to 7.3% mainly due to increase in multiple sex partners.[51]

2.7.2.3 Condom use behaviour

HIV is a life-threatening disease and mostly is a result of unprotected sex. Condom use is the cornerstone in prevention of HIV/AIDS. Use of Latex condoms not only helps prevention of HIV/AIDS but also protects from other STDs.[52]There are many programs to change behaviour to use condom during sex. Changing trend of condom use behaviour in female sex workers is a deep concern in many countries. Study conducted in Bangladesh among the female sex workers showed increasing trend of Condom use behavior during last sex which had increased to 66.7% from 30.9% [2005][53]. Out of 86 reporting countries in 2010 it was found that more than half reported less than 80% condom use by female sex workers.[21].

2.7.3 Health related risk behaviour

2.7.3.1 Alcohol use

Alcohol use behavior is a high risk behavior conducive to HIV infection. It is also related to very low condom use during influence of alcohol. There are studies to suggest positive association between alcohol use and HIV infection. A meta-analysis conducted in Africa [2007] found a significant association between alcohol use and HIV [(pooled OR=1.70; 95% CI=1.45-1.99; p<0.001).[54] A study conducted in Kenya [2007] showed 19% of the female sex workers were heavy drinkers while 60% were alcohol dependent. [55]

In a study among female sex workers in China 1/3rd of them reported alcohol use prior to having sex with client. It was found that there was significant association between alcohol consumption and HIV infection.[56]

2.7.3.2 Drug use

IV Drug Use is a potential cause of HIV AIDS. 7% of injectable drug users in Dhaka, Bangladesh were found to be HIV +ve [2010, USAID Bangladesh] which is 70 times more than in normal adult population [< 0.1%][57]. Survey by US CDC 2009 found that HIV/AIDS prevalence in the injectable drug users was as high as 9%, but the trend was decreasing as found to be 18% in 1990[58]. WHO has estimated that 3 out of 16 million of the injectable drug users have HIV globally.

[2012 March].[59] A recent study conducted in Pakistan revealed 4.8% of FSWs doing IDU while over 10.8% reported to have had sold sex to an injectable drug users[60].

CHAPTER III
MATERIALS AND METHODS

3.1 Study design

It is an epidemiological descriptive cross sectional study. The data of the female sex workers of Kathmandu and Pokhara collected during the Integrated biological and behavioral surveillance [IBBS] in 2004, 2006, 2008 and 2011 [total four rounds] was extracted separately from the data source.

The data from all the four rounds of IBBS was used separately to analyze the trends of general characteristics, sexual behavior and health related risk behavior, and STI/HIV among the female sex workers in Kathmandu and Pokhara during 2004 to 2011.

The same data was used to compare the general characteristics, sexual behavior and health related risk behavior, and STI/HIV among the female sex workers between Kathmandu and Pokhara during 2011.

3.2 Data source

The data was taken from New Era and ASHA project, Nepal. New ERA and ASHA project had collected data of the female sex workers of Kathmandu and Pokhara in 2004, 2006, 2008 and 2011 for FHI/Nepal during the four rounds of IBBS survey in the two cities.

3.3 Study population

The study was conducted among the female sex workers working in Kathmandu and Pokhara valley, the two major cities of Nepal.

3.4 Sampling frame and technique

New ERA and ASHA project had collected a sample of 500 female sex workers [300 establishment based and 200 street based] from Kathmandu and 200 FSWs from Pokhara , in each of all four round of survey. The inclusion criteria for the female sex workers in the Integrated biological and behavioral Surveillance was "Female 16 years and above having reported to be selling sex in exchange of cash or kind within the last 6 months and willing to participate in the study voluntarily".

All samples of the existed study were recruited in this study. The data was retrieved from the data source according to the variables of interest.

When concerning on epidemiological descriptive study, all the census data was analyzed.

3.5 Sample size estimation

The sample size was not calculated as the study does not intend to see association between general characteristics, sexual behavior and health related risk behavior, and STI/HIV. The study included all of the secondary data from the existing study from 2004 to 2011.

3.6 Sample Size recruited

The study recruited a total of 2800 samples.

A total of 700 samples from each of four IBBS survey in 2004, 2006, 2008 and 2011 were taken.

For each year out of the 700 samples, 500 were from Kathmandu [300 establishment based and 200 street based] and 200 were from Pokhara.

3.7 Control of duplication

The data has identification number given to each sample. The data was collected from all the three data sources separately. Then the data was carefully

verified according to the identification number given to each sample in order to avoid duplication.

3.8 Research Instrument

The data source has the data in encoded form; both the questions and the answers are encoded. Coding of the questions follow the question numbers. Coding of the answers is provided in the appendix. New Era and ASHA project had used standard questionnaires in guidance of FHI/Nepal for both Kathmandu and Pokhara valley being updated for different time of survey.

The coding form and instruction based on the standard use of the IBBS survey 2004 to 2011 in Kathmandu and Pokhara was thoroughly understood before extraction of the data from the data source. The secondary data from New ERA and ASHA project was extracted from the database using the research instrument. The data was extracted using standard software.

As guidance for extraction of the data, a standard questionnaire was formed (Appendix) according to the variables of interest. Data was segregated and extracted from the data source relating to the answers of the interested variables.

3.9 Data analysis: Data entry and editing

The data was collected from the data source using the research instrument. The study used SPSS, EPI-INFO and Excel for analysis and processing of the data.

For epidemiological descriptive study the female sex workers of Kathmandu and Pokhara were analyzed based on Person, Place and Time. The following analysis was used:

- Person: The general characteristics, sexual behavior and health related risk behavior and STI/HIV prevalence of the female sex workers was analyzed using mean, standard deviation, frequency and percentage.
- Place: Spot map and area map was used to analyze in terms of place [Kathmandu and Pokhara].

- Time: Time trend by graph plot and bar diagram was used to analyze the characteristics of the female sex workers for different period of time from 2004 to 2011. Chi square test, Fischer Exact test and t-test was done to see the change in between different period of time.

3.10 Validity and Reliability

3.10.1 Data Source

The data was taken from a reliable data source in Nepal. New ERA and ASHA project Nepal are entrusted organizations in Nepal. They have been trusted by various international organizations for collection of data for various surveys in Nepal. They have many national and international publications in their name. These four IBBS survey in Kathmandu and pokhara were conducted by New ERA and ASHA project for Family Health International/Nepal.

3.10.2 Data extraction from the source

The data source has the data in encoded form at both levels of the questions and answers. The coding of the data source was thoroughly understood before extraction of the data of interested variables.

The data was extracted from two level of data source in coded form with the guidance of the instructions of the data source. The first level was New ERA and ASHA project/Nepal and the second level was FHI/Nepal. The data from both the level was cross verified to ensure that no data was missed, duplicated or incomplete.

3.11 Ethical Issues

The ethical clearance was submitted to the Human Research Committee, Faculty of Public Health, Mahidol University. The title and objectives of the research was explained. Full proposal of the research, curriculum vitae of the researcher, advisor and co-advisor was submitted to the committee. On approval of the research, the researcher obtained the documented ethical clearance.

While collecting the data from the data source a “No objection letter” was obtained from Family Health International/Nepal, New ERA and ASHA project, Nepal. The data source receives acknowledgement in the study.

3.12 Limitation of the Study

This study intends to understand the shifting trends of characteristics related to STI/HIV in the female sex workers based in Kathmandu and Pokhara, Nepal. The findings of this study may be different in the female sex workers in another area of Nepal due to various causes. The study has focused only on findings from the data already collected for the purpose of the IBBS survey.

CHAPTER IV
RESULTS

This chapter describes and compares the general characteristics, sexual risk behavior, health related risk behavior and HIV/STI status of female sex workers of Kathmandu and Pokhara in 2004, 2006, 2008 and 2011. The data has been taken from integrated biological and behavioral survey conducted in the female sex workers in these two cities in 2004, 2006, 2008 and 2011.

This chapter is divided into five parts as follows:

Part I: General characteristics of the female sex workers of Kathmandu and Pokhara, 2004-2011

Part II: Sexual behavior of the female sex workers of Kathmandu and Pokhara, 2004-2011

Part III: Health related risk behavior of the female sex workers of Kathmandu and Pokhara, 2004-2011

Part IV: Prevalence of HIV/STIs in the female sex workers of Kathmandu and Pokhara, 2004-2011 and

Part V: Comparative study of the general characteristics, sexual behavior and health related risk behavior among the female sex workers of Kathmandu and Pokhara in 2011.

4.1 Part I: General Characteristics of FSWs of Kathmandu and Pokhara 2004-2011

4.1.1 General Characteristics of female sex workers of Kathmandu 2004-2011

Table 4.1 shows the general characteristics of the female sex workers of Kathmandu in the Integrated biological and behavioral survey conducted in the city in the four period of time.

The mean age of the female sex workers was 23.99 years (S.D- 7.26) with the range of 14 to 58 years in 2004. In 2011 the mean age has increased to 24.72 (S.D-6.70) years with range of 16 to 48 years. Majority of female sex workers were of the age group 20-24 years closely followed by less than 20 years of age group. All throughout the decade, the age group less than 24 years constituted above 60% of the population of the female sex workers.

Above 70% of the female sex workers were married atleast once. In 2004 about 39% of the female sex workers were found to be currently married while 52% of them were found to be married in 2011 survey.

The educational status of the female sex workers is still very poor. In 2004, 47.6% of them were found to be illiterate and about ½ of them had an educational level of grade 1 to grade 9. As of 2011 above 41.8% were still illiterate while 1/4th had only primary level of education. Only 5% of the female sex workers have received 10 years and more of formal education.

Table 4.1. General Characteristics of female sex workers of Kathmandu 2004-2011

General Characteristics	2004 % (N= 500)	2006 % (N= 500)	2008 % (N= 500)	2011 % (N= 500)	p-value
Age group (years)					0.961[c]
< 20	30.6	30.2	28.0	28.3	
20-24	33.2	35.4	33.4	29.2	
25-29	19.0	16.4	17.6	17.2	
>30	17.2	18.0	21.0	24.3	
Mean ± S.D	23.99±7.2	23.64±6.5	24.46±7.05	24.72±6.7	
Min, Max	14, 58	14, 49	16, 52	16, 48	
Marital status					0.829[c]
Married	39.2	45.6	41.4	52.4	
Divorced/Separated	32.4	30.2	29.4	23.3	
Unmarried	28.4	24.2	29.2	24.3	
Educational level					0.989[f]
Illiterate	47.6	43.6	46.0	41.8	
Grade 1-5	26.4	29.6	25.6	25.3	
Grade 6-9	21.2	23.2	23.8	27.8	
Above Grade 10	4.8	3.6	4.6	5.1	

c= Chi square test f= Fisher exact test

Table 4.1. General Characteristics of female sex workers of Kathmandu 2004-2011 (cont.)

General Characteristics	2004 % (N= 500)	2006 % (N= 500)	2008 % (N= 500)	2011 % (N= 500)	p-value
Ethnicity					0.999[c]
Brahmin	10.0	8.8	9.2	7.6	
Chhetri/Thakuri	30.0	32.6	30.2	30.5	
Newar	9.4	7.8	9.4	9.1	
Tamang/Lama	19.8	18.4	21.2	25.1	
Magar/Gurung	13.8	15.0	11.6	11.3	
Damai/Sarki/Kami	2.8	2.2	3.8	4.6	
Others	14.2	15.2	14.6	11.8	
Internal migration					0.959[c]
Born in valley Districts	15.2	13.4	12.6	13.5	
Born outside valley	84.8	86.6	87.4	86.5	

c= Chi square test

As of 2004, 40% of the female sex workers were of Brahmin and Chettri/Thakuri ethnic background, 20% were Tamang/Lama and 2.8% were from occupational caste groups (Damai/Sarki/Kami/Sunar). There has been a very slight increase of the female sex workers from occupational caste groups (4.6%) while the majority is still from Brahmin and Chetrri/Thakuri ethnic background (38.1%) as of 2011.

