The Determinants of Sexually Transmitted and Blood Borne Infection Risk Among Incarcerated Youth

by

Bohdanna Kinasevych

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Abstract

The purpose of this study is to describe the determinants of STBBI related knowledge, risk behaviours, and prevalence as they relate to sexual health among incarcerated youth between 16 and 24 years of age in Manitoba. The study involved a cross-sectional questionnaire and testing for chlamydia, gonorrhea, syphilis, HIV, and Hepatitis C among 210 male and female youth in nine provincial correctional centres. Descriptive analysis of STBBI knowledge, risk behaviours, and prevalence are presented. Potential associations between each of these sexual health outcomes and the epidemiologic context of risk are explored using univariate and multiple regression analysis. Longer incarceration history was associated with higher STBBI knowledge, higher sexual risk behaviours and higher STBBI prevalence. STBBI knowledge was associated with growing up on a reserve. Early age of initial substance use and injection drug use were found to be significantly associated with poor sexual health. Recommendations include increasing STBBI awareness using culturally appropriate, peer-led interventions, improving educational attainment, integrating sexual health education with substance use interventions inside corrections, increasing collaboration between community and corrections and improving opportunities for STBBI screening inside correctional centres.

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THE DETERMINANTS OF SEXUALLY TRANSMITTED AND BLOOD BORNE INFECTION RISK AMONG INCARCERATED YOUTH

Introduction

In Manitoba, rates of sexually transmitted infections (STI) and Human Immuno-deficiency Virus (HIV) are consistently among the highest in Canada. In 2008, at the time of data collection for this study, the rate of chlamydia infection in Manitoba was 576.6/100,000 compared to a national rate of 248.9/100,000. In the same year, Manitoba's rate of gonorrhea was 114.1/100,000, the highest in Canada where the overall rate was 38.2/100,000 (Public Health Agency of Canada, 2010). In 2008, the rate of positive HIV test reports among those 15 years and older in Manitoba was 9.0/100,000 representing the fourth highest provincial rate in Canada and only slightly lower than the national rate of 9.3/100,000 (Public Health Agency of Canada, 2009).

Among almost all reported sexually transmitted infections in Canada, young people, between the ages of 15 and 24 are disproportionately represented. More than 80% of all reported cases of chlamydia in Canada occur among people under 25 years of age and 68.3% of cases of gonorrhea occur within this age group (Jayaraman, Perrin, Totten, Fang, & Kurz, 2009). While they represent a small proportion of HIV positive tests in Canada, young people have also reported engaging in behaviours that place them at risk for HIV transmission (Public Health Agency of Canada, 2009). At particular risk are those young people with limited access to health services. This includes street-involved youth (i.e., youth that spend multiple, consecutive days and nights away from home without parental permission) as well as youth in contact with the justice system

(Beaudoin, 2004; Frye, Wallace, Chavez, Scott, & David, 2008). Factors that may drive transmission among at-risk youth include relatively high rates of infrequent condom use, earlier initiation of sexual behavior and more sex with high-risk partners than among the general population (Belenko et al., 2008). Vulnerable and at-risk youth are more likely to come into contact with law enforcement and the justice systems. For these young people, admission to a correctional facility may offer a point of entry into sexually transmitted and blood borne infection (STBBI) screening, care, and prevention of further transmission.

Sexual health education prior to and during incarceration provides one opportunity for intervention. The level of STBBI knowledge among incarcerated youth is poor and contributes to risk behaviours (Templeton, 2006). Increasing knowledge about STBBI involves developing and delivering appropriate messages targeted at specific high-risk populations, including incarcerated youth. Knowledge of risk factors within this population will help define effective prevention measures including the provision of information and education aimed at increasing STBBI related knowledge and possibly helping to reduce transmission risk (Niveau, 2006).

In Canada, provincial departments of justice are responsible for youth and adults with a sentence of less than two years in length and for individuals in remand (awaiting sentencing). Convicted offenders serving a sentence of two years or more serve their sentences at a federal institution under the jurisdiction of Correctional Services of Canada. Provincial correctional centres routinely observe a high rate of inmate turnover and shorter sentence duration. This represents both an opportunity in terms of health

service delivery as well as a challenge in terms of providing testing, counseling, and treatment to a highly mobile population.

In Manitoba, young offenders under the age of 18 years are held in custody at one of two juvenile correctional centres, while adult offenders, aged 18 years and over, are incarcerated at one of seven provincial correctional centres located across the province. Given the vulnerabilities facing incarcerated youth in terms of access to screening, health promotion, and education, further information is required to inform interventions for this vulnerable population both within adult and youth detention facilities. This research study sought to describe the determinants of STBBI risk among incarcerated youth in Manitoba (age 16 to 24 years) and explore opportunities to minimize the spread of STBBI among this high risk population both during incarceration and upon release.

Purpose and Objectives

The purpose of this study is to describe the determinants of STBBI related knowledge, risk behaviours and prevalence as they relate to sexual health among incarcerated youth between 16 and 24 years of age in Manitoba provincial correctional centres.

The study involved secondary data analysis of findings from *the Epidemiology of Sexually Transmitted and Blood Borne Infection (STBBI) in an Inmate Population study (STBBI in Prison Study)*. The aims of the parent study were to:

1. Quantify the prevalence of HIV, Hepatitis C, gonorrhea, chlamydia and syphilis within a provincial inmate population.
2. Identify the behaviours that may put inmates at risk for transmission of an STBBI while incarcerated.

3. Identify the changes in STBBI related risk behaviours as a function of incarceration.
4. Assess the knowledge of inmates related to disease risk behaviours.
5. Describe the social and environmental barriers to disease prevention which exist within a correctional setting.

This cross-sectional, anonymous study was carried out in Manitoba's nine provincial correctional centres between May and October 2008. The randomly selected sample consisted of 401 inmates between the ages of 16 and 74 that had served a minimum of three months in secure custody, either remand or sentenced. Participants completed an interview to assess their STBBI related risk and prevention behaviours, knowledge of transmission dynamics, and personal demographics. They were also asked to provide a blood and urine sample to test for HIV, Hepatitis C, gonorrhea, chlamydia, and syphilis.

The purpose of this study is to identify potential associations of STBBI related knowledge and risk behaviours (sexual and drug using) and the social and epidemiologic contexts among the 16 to 24 year old subsample housed either in a youth or adult correctional centre. Findings from the study will contribute to informing public health interventions aimed at this important target population both within the correctional setting and in the community. The specific objectives of the study are to:

1. Describe the STBBI related knowledge, risk behaviours and prevalence among 16 to 24 year olds in Manitoba provincial correctional centres.
2. Identify potential associations between sexual health outcomes and the epidemiologic context in which health risks occur.

3. Provide recommendations for screening, care and prevention of STBBI among the target population.

Review of Literature

The following section reviews the literature on the following topics: (a) prevalence of STI and HIV among incarcerated and at-risk youth (b) determinants of STI and HIV risk among incarcerated youth and (c) promising interventions aimed at reducing STI and HIV risk among incarcerated youth.

Prevalence of STI and HIV among Incarcerated and At-Risk Youth

Studies included in this review were limited to U.S. and Canadian populations. Most studies to date have been conducted in U.S. prisons; few prevalence studies have been carried out specific to incarcerated youth in Canada where research has been limited primarily to adult populations.

In Canada, in 2008, the overall rate of chlamydial infections rose to 248.9/100,000 population. In Manitoba the rate was 576.6/100,000 population or approximately 130% over the national rate. This represents the highest provincial rate in Canada (Public Health Agency of Canada, 2010b). Young people (aged 15 – 24 years) had the highest incidence of reported chlamydia, and females in particular have disproportionately higher rates of infection than males. In Canada, the difference in rate between males and females in 2006 was 801.4/100,000 among males versus 1656.1/100,000 among females (Jayaraman et al., 2009).

Nationally, the incidence of gonorrhea is also rising. In Canada, in 2008, new cases of gonorrhea affected 38.2/100,000 of the population, with Manitoba reporting the second highest provincial incidence of 114.1/100,000 (Public Health Agency of Canada,

2010b). As with chlamydial infections, rates of gonorrhea are highest among people under 25 years of age who account for 65% of reported cases. Among females, rates are highest among 15 to 19 year olds (143.8/100,000) while among males, the highest age-specific rate was within the 20 to 24 year old group (141.1/100,000) (Jayaraman et al., 2009).

When epidemiologic trends in chlamydia and gonorrhea in Manitoba are examined geographically, large inter-regional differences are evident (Elliott et al., 2002). Both chlamydia and gonorrhea show "a high degree of geographic variability, with a concentration of high rates … within the north/remote and urban core regions" (p. 142). The authors conclude that the high rates of chlamydia and gonorrhea in these regions is largely driving Manitoba's overall STI rates. These geographic areas of concentrated STI rates represent communities with greater degree of socio-economic disadvantage when compared with the rest of the province.

In Winnipeg's urban core, a cross-sectional study of STI incidence and risk factors among Winnipeg street-involved youth was carried out in 1999. Of the 320 street youth sampled, 11.6% tested positive for chlamydia and 1.9% tested positive for gonorrhea (Beaudoin, 2004). Here, geography and age intersect, leading to disproportionately poorer health outcomes for a highly marginalized group of young people. The Winnipeg sample represented one site of a multi-centered surveillance study of street youth across Canada; rates of chlamydia and gonorrhea among the national sample were 10.4% and 1.7% respectively (Public Health Agency of Canada, 2006b). In other jurisdictions, studies have identified high rates of chlamydia and gonorrhea among adolescent females and males. Kahn and colleagues (2005) determined that

among adolescents entering U.S. juvenile detention centres, rates were highest among females aged 15 to 19 years and males aged 20 to 24 years. Hammet and colleagues (2009) reviewed the prevalence of syphilis, gonorrhea, and chlamydia in U.S. adult and youth correctional populations. They determined that chlamydia was more prevalent among both female and male juveniles than among adult inmates; gonorrhea was more prevalent among girls in juvenile facilities than among adult females. In an investigation of recently arrested Florida youth, Belenko et al. (2008) found high prevalence of gonorrhea and chlamydia. In their sample of 948 youth, 11.5% tested positive for chlamydia, 4.2% for gonorrhea and 13.2% for either or both infections. Similarly, Lawrence, Snodgrass, Robertson and Baird-Thomas (2008) tested 234 adolescent females and found 20% were infected with chlamydia, 4% with gonorrhea and 1% with syphilis upon entry into a correctional centre. Of their 234 participants, 19% had a previous STI diagnosis.

A large number of studies have assessed HIV prevalence among adult offenders (Jurgens, 2005). These studies have consistently identified rates of HIV in prison to be much higher than within the general population (Jurgens, 2005). In Canada, two studies have screened youth in provincial corrections. Rothon and colleagues (1997) screened 787 juvenile offenders upon entry to juvenile corrections in British Columbia for HIV. Two of 787 youth tested HIV-antibody positive for an overall study rate of 0.25%. Calzavara and colleagues (2007) screened 1,578 adult and 299 youth offenders in Ontario provincial correctional centres for HIV and Hepatitis C virus (HCV). HIV prevalence among the adult participants was 2.0% (95% CI 1.3-2.8); none of the youth in their study tested HIV positive.

Determinants of STI and HIV Risk

Hogben and Leichlliter (2008) describe the role of social determinants and their relationship to the epidemiologic context in shaping STI risk. The authors identify some of the key social determinants that contribute to STI risk as social segregation, barriers to health care services, socio-economic status and incarceration history. Each of these determinants is of particular relevance to the lives of young people involved with the criminal justice system. These social determinants interact with the epidemiologic context including core areas and sexual networks to further affect each person's level of risk for acquisition or transmission of STI. The authors describe this "epidemiologic context" as mediating the relationship between social determinants and STI outcomes (Hogben & Leichliter, 2008).

Social Determinants of STI and HIV Risk

Social determinants of STBBI risk among youth include factors such as sex, education level, barriers to health and social services, and incarceration history. These determinants may contribute to a number of detrimental outcomes including decreased knowledge of sexual and reproductive health issues; engaging in high risk sexual behaviours and other risk behaviours; and ultimately increased risk of contracting or transmitting an STBBI.

Rucklos-Hampton and colleagues (2001) indicate that there are developmental and psychosocial influences that contribute to sex differences in sexual behaviours between adolescent females and males. These differences influence such factors as timing of first intercourse and use of condoms and contraception. They suggest that female sexual behaviours are more influenced by social controls and psychosocial factors

while stage of sexual development may be more influential on male sexual behaviour. Woolf and Maisto (2008) demonstrate the effect that sex and power in a relationship can have over condom use, where females who feel disempowered or submissive in their relationship are less likely to use condoms. Sex also has an influence upon related behaviours such as drug use, test seeking, and treatment (Dembo, Belenko, Childs, & Wareham, 2008).

Juvenile females face specific sexual health challenges but are underrepresented in the research. Willers and colleagues (2008) determined that among incarcerated females, those involved in sex work, reporting high numbers of lifetime sexual partners, or having a history of homelessness were at elevated risk of testing positive for an STI. In this study, being young was associated with a six-fold increase in chlamydia risk. Douglas and Plugge (2008) call for particular attention to be paid to the needs of young incarcerated females. Young females form a small but highly vulnerable part of the prison population such that "policy makers must guard against the risk that their needs will be 'tacked on' as an afterthought in the development of prison healthcare policy primarily concerned with the needs of male prisoners" (p. 75).

Educational attainment acts as another important social determinant of STBBI risk. In a study among female drug users, poor educational attainment was associated with HIV infection (Reid, 2006). In international research, there has been a relationship exhibited between knowledge of STBBI and higher educational attainment as well as increased prevalence of condom use among those with higher levels of education (Lagarde et al., 2001; Vandemoortele & Delamonica, 2000).

Where a person lives prior to incarceration is also associated with STBBI related knowledge, risks, and behaviours. In a study of incarcerated urban and rural females, Staton-Tindall et al. (2007) determined that while urban and rural females reported no significant differences in health problems, urban females report more service utilization including mental health and substance abuse services. Although people from rural geographic areas face barriers accessing services, the level of risk behaviours appears to be similar. Specific to drug using behaviours, rural residents were found to report similar drug use patterns to urban residents for most behaviours (Leukefeld et al., 2002). These findings suggest that while behavioural risks are similar across geographic regions, limited access to health services may increase vulnerability among those from rural areas.

Much of the research focused on incarcerated adolescents demonstrates that youth in contact with the justice system are at higher risk for contracting an STI or HIV (Belenko et al., 2008; Dembo et al., 2008; Spaulding, Clarke, Jongco, & Flanigan, 2009). Few studies have sought to assess whether or not the degree of involvement as indicated by age of first incarceration and length of time in custody relate to greater risk. In one such study, Tolou-Shams and colleagues (2007) identified having a history of prior arrest as a marker for HIV risk and substance abuse among a sample of adolescent incarcerated youth. Similarly, youth with multiple versus first admissions are at higher risk of STI and HIV infections (Harwell, Trino, Rudy, Yorkman, & Gollub, 1999).

