

**PREVALENCE OF HIV/SEXUALLY TRANSMITTED
INFECTIONS AMONG STREET BASED FEMALE SEX
WORKERS IN NAIROBI**

BY

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**A research project submitted in partial fulfilment of the requirements for the
award of the degree of Masters in Science in Tropical and Infectious Diseases at
the College of Health Sciences, Institute of Tropical and Infectious Diseases,
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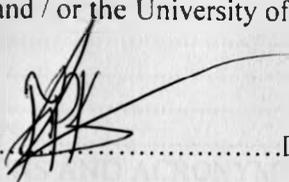
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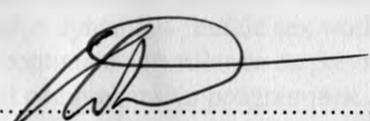
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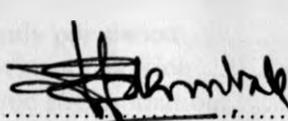
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DEDICATION:

To my dear late Grandmother, Loise Kavaya Mbat, who at the time of this proposal writing and finalisation of the project was ailing but continued to show her unwavering love and support up till her last days. She instilled in me the fact that anything is possible just with patience, dedication and perseverance.

I keep her candle burning through my continued services as a medical professional.

ACKNOWLEDGEMENTS:

Dr. J. Kimani (Supervisor) and Prof. B. Estambale (Supervisor) for their unwavering support and guidance, for their time, dedication and encouragement through out the development of the proposal, data collection and cleaning and write up of the project. Extremely grateful, God bless.

Dr. Machoki and Dr. Kinyari for the dedicated assistance in corrections and review of the project write up.

To the lecturers in UNITID for the guidance and knowledge.

To the staff of SWOP clinic for their time and support through out data collection and support in write up of the proposal and the final project

The UNITID staff ,the secretary's and Mr. Baraza .for all the technical assistance and support throughout the study period.

To the statisticians Mr. Richard Gichuki, Mr. Festus and Mr. Onchiri for their time and support in the data cleaning and analysis.

To my Parents who have continued to support me financially and emotionally through out my study period and their wise counsel.

To my fellow class mates Irene Njuguna, Josephine Wahito and Evelyne Wesangula for their support throughout the difficult and good times during our study period.

To God, through whom all things are possible.

LIST OF ABBREVIATIONS AND ACRONYMS:

STI's	Sexually Transmitted Infections
SWOP.....	Sex Workers Outreach Programme
HIV	Human Immunodeficiency Virus
KAIS	Kenya AIDS Indicator Survey
PITC	Provider Initiated Testing and Counselling
PEPFAR.....	President's Emergency Plan for AIDS Relief
CDC	Centres for Disease Control and Prevention
PCR	Polymerase Chain Reaction
OR	Odds Ratio
CI	Confidence Intervals
MOH	Ministry of Health

ABSTRACT:

Background:

Interventions that control the prevalence of STDs among sex workers are central in HIV prevention programs worldwide. The interplay between classical STDs and HIV is further compounded by FSW's clients who act as a bridging group to the rest of the population, other socio demographic factors and risk behaviours amongst FSW's contributing to the unique pattern of the HIV/ STI in different regions.

Methods:

A cross-sectional descriptive study was conducted among FSW's accessing care at SWOP clinic in Nairobi, Kenya over the period of 1st September 2008 to 31st August 2009 using the existing University of Manitoba/Nairobi research program database. Descriptive statistics on the prevalence of STIs, univariate and multivariate logistic regression analysis were then used to determine significant correlates of HIV and STI's among these FSWs

Results:

A total of 3011 FSWs were evaluated. Their median age was 31 years. Majority of the FSWs work within Nairobi environs. 53% of the FSWs had either been divorced or separated and was also the group that had high STI/HIV infection rates. The FSWs who had children had at least 1 child to support, with only menial jobs as a source of income to provide for themselves and dependants.

Majority of the FSW's had only attained upto primary level of education. Knowledge on how to use male condoms was 29.7%.

There were varying differences in the rates of STI s amongst the FSWs with HIV infection and those without HIV infection. Substance abuse (alcohol) came out as a significant covariable in influencing STI/HIV acquisition

use. to their knowledge and attitudes on HIV/STI, risk taking behaviours and stigma still hindering health seeking behaviours of this vulnerable group. Further studies on this most at risk population may be useful in guiding on other likely biological factors that may be influencing this variations.

1.1 INTRODUCTION:

According to the KAIS 2007 report 7.4% of Kenyan adults aged between 15 -64 years are infected with HIV. According to the survey, more than 1.4 million Kenyans are living with HIV/AIDS. In 2003, KDHS estimated a prevalence of 6.7 percent among 15-49 year olds. For the same age group, KAIS estimates that 7.8 percent are infected.

Sexually transmitted infections (STIs) are a major global cause of acute illness, infertility, long term disability and death. They are also associated with severe medical and psychological consequences for millions of men, women and infants besides facilitating HIV transmission and acquisition. ¹.

HIV and other sexually transmitted infections (STIs) may interact with each other through the effects of STIs on HIV and/or through the effects of HIV on STIs. The presence of either inflammatory or ulcerative STI's facilitates both the acquisition of HIV (STI's increase susceptibility to HIV) and/or transmission of the infection (STI's increase infectiousness of individuals with HIV). Among individuals who are co-infected with HIV and STI's, the STD's have been noted to run a severe and more protracted course. In addition, the presence of HIV-1 infection may decrease the reliability of common diagnostic tests and at times the response to conventional treatment².

STIs are usually concentrated in high frequency transmitter core groups such as female sex workers (FSWs), a group that is characterized by a high number of sexual partners, low rate of condom uptake and poor healthcare seeking behaviours. ³ The preliminary report on Nairobi's central business district sex workers enumeration, estimated the number of sex workers operating within the defined Nairobi's CBD to be about 7000 with a range from 6690 to 7118. (2009)⁴. Hence, from early 1980s, women engaged in sex work have been considered to be an important reservoir of STIs and human immunodeficiency virus (HIV) ⁵.

Compared to HIV that is a life long infection, curable bacterial STIs are biological markers that are more likely to reflect recent risky behaviour. While high STI

prevalence indicates frequent risky sexual practices, poor access or uptake of services, low STI prevalence indicates improved access to appropriate and quality care services or change in risky behaviours³. Moreover, in nearly all settings, female sex workers are a stigmatized group of people. Their very existence challenges the standard family and reproduction-oriented sexual morality found in most societies. Yet, they exist nearly everywhere, clearly indicating that they fulfil an important function to the society.

Hypocritically, most mainstream societies have relegated them to the margins, abused them, exploited them and restricted their rights as citizens. As women (in contrast to male sex workers), they are doubly powerless, increasing their risks to STI and HIV acquisition and transmission⁶.

2.1 LITERATURE REVIEW

By January 2007 AIDS had claimed more than 25 million lives since its recognition in 1981 and some 33 million people were living with HIV around the world⁷. STIs Account for a significant portion of illness worldwide, with more than 340 million new cases of curable STIs (mainly gonorrhoea, syphilis, chlamydia and trichomoniasis) Occurring globally in adults aged 15 to 49 each year^{8, 9},

The World Health Organization (WHO) estimates that approximately 340 million new cases of the four main curable STIs (gonorrhoea, chlamydial infection, syphilis, and trichomoniasis) occur every year, 75–85% of them in developing countries¹⁰.

HIV seroprevalence among female CSWs in Africa as per the international database was built by the USA Bureau of the Census,⁸ later taken over by UNAIDS^{11 12 13}. The results show high rates of infection, among CSWs, with mean around 40% and a range from 30% to 90%, with some exceptions with much lower values, such as Chad, Equatorial Guinea, Madagascar, Seychelles Islands and Senegal.

STIs impose an enormous burden of morbidity and mortality in developing countries, both directly through their impact on reproductive and child health, and indirectly through their role in facilitating the sexual transmission of HIV infection. The high prevalence of STIs has contributed to the disproportionately high HIV incidence and prevalence in Africa.

The greatest impact is on women and infants. The World Bank has estimated that STIs, excluding HIV, are the second commonest cause of healthy life years lost by women in the 15–44 age groups in Africa, responsible for some 17% of the total burden of disease¹⁴.

2.11 Sex workers (a high risk group) plight and HIV pandemic:

With the advent of the HIV pandemic, sex workers were among the first core groups in many settings to be targeted as vectors in the early waves of concerted prevention response since they were deemed dangerous to the general population. Until recently, they were perceived as the agents of infection and their clients as unwitting victims. Usually the sex trade or industry itself is left untouched.

The contrasting perspective is that the sex worker is a person whose livelihood places her in a highly vulnerable situation for acquiring and transmitting HIV. That livelihood, being illegal, is also surrounded by layers of uncontrolled and therefore abusive persons. Sex worker projects must therefore grapple with these variant perspectives, both in the society at large surrounding the sex worker and in the views and biases of the project personnel⁶.

For many people, sex work is their best or even their only opportunity to earn a living that can support their families. Those who take up the trade have various reasons that led them to engage in commercial sex and/or leaving it. These reasons may be personal, social or economical.

In Africa, some of the factors that have fuelled an increase in the numbers of those engaged in sex trade are: economic constraints or mismanagement that lead to increased unemployment, political strife that leads to increased displacement and desperate measures to survive, famine, war and more recently, sexual tourism which provides an easy income to increasingly unemployed youth.. Sex workers are also highly mobile and majority abuse substances to cope with their stressful life. These factors in addition to poor access to health care services seem to conspire increasing the vulnerability of those engaged in the sex trade.

2.1.2 Transmission dynamics- HIV/STI interaction:

As one of the key occupational hazards, sex workers are at risk of acquiring and transmitting more than 30 bacterial, viral and parasitic pathogens¹⁵. It is estimated that over 340 million new cases of curable STI's, namely those due to *Treponema pallidum* (syphilis), *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and *Trichomonas vaginalis*, occur every year throughout the world in men and women aged 15–49 years. The largest proportion of these infections have been documented in the region of south and south-east Asia, followed by sub-Saharan Africa, Latin American and the Caribbean¹⁶. Millions of viral STIs also occur annually, attributable mainly to HIV, human herpesviruses, human papillomaviruses and hepatitis B virus.

Globally, STI's constitute a huge health and economic burden, especially for developing countries where they account for 17% of economic losses caused by ill-health¹⁷. The predominant mode of transmission of HIV and other STIs in these regions is sexual. Hence, many of the interventions adopted for prevention purposes are similar across the different settings, as are the target audiences and populations.

These STIs, when present, facilitate the transmission of HIV at varying degrees. A number of studies have demonstrated both ulcerative and non-ulcerative pathogens being important core factors with relative risks ranging from 1.5 to 8.5. However, the transmission probability for HIV infection per single act in nature is probably much higher than the relative risks observed in cohort studies.

Study participants benefit from the health education and other services and are therefore not continuously affected by STIs during the follow-up period. Although the cofactor effect seems to be higher for ulcerative diseases, non-ulcerative infections could be more important in some populations because of their frequency and prevalence. Recent intervention studies have provided additional information and evidence base on STI/HIV interaction cofactor effect.

A recent community-based randomized control trial in the Mwanza District of the United Republic of Tanzania showed that strengthening STI case management of symptomatic patients, by using syndromic management provided through the existing primary health-care clinics, reduced HIV incidence by 38%¹⁸.

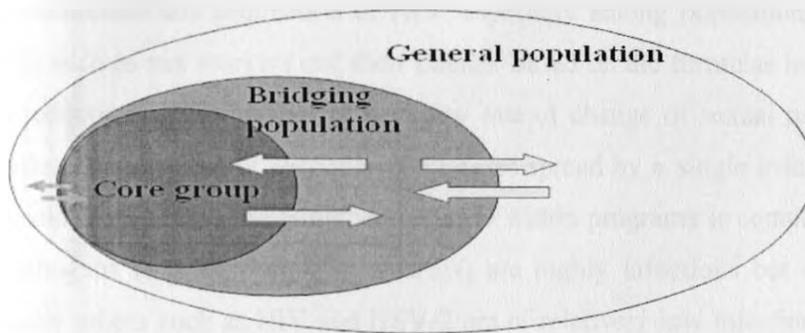
In the past 20 years, knowledge about the transmission dynamics of STI's has markedly improved. This could be a consequence of the global HIV epidemic that helped focus an integrated approach to control the other STI's. Existing evidence from mathematical modelling and clinical research activities have both shown the importance of sexual networks in determining the spread of STI's.

This improved understanding of the transmission dynamics of STI's has had good implications for the design of strategic prevention and control interventions. From these assorted studies, it's evident that within a given population the distribution of STI's is not static. The infections tend to evolve through different phases characterized by changing patterns in the distribution and transmission of the sexually transmitted pathogens, within and between subpopulations¹⁹

2.1.3 Transmission dynamics- female sex workers, STI's and bridging populations:

Generally, early in an epidemic or in any affected geographical settings, STI pathogens are likely to be transmitted within and from high-risk persons with high rates of infection and frequent sexual-partner change i.e core groups. As the epidemic progresses, the pathogens spread into the bridging populations who form an important sexual link between the core groups and members of the general population.

Figure 1: Transmission dynamics



Social or economic conditions of certain population groups can increase their vulnerabilities for acquiring and/or transmitting STIs, bringing them into this bridging category. Sexual networks vary from setting to setting but, in general, sexual partners of individuals with high rates of infection transmit to those in the bridging group who in turn, infect other sexual partners, such as their spouses or other regular sexual partners within the general population²⁰.

The situation is further complicated by the different interaction dynamics between host and pathogens which are governed by a threshold parameter, R_0 , the basic reproductive number. In all scenarios, R_0 represents the expected number of secondary cases produced by a single index case in a population of susceptible persons. This parameter is a product of three variables, represented as $R_0 = \beta \times D \times C$, where β is the transmission efficiency of the pathogen per single sexual contact (infectiousness), D is the duration of infectiousness and C is the rate of change of sexual partners²¹

Due to their high HIV infection rates and large numbers of sexual partners, sex workers have been considered an important core group in the transmission of HIV and other sexually transmitted infections. Their clients who have both commercial and non-commercial sex partners also play a major role in transmitting HIV and other infections. These "bridge" populations may be as important as the core groups in prevention programs.

Preventing and treating other STI's should therefore reduce the risk of sexual transmission and acquisition of HIV, especially among populations who are at high risk such as sex workers and their clients. Based on the formulae in above paragraph, a reduction in the number of partners/ rate of change of sexual partners (C) should reduce the number of secondary STI cases spread by a single index case in an ideal world. However, addressing parameter D within programs is complicated since some pathogens (e.g. *Haemophilus ducreyi*) are highly infectious but of short duration, while others such as HIV and HSV-2 are of relatively low infectiousness but of long duration.

Use of condoms should help address parameter β at the individual and population level by decreasing the mean efficiency of transmission of the pathogen involved. However, use of condoms 100% of the times is dependent on individual risk perceptions and easier said than done.

A major weakness of the threshold parameter R_0 is that, it does not adequately address issues of sexual mixing and concurrent partnerships. Sexual mixing patterns are also deemed crucial within populations in maintaining and spreading sexually transmitted infections (STIs) as highlighted through modelling exercises²².

Likewise, the importance of concurrent partnerships where sexual partnerships in which one or both of the members have other sexual partners while continuing sexual activity with the original partners has also been noted²³. Generally, individuals in concurrent partnerships and especially if they belong to different sexual networks, form an efficient bridge, potentially carrying STIs between groups²⁴.

Studies conducted to date seem to indicate that concurrency among partner's leads to linkages of various sexual networks thus fuelling the spread of STI's²⁵. But additional data is required from different communities and geographical regions to address this important aspect of the STI transmission dynamics. All these factors need to be taken into consideration, where possible, when planning an effective programme for the prevention and control of STIs.

STI programmes should promote accessible, acceptable and effective interventions that offer Comprehensive case management to persons with STIs to prevent further infections and their many complications and long-term sequelae. The components of such management program should include correct symptomatic/ lab diagnosis, provision of effective STI treatment, age appropriate counselling to prevent/ reduce risk taking behaviour, promotion of consistent and correct condom use as well as provision^{4, 26}

STI management that involves detection of asymptomatic infections, case finding of sexual partners of STI cases and increasing knowledge and awareness of individual risk would be preferred but too expensive. However, to achieve greater impact. STI prevention and care interventions must be evaluated for their technical elements and those found to be effective scaled up.

2.1.4 Need for continued surveillance on prevalence and determinants of STIs/HIV

The predominant mode of transmission of both HIV and other STIs is sexual intercourse. Measures for preventing sexual transmission of HIV and STIs are the same, as are the target audiences for interventions. In addition, strong evidence supports several biological mechanisms through which STIs facilitate HIV transmission by increasing both HIV infectiousness and HIV susceptibility²⁷.

Thus, detection and treatment of individuals with STIs is an important part of an HIV control strategy. If the incidence/prevalence of STIs is high in a country, then there is the possibility of high rates of sexual transmission of HIV.

An open cohort study (1985-2005) on FSWs was done by Kimani J et al on Reduced rates of HIV acquisition during unprotected sex by Kenyan female sex workers predating population declines in HIV prevalence. The study looked at how the temporal trends in HIV, adjusting for behavioral variables, may predict / casually be related to future prevalence trends in the general population. The decline in HIV incidence was seen in the enrollees who were on follow up in a prevention programme though this was sensitive to selection bias²⁸.

The study illustrated that decline in HIV incidence in this core transmitter cohort predated generalized declines in HIV prevalence by at least 10 years, suggesting that monitoring HIV incidence in high-risk cohorts may be an important means to predict future population trends. Thus indicating the need for a continued surveillance among this core transmitter group and preferably using both street based and brothel based sex workers

Monitoring trends in STIs provides valuable insight into the likelihood of the importance of sexual transmission of HIV within a country, and is part of second generation surveillance²⁶. These trends also assist in assessing the impact of behavioural interventions, such as delaying sexual debut, reducing the number of sex partners and promoting condom use.

Clinical services offering STI care are an important access point for people at high risk for both STIs and HIV. Identifying people with STIs allows for not only the benefit of treating the STI, but for prevention education, HIV testing, identifying

HIV-infected persons in need of care, and partner notification for STIs or HIV infection. Consequently, monitoring different components of STI prevention and control can also provide information on HIV prevention and control activities within a country²⁵. The association between HIV and the other STIs makes STI control an especially cost-effective intervention among social networks with high rates of partner change and in countries with high HIV and STI prevalence.

Lessons learned from the epidemiology of HIV thus far indicate that governments need to act quickly once HIV has entered a population to ensure prevention of infection among those populations most likely to contract and spread HIV²⁹

To accomplish this requires reliable information about the risk behaviours and the level of infection with HIV and other sexually transmitted infections (STI) in the general population and in these high risk “core” groups⁴

Behavioural and biological surveys in these groups provide this information and can be repeated over time in order to follow trends in the evolution of a HIV epidemic and assess where intervention is most likely to have an impact. Surveys in core groups are an important part of a population based perspective in the control of STIs and HIV²⁸

30

A similar cross-sectional study done in the red light district of India (Surat) looked at the prevalence of selected sexually transmitted infections (STI) and HIV among female sex workers (SWs). The SWs live in different ethnic clusters. Based on factors such as place of origin, language spoken, etc, participants were recruited from each of these clusters. It was difficult to prepare their list, so out of 500–600 SWs working in this area, coverage of about 200 SWs (one third) was considered a sufficient representative sample. However, because of the temporary migration of sex workers, only 124 SWs could be enrolled in this study. It further examined the performance of STI syndrome guidelines (for general population women in India) in this group against the standard aetiological diagnosis of STIs by laboratory methods.

The study revealed a high prevalence of different STIs and HIV among the FSWs in the Surat red light area despite high reported condom use with clients. Syndromic case management was noted to be missing a large number of asymptomatic cases and

providing treatment in the absence of disease. Recommendations indicated that it was necessary to explore alternative strategies for control of STIs in female sex workers³¹. Though the population of sex workers in India is different from here in Kenya, the need for surveillance of regions STI/HIV prevalence and associated determinants influencing the same stands out as an important factor in improving existing programmes for core-transmitter groups such as the female sex workers.

