SEROPREVALENCE AND RISK FACTORS FOR HIV INFECTION AMONG PRISON INMATES IN NAIROBI, KENYA

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DECLARATION

I Dr. Rael C. Mutai hereby declare that this dissertation is my original work and has not been submitted either wholly or in part to this university or any other institution for the award of any degree or diploma.

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DEDICATION

This work is dedicated to my children Ray and Earl. You have always been there for me and have persevered during my long hours of absence in the course of my study. It is also dedicated to my parents, who imparted in me the value of education early in life.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CDC	United States Centers for Disease Control and Prevention
CSO	Community Service Ordinance
CSW	Commercial sex work
HIV	Human Immunodeficiency Virus
HTC	HIV testing and counseling
FGD	Focus Group Discussion
IMC	International Medical Corps
KAIS	Kenya Aids Indicator Survey
KII	Key Informant Interview
KPS	Kenya Prison Service
MOH	Ministry of Health
NASCOP	National AIDS and STD Control Program
OR	Odds Ratio
PMTCT	Prevention of mother to child transmission of HIV
UNAIDS	United Nations Program on HIV/AIDS
UNODC	United Nations Office on Drugs and Crime
USDJ	United States Department of Justice
VCT	Voluntary Counseling and testing
W.H.O	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Attitude	It is the degree to which the person has a favorable or unfavorable evaluation of the behavior in question.
Correctional facility	Prison/Penal institution
Convicted	Sentenced prisoner
Incarcerated	In prison
Medium term	6 months – five year sentence
Prevalence	Number of affected persons present in the population at a specific time divided by the number of persons in the population at that time.
Remand custody	Pretrial confinement
Risk taking behavior	Any behavioral activity that increases a person's exposure to The Human Immunodeficiency Virus.
Short term sentence	0 - 6 months sentence
Social Norms	This is the influence of social pressure that is perceived by the individual (normative beliefs) to perform or not perform a certain behavior.
Seroprevalence	The overall occurrence of a disease within a defined population at one time, as measured by blood tests.

ABSTRACT

Background: HIV infection among prison inmates shows one of the highest prevalence rates for specific population subgroups, reaching as high as 17% in Brazil and elsewhere in the world.Published data on HIV infection in correctional facilities in Kenya is scarce. This study set out to establish the sero-prevalence and risk factors for HIV infection among prison inmates in Nairobi, Kenya.

Methodology: This was a cross-sectional study conducted between March and April, 2010. Using simple random sampling, 399 participants were selected. A standardized personal risk-factor questionnaire was then administered and rapid tests for HIV antibodies were carried out for 389 prison inmates as ten inmates declined the HIV test. These were drawn from the four short and medium term prisons (overall population: 4,930) situated within Nairobi province. Of the 389 prisoners tested, the sex composition was male (86.9%) and female (13.1%) inmates. Samples were analyzed for HIV using Determine HIV1/2^{TM} rapid test kit. Specimens initially reactive for HIV were retested with Bioline HIV1/2^{TM} rapid test kit. Data were analyzed using SPSS version 14.0 and P values ≤ 0.05 were considered significant.

Results: Of the 389 subjects, 25 (6.4 %) tested positive for HIV. Women and those aged above 30 years were more likely to be infected with HIV, with the highest prevalence in the 35-44years age group. The respondents perceived the risk of contracting HIV infection to be four times higher before prison than in prison. Condom use was reported to be low both before and during incarceration and the acceptability of condom distribution in prison was found to be low (16.4%). Associated risk factors for HIV infection included ignorance of transmission

modes, ignorance of prevention modes, illiteracy and injection drug use. A small proportion of inmates injected drugs at 3.1% before prison and 0.3% in prison.

Conclusions: The study confirms the presence of HIV infection in prison with an overall sero-prevalence of 6.4% which is lower than the national average of 7.4%. This low HIV prevalence may be attributed to the low prevalence of injection drug use among prison inmates, the increased perception of the HIV risk among prison inmates and possibly due to the fact that these were predominantly short and medium term prisoners and therefore more reflective of the HIV prevalence in the community rather than the prison system.

Majority of the inmates were HIV Sero-negative with self-reported high-risk behaviors. This indicates that prisoners are a vulnerable group and require special attention when addressing the needs of the most at risk populations in HIV programs. The study did not confirm homosexual contact among prisoners. This is possibly due to stigma associated with the issue. Prevalence of Injection drug use was very low. Uptake of HIV testing was low and there were notable gender differences in HIV testing; with women being more likely to have tested for HIV both before and during incarceration.

HIV preventive and treatment services were available on a small scale to the inmates; however, condom distribution was unavailable to inmates due to legal and moral barriers.

Recommendations: There is need for collaboration between KPS, academic institutions and policy makers to develop policies that will contribute towards minimizing HIV transmission and sustain the current low HIV prevalence within the prison. Kenya Prisons Service should provide easy access to voluntary HIV testing and counseling for inmates to increase testing uptake and provide linkage to treatment services. The HIV comprehensive education program for inmates should also be strengthened as the benefits have been demonstrated. Further

research should be conducted to establish the magnitude of HIV/AIDS and associated risk factors in prison.

CHAPTER 1: INTRODUCTION AND BACKGROUND

Acquired Immune Deficiency Syndrome (AIDS) was first described in 1981 and shortly afterwards, the virus responsible for this syndrome, the Human Immunodeficiency Virus (HIV) was characterized. As of the end of 2009, 33.3 million people were estimated to be living with HIV/AIDS worldwide (WHO, 2010).

The estimates indicate that the global HIV/AIDS prevalence rate has leveled off, although the number of people living with the disease continues to increase. An estimated 2.6 million people became newly infected with HIV in 2009, and 1.8 million people died of AIDS-related causes in 2009. Women comprise half (50%) of adults estimated to be living with HIV/AIDS. It is estimated that young people under the age of 25 account for more than half of all new HIV infections worldwide (UNAIDS, 2010).

HIV/AIDS in Correctional Facilities

Prisons form part of the criminal justice system and it is estimated that over 9 million people are in penal institutions worldwide (Walmsley, 2003). Overcrowding in prisons remains a concern in both developed and developing countries, and is a key causative factor for a myriad of other problems which ultimately turn these `custodial settings into breeding grounds for infectious diseases such as AIDS, hepatitis, gonorrhea, syphilis and tuberculosis. Compared to the general population, prisoners worldwide continue to demonstrate a significantly higher prevalence of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infections (Hennessey et al., 2009).

This phenomenon has been attributed to factors such as high-risk sexual behavior before and during incarceration, intravenous drug use with sharing of syringes and drug paraphernalia, as well as tattooing among inmates (Allwright et al., 2000).

In Africa, the median prison population rates range from 324/100,000 of the national population in Southern African countries to 52/100,000 in the West African nations and 130/100,000 for Kenya (Walmsley, 2005). However, competing demands for available resources mean that budgetary allocations for prisons are limited, resulting in an inability to meet minimum basic international standards.

Most inmates eventually get released and those infected represent a serious risk to their families and communities as they are reservoirs for further spread in the general population. As such, urgent and sustained action is needed at all levels to increase access to HIV prevention and treatment services across Africa.

One of these interventions would be to address the issue of HIV and other blood/sexually transmitted infections in the prison system. Firstly, there is need for more research, as the paucity of accurate data impedes proper appraisal of the impact of the prison population on the dynamics of the HIV/AIDS epidemic in Africa (UNAIDS, 2005).

Kenya Prison Service

In 1911, the Kenya Prison Service was established under the Ministry of Home Affairs, Heritage and Sports. In 1917, the posts of commissioner of prisons and assistant commissioner

of prisons were created, and the control and management of prisons became the sole responsibility of the commissioner of prisons. The 94 correctional institutions in Kenya include 91 prisons, two borstals and one youth corrective training center. In 1911, a total of 319 staff supervised 6,559 inmates. Currently, Kenya has a prison staff establishment estimated at 18,604 staff members of whom 17,943 are uniformed officers and 661 civilian posts. The prison population is estimated to be around 50,000 inmates at any given time (KPS, 2009).

The International Centre for Prison Studies report indicates that prisons are perennially overcrowded. For instance in July 2006, there were 47,036 sentenced and remand inmates incarcerated in facilities designed to hold 16,886 all over Kenya. More than 45 percent of the total prison population is pre-trial or remand detainees; 4 percent are female; 1.4 percent is juveniles/minors; and 0.1% is foreigners (Prison Brief for Kenya, 2007).

CHAPTER 2: LITERATURE REVIEW

2.1 Prisons and HIV/AIDS

The HIV/AIDS epidemic presents a major challenge to prison populations across the world. HIV prevalence within prisons is often far higher than in the general community, and prisons are a high-risk environment for HIV transmission. However, when it comes to tackling the epidemic, prisoners are often neglected and overlooked (UNAIDS, 2005).

Prevention programs that have been shown to reduce HIV transmission are rarely available for inmates, and many prisoners with HIV are unable to access life-saving antiretroviral treatment. In many parts of the world prison conditions are far from satisfactory and HIV positive inmates barely receive the most basic healthcare and food. When it comes to HIV testing, some prison authorities enforce mandatory testing, which is often seen as a breach of human rights (WHO, 2005).

These challenges are not confined to male prisoners; due to the high proportion of injecting drug users within prisons, female inmates have also been severely affected by HIV/AIDS.

2.2 HIV prevalence in prisons around the world

Prisons are a high-risk environment for HIV transmission. The number of prisoners living with HIV varies between countries and America has the highest prison population in the world, around 1.7% of whom is HIV positive (US DJ, 2007). Although this figure has declined, the HIV prevalence is still higher for incarcerated populations than for the general

population (USDJ, 2007). It has been estimated that around a quarter of people living with HIV/AIDS in America pass through the correctional system (Springer et al. 2005).

Studies from prisons in Brazil and Argentina reveal a particularly high HIV prevalence – ranging from 3.2 to 20% in Brazil and 4 to 10% in Argentina (WHO, 2007). The prevalence rates for some sub-Saharan African countries are also high; an estimated 41.4% of incarcerated people in South Africa are infected with HIV (Dolan et al. 2007). Generally, the HIV prevalence in the country reflects the prevalence in prisons. So while South Africa has a high percentage of HIV positive inmates, the HIV prevalence in the general population is also high, at an estimated 18.1% (WHO, 2008).

In Europe, many of the eastern countries have a high HIV prevalence among the prison population. Russia for example, has an estimated prevalence of 4.5% in prisons and in 2002 Estonia reported 12% prevalence. In comparison, the last study in England and Wales in 1997-1998 revealed a much lower prevalence of 0.3% among men and 1% among women (Weild et al. 2000).

2.3 Factors associated with higher HIV prevalence in prisons

Prisons are risk laden environments. Andrus et al (1989) documented risk histories among newly incarcerated prisoners as part of an HIV testing program in Oregon in the United States of America. Available evidence strongly suggests that risks are brought into and occur in prisons. Studies done in British Prisons thoroughly described sexual, drug using and tattooing risks that occur there (Turnball et al. 1991).

Other studies have also described prison drug use and sexual activity recalled by prisoners after their release. Study by Muller identified needle sharing in prison as the "most important risk factor for HIV Infection" (Muller et al. 1995)

Injecting drug use and incarceration are closely linked and many injecting drug users (IDUs) pass through the correctional system because of drug-related offences. As IDUs are at a greater risk of HIV infection there tends to be an over-representation of HIV infected IDUs among incarcerated populations. This poses a greater risk of HIV transmission within prisons, which is compounded by a lack of HIV preventative measures.

2.4 HIV Transmission in Prison

As it is difficult for researchers to gain access to prisoners, there are few documented cases of HIV transmission within prisons (Dolan, 2007). However, this does not mean that HIV is not a significant risk to prisoners. "Prison conditions are often ideal breeding grounds for onward transmission of HIV infection. Prisons are frequently overcrowded and commonly operate in an atmosphere of violence and fear. It has been demonstrated that tensions abound, including sexual tensions. Research has shown that release from these tensions, and from the boredom of prison life, is often found in the consumption of drugs and or in sex" (*UNAIDS,* 1997).

Although this view from UNAIDS refers to prisons in the 1990s, it still applies to many prisons across the world today. Injecting drug use, high-risk sexual behavior, and tattooing are common within prisons, each posing a risk of HIV transmission.

A). Injecting drug use

The use of contaminated injecting paraphernalia when using drugs is an effective route of HIV transmission. Outside sub-Saharan Africa, injecting drug use accounts for just under a third of infections. The estimated percentage of inmates who inject drugs ranges between 0 and 30% (Jurgen, 2007).

It has been shown that where there are high numbers of imprisoned injecting drug users, there is a higher risk of HIV transmission. Within prisons it is difficult to obtain clean injecting instruments as possessing a needle is often a punishable offence and therefore many people share instruments that have not been sterilized between uses. In a study of prisoners and HIV in England and Wales in 1997-1998, 75% of adult male IDUs and 69% of adult female IDUs had shared needles/syringes inside prison (Weild et al. 2000).

IDUs may be aware of the risks of HIV infection through sharing needles. However, if a clean needle is not available, many may still take the risk. A number of studies have found that IDUs are more likely to share injecting instruments within prison than before imprisonment. For instance, a study done in the Republic of Ireland showed that 70.5 percent of the IDUs surveyed reported sharing needles while imprisoned compared to 45.7 percent in the month before incarceration (Allwright, 2000). The proportions of offenders who continue to inject drugs within the prison seems to generally decrease but are more likely to share instruments and are less likely to clean them between uses (Mahon, 1996).