Epidemiologic Context

Epidemiologic context relates to the likelihood of contracting an STBBI within a particular social or sexual network. Shared practices such as sexual behaviours and drug

and alcohol using behaviours within a particular social network may increase one's risk (Hogben & Leichliter, 2008).

Sexual behaviours consistent with increased STBBI prevalence include multiple sexual partners and unprotected sex. Feldmann (2008) reviewed studies of STI risk and standards of care for incarcerated youth. She identified early sexual debut, high numbers of sexual partners and inconsistent condom use as frequent findings related to incarcerated youth and STBBI risk. She also concluded that "prevalence of STD infection is quite high, with the majority of infections being asymptomatic" (p. 399).

Several studies have demonstrated the relationship between drug and alcohol use and STBBI risk. Rothon, Strathdee, Cook and Cornelisse (1997) explored factors that contributed to high risk sexual behaviour and injection drug use (IDU) among young offenders in British Columbia detention centres. The study concluded that females were more likely to report sex with an IDU, placing them at increased risk of HIV transmission. Additionally, predictors of IDU differed between 12 to 15 year olds versus 16 to 19 year olds with older females being more likely to report injection drug use. In a study of incarcerated youth with major mental disorders and/or substance use disorder Elkington, Teplin, et al. (2008) identified higher prevalence of the following high risk behaviours: substance use during sexual intercourse, unprotected vaginal sex, oral sex, and sex with multiple partners. They concluded that "alcohol and drugs are indirectly related to HIV/STI risk behaviours because their use increases exposure to deviant peers and risky sexual partners" (p. 909). Kahn et al. (2005) concluded that illicit drug users are much more likely to have concurrent partnerships, multiple partnerships and unprotected sex placing them at higher risk of STBBI infection.

Other research has demonstrated a relationship between drug and alcohol consumption and STBBI risk. In particular, having sex while under the influence of drugs or alcohol, younger age of initiation of drug or alcohol use, and injection drug use are all associated with STI and HIV prevalence (Calzavara et al., 2007; Small et al., 2005; Voisin, Neilands, Salazar, Crosby, & DiClemente, 2008).

Studies exploring determinants of risk behaviour during incarceration are limited. Seal and colleagues (2008) conducted a study of males 18 to 29 years old to determine the prevalence and correlates of substance use and sexual behaviour during incarceration. Study findings provide additional corroboration of males engaging in substance use and sexual activities while incarcerated. Males who reported having had male sexual partners prior to incarceration were more likely to report consensual sexual behaviour during incarceration. Males who were affiliated with gangs were more likely to report using illicit substances during their incarceration. The study findings suggest, as do previous studies, that substance use and sexual practices "during incarceration may reflect behavioural practices in the community" (p. 34). In particular males who use hard drugs prior to incarceration were more likely to report using marijuana and/or alcohol while incarcerated.

Pathways to risk behaviours among incarcerated youth are not sufficiently understood. In his work, Voisin and colleagues (2008) confirmed that youth held in detention represent a highly vulnerable population for engaging in illicit drug use and risky sexual behaviour. These findings are consistent with previously cited research (for example Feldmann, 2008). Teplin et al., (2003) quantified rates of sexual and risk behaviours by sex, race and age. They concluded that 95% of 1829 randomly sampled

youth engaged in three or more of the reported sexual or drug using risk behaviours and 65% engaged in ten or more. Their research calls for further study, in particular examination of the structural factors associated with delinquency in youth: "poverty, poor education and neighborhood disintegration" (p. 910).

Interventions to Prevent STBBI Transmission among At-Risk Youth

Studies routinely identify STBBI screening upon entry to corrections as an effective tool for identifying cases, treating, and offering preventive education. The U.S. Centre for Disease Control recommends routine HIV testing as a component of standard medical evaluation for inmates (The Foundation for AIDS Research, 2008). One challenge related to screening for STI and HIV in a local prison setting is waiting periods for obtaining results which can result in a missed opportunity for treatment and follow-up, especially in centres where inmates are moved regularly. Rapid testing assays that allow the immediate provision of results may be a more viable option in these types of settings (The Foundation for AIDS Research, 2008).

In many U.S. centres, newly admitted inmates are screened only when symptomatic. Research clearly demonstrates that this results in many missed diagnoses, for example, 75% of chlamydial infections in females are asymptomatic and only detected through screening (Centers for Disease Control and Prevention, 2007). For this reason, the literature recommends universal screening of inmates, regardless of symptoms (Frye et al., 2008; Kahn et al., 2005). Willers et al. (2008) echo these findings and recommend rapid testing to ensure that treatment is offered prior to release or transfer.

In circumstances where resources for screening are limited, priority should be given to those most likely to be at risk of having an STBBI. In a study that included both

adult and juvenile males and females in San Francisco correctional centres, Barry et. al. (2007) sought to determine STI risk by sex and age. Among the study population, chlamydia and gonorrhea rates were highest among females aged 12 to 25 years (chlamydia rate = 9.5%, gonorrhea rate = 3%). Older females, aged 26 to 30 years, had slightly lower rates of infection (chlamydia = 6%, gonorrhea = 3%). Among males, STI prevalence was highest between the ages 18 and 25 years. Based on their findings, the authors concluded that should STBBI screening need to be prioritized, health service providers should focus on offering voluntary screening to females under 30 years of age and to adult males between 18 and 25 years old (Barry et al., 2007).

Studies have demonstrated that following admission, inmates continue to engage in STI and HIV related risk behaviours while incarcerated. Use of condoms or other preventive practices are rare in correctional settings (Seal et al., 2008). In a study of males 18-29 years old, it was determined that using any substance during incarceration was significantly associated with gang affiliation (Seal et al., 2008). This study concluded that substance use and sexual behaviour practices during incarceration may reflect behavioural practices in the community. Specifically, there was an association between hard drug use in the community and substance use while incarcerated. In order to reduce the risk of STBBI transmission, it is recommended that inmates be provided with comprehensive services that include screening, treatment, partner notification, and methods for reducing unprotected sex and drug use (Joesoef, Kahn, & Weinstock, 2006). Internationally, evaluations of harm reduction programs have shown these to be effective with little harmful consequence to the inmates and staff (Jurgens, 2005). Studies have repeatedly shown the need for comprehensive HIV, STI, and hepatitis prevention

programs which address risk behaviours that occur within correctional settings along with a need for correctional health policies which permit condom and clean needle distribution (Seal et al., 2008).

A review of 12 HIV intervention studies with juveniles in corrections was conducted to identify promising practices in HIV education and health promotion. This review included two Canadian intervention studies. According to the review's authors, the most effective interventions utilized computer assisted learning in a one-on-one setting versus small group interventions (Tolou-Shams, Stewart, Fasciano, & Brown, 2009). Overall, females were more likely than males to report adopting preventive behaviours post-intervention indicating a need to identify more effective strategies targeting males. This may include programs that integrate psychosocial aspects of HIV prevention, alcohol and drug risk reduction along with motivational enhancement. Their recommendations include the need to integrate affect management, motivational and skills training to more effectively impact on behaviour of incarcerated youth. However, the impact of interventions delivered within the correctional setting may be limited. For this reason, continuing interventions in a community setting after release may have more impact for those youth who may not consider sexual risk as relevant during incarceration (Tolou-Shams et al., 2009).

Elkington et al. (2008) reinforce this conclusion; they point out that youth have a median stay of two weeks in prison making their STBBI behaviours a community health problem. The study authors advocate for interventions that involve collaboration between corrections and child and adolescent health practitioners to ensure programs started in correction centres continue after release. Delivering interventions inside the

correctional centre may limit opportunity to involve and influence peers, partners and family in reducing risk. However, research has demonstrated that individual level factors are important predictors of risk suggesting the individual interventions while incarcerated may be beneficial (Lawrence et al., 2008).

Methods

Study Design and Data Sources

This study used a cross-sectional survey design and involved the analysis of secondary data collected via the 2008 *Epidemiology of STBBI in Prison Study*. The 2008 STBBI in Prison Study aimed to "provide groups offering services to incarcerated individuals with local scientific evidence to better address the HIV and STI prevention needs of their clientele by describing the social, legal and environmental factors that hinder or support preventive practices" (Beaudoin, 2007). The study design was chosen as the most appropriate method for gathering valid and reliable evidence on the prevalence of HIV, Hepatitis C, gonorrhea, chlamydia, and syphilis within the target population and to identify the behaviours and knowledge that may put inmates at risk for transmission of an STBBI while incarcerated. The study represents the first time this type of study was conducted in Manitoba provincial corrections and provides sound evidence for planning of local prevention efforts.

Data collection was carried out between May and October 2008 and involved structured interviews conducted by a study nurse. The questionnaire took approximately 45-minutes to complete and included collection of a blood sample for HIV, Hepatitis C, and syphilis testing, and a urine specimen for chlamydia and gonorrhea testing. All participants were randomly selected into the study using the Corrections Offender

Management System (COMS) database. Involvement was entirely voluntary and all study participants received a cash honorarium of $10.00 for taking part. Ethical approval was obtained through the University of Manitoba Research Ethics Board.

Sample

The original study sample comprised of 401 participants representing male and female adult and youth inmates. In order to assess current substance use and sexual behaviours during incarceration, only those individuals held in secure custody for a minimum of three months were eligible for inclusion into the study. Sample size was estimated using a confidence interval of z=1.96 and a p-value of 0.05. Based on previous prevalence studies of high risk populations and the aims of the study, it was determined that an overall sample of 400 would be sufficient.

Sampling involved single-stage sampling using the COMS database. The research coordinator was provided access to the database which included names and admission dates of the daily offender population. The research coordinator randomly chose a pre-selected number of inmates from a given centre which would be provided to the study nurse. The study nurse worked with an internal corrections liaison to exclude offenders that posed a potential security risk. The remaining inmates were then invited to voluntarily participate in the study. The study nurse reviewed the informed consent form with each participant prior to conducting the interview. Participants were informed that they could withdraw from the study at any time and that their choice to participate or not would in no way affect their treatment or services available through Manitoba Corrections. The overall rate of participation in the study was 77.3%.

Of the final study sample, 52% (n = 210) were between the ages of 16 and 24 and therefore selected for analysis in this study. This includes 87 participants considered to be young offenders and incarcerated at one of two youth correctional centres in the province. The remaining 123 participants were recruited from the adult inmate population. In order to detect a medium effect size ($r = 0.2$) and obtain a power level of 0.8 with $p < 0.05$, a minimum sample size of 85 is recommended (Field, 2009). Post hoc power analysis for medium effect size and $p < 0.05$ on a sample of 210 results in a power of 0.823 (Faul, Erdfelder, Buchner, & Lang, 2009).

Data Collection Instruments and Variables

The data collection instrument used in the study was a questionnaire designed to assess the participant's level of HIV, Hepatitis C, and STI knowledge, risk behaviour, and perceived barriers to prevention methods. Specifically the questionnaire asked a series of questions related to:

- Participants' demographics – age, sex, ethnicity, region of residence prior to incarceration.
- STI, HIV, and HCV related knowledge – assessed current understanding of potential disease risk factors and beliefs regarding the efficacy of various prevention efforts.
- Engagement in STBBI related risk behaviours – assessed participants' risks in terms of sexual and injection drug practices occurring prior to and during their incarceration.
- Perceived barriers to disease prevention – assessed the barriers perceived by participants that may hinder harm reduction efforts.

- Lifetime STI history – participants were asked to indicate if they had ever tested positive for any STI including gonorrhea, chlamydia or HIV. In addition to self-report, participants were asked to voluntarily provide a urine and blood specimen for testing. All specimens were submitted to Cadham Provincial Laboratory for testing. Gonorrhea and chlamydia testing was carried out using nucleic acid amplification test. HIV testing was carried out by enzyme immunoassay with confirmatory testing using western blot test. Hepatitis C antibody tests were carried out to detect Hepatitis C. Syphilis testing involved inmmuno-flourescent examination for treponema pallidum.

Objective 1: STBBI Knowledge, Behaviours, and Prevalence

The first objective of the current study is to describe the STBBI-related knowledge, risk behaviours, and prevalence in the target population. To meet this objective the following variables have been assessed:

STBBI knowledge. Participants' level of STBBI knowledge was based upon the number of correct responses to 25 questions assessing STI and HIV knowledge. Ten questions were related to sexually transmitted infections. Participants who answered "no" to "Do you know what sexually transmitted infections are?" were automatically assigned scores of 0 out of 10 for STI knowledge. As well, participants who answered "no" to "Do you know what HIV is?" were assigned scores of 0 out of 15 for HIV knowledge. Each individual response was coded 0 (incorrect or unknown) or 1 (correct). All correct answers were added to calculate a total score representing the number of correct responses and entered into one variable called STBBI knowledge.

Age of sexual debut. Participants were asked to report the age of their first consensual encounter. Age in years was entered as a continuous variable.

Number of sexual partners. Participants were asked how many sexual partners they had in the year prior to incarceration. This measure included all types of partners (i.e., same and opposite sex partners, regular partners, anonymous partners, client partners or sex trade workers). A continuous variable for number of sexual partners was based on the total number reported.

Condom use. Participants were asked to report on how often they used condoms in the year prior to incarceration. Consistent condom use mitigates risk of STBBI transmission. Participants were asked how often they used condoms with each type of sexual partner with response options on a four point scale from never (4) to always (1).

Sexual risk. While number of sexual partners and condom use each are important indicators of risk, the interplay between them is of particular interest. For example, inconsistent condom use with one partner may be more risky than consistent condom use with multiple partners. A new scale, called sexual risk, was thus created which multiplies an individual's condom use score by his/her number of sexual partners. This scale was truncated to the third quartile in order to minimize the effects of extreme values.

Having sex while drunk or high. Participants were asked if they had sex under the influence of drugs or alcohol in the year prior to incarceration. Responses were coded on a binary yes/no scale.

Age of initial drug use. This variable is based on self-report of age in years at which drugs or alcohol were first consumed and entered on a continuous scale.

Injection drug use. Participants were asked if they had ever used injection drugs. This was entered as a binary yes/no scale.

Sharing of needles. Participants who reported that they had used injection drugs in the year prior to incarceration were asked if they had shared needles or other drug using paraphernalia. This was asked as a binary yes/no question.

Positive STBBI diagnosis. Period prevalence of STBBI was based on self report of ever having tested positive for chlamydia, gonorrhea, syphilis, HIV, Hepatitis C, or herpes. In addition to self-report, participants were asked to provide urine and blood specimens for testing of chlamydia, gonorrhea, HIV, syphilis and HCV. Both self-reported STBBI diagnoses and lab confirmed diagnoses were combined to form a single variable for positive STBBI diagnoses. Positive STBBI reports are cumulative, that is, each reported STBBI was entered as one, added together, and entered as a continuous variable representing total number of reported and lab confirmed positive STBBI diagnoses.

Sexual health. STBBI knowledge, sexual risk behaviours and STBBI prevalence are all interdependent factors in determining an individual's overall sexual health. To reflect this, one variable was created which combined knowledge, behaviour and STBBI prevalence into an indicator of sexual health. Scores for STBBI knowledge (0 – 25) were reversed in order to correspond with the ascending level of risk associated with the other two variables (sexual risk and positive STBBI diagnoses). Age of sexual debut was transformed into a categorical five point scale from youngest to oldest. These four scores were summed to create one single continuous variable of sexual health.