In countries where such data are scarce such as in Africa and east-africa at large, it is imperative to identify practical methods for measuring STI/HIV prevalence and risk behaviours in high risk groups and to institutionalise those methods within the public sector so they can be repeated.

2.1.4 Successful comprehensive programmes:

In most countries, sex workers and their clients are commonly targeted with assorted interventions and respond well to HIV prevention campaigns. These programs subsequently lead to a reduction in the number of HIV infections among the high frequency transmitter core groups, reducing the overall spread of HIV in the country. Several such programs have been successfully implemented in several settings worldwide. The activities commonly implemented involves, promoting wide scale/nationwide use of condoms amongst sex workers with their clients, health education and control of STIs. One such program was successfully implemented and documented in Thailand where the 100% condom use among sex workers initiative was established⁷.

The provision of prevention and care services, focusing on STI's, HIV and reproductive services to vulnerable populations such as sex workers, has also been successfully implemented in India through the AVAHAN initiative and Karnataka Health Promotion Trust (KHPT)⁷⁻²⁶. The AVAHAN and KHPT programs have contributed to the expansion of targeted health care services for sex workers and other core groups, along major trucking routes and temples in many inaccessible districts in India. These services have been made friendly, accessible and affordable.

A demonstrable impact by these targeted interventions has been reflected by the increased uptake of condom use by sex workers, safer sexual practices and reduction in STI rates among these core groups.

From these few large scale programmes and anecdotal evidence from assorted projects involving sex workers around the globe, it is obvious that a lot can be done to address the underlying vulnerabilities. Safeguarding their human rights and provision of accessible and friendly health care services that minimises risks, assisting those who want to leave the trade (through suitable income generating option/s) are some of the viable options at hand.

The ultimate challenge for governments is however to make access to comprehensive HIV prevention and care available to this highly vulnerable core group a reality by implementing policy and legal frameworks that do not discriminate against sex workers.

Despite the prevailing harsh economic conditions, governments should strive to set up programmes that help empower young women and men that provide them with better options than sex work.⁷

2.1.5 Importance of continuous surveillance of STIs/HIV among core transmitter groups:

Data on global prevalence of STIs are limited because STI surveillance has been largely neglected and funding for surveillance remains inadequate; overall, STI prevalence rates continue to rise in most countries, including developed countries.²⁰

The predominant mode of transmission of both HIV and other STIs is sexual intercourse. Measures for preventing sexual transmission of HIV and STIs are the same, as are the target audiences for interventions.

In addition, strong evidence supports several biological mechanisms through which STIs facilitate HIV transmission by increasing both HIV infectiousness and HIV susceptibility.²⁶

Thus, detection and treatment of individuals with STIs is an important part of an HIV control strategy. If the incidence/prevalence of STIs is high in a country, then there is the possibility of high rates of sexual transmission of HIV.

Monitoring trends in STIs provides valuable insight into the likelihood of the importance of sexual transmission of HIV within a country, and is part of second generation surveillance.²⁶

An open cohort study done by Kimani, J et al of FSWs followed from 1985-2005 looked at temporal trends in HIV prevalence. A Cox proportional hazards model with time-dependent covariables was used to estimate infection risk as a function of calendar time. HIV prevalence in new FSW enrollees peaked at 81% in 1986, and was consistently below 50% after 1997. One of the implications of the results indicated that the decline in HIV incidence in this core transmitter cohort predated generalized declines in HIV prevalence by at least 10 years, suggesting that monitoring HIV incidence in high-risk cohorts may be an important means to predict future population trends²⁷

These trends also assist in assessing the impact of behavioural interventions, such as delaying sexual debut, reducing the number of sex partners and promoting condom use.

Clinical services offering STI care are an important access point for people at high risk for both STIs and HIV. Identifying people with STIs allows for not only the benefit of treating the STI, but for prevention education, HIV testing, identifying HIV-infected persons in need of care, and partner notification for STIs or HIV infection. Consequently, monitoring different components of STI prevention and control can also provide information on HIV prevention and control activities within a country ²⁶

The economic burden of HIV is enormous. STI control can help lessen this burden and reduce HIV transmission. The association between HIV and the other STIs makes STI control an especially cost-effective intervention among social networks with high rates of partner change and in countries with high HIV and STI prevalence.

Lessons learned from the epidemiology of HIV thus far indicate that governments need to act quickly once HIV has entered a population to ensure prevention of infection among those populations most likely to contract and spread HIV. ²⁵

To accomplish this requires reliable information about the risk behaviours and the level of infection with HIV and other sexually transmitted infections (STI) in the general population and in this high risk “core” groups. ⁴

Behavioural and biological surveys in these groups provide this information and can be repeated over time in order to follow trends in the evolution of a HIV epidemic and assess where intervention is most likely to have an impact. Surveys in core groups are an important part of a population based perspective in the control of STIs and HIV ²⁸.
²⁹

In countries where such data are scarce it is imperative to identify practical methods for measuring STI/HIV prevalence and risk behaviours in high risk groups and to institutionalise those methods within the public sector so they can be repeated.

2.1.6 Knowing your epidemic – Kenya:

In Kenya, STI/HIV prevention campaigns targeting sex workers were strengthened during the 1990s, focusing attention mainly on STI control, condom promotion and peer support. This resulted in a reduction in HIV incidence amongst sex workers especially in Nairobi from 25-50% to 4% by the end of the decade ³²

However, the most recent Kenya AIDS Indicator Survey (KAIS) 2007 implicated female sex workers and their clients as groups with significant contributions to incident infections to date. Sex workers and their clients create a continuous bridging population with the rest of the community in most settings and Kenya is no different ²⁵.

The KAIS 2007 report postulates that in 2006, 16% and 14.7% of 10,155 new cases of HIV in Nairobi were linked to sex workers and their clients respectively. To address this emerging information, the authors recommended a change in ongoing HIV programming by strengthening and expanding STI diagnosis and treatment programmes targeting specific core groups in the country. Scaling up focused prevention services targeting sex workers is easily justifiable anywhere given the synergistic interactions between STI's and HIV and the effectiveness of existing prevention strategies.

The Sex Workers Outreach Program (SWOP) clinic in Nairobi is one of the newer facilities opened in 2008 with a goal of providing a comprehensive package of STI/HIV prevention and treatment services to sex workers. This stand alone site targets both male and females engaged in sex work within Nairobi and environs and provides them with free services. The aim of the program is to:

- provide accessible, friendly, affordable STI/HIV services to SW
- promote STI/HIV screening, condom use and safer sexual behavior practices
- Offer a minimum HIV prevention, care and treatment package for those engaged in sex work.
- provide a platform for sex workers to exchange ideas
- create a model clinic cum drop-in centre for SW

Data on demographics, number of clients, sex work, risk factors, condom use etc is also collected routinely using standardized questionnaires. Results from blood and other biological samples are also availed to the clinical team on a timely basis to aid patient counselling and management.

To better guide future HIV and STI specific prevention strategies in Nairobi, and Kenya at large and as an initiating step in filling in the gap on surveillance data on this core transmitter group, a cross-sectional study was conducted among FSW's.

This was to estimate the seroprevalence of HIV and other STI's, as well and associated key drivers of STI acquisition among sex workers currently enrolled at the SWOP clinic. We utilised the vast database available.

2.2 JUSTIFICATION:

The need for regional continuous surveillance of prevalence and determinants of STI's comes out as a key factor in understanding and thus, managing the evolving HIV pandemic. This is especially so among core groups, in this case FSW's. The regional studies in Africa and East-Africa including Kenya are limited on this area.

The findings from this study will aid in providing a basic outlook of the prevalence of STIs/HIV and the determinants, among a section of FSWs.

This is in an effort to stimulate/contribute to further similar studies in different similar groups across the region so as to improve continued surveillance and thus timely and effective prevention measures among these core transmitter group given the regional varying dynamics of HIV/STI transmission.

2.3 RESEARCH QUESTION:

What is the prevalence of common STIs/HIV and the determinants, among female sex workers enrolled within the past 12 months at the SWOP clinic?

2.4 GENERAL OBJECTIVE:

To evaluate the prevalence and risk factors for classical STDS including HIV infection among female sex workers accessing STI/HIV health care information and services at the SWOP clinic.

3.1 MATERIAL AND METHODS:

3.1.1 Study site:

This study analyzed data collected at the SWOP clinic located in the Central Business District, Nairobi. This facility is currently managed by University of Nairobi, University of Manitoba and City Council of Nairobi in collaboration with the National AIDS and STDs Control Program (NAS COP), Ministry of Public Health and Sanitation.

The clinic is located in strategic area with many bars and lodgings in downtown Nairobi and occupies the fourth floor of a busy building that assures privacy to users. When a sex workers walks into the building the staircase leads to many busy commercial outlets that provides a decoy for those keen on privacy.

The facility is also close to key bus stops improving access since most sex workers use public transport. All the activities and services provided at the site are currently funded through a grant from the Centres for Disease Control and Prevention - President's Emergency Plan for AIDS Relief (CDC- PEPFAR).

2.4.1 SPECIFIC OBJECTIVES:

1. To evaluate the prevalence of HIV, gonorrhoea, Chlamydia trachomatis, Treponema pallidum(syphilis), bacterial vaginosis, and trichomonas vaginalis among female sex workers enrolled at SWOP clinic.
2. To assess the rates of risk factors for each STI and HIV controlling for any known confounding factors.

3.1.2 Study population:

Street based female sex workers in the Nairobi environs, enrolled at the SWOP clinic, who had complete demographic, behavioural and laboratory results.

3.1.3 Participant Inclusion and Exclusion Criteria;

Inclusion Criteria	Exclusion Criteria
1..Female Sex workers at first Enrollment with complete sociodemographic and laboratory data	Female Sex workers who were recruited but did not agree to have screening for HIV/STIs
2.Female Sex workers at first Enrollment from 1st Sept. 2008 to 31st August 2009	Female Sex Workers who had incomplete sociodemographic and laboratory datas

3.1.4 Sample size estimation:

Sample size estimation was not carried out and instead the whole data base of 3011 FSWs on follow up, with complete socio demographic and laboratory data from September 1st 2008 to August 31st 2009 was utilized.

3.1.5 Study design:

This was a cross-sectional descriptive study which was used to establish the prevalence of specific STI's and HIV at enrolment over 12 months duration, among female sex workers accessing care at the SWOP clinic. Important correlates that may be associated with the detected infections were then analysed. Data was obtained from an already existing data base.

3.1.6 Cross sectional descriptive study

Cross sectional surveys are a mode of descriptive studies. The surveys assess the status of an individual with respect to the presence or absence of both exposure and disease at the same point in time. It provides a snapshot of the experience of a population at a specified time.

3.1.7 Eligibility criteria

The project utilized data from the ongoing SWOP clinic data base. Female sex workers enrolled at the SWOP clinic in Nairobi, who have complete demographic, behavioural and laboratory results. Female sex workers enrolled at the SWOP clinic during the period of 1st September 2008 to 31st August 2009 were utilized for the study.

3.1.8 Patient recruitment and data collection:

The recruitment of female sex workers is conducted in three ways: through the Peer leaders/educators, mobilizers, and confidential referrals using the snow ball method. Peer leaders/educators are female sex workers who are already enrolled in the clinic and who have shown leadership qualities. They undergo training on how to be effective peer leaders and are provided with basic mobilizations skills. They are then able to organize meetings with female sex workers in the field where the program mobilizer can come and meet them. During this field visits, the mobilizer provides information about the clinic, gives health education talks on STI/HIV creating a demand for the services. Referral cards are then distributed to those keen on accessing the services by enrolling at the clinic. Trained peer leaders/educators can also give basic information to other sex workers on their own and refer those interested to join the program to the clinic.

The mobilizers are social workers working at the clinic. They are in-charge of organizing meetings with bar/ restaurant owners within the premises to facilitate health education and recruitment of sex workers reached to come to the clinic. Snow balling is the other method used. It involves the female sex workers who have already been recruited in the clinic, spreading the information to other sex workers in the field, work places and referral of those interested to the clinic.

During the enrolment interview at the clinic, a screening tool is utilized to verify potential client's sex work status and to collect standard bio data and demographic details.

A comprehensive health education session on STI/HIV prevention and care is provided to all those who visit the clinic for enrolment irrespective of whether they qualify to join the clinic or not. The counsellor then offers Provider Initiated Testing and Counselling (PITC) and screening conducted among those who agree, with on the spot results made available. Standard pre/post test counselling is offered and HIV screening done using recommended rapid tests as per the national MOH guidelines. At the SWOP clinic all rapid HIV tests are confirmed by ELISA on the samples collected for RPR tests.

After the HIV post test counselling session is over all these patients are offered free screening for STD's through a pelvic and speculum examination. All those with suspicious vaginal discharges, cervicitis, urethritis and genital ulcers are offered syndromic management. Those screened for STDs/HIV are then requested to come for results and a review a week later. Sex workers who test HIV positive are always encouraged to enrol with the onsite ART/Care program and samples collected for free CD4+ cell counts, basic monitoring tests. The clinical team also endeavours to provide Septrin prophylaxis to all HIV infected as per the national MOH guidelines

Screening for STI's (gonorrhoea, Chlamydia, Trichomonas vaginalis, syphilis and bacterial vaginosis) involves collection of samples in the appropriate transport media or inoculated onto the culture plates/media at the clinic. Venous blood samples are also collected in the appropriate tubes and urine collected for GC/CT Polymerase Chain Reaction (PCR). Blood is screened for Syphilis using RPR and all positives samples subject to TPFA, Those with Bacterial Vaginosis is determined through slide microscopy using a standardized scoring system while Inpouch media is used to detect those with Trichomonas vaginalis. Sex workers with STD's are also advised to inform their regular partners to come in for free treatment. All sex workers are then requested to come for regular follow up every 3 months although unscheduled visits are encouraged for any suspicious lesions, discharges and condom bursts.

3.1.9 Variable description

Below are the variables that were used as covariates in the univariate and multivariate analysis:

- Age of females sex workers (Independent variables)
- Duration of sex work (Independent variables) (confounder)
- Age of onset of commercial sex work. (Independent variables)
- Education level, (Independent variables)
- Source of income(Independent variables)
- Number of regular/ casual partner, (Independent variables)
- Douching (Independent variables)
- Sexual risk behaviours. (Independent variables)
- STI/HIV prevalence rates of gonorrhoea, syphilis, Chlamydia, bacterial vaginosis and trichomonas vaginalis.(Dependent Variables)

3.1.10 Definitions:

In this study the definitions of the following terms are as follows:

- Concurrent partners: Having two or more sexual relationships with partners at the same time.
- Multiple partners: Having two or more partners but at different times.
- Risk taking sexual behaviour is defined as involvement in unprotected vaginal, anal or oral sex.
- Sexually transmitted Infections refer to both ulcerative and non-ulcerative types. The specific ones of interest on follow up in this study includes gonorrhoea, Chlamydia, trichomonas vaginalis, Syphilis and bacterial vaginosis.

3.1.11 Data analysis:

The data analysed has received approval for secondary data collection and analysis by the Kenyatta National Hospital ethics committee (Ref number P258/09/2008 of 27th February 2009).

Data on demographics, past medical history, risk taking behaviours, condom use etc from the clinical database was merged with lab database using the enrolment numbers as identifiers.

The data was then cleaned for errors and inconsistent (conflicting) answers, missing entries and duplicate entries to ensure high quality data.

3.1.12 Descriptive statistics:

Conventional descriptive statistics was then used to assess the characteristics of study participants and summary statistics presented in tables and graphically.

3.1.13 Univariate analysis:

Univariate associations of baseline characteristics of each variable collected on the STI's and other socio demographic variables was then made using Pearson Chi-square test or Fisher-exact method for categorical or ordinal variables.

Continuous variables were compared using Student's *t* -test or the Mann-Whitney test for non-parametric data. Covariates were considered if they were associated with the baseline STI's and other socio demographic variables in the literature.

3.1.14 Multivariate analysis:

Variables with *P* -values less than 0.2 were then considered for inclusion in multinomial logistic regression models with tests of significance being two-tailed ($P < 0.05$).

Adjusted odds ratio (OR) and 95 percent confidence interval (CI) was calculated. Data was analyzed using Stata 9.0 (Stata Corporation, College Station, TX, USA)

As a measure of relative risk for HIV, odds ratios (ORs) and their 95 percent confidence intervals (CIs) computed from a logistic regression model was presented in a table. For all the analyses, two-sided tests will be used together with the 5percent level of significance with **p**-values of <0.05 being considered to be significant as stated above.

RESULTS

4.1 DESCRIPTIVE STATISTICS:

4.1.1 Characteristics of study participants:

To obtain an insight into the characteristics of the population of Female Sex Workers analysed summaries were done of the socio demographic and put into tables. This is as shown in the table.

Most of the female sex workers reside in various Nairobi city estates with a few coming from neighbouring towns bordering the city such as Narok, Muranga, Mlolongo, Limuru, Kiambu, and Thika. One or two came from other cities namely Mombasa and Kisumu. The larger percent coming from Nairobi reside in Dandora (13.9percent), Huruma (12.8percent) and Eastleigh (9.7percent) estates. These are mostly the low socioeconomic urban dwellings within the Nairobi city.

A closer look at where most of the FSW's come from shows that majority were born or originally from rural areas or districts outside Nairobi, an indicator of likely long term impact of rural to urban migration.

The minimum age of the female sex workers (FSW) was seen as 16 and a maximum age of 70years with the most frequent age being 25 years. The mean age being 32 years. Most sex workers are within the age groups of 21-30 and 31-40 depicting most reproductive age group

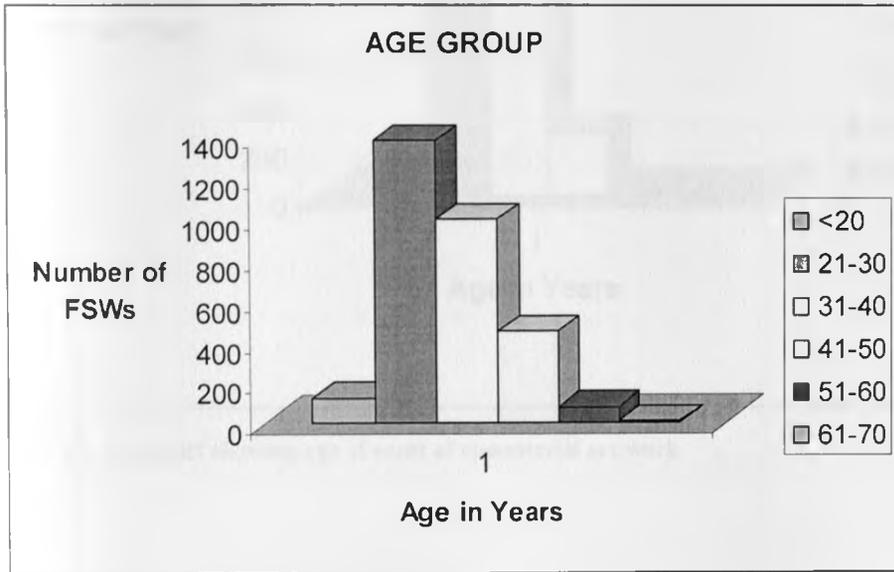


Figure 2: Bar chart showing age group of the FSW s

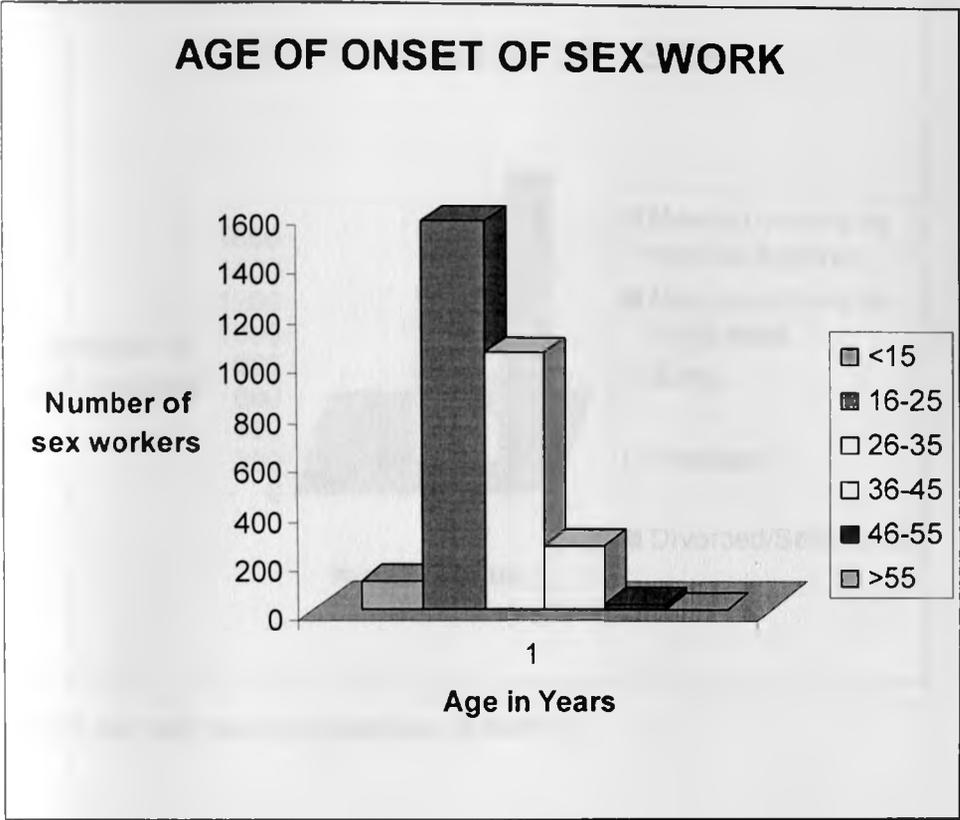


Figure 3: Bar chart showing age of onset of commercial sex work

Most of the sex workers are divorced/separated (53percent) or Single (35.6percent). However the percentage that is married whether living together or apart, totals to 1percent.