B). Sexual transmission

In many prisons both consensual and non-consensual sexual activities are common among inmates even though they may be forbidden under prison rules. It is difficult to determine to what extent such activities occur, as those involved risk punishment if exposed to fellow inmates or prison officers. Therefore the majority of incidences go unreported (WHO, 2007).

Several researchers have documented that high risk HIV transmission behaviors occur inside prison. Estimates of the proportion of inmates who indulge in homosexual sex while in prison range from 2% to 65% (Saum et al. 1995). The majority of the sexual contacts are likely to be of the unsafe variety, because few correctional facilities address the issue of intra-prison sex or distribution of condoms.

One of the primary routes of HIV transmission is through sexual intercourse. Although it is difficult to know to what extent HIV is transmitted in this way within prisons, a number of factors contribute to an increased risk:

Unavailability of condoms: Condoms, which can prevent HIV infection if used consistently and correctly, are often considered contraband within prisons (Hammet et al. 1998). A study of HIV transmission among male prisoners in Georgia, America, found that only 30 percent of those who reported any consensual sex used condoms or improvised condoms (USDJ, 2005).

Rape: The often violent nature of non-consensual sex can cause tearing and bleeding, which increases the risk of HIV transmission. Rape in prisons is rarely reported, but the WHO estimate that prevalence ranges from 0 to 16 percent. The taboo nature of rape in society and

prison makes estimating its prevalence problematic. However, it does occur and must be considered in any discussions on HIV transmission inside Prison (Zweig et al. 2007).

C). Tattooing

Although illegal in most prisons, tattooing is still commonplace among incarcerated people. It is usually associated with the desire to advertise a group or membership status, or results from peer pressure, or often just boredom. Those who perform the tattooing tend not to have proper, sterilized tattooing equipment, posing another risk of HIV transmission. However, there have been only a few reported cases of suspected transmission due to contaminated instruments (WHO, 2007).

A study in Canada estimated that 45% of inmates acquired a tattoo while in prison (correctional Service Canada, 1996). Needles that are used to make tattoos are difficult to obtain in correctional settings as a result; many prisoners are therefore forced to share tattooing equipment, thereby increasing their risk of contracting HIV (Mahon, 1996).

2.5 Response to HIV/AIDS in prisons

Despite the high risk of HIV transmission within prisons, HIV prevention programs are often not provided for inmates. Some fear that these programs will encourage illegal or undesirable behaviors. However, prisoners are entitled to the same human rights standards as non-incarcerated people and this includes protection from any communicable illness.

Most of the data on HIV prevention in prisons have been collected in developed countries, and are, strictly speaking, only valid for the countries where they were obtained. However, there is

no evidence indicating that interventions implemented in developing countries or in countries with economies in transition would yield different results. Interventions would have to be adapted to the specific cultural circumstances of each country in which they were implemented (WHO, 2004).

The following prevention initiatives have been tested within prisons and majority of times produced positive results.

A). Education

Educating people about HIV/AIDS can prevent new HIV infections, improve the quality of life of HIV positive people and help to reduce stigma and discrimination. It is usually considered an essential component of HIV prevention (Dolan et al. 2004). HIV education within prisons is one of the least controversial prevention methods in use. Due to the higher risk of HIV transmission within prison and subsequent transmission once released from prison, it is essential that inmates receive adequate information about HIV.

Many prisoners are from groups of society that are hard to reach for HIV prevention programs and so prison settings provide an ideal opportunity to target these groups. The WHO recommends:

"*Prisoners and prison staff should be informed about HIV/AIDS and about ways to prevent HIV transmission, with special reference to the likely risks of transmission within prison environments and to the needs of prisoners after release*" (WHO, 2003).

Across the world, inmates do not receive adequate level of HIV education. In the UK, over half of the prison healthcare managers in one study said they were dissatisfied with the educational HIV and hepatitis materials available to them and in a Californian prison, former prisoners reported that they received no HIV/AIDS education whilst incarcerated (USDJ, 2007).

Grinstead et al (1999) reported that peer education as an HIV prevention intervention works with a target audience that is culturally, geographically and linguistically diverse. This was found to be due in part to the observation that peer educators have the advantage of sharing the same environment as their target audience. Peer education has also been found to be cost effective.

However, information is not enough to reduce HIV transmission within prisons. The commodities needed to prevent HIV, such as condoms and clean needles, are often not available. Although education may provide inmates with the knowledge about HIV prevention, frequently the resources are not there for inmates to protect themselves. HIV education is only one part of HIV prevention and other supplementary methods are needed.

B). Harm reduction programs

Harm reduction programs aim to reduce the harm caused through injecting drug use without condoning or prohibiting drug use. These programs, which include needle exchanges, drug substitution therapy and bleach provision, are rarely used within prisons (WHO, 2005).

I. **Needle exchanges** provide access to clean syringes in order to reduce the frequency of injecting with contaminated equipment. The European department of the World Health Organization recommends that where resources are available, needle exchange programs should be introduced to prisons, regardless of the current HIV prevalence.

In 1992 Switzerland was the first country to distribute syringes to inmates through a prison doctor and today needle exchange programs operate in over 50 prisons worldwide (Jurgen, 2009).

II. **Providing IDUs with bleach** to clean injecting instruments is a strategy more commonly used in prisons. However, this prevention method is thought to be ineffective. The WHO suggests that bleach should only be used in community or correctional settings where needle exchanges are impossible to implement due to fear or hostility from community members or authorities (Kegg, 2007).

III. **Drug substitution therapy** is another harm reduction approach that is implemented both within the community and within prisons. The aim is to reduce heroin use by providing a substitute in the form of either methadone or buprenorphine. In England and Wales in 2005, maintenance therapy was used by 43% of prisons in the study sample (Weild, 2007). Within prisons that use the scheme, a growing body of evidence has shown a decline in the frequency of injecting among those taking methadone (WHO, 2007). In most developed countries some type of dependence treatment program is used, although a substantial proportion remains inadequate.

C) Condom distribution

The WHO suggests that all prisons implement condom distribution programs to prevent the sexual transmission of HIV and it also recommends provision of condoms and other safer sex measures for female prisoners due to the reported frequency of sexual activity among inmates and between prisoners and prison staff (WHO, 2007).

A study done in the U.S.A to determine the acceptability of condom availability in a U.S. jail, found condom access to be generally acceptable to both the inmates and the prison officers (May et al, 2002). In another survey of over 400 officers in Canada's federal prison system, 82% reported that condom availability had created no problems in their facilities (Expert Committee on AIDS and Prisons, 1994).

Many prisons do not provide condoms for inmates as sexual activities are usually forbidden in prisons, it is thought that providing condoms would condone such behavior and could lead to an increase in such activities.

However, most prison authorities in the UK only provide condoms when prescribed by a doctor and will refer to section 74 of the Sexual Offences Act 2003, which prohibits sexual activity in a 'public place'.

Some prisons do make condoms freely available through a dispensing machine usually placed in a discreet location. These schemes have generally been accepted by staff and inmates, and very few untoward security problems, such as drug smuggling, have been reported (WHO, 2007).

D) HIV testing in prisons

HIV testing is not only important for diagnosing those with HIV and offering them support, treatment and care, but it also provides an opportunity to identify those taking part in risky behaviors, and provides a chance to offer them information and advice.

The WHO recommends that prisons should provide easy access to voluntary HIV testing and counseling for inmates; this method has proven to increase testing uptake. Testing should be kept confidential, as those who test positive often face stigma if their status is revealed to inmates or staff (MacGowan et al. 2009). If testing is unavailable or testing programs are not properly carried out, there is a risk that prisoners infected with HIV will not be diagnosed until they develop symptoms. In two prisons in Bangkok, Thailand, the majority of the 112 prisoners diagnosed within prison were only diagnosed once they had developed an opportunistic infection (Wilson, 2007).

E) HIV treatment and care in prisons

Once a person has been diagnosed with HIV, at some point they will need antiretroviral drugs to delay onset of AIDS. In many countries access to these drugs is limited, and the situation can be far worse in prison. Malawi, for example, has recently scaled-up access to antiretroviral drugs for its large HIV positive population, but vulnerable and neglected populations, such as prison inmates, rarely receive the medication (Makombe, 2007).

In 2006 inmates in Westville prison went on a hunger strike demanding access to antiretroviral medication. Administrative obstacles meant that a number of HIV positive

prisoners had been denied the drugs, even though they were in urgent need of treatment (IRIN, 2006).

2.6 What needs to be done?

Even though a substantial body of evidence shows that HIV prevention measures i.e. Information, Education and counseling, Harm reduction through needle exchange programs, provision of bleach and drug substitution therapy and condom distribution effectively reduce HIV related risk-behaviors both within the general community and within prison populations, the majority of inmates do not have access to these programs. Recommended HIV testing guidelines are rarely followed, and poor prison conditions make it impossible to provide HIV positive prisoners with a reasonable standard of healthcare.

Without sufficient protection from HIV and adequate treatment and care, prisoners will continue to suffer from the devastating effects of the HIV/AIDS epidemic.

In recognition of the importance of evidence from research informing best practice in prison setting, policy, research and strategic information were identified as priority program areas in Kenya Prisons Service HIV/AIDS Program statement of works 2007/2008.

CHAPTER 3: STATEMENT OF RESEARCH PROBLEM

3.1 PROBLEM STATEMENT

The HIV epidemic has struck prisons and other places of detention around the world with particular severity. Penal institutions have grossly disproportionate rates of HIV infection and confirmed AIDS cases. International data show that HIV prevalence among prisoners is between six to fifty times higher than that of the general adult population. For example, in the USA the ratio is 6:1; in France it is 10:1; in Switzerland 27:1 and in Mauritius 50:1 (Goyer, 2003); in South Africa 2:1 and in Kenya 2:1 (NASCOP, 2006)

On a global scale, the prison population is growing rapidly, with high incarceration rates leading to overcrowding, which largely stems from national law and criminal justice policies (Walmsley, 2003). In most countries, overcrowding and poor physical conditions prevail. This phenomenon poses significant health concerns with regard to control of infectious diseases and HIV prevention and care most of all.

Prison populations are predominantly male and most prisons are male-only institutions, including the prison staff. In such a gender exclusive environment, male-to-male sexual activity (prisoner-to-prisoner and guard-to-prisoner) is frequent (Human Rights Watch, 2002). The actual number of instances is likely to be much higher than what is reported mainly due to continual denial, fear of being exposed or the criminalization of sodomy and homosexuality.

With regard to the gender ratio of those incarcerated throughout the world, according to recently available data, more than half a million women and girls are held in penal institutions

though there are significant variations across continents, with America and Asia showing the highest percentage of female prisoners in their total prison populations at over 5 per cent compared to Africa reporting the lowest overall rate at 2.2 per cent (Walmsley, 2005).

About 668,000 men and women are incarcerated in sub-Saharan Africa. South Africa has the highest prison population with 157,402 people behind bars in the region and 335 prisoners per 100,000 of the national population; it has the ninth largest prison population in the world. Rwanda has the second largest number of prisoners in the region, with 67,000 incarcerated persons (CDC, 2007). Ethiopia and Kenya also report significant prison populations ranging between 65,000 and 50,000 respectively. Many other African nations show high prison population rates, reporting between 120 and 169 incarcerated individuals per 100,000 persons. Overall, West African countries indicate the lowest prison population, with between 2,800 and 6,000 people in penal institutions (UNAIDS, 2008).