Variables related to drug use (having sex while drunk or high, age of initial drug use, injection drug use and sharing or needles) were excluded as variables in calculating sexual health so as to allow the analysis to include an examination of the associations between drug using behaviours and sexual health.

Objective 2: Associating Sexual Health Outcomes with Epidemiologic Context

The second objective of this study is to identify the potential associations between the sexual health indicators described in Objective 1 and the epidemiologic context in which they occur. This objective was met by quantifying the association with each of the sexual health indicators and the following contextual variables:

Biological sex. Participant sex was self-reported as male, female or other.

Educational attainment. Level of education attained was self-reported as having completed either above or less than grade eight.

Geographic area of childhood residence. Place where participant grew up as a child was self-reported as city, rural area, on reserve or other.

Age first incarcerated. Age, in years, at which the participant was first ever incarcerated in a correctional centre was entered on a continuous scale.

Total time incarcerated. Total number of months spent in custody in the participant's lifetime was entered on a continuous scale.

While ethnicity data was collected in the STBBI in Prison Study, it was excluded as a variable of interest in this study. Apart from sex, all variables of interest considered were deemed to be structural factors contributing to risk such as access to care, educational attainment and institutionalization

Additionally, the association between STBBI knowledge and sexual and drug risk behaviours was also assessed, as was the association between age of sexual debut, STBBI knowledge, and sexual risk with the number of diagnosed STBBI.

While the 16 to 24 year old cohort is routinely considered as "youth" in public health literature and practice, within the Manitoba corrections system services are delivered very differently to juveniles under the age of 18 years than to adults. In order to ensure that findings are equally relevant to public health practitioners as well as to staff within the corrections system, data were analyzed for the entire youth cohort and separately by type of correctional centre (i.e., youth centre versus adult correctional centre).

Data Analysis Procedures

Analysis included univariate as well as multiple regression analysis using Statistical Package for Social Sciences (SPSS) 17.0 to test for significant associations between study variables. Significant relationships were based on a value of $p < 0.05$. Specific analytic procedures for each of the study objectives are described below.

Objective 1: STBBI Knowledge, Behaviours, and Prevalence

In order to describe the STI and HIV related knowledge, risk behaviours and prevalence among 16 to 24 year olds in Manitoba provincial correctional centres, the frequency, percentage, mean, standard deviation, median and range were determined for each previously identified variable.

The distribution of each variable was plotted on a histogram to ensure that the assumptions for parametric tests were met. Variables that did not meet criteria for normal distribution utilized non-parametric tests of association.

Objective 2: Associating Sexual Health Outcomes with Epidemiologic Context

To identify potential associations between sexual health outcomes and the epidemiologic context in which health risks occur, tests of association were carried out and reported on each previously identified variable using independent pairs t-tests to compare means between groups of two categories and analysis of variance (ANOVA) to compare means between groups of three or more categories. Pearson's-r was used to determine the relationship between a continuous scale variable and sexual health. Following univariate analysis, all variables were entered into a stepwise multiple regression model using a forward method to identify and isolate significant predictors of poor sexual health (Field, 2009) .

Results

Objective 1: STBBI Knowledge, Behaviours, and Prevalence

The final study sample consisted of 210 individuals. Of these, 87 (41.4%) were interviewed at one of two youth centres (Agassiz Youth Centre, Manitoba Youth Centre). The remaining 123 participants (58.6%) were interviewed while incarcerated at one of seven adult correctional centres around Manitoba. Table 1 presents the distribution of participants across all nine correctional centres by sex.

Table 1. Study participants by sex and correctional centre

	Male		Female		Total	
Correctional Centre	n	%	n	%	n	%
Agassiz Youth Centre	38	21.5	0	0	38	18.1
Manitoba Youth Centre	41	23.2	8	24.2	49	23.3
Brandon CC	23	13.0	0	0	27	12.9
Dauphin CC	16	9.0	0	0	16	7.6
Milner Ridge CC	17	9.6	0	0	49	23.3
Winnipeg Remand Centre	17	9.6	3	9.1	20	9.5
The Pas CC	4	2.3	1	3.0	5	2.4
Portage CC	0	0	17	51.5	17	8.1
Headingley CC	21	11.9	0	0	21	10
Total	177	100	33	100	210	100

Demographics

The survey collected the following demographic data: biological sex, age, level of education, geographic area of residence as a child, geographic area of residence prior to incarceration, total time spent in custody to date, and age at first incarceration. Table 2 summarizes these data by sex. There are no statistically significant differences between the male and female participants on any of the demographic variables presented.

Participants were asked to self-identify their sex as either male, female, or other. Eighty four percent (n = 177) of respondents were male and 16% (n = 33) were female. None of the participants identified their sex as 'other' (for example, transgender).

The overall mean age of the sample population was 19.4 years (SD = 2.46). Mean age among those interviewed in a youth centre was 17 years (range = 16 – 19). Within the adult correctional centres, participant mean age was 21 years (range = 18 – 24). Males were slightly younger than females: 19.2 years compared to 20.1 years, respectively. Given that the sample is comprised of individuals from both youth and adult centres, comparison with the overall mean age of the provincial prison population is not possible.

Education data shows an overall level of low educational attainment when compared with the general population. With a minimum participant age of 16, it is expected that all would have attained, at minimum, a grade nine education. Findings show that one quarter of the total sample fall below this threshold. Similarly, 147 participants were over the age of 18 and would therefore be expected to have completed high school at the time of the interview. Of these 147, only 5 (3.4%) reported having at least a high school diploma leaving 97% of those 18 years and over with less than high school education. In order to ensure adequate variability, participants' level of educational attainment was classified as having completed grade eight or higher versus having less than grade eight education.

Almost 60% of respondents lived in a city or urban centre as children and 67% were living in a city or urban centre prior to their current incarceration. Thirty percent lived on a reserve as a child, and one quarter of participants were living on reserve prior to incarceration. Approximately ten percent grew up in a rural area or town or were living in a rural area prior to their current incarceration. Not surprisingly the numbers of

participants stating they lived in a rural area or on reserve as children is slightly higher indicating reserve to urban migration over time.

Mean age at first incarceration was 15 years (SD = 2.81), indicating a high rate of recidivism among the participants. Total time spent in custody ranged from a minimum of 3 months to a maximum of 144 months or 12 years. The median time spent in custody was 18 months (mean = 28.5 months).

Table 2. Demographics by sex.

	Total (210)		Male (177)		Female (33)		Test statistic
	Mean	SD	Mean	SD	Mean	SD	
Mean age in years	19.4	2.46	19.2	2.41	20.1	2.60	t = 1.96, p<0.05
Mean age of sexual debut	13.7	1.73	13.7	1.76	13.9	1.61	t = 0.69, n.s.
Mean age of first incarceration	15.5	2.81	15.4	2.76	16	3.10	t = 1.04, n.s.
Mean number months in custody	28.5	26.36	28.6	25.41	27.7	31.69	t = 0.52, n.s.
Education	n	%	n	%	N	%	
grade 8 or less	54	25.7	44	24.9	10	30.3	
Grade 9 - 12	151	71.9	129	72.9	22	66.7	
High school diploma	3	1.4	2	1.1	1	3.0	x^2 = 0.65, n.s.
some university/college	2	1.0	2	1.1	0	0	
University/college graduate	0	0	0	0	0	0	
Place they grew up							
City	120	58.3	101	57.1	19	57.6	
Rural	24	11.7	19	10.7	5	15.2	x^2 = 0.52, n.s.
On reserve	62	30.1	53	29.9	9	27.3	

The first objective of this study is to describe the STBBI related knowledge, risk behaviours, and prevalence among 16 to 24 year olds in Manitoba provincial correctional centres. The following results provide findings from descriptive analysis for each of the

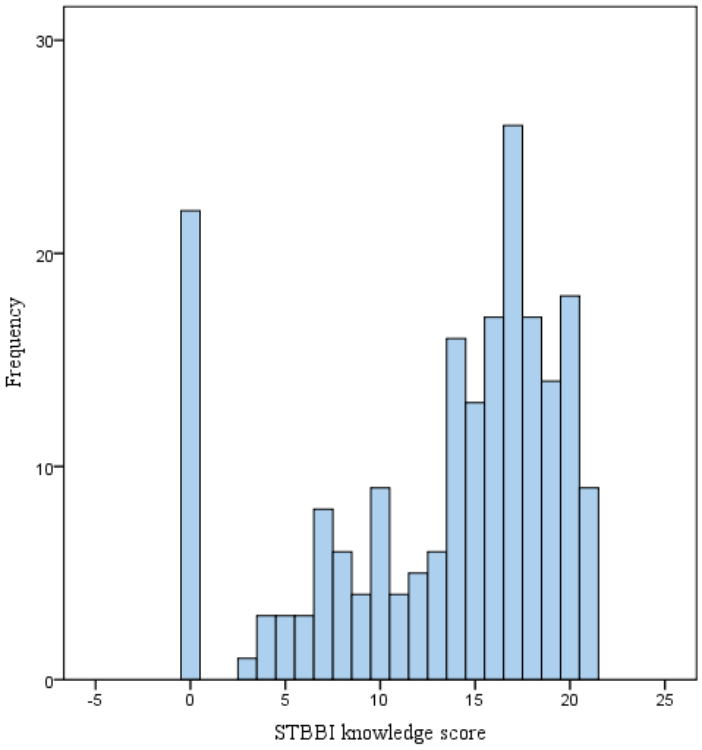
three variable groupings: (a) STBBI knowledge; (b) sexual and drug using behaviours and (c) STBBI prevalence.

STBBI Knowledge

STBBI knowledge scores were based on the total number of correct responses provided to questions related to STBBI transmission risks. 204 participants responded to the STBBI knowledge questions. Of these, 10.8% (n = 22) stated that they did not know what a sexually transmitted infection or HIV were and thus scored 0 out of 25.

In all, 182 individuals knew what HIV and STI were, and thus completed the STBBI knowledge questions. Mean score of STBBI knowledge was 13.3 (SD = 6.28) and median value was 15.0. Scores ranged from a low of zero to a high of 21. Figure 1 presents the distribution of STBBI knowledge scores.

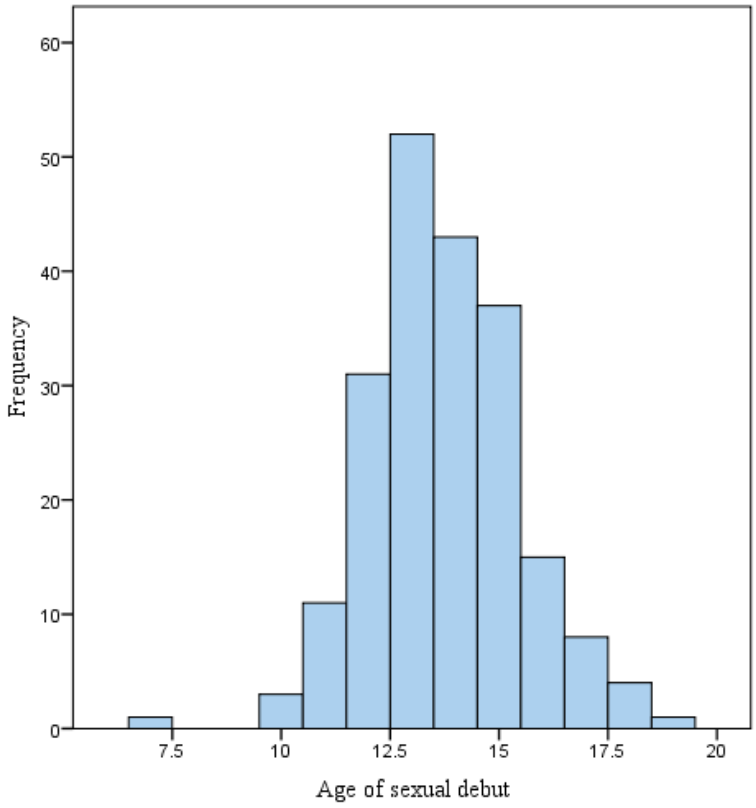
Figure 1. Distribution of STBB1 knowledge scores



Age of Sexual Debut

Participants were asked to report the age at which they first had sexual intercourse (vaginal, anal or oral). Out of the study sample, 207 had ever had sex. The mean age of sexual debut was 13.7 years (SD = 1.73). The median age of sexual debut was 14 years and the range was from a seven years to 19 years old. Figure 2 presents the distribution of age of initial sexual encounter.

Figure 2. Distribution of age of consensual sexual debut.



Number of Sexual Partners

Participants were asked to indicate the total number of sexual partners they had in the twelve months prior to incarceration. 71.4% (n = 151) of participants reported having more than one sexual partner in the year prior to incarceration. Half of the participants, 51.4% (n = 108), reported having more than three different sexual partners in the year

prior to incarceration. 21.9% (n = 46) had one sexual partner in the year prior to incarceration. The mean number of sexual partners was 7.5 (SD = 13.65). The median was 4.0 and responses ranged from one to over 100.

Condom Use

Participants were also asked how regularly they used condoms. A small number, 18.6% (n = 39) reported always using a condom with all partners, 18.1% (n = 38) reported that they never used a condom in the year prior to incarceration. Of those who had more than one sexual partner, the majority (71.2%) reported inconsistent condom use. Table 3 presents the proportion of males and females who had unprotected sex with multiple sexual partners in the year prior to incarceration by type of sexual partner.

Table 3. Proportion reporting unprotected sex in year prior to incarceration by partner type.

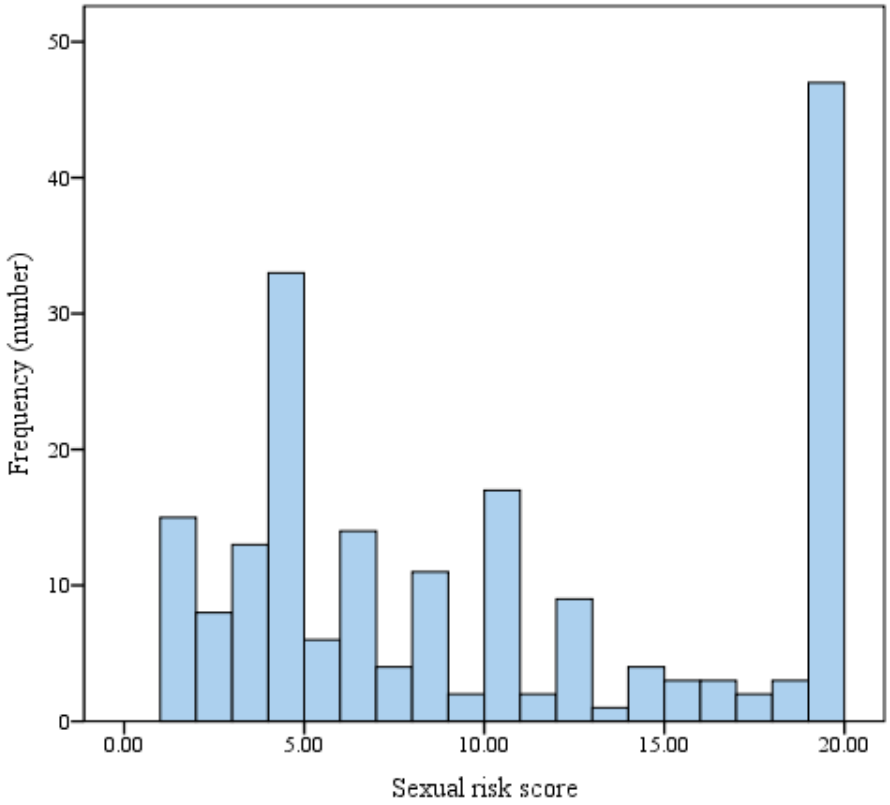
	Total		Male		Female		
	N	%	n	%	n	%	test statistic
Regular partner	108	71.5	96	82.8	12	85.7	$x^2 = 0.75$, n.s.
Anonymous partner	61	40.4	55	46.6	6	35.3	$x^2 = 0.70$, n.s.
John	2	1.3	1	14.3	1	16.7	$x^2 = 2.58$, n.s.
Sex Worker	0	0	0	0	0	0	
Any partner	127	84.1	112	84.8	15	78.9	$x^2 = 0.43$, n.s.