Majority of the female sex workers in Kathmandu have always been emigrants in the valley. In 2004, it was found only 15.2% of the female sex workers were born and living permanently in Kathmandu while the rest (84.5%) had migrated

from outside. As of 2011, the majority (86.5) of them were found to have migrated to the valley from other districts.

As shown in figure 4.1 and 4.2, the female sex workers had migrated to the valley from different part of the country. The majority of the female sex workers were born and migrated to Kathmandu from the districts around. In 2004 the high endemic districts for migration of the female sex workers were Nuwakot**,** dhading, chitwan, makwanpur, sindhuli, kavre, sindhupalanchowk (nearby districts); Sunsari and Jhapa (distant districts). In 2011 it was found that more female sex workers were born and migrated from the districts around the valley. The female sex workers were migrating more from other nearby districts as Gorkha and Ramechap while less from distant districts as Sunsari and Jhapa.

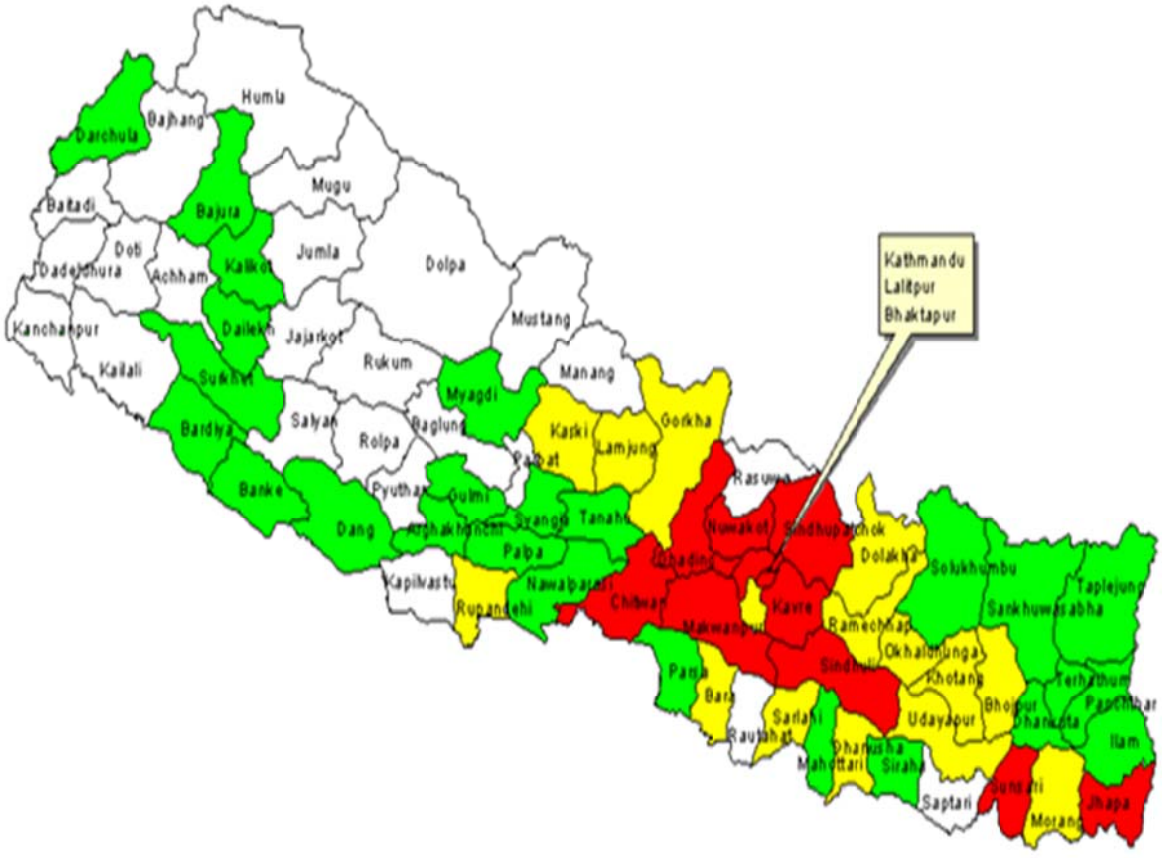


Figure 4.1: Birth districts of female sex workers of Kathmandu and endemic density, 2004.

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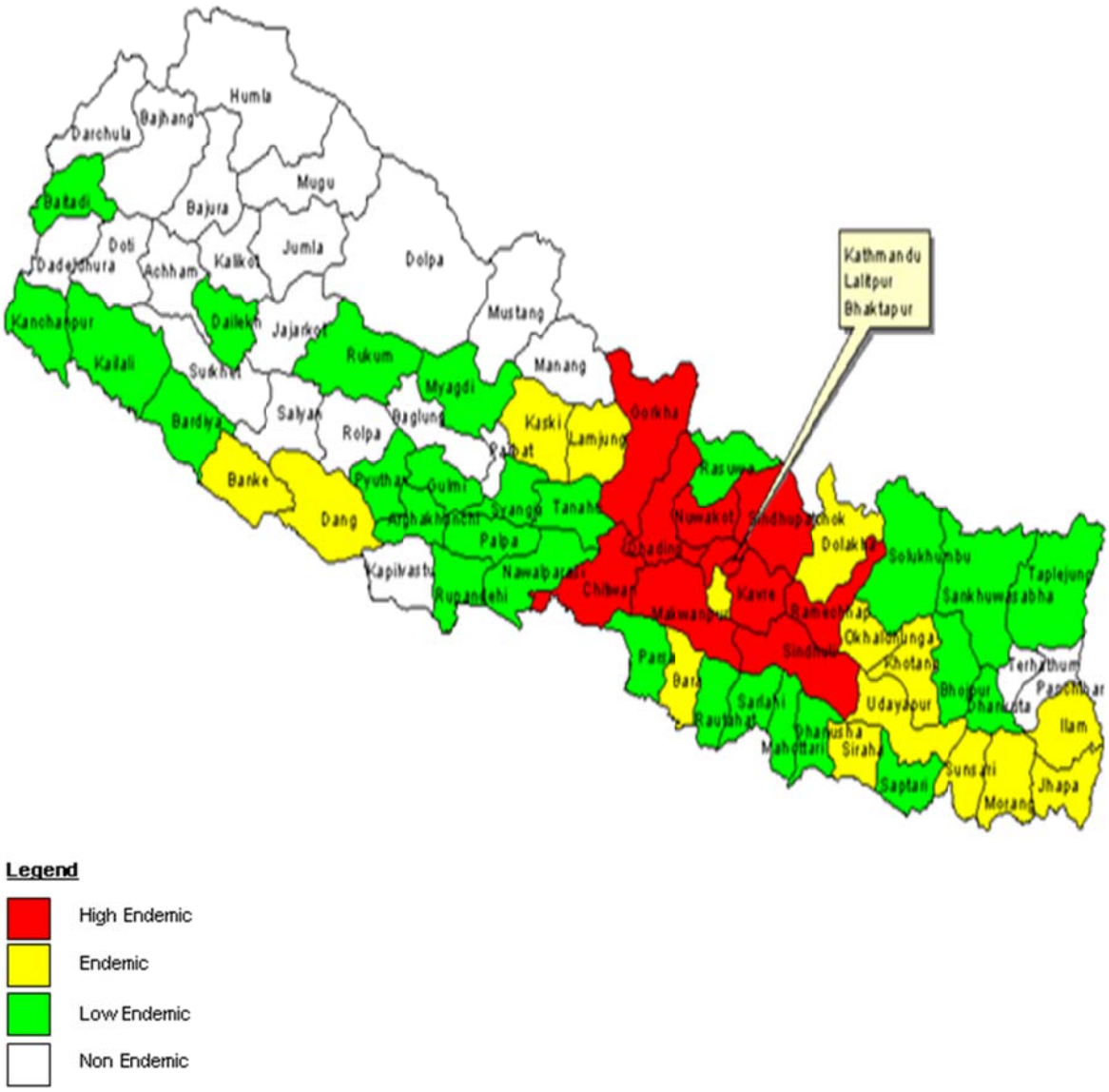

Figure 4.2: Birth districts of female sex workers of Kathmandu and endemic density, 2011

4.1.2 General Characteristics of female sex workers of Pokhara 2004-2011

Table 4.2 shows the general characteristics of the female sex workers of Pokhara in the Integrated biological and behavioral survey conducted in the city in the four period of time.

Table 4.2. General Characteristics of female sex workers of Pokhara 2004-2011

General Characteristics	2004 % (N= 200)	2006 % (N= 200)	2008 % (N= 200)	2011 % (N= 200)	p-value
Age (years)					0.626[c]
<20	40.0	41.0	38.5	41.7	
20-24	21.0	24.0	28.5	33.3	
25-29	20.0	13.0	11.0	11.3	
>30	19.0	22.0	22.0	13.6	
Mean± S.D	23.62±7.4	23.45±7.4	23.71±7.6	22.29±5.8	
Min, Max	16,47	14,45	16,49	16,44	
Marital status					0.0554[c]
Married	30.0	23.5	37.0	33.3	
Divorced/Widow	39.5	48.5	28.0	24.9	
Unmarried	30.5	28.0	35.0	41.7	
Educational level					<0.001[f] **
Illiterate	41.0	44.0	45.5	18.2	
Grade 1-5	32.0	34.5	25.5	30.7	
Grade 6-9	25.5	20.0	25.0	44.3	
Above Grade 10	1.5	1.5	4.0	6.7	

c= Chi square test f= Fisher exact test **significant at p<0.05

Table 4.2 Gerneral Characteristics of females sex workers of Pakhara 2004-2011 (cont.)

General Characteristics	2004 % (N= 200)	2006 % (N= 200)	2008 % (N= 200)	2011 % (N= 200)	p-value
Ethnicity					0.634[f]
Brahmin	8.0	6.5	9.0	5.5	
Chhetri/Thakuri	21.0	27.0	28.5	29.3	
Newar	3.0	2.5	3.5	4.6	
Tamang/Lama	6.0	5.0	3.5	7.2	
Magar/Gurung	26.5	22.5	18.0	33.9	
Damai/Sarki/Kami	29.5	32.5	32.5	14.2	
Others	6.0	4.0	5.0	5.2	
Internal migration					0.079[c]
Born in valley districts	37.5	40.0	39.0	24.6	
Born outside valley districts	62.5	60.0	61.0	75.4	

c= Chi square test f= Fisher exact test

In 2004 the mean age of the female sex workers working in Pokhara was 23.62 years (S.D-7.40) with a range from 16 to 47 years. In 2011 there has been a slight decline in the mean age (22.29 years, S.D-5.89) with range from 16 to 44 years. In 2004, 40% of the FSWs were of age < 20 years, which has slightly increased to 41.7% of them in 2011. There has been a tendency for younger girls to be joining the sex industry in Pokhara since 2004. Only 61% of the female sex workers were of the age <24 years in 2004 which was found to be gradually increasing to 65% in 2006, 67% in 2008 and 75% in 2004.

In 2004, it was seen a large proportion (69.5%) of the female sex workers had married at least once of which 30% were currently married and 37% were divorced/separated; 30.5% were unmarried. In 2011 more (41.7%) female sex workers

were found to be unmarried (never married) in comparison to their counterparts in 2004 (30.5% were never married). There has been a change in the tendency of the female sex workers to be married.

More and more of them were found to be literate. In 2004 about 41% were found to be illiterate while in 2011 only 18.2% were found to be illiterate. About 57.5% of them were found to have educational background of grade 1 to 9 in 2004 while in 2011 it was found that 3/4th of them that received grade 1 to 9 of education. A significant change ($p< 0.001$) was found in the educational status among them.