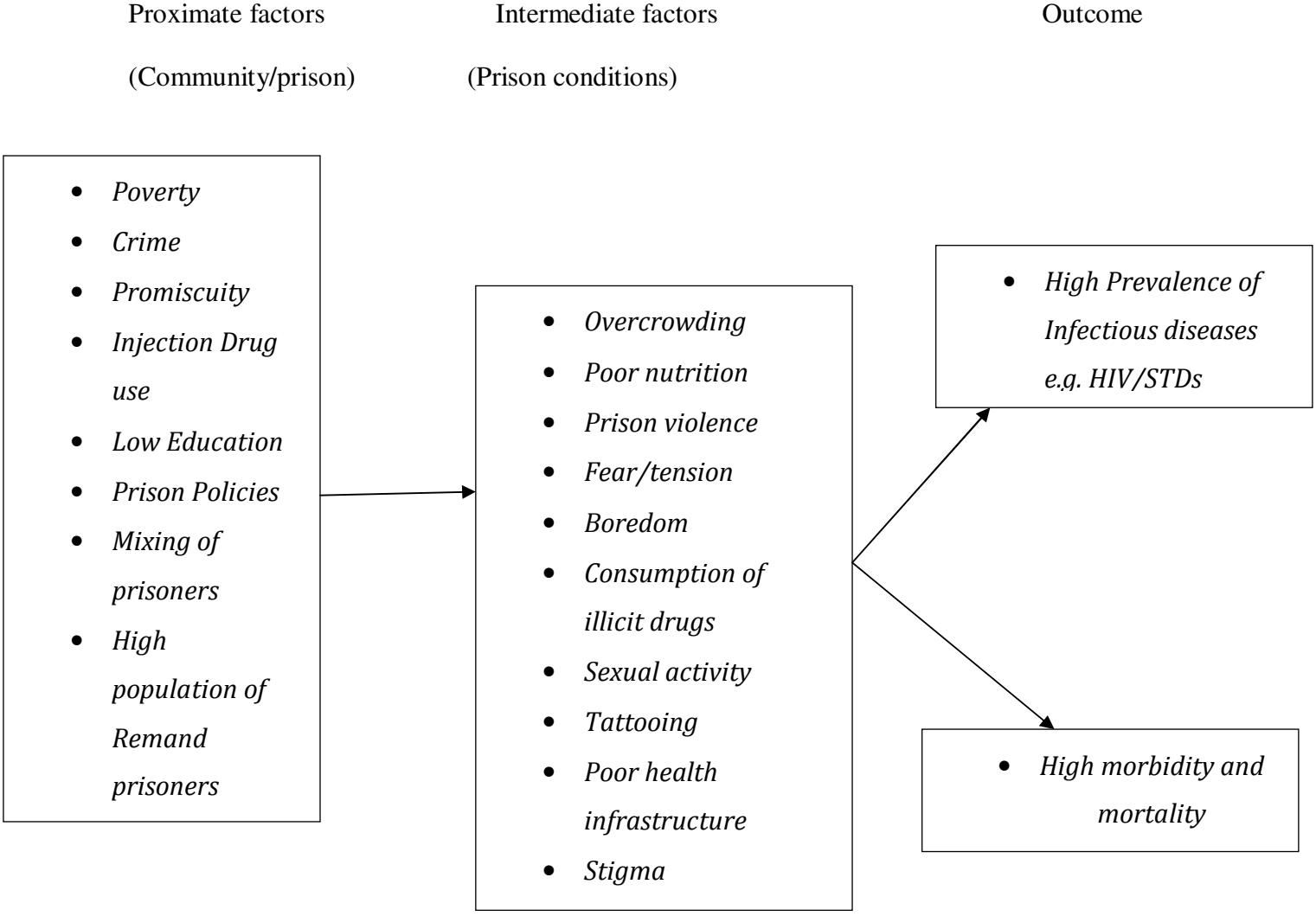
The Kenya Prison Service recognizes that sex between men occurs in prison even when prohibited and that there is absence of concrete information regarding prisoner HIV knowledge and risk behavior, routes of HIV transmission and drivers of vulnerability, and HIV prevalence in correctional facilities. This information is necessary to facilitate the design, implementation and monitoring of public health programs for the prevention, control and care of HIV infection and AIDS. These data is critical for developing prison specific interventions for prevention and Control of HIV and AIDS.

This study attempts to document risk taking behavior among prisoners and to recommend harm reducing services. It is the intention of the study to determine the risk factors for HIV infection among prison inmates and to estimate the HIV prevalence in the selected correctional facilities in Nairobi, Kenya.

3.2 CONCEPTUAL FRAMEWORK FOR HIV INFECTION IN PRISON

Prisoners are a vulnerable population as prisons have a high concentration of individuals who engage in risky behavior. Interventions in this setting have the potential to influence incarcerated populations, their families and partners, and the general public health.

Fig 1: CONCEPTUAL FRAMEWORK



3.3 JUSTIFICATION

In 2007, Kenya had an estimated prison population of about 49,000 in the 93 Correctional facilities with an estimated HIV prevalence of about 10% (NASCOP, 2008). There is high turnover and mobility rates among the prisoners where the average stay is short while the return rate is high (KPS, 2008).

International evidence suggests that most prisoners are eventually released into the general population and return to their communities. It has also been shown that if the prisoners contracted HIV, whether outside or inside the prison, they become potential links for transmitting HIV from and into the general population (Batterfield, 2003). Lack of knowledge and education among prisoners about the risks of contracting and transmitting HIV coupled with the absence of protective means and proper medical care increase their risks of HIV infection. The risk of infection is also increased for those in contact with members of prison populations such as prison staff and spouses or partners of prison inmates, and by extension, the broader population.

There is a considerable knowledge gap in understanding the magnitude of the HIV epidemic in prison communities and its multiplier effect on the non-prison population in the country. The patterns of sexual behavior of men and women prisoners, the nature of circumstances leading to high-risk sexual activity in prison environments, as well as the risky behaviors associated with the injection of drugs or tattooing, are largely unknown in Africa.

Most inmates eventually get released and those infected represent a serious risk to their families and communities as they are reservoirs for further spread of HIV in the general population. As such, urgent and sustained action is needed at all levels to increase access to HIV prevention and treatment services across Africa (UNAIDS 2007).

One of these interventions is to address the issue of HIV and other blood and sexually Transmitted infections in the prison system. Firstly, there is need for more information as the paucity of accurate data impedes proper appraisal of the impact of the prison population on the dynamics of the HIV/AIDS epidemic in Kenya. Secondly, there is a need to identify which policies and intervention programs will work in Kenyan prisons in the face of limited resources, legal restrictions and cultural norms. For example, condom distribution recommended by World Health Organization and UNAIDS remains highly controversial due to moral and legal barriers in many countries (Spielman et al, 2002).

3.4 STUDY OBJECTIVES

MAIN OBJECTIVE:

To determine the HIV sero-prevalence and the risk factors for HIV infection among incarcerated persons in Nairobi, Kenya

SPECIFIC OBJECTIVES:

1. To determine the Socio-demographic profiles of the study population before incarceration
2. To determine the knowledge, attitude and practices with regard to HIV/AIDS transmission and prevention
3. To document risk taking behavior among incarcerated populations
4. To determine the availability of harm reducing services within the correctional facilities
5. To determine the HIV sero-prevalence in the selected prisons.

CHAPTER 4: METHODOLOGY

4.1 STUDY DESIGN

A descriptive, Cross sectional Survey was conducted between March and April 2010 to determine the HIV sero-prevalence and risk factors for HIV infection in correctional facilities in Nairobi.

4.2 VARIABLES

Independent variables

1. Age
2. Sex
3. Marital status (pre -incarceration)
4. Occupation (Pre-incarceration)
5. Level of education
6. Duration of incarceration
7. HIV Sero-status

Dependent variables

1. Knowledge
2. Attitude
3. Practices related to HIV/AIDS

4.3 STUDY AREA

The study was conducted within the penal institutions in Nairobi province namely:

1. Nairobi Short Sentence Prison (Industrial area)
2. Nairobi West Prison
3. Langata Women's Prison
4. Kamiti Medium Prison

The above facilities were selected conveniently because they host a large population of short and medium term prisoners where as facilities hosting long term and capital offenders have been left out because they are not readily accessible due to the nature of security in those facilities.

Nairobi offers an ideal location for this study due to the High prevalence of HIV (9% KAIS 2007) compared to other provinces and also because of the high population of prisoners estimated at 9,153 as of February 2010, with 3659 men serving Long term sentences, 1618 serving short and medium term sentences, 3,133 males in remand custody and another 743 female prisoners serving different sentences (KPS, 2010).

Nairobi is the capital city of Kenya and therefore cosmopolitan with virtually every cultural group represented. It is home to some of the poorest sections of the population who are more predisposed to crime and subsequent incarceration.

4.4 STUDY POPULATION

The study was proposed to the entire population of prison inmates at the selected prison facilities. A detailed explanation of the purpose of the study was done at meetings organized specifically for that purpose in each of the participating prison facilities.

4.5 SAMPLING

The sampling frame included all prisoners serving short to medium term sentences in the four selected prisons in Nairobi (Males = 1,618 and Females = 743)

Sample size: The sample size was determined using the epidemiological method for Prevalence studies. The following simple formula (Dobson, 1984) was used:

$$n = \frac{Z^2 \times p(1-P)}{d^2}$$

Where n = sample size,
Z = Z statistic for a level of confidence,
P = expected prevalence of HIV among prisoners (P =0.5)
d = degree of precision 5% (in proportion of one =0.05).

Z statistic (Z): For the level of confidence of 95%, which is conventional, Z value is 1.96. In these studies, investigators present their results with 95% confidence intervals (CI).

By substitution, therefore

$$N = \frac{1.96^2 \times 0.5(0.5)}{0.05^2} = 385 \text{ Respondents}$$

Sampling Procedure

Following preliminary enquiries with the Kenya Prisons Service Headquarters, the researcher established the locations of the different penal institutions Within Nairobi area and the average numbers of prisoners in each facility.

The numbers of respondents recruited per prison facility were as indicated below:

1. Nairobi Short Sentence Prison (Industrial area) (n=110)
2. Nairobi West Prison (n=105)
3. Langata Women Prison(n=51)
4. Kamiti Medium Prison(n=123)

The number of respondents in each of the four facilities was allocated proportionately using the estimates of Prisoners on short and medium term sentences (Males = 1,618 and Females = 743 at the time of data collection). The study subjects were randomly selected using computer

generated random numbers. Following the selection, the subjects were referred to trained enumerators who conducted the interviews using semi-structured questionnaires. Thereafter the study participants underwent pre-test counseling for HIV testing and those who consented had a rapid HIV test and received post test counseling.

Inclusion criteria

a) Male and female prisoners aged 18 years and above
b) Convicted inmates
c) Inmates serving short to medium term sentences.
d) Informed consent

Exclusion criteria

a) Any prisoner under 18 years of age
b) Remand prisoners
c) Prisoners serving long sentences
d) Those who declined to participate
e) Sick prisoners admitted within facility or other hospitals

4.6 DATA COLLECTION PROCEDURES

4.6.1 Recruitment and training of interviewers

Four enumerators were recruited and trained on the objectives of the study and the data collection tools. A pilot study was carried out in February, 2010 at Shimo La Tewa prison in Mombasa on 140 respondents to test the study tools. Following the pilot study, the study instrument was adjusted accordingly before the definitive study.

4.6.2 Serological testing (screening)

The study hired 4 certified staff for the purpose of HIV testing and counseling.

The Universal Opt-out screening method was applied in the study and the HIV Prevalence was determined through a single cross-section, i.e. through a onetime screening of the inmate population for the presence of HIV antibodies. Prevalence was calculated as:

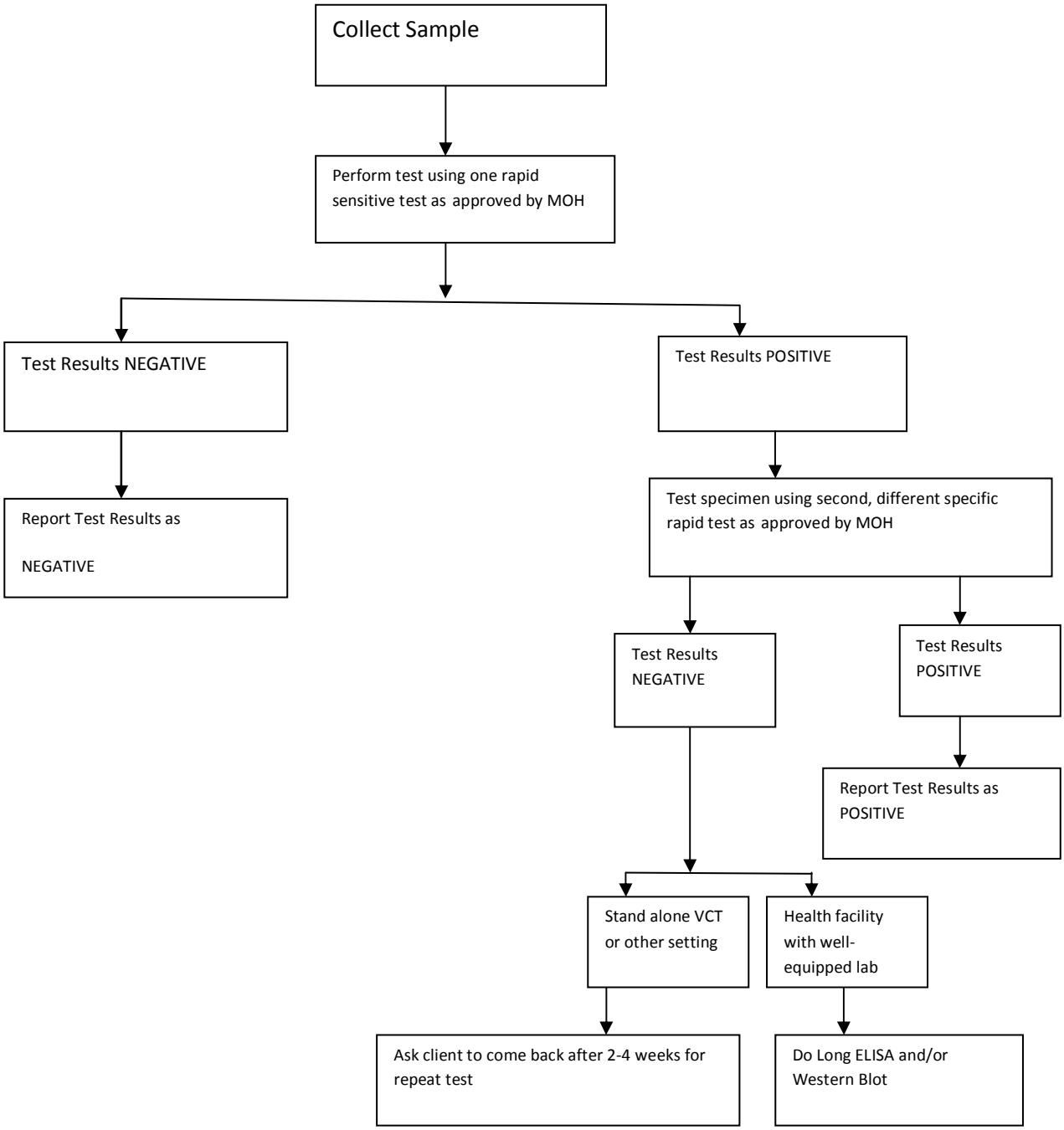
$$Prevalence = \frac{number\ of\ individuals\ with\ HIV\ (Positive\ \ specimens)}{Population\ size\ (Sample\ size)} \times 100$$

Licensed rapid tests were done on the spot by qualified HTC service providers and all HIV positive test results were confirmed by at least one other test. The Serial testing algorithm was followed in this study and the tests were done in order specified by NASCOP (Figure 2).