Sexual Risk

Rate of condom use was factored with number of sexual partners to create a variable for sexual risk. Higher scores reflect increased risk due to higher numbers of

sexual partners combined with irregular or infrequent condom use. Scores for sexual risk ranged from a low score of 1 to a high of 297. In order to reduce the influence of extremely high scores, the scale was truncated to the third quartile which was 19. The resulting mean was 9.7 (SD = 6.53) and median score was 8.0. Figure 3 presents the distribution of sexual risk among the study population.

Figure 3. Sexual risk (number of sexual partners weighted by condom use)



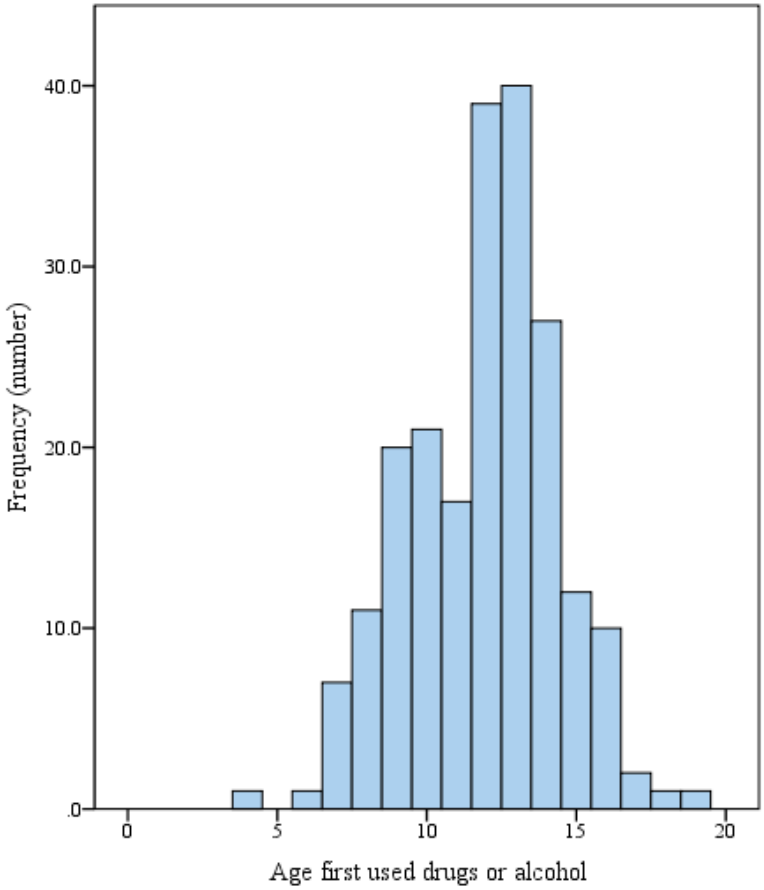
Having Sex while Drunk or High

All female respondents (n = 29) and 89.1% of male respondents (n = 156) answered yes to having used alcohol or drugs within two hours of having sex in the year prior to incarceration. Given the small number of individuals within the group reporting never having sex drunk or high, further analysis of this variable was not possible.

Mean Age of Initial Drug Use

All 210 participants reported having ever used alcohol or street drugs. Only one participant reported never having used alcohol. Almost all, 98.1% (n = 206) reported having ever used street drugs. Mean age of initial drug or alcohol use was 11.9 years (SD = 2.48); median age was 12.0, and range was from 4 to 19 years. Figure 4 presents the distribution of age of initial drug or alcohol use.

Figure 4. Distribution of age of initial drug or alcohol use.



Injection Drug Use

Out of the entire study sample, 6.3% (n = 13) reported having ever used injection drugs. Of those reporting prior injection drug use, seven were male and six were female.

Sharing of Needles

Only four participants (two male and two female) reported having used injection drugs in the year prior to incarceration. Of these, only one female reported that she shared needles regularly. All other respondents reported never having shared needles in the year prior to incarceration.

Positive STBBI Diagnosis

The STBBI in Prison study determined both period and point prevalence of STI and HIV in Manitoba Provincial Correctional Centres. Among 16 - 24 years olds studied, 86.7% (182) provided a urine specimen for chlamydia and gonorrhea testing and 94.8% (199) provided a blood specimen for testing of HIV, Hepatitis C and syphilis.

Shown in Table 4, point prevalence of chlamydia in the study sample was 9.3% (n = 17), and all identified cases were among males. Point prevalence of gonorrhea in the study sample was 1.6% (n = 3), of which two cases were male and one was female. Point prevalence of HIV was 1.0% (n = 2), one male and one female. Point prevalence of HCV was 1.0% (n = 2), one male and one female. No cases of syphilis were identified.

Table 4. Point prevalence of STBBI by sex.

	Chlamydia		Gonorrhea		HIV		HCV		Syphilis	
	N	%	n	%	n	%	n	%	n	%
Male (155)	17	10.8	2	1.3	1	0.6	1	1.2	0	0
Female (29)	0	0	1	4.2	1	3.2	1	6.5	0	0
Total (184)	17	9.3	3	1.6	2	1.0	2	2.0	0	0

In addition to laboratory testing for each of the above pathogens, period prevalence of chlamydia, gonorrhea, HIV, HCV and syphilis was assessed by self-report of ever having been diagnosed with any STBBI, combined with their current laboratory test result. Period prevalence was calculated only for those participants who had prior testing or had consented to STBBI testing as part of the study. Missing cases (i.e., never tested, refused or don't know) were excluded. This resulted in period prevalence being calculated for 184 participants.

Period prevalence of chlamydia was 33.4% (n = 61). Thirteen percent (n = 24) had ever tested positive for gonorrhea. More females (45%) than males (31%) had tested positive for chlamydia in the past. Females were also more likely to have had gonorrhea (28%) than males (10%). Period prevalence of HIV is equal to point prevalence (1.0%); one male and one female. Period prevalence of Hepatitis C includes two laboratory confirmed cases as well as two latent or past positive cases for an overall HCV period prevalence of 2.0% (n = 4). The only other reported previously diagnosed STI were two cases of herpes simplex virus (HSV), both male, resulting in an overall HSV rate of 1%.

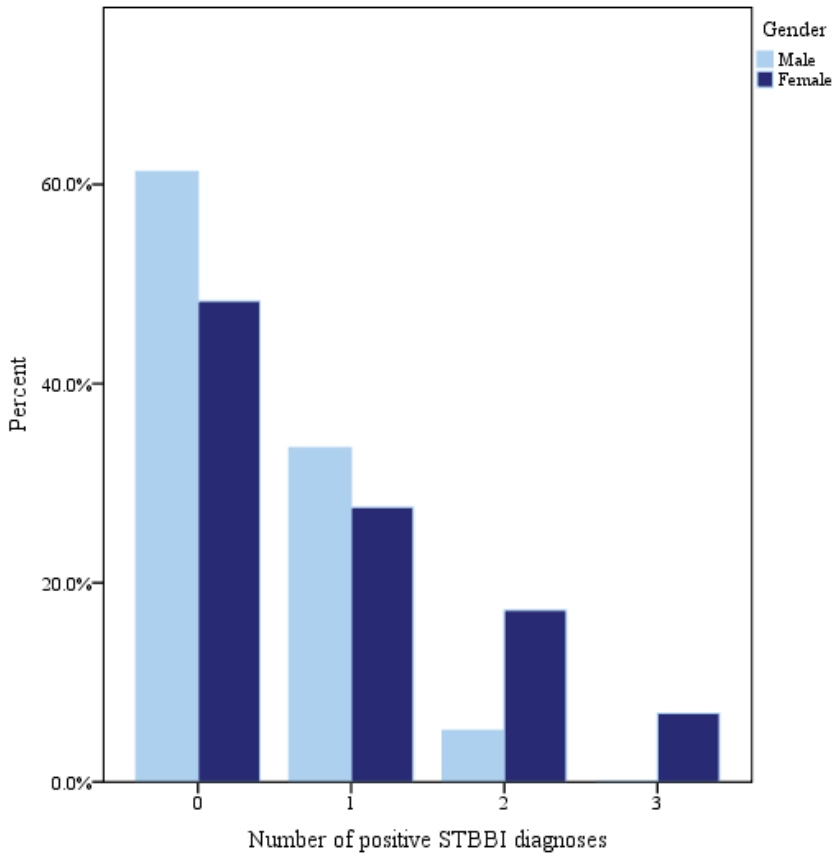
Table 5. Period prevalence of STBBI by sex

	Chlamydia		Gonorrhea		HIV		HCV		HSV	
	n	%	n	%	n	%	n	%	n	%
Male	48	31.0	16	10.3	1	0.6	2	1.3	2	1.3
Female	13	44.8	8	27.6	1	3.4	2	6.9	0	0
Total	61	33.4	24	13.0	2	1.0	4	2.2	2	1.1

In order to determine overall lifetime exposure to STI and HIV, period and point prevalence of all STBBI were combined into one variable for positive STBBI diagnosis. Scores range from zero (never being diagnosed) to three STBBI diagnoses.

When all STBBI are combined, 40.8% (n = 75) of respondents reported having at least one STBBI diagnosis in their lifetime. Among females 51.7% (n = 15) have had at least one STBBI diagnosis compared to 38.7% of males (n = 60). Figure 5 presents the rate of positive STBBI diagnosis in the study group by sex.

Figure 5. Number of previous STBBI by sex.

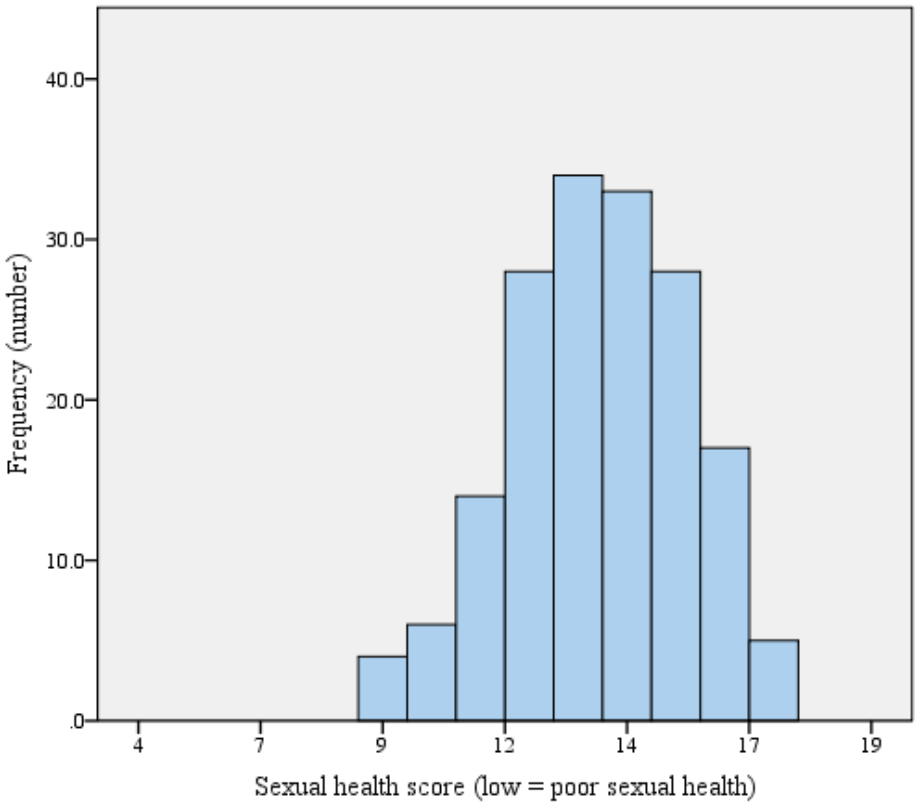


Sexual Health

In order to account for the combined influence of knowledge, attitudes and behaviour on sexual health, scores for STBBI knowledge, age of sexual debut, sexual risk

and positive STBBI diagnosis were added to form a single score of overall sexual health. The theoretical scale of sexual health ranged from a lowest possible score of four, indicating poor sexual health, to a highest possible score of nineteen. After excluding participants with a missing score in one or more of the variables of interest, sexual health scores were computed for 169 study participants. Actual scores ranged from nine to seventeen, with a mean score of 13.4 (SD = 1.81); median score was 13.0. Figure 6 plots the distribution of sexual health scores within the study sample.

Figure 6. Distribution of sexual health scores.



Objective 2: Associating Sexual Health Outcomes with Epidemiologic Context

The second objective of this study is to identify the associations between STBBI related knowledge, risk, prevalence, and sexual health and factors related to biological sex, level of education, place of childhood residence, age of first incarceration, total time

in custody, and facility type. The following results provide findings from univariate analysis for each of the three variable groupings: (a) STBBI knowledge; (b) sexual and drug using behaviours and (c) STBBI prevalence and multivariate analysis for sexual health.

STBBI Knowledge

Analysis of STBBI knowledge was carried out separately for those with no STBBI knowledge and those who completed the questions. Twenty-two participants (10.5%) had no knowledge of STBBI (i.e., had a score of zero on STBBI knowledge scale). Participants with no STBBI knowledge were significantly more likely to report their childhood residence as being on a reserve.

Participants who spent less time in custody where more likely to report having no STBBI knowledge at all (Table 6). Mean age of first incarceration among those who scored zero on STBBI knowledge was 16.1 years (SD = 1.89) compared to 15.5 years (SD = 2.91) for those with some STBBI knowledge ($t_{(1,202)} = 0.93$, $\underline{p} < 0.05$). Having spent fewer months in custody (transformed to log 10) was also associated with no STBBI knowledge ($t_{(1,202)} = 0.84$, $\underline{p} < 0.05$).