MARITAL STATUS OF FSWs

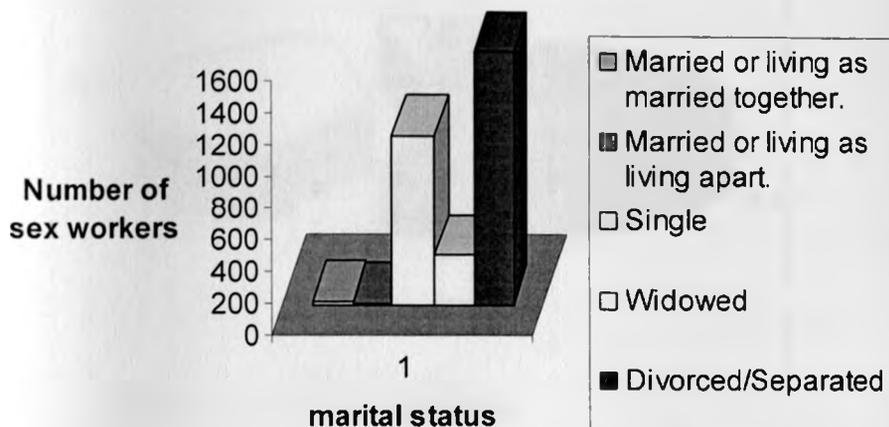


Figure 4: Bar chart showing marital status of the FSWs

54.5percent have achieved a primary level of education with only 3percent having not attended any form of higher level education. 35.7percent have a secondary education. This poses a challenge when it comes to the market of employment with many being secondary school leavers.

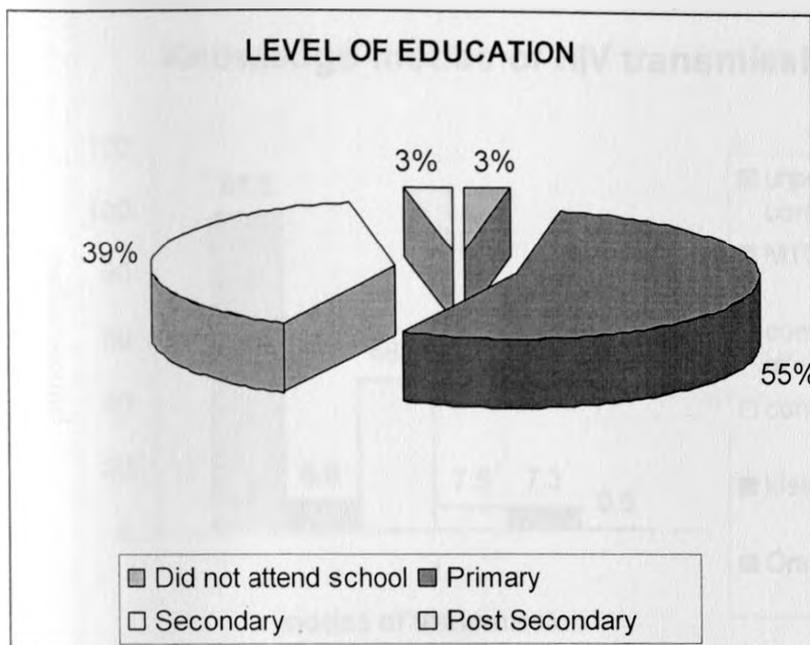


Figure 5: Pie chart showing level of education

With the rising unemployment there is thus seeking of income sources from other alternatives. Looking at the cohort in interest, majority of them are doing other menial jobs as sources of income. 81.9percent were seen to have 'other' sources of income namely bar attendants, waitresses, but 75.8percent out of this 81.9percent had no source of income. Thus not surprisingly, the age of onset into sex work for this cohort, begins between 16-25 years of age (52.2percent) and 26-35 years of age (34.6percent).

4.1.2 Knowledge and attitudes:

98.9percent of the FSW's knew that HIV transmission occurred through unprotected sexual contact. Only 8.8percent knew that HIV can be transmitted via mother to child; and only 7.5 percent with knowledge that condom burst was a way HIV can be transmitted. This is as illustrated below:

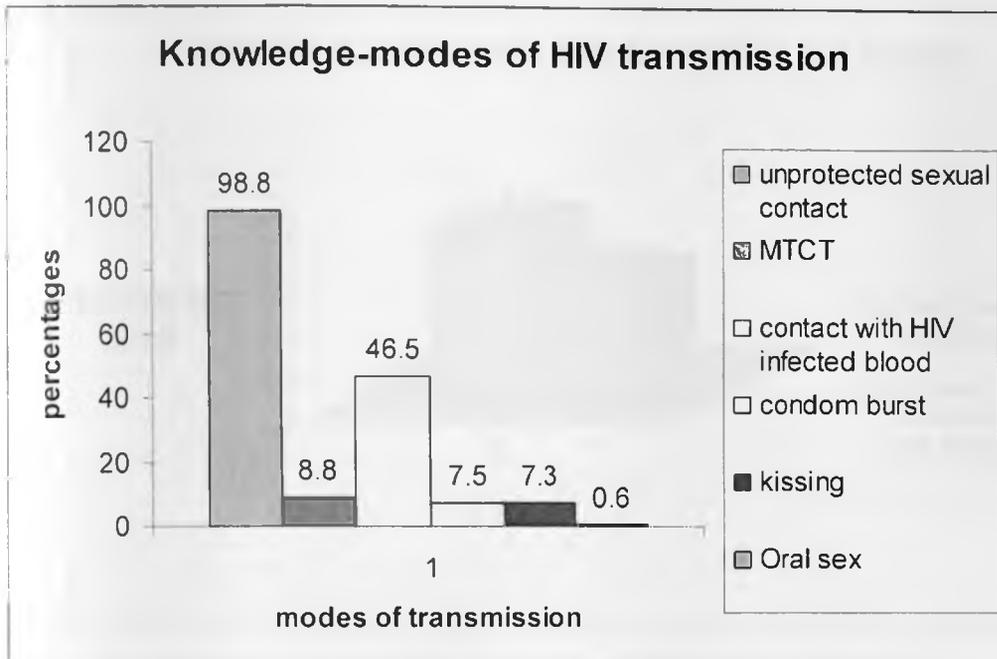


Figure 6: Bar chart showing knowledge of sex workers on modes of HIV transmission

When it came to knowledge on how HIV can be prevented, majority of the FSW's (48.2 percent) believe in condom use. Avoidance of sex with multiple partners, limiting number of partners and remaining faithful to partner/asking partners to be faithful, were not commonly cited as a way of HIV prevention. Percentages who cited these methods as ways of HIV prevention were 0.4percent, 2percent and 9.6percent respectively.

Knowledge on use of male condoms was poor with only 29.7percent correctly demonstrating how to use the male condom on a dummy after being shown by a health educator in the clinic. This is illustrated in the graph below:

MALE CONDOM DEMONSTRATION

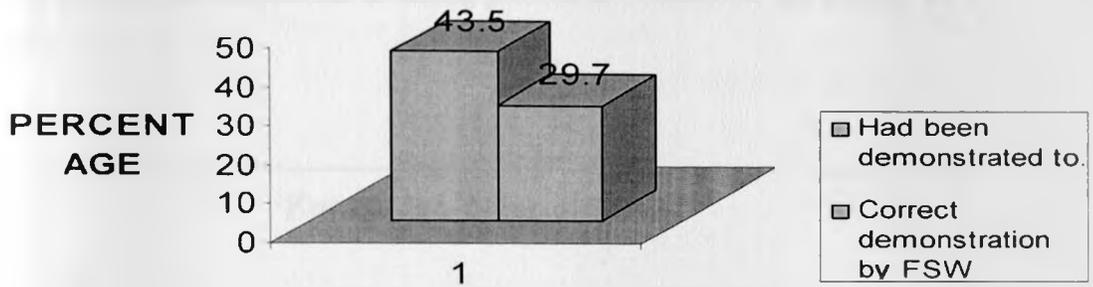


Figure 7: Bar chart showing knowledge on correct demonstration of male condom use

Knowledge-Modes of HIV prevention

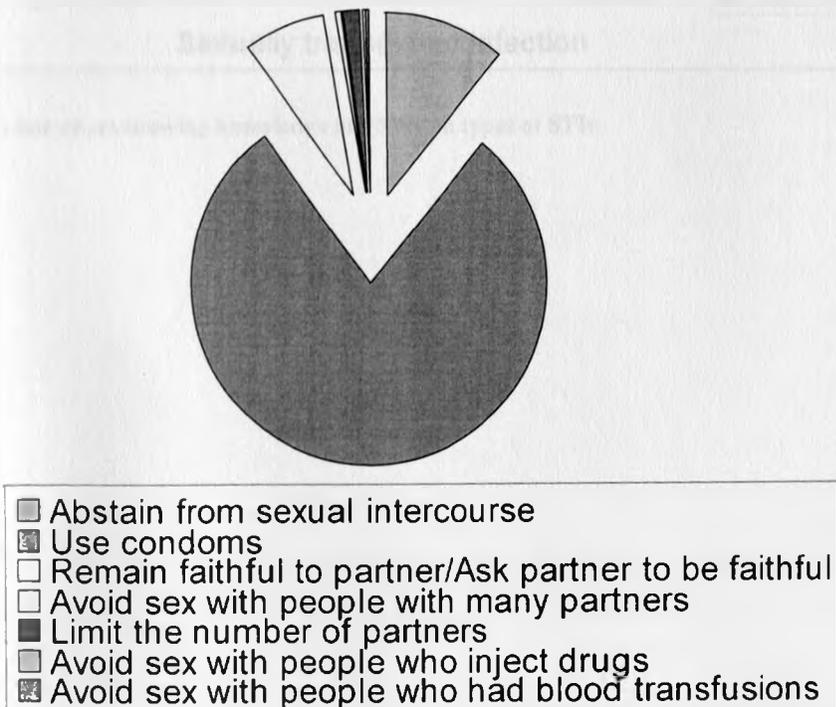


Figure 8: Pie chart showing knowledge of FSWs on modes of HIV prevention

Looking at barriers to seeking VCT services, majority cited peer/friends disapproval (50.9percent), Unsupportive family/community (48.6percent), and lack of confidentiality (57percent), as reasons for not seeking these services. Another large percentage (83percent) cited fear of testing positive as a reason for not seeking VCT services.

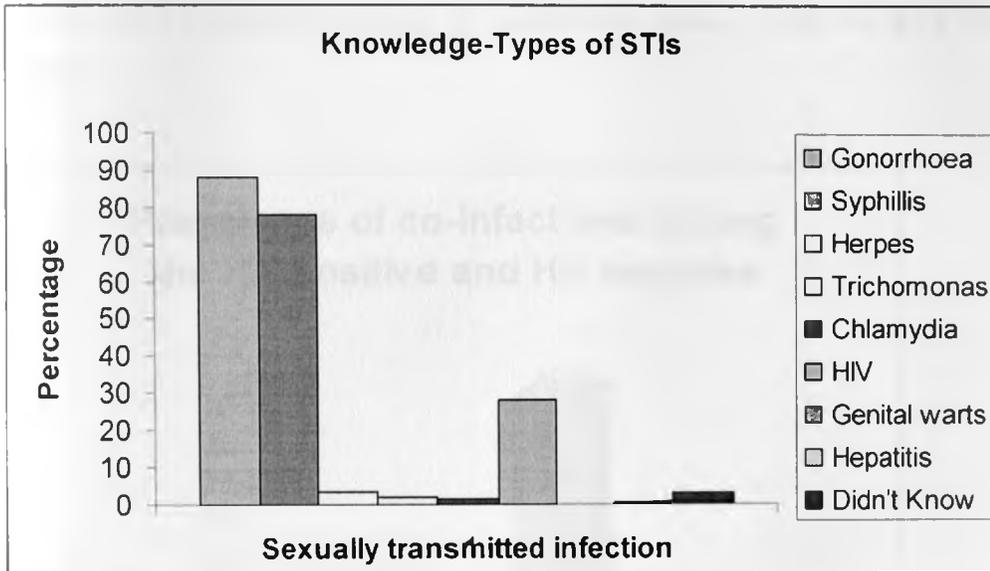


Figure 9: Bar chart showing knowledge of FSWs on types of STIs

4.1.3 Seroprevalence of HIV and STI:

The total population of FSWs was 3012. The prevalence of FSWs who were HIV positive was 32.9% and HIV negative was 67.1%. Prevalence of co-infections indicated 19.6 percent prevalence of co-infections among those who were HIV positive and 7.4 percent prevalence of co-infections among those who were HIV negative

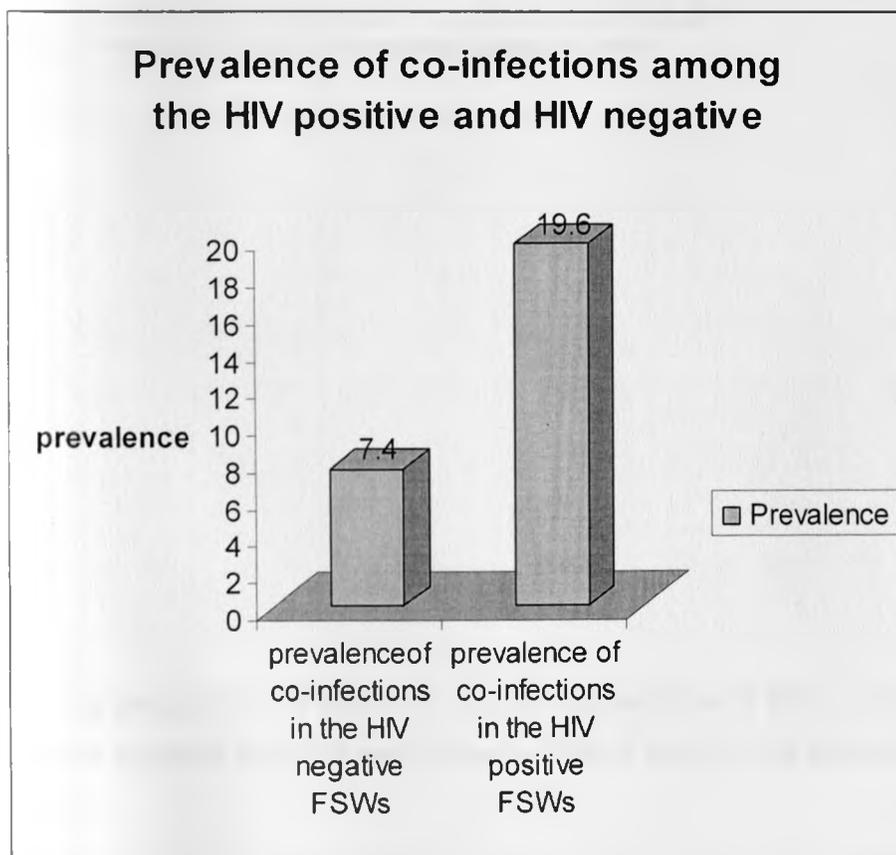


Figure 10: Prevalences of co-infections among the HIV positive and HIV negative sex workers

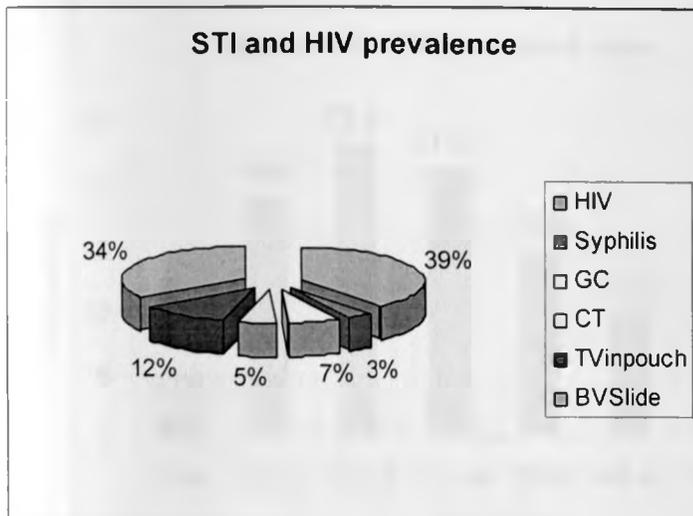


Figure 11: Pie chart showing STI prevalence among the FSWs

The age group of 21-30 and 31-40 had the highest rates of STI's with HIV and bacterial vaginosis being the most common. This is shown in the grouped bar chart below.