The approved Rapid Test kits used were:

1. Determine HIV1/2^{TM} rapid test kit (Abbot Laboratories) with Sensitivity of 100% and Specificity of 99% (Van den Berk et al, 2003)
2. Bioline HIV 1/2^{TM} rapid test kit (Standard Diagnostics, Kyonggi – do, Korea) with Sensitivity of 100% and Specificity of 99.8% (Kannangai et al, 2003)

Figure 2: Serial algorithm for rapid HIV Testing



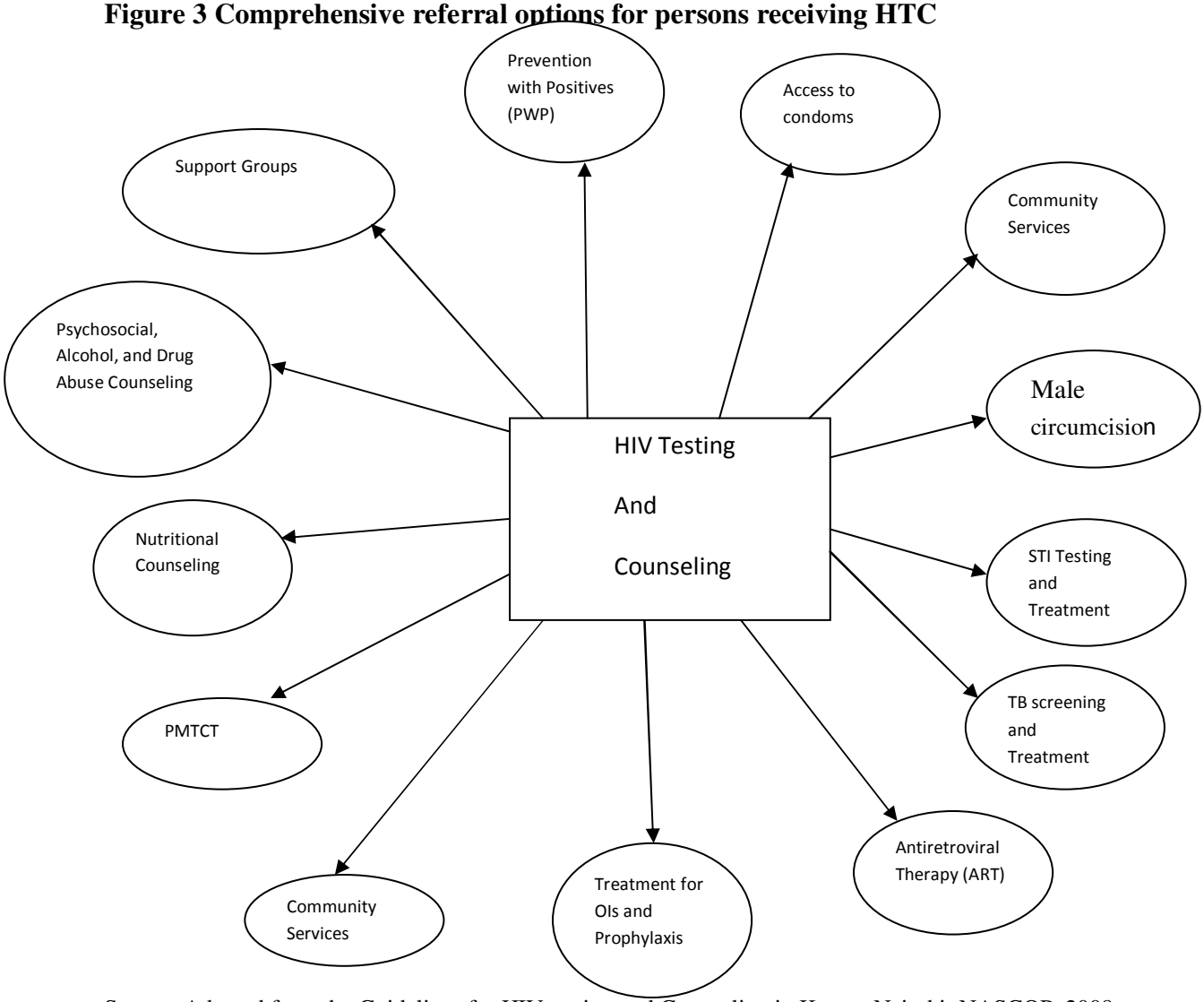
Source: Adapted from Guidelines for HIV Testing and Counseling in Kenya. Nairobi: NASCOP, 2008.

In the event of discrepant test results, the study participant was advised to return for another test in 2-4 weeks to determine their true HIV status (at facility VCT center).

4.6.3 Post-Test Counseling

Following the completion of the HIV test, the HTC personnel offered Post-test counseling to the study participants based on the results (Figure 3). Risk reduction information and emotional support were provided at this time based on the individual's personal risk factors, and referrals to appropriate follow-up services were given using standard referral forms.

Figure 3 Comprehensive referral options for persons receiving HTC



Source: Adapted from the Guidelines for HIV testing and Counseling in Kenya. Nairobi: NASCOP, 2008

4.7 DATA PROCESSING AND ANALYSIS

4.7.1 Quantitative data analysis

The completed questionnaires were checked daily to ensure each question had been filled correctly and that no data were missing. The questionnaires were then numbered and coded for ease of handling.

Data from the structured questionnaires were entered, checked, cleaned and analyzed using SPSS version 14.0. Summary statistics were then generated using frequency and contingency tables. A p-value less than .05 denoted statistical significance for chi-square tests.

The data collected from the different facilities were treated as one simple random sample during the analysis.

4.7.2 Serologic test results

The data collected from the screening tests was analyzed according to sex, age and duration of incarceration for each submitted sample.

4.8 Minimization of Biases

The investigator was responsible for the overall co-ordination and conduct of the research. The interviewers were given a brief overview of the study and trained on the interviewing techniques, logistics and accurate recording of data into the questionnaires before the commencement of the study; Standardized questionnaires were used and all of them reviewed with the research assistants at the end of each day and any necessary corrections were made at the earliest opportunity. Probability sampling was used to generate a representative sample and to minimize on selection bias. The data collection tool was also pretested prior to the definitive study.

4.9 ETHICAL CONSIDERATIONS

The study has potential for significant ethical issues as prisoners are a vulnerable population subject to abuse and exploitation. Indeed, several subclasses of prisoners make up some of society's most vulnerable populations as they comprise of persons with mental disabilities, racial minorities, women, and people with diseases (addiction, hepatitis, HIV, hypertension, diabetes) that may or may not be treated during imprisonment.

It is clear that prisoners have severely restricted autonomy; thus, this study required special attention as prisoners had to be protected from the risk of coercion, undue inducement, and exploitation. For these reasons, the study was approached with caution as follows:

1. Approval to carry out the study was obtained from the Kenyatta National Hospital and University of Nairobi Ethics and Research committee.
2. Authority was obtained from the Kenya Prisons Service, Directorate of Health to access the facilities and collect data.
3. The value of the study was well explained to all respondents and informed consent was obtained from willing participants in the study.
4. Participants were provided with pretest counseling prior to collection of the blood specimens and post test counseling was provided following the HIV test. Those who tested positive were linked to comprehensive care centers using standard referral forms.
5. No prison officer was involved in the process. The study was conducted in a confidential manner and unique generated identifiers were used to link questionnaires and HIV test results. This information was only available to the principal investigator.

6. Confidentiality and anonymity was maintained during data collection, storage, analysis and presentation of data.

4.10 STUDY LIMITATIONS

The study limitations include reliance on self reported data. The questions asked were of a personal nature (e.g. sexual activity) and the responses were more likely to be distorted by embarrassment or fear of reprisal. Sex is prohibited in most prison systems, leading inmates to deny their involvement in sexual activity as it is characterized by violence or intimidation. Other limitations of the study were:

- The female prisoners were housed as one homogenous group hence some long sentence prisoners participated in the study.
- Access to the prisoners was only granted for the short and medium sentence facilities and therefore all the maximum security prisons did not participate in the study.
- HIV sero-status of prisoners prior to incarceration was unknown hence the HIV prevalence found in the study could not be attributed entirely to the behavior in the prison.
- This was a cross sectional descriptive study and as such did not allow for examination of the direction of effects.
- Quantitative data collection methods were used and some additional information to enrich the study may have been missed out.

CHAPTER 5: RESULTS

This chapter presents the results of the study on HIV sero-prevalence and risk factors for HIV infection Among Prison inmates in Nairobi, Kenya. Of the 399 inmates who answered the questionnaire and signed a free informed consent form, 389 provided a blood sample and effectively participated in the study. Ten inmates declined the HIV test.

5.1 Socio-demographic Profile of the Study Population

This study was conducted among persons drawn from the prison population in Nairobi. The study sample was drawn from four prison facilities and respondents who participated in this study were those who had given informed consent as per the research protocols. Three of the prison facilities were for male inmates while one was for female inmates. The composition of selected respondents, by prison facility, is shown in Table 1:

Table 1: Distribution of respondents by prison facility

Name of prison	Number of respondents (n)	Percentage (%)
Kamiti Medium	123	31.6
Nairobi Short Sentence (SS)	110	28.3
Nairobi West	105	27.0
Langata Women	51	13.1
Total	**389**	**100.0**

Of the respondents sampled, males were 338, representing 86.9% of the respondents while female respondents accounted for the rest (n = 51), representing 13.1%.

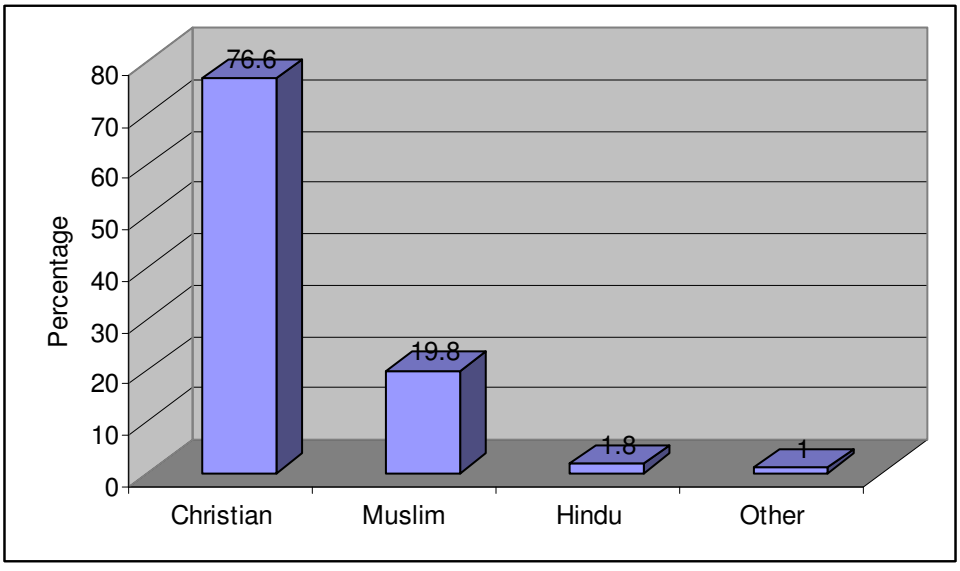
The age of the respondents was spread between 18 and over 55 years with a mean of 30.2 years and a median of 28.0 years. Table 2 shows the distribution of respondents by age:

Table 2: Distribution of respondents by age

Age category(years)	Number of respondents (n)	Percentage (%)
18 to 24	97	24.9
25 to 34	196	50.4
35 to 44	60	15.4
45 to 54	28	7.2
55 and above	8	2.1
Total	**389**	**100.0**

The composition of respondents by religion is shown in Figure 4:

Figure 4: Composition of respondents by religion



Respondents who described themselves as Christians accounted for slightly more than three-quarters (76.6%) of the total in the sample. Muslims comprised 19.8% while Hindus and those professing other religions were a small minority (1.8% and 1.0%, respectively).

Table 3: Composition of respondents by Level of Education

Highest education level	**Number of respondents (n)**	**Percentage (%)**
None	21	5.4
Primary	199	51.2
Secondary	132	33.9
Post secondary	37	9.5
Total	**389**	**100.0**

Analysis of respondents' educational qualifications (Table 3) shows that slightly over half (51.2%) had achieved primary level of education, a third (33.9%) secondary school level of education, while 9.5% had post secondary education. A small percentage (5.4%) had not acquired any formal education.