Table 6. Demographic description of youth reporting no STBBI knowledge.

	n	%	test statistic
Sex			
Male	18	10.4	
Female	4	12.9	$x^2 = 0.171$, n.s.
Education			
Less than grade 8 completed	5	10.2	
Grade 8 or higher	17	11.0	$x^2 = 0.023$, n.s.
Childhood residence			
City	5	4.4	
Rural	1	4.2	
Reserve	15	24.2	$x^2 = 17.93$, $p < 0.001$
Facility type			
Youth centre	11	12.9	
Adult centre	11	9.2	$x^2 = 0.71$, n.s.

The majority of participants (86%) reported having some STBBI-related knowledge and completed this section of the questionnaire. Subsequent scores were compared for associations related to biological sex, level of education and geographic region of childhood residence. Females had a slightly lower mean score of STBBI knowledge: 14, compared to a mean score of 15 among males, however, this difference was not statistically significant. There was no significant difference between STBBI knowledge and level of education. However, low STBBI knowledge was significantly

associated with geographic region of childhood residence being on reserve. Participants reporting childhood residence as being on reserve had a mean STBBI knowledge score of 13, whereas mean STBBI knowledge among urban youth was 16 (Table 7).

Table 7. Demographic description of youth with at least some STBBI knowledge.

	Mean	SD	test statistic
Sex			
Male	15.1	4.29	
Female	14.0	5.52	t = 1.10, n.s.
Education			
Less than grade 8 completed	15.2	4.42	
Grade 8 or higher	14.8	4.74	t = 0.46, n.s.
Childhood residence			
City	15.9	4.01	
Rural	14.8	5.19	
Reserve	12.6	4.49	$F = 9.30$, $p < 0.001$

Age of first incarceration and total length of time spent in custody were correlated with STBBI knowledge scores to determine potential association between involvement in the correctional system and level of STBBI knowledge. For many at-risk youth, incarceration presents an opportunity to access health care services that may not be available to them in the community (Rosengard et al., 2006). As such, incarceration history can be either a risk factor for low STBBI knowledge or it may have a positive

influence for those accessing available correctional health services. For this reason, correlation coefficients were calculated at a two-tailed, $p < .05$ level.

Results show that there is a very small negative relationship between age of first incarceration and STBBI knowledge. In other words, the younger the age at which the youth were first incarcerated, the higher their STBBI knowledge (Pearson's r (two-tailed) = -0.24, $\underline{p} < .001$). In order to reduce the effect of extreme values and achieve a normal distribution, total number of months in custody was transformed to a base 10 logarithmic scale. When STBBI knowledge rates are compared to length of time spent in custody, there is a slight positive association; as total length of time spent in custody increased so does overall STBBI knowledge (Pearson's r (two-tailed) = 0.18, $\underline{p} < 0.05$).

STBBI knowledge was compared between those surveyed in a youth correctional centre and those in an adult correctional centre. Mean STBBI knowledge scores were the same for both groups (Mean = 14.9, SD = 4.36).

Age of Sexual Debut

Studies have shown that the longer individuals delay sexual activity, the lower their risk of contracting a sexually transmitted infection or HIV (Mardh, Creatsas, Guaschino, Hellberg, & Henry-Suchet, 2000). Among the study group, age of sexual debut was the same (14 years) for both males and females. Mean age of sexual debut was slightly higher among participants who had completed grade eight or higher; 14 years versus 13 years among those with less than grade eight education Table 8). There was no difference in mean age of first sexual encounter between youth raised in a city, rural area or on reserve.

Table 8. Demographic description of youth according to mean age of sexual debut.

	Mean	SD	test statistic
Sex			
Male	13.7	1.76	
Female	13.9	1.61	t = 0.69, n.s.
Education			
Less than grade 8 completed	13.3	1.72	
Grade 8 or higher	13.9	1.72	t = 2.02, p < 0.05
Childhood residence			
City	13.5	1.62	
Rural	13.9	2.44	
Reserve	14.0	1.61	F = 1.92, n.s.

The relationship between incarceration history and sexual risk behaviour as exhibited by age of first sexual encounter is evident among the study sample. Among participants, lower age of incarceration is positively correlated with younger age of sexual debut (Pearson's r (two-tailed) = 0.379, $p < .001$). Similarly, the more time an individual had spent in custody to date, the lower their age of initial sexual encounter (Pearon's r (two-tailed) = -0.305, $p < 0.001$).

Number of Sexual Partners

Overall mean number of sexual partners in the year prior to incarceration was 7.5 (SD = 13.65). Distribution of responses did not meet assumptions of a normal distribution (see Figure 3; weighted number of sexual partners). Non-parametric tests of association

were used to identify potential associations between groups by sex, education, childhood residence, and facility type. Growing up in a rural area was significantly associated with having a higher mean number of sexual partners in the year prior to incarceration (Table 9).

Table 9. Mean number of sexual partners in year prior to incarceration.

	Mean	SD	test statistic
Sex			
Male	7.3	12.55	
Female	8.7	19.31	Mann-Whitney U, n.s.
Education			
Less than grade 8 completed	7.8	15.87	
Grade 8 or higher	7.3	12.85	Mann-Whitney U, n.s.
Childhood residence			
City	8.5	14.88	
Rural	12.1	21.66	Kruskal-Wallis, $p < 0.05$
Reserve	4.1	3.92	
Facility Type			
Youth centre	6.7	9.75	
Adult centre	8.0	15.80	Mann-Whitney U, n.s.

Number of sexual partners was correlated with age of first incarceration and total time spent in custody. There was no significant relationship observed between the number of sexual partners reported in the year prior to incarceration and age of first

incarceration. There was a small positive relationship observed between total time spent in custody and number of sexual partners (Spearman's rho (two-tailed) = 0.14, $p < 0.05$).

Sexual Risk

Number of sexual partners was combined with rate of reported condom use to determine overall sexual risk. To reduce the influence of high values, sexual risk was truncated at 19 corresponding to the third quartile (i.e., 75% of respondents had a sexual risk score below 19). Higher scores reflect increased risk due to higher numbers of sexual partners combined with irregular or infrequent condom use. Sexual risk was compared between males and females, those with below and above a grade eight education, those growing up in the city versus rural or reserve community, and between those in a youth versus adult facility. Non-parametric tests of significance were used.

Mean scores of sexual risk were similarly distributed across all groups. Mean sexual risk among males was 10, compared to a slightly lower risk among females (mean = 9). Sexual risk behaviour was not associated with level of education or geographic area of childhood residence (Table 10). Sexual risk was also similar between those interviewed in a youth centre (mean = 10) and those in an adult facility (mean = 9).

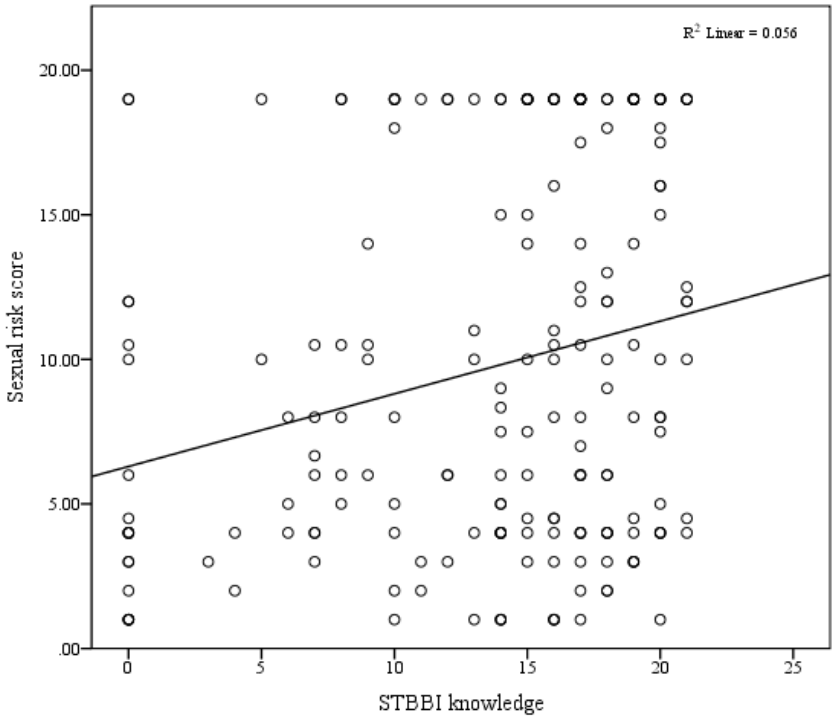
The relationship between sexual risk behaviour and incarceration history was explored. There was no evident correlation between age of first incarceration and sexual risk. However, as overall time spent in custody increases, sexual risk behaviours also increased (Spearman's rho (two-tailed) = 0.15, $p < 0.05$).

Table 10. Demographic description of youth according to mean sexual risk scores.

	Mean	SD	test statistic
Sex			
Male	9.8	6.6	
Female	8.8	6.1	Mann-Whitney U, n.s.
Education			
Less than grade 8 completed	9.8	6.6	
Grade 8 or higher	9.6	6.5	Mann-Whitney U, n.s.
Childhood residence			
City	10.1	6.5	
Rural	11.5	7.1	Kruskal-Wallis, n.s.
Reserve	8.6	6.3	
Facility Type			
Youth centre	10.4	6.4	
Adult centre	9.2	6.6	Mann-Whitney U, n.s.

Health promotion efforts aimed at reducing risk include increasing STBBI knowledge in order to influence behaviours. Among the study sample, increased knowledge of STBBI did not result in decreased sexual risk (Figure 7). As STBBI knowledge increased, sexual risk behaviours increased (Spearmans rho (two-tailed) = 0.213, $p < 0.01$).

Figure 7. Level of sexual risk taking by STBBI knowledge.



Mean Age of Initial Drug Use

Reported age of initial drug and/or alcohol use was compared between males and females, those with less than grade eight education or above, geographic area of childhood residence as city, rural or reserve, and adult versus youth facility.

Males reported a slightly younger age of initial drug or alcohol use (mean = 12) compared to females (mean = 13). There was neither an association between childhood residence and age of initial drug or alcohol use nor between type of facility and age of initial use. However, reporting having less than grade eight education was significantly associated with lower age of initial drug or alcohol consumption (Table 11).

Table 11. Demographic description of youth according to mean age of initial drug use in years.

Sex	Mean	SD	Test statistic
Male	11.8	2.52	
Female	12.6	2.15	t = 1.61, n.s.
Education			
Less than grade 8 completed	11.2	2.38	t = 2.39, p < 0.05
Grade 8 or higher	12.2	2.47	
Childhood residence			
City	11.7	2.45	
Rural	12.4	3.05	
Reserve	12.1	2.24	F = 1.11, n.s.
Facility type			
Youth centre	11.2	2.21	
Adult centre	12.4	2.54	t = 3.49, n.s.

Longer history of incarceration is related to earlier age of initial drug or alcohol use. Participants who reported younger age of initial drug and alcohol use were more likely to have been incarcerated at a younger age (Pearson's r (two-tailed) = 0.343, $p < 0.001$). Similarly, earlier age of initial drug and alcohol use was negatively correlated with length of time spent in custody (Pearson's r (two-tailed) = -0.275, $p < 0.001$).

Not surprisingly, early age of drug or alcohol consumption also has a significant relationship with sexual risk. Consuming drugs or alcohol at a younger age is associated with higher sexual risk scores (Spearman's rho (two-tailed) = 0.27, $\underline{p} < 0.001$).

Injection Drug Use

Rates of injection drug use within the study sample were small - 6.3% (n = 13). Four of the thirteen people had used injection drugs in the year prior to incarceration. Only one person reported having shared needles in this time period.

Reported rates of injection drug use were higher among females (19%) than among males (4%) however small sample size limits the ability to compute the statistical significance of this difference. There was no notable difference in rates of injection drug use based on level of education or childhood residence. Participants surveyed in an adult correctional centre were more likely to report injection drug use than those in a youth centre (Table 12). Self report of prior injection drug use was significantly associated with higher risk sexual behaviour based on sexual risk scores (Independent samples Mann-Whitney U test, $\underline{p} < 0.05$).

Table 12. Demographic description of youth having ever used injection drugs.

	Injection drug use				
Variable of interest	Yes (13)		No (195)		
Sex	n	%	n	%	test statistic
Male	7	4.0	169	96.0	
Female	6	18.8	76	81.3	unable to compute
Education					
Less than grade 8 completed	5	9.3	49	90.7	
Grade 8 or higher	8	5.2	146	94.8	unable to compute
Childhood residence					
City	9	7.5	111	92.5	
Rural	3	12.5	21	87.5	
Reserve	1	1.7	59	98.3	unable to compute
Facility type					
Youth centre	1	1.1	86	98.9	
Adult centre	12	9.9	109	90.1	$x^2 = 6.64$, $p < 0.01$

Positive STBBI Diagnosis

Point and period prevalence of any STBBI were combined to determine the total lifetime number of diagnosed STBBI. The resulting number of positive STBBI diagnoses (ranging from from zero to three) were examined for possible associations with each of the following factors: biological sex, education level, area of childhood residence, type of

facility, incarceration history, STBBI knowledge, sexual risk, age of initial drug use, and injection drug use (Table 13).

Table 13. Demographic description of youth according to mean number of STBBI.

Variable of Interest	Mean	SD	Test statistic
Sex			
Male	0.44	0.59	
Female	0.83	0.97	t = 2.89, < 0.01
Education			
Less than grade 8 completed	0.55	0.77	
Grade 8 or higher	0.48	0.65	t = 0.61, n.s.
Childhood residence			
City	.54	0.72	
Rural	.67	0.80	
Reserve	.39	0.53	F = 1.54, n.s.
Facility type			
Youth centre	0.28	0.56	
Adult centre	0.65	0.71	t = 3.78, p < 0.001
Injection drug use			
IDU	1.17	0.84	t = 3.62, p < 0.001
non-IDU	0.46	0.64	

Over half of female participants (52%) had at least one prior or current STBBI diagnosis. Less than 40% of males had ever been diagnosed with an STBBI. Mean number of diagnosed STBBI among females was 0.8 compared to males with a mean of 0.4. The number of diagnosed STBBI was similar among those who had completed less than grade eight education (mean = .55) and those with grade eight education or higher (mean = 0.48). Rate of STBBI prevalence was also similar among those who grew up in a city, rural area or on reserve. Being in an adult versus youth centre was associated with higher number of positive STBBI diagnoses as was having ever used injection drugs.

In correlation analysis, age of first incarceration was not significantly associated with number of positive of STBBI diagnoses. Length of time in custody was positively correlated with positive STBBI diagnosis. Participants who had spent more time in custody were more likely to report higher number of positive STBBI (Pearson's r (two tailed) = 0.22, $\underline{p} < 0.01$). Within the study group, no other indicator of sexual health risk was independently associated with positive STBBI diagnosis (Table 14).

Table 14. Correlates of number of positive STBBI diagnosis.

	Correlation coefficient	r^2
Age of first incarceration	-0.114, n.s.	
Total time in custody	0.154, $p < 0.05$	2.4
STBBI knowledge	0.110, n.s.	
Sexual risk	0.066, n.s.	
Age of sexual debut	0.008, n.s.	
Age of first drug use	0.030, n.s.	