As of 2004, almost 30% of the female sex workers were of occupational caste groups (Damai/Sarki/Kami/Sunar), 29% were of Brahmin and Chhetri/Thakuri ethnic background and almost 1/3rd of them were of Tibeto-Burman communities (Newar, Tamang/Lama, Magar, Gurung). In 2011 it was found that almost 45% were from Tibeto-Burman communities, 35% from Brahmin and Chhetri/Thakuri ethnic backgournd. Female sex workers from occupational caste groups had decreased from 29.5% (2004) to 14.2% (2011).

Though majority of the female sex workers in Pokhara were always emigrants; recently there seems to have been a sudden huge migration of the female sex workers from outside districts. The FSWs from outside the valley district has suddenly increased to over 75% in 2011 which is 61% in 2008. There has been an increase in emigrant female sex workers by 14% just in the last 3 years.

Figure 4.3 shows that the female sex workers working in Pokhara has been found to have migrated to the city mainly from the nearby districts. The endemic districts for migration of the sex workers in 2004 were Myagdi, Baglung, Parbat, Syanga, Tanahu, Lamgung and Chitwan.

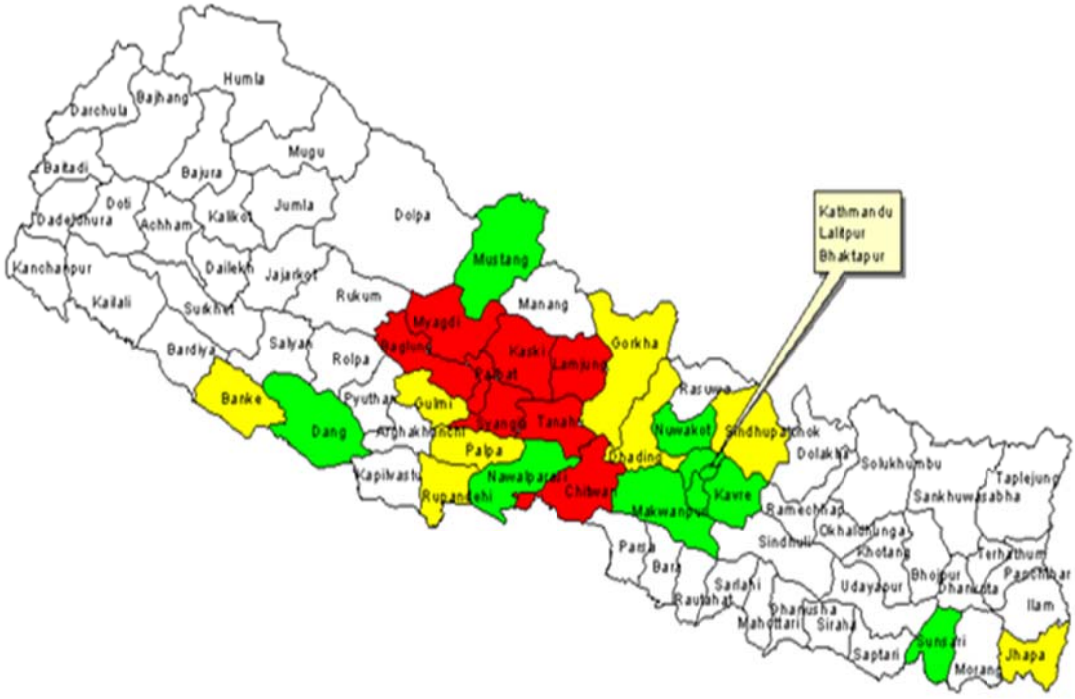

Figure 4.3: Birth districts of female sex workers of Pokhara and endemic density 2004.

Also in 2011 the high endemic districts for migration of the female sex workers were the districts around them. Less of them were migrating from Parbat and more were migrating from Dhading district. [Figure: 4.4]

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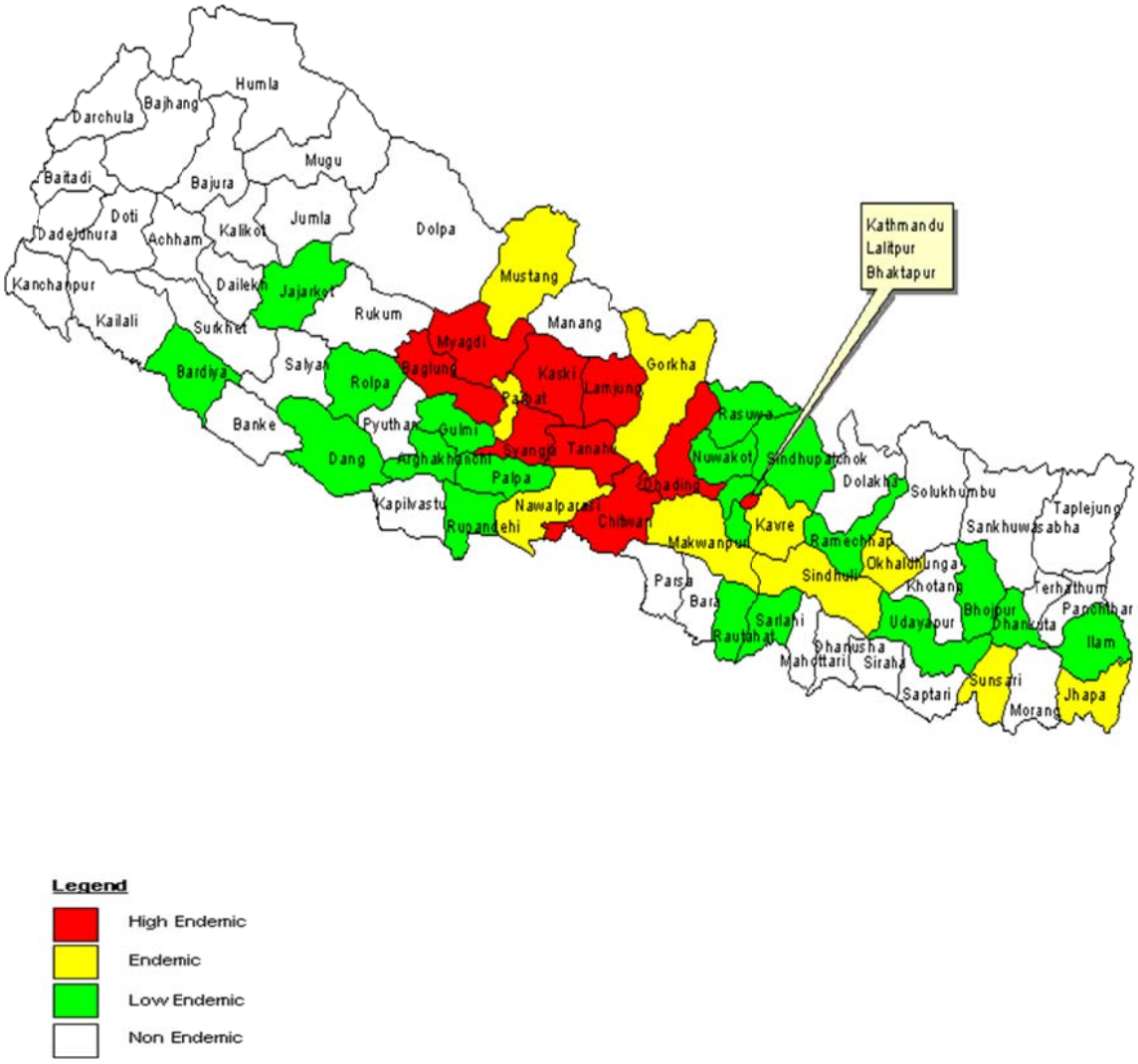

Figure 4.4: Birth districts of female sex workers of Pokhara and endemic density 2011

4.2 Part II: Sexual behavior of female sex workers of Kathmandu and Pokhara, 2004-2011

Early age at first sexual intercourse, longer duration of sex work and multiple partner relationship increases the occupational vulnerability of the sex workers to HIV/STI.

4.2.1 Sexual behavior of female sex workers of Kathmandu 2004-2011

In 2004 the mean age at first sexual intercourse was 16.13 years (S.D- 2.57) and the age at first sexual intercourse was as early as 10 years. Majority (> 90%) of the female sex workers had their first sexual intercourse at the age below 20 years of age. The findings of 2011 reveal that still the majority (>90%) of them have their first sexual intercourse below the age of 20 years while the mean age at first sex has decreased to 16.39 years (S.D- 2.42)) with the range of first sexual intercourse as early as 10 to 29 years.

It seems more and more of female sex workers are retaining in the sex trade for a longer duration. The mean duration of sex work was 24.46 months (range 6 to 240 months) in 2004 which has gone up to 30.04 months (range 6 to 240 months) in 2011. The increase in the mean duration of sex work is significant. In 2004 about 15.4% of the female sex workers were found to be in the sex trade for over 3 years and over 25% of them were working as sex workers for over 2 years. With contrast to 2004, in 2011 it was found that 22.4% of them were working for over 3 years and over 35% of them were engaged for over 2 years.

Table 4.3. Sexual behavior of female sex workers of Kathmandu 2004-2011

Sexual Behavior	2004 % (N=500)	2006 % N=500)	2008 % (N=500)	2011 % (N=500)	p-value
Age at first sexual Intercourse					0.88[C]
11-14	29.4	23.6	20.2	20.4	
15-19	61.8	68.6	67.4	70.5	
>20	8.8	7.8	12.4	9.1	
Mean± S.D	16.13±2.57	16.12±2.32	16.59±2.58	16.39±2.42	
Min, Max	10, 30	10, 28	11, 30	10, 29	
Duration of sex work (months)					0.97[c]
6-12	46.4	49.4	48.2	40.3	
13-24	27.4	21.6	23.4	22.6	
25-36	10.8	12.6	11.8	14.7	
>37	15.4	16.4	16.6	22.4	
Mean ± S.D	24.46±28.17	25.00±28.68	24.96±27.62	30.04±30.04	
Min, Max	6, 240	6, 252	6, 288	6, 240	
Number of sex partners					
Average number of clients/day					0.96[c]
1	67.2	66.4	61.4	58.7	
2	23.2	21.8	25.6	26.3	
>3	9.6	11.8	13.0	15.0	
Mean± S.D	1.53±1.23	1.51±0.88	1.60±0.98	1.79±1.10	
Min, Max	1,15	1,8	1,7	1,9	

c = Chi square test

Table 4.3. Sexual behavior of female sex workers of Kathmandu 2004-2011 (contd)

Sexual Behavior	2004 % (N=500)	2006 % (N=500)	2008 % (N=500)	2011 % (N=500)	p-value
Number of clients in past week					0.616[c]
0	10.4	8.4	1.2	5.4	
1	14.8	12.8	12.2	9.9	
2	13.8	16.8	22.4	17.9	
3-4	25.2	27.8	27.0	28.7	
>5	35.8	34.2	37.2	38.1	
Mean± S.D	4.81±7.25	4.47±4.24	5.41±5.95	5.04±4.76	
Min, Max	0,94	0,28	0,42	0,35	

c = Chi square test

Multiple partner relationship has been persistently increasing in female sex workers of Kathmandu during this decade. The mean of average number of clients per sex worker per day was 1.53 (range 1 to 15 clients/sex worker/day) in 2004. This has gone up to 1.79 clients/sex worker/day (range 1 to 99 clients/sex worker/day). The average number of clients per week has increased from 4.81 in 2004 to 5.04 in 2011. In 2004, 61% of the sex workers were entertaining more than 3 clients per week while in 2011 it was found that about 67% of the sex workers were engaged with 3 or more clients per week.

The condom use behavior is very poor among the females sex workers of Kathmandu, one in four of the female sex workers did not use condom with the last client. The condom use with last client was found to be 82.6% in 2011 which was 74% in 2004. The consistent condom use with client during the past 12 months has

improved from 56.6% to 73.4% in between 2004 and 2011. The difference in consistent condom use with client is significant (p=0.016).