Table 4: Distribution of respondents by Pre-incarceration Marital status

Marital status	Number of respondents (n)	Percentage (%)
Never married/Single	64	16.3
Steady partner, not living together	90	23.1
Steady partner, living together	32	8.2
Married, monogamous	159	40.9
Married, polygamous	13	3.3
Widowed/divorced/separated	31	8.0
Total	**389**	**100.0**

Information on respondents' marital status shows that 40.9% were married (monogamous), 3.3% were married (polygamous) while 8.0% were widowed, divorced, or separated. About one quarter (23.1%) had a steady partner but were not living together, 8.2% had a steady partner and living together, while 16.3% had not married.

The employment status of the respondents prior to incarceration shows that about one-third were in paid employment; about two-fifths were in self-employment while students and those unemployed were about One-fifth of the total sample. This information is shown in Table 5.

Table 5: Employment status of respondents prior to incarceration

Nature of employment	Number of respondents (n)	Percentage (%)
Student	34	8.7
Unemployed	55	14.1
Paid employee	124	31.9
Self-employed	164	42.2
Other employment	6	1.5
Uncategorized	6	1.5
Total	**389**	**100.0**

5.2 Prison Profile

Most respondents (73.0%) were serving their first time in prison. Repeat offenders comprised 21.3%. The average number of times respondents had been in prison was 2.23 with a standard deviation, *s* of 1.02 times. This gives a coefficient of variation of 45.78% and shows a moderate variability in prison turnover. Table 6 shows the duration of incarceration:

Table 6: Duration of incarceration of respondents

Duration (years)	Number of respondents (n)	Percentage (%)
0 up to 1	269	69.0
2 up to 3	73	18.8
3 and above	47	12.1
Total	**389**	**100.0**

There was significant correlation between the age of the respondent and the number of years already spent in prison (r = 0.203, *p*-value = 0.000) and also between length of sentence and age of the respondent age (r = 0.183, *p*-value = 0.000).

The representation of respondents by offences is shown as follows: robbery (5.7%), theft (27.5%), sexual offences (1.0%), drug trafficking (10.3%), assault (5.4%), and murder (1.8%). Other offences (including child theft, loitering, and miscellaneous offences) accounted for 48.1% of the total. Thus, miscellaneous offences accounted for most of the prison sentences.

5.3 Respondents' Knowledge of HIV/AIDS

Most respondents (97.4%) had heard about HIV and a large percentage (81.2%) reported that they knew someone who had HIV and these were listed as parent, brother or sister, spouse, friend or neighbor, as shown in Table 7:

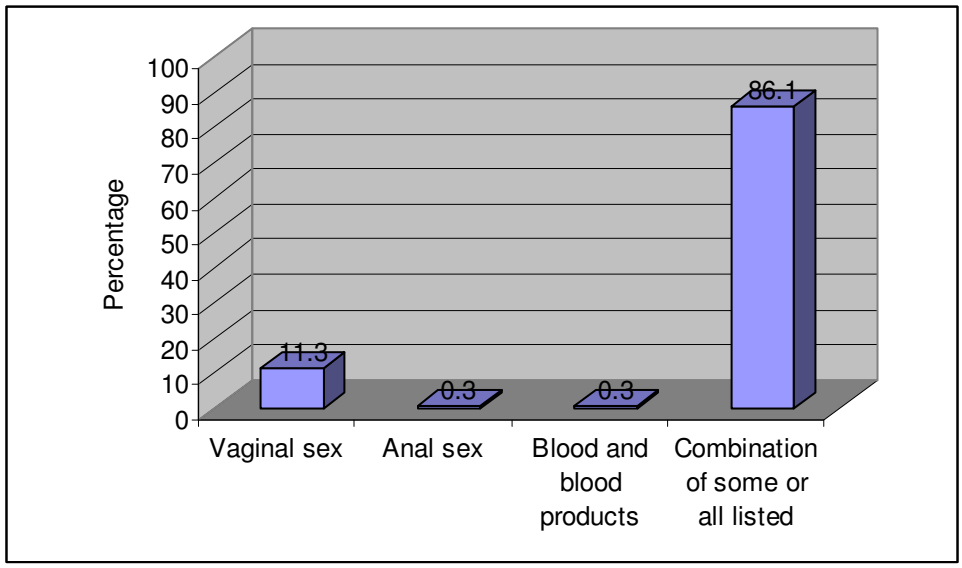
Table 7: Nature of respondent's relationship with person who had HIV

Nature of relationship	Number of respondents (n)	Percentage (%)
Parent	6	1.5
Brother or sister	24	6.2
Spouse	4	1.0
Friend or neighbour	232	59.6
Combination of above	23	5.9
Other relationships	26	6.7
Uncategorized	74	19.0
Total	**389**	**100**

From Table 7, friends and neighbors were more likely to be identified as persons with HIV than any other category of persons. The study found that respondents were 1.5 times more likely to know someone with HIV in the general population outside prison than in prison. Thus, whereas 81.2% of respondents knew of someone in the general population who had HIV, only 51.2% reported knowing such a person within the prison facility. The percentage of respondents who knew someone who had died of HIV in prison was even smaller (18.3%).

The study found a widespread knowledge of how HIV is transmitted. Respondents listed most of the common ways in which transmission occurs and also demonstrated their knowledge of multiple transmission modes as shown in Figure 5:

Figure 5: Respondents' knowledge of HIV transmission mode



Respondents also demonstrated valid knowledge of how HIV/AIDS transmission can be reduced. They listed most of the generally accepted ways and indicated that a combination of

these methods was preferable. The respondents listed the ways by which transmission can be reduced as shown in Table 8.

Table 8: How HIV/AIDS transmission can be reduced

Method of reducing transmission	**Number of respondents (n)**	**Percentage (%)**
Abstinence	13	3.3
Using condoms	101	26.0
Having one faithful partner	12	3.1
Disclosing HIV status to partner	5	1.3
Most or all of above	250	64.3
Uncategorized	8	2.1
Total	**389**	**100.0**

There was a large difference between respondents' perception of the risk of contracting HIV before prison compared to the risk in prison. The risk of HIV infection was perceived to be four times higher before prison (that is, outside prison) than in prison. Thus, whereas 43.2 % (168) of respondents considered the risk of contracting HIV high or very high before prison, only 11.1% (43) considered the risk to be high or very high in prison. This is shown in Figure 6:

Figure 6: Comparative perception of HIV risk before prison and inside prison (N=389)

Respondents attributed their high risk disposition to HIV infection before prison to the fact that they never used condoms (1.3%), had more than one sex partners (20.1%), their sex partner had other partners (2.6%), and to a combination of some or all of these factors (18.5%). Persons who rated their chances of contracting HIV before prison as low reported that they were not having sex (9.0%), used condoms (4.6%), had only one partner (27.0%), or had only a limited number of partners (2.6%).

From Figure 6, most respondents (85.6%) rated their chance of contracting HIV in prison as low or very low. Reasons given for this were: respondent was not having sex (72.5%), used condoms (0.5%), and had only one partner (2.1%). Those who rated their chances of contracting HIV in prison as high gave the following reasons: engaged in sex with men (2.3%) and, shared syringes with colleagues (1.3%).

A large percentage of respondents (69.7%) reported that they knew of sexual practices that took place in prison and a similar percentage (69.4%) also acknowledged that HIV transmission takes place in prison. Inmates proposed the following ways to reduce HIV transmission: provision of information, education, and counseling (33.7%), provision of a new blade to each inmate for shaving (14.7%), provision of conjugal rights (7.2%), provision of condoms (4.1%) and HIV testing (2.3%). Other respondents (21.1%) favored a combination of the listed methods.

5.4 HIV Risk related Behavior and Practice

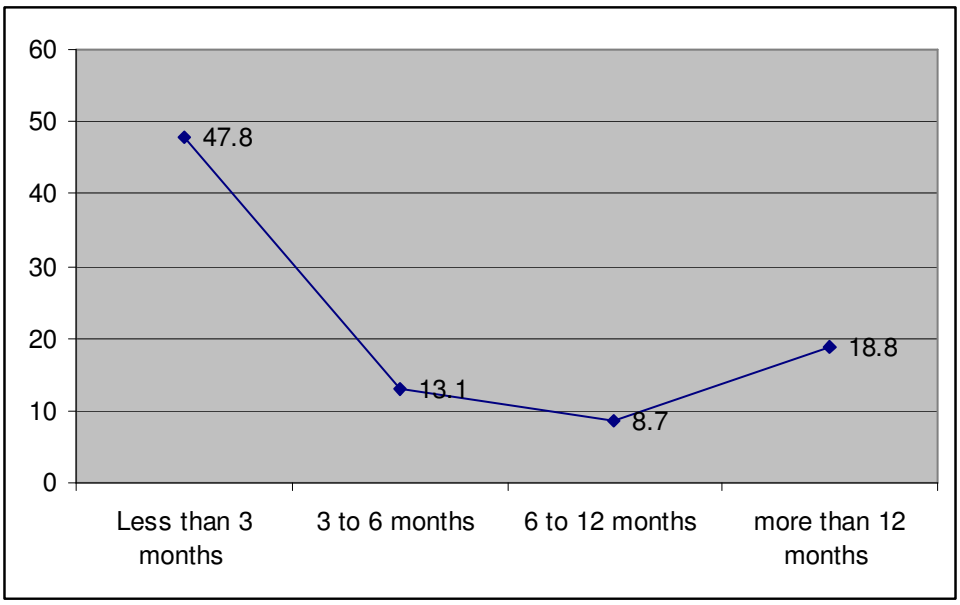
5.4.1 Sexual Practices

Most respondents 96.1% (373) had engaged in sexual activity prior to incarceration. Of these, majority (82.8%) were insertive partners (heterosexual intercourse) while the rest (12.3%) were recipient partners (predominantly females in heterosexual relationships). Most respondents had history of multiple sexual partners with the mean number of partners being 5.43 (and standard deviation, s = 19.90). This indicates that the bulk of the respondents were high risk for contracting HIV. Persons who described themselves as paid employees had the most number of multiple partners followed by self employed persons. Students and unemployed persons had the least number of multiple partners. Only a small percentage of inmates (2.6%) reported engaging in sexual activity within prison while the majority (92.0%) reported that they did not.

Respondents' sexual activity before prison was mainly consensual 93.3% (363). There was, however, a small percentage who reported incidences of rape (1.3%) or favor-driven sex

(0.5%). The period within which respondents had had sex prior to imprisonment varied from less than three months to more than twelve months and was defined mainly by the period the respondent had served in prison as at the time of this research. This information is shown in Figure 7:

Figure 7: Trend of respondents' sexual activity prior to imprisonment (N=389)



From Figure 7, the highest proportion of respondents (47.8%) had had sex less than three months preceding the study while the lowest proportion (8.7%) were those who reported sexual activity in the period of six to twelve months preceding the study. These results are typical given that most of the respondents had spent a relatively short time in prison (median = 1.82 years). Many respondents, in addition, were serving a relatively short sentence. About one-half of the respondents or 48.2% were serving a sentence of one year. About three quarters (or 73.5%) were serving a term of between one and three years. Further, only a few of the respondents (5.4%) had had new sex partners in the preceding three months while

majority (72.5%) had not. Of the new sex partners in the preceding three months, 23.9% were opposite sex partners while only 3.3% were same sex partners.

The nature of sexual activity in prison (for the few cases that were reported) was distributed as follows: consensual (1.8%), rape (0.3%), and other (2.6%). In addition 0.8% reported sexual intercourse with members of the opposite sex while 2.1% reported same sex intercourse. The study therefore finds evidence of underreporting of sexual activity. Whereas only 2.6% of respondents indicated that they had had sex in prison, a much larger percentage (69.7%) reported that they were aware of sexual activity within the prison facility. This implies that for every case of sexual activity reported; about 27 others were not reported.

The percentage of respondents who reported transactional sex was higher before prison (36.0%) compared to that in prison (2.3%). The frequency with which paid for sex was secured before prison was also higher compared to that in prison as shown in Figure 8.