Sexual Health

Individual scores for STBBI knowledge, age of sexual debut, sexual risk and total number of STBBI diagnosis were combined to form one indicator of overall sexual health. As with all previous outcomes, associations between sexual health and the following factors were explored: biological sex, education, geographic area of childhood residence, age of first incarceration, total time in custody, age of initial drug or alcohol use, and injection drug use.

There was no difference in sexual health outcomes between males (mean = 13.5) and females (mean = 13.0). Similarly, level of education had no association with sexual health, nor did geographic area of childhood residence. However, participants with a history of injection drug use were significantly more likely to have poorer sexual health than those without. Participants who reported having ever used injection drugs had a mean sexual health score of 12 compared to non-injection drug users with a mean score of 14 (Table 16).

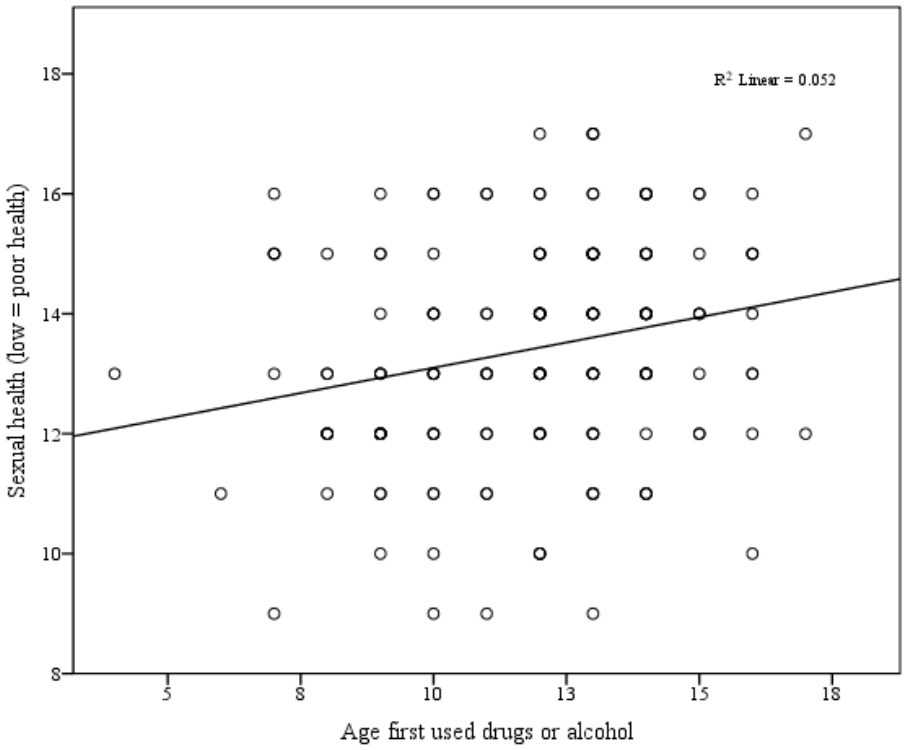
There was no association between sexual health score and age of initial incarceration. However, sexual health scores decreased as total time in custody increased (Pearson's r (two-tailed) = -0.18, $\underline{p} < 0.05$).

Table 15. Demographic description of youth according to mean sexual health scores.

Variable of Interest	Mean	SD	Test statistic
Sex			
Male	13.5	1.80	
Female	13.0	1.89	t = 1.06, n.s.
Education			
Less than grade 8 completed	13.0	1.89	
Grade 8 or higher	13.6	1.77	t = 1.82, n.s.
Childhood residence			
City	13.5	1.92	
Rural	13.3	1.97	
Reserve	13.1	1.45	F = 0.93, n.s.
Injection drug use			
IDU	12.2	2.04	t = 2.49, $p < 0.05$
non-IDU	13.5	1.77	

Finally, in order to determine if any association exists between early drug and alcohol use and sexual risk, age of initial use was correlated with sexual health scores. There was a small positive relationship between age of initial drug or alcohol use and sexual health scores (Figure 8).

Figure 8. Sexual health by age of initial drug or alcohol use.



All variables of interest were entered into a stepwise multiple regression (Table 17). After controlling for interactions between variables, younger age of initial drug or alcohol use and ever having injected drugs were significantly correlated with lower sexual health score. The resulting regression equation is presented as sexual health = 11.65 + (0.152 x age first used drugs) – (1.20 x ever injecting drugs). Table 16 presents the partial correlation coefficients and corresponding test statistic for each independent variable entered into the equation.

Table 16. Stepwise multiple regression model: Outcome=sexual health (N=167).

Explanatory variable	adjusted r^2	Beta	95% CI	test statistic
Age first used	0.044	0.206	.041 - .263	t = 2.71, p < 0.01
IDU	0.032	0.176	-2.23 - -.175	t = -2.31, p < 0.05
Education	0.017	0.126		t = 1.65, n.s.
Age of incarceration	0.001	.024		t = 0.297, n.s.
Total time in custody	0.012	0.105		t = 1.32, n.s.
Sex	0.004	0.062		t = 0.78, n.s.
On reserve	0.021	0.138		t = 1.85, n.s.

Sexual Health in Youth vs Adult Corrections

When sexual health is considered for youth correctional centres only, significant predictors include reporting childhood residence as reserve and age of initial drug use (Table 18). The resulting regression equation is sexual health = 11.51 – (1.04 x childhood on reserve) + (0.19 x age first used drugs).

When sexual health is considered for adult correctional centres only, the only significant predictor is having completed less than grade eight education (Table 17). The resulting regression equation is sexual health = 13.60 – (1.49 x less than grade 8 completed).

Table 17. Stepwise multiple regression model: Outcome=sexual health by facility type.

Explanatory variable	adjusted r^2	Beta	95% CI	test statistic
Youth Facility				
Raised on reserve	0.075	-0.266	-1.94 - -.136	t = -2.30, p < 0.001
Age first used drugs	0.062	0.239	.007 - .382	t = 2.07, p < 0.05
IDU	0.009	-0.088		t = 0.74, n.s.
Less than grade 8 completed	0.010	0.093		t = 0.79, n.s.
Age of incarceration	0.010	0.108		t = 0.82, n.s.
Total time in custody	0.016	-0.140		t = 1.01, n.s.
Sex	0.013	-0.109		t = 0.94, n.s.
Adult Facility				
Less than grade 8 completed	0.10	-0.317	-2.40 - -.569	t = 3.22, p < 0.01
Age first used drugs	0.04	0.181		t = 1.86, n.s.
IDU	0.03	-0.164		t = 1.67, n.s.
Age of incarceration	0.01	0.108		t = 1.10, n.s.
Total time in custody	0.03	-0.176		t = 1.81, n.s.
Sex	0.005	-0.066		t = 0.67, n.s.
Raised on reserve	0.000	-0.014		t = 0.15, n.s.

Summary and Discussion

As outlined previously in the purpose and objectives, the purpose of this study was to describe the determinants of STBBI related knowledge, risk behaviours and prevalence as they relate to sexual health among incarcerated youth between 16 and 24 years of age in Manitoba provincial correctional centres. Factors that were considered as potential determinants of STBBI knowledge, behaviours and prevalence among incarcerated youth were biological sex, education level, geographic area of childhood residence, and history of incarceration. Sexual health, as a construct that was comprised of knowledge, age of sexual debut, sexual risk, and STBBI prevalence was also assessed according to the aforementioned determinants.

The study involved secondary analysis of surveys completed through the *Epidemiology of Sexually Transmitted and Blood Borne Infection (STBBI) in an Inmate Population Study (STBBI in Prison Study).* This cross-sectional, anonymous study was carried out in Manitoba's nine provincial correctional centres between May and October 2008 among a randomly selected sample of 401 inmates between the ages of 16 and 74. Participants completed an interview to assess the STBBI related risk and prevention behaviours, knowledge of transmission dynamics and personal demographics. The study included testing for HIV, Hepatitis C, syphilis, gonorrhea and chlamydia. Of the overall study sample, 210 participants were younger than 25 and thus comprised the youth sample under study in this research project.

Outcome measures were created for STBBI knowledge, based on a score from zero to 25 corresponding to the number of correct responses to questions related to STBBI transmission dynamics; sexual and drug using risk behaviours, including mean

age of sexual debut, number of sexual partners weighted by condom use, age of initial drug or alcohol consumption, and ever having used injection drugs; and STBBI prevalence based on reporting any previous STBBI diagnosis as well as confirmatory tests carried out during the *STBBI in Prison Study*. Finally, scores for STBBI knowledge, age of sexual debut, sexual risk, and STBBI prevalence were combined into an overall score of sexual health. Univariate analysis was carried out for each outcome by sex, education, childhood residence and history of incarceration to identify significant associations between each determinant and corresponding outcomes. A multivariate multiple regression model was created in which each independent variable was entered and tested for their unique contribution to overall sexual health when controlling for all other factors in the model.

Summary of Results

Given the small numbers of young females in custody relative to males, the majority of youth studied (84%) were male. Just over half (59%) were incarcerated in an adult correctional centre, while (41%) were part of the youth corrections population. The average age of the entire sample was 19 years.

Overall, the study population exhibited multiple socio-behavioural risk factors. For example, participants had a much lower level of education attainment than that of the general population. Within the study sample, only 3% of participants over 18 years old had attained a high school diploma compared to 71% graduation rate among the general population. One quarter of the total study sample had not yet completed more than grade eight education.

Almost one-third (30%) of respondents reported growing up in a reserve community. The majority of participants (60%) stated that they lived in a city as children. The remaining 10% grew up in a rural town or area.

Many of the participants had a long history of involvement in the criminal justice system. The mean age of first incarceration was 15 years and the median amount of time spent in custody was 1.5 years (18 months). Participants reported spending as little as three months to as much as 12 years in prison. Given that 50% had been in custody for more than 1.5 years in total, rates of recidivism among the study group are high.

The study objectives considered the ways in which the above social and individual factors contribute to STBBI knowledge, risk behaviours, prevalence and sexual health. Additionally, the influence of knowledge and risk behaviours on prevalence and sexual health was explored.

STBBI knowledge was varied within the group. A small number (11%) had no knowledge of STBBI at all. The scale of STBBI knowledge was based on number of correct responses to 25 questions related to the dynamics of STI and HIV transmission. Of those who responded to these questions, mean score was 15/25 with scores ranging from a low of 3 to a high of 21. Distribution of STBBI knowledge was slightly skewed right towards the upper end of the scale, indicating a good degree of overall knowledge.

Among those participants with no STBBI knowledge (i.e., a score of 0 out of 25 on knowledge-related questions), almost one quarter (24%) reported their childhood residence as being a reserve community. Having no STBBI knowledge was also associated with older age of initial incarceration and less overall time in custody.

Most participants, (86%) had some level of STBBI knowledge. Factors associated with low STBBI knowledge were the same as those associated with having no STBBI-related knowledge at all. These were having childhood residence as on reserve and a shorter history of incarceration. Mean STBBI knowledge among those raised on reserve was 12.6, significantly lower than urban youth with a mean knowledge score of 15.9. As well, as time spent in custody decreases, either due to older age of first incarceration or less time in custody, STBBI knowledge increases.

Participants were asked to report on sexual behaviours, including age of first consensual sexual encounter, number of sexual partners in year prior to incarceration, and frequency of condom use. Sexual risk was indicated by the number of sexual partners in the year prior to incarceration weighted by self-reported frequency of condom use in the same time period.

Mean age of the first consensual sexual encounter was 14 years for both males and females, ranging from 7 to 19 years. Participants who had less than grade eight education had sex at a younger age (mean = 13 years) than those who had completed grade 8 or higher (mean = 14 years). Individuals who had been incarcerated at a younger age and those who had spent more time in custody were more likely to report a younger age of sexual debut.

Just over half of the participants (51%) reported having more than three different sexual partners in the year prior to incarceration. The median number of sexual partners in the year prior to incarceration was 4. Despite the fact that most participants had multiple partners in the year prior to incarceration, only 19% reported consistent condom use with all partners. Among those who reported having more than one sexual partner,

the majority (71%) had unprotected sex at some point in the year. Factors associated with higher rates of sexual partnering included growing up in a rural area and having spent a greater amount of time in custody.

The sexual risk scale factors the number of sexual partners by frequency of condom use to determine an individual's level of behavioural risk. Scores ranged from one to as high as 297. Seventy-five percent of scores fell below 19, thus the scale was truncated at this value (i.e., scores falling above the 75th percentile were entered as 19). The resulting scale ranged from a low of one to a high score of 19 with a mean of 9.7. Participants with higher levels of STBBI-related knowledge engaged in higher risk behaviours.

In addition to sexual risk behaviours, drug and alcohol abuse contribute to STBBI risk. Participants reported on the following drug and/or alcohol using behaviours: having sex while high or drunk, age of initial drug use, injection drug use, and sharing of needles. All participants reported having ever used alcohol or street drugs. Almost all, 98.1% had used street drugs at some time. Mean age of initial drug or alcohol use was 12 years. Factors associated with younger age of drug or alcohol use included having completed less than grade eight, younger age of incarceration as well as having spent a greater amount of time in custody, and younger age of first sexual encounter. Almost all participants (90%) had sex while drunk or high in the year prior to incarceration.

Only 13 participants (6%) had ever used injection drugs. Of these, only four had injected in the year prior to incarceration and only one person reported sharing needles in this time period. Among the study group, injection drug use was associated with higher sexual risk scores.

STBBI prevalence within the study sample was high. Point prevalence, determined by laboratory test conducted at the time of the study, was: chlamydia – 9.3%; gonorrhea – 1.6%; HIV – 1.0%; Hepatitis C – 2.0%. Period prevalence, determined by self-report of ever having been diagnosed with an STBBI combined with laboratory tests was: chlamydia – 33.4%; gonorrhea – 13.0%; HIV – 1.0%; Hepatitis C – 2.2%; and Herpes Simplex Virus – 1.1%. Among females, 52% had ever been diagnosed with at least one STBBI and 39% of males had ever been diagnosed with an STBBI. In addition to sex, injection drug use was a determinant of STBBI prevalence as was increased length of time in custody. However, given the clear relationship between drug abuse and incarceration, there is a likely confounding effect between one or both of these factors as they relate to STBBI prevalence.

Level of STBBI knowledge, age of sexual debut, sexual risk, and number of positive STBBI were combined into a single scale of sexual health. Possible scores for sexual health could range from a low of four, indicating poor sexual health, to a high of nineteen, indicating good sexual health. Mean sexual health score for the study group was 13.4, ranging from a low score of 9 to a high score of 17.

After controlling for interactions between variables, drug using behaviours were significantly associated with poor sexual health outcomes. Younger age of initial drug or alcohol use resulted in lower sexual health as did reported history of injection drug use. Younger participants (those under 18) were less likely to report injection drug use. When those interviewed in a youth centre are considered separately, growing up on a reserve is found to be significantly associated with poor sexual health along with young age of initial drug use. Among adult participants, the relationship between drug use and sexual

health is no longer evident. However, adults with poor overall sexual health were more likely to report having less than a grade eight education.