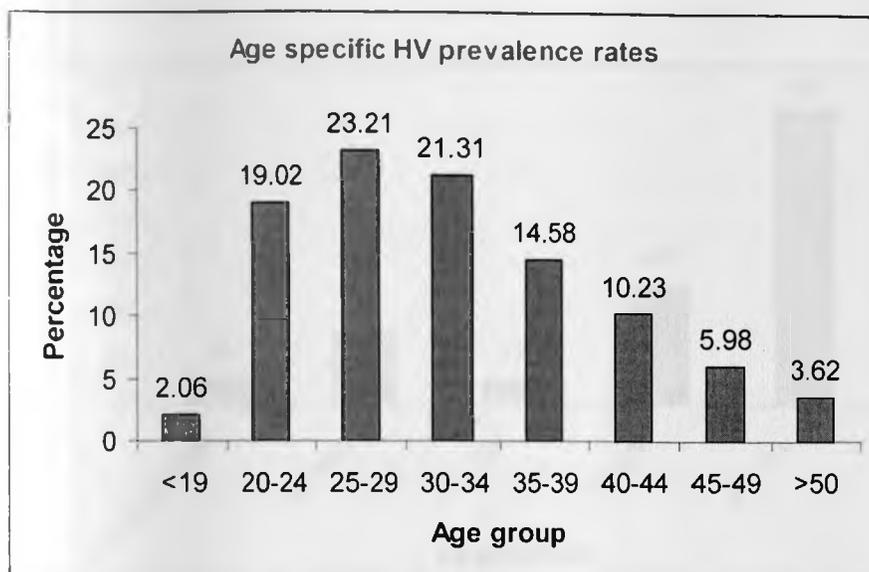


Figure 12: Bar graphs showing the age specific prevalence of HIV

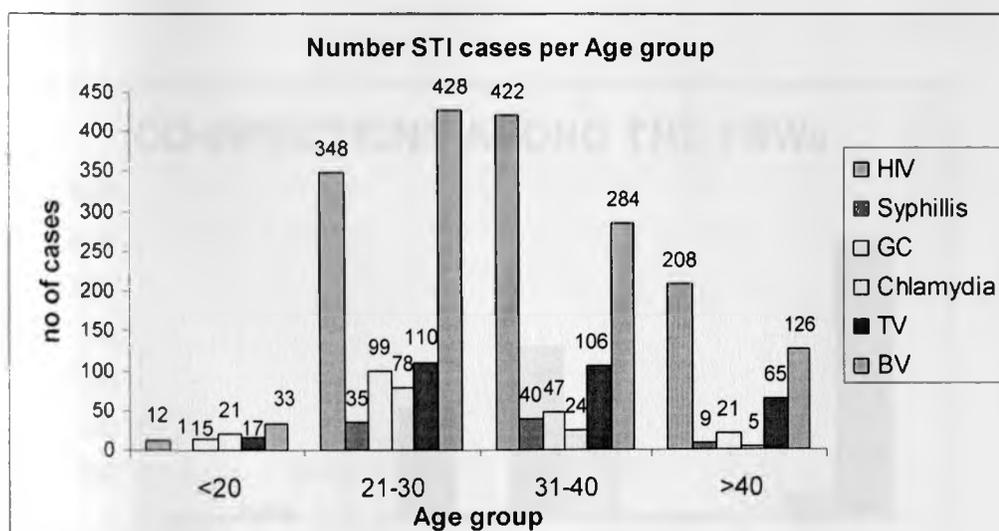


Figure 13: Grouped bar graphs showing the STI cases per age group

Looking at the co-infections, Bacterial vaginosis and HIV co- infection was the most common followed by Trichomonas vaginalis and HIV co-infection. No had all the 6 infections at one time. One patient had HIV+Chlamydia+Syphilis at the same time. 121 patients had both Trichomonas vaginalis and Bacterial vaginosis, and 74 patients had both Bacterial vaginosis and Gonorrhoea. The charts below show these variations:

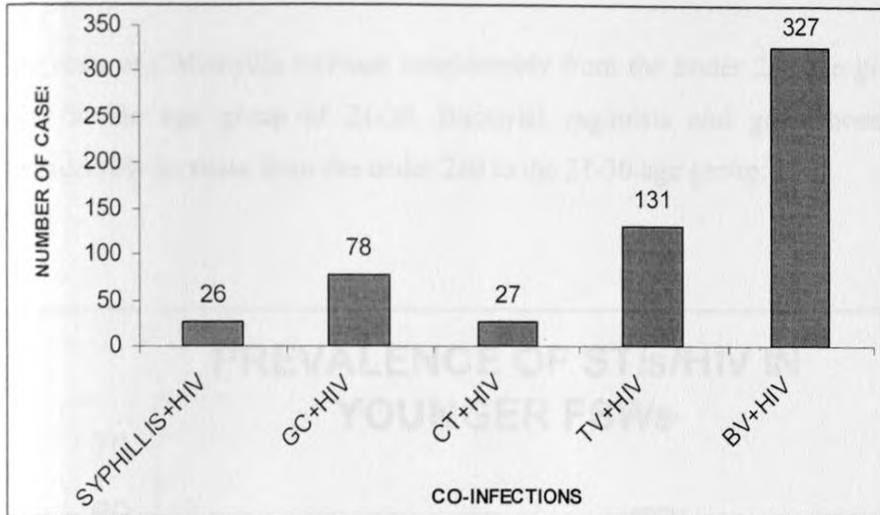


Figure 14: Bar graph showing co-infection of HIV and other STIs

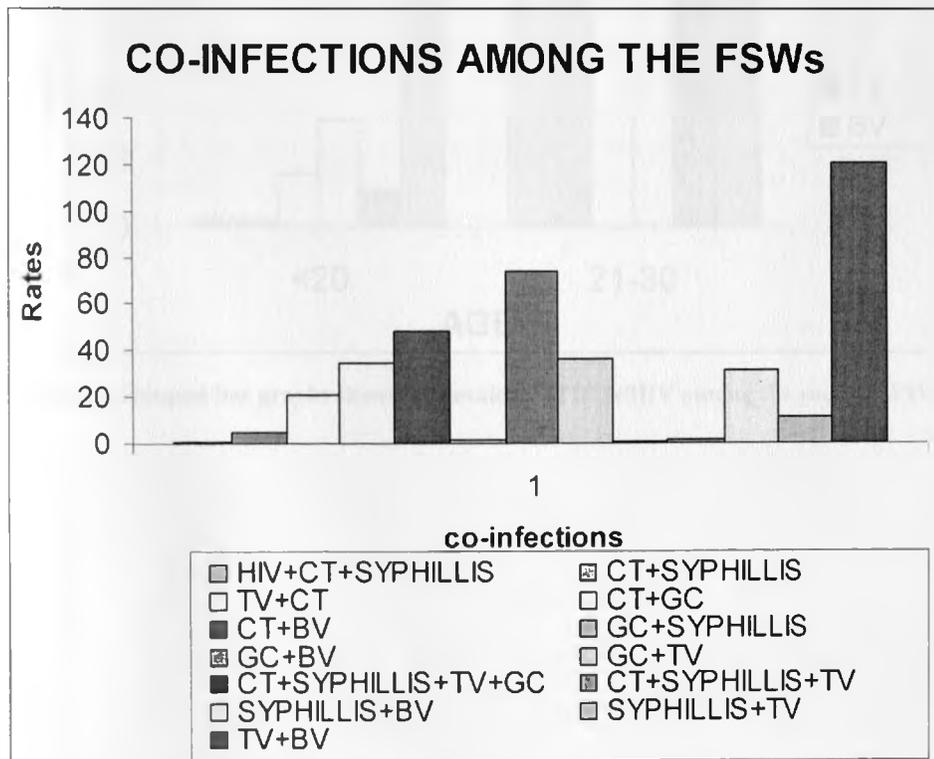


Figure 15: Bar graphs showing co-infections among the sex workers

The rates of Chlamydia increase considerably from the under 20s age group to high rates in the age group of 21-30. Bacterial vaginosis and gonorrhoea rates also considerably increase from the under 20s to the 21-30 age group.

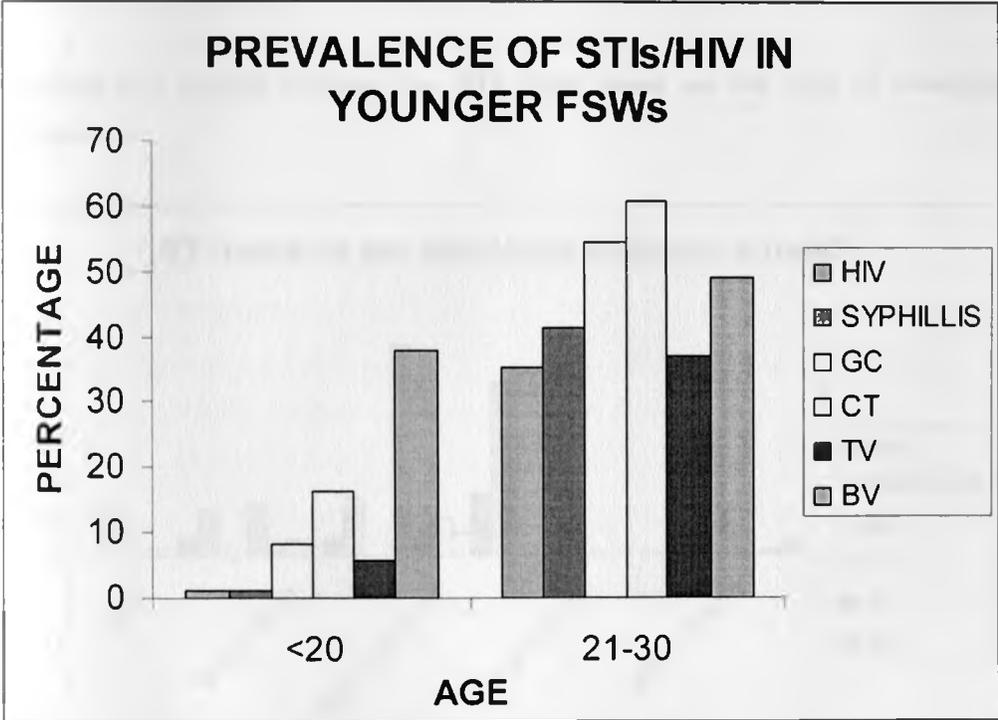


Figure 16: Grouped bar graphs showing prevalence of STIs/HIV among the younger FSWs

Those female sex workers who douched with water and soap or water and a cloth seemed to have a high rate of gonorrhoea, syphilis and HIV though this may be because most of the FSW's use these substances to douche. The graphs below depict this aspect.

Grouped bar graphs showing the STI cases based on the type of douching substance:

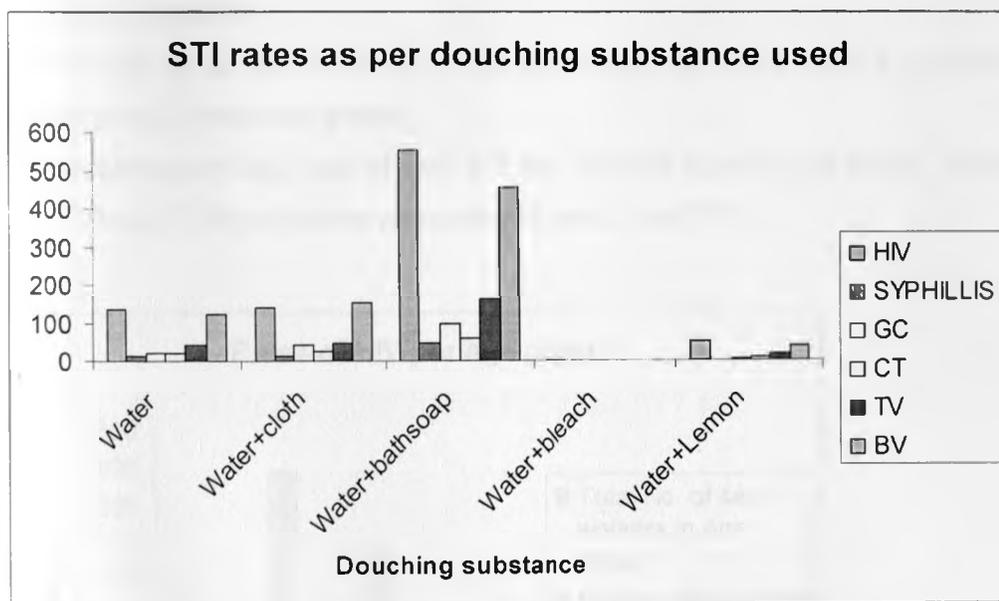


Figure 17: STI rates as per douching substance used

4.1.4 Risk factors:

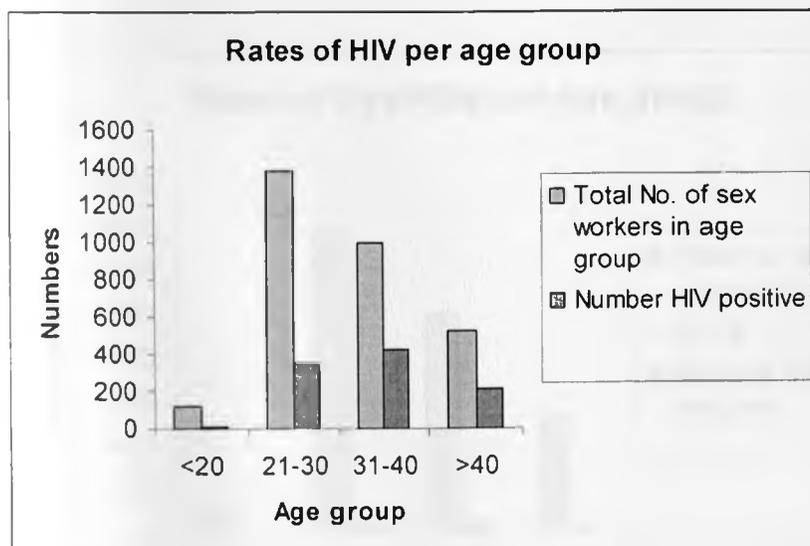
37.7% of the FSW's had a known HIV positive sexual partner within the last 6 months and 21.5% of these had at least 1 of such partners. Out of these only 18.2% used a condom always with partners who were known to be HIV positive.

For those who were sexually active 82.7% had at least 20 casual clients per week, of which 94% practised vaginal sex, with 62.9% using condoms with these clients.

Whereas with regular clients, 51.5% had at least 1 regular client with 64.5% practicing vaginal sex but condom usage with these clients was only 13.6% when practicing vaginal sex.

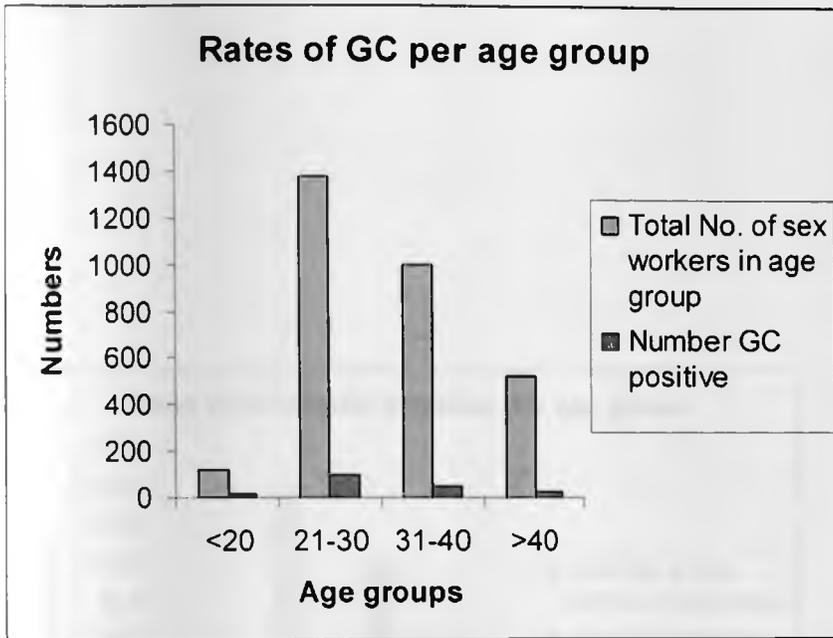
Between the age groups 21-30 and 31-40, gonorrhoea and syphilis had a significant predominance in these age groups.

The prevalence per age group of each STI was analysed showing that the age groups of 21-30 and 31-40 had highest prevalence of each of the STI's.



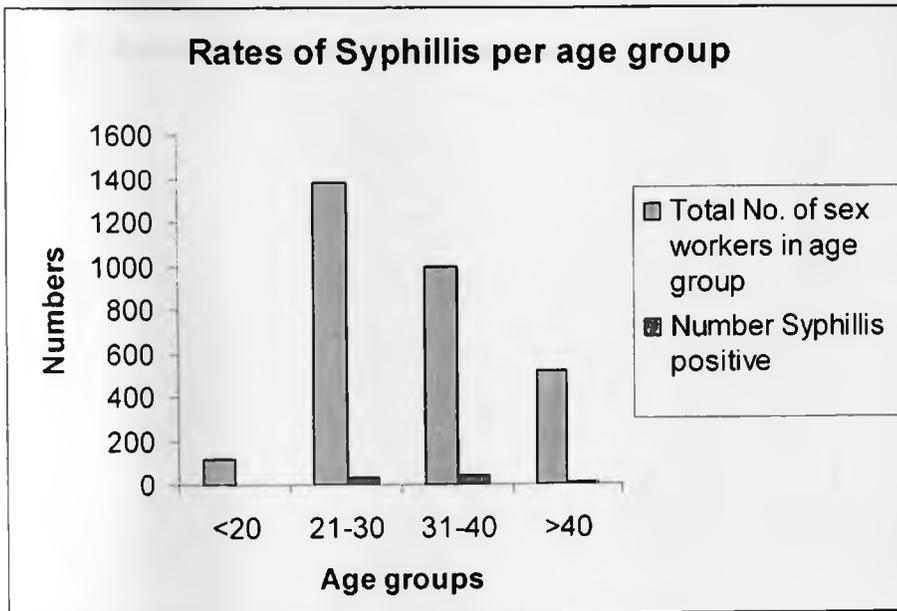
P-value <0.001

Figure 18: Rates of HIV per age group



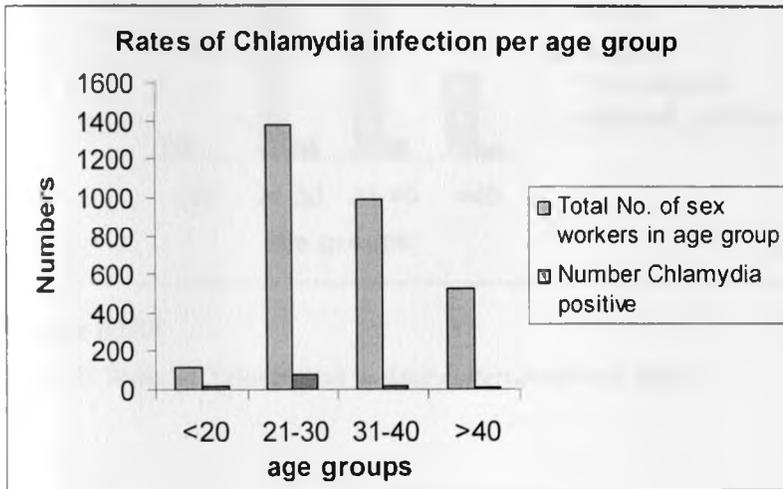
P-value <0.001

Figure 19: Rates of Gonorrhoea per age group



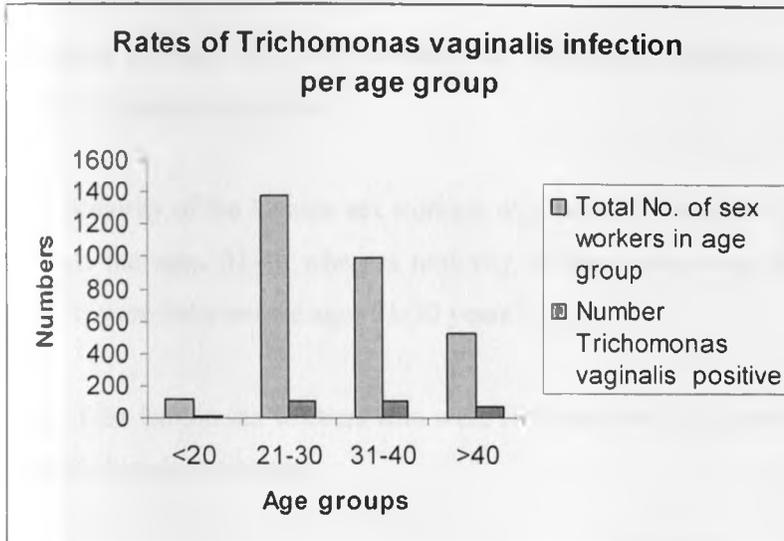
P-value 0.046

Figure 20: Rates of Syphilis per age group



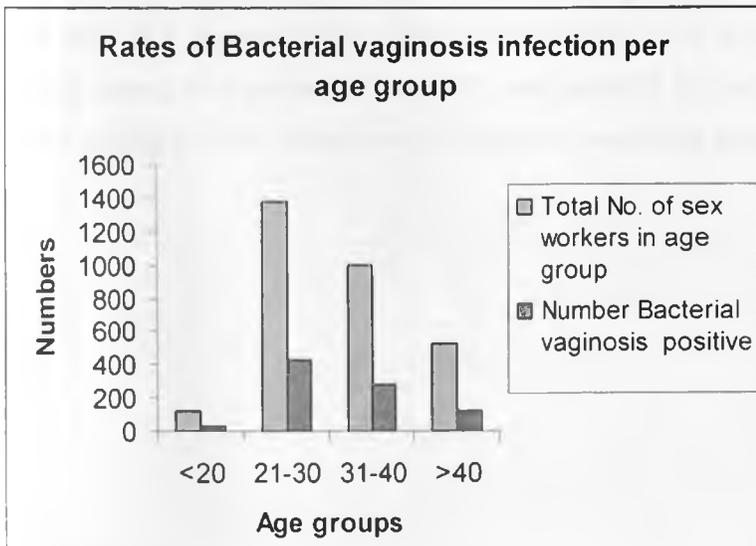
P-value <0.001

Figure 21: Rates of chlamydia infection per age group



P-value 0.015

Figure 22: Rates of Trichomonas vaginalis infection per age group



P-value 0.045

Figure 23: Rates of Bacterial vaginosis infection per age group

4.2 Univariate analysis:

4.2.1 Cross-tabulation / Chi square:

Univariate analysis was done to determine significant variables for further analysis and the following was found:

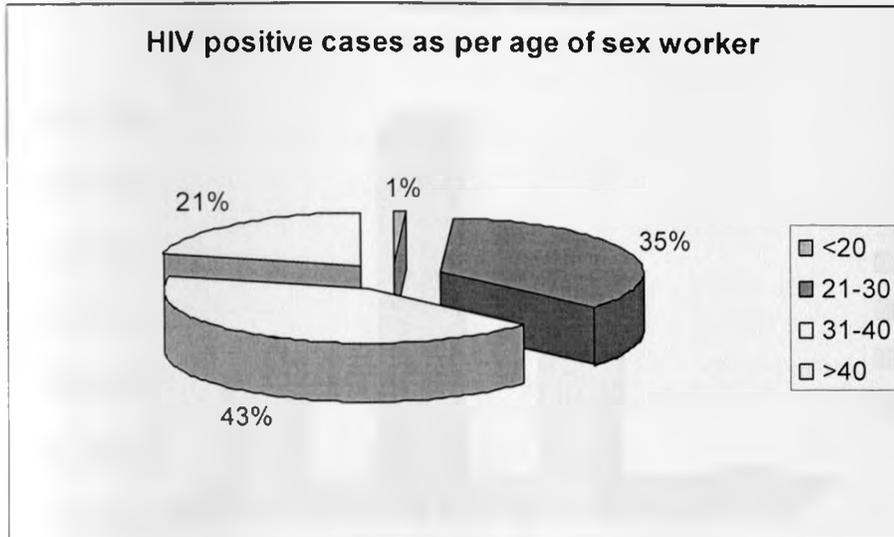
HIV: Majority of the Female sex workers who were HIV positive (42.6 percent), were between the ages 31-40 whereas majority of those who were HIV negative (50.9 percent) were between the ages 21-30 years of age.