There has been a gradual increase in number of female sex workers serving regular clients. In 2004 less than 70% of the FSWs were engaged with regular clients. In 2011 about 80% of them were found to have regular clients. Also the consistent condom use behavior with regular clients has shown slight improvement. It was about 44% in 2004 and has gone up to 60% in 2011.

Table 4.4 Condom use behavior of the female sex workers of Kathmandu, 2004-2011

Condom Use	2004 % (N=500)	2006 % (N=500)	2008 % (N=500)	2011 % (N=500)	p-value
Condom use with last client					0.473[c]
Yes	74.0	77.2	75.0	82.6	
No	26.0	22.8	25.0	17.4	
Condom use suggested by					
Own self	43.8	54.4	51.2	74.8	<0.001[c**]
Sex partner	30.2	22.8	23.8	7.8	
Consistent condom use with client in past 1 year					0.016[c]**
Every time	56.6	56.2	53.8	73.4	
Not every time	41.4	43.9	46.2	26.7	
Most of the time	21.2	24.6	29.4	14.7	
Sometimes	7.8	10.8	9.4	4.9	
Rarely/Never	12.4	8.5	7.4	7.1	

c = Chi square test ** significant at p<0.05

Table 4.4 Condom use behavior of the female sex workers of Kathmandu, 2004-2011(contd.)

Condom Use	2004 % (N=500)	2006 % (N=500)	2008 % (N=500)	2011 % (N=500)	p-value
Regular client in past year					0.244[c]
Yes	70.4	73.4	1.0	81.6	
No	29.6	26.6	29.0	18.4	
Consistent use of condom with regular clients in the past year					0.146[c]
Every time	44.0	47.8	40.6	60.9	
Not every time	26.4	25.6	30.4	20.8	
Most of the time	8.4	14.0	15.8	8.4	
Sometimes	4.6	6.2	7.6	4.4	
Rarely/Never	13.4	5.4	7.0	8.0	
Non-Paying partner during past year					0.026[c**]
Yes	65.0	50.0	44.8	56.8	
No	35.0	50.0	55.2	43.2	
Consistent condom use with non-paying partner in the past year					0.142[f]
Every time	11.8	3.6	2.4	6.6	
Not every time	53.2	46.4	42.4	49.7	
Most of the time	17.0	14.4	8.8	9.1	
Rarely	5.0	5.6	3.6	9.1	
Never	31.2	26.4	30.0	31.5	

c = Chi square f= Fisher exact test ** significant at p<0.05

On the contrary to regular partners, it was observed that 57% of the female sex workers still have non-paying partners as husbands and male friends and the condom use behavior with non-paying partner is still very poor. Almost 40% of the 57% of the female sex workers who have non-paying partners, rarely or never use condom with them and there is no trend of improvement.

4.2.2 Sexual behavior of female sex workers of Pokhara 2004-2011

Data collected from the female sex workers working in pokhara in 2004 shows 95% of them had their 1st sexual intercourse below the age of 20 years with the other 5% at the age 20-25 years with the mean age at 1st sexual intercourse of 15.63 years (range 12 to 24 years). In 2011 the mean age at first sex has slightly increased to 16.20 years (range 12 to 29 years) but still around 95% of the sex workers had their 1st sexual intercourse below the age of 20 years. In 2004 about 1/3rd of them had their debut sex at age < 15 years and in 2011 still 19.4% had their 1st sexual exposure below the age of 15 years.

The mean duration of sex work was 28.92 months (S.D-34.24) and 35.5% of the sex workers were working for over 2 years as of 2004. In 2011 the mean duration of sex work has decreased to 25.14 months (S.D-25.371) and less than 30% of them were found to be engaged for over 2 years.

The average number of clients per day was 1.39 in 2004, 1.57 in 2006, 1.65 in 2008 and 2.14 in 2011. Also an increase in client load per week has been noted from 4.01 clients/week in 2004 to 5.68 clients/week in 2011. A significant increase was found in the average number of clients per day ($p<0.001$) and client load per week ($p<0.002$) during the period 2004 to 2011.

Table 4.5. Sexual behavior of female sex workers of Pokhara 2004-2011

Sexual Behavior	2004 %(N=200)	2006 %(N=200)	2008 %(N=200)	2011 %(N=200)	p-value
Age at first sexual Intercourse					0.522[c]
11-14	31.0	35.0	24.5	19.4	
15-19	64.0	58.5	68.0	74.5	
>20	5.0	6.5	7.5	6.1	
Mean± S.D	15.63±2.10	15.45±2.28	15.89±2.18	16.20±2.09	
Min, Max	12,24	12,25	12,26	12,29	
Duration of sex work (months)					0.268[c]
6-12	43.0	44.5	49.0	47.5	
13-24	21.5	23.5	27.5	22.9	
25-36	13.5	14.5	10.0	11.6	
>37	22.0	17.5	13.5	17.9	
Mean± S.D	28.92±34.24	24.86±29.43	22.25±20.26	25.14±25.37	
Min, Max	6,264	6,240	6,180	6,192	
Number of sex partners					
Average number of clients per day					<0.001[c] **
1	71.0	52.5	47.5	54.2	
2	24.0	38.5	42.0	20.9	
>3	5.0	9.0	10.5	24.9	
Mean± S.D	1.39±0.74	1.57±0.67	1.65±0.72	2.14±1.98	
Min, Max	1,5	1,4	1,5	1,16	

c= Chi square test ** significant at p<0.05

Table 4.5. Sexual behavior of female sex workers of Pokhara 2004-2011 (contd)

Sexual Behavior	2004 % (N=200)	2006 % (N=200)	2008 % (N=200)	2011 % (N=200)	p-value
Number of clients last week					<0.001[c] **
0	17.5	11.0	1.0	15.7	
1	17.5	7.5	7.0	15.9	
2	12.5	10.0	16.0	13.3	
3-4	22.0	40.0	38.5	22.9	
>5	30.5	31.5	37.5	32.2	
Mean± S.D	4.01±4.68	3.98±3.40	4.13±2.44	5.68±8.33	
Min, Max	0,30	0,29	0,15	0,50	

c= Chi square ** Significant at p<0.05

Though the condom use with last client has been increasing it is still below 80% among the female sex workers of pokhara. The consistent condom use during last sex has changed significantly (p<0.001) over the past decade. In 2004 survey around 35% of the female sex workers were using condom consistently with their last client which has increased to over 60% as of 2011.

During the past decade, more and more female sex workers were being engaged with regular clients. In 2011 almost 90% of the female sex workers were having regular clients. A significant change in consistent condom use with regular clients has seen. It was 36% in 2004, 39.5% in 2008 which has gone up to 61.4% in 2011.

In 2004, 68% of female sex workers had nonpaying partners which has decreased to 33.9% in 2011. The consistent condom use with nonpaying partner was noted to be very poor. In 2004 68% of the female sex workers had nonpaying partners

of whom 31.5% reported to never use condom with them; while in 2011 23.5% out of 33.9% having nonpaying partners reported to never use condom.

Table 4.6. Condom use behavior of the female sex workers of Pokhara, 2004-2011

Condom Use	2004 % (N= 200)	2006 % (N= 200)	2008 % (N= 200)	2011 % (N= 200)	p-value
Condom use with last client					0.051[c]
Yes	64.5	75.0	64.5	78.8	
No	35.5	25.0	35.5	21.2	
Condom use suggested by					<0.001[c**]
Own self	29.0	49.5	50.5	69.0	
Sex partner	35.5	25.5	14.0	9.8	
Consistent condom use with client in past 1 year					<0.001[c**]
Every time	35.5	37.0	49.5	61.4	
Not every time	64.5	63	50.5	38.5	
Most of the time	33.5	42.0	17.5	20.0	
Sometimes	8.5	8.5	15.0	8.1	
Rarely/Never	22.5	12.5	18.0	10.4	

c= Chi Square test ** significant at p<0.05

Table 4.6. Condom use behavior of the female sex workers of Pokhara, 2004-2011 (cont.)

Condom Use	2004 %(N= 200)	2006 %(N= 200)	2008 %(N= 200)	2011 %(N= 200)	p-value
Regular client in the past year					<0.001[c**]
Yes	76.5	67.0	55.0	89.9	
No	23.5	33.0	45.0	10.1	
Consistent use of condom with regular clients in the past year					0.006[c**]
Every time	36.5	34.5	39.5	61.4	
Not every time	40	32.5	15.5	28.4	
Most of the time	13.5	20.0	6.5	14.8	
Sometimes	6.0	6.5	3.5	6.1	
Rarely/Never	20.5	6.0	5.5	7.5	
Non-Paying partner during past year					<0.001[c**]
Yes	68.0	28.5	34.0	33.9	
No	32.0	71.5	66.0	66.1	
Consistent condom use with non-paying partner in the past year					0.314[f]
Every time	9.0	2.0	2.5	5.2	
Not every time	59	26.5	31.5	28.7	
Frequently	27.5	6.0	7.0	5.2	
Never	31.5	20.5	24.5	23.5	

c= chi square test f= Fisher exact test ** significant at p<0.05

4.3 Part III: Health related risk behavior among the female sex workers of Kathmandu and Pokhara, 2004-2011

4.3.1 Use of Alcohol and Drugs by female sex workers of Kathmandu 2004-2011

More of the female sex workers are changing from regular drinkers to frequent drinkers of alcohol. Though, during the decade there has been a gradual decline in regular alcohol consumption habit in the female sex workers, still around 1/3rd of them drink regularly. In 2004, 38.2% of the female sex workers reported as drinking alcohol regularly which has dropped to 29.2% of them drinking alcohol regularly.

The much worrying aspect is the slight but progressive increment in drug use behavior. In 2004, 4.4% reported to have ever experienced drug use. It was found to be 7.8% in 2006, 7% in 2008 and increased to 8.9% in 2011.

Another major concern is the steady rise in injectable drug use behavior among the FSWs. In 2011, 1.5% of the female sex workers of Kathmandu were found to have injected drug within the last 12 months while the same was about 1.5% in 2011.

Table 4.7. Use of Alcohol and Drugs by female sex workers of Kathmandu 2004-2011

Alcohol and drugs consumption	2004 % (N=500)	2006 % (N=500)	2008 % (N=500)	2011 % (N=500)	p-value
Alcohol consumption in past 1 month					0.799[c]
Everyday	38.2	35.4	31.0	29.2	
At least once a week	26.6	33.0	33.6	37.9	
Less than once a week	12.4	8.8	7.8	9.4	
Never	22.8	22.8	27.6	23.4	
Ever experience of drugs use					0.659[c]
Yes	4.4	7.8	7.0	8.9	
No	95.4	92.2	93.0	91.1	
Experience of injected drugs use					0.808[f]
Yes	1.4	0.8	0.4	1.7	
No	98.6	99.2	99.6	98.3	

f = Fischer exact test c= Chi square test

4.3.2 Use of Alcohol and Drugs by female sex workers of Pokhara 2004-2011

During the decade, there has been a change in the alcohol consumption habit in the female sex workers of pokhara which has dropped to around 16% in 2011 from 34% in 2006 and 39.5% in 2006. But there has been an increased tendency for frequent drinking of alcohol in this population. The frequent drinkers are above 30% in 2011 which was just above 15% in 2004.

Though a majority of them have never experienced drugs, there has been an alarming and increase in drug use behavior in them. In 2004 only 5% of the FSWs had ever experienced drugs which have increased to 16% of the female sex workers ever experiencing drugs as of 2011.

Another concern in the female sex workers of Pokhara is the sudden increase in habit of injectable drug use by them. In 2011, 5% of them reported to have experienced injecting drug use while only 1% had in 2004 and none had in 2006 and 2008.