Discussion

Reducing rates of STBBI among incarcerated youth will require carefully planned and targeted interventions centered upon changing behaviours such as increasing condom use and reducing numbers of sexual partners. Knowledge about the social and epidemiologic factors that influence risk behaviours are important for focusing prevention efforts. This study aimed to describe the key determinants of STBBI transmission among at-risk youth. Identified risk factors were sex, education, geographic area of childhood residence, and incarceration history. Information about how these factors affect ones level of STBBI-related knowledge as well as sexual and drug using behaviours will contribute to informed public health planning and interventions aimed at vulnerable and at-risk youth.

The following discussion reflects on the current study findings as they relate to the research literature and outcomes related to STBBI knowledge, sexual and drug using risk behaviours, STBBI prevalence and poor sexual health. Recommendations for screening, care and prevention among the study population are discussed.

Risk Factors of Low STBBI Knowledge

The first outcome of interest explored in the study was STBBI-related knowledge. In particular, the study sought to identify the factors that contribute to low levels of STBBI knowledge. Factors that can influence access to health education and therefore knowledge level include sex, level of education, and barriers to health services due to

geography (Robertson, Baird Thomas, St. Lawrence, & Pack, 2005; Staton-Tindall et al., 2007).

One of the risk factors identified within the study was geographic area of childhood residence. Research carried out in the community has demonstrated that people living in more isolated geographic regions have limited access to supports and services aimed at reducing STBBI risk (Leukefeld et al., 2002). In Manitoba, rates of STBBI are higher in more isolated, northern regions of the province (Elliott et al., 2002). In the context of this study, participants who grew up in a reserve community, where access to sexual health information may be limited, had lower level of STBBI-related knowledge.

The increased isolation and limited health services that are often associated with living in reserve communities present a challenge in accessing sexual health services. This is evident when STBBI knowledge scores are compared between youth from a reserve community and those growing up in an urban area. Youth from a reserve were significantly more likely to report having no knowledge of any STBBI at all. Of the 21 individuals whose STBBI knowledge equals zero, 71.4% reported their childhood residence as being on reserve. When scores among those who responded to STBBI questions are compared, the same pattern emerges. Youth raised on a reserve had lower mean STBBI knowledge scores than those from a rural or urban area.

Higher STBBI knowledge was associated with having spent more time in custody. Findings suggest that those with a longer history of incarceration, indicated by both young age of first incarceration and greater time spent in custody, have slightly higher STBBI knowledge. The effect size (r^2) of age of incarceration on STBBI knowledge was 0.06 or 6%. The effect size (r^2) of time spent in custody on STBBI knowledge was 0.04

or 4%. These findings suggest that incarceration history has a slight positive impact on STBBI knowledge. One possible reason may be that correctional facilities, particularly youth facilities, offer this high risk population with an opportunity to access health care services and obtain much needed health education. Thus, the more time spent in custody, the more opportunity participants have to seek and obtain resources, care and information.

While further evaluation of health promotion services inside correctional facilities is required, initial results indicate that incarceration offers a protective factor in terms of access to health education leading to increased STBBI knowledge. More effort to reach youth coming from an isolated community may be beneficial. This can occur in the form of a peer education group or simply offering more comprehensive one-on-one education to youth who may be at risk for lower STBBI knowledge including those having spent their childhood on reserve.

Sexual and Drug Using Behavioural Risk Factors

Both individual risk factors such as sex, education, drug use, and incarceration along with community level risk factors such as poverty and isolation contribute to increased risk taking behaviours among incarcerated adolescents (Dembo, Belenko, Childs, Wareham, & Schmeidler, 2009). The present study population exhibits many of the same risk factors identified in other studies examining incarcerated youth.

When compared with the general Canadian population, study participants exhibit a younger age of sexual initiation. Among the general Canadian population, average age of sexual debut has been reported as 15 years (Frappier et al., 2008). Average age of first sexual encounter within the study was 13.7 years. Study participants also reported having

multiple sexual partners and infrequent condom use. The median number of partners in the year prior to incarceration was four. Of the 151 participants with multiple partners, 85% reported that they occasionally or never used condoms.

Prior research has demonstrated the connection between poor educational attainment and STBBI risk (Reid, 2006). Overall level of educational attainment was low among the study participants. In the general Manitoba population high school graduation rates are 70.5%, significantly higher than the 2.4% graduation rate among the study sample (Statistics Canada, 2009b). With little variability in education level among the study sample, the overall impact on education and STBBI risk may not have been immediately evident. When level of educational attainment is based on having above or below grade 8 education, youth who have not attained at least grade eight education are more likely to report a young age of sexual debut (13 years) when compared to those who have completed grade eight or higher (14 years).

Schools act as an important setting for providing adolescents with information about sexual health and STBBI prevention. Leaving school at an earlier age may result in a missed opportunity for comprehensive sexual health education and the development of healthy relationships. As such, strategies to improve educational attainment among at-risk youth may also result in lowering risk taking behaviours.

Sex is a key determinant of STBBI risk. Within the study population, sex was not identified as a significant factor in terms of sexual risk behaviours. However, it should be noted, that females represented a small proportion of the study group and, in fact, represent a small but highly vulnerable segment of the overall prison population. While sex may not have accounted for any specific risk factors, past research has demonstrated

that females are highly vulnerable due to involvement in sex work and high numbers of reported sexual partners (Willers et al., 2008). In this study, mean number of sexual partners was higher among females (8.7) than males (7.3). Injection drug use also appears to be a greater risk factor among females than males; 19% of females and only 4% of males reported ever using injection drugs. In general, incarcerated females are underrepresented in the research literature (Douglas & Plugge, 2008). Understanding and addressing the sexual health risks unique to incarcerated young females so as to ensure effective and appropriate health promotion should be a public health priority.

Higher risk sexual behaviour may be related to other risk behaviours including involvement in gangs and criminal activities (Buffardi, Thomas, Holmes, & Manhart, 2008). Among study participants there was a relationship observed between increased time in custody and increased sexual risk. Although small in effect ($r^2 = 0.023$), this finding is consistent with earlier studies. Nor does sexual risk taking correspond with a lack of knowledge about STBBI in general. In fact, among the study sample, there is converse relationship between STBBI knowledge and sexual risk taking ($r^2 = 0.045$). This suggests that education alone does not influence behaviour among high risk populations and that lowering STBBI risk requires multi-faceted approaches that address the social factors that influence behaviours.

In addition to sexual risk behaviours, alcohol and drug use can impact on STBBI risk. Having sex while under the influence of drugs or alcohol reduces the likelihood of condom use and increases transmission risk. Younger age of initiating drug and alcohol use is associated with increased sexual risk and higher rates of STI and HIV (Teplin et

al., 2003). Injection drug use and sharing of needles also contributes greatly to HIV risk (Public Health Agency of Canada, 2007) .

Almost all participants, (98.1%) reported some history of drug use. The mean age of first use of drugs or alcohol was 11.9 years. As with age of sexual debut, younger age of initial drug use was closely associated with having completed less than grade eight education. Among those completing less than grade eight, mean age of initial drug or alcohol use was 11.2 years compared to 12.2 years among those completing grade eight or higher. Not surprisingly, the earlier an individual started using drugs or alcohol the more time they had spent in custody.

When asked about injection drug use, older participants (those over 18 years) were more likely to report having ever injected drugs. While relatively few in number (13 out of 210), those participants were more likely to engage in higher risk sexual behaviour and to have spent more time in custody.

Risk taking behaviours are complex and driven by multiple factors. Incarcerated adolescents are highly vulnerable due to lower educational attainment and engaging in behaviours that increase risk for STBBI transmission and incarceration. Younger age of sexual debut and drug use combine to increase risk; both need to be addressed through integrated approaches that take place in community and prison settings.

STBBI Prevalence Risk Factors

Repeated exposure and transmission of STI puts one at increased risk for HIV and suggests recurring sexual risk behaviour (Nusbaum, Wallace, Slatt, & Kondrad, 2004). In Manitoba, STBBI infection rates are alarmingly high when compared with the general population of 15 – 24 year olds. These findings are consistent with research in other

jurisdictions where rates of STI and HIV among incarcerated youth are higher than that of the general population (Calzavara et al., 2007).

In 2008, the chlamydia prevalence among 15 – 24 year olds in Manitoba was 2,686.8/100,000 or 2.7% (Manitoba Health, 2010). In the study group, overall point prevalence of chlamydia was 9.3%. Provincially, there are more cases of chlamydia diagnosed in females than in males (3.8% of females compared with 1.6% of males). However, in the study sample, all 17 cases of chlamydia detected were among males. If only treatable STI are considered, a total of 18 males (10%) had an undiagnosed STI at least three months after admission into a correctional centre. Screening upon entry into a correctional centre would identify positive cases and result in treatment. These findings suggest that within provincial correctional centres, STI screening is more routine among females. Increasing screening among males would result in fewer missed and untreated cases among incarcerated males.

Cases of gonorrhea, HIV, and Hepatitis C were all also much higher among the study participants than among 15 – 24 years olds across Manitoba (Table 18). Localization of STI rates within the province are evident. Specifically, chlamydia and gonorrhea are concentrated within the north of the province and in core urban areas (Elliott et al., 2002). Youth from these high prevalence regions are at increased risk of incarceration and have high rates of STBBI. For example, street involved youth living in Winnipeg's inner city are in frequent contact with law enforcement and are at increased risk for chlamydia and gonorrhea (Beaudoin, 2004). Increasing efforts to provide routine screening upon entry into corrections would offer an opportunity to screen and treat infections among this high risk population.

Table 18. Point prevalence of STBBI among 15-24 year olds in Manitoba and the study population.

	Chlamydia		Gonorrhea		HIV		HCV		Syphilis	
	MB	Study	MB	Study	MB	Study	MB	Study	MB	Study
Male	1.6%	10.8%	0.4%	1.3%	0.01%	0.6%	s	1.2%	s	0
Female	3.8%	0	0.6%	4.2%	0.01%	3.2%	0.01%	6.5%	s	0
Total	2.7%	9.3%	0.5%	1.6%	0.01%	1.0%	0.01%	2.0%	0.003%	0

s – rate suppressed due to cell count less than 5 cases

When period and point prevalence of all STBBI are combined, 41% of participants report ever having had at least one STBBI. The most common STI reported is chlamydia with 33.4% of participants having had a positive diagnosis at some time in their life. Thirteen percent of participants had ever tested positive for gonorrhea. Females are more likely than males to have been diagnosed with an STBBI; 52% of females compared to 39% of males had at least one STBBI. Higher rates among females may, however, be reflective of increased screening and detection rather than actual risk.

Spending more time in custody was associated with increased number of STBBI diagnosed. The exact nature of the relationship between incarceration and STBBI risk is unclear. Higher number of diagnosed STBBI among those with longer incarceration history may reflect increased opportunity for testing upon incarceration rather than actual risk. The study identified a number of undiagnosed cases of STBBI within the study population which points to some gaps in screening, in particular among males. However, time in custody may represent an otherwise unavailable opportunity to access health care.

Strategies to increase and improve on routine STBBI screening upon entry into a correctional centre, in particular among males, would further benefit efforts to reduce high STBBI rates among at-risk males and females.

The relationship between substance abuse and STBBI transmission risk has been previously documented (Rothon et al., 1997). In the current study, number of STBBI diagnosed was higher among those who reported ever having used injection drugs. Individuals with a history of drug use should be routinely and regularly counseled on the risk of STBBI transmission. Individuals may choose to use their time in custody as an opportunity to participate in substance abuse treatment. These programs, both within the correctional centre as well as in the community, should seek ways to integrate relevant STBBI prevention skills and risk reduction with drug abuse treatment (Tolou-Shams et al., 2009).

Risk Factors of Poor Sexual Health

Sexual health is a function of multiple factors including knowledge, behaviour and STBBI prevalence. A sexual health scale was created to act as a construct that included the following variables: STBBI knowledge, age of sexual debut, sexual risk, and number of STBBI diagnoses. On a scale with poorest sexual health score of four and a best possible sexual health score of nineteen, mean sexual health was 13.4. In the analysis of individual variables of STBBI knowledge, risk behaviour and prevalence, incarceration history, and injection drug use were significantly associated with STBBI risk. The relationship between sexual health and drug use is also evident when knowledge, risk, and prevalence are combined. After controlling for other variables, drug

using behaviours including younger age of initial use and injection drug use continued to have a significant influence over sexual health.

Risk behaviours, be they sexual or drug and alcohol-related, are closely inter-related in terms of their impact on health and well-being. The factors that drive both sexual and drug using risk behaviours are also interconnected. For example, young age of sexual debut and early age of initial drug use are both associated with poor educational attainment. The exact nature of the relationship between education and risk behaviours cannot be determined within the scope of this study. However, it is clear that addressing limited opportunities or barriers to education combined with efforts to delay sexual activity and drug use would have a positive impact on overall health and wellbeing.

There were no differences identified in terms of risk behaviours between those in a youth centre versus adult facility. However, older participants (those in an adult correctional centre) were more likely to have had a positive STBBI result and were more likely to report injection drug use. In other words, while risk behaviours were the same across these two groups, negative impacts were more evident among older participants. Given this difference, along with the different ways in which programs and services are delivered in youth and adult corrections, different strategies are required for each population.

Among those in a youth centre, those who grew up on reserve and those who used drugs or alcohol at a younger age, exhibited poorer sexual health. In adult correctional centres, poor sexual health was associated with lower educational attainment.

Recommendations for Intervention

The third and final research objective was to provide recommendations for screening, care, and prevention of STBBI among the target population. The following discussion will discuss promising interventions aimed at primary and secondary prevention of STBBI among at-risk and incarcerated youth.

The *Canadian Guidelines for Sexual Health Education* state that*;*

> "street involved youth often lack access to information and education that meets their specific needs. Correspondingly, it is important that sexual health educators and service providers give particular attention to the kinds of programs and resources that support the sexual health and personal well being of these individuals across their lifespan. (Public Health Agency of Canada, 2008, p.8).

It is important that sexual health education efforts aimed at increasing knowledge related to STBBI in vulnerable populations consider the unique cultural needs of at-risk youth. STBBI knowledge scores among the study participants indicate a disparity in STI and HIV-related knowledge between those raised on a First Nations reserve and those raised in an urban or rural area. In Canada, Aboriginal people are disproportionately over-represented among those diagnosed with STI and HIV/AIDS and tend to be diagnosed with HIV at a younger age than non-Aboriginal persons (Public Health Agency of Canada, 2007). Low STBBI knowledge among on-reserve youth reinforce these health inequities due to limited awareness of and access to sexual health information. Programs that offer culturally-relevant peer-led community education have been show to effectively change "community norms," connect youth to health services

and increase access to prevention resources such as condoms (Maticka-Tyndale & Barnett, 2010). Evaluation of a peer-led educational workshop in which Aboriginal youth "shared, discussed, and acquired relevant HIV/AIDS information from their peer facilitators" demonstrated that participants gained in knowledge and "experienced a positive change in attitude" towards HIV/AIDS (Majumdar, Chambers, & Roberts, 2004, p.71). The program applied a train-the-trainer model, in which Aboriginal peer facilitators were trained to deliver culturally sensitive AIDS education to youth. In the context of at-risk and incarcerated youth, this brief intervention (13 hours of peer training and 12 hours of health education) is well suited and potentially highly beneficial within a community setting as well as in correctional centres.