Most of the female sex workers who were HIV positive (76.4 percent) had been in sex work for less than 10 years.

Majority of the sex workers who were HIV positive had started sex work between the age's 21-30years (55.8 percent). 64.2% of the women who were HIV positive reported that they used condoms with their regular partners more than 50 percent of the time.

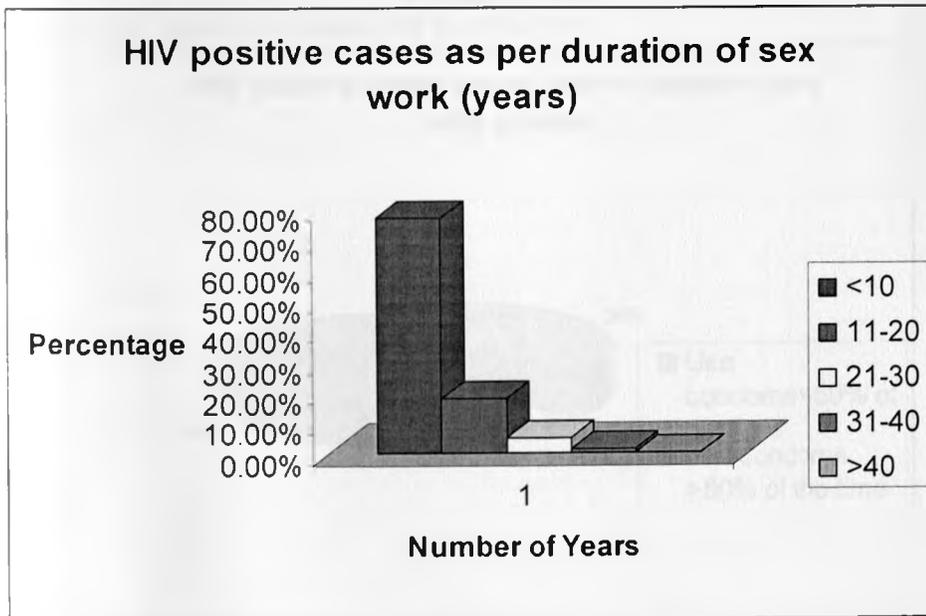
Most of the women who were HIV positive (53.8 percent) were actually divorced/ separated. 58.8 percent of the FSW's who had HIV had an education level upto primary school. 90.9 percent of the FSW's who had HIV did not use female condoms. 70.981 percent of FSW's who were HIV positive were using alcohol (P-value 0.003).

HIV



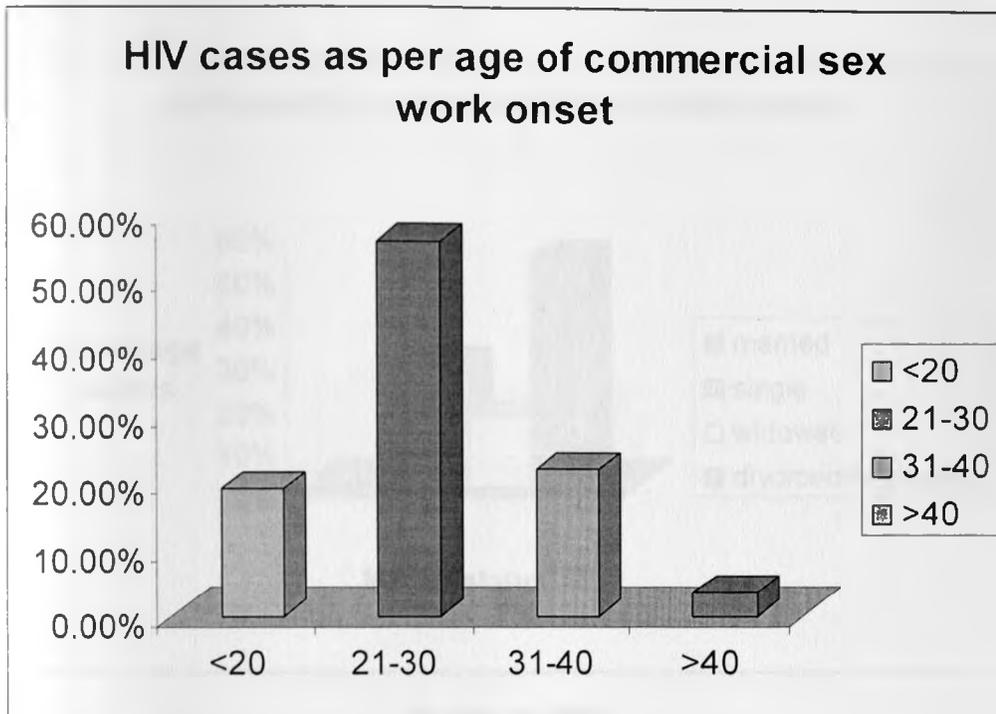
P-value <0.0001

Figure 24: HIV positive cases as per age of sex worker



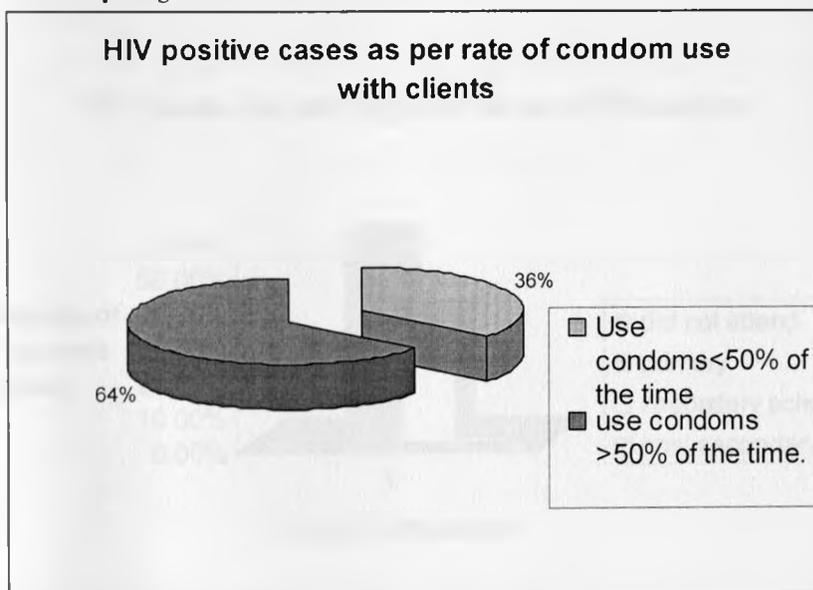
P-value <0.0001

Figure 25: HIV positive cases as per duration of sex work (in years)



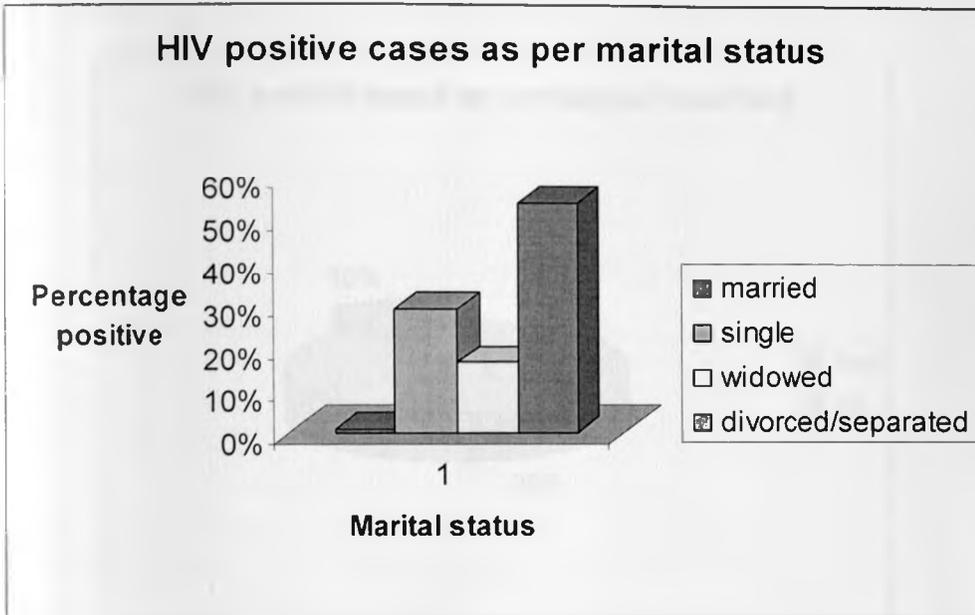
P-value <0.0001

Figure 26: HIV as per age of commercial sex work onset



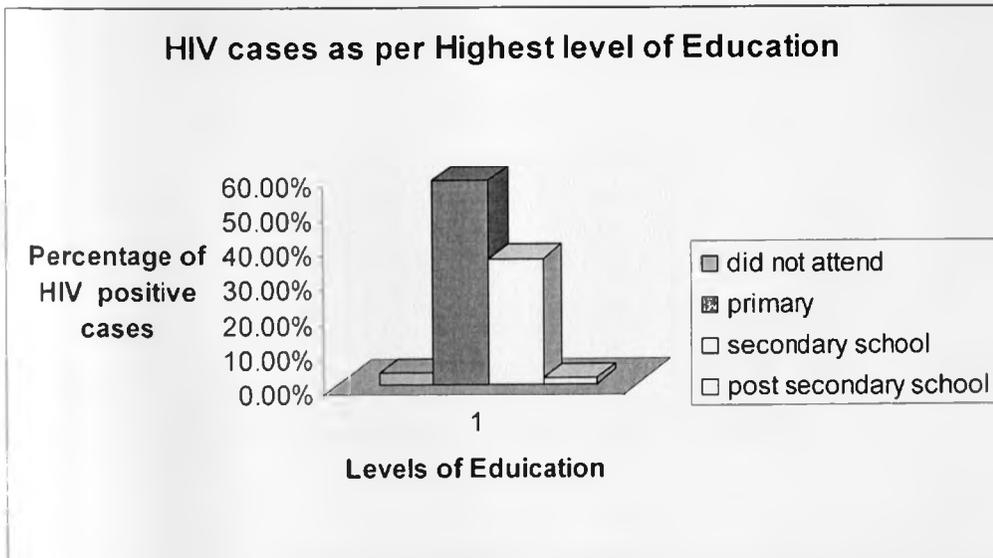
P-Value <0.0001

Figure 27: HIV positive cases as per rate of condom use with clients



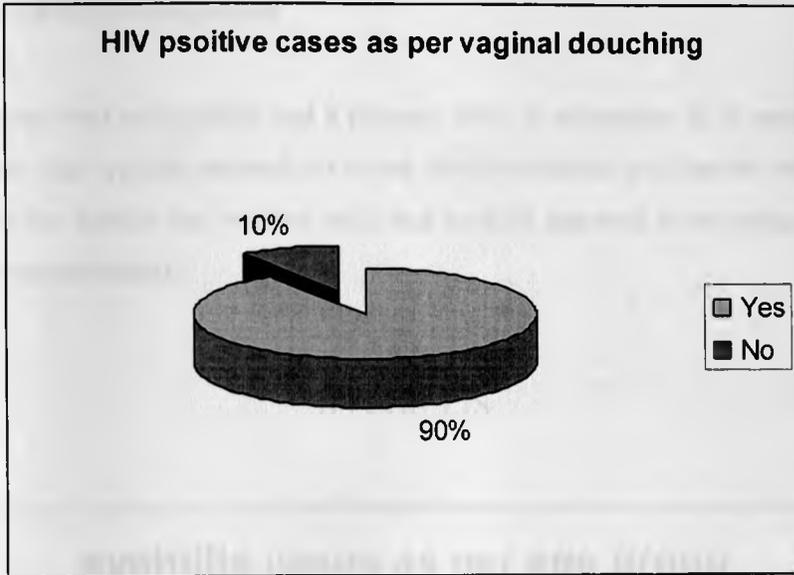
P-value <0.0001

Figure 28: HIV positive cases as per marital status



P-Value <0.0001

Figure 29: Bar graphs showing HIV positive cases as per highest level of Education



P-value 0.012

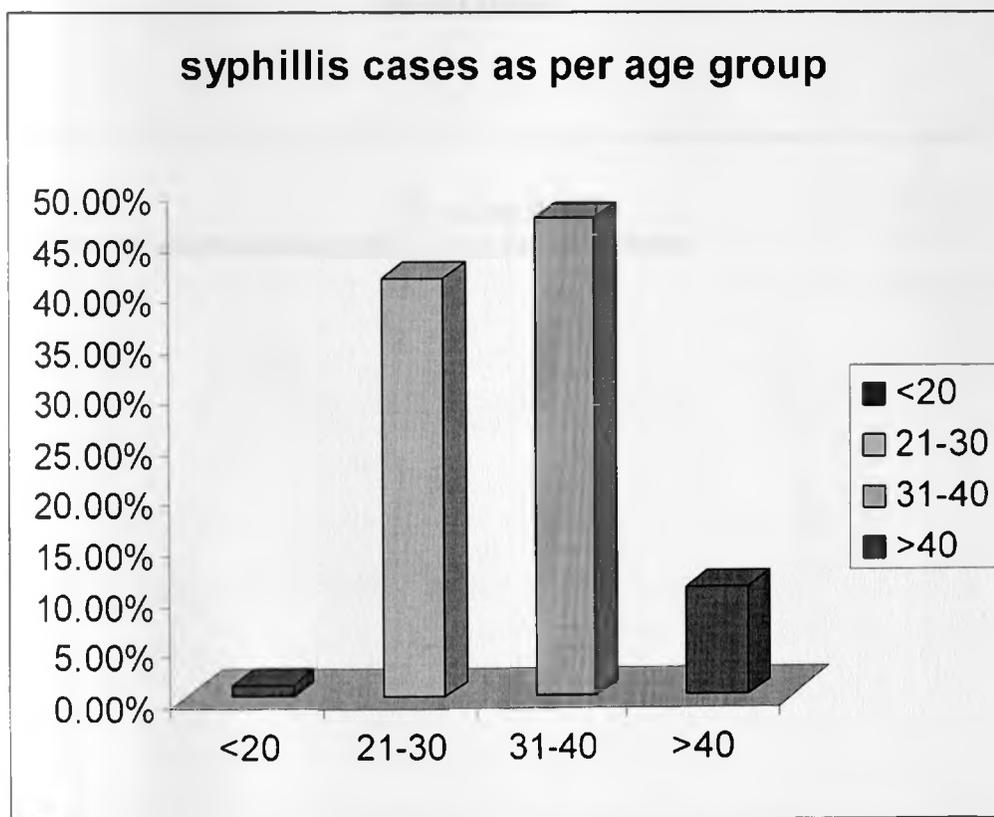
Figure 30: Pie chart showing HIV positive cases as per vaginal douching



Syphilis: 47.1 percent (majority) of the FSW's who had syphilis were between the ages of 31-40 years (p-value 0.046). 62.4 percent (majority) of the FSW's who had syphilis were divorced/separated.

65.9 percent who had syphilis had a primary level of education. 92.8 percent of the FSW's who had syphilis reported not to use female condoms as a barrier method. 100 percent of the female sex workers who had syphilis reported to be using condoms with their casual clients.

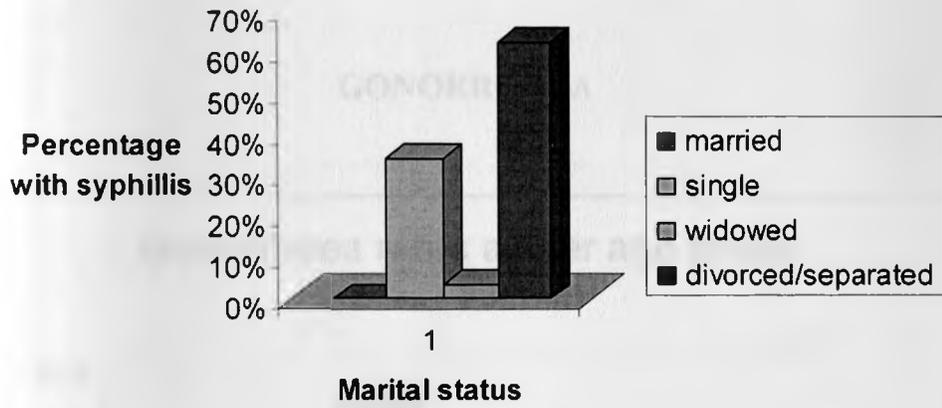
SYPHILLIS



P-Value 0.046

Figure 31: Bar graph showing syphilis cases as per age group

Syphilis cases as per marital status



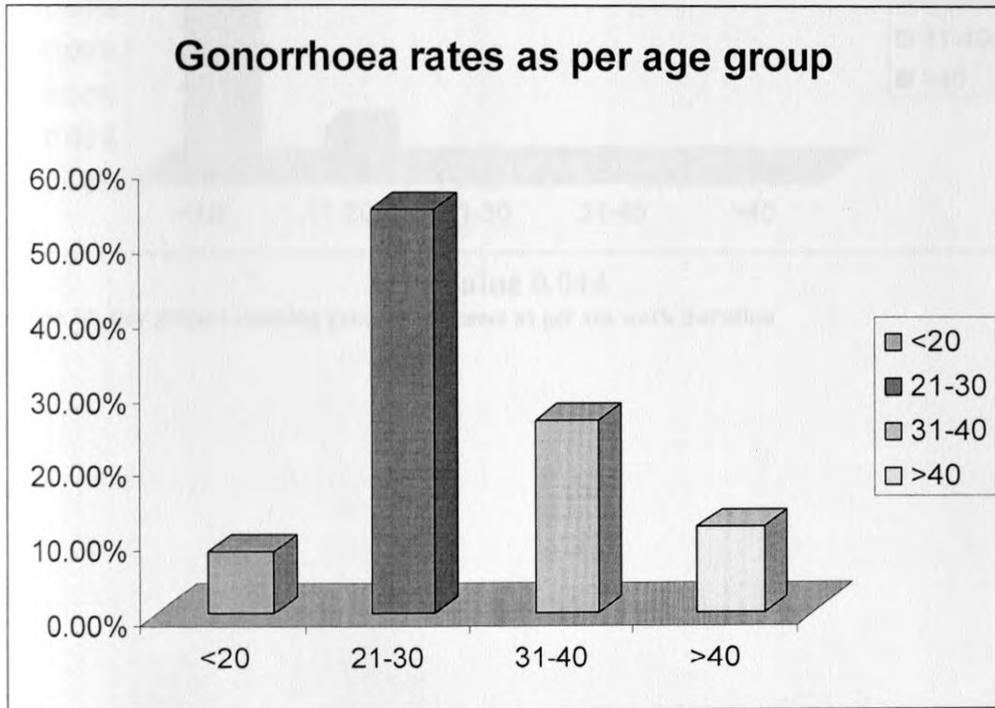
P-value 0.097

Figure 32: Bar graph showing syphilis cases as per marital status

Gonorrhoea:

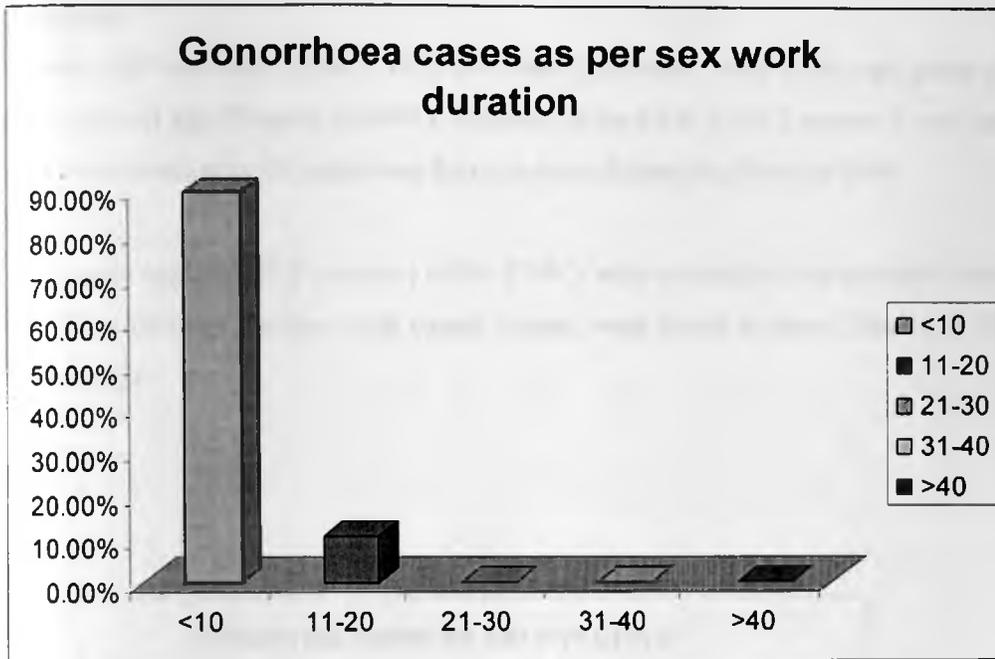
Majority of the FSW's who had gonorrhoea (54.4 percent) were between the age group of 21-30 years (P-value <0.0001). 89.5 percent of the FSW's who had gonorrhoea had been in CSW for < 10 years (P-value 0.044).