Table 4.8. Use of Alcohol and Drugs by FSWs of Pokhara 2004-2011

Alcohol and Drugs consumption	2004 % (N= 200)	2006 % (N= 200)	2008 % (N= 200)	2011 % (N=200)	p-value
Alcohol consumption in past 1 month					<0.002[c**]
Everyday	34.0	39.5	26.5	16.5	
At least once a week	17.5	29.0	33.0	31.3	
Less than once/week	11.5	6.5	5.5	17.4	
Never	37.0	25.0	35.0	34.8	
Ever experienced any other drugs					<0.002[c**]
Yes	5.0	12.5	2.0	15.9	
No	95.5	87.5	96	84.1	
Injected drugs in the past 12 months					0.011[f**]
Yes	1.0	0	0	4.9	
No	99	100.0	100.0	95.1	

c = Chi square f = Fisher exact test ** significant at p<0.05

4.4 Part IV: Prevalence of HIV/STIs in the female sex workers of Kathmandu and Pokhara, 2004-2011

The HIV prevalence in the female sex workers of Kathmandu seems to have been more or less stationary over the past decade.

Though a slight improvement in the STIs during the four period of the survey was noted, even in 2011 near about ½ of the FSWs were having symptoms of STIs.

Table 4.9. Prevalence of HIV/STI in female sex workers of Kathmandu 2004-2011

HIV/STI Infection	2004 % (N=500)	2006 % (N=500)	2008 % (N=500)	2011 % (N=500)	p-value
HIV +ve	2.0	1.4	2.2	1.7	0.922[f]
Other STIs Currently	47.4	55.2	58.2	48.2	0.338[c]

c= Chi square test f= Fisher exact test

In 2011, 1.2% of the female sex workers of Pokhara have been found to have HIV which was 2% in 2004 and 2006. A fall of over 50% in the HIV status was noted between 2008 (3%) and 2011(1.2%).

A slow but progressive decline has been noted in STIs in the female sex workers of Pokhara. In 2004 50% of them reported to have been currently suffering from STI symptom during the survey. This has gone down to 48.5% in 2006, 44.5% in 2008 and 44.3% in 2011.

Table 4.10. Prevalence of HIV/STI in female sex workers of Pokhara 2004-2011

HIV/STI Infection	2004 %(N=200)	2006 %(N=200)	2008 %(N=200)	2011 %(N=200)	p-value
HIV +ve	2.0	2.0	3.0	1.2	0.748[f]
Other STIs	50.5	48.5	44.5	44.3	0.771[c]

c= Chi square test f= Fisher exact test

In 2004 the female sex workers of both Kathmandu and Pokhara had HIV prevalence of 2% but in the female sex workers of Pokhara a decline in the HIV prevalence has been noted further than in the female sex workers of Kathmandu.

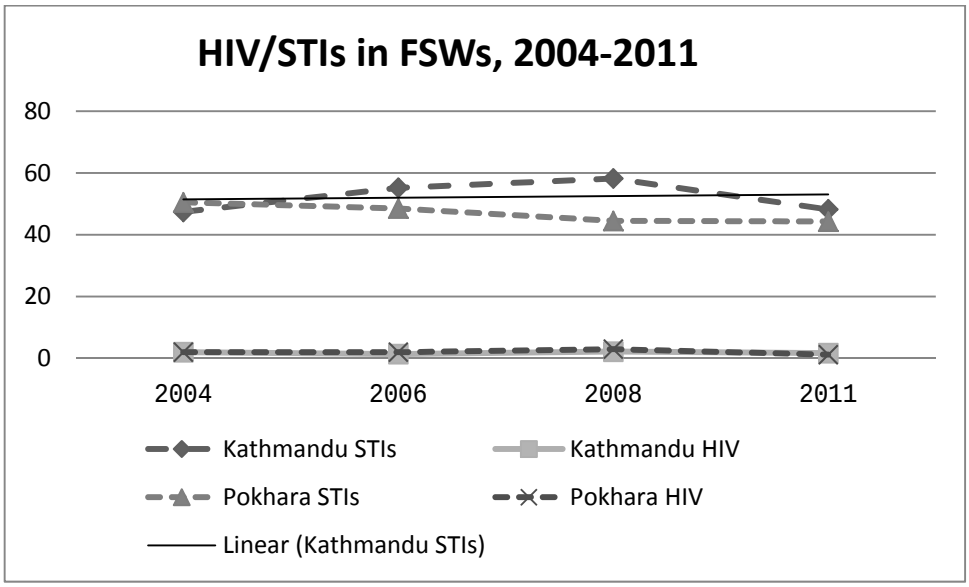

Figure 4.5 HIV/STIs in FSWs of Kathmandu and Pokhara, 2004-2011.

In 2004, though the STIs was slightly higher (50.5%) in the female sex workers of Pokhara than their counter part of Kathmandu (47.4), it was seen that female sex workers of Pokhara has been ever experiencing slightly lower STIs than their counterpart in Kathmandu.

Part V: Comparision of female sex workers of Kathmandu and Pokhara, 2011

In order to understand the high prevalence of HIV/STIs in the female sex workers of Pokhara and Kathmandu, a further comparison was done between the general characteristics, sexual behavior and health related risk behavior among the female sex workers of these two cities in 2011. Comparative study was done of 2011 only because it would give an understanding of the most recent situation.

In 2011, the female sex workers of Pokhara were younger than those of Kathmandu. About 58% of the female sex workers of Kathmandu were of age below 25 years while 75% of those of Pokhara were of the same age group. The mean age of the female sex workers of Pokhara was 22.29 years (S.D-5.58) which is significantly lower than those of Kathmandu (Mean- 24.72 years and S.D- 6.71). Majority (75%) of the female sex workers of Kathmandu were married at least once while the same was 60% in those of Pokhara. A significant difference (p=0.03) was found in the marital status among them. The tendency of literacy is high among the female sex workers of Pokhara than those of Kathmandu. 42% of the female sex workers of Kathmandu were illiterate while only 18% of those of Pokhara were illiterate and 75% of them were found to have attended grade 1 to grade 9 of formal education. The difference in the literacy status is significantly (p=0.004) different among them. Majority (86.5%) in Kathmandu and 75.4% of the female sex workers of Pokhara were found to be internal migrants and the difference was significant (p=0.036).

Table 4.11. General Characteristics of female sex workers of Kathmandu and Pokhara 2011

General Characteristics	Kathmandu % (N= 500)	Pokhara % (N= 200)	p-value
Age (years)			0.068[c]
<20	28.3	41.7	
20-24	29.2	33.3	
25-29	17.2	11.3	
>30	24.3	13.6	
Mean±S.D	24.72±6.70	22.29±5.89	
Min, Max	16,48	16,44	
Marital status			
Married	52.4	33.3	0.030[c**]
Divorced/Separated	23.3	25.9	
Unmarried	24.3	41.7	
Educational status			
Illiterate	41.8	18.2	0.003[c**]
Grade 1-5	25.3	30.7	
Grade 6-9	27.8	44.3	
Above Grade 10	5.1	6.7	
Internal migration			0.036[c**]
Born in valley districts	13.5	24.6	
Born outside valley	86.5	75.4	

c= Chi square test **significant at p<0.05

The mean age at first sexual intercourse among the female sex workers of Kathmandu was 16.39 years (S.D- 2.42) while in those of Pokhara was 16.20 years (S.D-2.09). The female sex workers of Kathmandu had a tendency to remain in the sex trade for a longer time. The mean duration of sex work was 30.04 months (Range: 6-240) among the female sex workers of Kathmandu while it was 25.14 months (Range:

6-192) among the sex workers of Pokhara and the difference was significant. (p=0.042). The average number of clients was 1.79 clients/day and 5.04 clients/week among the female sex workers of Kathmandu which was 2.14 clients/day and 5.68 clients /week among the female sex workers of Pokhara.

Table 4.12. Sexual behavior of female sex workers of Kathmandu and Pokhara, 2011

Sexual Behavior	Kathmandu (N=500)	Pokhara (N=200)	p-value
Age at first sexual Intercourse			
Mean	16.39	16.20	0.330[t]
S.D	2.42	2.09	
Min	10	12	
Max	28	29	
Duration of sex work (months)			
Mean	30.04	25.14	0.042[t]**
S.D	30.04	25.37	
Min	6	6	
Max	240	192	
			0.202[t]
Number of clients in past week			
Mean	5.04	5.68	
S.D	4.76	8.33	
Min	0	0	
Max	35	50	

t= T test ** significant at p<0.05

The condom use with last client was 82.5% in those of Kathmandu and 78.2% in those of Pokhara. The consistent condom use behavior among them was found to be poor. The consistent condom use with client was 73.4% and with regular client was 60.9% among the female sex workers of Kathmandu and was about 60% in both cases in the female sex workers of Pokhara. The consistent condom use with non-paying partner was seen to be very poor among them. Only 6.6% of the female sex workers of Kathmandu and 2.9 % of the female sex workers of Pokhara who had non-paying partners reported to use condom consistently with them.

Table 4.13. Condom Use by female sex workers of Kathmandu and Pokhara, 2011

Condom Use	Kathmandu %(N= 500)	Pokhara % (N= 200)	p-value
Condom use with last client			0.248[c]
Yes	82.6	78.8	
No	17.4	21.2	
Consistent condom use with client in past 1 year			0.052[c]
Every time	73.4	61.4	
Not every time	26.7	38.5	
Most of the time	14.7	20.0	
Sometimes	4.9	8.1	
Rarely/Never	7.1	10.4	

c= Chi square test

Table 4.13. Condom Use by female sex workers of Kathmandu and Pokhara, 2011 (cont.)

Condom Use	Kathmandu % (N= 500)	Pokhara % (N= 200)	p-value
Regular client in the past year			0.047[c]**
Yes	81.6	89.9	
No	18.4	10.1	
Consistent use of condom with regular clients in the past year			0.228[c]
Every time	60.9	61.4	
Not every time	20.8	28.4	
Most of the time	8.4	14.8	
Sometimes	4.4	6.1	
Rarely/Never	8.0	7.5	
Non-Paying partner during past year			<0.001[c**]
Yes	56.8	33.9	
No	43.2	66.1	
Consistent condom use with non-paying partner in the past year			0.354[f]
Every time	6.6	2.9	
Not every time	49.9	31	
Most of the time	18.4	7.5	
Never	31.5	23.5	

c= Chi square test **significant at p<0.05

About 30% of the female sex workers of Kathmandu used to consume alcohol regularly and only 23% of them never drank alcohol. Among the female sex workers of Pokhara 16.5% reported to consume alcohol regularly and about 35% never consumed alcohol. A significant difference (p=0.032) was found in the alcohol consumption habit among them. About 9% of the female sex workers of Kathmandu and 16% of them of Pokhara have reported to have tried drugs at least once and 1.7% of them of Kathmandu and about 5% of the female sex workers of Pokhara had used injectable drugs in the past 1 year.

Table 4.14. Alcohol and drugs use by female sex workers of Kathmandu and Pokhara 2011

Alcohol and Drugs consumption	Kathmandu %(N=500)	Pokhara %(N=200)	p-value
Alcohol consumption in past 1 month			0.032[c**]
Everyday	29.2	16.5	
At least once a week	37.9	31.3	
Less than once a week	9.4	17.4	
Never	23.4	34.8	
Ever experience of Drugs use			0.076[c]
Yes	8.9	15.9	
No	91.1	84.1	
Experience of injected drugs use			0.262[f]
Yes	1.7	4.9	
No	98.3	95.1	

c= Chi square test f= Fisher exact test ** significant at p<0.05

The prevalence of HIV was 1.7% and STIs was 48.2% among the female sex workers of Kathmandu and the same was 1.2% and 44.3% among the female sex workers of Pokhara.

Table 4.15. Prevalence of HIV/STI in female sex workers of Kathmandu and Pokhara, 2011

HIV/STI Infection	Kathmandu %(N=500)	Pokhara %(N=200)	p-value
HIV +ve	1.7	1.2	0.4785[f]
Other STIs Currently	48.2	44.3	0.3116[c]

c= Chi square test f= Fisher exact test

The comparative study among the female sex workers of Kathmandu and Pokhara reveals that the female sex workers of Pokhara are slightly younger than their counterparts of Kathmandu.