Figure 8: Comparative frequencies of transactional sex before prison and in prison

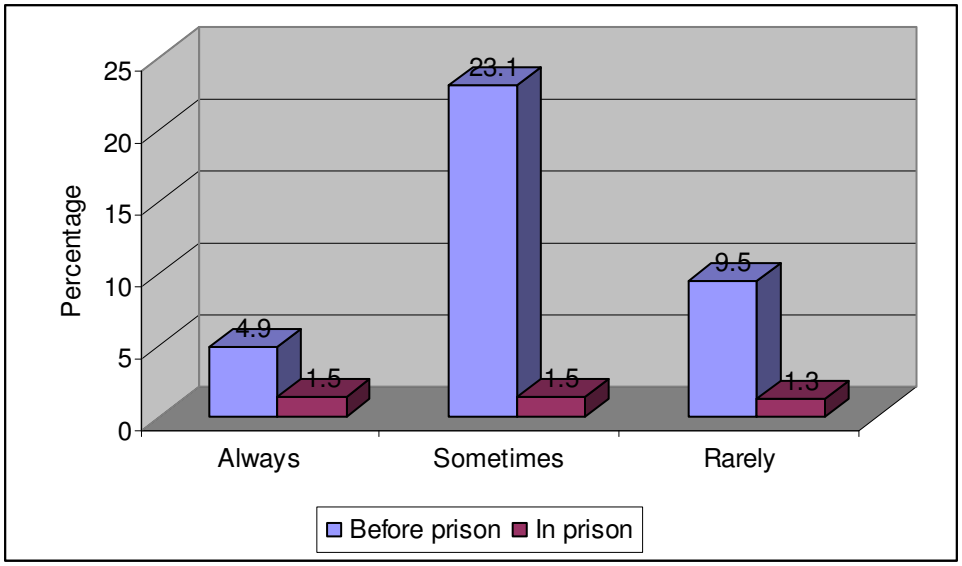
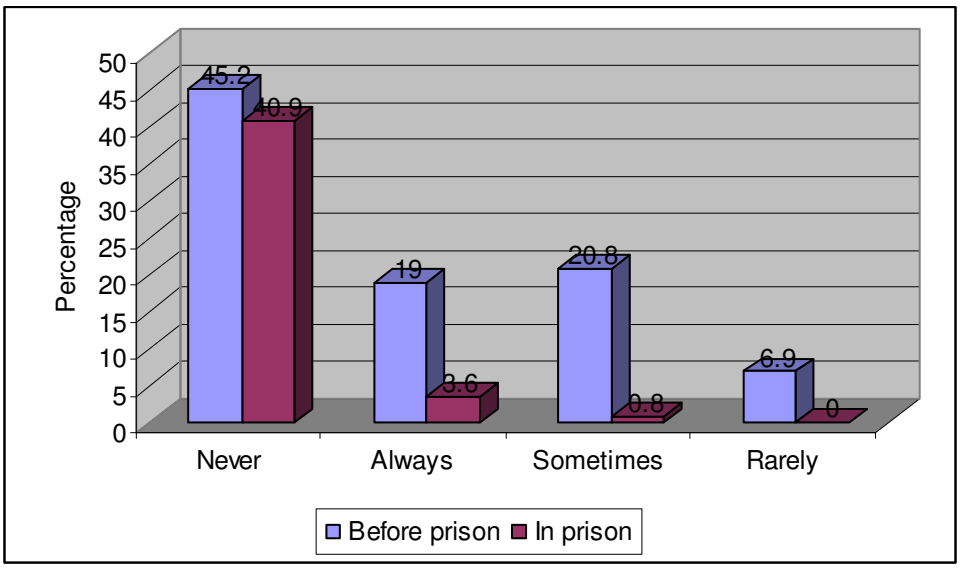


Figure 8 shows that transactional sex was about five times secured on a "sometimes" basis compared to an "always" basis for before prison. The study, however, did not find any significant statistical difference between HIV prevalence and sexual activity procured on a paid-for basis (*p*-value = 0.842).

The study shows low usage of condoms before prison and within prison (for those who reported engaging in sex). Almost half of respondents (45.2%) reported that they never used these devices before prison (n=169) while an almost similar percentage (40.9%) reported that they never used condoms in prison (n=4). The frequency of condom use before prison and in prison is shown in Figure 9.

Figure 9: Frequency of condom use before prison and in prison



When respondents were asked if condoms should be provided in prison, majority (71.7%) said that these should not be provided. Only a small percentage (16.5%) wanted condoms provided. About one quarter of respondents (23.7%) reported that they had contracted a sexually transmitted disease (STD) before coming to prison and only 3.1% contracted the STD in prison. Both groups of respondents, that is, the before-prison and in-prison, who had contracted a sexually transmitted disease, reported that they sought treatment for their condition.

5.4.2 Drug Use

The study found that drug use among respondents was high. Almost one-half 48.3% (188) reported that they had used drugs (such as bhang) before coming to prison. Drug use in prison was also high as one-fifth of respondents 21.1% (82) continued to have access to these drugs. Bhang was the single most common drug used in both situations as shown in Table 9:

Table 9: Drug use among respondents before prison and in prison

Drug description	Before prison		In prison	
	Number using(n)	Percentage (%)	Number using(n)	Percentage (%)
Bhang	107	27.5	33	8.5
Mandrax	9	2.3	9	2.3
Valium	1	0.3	2	0.5
Other drugs	49	12.6	38	9.8
Combination	14	3.6	2	0.5
Not used drugs	209	53.7	305	78.4
Total	**389**	**100.0**	**389**	**100.0**

Table 9 shows that though consumption of bhang (marijuana) declined in prison, the other drugs continued to be available to almost the same extent as before prison. It is also shown that the percentage of persons who did not use drugs increased by 24.7% in prison. This rise in non-use of drugs may be attributed to the strict prison regulations where drug use is prohibited.

Most respondents reported that they used drugs orally or by means of smoking. Only a few respondents (3.1%) injected themselves. The frequency of injection drug use before prison was also limited with the percentages for always, sometimes, and rarely being 1.5%, 2.6%, and 0.5% respectively.

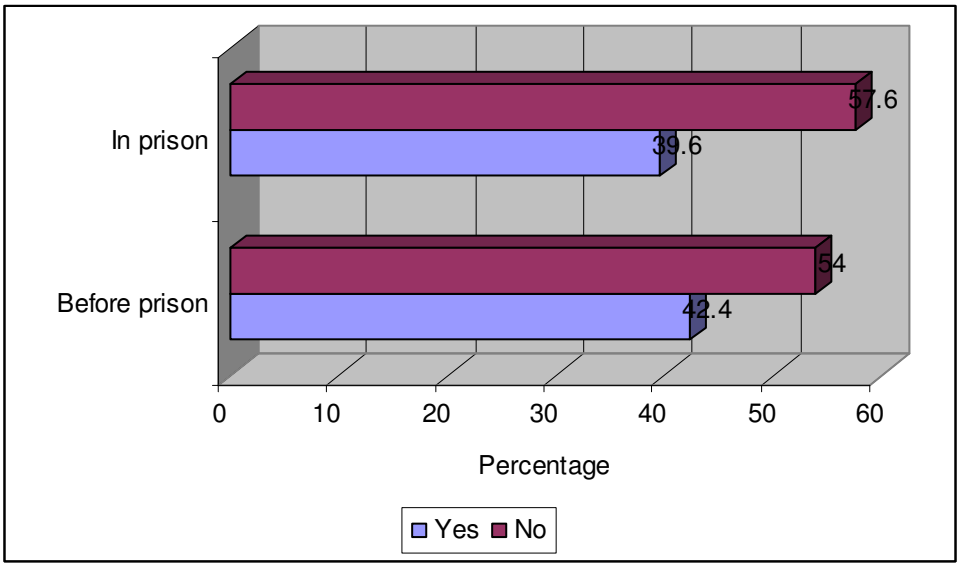
Use of "used" syringes was also found to be low both before prison and in prison. The comparative use before prison and in prison was 2.1% and 0.3% respectively. Sharing of syringes was also very limited with only 0.8% sharing before prison and 0.5% sharing in

prison. The presence of tattoos was also limited with 9.5% of respondents reporting having had a tattoo before prison and only 1.3% having one made in prison. The mean number of tattoos made before prison was 1.59 while those made in prison was1.00.

5.5 HIV Testing

Some respondents reported that they had been tested for HIV before coming to prison. While some respondents reported that they tested for HIV at prison, others said that they tested for HIV in both places, that is, outside prison and while in prison. Figure 10 shows the comparative percentages for HIV testing before prison and testing in prison.

Figure 10: HIV testing for before prison and in prison (N=389)



From Figure 10, the general before-prison and in-prison HIV testing level was about the same. However, further analysis of testing on the basis of sex of respondents showed that females were more likely to have been tested for HIV before-prison or in-prison. The difference in the relationship between HIV testing and respondent's gender was statistically significant both for

before-prison (*p*-value = 0.001) and in-prison (*p*-value = 0.000) situations. This information is shown in Table 10:

Table 10: Differences in HIV testing by sex of respondent

Respondent's Sex	Before prison		In prison	
	Number tested	**Percentage (%)**	**Number tested**	**Percentage (%)**
Male	137 (338)	40.4	123 (338)	36.3
Female	28 (51)	58.3	30 (51)	62.5
Total	**165 (389)**	**42.4**	**153 (389)**	**39.3**

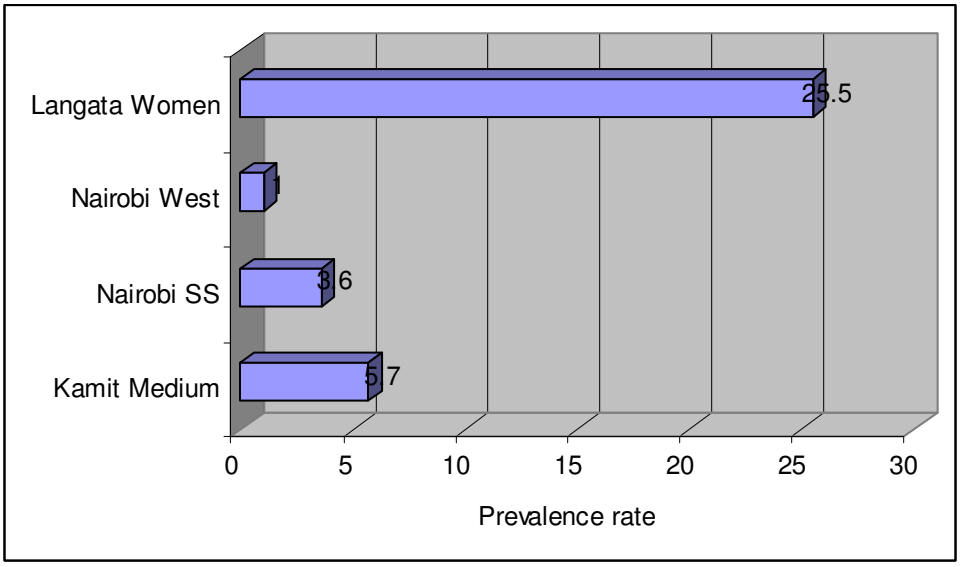
** Number in brackets is total in that category*

The chi-square value (chi square test of association) for HIV testing before prison is 19.332 with 4 degrees of freedom (d.f. = 4). The results show a significant relationship between male and female testing (p-value is 0.001). The corresponding results for in-prison testing are: Chi-square 29.183, degrees of freedom 4 and p-value 0.000). Thus, in both cases, the results show a significant difference in the degree of testing on basis of male and female gender. Females are significantly more likely to be tested than males.

5.6 Prevalence of HIV

The overall prevalence rate among prison inmates was 6.4%. However, prevalence was highest in Langata Women (25.5%) and lowest in Nairobi West (1.0%). HIV prevalence analyzed by sex of respondents showed that female respondents were disproportionately overrepresented in the infected category compared to their male counterparts (prevalence of 7.74 higher than for male respondents). The prevalence by prison facility is as shown in Figure 11:

Figure 11: HIV prevalence by prison facility (N=25)



The analysis of HIV prevalence by prison facility shows that prevalence is highly significant. The chi-square value is 40.264 distributed with 6 degrees of freedom. The corresponding P-value is 0.000 which shows that prevalence varies significantly from one prison facility to the next. This variation is mainly attributed to the more than disproportionate HIV prevalence in Langata Women's' Prison.

Table 11: Distribution of HIV+ inmates by age groups

Age category (years)	**Frequency infected (n)**	**Number of respondents (N)**	**Percentage (%)**
Under 24	4	97	4.0
25 to 34	13	196	6.6
35 to 44	8	60	13.3

Distribution of HIV positive respondents was highest in the age categories under 44 years and varied from 6.6% in the 25-34 year group to 13.3% in those 35-44 years of age. There was no significant relationship between the age group and the respondents' HIV sero-status (chi-square = 8.678, degrees of freedom = 8 and p-value = 0.350).

The distribution of HIV infection by respondent' level of education is as shown in Table 12.

Table 12: Distribution of HIV+ inmates by level of education

Highest education level	Frequency infected (n)	Number of respondents (N)	Percentage (%)
None	3	21	14.3
Primary	14	199	7.0
Secondary	6	132	4.5
Post secondary	2	29	6.9

The results indicate that HIV infection was inversely proportional to schooling with the highest concentration amongst those with no education at 14.3%. However, there was no significant association between level of education and HIV status (p-value = 0.839). The chi-square value is 4.197 distributed with 8 degrees of freedom.

Table 13: Distribution of HIV+ inmates by pre-incarceration marital status

Marital status	Frequency infected (n)	Number of respondents (N)	Percentage (%)
Never married	3	62	4.8
Steady partner, not living together	4	90	4.4
Steady partner, living together	2	32	6.3
Married, monogamous	9	159	5.7
Married, polygamous	2	13	15.4
Widowed/divorced/separated	5	31	16.1

Table 13 shows the distribution of HIV infection by respondent's pre-incarceration marital status. Results indicate that widowed/divorced/ separated persons had the highest prevalence rate followed by those who were in married and monogamous relationships. Prevalence is lowest among respondents who had a steady partner, not living together (4.4%) and among those who had never married (4.8%). The results however do not show any association between marital status and HIV infection as the chi-square value is 8.999 distributed with 12 degrees of freedom. The corresponding p-value is 0.703.

Table 14 shows the HIV prevalence by length of prison sentence. Chi-square test of association between length of prison sentence and HIV infection found no statistically significant association (p-value = 0.291). The chi-square value is 7.336 distributed with 6 degrees of freedom.