GONORRHOEA



P-Value <0.0001

Figure 33: Bar graphs showing gonorrhoea cases as per age group



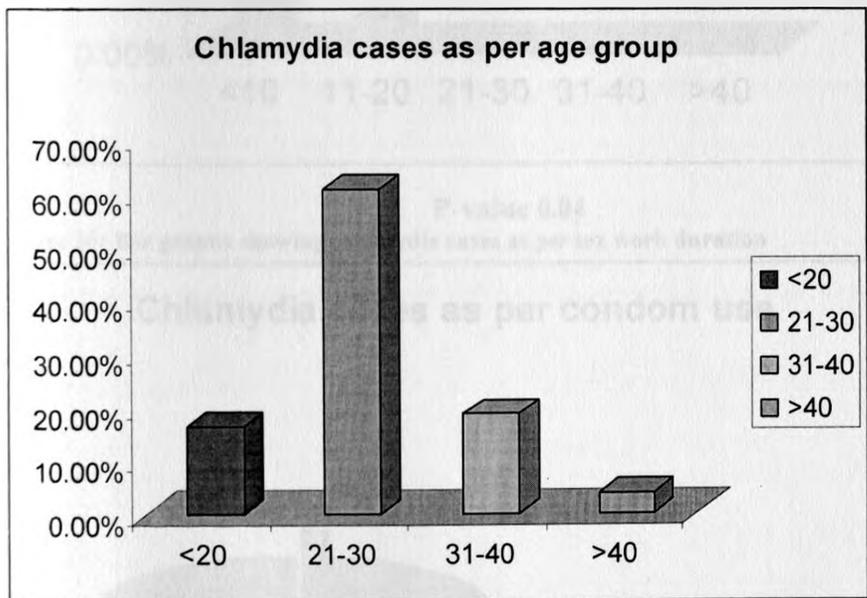
P-Value 0.044

Figure 34: Bar graphs showing gonorrhoea cases as per sex work duration

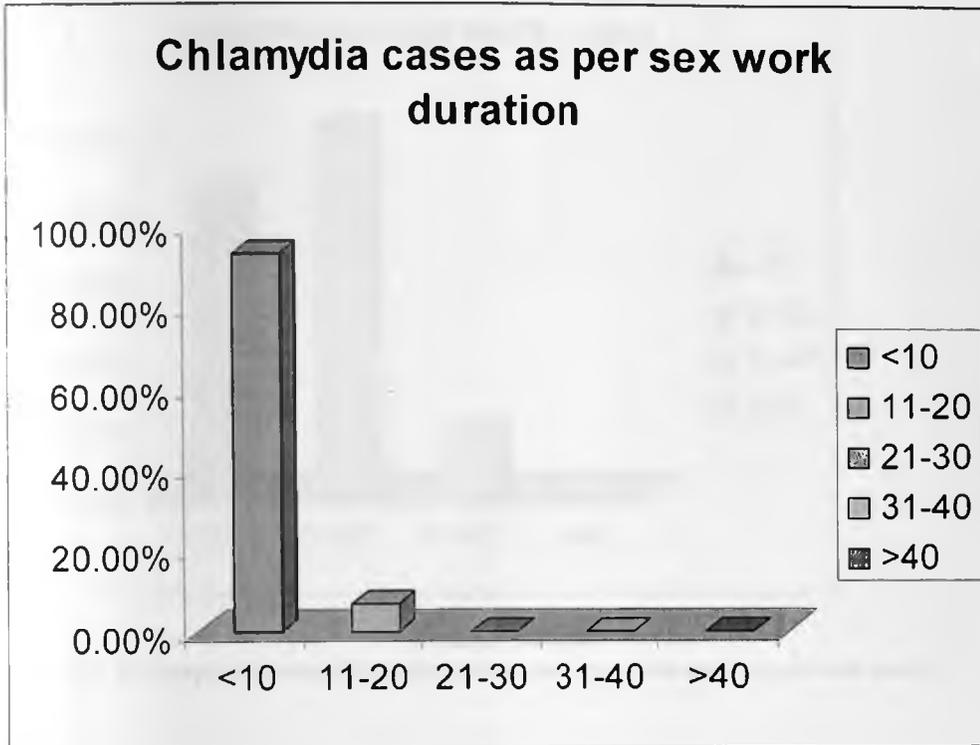
Chlamydia:

Majority (60.9 percent) of the FSW's who had Chlamydia were in the age group of 21-30 years of age (P-value <0.0001). Majority of the FSW's (93.2 percent) who had been in sex work for <10 years were found to have chlamydia (P-value 0.04).

Once again majority(97.7 percent) of the FSW's who claimed to use condoms more than 50 percent of the time with casual clients, were found to have Chlamydia (P-value 0.002)

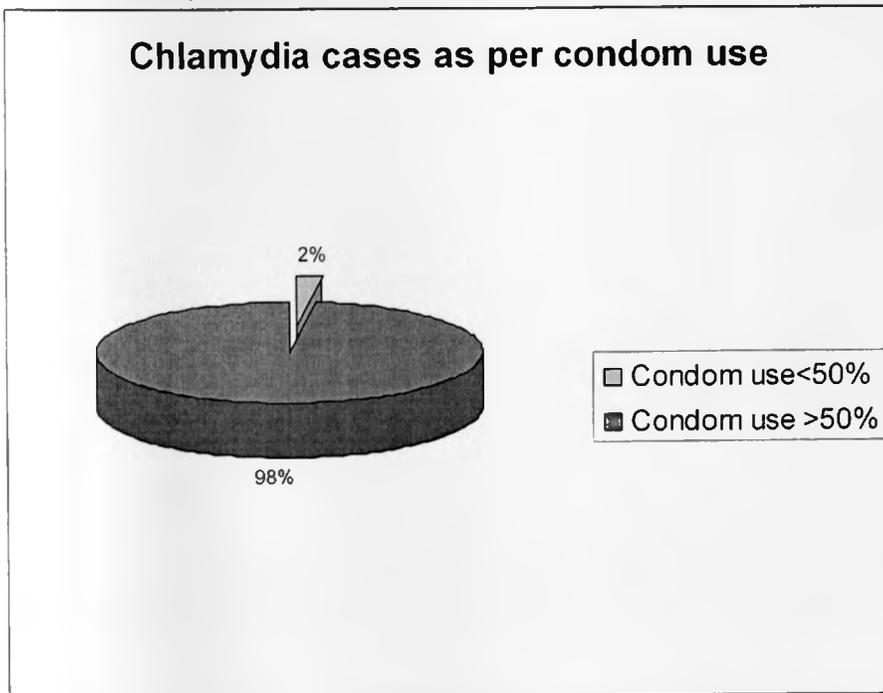


P-Value <0.0001 **Figure 35: Bar graphs showing chlamydia cases as per age group**



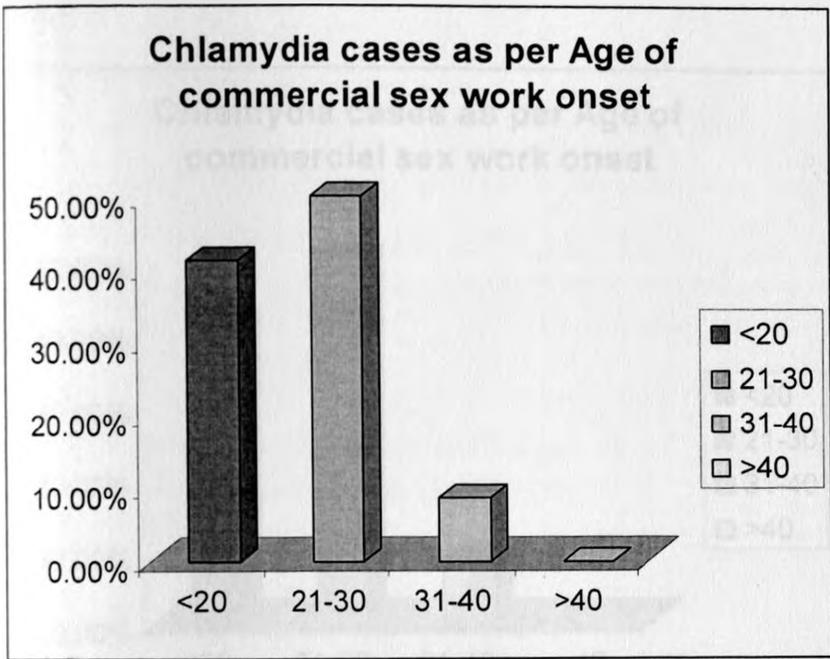
P-value 0.04

Figure 36: Bar graphs showing chlamydia cases as per sex work duration



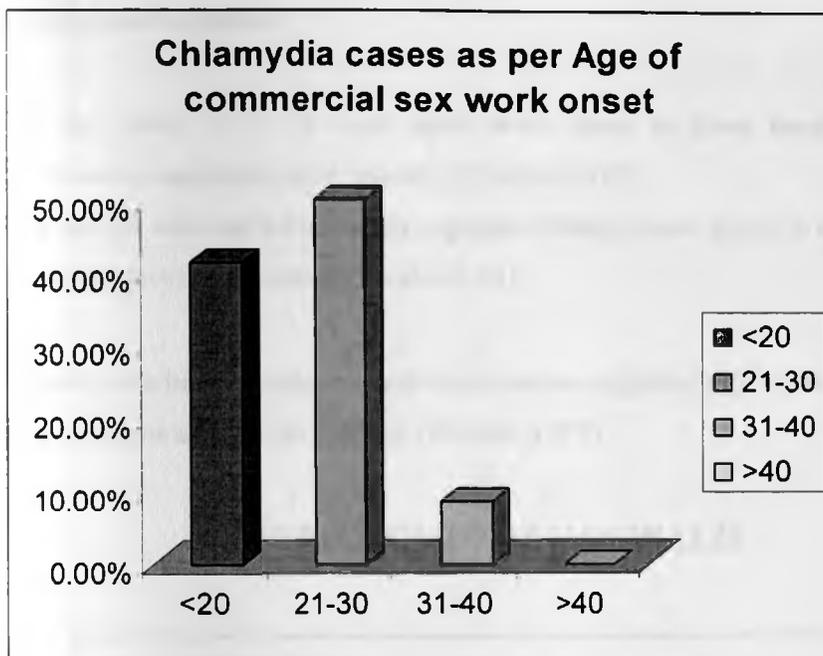
P-value 0.002

Figure 37: Pie chart showing chlamydia cases as per condom use



P-value <0.0001

Figure 38: Bar graphs showing chlamydia cases as per age of commercial sex work onset



P-value <0.0001

Figure 38: Bar graphs showing chlamydia cases as per age of commercial sex work onset

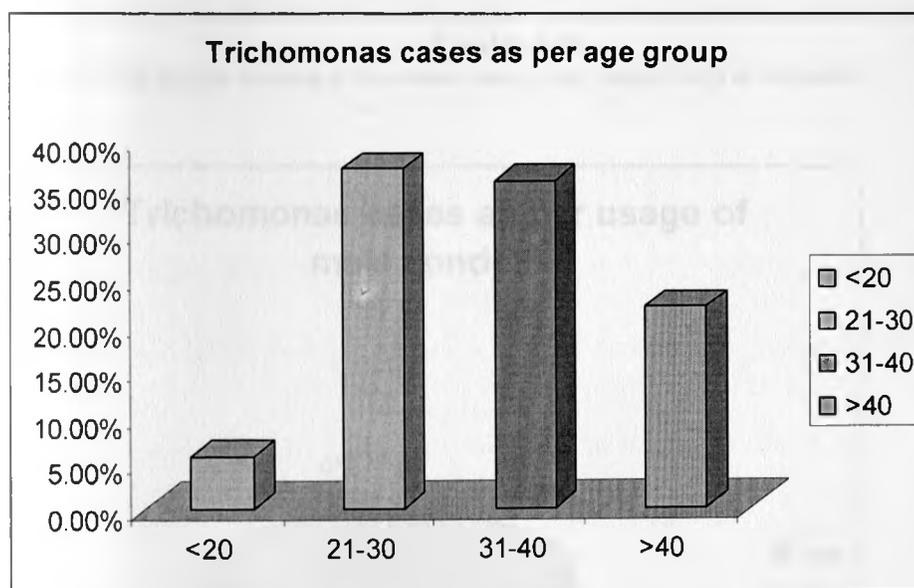
Trichomonas vaginalis:

The age group of 21-30 once again were found to have most infection with *Trichomonas vaginalis* (36.9 percent). (P-value 0.015)

62.8 percent who had *trichomonas vaginalis* infection were found to have attended up to primary level of education (P-value 0.01).

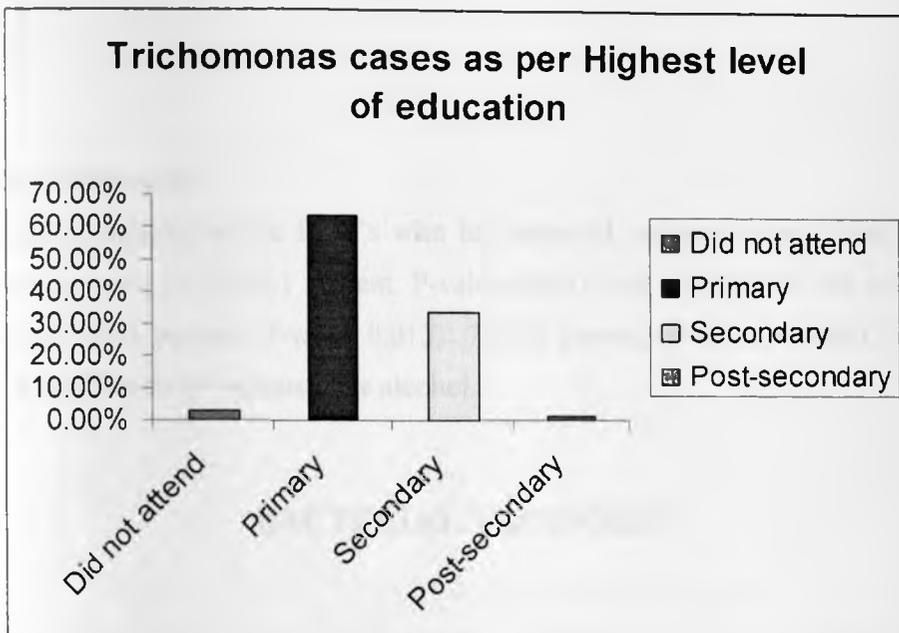
Majority who had the infection with *trichomonas vaginalis* (95.9 percent) were using male condoms as a barrier method. (P-value 0.015)

TRICHOMONAS VAGINALIS



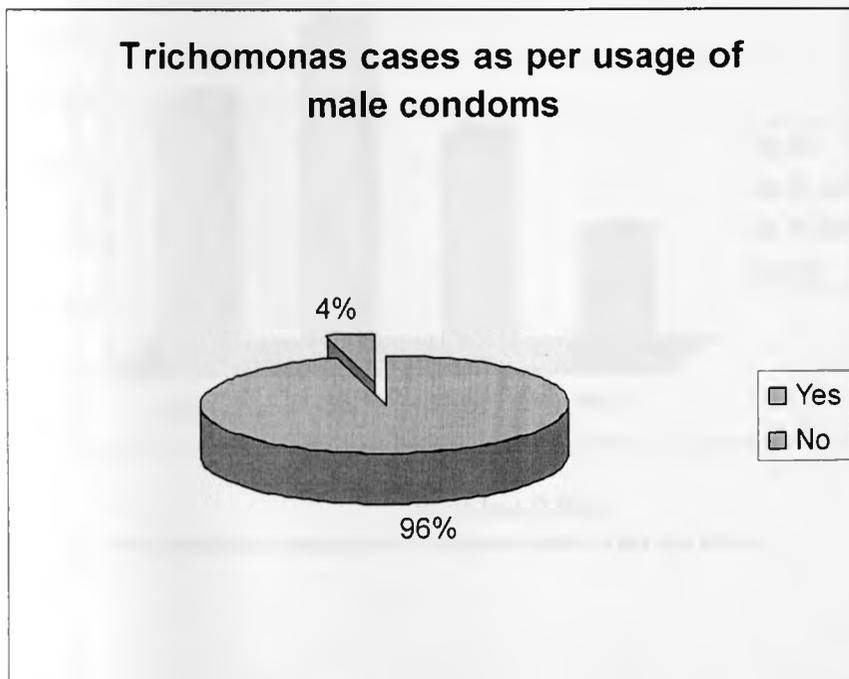
P-value 0.015

Figure 39: Bar graphs showing trichomonas cases as per age group



P-value 0.01

Figure 40: Bar graphs showing trichomonas cases as per highest level of education