The tendency of marriage among female sex workers was high but it is seen that less proportion of female sex workers of Pokhara are ever married than those of Kathmandu.Recently an improvement in literacy status has been observed among the female sex workers of Pokhara with no sign of improvement in those of Kathmandu. It has also been noted that majority of the female sex workers are poor internal migrants and recently there has been an increased migration of 15% of the new sex workers in Pokhara, just in last 3 years.

The age at first sexual intercourse is lower is the female sex workers of Pokhara than those of Kathmandu. It also can be observed that recently younger females are entering the sex trade more in Pokhara than in Kathmandu and the female sex workers of Kathmandu were found to have tendency to stay longer in the sex trade than those of Pokhara.

The average number of clients/day has been higher among the female sex workers of Pokhara than that of Kathmandu and a recent increase in multiple partner

relationship has been noted in the female sex workers of Pokhra than in Kathmandu. Condom use with last client has been improving slowly but the situation of consistent condom use is very poor. The situation is worse among the female sex workers of Pokhara. Also, a recent rise of ever experience of drug use among the female sex workers, more among those of Pokhara is one of the major concerns.

CHAPTER V
DISCUSSIONS

Female sex workers are one of the most at risk populations for HIV/STIs. The clients of female sex workers act as a bridge for HIV/STIs transmission to the general population. This makes the female sex workers an important target group for prevention and control programs of HIV and STD. In Nepal, the government of Nepal (NCASC), many NGO's, INGO's and local organizations have been working for prevention and control of HIV/STIs with focus to this group. Despite their high efforts, the prevalence of HIV/STIs has not been able to decline in this population in different parts of Nepal, mainly the highway districts and the major cities of Nepal. This study has been conducted in the female sex workers of two major cities on Nepal, Kathmandu and Pokhara from 2004 to 2011.

5.1 HIV/STIs

It is seen that the HIV prevalence, though around 1.5%, have somewhat stabilized but the prevalence of STIs is as high as about 50% in the female sex workers of these two cities and have not been able to decline. The stabilization of HIV and STIs could be due to safer sex practice, rising awareness of STI symptoms, better treatment facilities at local level, change in health seeking behaviors among them in recent times and could also be attributed for the efforts of the various organizations working with focus to this group. The HIV prevalence has been decreasing and has found to be stabilized in the female sex workers globally. The prevalence of HIV has decreased from 11.4% to 5.1% in female sex workers of India in between 2002 to 2009. In Thailand the prevalence of HIV among direct female sex workers was 28% and in indirect female sex workers was 14% in 1993 which has decreased to 4.5% and 2% in them respectively as of 2009.[61] The main reasons for it are successful programs for condom use as 100% Condom Utilization Program in Thailand and

Sonagachi in West Bengal, India.(World Bank report 2013). But, the ever high prevalence of STIs in the female sex workers of Kathmandu and Pokhara is one of the major concerns as studies have shown HIV and STIs to be closely related.[62,63] The high prevalence of STIs in this population shows a room for unmet target of condom use practice among them.

5.2 General Characteristics

The sex workers of Kathmandu and Pokhara were found to be young. Though a slight increase in the mean age of the female sex workers of Kathmandu has been noted, above 28% of them were below the age of 20 years. There has been a slight decline in the mean age of the female sex workers of Pokhara and above 40% of them were found to be below the age of 20 years as of 2011. The female sex workers of Pokhara may be younger than those of Kathmandu because of the fact that Pokhara is a relatively small, confined and a safer city than Kathmandu attracting more young and adolescent girls. There are studies to suggest that entering into Sex trade at younger age make them more vulnerable to HIV. A study in FSWs in Thailand have shown that HIV prevalence was as high as 36% in the female sex workers who started commercial sex work at age 12-15 years while the same was only 11% in them who joined the trade after 21 years of age.[27] Younger girls entering into the sex trade is threatening because of their inability to understand the importance of condom use and also their lower power to negotiate for condom use. It is essential to launch the program of safe sex education at primary level of education in order to bring a behavior change among the young girls.

The trend of marriage is higher among the female sex workers of Kathmandu than those of Pokhara. This may be due to a relatively younger girls being in sex trade in Pokhara than Kathmandu. Comparative study of the female sex workers of Kathmandu and Pokhara 2011 showed that in Kathmandu over 75% of the females sex workers have been found to be married atleast once while 60% of the female sex workers of Pokhara have married atleast once. Studies have shown lower HIV prevalence among the married female sex workers [38,64]. But the danger of married FSWs being infected with HIV is in transmitting to their non-paying partners as

studies have shown very low condom use with non-paying partners of FSWs. Married couples tend to use condom less with their partner, the main reason being "trust toward the partner"[41].Tendency of unprotected sex among married couples make them more vulnerable to HIV if one partner is infected. So marriage can be a bridge for transmission of HIV. The existing programs focusing on condom use must be able to advocate the importance of use of condom even with non-paying partners of the female sex workers.

Recently, there has been an increase in the proportion of low literates in Pokhara where 75% of the female sex workers were found to have education of grade 1 to grade 9 in 2011 but only ½ of the female sex workers of Kathmandu had the same level of education. In both cities just around 5% of the female sex workers were found to have education of above grade 10 during the decade. HIV/AIDS is behavioral related disease. In FSWs behavioral change is possible and is related with Educational status.[35] Studies have found the proportion of STI, multiple partners and non-condom use significantly high among illiterate FSWs.[36] Illiteracy in female sex workers has also been associated with higher risk to HIV infection.[37]

Majority of the female sex workers were found to be internal migrants. Around 85% of the female sex workers working in Kathmandu were found to be internal migrants. Though 60% of them in Pokhara were found to be internal migrants in 2008, recently there has been an increase in internal migration to Pokhara which has reached to 75% in 2011. Studies have shown sexual risk behavior to be very high in poor internal migrants [46]. A study conducted in Beijing China in 2008 revealed that 47% of internal migrants were engaged in Extra-Marital Sex.[47] FSWs who are internal migrants have been found to practice very high risk behavior. As high as 95% of FSWs were found to be migrants in a study in Hainan Province in South China with median stay at a site of 2-3 months, consistent condom use was 15% with clients and only 8% with non-paying partners, 30% of them used alcohol prior to sex and STD was found to be 19%[48]. Majority of the female sex workers being migrants in both these cities calls for drawn attention to focus the HIV/AIDS related programs to reach these populations.

5.3 Sexual behavior

Majority (90%) of the female sex workers had their first sexual intercourse below the age of 20 years. There has been a very slight decline in the proportion of the female sex workers having their 1st sexual intercourse below the age of 14 years. Studies have suggested that women are more at risk than men for heterosexual transmission of HIV, the main reason being that they are twice more biologically susceptible than man.[39,40] Also a study conducted in West Bengal, India have shown that HIV infection was higher in FSWs with age group less than 20 years [12.5%] as compared to older age group [5.4%].[32] Early age at first sexual intercourse is one of the major concerns among them.

Multiple partner relationship has been increasing in the female sex workers of both cities. There has been a consistent rise in the average number of clients per day and number of clients in the past week over this period of time. This situation has persistently been worse in the female sex workers of Pokhara than those of Kathmandu. There are studies to suggest that increase in number of sex partner increases the risk to HIV because, with each partner, a new route to HIV is created. A study conducted in general population in Sub-Saharan Africa for age 15-44 years revealed that there was a significant relation between multiple partners and HIV infection with an OR 3.32 for female and 2.87 for male after adjusting for other factors as literacy, residence, condom use.[50] A report from Uganda suggests that that HIV infection of 5.4% in 2005 has increased to 7.3% mainly due to increase in multiple sex partners.[51] It is exactly unclear why the multiple partner relationship was higher among the female sex workers of Pokhara. It could be because Pokhara is a small city, concentrated tourist hub with rapid turnover of visitors making it easier for the female sex workers to solicit more clients easily. The ever increase in the multiple partner relationship among the female sex workers of both the cities could also be due to the easy availability of condom and also to meet the increasing living cost in these cities which has been skyrocketing in this period of time.

The trends of condom use among the female sex workers of both the cities shows an improvement in condom use behavior (with clients and regular clients) only in recent years between 2008 and 2011. This reflects a very recent increase in self efficacy and bargaining power of the female sex workers with the clients to use

condom. This may be the result of the positive outcomes of the condom use awareness programs focusing in this group. But the condom use behavior with the non-paying partners has shown no improvement during this period. Less than 7% of the female sex workers of Kathmandu and 3% of them in Pokhara reported to use condom consistently with their non- paying partners in 2011. This may be due to lack of the awareness and false perception of the risk of unprotected sex even with non-paying partners. Condom use is the cornerstone in prevention of HIV/AIDS. Studies have also suggested low condom use among non-paying partners as husband the main reason being trust. But this increases the risk of HIV transmission to either partner if one is infected.[41]A decline in HIV/STIs has been achieved due to successful programs for HIV prevention focusing on no condom, no sex among the female sex workers of West Bengal, India[65,66]. This shows necessity of the existing condom use programs to change their strategies to be able to reach more of this population and also focus on the need of condom use with non-paying partners.

5.4 Alcohol and drug use behaviour

There has been improvement in the alcohol use behaviour among the female sex workers of both the cities. The main concern is the drug use behaviour and ever experience of injectable drugs by them. More and more of the female sex workers are being exposed to drug use and the situation is worse among the female sex workers of Pokhara. IV Drug Use is a potential cause of HIV AIDS. 7% of IDUs in Dhaka, Bangladesh were found to be HIV +ve [2010, USAID Bangladesh] which was 70 times more than in normal adult population [< 0.1%][57]. So, the recent increase in the drug use behavior is one of the major concerns may be a upcoming challenge to control the HIV among the female sex workers.

The overall trend of general characteristics, sexual and health related risk behaviour of the female sex workers of both the cities can help us understand the slow rather no decline of HIV/STIs in them. An improvement has been seen in condom use with client and regular clients. But overall, the condom use behaviour was found to be very low. This can be linked to the ever non-decreasing high prevalence of STIs in this population. Other factors as younger entrants, low literates, increase in proportion of

ever married, high internal migration, early age at first sexual intercourse, longer duration of stay in the sex trade, multiple partner relationship, low condom use among non-paying partners, increase in drug use behaviour have all added to the risk of HIV/STIs in this population.

5.5 Comparison of FSWs of Kathmandu and Pokhara

Both the cities have not achieved a declining trend in HIV/STIs in the female sex workers. At present comparing the situation of HIV/STIs in the female sex workers of the two cities, it looks that the female sex workers of Pokhara are better off. But looking deeper into the situation, it might not be the same in the upcoming years. The relatively younger and increase in proportion of low literates among the female sex workers can be explained by recent huge (15%) migration of new younger female sex workers, who are low literates, from the nearby districts. These new entrants may not be able to understand the importance of and also negotiate condom use easily. Moreover, it has been noted that there has been a steady rise in multiple partner relationship among the female sex workers of both cities and more among the female sex workers of Pokhara. Increase in drug use and ever experience of injectable drugs makes them more vulnerable to HIV/STIs and this situation is worse among the female sex workers of Pokhara.

The study helps us to understand the increased risk of HIV/STIs in the female sex workers of both the cities in the upcoming days. It seems that the female sex workers of Pokhara pose a higher threat than their counterpart of Kathmandu. The situation of HIV/STIs among the female sex workers of both the cities may be worse in the recent future and thus has to be considered as an area of continuous attention.

CHAPTER VI
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This cross sectional study was conducted in female sex workers of Kathmandu and Pokhara valley. All the samples of the existing Integrated Biological and Behavioral survey conducted in the female sex workers in 2004, 2006, 2008 and 2011 in Kathmandu and Pokhara were recruited in this study. The data of the existing survey was present in coded form. The encoding of the data was understood and it was extracted from the primary source according to the variables of interest. The study has seen the trend of general characteristics, sexual and health related risk behavior and HIV/STIs in the female sex workers of Kathmandu and Pokhara, 2004-2011. Further a comparative study of the general characteristics, sexual and health related risk behavior, and HIV/STIs of the female sex workers of these two cities of 2011 was done.