Table 14: Distribution of HIV+ inmates by length of prison sentence

Prison sentence (years)	Frequency (n)	Number of respondents (N)	Percentage (%)
Under 5	19	338	5.6
5 and above	6	51	11.8
TOTAL	25	389	

Table 15 shows the distribution of HIV infection by respondent's employment category. Analysis of results found no significant association between HIV infection and employment category. The calculated Chi-square value is 5.679 distributed with 10 degrees of freedom. The corresponding p-value at 95% significance level is 0.842. However, the table seems to show that self employed persons were less likely to be infected compared to those who described themselves as unemployed or as students. The table shows the distribution of respondents by employment category, frequency of infection and percentage of persons infected.

Table 15: Distribution of HIV+ inmates by employment category

Employment category	Frequency infected (n)	Number of respondents (N)	Percentage (%)
Student	3	34	8.8
Unemployed	6	55	10.9
Paid employee	9	124	7.3
Self employed	7	164	4.3

The study also attempted to explore the relationship between HIV infection and number of sexual partners a respondent has had prior to incarceration. The summary of the results is as shown in Table 16.

Table 16: Distribution of HIV+ inmates by number of sexual partners

Number of sexual partners	Frequency infected (n)	Number of respondents (N)	Percentage (%)
0 to 5	21	310	6.8
6 and above	4	79	5.1

The chi-square test of association between number of sexual partners and frequency of infection is not significant as the calculated chi-square value is 2.169 distributed with 2 degrees of freedom and the corresponding p-value at 95% level of significance is 0.338. It is thus concluded that there was no significant association between HIV infection and reported number of sex partners during the year preceding incarceration. However, the prevalence values were discrepant for the two categories at 6.8% for those with less than 5 partners and 5.1% for those with more than 5 partners in the preceding year.

Table 17 shows the distribution of HIV prevalence by history of sexually transmitted diseases (STDs). Results indicate that there is no significant association between respondent's having had a sexually transmitted disease before prison and his being infected. The chi-square value for the two variables is 10.714 distributed with 10 degrees of freedom and with a p-value of 0.098. Results for frequency and percentage of infection are shown as follows:

Table 17: Distribution of HIV+ inmate by history of Sexually Transmitted Diseases

Respondent has had STD before prison	Frequency (n)	Number of respondents (N)	Percentage (%)
Yes	9	92	9.8
No	15	280	5.4

The study showed a significant correlation between HIV infection and a history of drug use (p-value= 0.017). However, the results are somewhat moderated by the low frequency of drug use in the study population. This information is shown in Table 18:

Table 18: Distribution of HIV+ inmates by previous drug use (IDU)

Respondent has used drugs before prison	Frequency (n)	Number of respondents (N)	Percentage (%)
Yes	5	188	2.7
No	20	201	9.9

There was a significant association between HIV+ status and drug use in the past (p= 0.017) despite the low frequency of this practice in the study population. The calculated chi-square value is 12.059 distributed with 4 degrees of freedom.

With respect to access to health care and treatment services, this study found that respondents had reasonable access to HIV care services with about 60.9% of respondents currently enrolled for care and treatment while 20.3% were not on any care and treatment.

This study shows that women respondents were significantly more likely to be tested for HIV than men before prison and also in prison. Female respondents were also significantly more

likely to be infected by the HIV than men. The study found that respondents who reported a history of drug use were significantly more likely to be HIV positive compared to those who did not have that history. The study further found that respondents who had lower levels of education were more likely to be HIV positive than those with higher levels of education.

CHAPTER 6: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

6.1 DISCUSSION

This study investigated the sero-prevalence and risk factors for HIV infection among prison inmates in Nairobi- Kenya. Similar studies have been undertaken in a good number of countries especially in Europe and America, yet reports on HIV infection among Kenyan prison inmates are scarce.

Results from this study indicate that 6.4% of the short to medium term prisoners in Nairobi are infected with HIV, the virus that causes AIDS. The low HIV sero-prevalence rate of 6.4% observed in this study is consistent with the similarly low (5.6%) rate reported among male prison inmates in Kenya (Kimetu et al, 2009), the slight difference notwithstanding. In accordance with our findings, some earlier studies have also reported low sero-prevalence rates of HIV among prison inmates. For instance a study in Nigeria reported a sero-prevalence rate of 6.7% among male prisoners in Lagos, Nigeria by (Dada et al, 2006).

This prevalence rate is startling because it is not higher than that of the general population of Nairobi (9%) and still lower than the national prevalence rate of 7.4% (KAIS, 2007), even though the prison population is thought to be a high risk one. The lower HIV prevalence as compared to other studies may be due to different factors such as the low prevalence of Injection drug use among prison inmates and increased perception of the risk of HIV infection through different transmission routes. It is also possible that since these were short and medium term prisoners, the low HIV prevalence may be more of a reflection of the HIV

prevalence in the community rather than of the prison environment. Equally noteworthy is the role of HIV prevention programs currently available within the prisons.

A similar study done in Ghana found an overall sero-prevalence rate of HIV (5.9%) among prisoners. This finding compares well with our study finding though it is still higher than that reported in the general public in Ghana, mainly healthy blood donors and pregnant women (Adjei, 2008).

In contrast, Adoga et al. (2009) reported a higher HIV sero-prevalence rate of 18.0% observed in a study of prisoners in Nasarawa state in Nigeria. This is consistent with the similarly high 19.2% rate reported in an earlier study among prison inmates in Ghana (Adjei, 2006). In accordance with these findings, some earlier studies have also reported high sero-prevalence rates of HIV among prison inmates. For instance, Burattini *et al*. (2000) reported HIV sero-prevalence rate of 16.0% among Brazilian prisoners.

The higher prevalence of HIV in prisoners in Brazil compared to Kenyan prisoners (in whom no harm reduction interventions have yet been implemented) most probably reflects a persistently higher prevalence of intravenous drug use within and without the prisons in Brazil compared to Kenya, despite the implementation of harm reduction interventions within most prisons in Brazil.

A higher proportion of women (25.5%) than men (3.8%) are infected with HIV according to the study. A similar study done among female prisoners in Portugal found an overall prevalence rate of 10%. In the same study when prisoners were stratified into those who had ever injected drugs and non injecting drug users, the prevalence for the IDUs was found to be

fairly high at 44% compared to 6% for those who had never injected drugs (Barros, 2008). The significantly higher prevalence of HIV infection in female prison inmates compared to their male counterparts in Nairobi is not unexpected, since similar gender disparity has been reported in prisoners and minority women in the southern United States of America (Fleming, 2006), driven by similar predisposing sexual and socioeconomic risk factors. Additionally, women are also more likely to engage in commercial sex work (CSW), a high-risk sexual behavior that correlates with the prevalence of HIV and other STDs.

Our observed gender disparity in the risk of this infection in the prison system most probably also reflects the general lower socioeconomic status of women worldwide but especially in developing countries, and emphasizes the specific needs of women in the implementation of efforts aimed at reducing the risk for blood borne and sexually transmitted infections.

The study found that drug use among respondents was high. Almost a half (48.3%) reported that they had used drugs (such as Marijuana) before coming to prison. Drug use in prison was also high as one-fifth of respondents (21.1%) continued to have access to these drugs. Marijuana was the single most common drug used in both situations. Most of the drugs were taken orally or smoked.

The results show that very few respondents (3.1%) reported injecting themselves with drugs before prison and another 2.1% of respondents reported that they sometimes injected themselves with drugs in prison. This is consistent with the assertion by Madhava et al (2002) that injected drug use is infrequent in Sub Saharan Africa. Injected drug use has been implicated as a major risk behavior for HIV transmission among prison inmates, especially in

countries outside of Africa, with prevalence of HIV among a Russian population of Injecting drug users reaching as high as 56.0% (Frost, 2002).

The sero-prevalence rate of HIV was significantly high in inmates aged >30 years, with the highest prevalence in the 35-44 years age group. This finding compares well with the findings of Kenya AIDS Indicator Survey which showed that a higher proportion of Kenyans ages 30-34 are currently infected with HIV than in any other age category (KAIS, 2007).

Nearly 68% of inmates in the present study had none or primary level of education, reflecting difficult access to school, or more probably, early dropout. Although this difference did not reach statistical significance (P=0.839), there was a higher concentration of HIV sero-positive inmates with low schooling (14.3%), consistent with other studies in prison populations such as that in Brazil (Harnoldo, 2007).

When we compared prevalence rates in the four prisons, inmates in Langata women's prison were more likely to be infected with HIV, and the difference was statistically significant. Other factors that were associated with HIV infection were type of sexual activity before prison, being unmarried, duration of incarceration, past history of injecting drug use and history of Tuberculosis infection in the past. Other factors such as number of sexual partners were not found to be associated with HIV infection in this study. This finding contrast with the findings of a similar study in Nigeria which found the number of sexual partners, anal sex, tribal marks and previous incarceration to be predictive of HIV infection (Adoga, 2008).

Several reports mention homosexual contact among prison inmates. The present study did not confirm this finding, a fact possibly explained by the stigma associated with this issue, leading

inmates to deny this practice. It is also plausible that sexual preference in this setting may be circumstantial. In the prison set up, an individual may be *currently* rather than *definitively* involved in homosexual contact for a number of reasons, the most predominant of which is coercion.

Condom use was found to be low both before incarceration (45.2%) and during incarceration (40.9%). On further inquiry on the acceptability of condoms in the prison set up, majority of the respondents (71.7%) were opposed to condom provision in the prison set up. This finding contrasts with a study done in the U.S.A to determine the acceptability of condom distribution and availability in a U.S. jail, which found that condom access was generally acceptable to both the inmates and the prison officers (May et al, 2002).

Overall, 42.4% of prisoners had tested at least once for HIV prior to incarceration and were aware of their HIV status. This compares well with the findings of the Kenya AIDS indicator survey which found that only 36% of those interviewed had undergone the test and were aware of their status (KAIS, 2007). There was a notable increase in HIV testing among women compared to men (p-value = 0.001). This may be attributed in part to PMTCT services and testing in antenatal clinics. Nearly two-thirds of prison inmates reported that they had never tested for HIV, and were therefore unaware of their status and therefore could not access appropriate services for prevention, care and treatment of HIV.

Most prison inmates were aware of the HIV transmission modes, especially the sexual route. However, implementation of preventive measures within the prisons is still minimal, indicating the need to develop and maintain aggressive activities aimed at on-going education

and counseling. The observation that more than 50% (195) of participants in this study had never tested for HIV reinforces the need to introduce counseling, which could be implemented on a group basis, thus allowing the exchange of experiences and information that could greatly enrich the process.

6.2 Conclusions

The study confirms the presence of HIV infection in the prison set up though the overall sero-prevalence is lower at 6.4% compared to that of the general population at 7.4% (KAIS, 2007). The lower HIV prevalence is attributed to the low prevalence of Injection drug use among prison inmates and increased perception of the risk of HIV infection through different transmission routes.

The sero-prevalence rate of HIV was significantly high in inmates aged >30 years, with the highest prevalence in the 35-44 age group, unmarried inmates, illiterate inmates, inmates incarcerated for longer than the median time served of 18 months, inmates reporting previous histories of IDU, and those of female gender.

The majority of the prison inmates are HIV sero-negative with self-reported high-risk behaviors. This indicates that prisoners are a vulnerable group and require special attention when addressing the needs of the Most at risk populations in HIV programming.

This study did not confirm homosexual contact among prison inmates. This is possibly explained by the stigma associated with this issue, leading inmates to deny this practice. Prevalence of Injection drug use was very low and is therefore an unlikely major transmission mode of HIV among prison inmates in Nairobi.

There are gender differences in HIV testing with a notable increase in HIV testing among women inmates. This was attributed to PMTCT services and routine testing in antenatal

clinics. Overall, nearly two-thirds of prison inmates had never tested for HIV, and were therefore unaware of their HIV status.

HIV preventive and treatment services were available on a small scale to the inmates. However, other preventive measures such as condom distribution were not available within correctional facilities due to legal and moral barriers.

6.3 Recommendations

Based on the results and the conclusions of this study, the following recommendations can be made:

1. There is need for collaboration between the prison's administration, academic institutions, policy makers and community-based organizations to develop Prison specific Policies that will minimize transmission of HIV and sustain the current low HIV prevalence within the prisons.
2. The Kenya Prisons Service (KPS) should provide inmates with readily accessible testing opportunities for HIV to increase uptake and treatment should be initiated before release back into the community. Additionally, linkages with the community for continuum of care also need to be strengthened.
3. There is need to develop comprehensive HIV prevention programs targeted at the prison population and efforts must be directed at harm reduction as these will help prevent not only transmission of HIV inside prisons but also reduce risk behavior back in the community after release. Such harm-reduction interventions should include a comprehensive education program for inmates on HIV as this is least controversial in the prison set up and the benefits have been demonstrated.
4. To win the war against HIV/AIDS, The Ministry of Health's HIV/AIDS treatment services and general prevention efforts, must include prisons.
5. Considering the potential of such a study to serve as the basis for better strategies towards controlling the spread of HIV, we recommend a prevalence study that will involve more prisons countrywide.

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APPENDICES

Appendix 1: CLIENT INFORMATION SHEET

Good morning/Good afternoon,

My name is Dr. Rael Mutai (or interviewer), a Postgraduate student from the University of Nairobi, School of Public Health. I am carrying out a study on Seroprevalence and risk factors for HIV in prison.