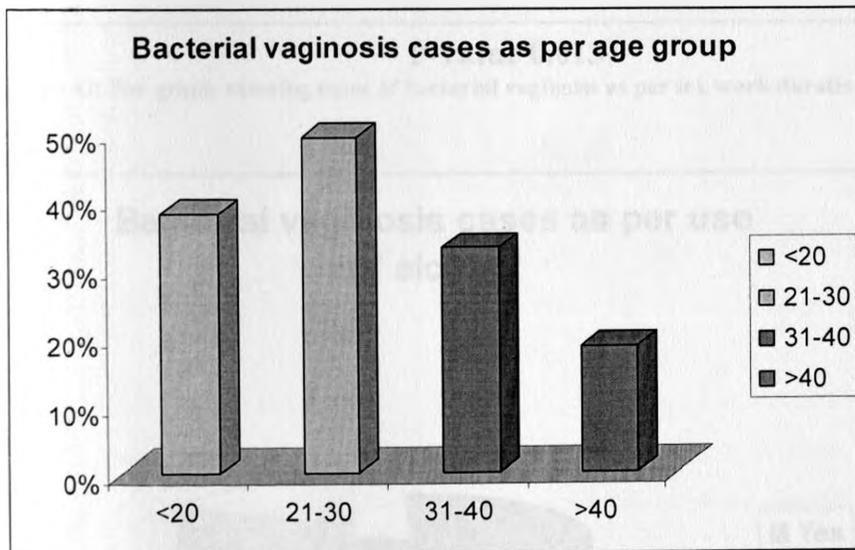
P-value 0.015

Figure 41: Bar graphs showing trichomonas cases as per usage of male condoms

Bacterial Vaginosis:

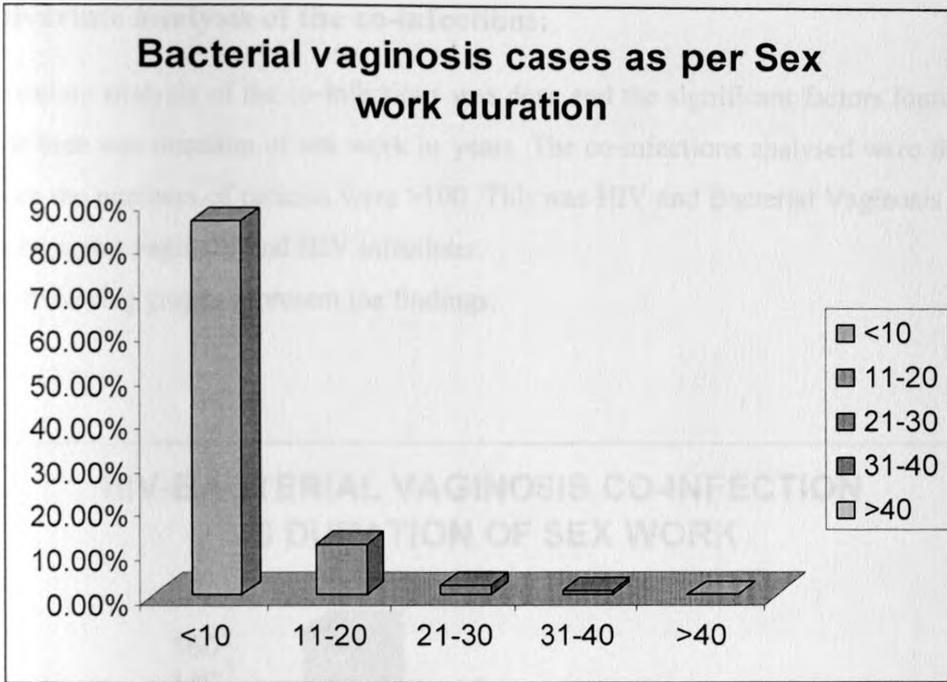
Once again majority of the FSW's who had bacterial vaginosis were found to be between the ages 21-30(49.1 percent, P-value 0.045), and had been in sex work for <10 years (85.4 percent, P-value 0.013). 79.678 percent (P-value <0.0001) of the FSW'S with Bacterial vaginosis use alcohol.

BACTERIAL VAGINOSIS



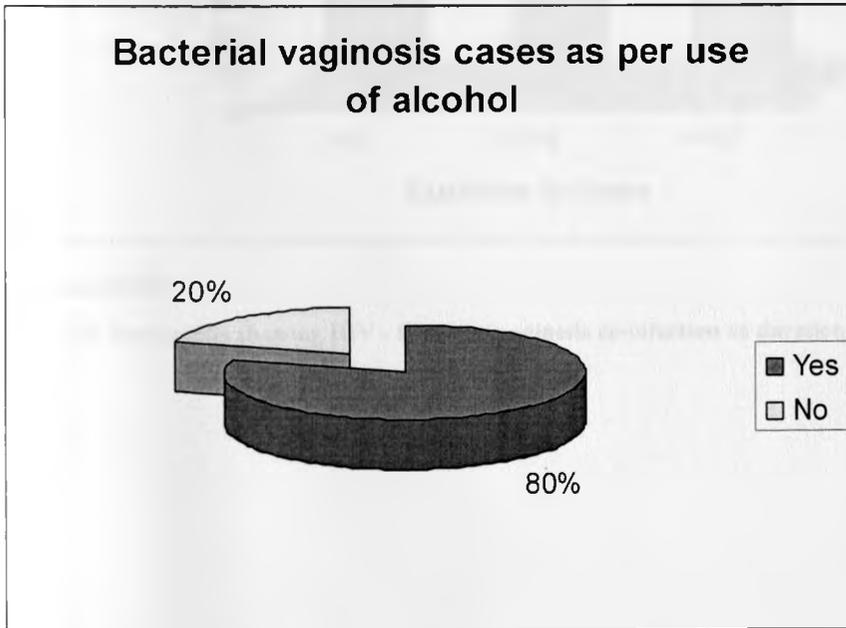
P-value 0.045

Figure 42: Bar graphs showing bacterial vaginosis cases as per age group



P-value 0.013

Figure 43: Bar graph showing cases of bacterial vaginosis as per sex work duration



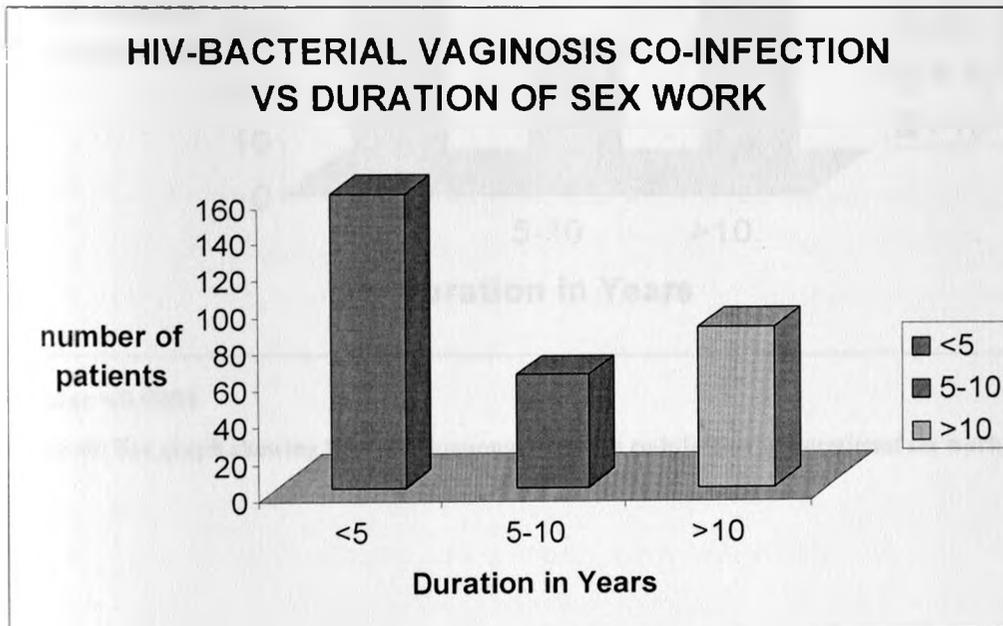
P-value <0.0001

Figure 44: Pie chart showing bacterial vaginosis cases as per use of alcohol

Univariate analysis of the co-infections:

Univariate analysis of the co-infections was done and the significant factors found to contribute was duration of sex work in years. The co-infections analysed were those whom the numbers of patients were >100. This was HIV and Bacterial Vaginosis and Trichomonas vaginalis and HIV infections.

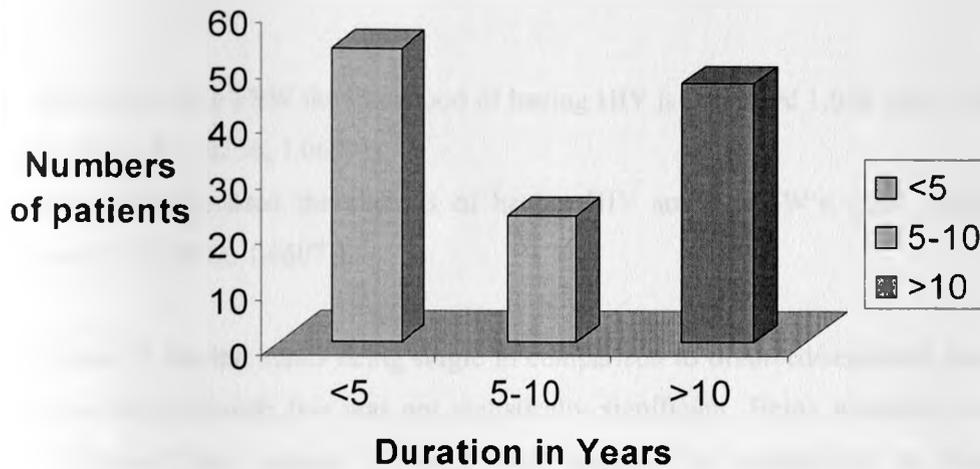
The following graphs represent the findings:



P-value 0.015

Figure 45: Bar graphs showing HIV - Bacterial vaginosis co-infection vs duration of sex work

HIV-TRICHOMONAS VAGINALIS CO-INFECTION VS DURATION OF SEX WORK



P-value <0.0001

Figure 46: Bar graph showing HIV- Trichomonas vaginalis co-infection vs duration of sex work

4.3 Multivariate analysis:

From the univariate analysis done above, the significant co – variables were put into a multilinear regression analysis for each STI. The following was found.

HIV:

The older one is as a FSW the likelihood of having HIV is increased 1.048 times (OR 1.0475, 95% CI (1.0256, 1.0699)).

Douching also increased the chances of having HIV among FSW's. (OR 1.2635, 95percent CI (0.9612, 1.6607)).

In reference to marital status being single in comparison to divorced/separated has a protective factor though this was not statistically significant. Being widowed as a FSW increased the chance of being HIV infected in comparison to those divorced/separated. (OR 1.882 95 percent CI (1.4469, 2.4478))

Sex workers who began sex work between the ages 21-30 had a 3 fold risk of having HIV compared to starting at an older age (OR 3.130, 95 percent CI (1.7168, 5.7078)). Having a primary level of education increases the risk that a FSW will have HIV compared to those with a post primary education (OR 1.6885) though this was not statistically significant.

Table 1: Multivariate analysis of HIV and significant co-variables

HIV	OR	Std. Error	P-value	95% CI
Age	1.0475	0.010811	<0.001	(1.0256, 1.0699)
Douching				
Yes	1.2635	0.139489	0.0936	(0.9612, 1.6607)
No	Reference			
Condom use with regular partner				
No	0.7692	0.086279	<0.001	(0.6495, 0.9109)
Yes	Reference			
Maritals Status				
Married	1.4742	0.415711	0.35	(0.6527, 3.3298)
Single	0.8622	0.097251	0.127	(0.7126, 1.0432)
Widowed	1.8819	0.134127	<0.001	(1.4469, 2.4478)
Divorced/Separated	Reference			
Age at Onset of CSW				
<20	2.7775	0.361236	0.004	(1.3682, 5.6381)
21-30	3.1303	0.306481	<0.001	(1.7168, 5.7078)
31-40	2.1824	0.264661	0.003	(1.2991, 3.6661)
>40	Reference			
Education Level				
None	1.4511	0.37995	0.327	(0.6891, 3.0556)
Primary	1.6885	0.292524	0.073	(0.9517, 2.9957)
Secondary	1.4207	0.294484	0.233	(0.7977, 2.5303)
Post Secondary	Reference			

CHLAMYDIA:

For Chlamydia female sex workers who were < 20 years of age were more at risk of acquiring the infection (OR 1.157) though this was not statistically significant. FSW's who were single and widowed have a higher risk of having Chlamydia (OR 1.000 and 1.582 respectively) though this was not statistically significant.

Table 2: Figure showing multivariate analysis for chlamydia and significant co-variables

Chlamydia	OR	Std. Error	P-value	95% CI
Age group				
<20	1.157297	1.129053	0.897	(0.127,10.580)
21-30	0.577477	0.91416	0.548	(0.096,3.465)
31-40	0.520186	0.667753	0.328	(0.141,1.926)
>40	Reference			
marital status				
Married	0.771574	1.045067	0.804	(0.100,5.983)
Single	1.000807	0.229585	0.997	(0.638,1.570)
Widowed	1.582157	0.367469	0.212	(0.770,3.251)
Divorced/Separated	Reference			
condom use with casual clients				
No	10.68936	0.741572	0.001	(2.500,45.728)
Yes	Reference			

TRICHOMONASIS:

The older one is as a FSW the higher the risk of having trichomonas vaginalis infection (OR 1.0134). Having a primary level of education increases the risk 3 fold of having trichomonas infection compared to a post secondary education (OR 3.434, 95% CI (1.072, 11.002)).

Table 3: Table showing multivariate analysis of trichomonas and significant co-variables

Trichomonas vaginalis	OR	Std. Error	P-value	95% CI
Age	1.013353	0.019064	0.486552	(0.976,1.052)
level of education				
None	2.127403	0.704726	0.284079	(0.535,8.467)
Primary	3.43421	0.59403	0.037804	(1.072,11.002)
Secondary	2.547582	0.598025	0.117883	(0.789,8.226)
Post Secondary	Reference			

SYPHILLIS:

For every 1 year increase in age FSW's have an increased risk of acquiring Syphilis infection (OR 1.076, 95 percent CI (1.007, 1.151)).

Table 4: Figure showing multivariate analysis of syphilis and significant co-variables

Syphilis	OR	Std. Error	P-value	95% CI
Age	1.076224	0.034113	0.031286	(1.007,1.151)

GONORRHOEA:

The younger age group (OR<0.1664, CI (0.030, 0.915)) seem to be at less risk of acquisition of gonorrhoea. In general the FSW seem to have low risk of acquisition of gonorrhoea across the age groups.

Table 5: Figure showing multivariate analysis of gonorrhoea and significant co-variables

Gonorrhoea	OR	Std. Error	P-value	95% CI
Age group				
<20	0.1664	0.8700	0.0392	(0.030,0.915)
21-30	0.1697	0.6446	0.0059	(0.048,0.600)
31-40	0.2920	0.4171	0.0032	(0.129,0.661)
>40	Reference			

BACTERIAL VAGINOSIS

For every 1 year increase in age there is a protective aspect from acquiring bacterial vaginosis infection (OR 0.9948) but was not statistically significant in this study.

Table 6: Figure showing multivariate analysis of bacterial vaginosis adn significant co-variables

Bacterial vaginosis	OR	Std. Error	P-value	95% CI
Age	0.994853696	0.014098	0.714384	(0.968,1.023)

5.1 DISCUSSION:

This cross-sectional study provided an important opportunity to assess the status of HIV infection and seroprevalence of STI's among female sex workers in Nairobi.

The prevalence of HIV was at 32.8 percent and an almost similar high prevalence of bacterial vaginosis of 28.9 percent amongst this sub population. The age groups of 21-30 and 31-40 had the highest rates of STI's with HIV and Bacterial Vaginosis being the highest. Perhaps the high prevalence may be due to the fact that majority of the FSW's are within this age group.

The likelihood of the co-relation between the two infections especially among this high risk groups is thus raised.

The co-infections analysed in this cohort indicated that there exists patients with different co-infections. Out of the cohort sampled 19.6 percent of the FSWs had HIV and other STIs co-infection. Though it was interesting that when a FSW had HIV it was common to only have one co-infection at a go indicating a possible protective factor or down regulating aspect of HIV.

Only 7.4 percent of the same cohort had other STI combinations excluding HIV. Among those FSWs who had HIV, the commonest co-infections were HIV and Bacterial vaginosis(the highest) , followed by HIV and Trichomonas vaginalis. One patient had HIV, Chlamydia trachomatis and Syphilis, 1 patient had Chlamydia trachomatis, syphilis, trichomonas vaginalis and gonorrhoea co-infection at the same time.

Duration of sex work in years was significant in those patients who had HIV/Bacterial vaginosis co-infection and HIV/Trichomonas Vaginalis co-infection. with those who had been in sex work for less than 5 years having the most co-infection rates.

Knowledge on ways of HIV/STI transmission was still poor among the FSW's. This indicates that the FSW's may still be engaging in risk behaviours unaware of the underlying risks of exposure. Majority of the FSW's do not associate multiple

partners and condom bursts as a high risk behaviours. Indicating the probable need for emphasis on modes of HIV/STI transmission to FSW's during health education sessions.

Stigma still stands out as a limiting factor for seeking VCT and probably also other STI services as majority of the FSW's were conscious as to what their family, friends and community would perceive if seen seeking VCT services. Thus a need to still find ways of de-stigmatizing the community at large about HIV/STI's

Substance use has been seen as a significant risk behaviour that is increasing the STI/HIV rates in this population. Raising the question as to whether there exists a vicious cycle between sex work to sustain substance abuse.

Other risk factors from socio demographic data analysed that seem to play a role though not so significant are age of sex worker with higher STI rates being seen amongst the most reproductive age group .Majority of the sex workers are divorced/separated (53 percent) indicating a push factor into sex work due to break down of family social systems. The level of education for majority of the sex workers is primary education. This indicates a likely challenge when it comes to educating this subpopulation on various health issues pertaining to risk behaviour and how to protect themselves. Thus may contribute to the reason why majority of the FSW's admit to high usage of condoms with casual clients 62.9 percent , yet STI rates amongst the FSW 's is still high.

Uptake and use of condoms also seems to be poor with very low condom usage (13.6 percent) with their regular clients. These regular clients subsequently act as a bridging population with risk of spread of STI's and HIV to the general population. The irregular condom use noted in this study especially among FSW's with their steady partners suggests that female sex workers only consider being at risk with their clients or non steady partners. Further studies are necessary to understand this behaviour.

The co relation with substance abuse indicates another dimension into the dynamics of HIV/STI transmission, thus the possible need to incorporate rehabilitation programmes into prevention and care strategies for FSW's.

In this study majority of the female sex workers having any of the STI's were in the younger age bracket from 21-30 with the exception of syphilis which seemed to affect a slightly higher age bracket of 31-40. For most of the FSW's who had STI's majority had been in sex work for less than 10 years.

In this study majority of the female sex workers who had HIV infection, Chlamydia and Syphilis had reported condom use more than 50 percent of the time with casual clients. Thus a great likelihood that either the FSW's are not using condoms or do not know how to use the condoms properly. Interestingly, use of female condoms seemed to offer some protection. This is seen in the univariate analysis of syphilis and HIV which indicated that majority that were infected had not used female condoms. The samples for those who used female condoms may have been small and thus the results but this may be an area to research on further. Though more expensive than male condoms female condoms may offer more self control by the user. In relation to this the study also indicated on univariate analysis that even those who used male condoms had a higher rate of STI infection such as is seen with *Trichomonas vaginalis*. Many factors may be leading to this such as, poor skill in using the condom well; influence by the clients of the FSW's who may refuse to use condoms.

Across the class of STI's having a low level of education (primary) seemed to be associated with risk of having an STI though in this study it was not statistically significant.

Being single or widowed from this study was associated with an increased risk of having an STI except with HIV where being single seemed to be protective. This brings in the aspect of concurrency of partners that may be playing a role in this picture as well as the fact that this are the FSW's being pushed or pulled into sex work and acting as a bridging population to the rest of the population. In general being divorced/separated or widowed from this study was associated with a higher risk of having HIV and/ or any STI.

The KAIS report 2007 also reflected this for the general population indicating that women who have ever been widowed and women who are currently divorced or separated have high HIV prevalence at 17-21 percent. This is especially relevant since

the proportion of Kenyans (both women and men) currently widowed has more than tripled since 2003.

One hypothesis is that the deceased partners of women respondents are likely to have died from HIV-related illness after years of infection, since HIV is the leading adult cause of death among Kenyans age 15-49. These women were potentially exposed to HIV for several years before their partners died.