6.1.1 Female sex workers of Kathmandu, 2004-2011:

The study of the general characteristics of the female sex workers of Kathmandu shows that the mean age of the sex workers have not changed much from 2004 (23.99 years) to 2011 (24.72) years and above 60% of the female sex workers were of the age less than 24 years. Above 70% of them were married at-least once. The educational status is still very poor with less than 5% of the sex workers having received 10 or more years of formal education. Majority (85%) were poor internal migrants mainly from the districts around the valley. Majority (90%) of them had their first sexual intercourse below the age of 20 years. The mean duration at sex work had increased from 24.46 month to 30 months in between 2004 to 2011 showing that more of the sex workers were staying in the sex trade for a longer duration. Multiple partner relationship was seen to be increasing in them. The average number of clients in 2004 (1.53 clients/sex worker/day) had increased to 1.79 in 2011. Some improvement was

seen in condom use in last sex and consistent condom use with client and regular client during the decade. The condom use with last client has increased from 74% to 83%; consistent condom use with client has increased from 56.6% to 73.4% and with regular client has increased from 44% to 61%. Consistent condom use with non-paying partner was very low and has been progressively decreasing from 11.8% to 6.6% from 2004 to 2011. Though some improvement has been seen in alcohol consumption habit the much worrying aspect was the gradual increase in ever experience of drugs and use of injectable drugs. The HIV status is more or less stationary and the STIs symptoms are still as high as 48.2%.

6.1.2 Female sex workers of Pokhara, 2004-2011:

The study of the general characteristic of the female sex workers of Pokhara shows a slight decrease in the mean age from 23.62 years (2004) to 22.29 years (2011). In 2004 about 61% of them were below the age of 24 years while in 2011 it was seen 75% of them were below 24 years showing that younger girls had entered the sex trade in Pokhara. There has been a decline in the proportion of ever married from 69.5% to 58%. Though mostly (75%) in primary level, significant increase in the literacy status has been noted in them. Though internal migrants have always been higher, Pokhara has witnessed in 12% increase of internal migrant female sex workers in between 2008 to 2011. A slight increase in age at 1st sex was seen in between 2004 (15.63 years) to 2011 (16.20 years). A significant increase in multiple partner relationship has been found. The average number of clients/day has increased from 1.39 (2004) to 2.14 (2011) and also there has been an increase in number of clients in past week from 4.01 in 2004 to 5.68 in 2011. Improvement in condom use in last sex and consistent condom use has been noted with client and regular partners. The consistent condom use with client has significantly increased from 35.5 in 2004 to 61.4 in 2011 and from 36.5 in 2004 to 61.4 in 2011 with regular clients. Nevertheless, the consistent condom use with non-paying partner is very poor and has been decreasing from 9% in 2004 to 3% in 2011. Though an improvement has been noted in alcohol consumption habit, there is an alarming increase in drug use experience and use of injectable drugs by the female sex workers. HIV status was 2% in 2004 and is still 1.2% in 2011. The STIs symptoms in 2011 are still among 44.3% of them.

6.1.3 Comparison of Female sex workers of Kathmandu and Pokhara:

The female sex workers of Pokhara were found to be younger, better literate and less ever married than their counterpart of Kathmandu. The age at first sexual intercourse was also found to be lower is the female sex workers of Pokhara than those of Kathmandu. This may be due to higher proportion of the younger (< 25 years) FSWs in Pokhara and a recent increase in internal migration of young low literate female sex workers in Pokhara more than in Kathmandu. The average number of clients/day was higher and a recent increase in multiple partner relationship has been noted in the female sex workers of Pokhra than those of Kathmandu. Condom use with last client and consistent condom use is still very poor and the situation is worse among the female sex workers of Pokhara. A recent rise of ever experience of drug use among the female sex workers is a major concern and is more in Pokhara. The HIV/STIs in Pokhara is slightly lower than in Kathmandu but the female sex workers of Pokhara seems to be more vulnerable to HIV/STIs than their counterpart of Kathmandu.

Looking into the overall situation, it can be said that there are enough reasons to worry and predict the upcoming worse situation of HIV/STIs in the female sex workers of both the cities. Younger girls entering into the sex trade, low literacy rate among them, increase in internal migration among this population make them vulnerable to HIV/STIs. The vulnerability is further increased by an increase in multiple partner relationships, experience of drug use and increase in injectable drug use. Though improvement in condom use with client and regular partners have been witnessed, the high STIs among them show the fact that there is more need for further improvement; and the low condom use with non-paying partners needs immediate attention.

6.2 Recommendations

6.2.1 Recommendations for Program implementation

- The currently existing HIV/STIs programs targeted on the female sex workers has to be further expanded and intensified to work more vigorously. The existing HIV/STIs related awareness programs should turn their focus targeting more of young and adolescent population. The Ministry of Education should plan and start sex education to be a part of school health education program at primary level.

- Internal migrants are vulnerable to HIV/STIs. It is important to map their site of residence in large cities and focus the HIV/STIs awareness programs and VCT to make it more assessable to this population.

- Programs for condom use should focus on educating these groups regarding the outmost importance of use of condom even with their non-paying partners. It would be the duty of the existing NGO's/INGO's working closely with these groups.Important work places of the female sex workers have to be identified. Condoms should be made more available to them. The bargaining power among the females sex workers to refuse the client to have sex without condom has to be improved through constant support by peers, brothel owners and education by information, education and communication materials (IEC materials).

- A more integrated inter-sectorial co-ordination and approaches are required between the government authorities and key partners (NGO's/INGO's) to address the growing risk of HIV/STIs in this population. Law enforcement has to be made in certain areas. It has to be mandatory for the brothel owner to have the female sex workers screen for STIs regularly and also consistently encourage condom use by them. A punishment of fine or temporary closure of the brothels with increase in STIs is recommended.

- The female sex workers should be empowered and important key persons among them should be used for peer education of safe sex; discourage drug use and risk of multiple partner relationship.

6.2.2 Recommendations for Further Studies:

- A study is required to establish a relationship between the general characteristics, sexual and health related risk behavior and HIV/STIs. This would give us more evidence and guidelines for launching of programs to tackle the upcoming risk of HIV/STIs in the female sex workers of these cities.

- The Integrated biological and behavioral survey has to be continued in female sex workers of these major cities with further concern about the drug use behavior. These surveys should also be extended to the endemic districts.

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APPENDICES

APPENDIX A
ETHICAL CLEARENCE

Documentary Proof of Exemption
Ethical Review Committee for Human Research
Faculty of Public Health, Mahidol University

Protocol Title :	EPIDEMIOLOGICAL TREND ANALYSIS OF HIV/STI IN FEMALE SEX WOKERS IN KATHAMNDU AND POKHARA VALLEY, NEPAL, 2004-2011
Protocol No. :	248/2555
Principal Investigator :	Dr. Saroj Dhakal
Affiliation :	Master of Public Health (International Program) Faculty of Public Health, Mahidol University

This protocol complies with a "Research with Exemption" category

Date of Issue : 3 December 2012

The aforementioned project have been reviewed and approved according to the Standard Operating Procedures of Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University.

S. Nanthan

(Assoc. Prof. Sutham Nanthamongkolchai)
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APPENDIX B
METHODOLOGY OF DATA SOURCE

The general outline of Methodology followed by New ERA and ASHA project for the data collection is as follows.

Study Design

All the four round of IBBS survey was a cross sectional study conducted among female sex workers in Kathmandu and Pokhara in 2004, 2006, 2008 and 2011.

The inclusion criteria of the study was "All female aged 15 years and above who reported having sold sex for cash or kind within the last 6 months of the survey and ready to participate in the study voluntarily".

The exclusion criteria: Anyone who decided to discontinue the study during data collection or those who do not provide complete information.

Sample Size Estimation

Sample size was estimated to detect up to 15% differences in various key behaviors. In all four round of surveys a total of 500 samples were collected, 300 from establishment based and 200 from street based FSWs.

The formula used for Sample size detection is :

n = D [(Zo + Zb)2 x (P1(1-P1) + P2 (1-P2))/(P2-P1)2]

where

n = required minimum sample size per survey round or comparison groups

D = design effect [taken as default of 2]

P1 = the estimated number of an indicator measured as a proportion at the time of the first survey or for the control area

P2 = the expected level of the indicator either at some future date or for the project area such that the quantity [P2-P1] is the size of the magnitude of change it is desired to be able to detect

Z0= the Z-score corresponding to the degree of confidence with which it is desired to be able to conclude that an observed change of size [P2-P1] would not have occurred by chance [o-level of statistical significance]

Zb= The Z-score corresponding to the degree of confidence with which it is desired to be certain of detecting the change of size {P2-P1] if one actually occurred [B- statistical power]

Sampling Method

It was done in two phases. In the first phase mapping of the locations where FSWs solicited clients were done and 5-7 areas were identified in different year of the survey. Then the study team went to the areas and talked to various key informants as brokers, clients of FSWs, restaurant staff etc. to find the potential candidates. Direct and indirect counting was done in each location in order to determine the population size. After estimating the population of female sex workers in different locations, the locations were divided into different clusters.

In the second phase selection of the study participants were done from these clusters. Female sex workers were selected from street and establishment based centers as from cabin, dohori/dance restaurants, hotels/lodges, house settlements and massage parlors.

Refusals

In all four surveys care was been taken to ensure that the participants participated voluntarily. As in Kathmandu in 2008 survey there were 146 sex workers who refused to participate in the study. 40 of them refused at the time of approaching them at different locations [stage 1] and 106 of them refused after arriving the study site [stage 2]. The most commons reasons of the refusal was not being interested in the study, started sex trade less than 6 months, had recently been to a VCT for check-up, were too busy, scared to blood test, denied to be sex workers, demanded money, employer denial.

Control of duplication

Great care was taken to control duplication. ID number was issued to the study participants. Various questions were asked to the participants to ensure no duplication. Lab technicians, staff nurse and interviewer were asked to remain vigilant.

Research Instrument

It was a quantitative research approach. Structured questionnaire were used to conduct the interview. The questionnaire was updated in various round of surveys.

It included questions on Socio-demographic variables and sexual behaviors- sexual history, use of condoms, risk perception, awareness of HIV/AIDS/STIs, incidence of STI symptoms, participation in HIV/AIDS awareness programs and alcohol and drug using habits.Then after completion of the interview to fill up the questionnaire, blood was collected for HIV and Syphilis tests.

Incentive to participate in the study

An amount of Nrs 100/- per participant was given as travelling expense to reach the study site. A free routine general check up was done with symptomatic examination of STI was done. Free syndrome treatment was provided to those having STI.No expense was provided to collect the report of the tests [HIV and Syphilis].