- Acquired immune deficiency syndrome (AIDS) is an infectious disease caused by the human immunodeficiency virus (HIV). It was first recognized in the United States in 1981. AIDS is the advanced form of infection with the HIV virus, which may not cause recognizable disease for a long period after the initial exposure (latency). No vaccine is currently available to prevent HIV infection. At present, all forms of AIDS therapy are focused on improving the quality and length of life for AIDS patients by slowing or halting the replication of the virus and treating or preventing infections and cancers that take advantage of a person's weakened immune system.
- HIV infection is consistent with all generally accepted criteria that justify screening:

  1) HIV infection is a serious health disorder that can be diagnosed before symptoms develop;

  2) HIV can be detected by reliable, inexpensive, and noninvasive screening tests;

  3) Infected patients have years of life to gain if treatment is initiated early, before symptoms develop; and

  4) The costs of screening are reasonable in relation to the anticipated benefits.
- There will be a total of 399 participants in the study and participation is voluntary.

- Confidentiality – Results will be kept confidential, only the VCT counselor will have access to it and will discuss it with you. Although the results of the study will most likely be published, your names will not appear in any publications or project reports.

Benefits and other rewards

- No financial rewards will be given for participating.
- Free HIV test and linkage to treatment will be availed to those who test positive.
- Other benefits from the study include: information gathered may assist the prisons Department in better planning of services and also to be used in policy formulation and in improving services.

Harmful effects

- Questions of general and personal nature will be asked in the study. If questions are uncomfortable, you are not obliged to answer.
- The procedure of taking blood is associated with slight discomfort and waiting for the results may cause some anxiety.

Appendix 2: CONSENT FORM: Individual questionnaire and screening

Sero-prevalence and Risk factors for HIV infection among prisoners – Nairobi

DATE: ……

INFORMANT ID: …….

I have read or had read to me the information sheet for the study. I understand that if I decide to be involved in the study I will have a face to face interview with a trained interviewer for about thirty minutes and thereafter undergo pretest counseling for HIV screening purposes. I understand that am free to withdraw from the study at any time. I am also aware of the fact that if I decide not to participate in the study this will not affect my normal health care and rights in any way.

Any questions or concerns about the study will be answered at any time by the study coordinator.

I agree to take part in the study

Signature…….

Date…….

Interviewer:

Name…….

Signature……

Appendix 3: SCREENING TOOL

CLIENT NO ……..

AGE ……

SEX (M) (F)

DURATION OF IMPRISONMENT ……...Yrs…….Mo

HIV SEROLOGY RESULTS (+ve) ……. (-ve) …… Discrepant----------

Appendix 4: Individual Questionnaire

Instructions to the interviewer: This questionnaire will be administered by an interviewer. Circle the appropriate responses. Allow the respondent to freely list their responses; do not read out the options listed unless otherwise stated. Ensure that you have filled the consent form before proceeding on with the interview.

Date ___/___/2010 Questionnaire No_____

Prison _____ Interviewer Name: _____

1.0 **BACKGROUND INFORMATION**

1.1 Age ____years Sex (M), (F)

1.2 Religion? (1) Christian (2) Muslim (3) Hindu (4) Others

1.3 Highest Current Education Level (1) None (2) Primary (3) Secondary (4) Post Secondary

1.4 Marital status before Incarceration? 1. Never married 2. Steady partner, not living together 3. Steady partner living together 4. Married, monogamous

5. Married, polygamous 6.Widowed/divorced/separated

1.5 Employment status prior to incarceration? 1. Student 2. Unemployed

3. Paid employee 4. Self employed 5. Others (Specify) _____

1.6 Is this your first time in prison? 1. Yes 2. No

1.7 If No to 1.6 above, how many times have you been in prison? _____

1.8 How long have you been in this prison? ____years ____months

1.9 How long is your sentence? _____years _____months

1.10 What offence have you been charged with?

1. Robbery 2. Theft 3. Sexual offence 4. Drug trafficking 5. Assault

6. Others (specify) _____

2.0 <u>HIV KNOWLEDGE</u>

2.1 Ever heard of HIV? 1. Yes 2. NO

2.2 Do you know someone who has HIV/AIDS? 1. Yes -------→ 2.3

2. NO ---------→2.4

2.3What was your relationship with the person above? 1. Parent 2. Brother/sister

3. Spouse 4. Friends/neighbors 5. Others (specify)_____

2.4 Do you know someone who has HIV/AIDS in this prison? 1. Yes 2. NO

2.5 Do you know someone who has died of HIV/AIDS in this prison? 1. Yes 2. NO

2.6 Indicate how HIV/AIDS virus is transmitted.

1. Vaginal sex 2. Anal sex 3. Mother to child transmission

4. Blood/ blood products 5. Sharing of sharp objects

6. Injection drug use (sharing syringes) 7. Others

2.7 Indicate the ways/methods of reducing the risk of HIV transmission

1. Abstinence 2. Using condoms 3.Having one faithful partner

4. Disclosing HIV status to partner 5. PMTCT

6. Others (specify)_____

		BEFORE IMPRISONMENT **Column A**		**DURING IMPRISONMENT** **Column B**
2.8.1	How did/do you rate your chances of contracting HIV?	1.☐ Very high→ 2.9.1 2.☐ High → 2.9.1 3.☐ Low → 2.10.1 4.☐ Very low→ 2.10.1 5.☐ Don't Know→ 6.☐ No response→	2.8.2	1.☐ Very high→ 2.9.2 2.☐ High → 2.9.2 3.☐ Low → 2.10.2 4.☐ Very low→ 2.10.2 5.☐ Don't Know→ 6.☐ No response→
2.9.1	Why did/do you rate your chances of contracting HIV as high/very high?	1.☐ Never used condoms 2.☐ Had more than one sex partners 3.☐ Engaged in sex with men 4.☐ Had blood transfusion/injection 5.☐ Partner had other partners 6.☐ Was using 'used' syringes 7. ☐ Shared syringes with colleagues 8.☐ Other (specify)☐_____	2.9.2	1.☐ Never use condoms 2.☐ Have more than one sex partner 3.☐ Engage in sex with men 4.☐ Had blood transfusion/injection 5. Partner has other partners 6.☐ Uses 'used' syringes 7.☐ Shares syringes with colleagues 8. ☐ Other (specify)_____ 9. ☐ N/A

		— 9. ☐ N/A		
2.10.1	Why did/do you rate your chances of contracting HIV as low/very low?	1. was not having sex 2. ☐ Used condoms 3. ☐ Had only one partner 4. ☐ Had limited number of partners 5. ☐ Partner had no other partners 6. ☐ Had no blood transfusion/injection 7. ☐ Did not use 'used' syringes 8. ☐ Did not share syringes with colleagues 9. ☐ other (specify)_____ — 10. ☐ N/A	2.10.2	1. ☐ Does not engage in sex 2. Use condoms 3. ☐ Have only one partner 4. ☐ Have limited number of partners 5. ☐ Partner had no other partners 6. ☐ Had no blood transfusion/injection 7. ☐ Does not use 'used' syringes 8. ☐ Does not share syringes with colleagues 9. ☐ other (specify)_____ 10. ☐ N/A

2.11 Do you know of any sexual practices that take place among prisoners? 1. Yes 2. No

Namely_____

2.12 Does HIV transmission take place in prison? 1 .Yes 2.No

2.13 What would you say are the ways of reducing the risk of HIV transmission in prison?

1. Provision of conjugal rights 2. Provision of condoms 3. Information, education and Counseling 4. Provision of ARVS 5. HIV testing (VCT)

3.0 HIV RISK RELATED BEHAVIOUR AND PRACTICE

		BEFORE IMPRISONMENT **Column A**		**DURING IMPRISONMENT** **Column B**
3.1.1	Ever had sex?	1. ☐ Yes 2. ☐ No	3.2.1	1.☐ Yes 2.☐ No
3.1.2	Of what nature was the sex?	1. ☐ Consensual 2. ☐ Rape (Single) 3. ☐ Rape (multiple) 4. ☐ Favor driven 5. ☐ Other (specify)_____	3.2.2	1.☐ Consensual 2.☐ Rape (Single) 3.☐ Rape (multiple 4.☐ Favor driven 5.☐ Other (specify)_____
3.1.3	If yes to 3.1.1, would you say you were the:	1. ☐ Insertive partner 2. ☐ Recipient partner 3. ☐ Both at times 4. ☐ Both always 5. ☐ N/A	3.2.3	1.☐ Insertive partner 2.☐ Recipient partner 3.☐ Both at times 4.☐ Both always 5.☐ N/A
3.1.4	If yes to 3.1.1 how long ago?	1. ☐ <3 months	3.2.4	1.☐ <3 months

		2. ☐ 3-6 months 3. ☐ 6 months-1 yr 4. ☐ >1 yr		2.☐ 3-6 months ☐ 3. 6 months-1 yr 4.☐ >1 yr
3.1.5	Number of sexual partners in the last 12 months (Year preceding incarceration)	_____	3.2.5	1.☐ Opposite sex partners_____ 2. ☐ Same sex partners_____ 3.☐ N/A
3.1.6	Any new sexual partner(s) in the last 3 months?		3.2.6	1.☐ Yes 2.☐ No 3.☐ No response
3.1.7	If yes to 3.1.6, how many partners?	1.☐ Opposite sex partners_____ 2.☐ Same sex ☐ partners_____ 3. N/A	3.2.7	1.☐ Opposite sex partners_____ 2.☐ Same sex partners_____
3.1.8	Ever paid or been paid to have sex?	1. ☐ Yes 2. ☐ No	3.2.8	1. ☐ Yes 2. ☐ No
3.1.9	If yes in 3.1.8, how often?	1. ☐ Always 2. ☐ sometimes	3.2.9	1. ☐ Always 2. ☐ sometimes

		3. ☐ Rarely 4. ☐ No response 5. ☐ N/A		3. ☐ Rarely 4. ☐ No response 5. ☐ N/A
3.1.10	How often do you use condoms?	1. ☐ Never 2. ☐ Always 3. ☐ Sometimes 4. ☐ Rarely 5. ☐ No response	3.2.10	1. ☐ Never 2. ☐ Always 3. ☐ Sometimes 4. ☐ Rarely 5. ☐ No response
3.1.11	Should condoms be provided in prisons?		3.2.11	1. ☐ Yes 2. ☐ No 3. ☐ Don't know
3.1.14	Ever contracted sexually transmitted infection?	1. ☐ Yes 2. ☐ No 3. ☐ No response	3.2.14	1. ☐ Yes 2. ☐ No 3. ☐ No response
3.1.15	If yes to 3.1.14, did you seek treatment?	1. ☐ Yes 2. ☐ No 3. ☐ No response	3.2.15	1. ☐ Yes 2. ☐ No 3. ☐ No response
3.1.16	Ever used drugs for non medical	1. ☐ Yes 2. ☐ No	3.2.16	1. ☐ Yes 2. ☐ No

	purposes?(**cocaine, heroin etc**)	3. ☐ No response		3. ☐ No response
3.1.17	If yes to 3.1.16, which drugs?	1. ☐ Bhang 2 ☐ Mandrax 3. ☐ Phenobarbitone 4. ☐ Valium 5. ☐ Other (Specify)- _____	3.2.17	1. ☐ Bhang 2 ☐ Mandrax 3. ☐ Phenobarbitone 4. ☐ Valium 5. ☐ Other (Specify)- _____
3.1.18	Ever injected yourself with drugs for non medical purposes?	1. ☐ Yes 2. ☐ No 3. ☐ No response	3.2.18	1. ☐ Yes 2. ☐ No 3. ☐ No response
3.1.19	If yes to 3.1.18 how often did/do you inject yourself?	1. ☐ Always 2. ☐ sometimes 3. ☐ Rarely 4. ☐ No response 5. ☐ N/A	3.2.19	1. ☐ Always 2. ☐ sometimes 3. ☐ Rarely 4. ☐ No response 5. ☐ N/A
3.1.20	Ever used 'used'	1. ☐ Yes	3.2.20	1. ☐ Yes

	or old syringes to inject yourself with drugs?	2. ☐ No 3. ☐ No response		2. ☐ No 3. ☐ No response
3.1.21	Ever shared syringes with other people?	1. ☐ Yes 2. ☐ No	3.2.21	1. ☐ Yes 2. ☐ No
3.1.22	If yes to 3.1.21, how often?	1. ☐ Always 2. ☐ sometimes 3. ☐ Rarely 4. ☐ No response 5. ☐ N/A	3.2.22	1. ☐ Always 2. ☐ sometimes 3. ☐ Rarely 4. ☐ No response 5. ☐ N/A
3.1.23	Ever had a tattoo?	1. ☐ Yes 2. ☐ No	3.2.23	1. ☐ Yes 2. ☐ No
3.1.24	If Yes how many tattoos?	_____	3.2.24	_____
3.1.25	When was/were the tattoo(s) done?	1. ☐ Before imprisonment 2. ☐ N/A	3.2.25	1. ☐ During this imprisonment 2. ☐ N/A

4.0

a).Have you ever been tested for HIV in prison? Yes---------- No----------

b).Have you ever been tested for HIV anywhere else? Yes----------No------

c).If Yes, what was your test result? Positive---------Negative----------

d).If positive, are you enrolled for HIV/AIDS care and treatment? Yes-------No------

c). Did you get PMTCT services? Yes----------No-------

d). If yes, where did you get the services? (name of facility)----------

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