In relation to age, the older a female sex worker is the more risk they are of having any STI. This may be due to multiplicity of partners both casual and regular clients. A possibility of alterations in the vaginal or cervical components that may be playing a role. However in this study it was noted that with increase in age Bacterial vaginosis infection was less; thus a likelihood that older age is protective, again bringing out the role of the vaginal and/or change in cervical components that may be interacting with the pathogen.

Those FSW's who douched seemed to have a significant increased risk of having HIV infection in this study. Douching in this study was mostly with water or water and soap hence the higher rates of STIs among those who douched with these substances.

This is as seen in other studies that sought to determine the link between vaginal douching, bacterial vaginosis and HIV infection.^{33, 34}

In this study bacterial vaginosis and HIV co-infection was the most common in this cohort followed by *Trichomonas vaginalis* and HIV co-infection. Indicating the likely interaction between bacterial vaginosis and HIV infection. Most epidemiological studies that have looked for an association between BV and HIV have found one. A causal relation between BV and HIV is further supported by other prospective studies³⁵. A study done in Kenya showed that commercial sex workers without lactobacilli were more likely to acquire HIV (adjusted hazard ratio = 2.0, 95% CI = 1.2-3.5)³⁶

Data on the association between BV and HIV have shed light on an important risk factor for HIV infection. The challenge now is to determine how to reduce BV related

HIV transmission. More research is needed on BV, its aetiology, and how to better treat and prevent it.

From this study the prevalence of HIV and Bacterial Vaginosis are thus still significantly high. The determinants that are influencing the acquisition of HIV and STI's among FSW's in this population in Nairobi are both sociodemographic and knowledge and attitudes. Determinants in this study included marital status, level of education, duration of sex work, age of the sex worker, including the age bracket, knowledge of modes of STI&HIV transmission, knowledge on risk behaviours, practices such as seen with condom use among regular and casual clients, and alcohol use.

In conclusion, this study has highlighted the heterogeneity in the structure and organization of female sex work, and how this is reflected in HIV and STI prevalence among FSW in Nairobi. District-level variations in HIV prevalence among FSW are may be a further step in another study to look at other determinants that may be influencing the regional prevalence among this high-risk population. Different cultures may be operating among the sex workers in Kenya and this would be an important aspect to study further. A similar study that was done in India where comprehensive existing programmes for FSW's exist was carried out with similar findings ^{37,39}. These understandings should form an important consideration for designing and enhancing HIV preventive interventions for FSW.

The prevalences and determinants of STI's/HIV found in this study indicate that it is still essential that prevention programmes focus not only on the high risks associated with commercial sex work but also the risks with other sexual partners (casual or steady), and socio demographic aspects that seem to be pushing/pulling more women into sex work and keeping them in sex work.

1.1 LIMITATIONS OF STUDY:

- This was a cross-sectional study thus not able to determine amongst the determinants of STIs/HIV whether exposure occurred before or after the outcome.
- Secondary data analysis thus limited by the questions in existing questionnaire, and errors in entry made could not be cross-verified.
- Selection bias as the study participants were only those who were enrolled in the clinic.
- The study only dealt with street based sex workers.
- Sample size estimation was not done. This resulted in analysis of a large varied group with mixed characteristics and thus leading to interference of confounders.

5.1.2 RECOMMENDATIONS:

- The prevention needs of the younger sex workers may be different from the older sex workers and this should be taken into consideration when structuring prevention/ intervention programmes.
- Co-infections with the various pathogens require to be followed up in subsequent follow ups so as to identify if there are possible factors that are increasing these FSWs risks of having the various co-infections. The preventive methods including treatment methods being used for these FSWs with co-infections will need to be followed up to see if these are effective in clearing the co-infections.
- A sample size can be used in a similar study on the same population studied so as to give more accurate results.
- For the clinic, there may be need to recruit sex worker who work in other set ups such as brothels, secluded homes and other areas where they are based so as to include them in the prevention programmes get and also to get at representative picture of the varied FSW s working within Nairobi.
- The questionnaire in the clinic may be expanded to include comprehensive details on the socio demographics such as age of onset of commercial sex work and areas of operation of sex work.
- Further prospective or retrospective studies may need to be done to establish associations between likely socio demographic and biological variables that may have and impact on the STI/HIV and the associations being seen in the region.
- A subsequent follow up on the similar findings on the STI/HIV rates can be done from the clinic at a later period (e.g. after 6 months) so as to see the trend occurring in these infections/ co-infections.

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²⁴ Global prevalence and incidence of selected curable sexually transmitted infections. Geneva, World Health Organization, 2001 (WHO/CDS/CDR/EDC/2001.10).

²⁵ Moses S, Plummer FA, Ngugi EN et al. Controlling HIV in Africa: effectiveness and cost of an intervention in a high-frequency STD transmitter core group. *AIDS*, 1991, 5:407–411.

²⁶ World Bank. *Confronting AIDS: public priorities in a global epidemic*. New York: World Bank, 1997.

²⁷ UNAIDS/WHO Epidemiological fact sheet-2004 Update

²⁸ Reduced rates of HIV acquisition during unprotected sex by Kenyan female sex workers predating population declines in HIV prevalence

²⁹ Aral O, Holmes KK, Padian NS, et al. Overview: individual and population approaches to the epidemiology and prevention of sexually transmitted diseases and human immunodeficiency virus infection. *J Infect Dis* 1996;174(Suppl 2):S127–33.

³⁰ Mills S, Saidel T, Bennett A, et al. HIV risk behavioral surveillance: a methodology for monitoring behavioral trends. *AIDS* 1998;12(Suppl 2):S37–46.

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- ³¹ Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India. V. K. Desai et al *Sex Transm Infect* 2003;79:111-115 doi:10.1136/sti.79.2.111
- ³² Prevention and control of sexually transmitted infections: draft global strategy WHO 18th May 2006
- ³³ Journal article by J. Rosenberg; *International Family Planning Perspectives*, Vol. 27, 2001
- ³⁴ Fonck A et al., Sexually transmitted infections and vaginal douching in a population of female sex workers in Nairobi, Kenya, *Sexually Transmitted Infections*, 2001, 77(4):271-275.
- ³⁵ HIV/AIDS Surveillance Data Base. Washington, DC: US Census Bureau, Health Studies Branch, International Programs Center, Population Division, 1996
- ³⁶ HIV/AIDS Surveillance Data Base. Washington, DC: US Census Bureau, Health Studies Branch, International Programs Center, Population Division, 2000
- ³⁷ UNAIDS. *2004 Report on the Global AIDS/HIV Epidemic: 4th Global Report: Joint United Nation Programme on HIV/AIDS*, 2004

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APPENDICES

SWOP Enrollment Questionnaire

SWOP Enrollment No. -

Date:

HIV/AIDS KNOWLEDGE

<p>1. How is HIV transmitted? (Mark all mentioned- do not read out)</p>	<p>1. Through unprotected sexual contact <input type="checkbox"/></p> <p>2. From infected mother to child <input type="checkbox"/></p> <p>3. Contact/exposure to HIV infected blood <input type="checkbox"/></p> <p>4. Handshake and close body contact <input type="checkbox"/></p> <p>5. Mosquito's and other insects <input type="checkbox"/></p> <p>6. Condom burst <input type="checkbox"/></p> <p>7. Kissing <input type="checkbox"/></p> <p>8. Others [specify] _____</p> <p>_____</p> <p>_____</p>	
<p>2. Please List all the Sexually transmitted infections that you know:</p> <ul style="list-style-type: none"> • DO NOT READ OUT • TICK ALL Mentioned 	<p>1= Gonorrhoea</p> <p>2= Syphilis</p> <p>3= Herpes</p> <p>4= Trichomonas</p>	<p>5= Chlamydia</p> <p>6= HIV</p> <p>7. Others _____</p>
<p>3. Have you ever had any of these conditions?</p> <ul style="list-style-type: none"> • PLEASE READ ALL 	<p>a. Genital ulcer disease 1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/></p> <p>b. Foul smelling vaginal discharge 1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/></p> <p>c. Painless growth in vaginal area 1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/></p>	
<p>4. Where do you currently go for treatment if you have a genital problem?</p>	<p>1= Pharmacy</p> <p>2= Private Doctor</p> <p>3= Government clinic</p>	<p>4= Herbalist</p> <p>5= Other</p> <p>_____</p>
<p>5. How can people prevent contracting or transmitting HIV/AIDS?</p> <p>{Do not read, Mark all mentioned}</p>	<p>1. Abstain from sexual intercourse <input type="checkbox"/></p> <p>2. Use condoms..... <input type="checkbox"/></p> <p>3. Remain faithful to partner/Ask partner to be faithful <input type="checkbox"/></p> <p>4. Limit the number of partners <input type="checkbox"/></p> <p>5. Avoid sex with people with many partners <input type="checkbox"/></p> <p>6. Avoid sex with people who inject drugs <input type="checkbox"/></p> <p>7. Avoid sex with people who had blood transfusions</p>	

SWOP staff Initials: _____

APPENDICES

SWOP Enrollment Questionnaire

	<input type="checkbox"/> 8.Avoid injections <input type="checkbox"/> 9.Avoid kissing/hugging..... <input type="checkbox"/> 10.Avoid mosquito bites <input type="checkbox"/> 11.Get protection from traditional healer <input type="checkbox"/> 12.Other specify] _____ _____ 13.Don't know..... <input type="checkbox"/>
6. Do you use any of the following substances? <ul style="list-style-type: none"> • Alcohol • Cigarettes • IV drugs • Miraa/Khat • Bhang • Others [specify] _____ _____ _____	1= Alcohol Yes <input type="checkbox"/> No <input type="checkbox"/> , 2= Cigarettes Yes <input type="checkbox"/> No <input type="checkbox"/> 3= IV drugs Yes <input type="checkbox"/> No <input type="checkbox"/> 4= Miraa/Khat Yes <input type="checkbox"/> No <input type="checkbox"/> 5= Bhang Yes <input type="checkbox"/> No <input type="checkbox"/> 6. Others Yes <input type="checkbox"/> No <input type="checkbox"/>
7. Have you had a "black out" from alcohol intake in the past 3 months	Yes <input type="checkbox"/> No <input type="checkbox"/> Others Specify _____

TESTING

8. EVER been tested for HIV?	1= Yes <input type="checkbox"/> If YES go to 25	2= No <input type="checkbox"/> If NO go to 24
9. If no, why haven't you EVER gone for the HIV test? Probe and note all answers given!!!	_____ _____ _____ _____	

SWOP staff Initials: _____

APPENDICES

SWOP Enrollment Questionnaire

<p>What was the main reason you wanted to know your HIV status?</p> <p>[DO NOT READ OUT, Mark all mentioned]</p>	<p>1 = marriage <input type="checkbox"/></p> <p>2 = Don't trust spouse/partner <input type="checkbox"/></p> <p>3 = Feeling unwell <input type="checkbox"/></p> <p>4 = Requirement e.g. job <input type="checkbox"/></p> <p>5 = Friend infected <input type="checkbox"/></p> <p>6 = Condom burst <input type="checkbox"/></p>	<p><input type="checkbox"/> 6: Others specify</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
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<p>10 I am going to read a list of reasons that might keep SEX WORKERS from seeking VCT services:</p>	<p>Lack of transport Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Peer / Friends disapproval Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Distance from facility Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Unsupportive family / community attitudes Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>No effective cure for HIV/AIDS Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Lack of confidentiality Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Fear of testing HIV+ Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>
	<p>Health worker attitudes Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><input type="checkbox"/></p>

<p>11 What are the advantages, if any, of knowing your HIV status? Probe and note all answers mentioned. "Just to know" is NOT a sufficient answer.</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>12 What are the disadvantages, if any, of knowing your HIV status? Probe and note all answers mentioned. "None" is NOT a sufficient answer. Probe for more.</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

SWOP staff Initials: _____

APPENDICES

SWOP Enrollment Questionnaire

REPRODUCTIVE

13. No of pregnancies:

a. Are you pregnant now? Y N Don't Know

b. Date of last delivery? Date: ___/___/___.

c. Any History of multiple pregnancies? Y N
If yes how many? _____

d. Last Menstrual Period (First day of the last period) Date: ___/___/___.

14. No of Children: 1= alive 2=Dead 3=Spontaneous Abortion

4 =Therapeutic Abortion 5=Induced abortions

CONDOMS

		MALE CONDOM [A]	FEMALE CONDOM [B]
15.	Do you use these condoms?	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/>	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/>
16.	If yes , how often do you use these condoms?	1= always <input type="checkbox"/> 2=sometimes <input type="checkbox"/> 2=never <input type="checkbox"/>	1= always <input type="checkbox"/> 2= sometimes <input type="checkbox"/> 3=never <input type="checkbox"/>
17.	Do you lubricate the condoms during sex?	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3=N/A <input type="checkbox"/>	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3 =N/A <input type="checkbox"/>
18.	What do you use for lubrication with the condoms	1= water <input type="checkbox"/> 2=Vaseline <input type="checkbox"/> 3= K.Y Jelly <input type="checkbox"/> 5=Others : <input type="text"/> _____ 3=N/A <input type="checkbox"/>	1= water <input type="checkbox"/> 2=Vaseline <input type="checkbox"/> 3= K.Y Jelly <input type="checkbox"/> 4= Others: <input type="text"/> _____ 3= N/A <input type="checkbox"/>
19.	Has anyone ever demonstrated how these condoms are correctly used?	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3= Not sure <input type="checkbox"/>	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3= Not sure <input type="checkbox"/>
20.	Can you demonstrate how the condoms are used?	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3= Not sure <input type="checkbox"/>	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/> 3= Not sure <input type="checkbox"/>
21.	Please request all clients to demonstrate how male condoms are used with the penile model! <i>[Is the Demo correct?]</i>	1= Yes <input type="checkbox"/> 2= No <input type="checkbox"/>	

APPENDICES

SWOP Enrollment Questionnaire

Current Contraception

22. 0-none 1-oral 2-IUCD 3-depo 4-TL 5-Condom 6- Diaphragm
 7. Spermicidal 8. Implant 10.Others (Specify) _____

SEXUAL PRACTICES AND RISK ASSESSMENT

23. When did you last have sex? Date: ___/___/___ 39b. Did you use a condom? Yes No
24. Any known/suspected HIV+ sexual partners in the last 6 months? Y N
 a. If yes, how many? _____
 b. Did you use a condom? 1= always 2=sometimes 2=never
25. Are you now (past 3 months) active in sex work? Y N
 If yes, continue to question 26a. If no, skip to question 27.
26. Average no. of casual clients per day? _____
 a. Average no. of casual clients per week? _____
 b. Number of Casual clients - Yesterday? _____
 c. Number of Regular clients - Yesterday _____
 d. Average no. of condoms used per day? _____
27. How often do you practice the following sexual behaviors with CASUAL CLIENTS?

	Never	Sometimes (<50%)	Most (>50%)	Always (100%)
Vaginal sex				
Oral Sex				
Anal sex				
Sex During Menses				

28. How often DO YOU use a condom with CASUAL CLIENTS when engaging in the following?

	N/A	Never	Sometimes (<50%)	Most (>50%)	Always (100%)
Vaginal sex					
Oral Sex					
Anal sex					
Sex During Menses					

Who supplies condoms: 0- Yourself 1- Clients 2- Both

29. Do you have a regular partner (boyfriend, husband or lover)? Y N

[Regular partner: defined as a special sex partner who meets both financial and emotional support]

SWOP staff Initials: _____

APPENDICES

SWOP Enrollment Questionnaire

➤ If yes, continue to question 29a

➤ If no, continue to question 30.

- a. How many regular partners? _____
- b. How many times do you have sex with regular partner(s) per week? _____
- c. How many times did you have sex with a regular partner LAST WEEK? _____

APPENDICES

SWOP Enrollment Questionnaire

30. How often do you practice the following sexual behaviors with **REGULAR PARTNER(S)**:

	Never	Sometimes (<50%)	Most (>50%)	Always (100%)
Vaginal sex				
Oral Sex				
Anal sex				
Sex During Menses				

31. How often do you use a condom with **REGULAR PARTNER(S)** when engaging in the following?

	N/A	Never	Sometimes (<50%)	Most (>50%)	Always (100%)
Vaginal sex					
Oral Sex					
Anal sex					
Sex During Menses					

32. Who supplies condoms: 0- Yourself 1- Partner 2- Both N/A

DOUCHING

33. Do you practice vaginal douching (**Inserting cleaning fluid in the vagina**)? Y N
(If no -end interview)

34. **When do you Douch?:** 1. After sex 2. When showering or bathing 3. Condom burst 4. When no condom used
5. Others (explain) _____

35. **How many times do you douche?** :1. Per Day _____ 2. Per week _____

36. **What do you use to Douch?:** 1. water only 2. Water and cloth 3=Water + bath soap 4. Water and bleach
5. Water and lemon 6. Water + Herbs 7. Other (specify)_____

37. **Did you douche today?** Y N

Others

38. How much do you charge on average for one round or session to casual clients Ksh _____

39. Could we contact you by phone (Including sms) in case you are late for results, appointment and/or for additional services? Y N

40. Would you participate in HIV prevention studies e.g. Microbicides trials, HIV Vaccine trial etc if ever given a chance Y N

Thank you

SWOP Biodata Form

SWOP Screening Clinic No.

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Date

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DEMOGRAPHIC:

1.	First Name: _____ Middle Name: _____ Last Name: _____					
2.	Residence (Estate) in Nairobi _____					
3.	Contact phone no. _____ Phone number of a relative/ friend _____					
4.	Home District _____ Country _____					
5.	Year of Birth <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px;"> <tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td><td style="width: 10px; height: 15px;"></td></tr> </table> Age (yrs) <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px;"> <tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td></tr> </table>					
6.	When did you start commercial sex work (year started): <table border="1" style="display: inline-table; border-collapse: collapse; width: 60px;"> <tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td><td style="width: 10px; height: 15px;"></td><td style="width: 10px; height: 15px;"></td></tr> </table>					
7.	Duration of commercial sex work (yrs): <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px;"> <tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td></tr> </table> Months <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px;"> <tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td></tr> </table>					
8.	Have you had clients the past week? [] Y [] N					
9.	Where do you operate/conduct sex work? [Name of Street, bar, hostel etc] _____					
10.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">What is your marital status?</td> <td style="padding: 5px;"> 1 = married or living as, living together 2 = married or living as, living apart 3 = Single 4 = Widowed 5 = Divorced/separated </td> </tr> </table>	What is your marital status?	1 = married or living as, living together 2 = married or living as, living apart 3 = Single 4 = Widowed 5 = Divorced/separated			
What is your marital status?	1 = married or living as, living together 2 = married or living as, living apart 3 = Single 4 = Widowed 5 = Divorced/separated					
11.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">What is your other source of income? (specify self)</td> <td style="padding: 5px;"> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> 0 = Housewife (Spouse support) 1 = Small scale farmer 2 = Small scale trader </td> <td style="width: 50%; vertical-align: top;"> 3 = Salaried full time worker 4. Casual/Contract worker 5 = Hawker = Other (specify e.g. student) _____ _____ </td> </tr> </table> </td> </tr> </table>	What is your other source of income? (specify self)	<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> 0 = Housewife (Spouse support) 1 = Small scale farmer 2 = Small scale trader </td> <td style="width: 50%; vertical-align: top;"> 3 = Salaried full time worker 4. Casual/Contract worker 5 = Hawker = Other (specify e.g. student) _____ _____ </td> </tr> </table>	0 = Housewife (Spouse support) 1 = Small scale farmer 2 = Small scale trader	3 = Salaried full time worker 4. Casual/Contract worker 5 = Hawker = Other (specify e.g. student) _____ _____	
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0 = Housewife (Spouse support) 1 = Small scale farmer 2 = Small scale trader	3 = Salaried full time worker 4. Casual/Contract worker 5 = Hawker = Other (specify e.g. student) _____ _____					

12.	Religion	1=Catholic 2=Protestant 3=Muslim 4=Others specify _____
13.	What has been your <u>main</u> source of HIV/AIDS information?	1 = Newspapers 2 = Radio 3 = Television 4= Barazas 5=Friends 6 = Others : _____
14.	What is the highest level of schooling you attained?	0 = did not attend 1 = primary 2 = secondary 3 = post- secondary
15.	How did you learn about this clinic?	_____ _____
16.	What services are you keen on today?	_____ _____
17.	What's your Majengo Clinic Registration Number if any?	ML _____