Collection, Storage and Transportation of Blood Samples

After consent of the participant, the lab technician drew 5 ml of blood in a disposable syringe and stored it in a sterile glass tube with the respondent's ID number. Then the serum was separated and kept in a sterile serum vial with ID number. Everyday the samples were transported in cold box to the SACTS laboratory in Kathmandu and Pokhara where the serum samples were stored at a temperature -12 to -20.C

Laboratory Tests

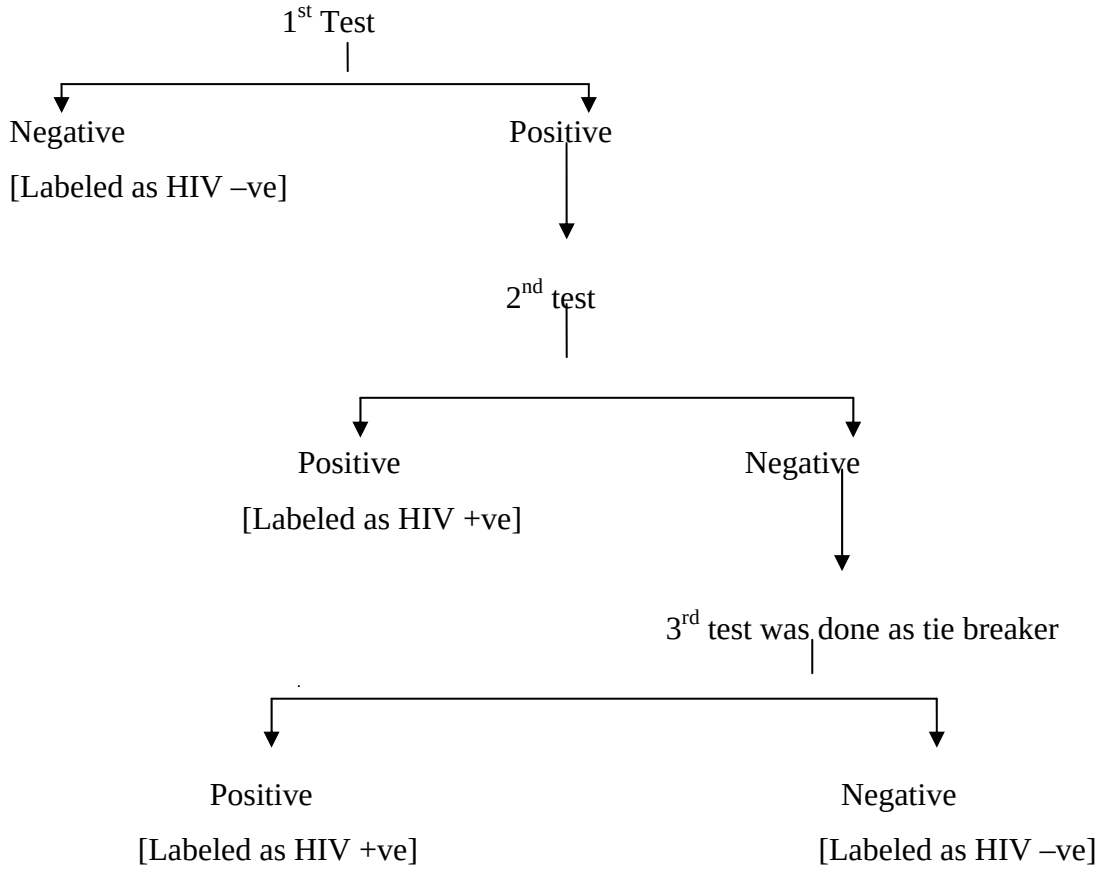
Three tests were used to detect antibodies against HIV.

1st test: Determine HIV 1/2 [Abbott Japan Co. Ltd]

2nd test: Uni-Gold [Trinity Biotech, Dublin, Ireland]

3rd test: SD Bioline HIV 1/2 [Standard Diagnostics, Inc, Kyonggi-do, South Korea]

Interpretation of result



Ethical Clearance

In all the four surveys Ethical Clearance was taken from two bodies. 1st from the NHRC [National Research Health Council], the government's ethical clearance body and also from Protection of Human Subjects Committee [PHSC] of Family Health International [FHI].

APPENDEX C
QUESTIONNAIRES AND CODING

General Characteristics

Q.N	Questions and Filters	Coding Categories
201	Age: How old are you?	Age…….. (write the completed years)
204	Marital status: What is your present marital status?	Married…….1 Divorced/Separated……..2 Widow……..3 Never married……...4
204.1	How old were you when you got divorced/ widowed?	Age …….. [write the completed years]
204.2	Are you presently living with your husband?	Yes……1 No…….2
205	At what age were you married for the first time?	Years old…… [write the completed years]
203	Educational status: What is your educational status?	Illiterate……....0 Literate……19 Grade……
202	Ethnicity: What is your caste? [specify Ethnic group/Caste]	Ethnicity/Caste…… [specify] Code No…….
104	Internal migration:	District……

	Where were you born?	VDC/Municipality…….. Ward No……. Village/Tole……
105	Where do you live now? [Name current place of residence]	District…… VDC/Municipality……. Ward No……. Village/Tole……
106	How long have you been continuously living in this location?	Month……. Always [since birth]…….0 Since less than 1 month….995
107	Before you moved here, where did you live?	District…… VDC/Municipality……. Ward No……. Village/Tole……

Sexual Behavior

Q.N	Questions and Filters	Coding Categories
301	Age at 1st sex: How old were you at your first sexual intercourse?	Years old…… Don't know/Can't recall….98
208	Duration of sex work: How long have you been exchanging sexual intercourse for money or other things? [Stop interview if less than 6 months]	Months…… Don't know……98
302	Number of sex partners: Among all of your partners, how many had sex with you in exchange of money in the past week?	Number…….. Don't know……98
303	Among all of your partners, how many of them had sex with you without paying any money in the past week? [Include spouse and live-in-partners]	Number…….. Don't know……98
304	With how many different partners in total have you had sex during the past one week? [Check with 302 and 303—match with 304]	Number…….. Don't know……98
305	Usually, how many clients visit you in a day?	Number…….

305.1	With how many clients did you have sexual intercourse yesterday?	Number…….
305.2	With how many clients did you have sexual intercourse in the past week?	Number…….
308	When did you have the last sexual intercourse with a client? [00 if today]	Days before……
309	How many partners did you have sexual intercourse with on that day?	Number……..
401	Condom Use: The last time you had sex with your client, did he use a condom?	Yes……..1 No……....2
401.1	Who suggested condom use at that time?	Myself…….1 My partner……...2 Don't know…….98
401.2	Why didn't your client use condom at that time?	Not available……...1 Too expensive…….2 Partner objected……..3 I didn't like to use it……4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify).…….96 Don't know……98

402	How often did your clients use condom over the past 12 months?	All the time…….1 Most of the time……..2 Sometime……3 Rarely…….4 Never……..5
402.1	Why didn't your client use condom always?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……...4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify)……..96
403	Do you have a client who visits you on regular basis?	Yes…….1 No……..2
404	Did your regular client use condom in the last sexual contact with you?	Yes…….1 No……..2
404.1	Who suggested condom use at that time?	Myself……1 My partner……..2 Don't know…….98
404.2	Why didn't your regular client use condom at that time?	Not available……...1 Too expensive……2 Partner objected…….3 I didn't like to use it……4

		Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify)……..96 Don't know……98
405	How often did your regular partner use condom with you during the past 12 months?	All the time…….1 Most of the time……..2 Sometime……3 Rarely…….4 Never……..5
405.1	Why didn't they use condom always?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……...4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify)……..96 Don't know…….98
406	Did you have sexual intercourse with our husband or male friend in the past 6 months?	Yes…….1 No……..2

408	The last time you had sex with your husband or male friend, did your sex partner use condom?	Yes…….1 No……..2
408.1	Who suggested condom use at that time?	Myself……1 My partner…….2 Don't know……98
408.2	Why didn't your partner use condom at that time?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……...4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify)……..96 Don't know……98
409	How often did all of your nonpaying partners use condom over the last 12 months?	All the time…….1 Most of the time……..2 Sometime……3 Rarely…….4 Never……..5
409.1	Why didn't they use condom always?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……4 Used other contraceptive…5

		Didn't think necessary……6 Didn't think of it……7 Client offered more money..8 Others (specify)……..96 Don't know……98
410	During the past one year, did you have sexual intercourse with a person other than your client, husband/male friend?	Yes…….1 No…….2
411	Did he use condom when he had last sexual contact with you?	Yes…….1 No……..2
411.1	Who suggested condom use at that time?	Myself……1 My partner……..2 Don't know…….98
411.2	Why didn't he use condom at that time?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it…….7 Client offered more money..8 Others (specify)……..96 Don't know……98

412	How often did your other partners use condom with you over the past 12 months?	All the time…….1 Most of the time……..2 Sometime……3 Rarely…….4 Never……..5
412.1	Why did your other partners not use condom regularly?	Not available……..1 Too expensive……2 Partner objected…….3 I didn't like to use it……4 Used other contraceptive…5 Didn't think necessary……6 Didn't think of it……7 Client offered more money..8 Others (specify)……..96 Don't know……98

Health related risk behavior

Q.N	Questions and Filters	Coding Categories
801	Alcohol use During the last 30 days how often did you have drinks containing alcohol?	Everyday…….1 2-3 times a week…….2 At least once a week……...3 Less than once in a week…4 Never……..5 Don't know…….98
802	Drug use: Some people take different types of drugs. Have you also tried any of those drugs in the past 30 days? [Ganga, Bhang, Nitroson, Nitrovet E, others]	Yes…….1 No……...2 Don't know…….98
803	Some people inject drugs using a syringe. Have you ever injected drugs?	Yes…….1 No……...2 Don't know…….98
804	Have you injected drugs in the last 12 months? [Do not count drugs injected for medical purposes or treatment of an illness]	Yes…….1 No……...2 Don't know…….98
805	Are you currently injecting drugs?	Yes…….1 No……...2
806	Think about the last time you injected drugs. Did you use a needle or syringe	Yes…….1

	that had previously been used by someone else?	No……..2 Don't know……98
807	Think about the last time you injected drugs during the past one month. How often was it with a needle or syringe that had previously been used by someone else?	Every time……..1 Almost every time……..2 Sometimes……..3 Never……..4 Don't know…….98

Sexually transmitted infections

Q.N	Questions and Filters	Coding Categories
702.	Do you currently have any of the following symptoms?	
	Symptoms	**Yes** **No**
	1. Pain in the lower abdomen	1 2
	2. Pain during urination	1 2
	3. Frequent urination	1 2
	4. Pain during sex	1 2
	5. Ulcer or sore in genital area	1 2
	6. Itching in or around vagina	1 2
	7. Vaginal odor or smell	1 2
	8. Vaginal bleeding [unusual]	1 2
	9. Heavy, Foul smelling vaginal discharge	1 2
	10. Genital warts	1 2
703	Have you gone through medical treatment for any of these symptoms?	Yes…….1 No……..2
703.1	If yes, for how long did you wait to go for the treatment? (Write '00' if less than a week)	Week……..
705	For which symptoms did you get treatment? Specify treatment.	
	Symptoms	**Treatment**
	1. Pain in the lower abdomen 2. Pain during urination 3. Frequent urination 4. Pain during sex 5. Ulcer or sore in genital area	

	6. Itching in or around vagina 7. Vaginal odor or smell 8. Vaginal bleeding [unusual] 9. Heavy, Foul smelling vaginal discharge 10. Genital warts 96. Others (Specify) ……		
710.	Did you have any of the following symptoms in the past one year? **Symptoms**	**Yes**	**No**
	1. Pain in the lower abdomen 2. Pain during urination 3. Frequent urination 4. Pain during sex 5. Ulcer or sore in genital area 6. Itching in or around vagina 7. Vaginal odor or smell 8. Vaginal bleeding [unusual] 9. Heavy, Foul smelling vaginal discharge 10. Genital warts 96. Others (Specify) ……	1 1 1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 2 2 2
711.	Have you gone through medical treatment for any of these symptoms in the past year? **Symptoms**	**Yes**	**No**
	1. Pain in the lower abdomen 2. Pain during urination 3. Frequent urination	1 1 1	2 2 2

	4. Pain during sex	1	2
	5. Ulcer or sore in genital area	1	2
	6. Itching in or around vagina	1	2
	7. Vaginal odor or smell	1	2
	8. Vaginal bleeding [unusual]	1	2
	9. Heavy, Foul smelling vaginal discharge	1	2
	10. Genital warts	1	2
	96. Others (Specify) ……		

HIV status

Sample	Determine HIV	Uni-Gold	SD Bioline	Result
	Non-Reactive			Negative
	Reactive	Reactive		Positive
	Reactive	Non-Reactive	Reactive	Positive
	Reactive	Non-Reactive	Non-Reactive	Negative

BIOGRAPHY

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