Increased STBBI knowledge, in and of itself, does not however result in reducing the incidence of risky behaviours (Andersson-Ellström & Milsom, 2002). Among the study group, overall STBBI knowledge was high with a median knowledge score of 16 out of 25. Those who scored higher on STBBI knowledge exhibited higher risk behaviour (younger age of sexual debut, increased number of partners and lower rates of condom use). Although access to sexual health information is an important first step in addressing STBBI risk, actual sexual practices and decision making are driven by a multitude of much more complex societal, behavioural and emotional factors that cannot be addressed through the provision of information alone (Majumdar et al., 2004). In order to effectively reduce STBBI transmission risk, efforts must also focus on identifying and addressing modifiable risk factors.

Poor educational attainment and substance abuse were two factors contributing to STBBI risk among incarcerated youth. Among the study group, low educational

attainment was associated with younger age of sexual debut. Among young adults alone, (18 – 24 years old) completing less than grade eight was significantly associated with poor overall sexual health. Substance use is closely related to educational attainment as well as sexual risk. Completing less than grade eight was a related to younger age of substance use as well as younger age of sexual debut thus, reinforcing the dynamic between substance use and sexual risk taking. In multiple regression analysis, age of initial drug use and having ever used injection drugs were both associated with poor sexual health after controlling for all other variables except age. When younger participants are analyzed separately from the adult population, age of initial drug use along with being raised on a reserve contributed to poor sexual health. These findings confirm the importance of implementing interventions that can improve on educational outcomes and limit substance abuse before and throughout adolescence in order to improve health and reduce disease rates.

Poor education and substance abuse are only two determinants of sexual health affecting at-risk youth. Other important factors to address include mental health, family dynamics and negative peer influence (Elkington et al., 2008). Successfully addressing these factors and changing behaviour requires multi-faceted approaches, delivered across settings and levels (individual, community, social) that are carefully designed to address specific individual and community needs (Greenwood, 2008). The exact nature of the intervention will vary depending upon the setting. In this regard, correctional centres face unique challenges and limitations in terms of the scope and type of programs that can be offered within the institution.

In systematic review of community and institutional-based behavioural interventions aimed at at-risk youth, successful outcomes were based on the following principles:

- programs focused on "dynamic and changeable risk factor behaviours, such as drug use and relationships with negative peers"; and
- targetted to the specific behavioural issues being addressed and were based on best available evidence (Greenwood, 2008, p.284).

The delivery of interventions occurs in three stages: assessment; developing the intervention based on a formal theoretical framework and evidence base; and collaboration in delivery (Godin et al., 2003). In the context of at-risk and incarcerated youth, practitioners must consider the multiple social and behavioural risk factors while managing with limited human and financial resources. Collaboration between community and prison-based practitioners can ensure that collective efforts complement and enhance each other while supporting the transition from prison to community and vice versa.

In identifying potential strategies, the above principles and features were carefully considered. A range of evidence-based interventions that would address social and behavioural issues and could be implemented in the community or a correctional centre were assessed. In particular, opportunities to reduce STBBI risk through increased educational attainment and addressing substance abuse behaviours were sought.

Community-level strategies focusing on modifiable risk factors can have a positive impact on level of educational attainment and substance use behaviours with vulnerable populations. A search of best practices in these areas resulted in the identification of a community-based intervention aimed at prevention of youth problems

including school drop-out, substance use and teen pregnancy (Public Health Agency of Canada, 2010a). Communities That Care (CTC) is an evidence-based intervention that works through community coalitions and is implemented in five phases: community readiness; mobilization; community risk; protection and resource assessment; community strategic planning; and community plan implementation. Evaluation of CTC showed that the program's use of community coalitions to address problem behaviour had a positive impact on adolescent risk and protective behaviours (Brown, Hawkins, Arthur, Briney, & Abbott, 2007; Feinberg, Jones, Greenberg, Osgood, & Bontempo, 2010). Local law enforcement and corrections liaisons can engage with CTC coalitions in order to provide a link between community strategies and corrections programming.

In Manitoba, all nine correctional centres operate differently from one another. Interviews conducted with program staff at each of the correctional centres documented a broad range in terms of population size, lengths of stay, mobility and operations between centres (Manitoba Correctional Centre staff, personal communication, November 2008). As such, programs and interventions to be implemented inside a correctional centre must be adaptable in order to fit within a range of potential circumstances and environments. Additionally, planning must consider resource availability and limitations as well as evolving security issues. Rather than recommend a prescriptive program or intervention, the recommendations below share key considerations that should inform STBBI prevention and planning efforts inside a correctional centre.

In systematic review, Sales, Milhausen, and DiClemente (2006) determined that interventions aimed at special populations, including incarcerated youth, that reported some behaviour change were (a) based on a strong theoretical framework; (b)

implemented by trained staff; (c) included a broad content area (for example social skill building); and (d) used a variety of teaching methods. Additionally, studies have determined that individual interventions rather than group activities are more beneficial in addressing risk behaviours among incarcerated youth (Lawrence et al., 2008). When delivering individual behavioural counseling, multiple sessions were found to be more effective with high-risk youth (Lin, Whitlock, O'Connor, & Bauer, 2008). When services are delivered is also an important factor. Timing of interventions should be at the earliest possible point in incarceration in order to maximize impact especially among youth with a history of multiple incarcerations (Harwell et al., 1999). Counseling and information shared should "address the barriers to and facilitators of condom use, strategies to promote positive attitudes towards condoms and strategies to reduce the high level of alcohol and substance use" (p. 266). The above guidelines, where not already incorporated, can contribute to existing best-practices for STBBI prevention within corrections. Existing programs operating in provincial correctional centres should be evaluated and assessed to ensure that the above criteria are incorporated and opportunities to enhance such initiatives identified and explored.

In the context of program delivery within corrections, the relationship between incarceration history and STBBI risk requires further exploration. In the current study, total time spent in custody was associated with all outcomes; STBBI knowledge, risk and prevalence were all consistently higher among those who had spent more time in custody. While the exact nature of the interrelationship between these three outcomes and incarceration remains to be explored, there is some evidence to suggest that admission to a correctional centre results in increased access to STBBI screening and care. Higher

rates of STBBI among incarcerated groups as a result of increased risk has been previously documented (Calzavara et al., 2007; Lawrence et al., 2008) and appears to be consistent within this group. However, in addition to increased STBBI rates among incarcerated individuals as a whole, within this group itself, those who had spent more time in custody exhibited higher level of STBBI-related knowledge and had a higher number of diagnosed STBBI. One explanation for this may be that incarceration provides an opportunity to access testing and subsequently education that may not be readily available to them in the community. In this regard, repeated incarcerated will result in higher rates of diagnoses, not only as a function of risk but also through improved access to testing accompanied by health education and counseling. Further evaluation of health services and education activities within provincial corrections are required to better understand the influence of incarceration upon STBBI knowledge and prevalence and to support improved efforts for identification of cases as well reducing future risk taking behaviour.

In the absence of a formal evaluation, it remains clear that admission into a provincial correctional facility represents an opportunity to offer STBBI testing, counseling and treatment. Admittedly, there are challenges inherent in offering universal STBBI testing within a provincial correctional centre. In 2008, 69% of the provincial incarcerated adult population was in remand (Statistics Canada, 2009a) and are therefore, highly mobile; an individual admitted to the Winnipeg Remand Centre and tested for STBBI may be transferred or released before results become available. Increased staff resources would be required in order to conduct routine testing and ensure subsequent follow up and treatment with a constantly changing population. In the two youth centres,

with a smaller population and fewer transfers, health services staff have more time and opportunity to provide counseling and care. In fact, when asked if they had been offered STBBI testing while in custody, 67.4% of youth replied that they had. Among adult participants, 29.3% recalled being offered an STBBI test at some time during their incarceration (Beaudoin et al., 2009). Screening conducted at the time of the study identified 21 individuals with at least one undiagnosed STI (14 adult and 7 youth). Routine screening of inmates has been recommended (Frye et al., 2008; Kahn et al., 2005). Where universal screening is not possible, in particular within the adult correctional system, priority should be given to females under 30 and adult males between 18 and 25 years (Barry et al., 2007). In all cases, the introduction of rapid test assays has been recommended as a viable strategy for increasing access to STBBI screening and treatment in prison (Willers et al., 2008). Given the high rates of STBBI among the provincial prison population, it is recommended that current policies and practice be reviewed and implementation of rapid testing in corrections, in particular for females under 30 and males under 25, be considered.

Study Limitations

The first study limitation is the small sample of females included in the study. Females make up a small portion of incarcerated individuals. While the study design attempted to oversample females so as to ensure fair representation, very few females were available for recruitment into the study. As such, findings cannot be generalized to the female inmate population as a whole.

A second limitation was the sampling criteria included in the original design that limited participation to those having spent at least three consecutive months in custody at

the time of the study. Half of those admitted to a provincial correctional centre are released before reaching three months (Statistics Canada, 2009a). Limiting the sample to those with a minimum stay of three months excluded participants admitted for shorter periods of time or those newly admitted or readmitted to a correctional centre. As a result, the sample represented individuals who were on remand or sentenced for more serious crimes which may have resulted in a selection bias towards more serious offenders. This sampling method may also have resulted deflated STBBI rates among the study sample. As indicated by the findings, participants who had spent more time in custody had increased opportunity to access screening and treatment. Had the sample included individuals newly admitted to corrections, the prevalence of STBBI may have been higher.

A third limitation of the study relates to the inability to determine the exact number of previous STBBI as a function of risk. The original study questionnaire asks participants to indicate whether they have ever tested positive but does not ask for the number of times diagnosed. Therefore, it is not possible to distinguish between those with a single past exposure or repeated past exposures to the same STBBI. Knowledge about the exact number of times an individual had been diagnosed in addition to the different types of STBBI would increase the sensitivity of this measure.

Finally, STBBI knowledge may act as a potential confounder in calculating overall sexual health along with age of sexual debut, sexual risk, and prevalence. The level of STBBI-related knowledge is not a behavioural measure and therefore not directly related to risk in the same way as number of partners, age of sexual debut or number of STBBI. Study findings suggest that those with higher STBBI knowledge tended to also

engage in higher risk behaviours. As a result, for these individuals, high STBBI knowledge scores would artificially increase sexual health scores despite being engaged in high risk behaviour. Future analysis of sexual health should examine STBBI knowledge separately from sexual risk behaviours as an indicator of sexual health.

Conclusion

To date, inmate-related research in Canada has focused on STBBI transmission risk within federal correctional institutions (Public Health Agency of Canada, 2006a). These studies have routinely identified higher rates of STBBI among inmates than among the general population. This research typically represents an older, more established prison population with median sentence length of over 900 days versus 90 days in provincial corrections (Statistics Canada, 2009a). Additionally, the federal corrections prison population varies in terms of risk factors related to types of criminal behavior and incarceration history. Findings from studies carried out in federal corrections cannot be directly applied to the provincial prison population. Currently, there is a paucity of research on provincial inmates in Canada and a complete lack of studies on STBBI risk among young adults within provincial corrections (Rothon et al., 1997).

Additionally, information about STBBI risk and knowledge among incarcerated youth does not exist at the provincial level. This study provides additional evidence to support routine screening and education among young people aged 16 to 24 years incarcerated in Manitoba correctional centres. Entry into corrections can provide an important opportunity to screen and treat a high risk population with overall limited access to health care in the community (Frye et al., 2008). Given the high rate of turnover

and mobility between correctional centres it is important to maximize on the limited opportunities for screening prior to release or transfer.

"Identifying risk factors is a first, and much needed, step towards obtaining an in-depth understanding of the high STD prevalence rates among juvenile offenders" (Dembo et al., 2009, p. 130). Knowledge of risk factors can inform interventions to reduce risk behaviours and increase access to testing and treatment among at-risk youth.

The number of females included in the final study sample was small. Further research focused specifically on incarcerated females is required. Females form an often overlooked, small but vulnerable population within the corrections system. In the literature review, females were underrepresented in the research and were underrepresented in this study. Large scale studies that include significant numbers of females may be difficult to carry out within the context of the overall primarily male prison population. Qualitative and quantitative investigations into the specific needs and risks of incarcerated females are required.

Findings from this study support the need for focused health promotion planning in corrections and the community. It has identified potential drivers of knowledge gaps and risk taking behaviour among young people including growing up on a reserve, poor educational attainment, and substance abuse. Potential strategies to address these risks in community and correctional centres have been presented.

Addressing the social factors that contribute to risk behaviours requires a multi-faceted approach. Models of community coalition building such as Communities That Care are effective in engaging community members, youth, and corrections officials in identifying and addressing the systemic barriers to wellbeing, forming positive

relationships and prevention of STBBI. These forms of community development go beyond information sharing and social marketing towards changing the social conditions that contribute to poor health.

Implementing programs inside a correctional centre is much more complicated than in the community. Challenges include limited human and financial resources, high numbers of inmates and frequent transfers, and the need to prioritize and address multiple complex issues in a short period of time. Planning interventions based on a strong theoretical framework, ensuring staff are well trained and supported and implementing a variety of approaches to health promotion will provide increased benefit. Group interventions aimed at increasing knowledge should consider incorporating a peer-led cultural education model. Integrating sexual health education with substance abuse prevention programs will maximize opportunities to address and raise inmate awareness of the related issues health risks. Multiple, individual behavioral counseling sessions were found to be more effective with at-risk youth. Applying any of the above methods in a variety of approaches that address both individual and peer influences may enhance overall outcomes.

The above examples are offered for consideration in planning health promotion programs so as to enhance existing programs and services. The partnership between public health and corrections that offers STBBI counseling and testing to inmates in several correctional centres is an example of a current initiative that links community services with correctional services to improve access to care. The impact of this collaboration on inmate health should be continuously evaluated to ensure relevance and identify opportunities for improvement. The implementation of new programs or changes

to existing programs should be carried out in full consultation with both corrections and public health staff to ensure that they are appropriate and feasible within the context of the correctional centre setting. Finally, community-based and correctional centre practitioners should work collectively to identify effective strategies to continue to provide support to inmates upon release. Through partnerships that impact on the most vulnerable youth and focus on identified risk factors, it is hoped that limited resources can be directed to where there exists the highest potential for individual and community benefit.

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APPENDIX 1

THE EPIDEMIOLOGY OF SEXUALLY TRANSMITTED INFECTIONS AND BLOOD BORNE PATHOGENS IN AN INMATE POPULATION

STUDY QUESTIONNAIRE

Please complete prior to interview.

Study ID Number _____

Date of Interview _____ (mm/dd/yyyy)

Time of Interview _____ a.m. or p.m.

Time of Interview Complete _____ a.m. or p.m.

Interview Not Completed
(1) Unable to complete
(88) Don't know
(99) Refused

Correctional centre

(1) AYC	(4) MRCC	(7) TPCC
(2) BCC	(5) MYC	(8) PCC
(3) DCC	(6) WRC	(9) HCC

Informed Consent Received _____ (interviewer's initial)

Date of Current Admission _____ (mm/dd/yyyy)

Serology CPL Requisition _____ ☐Refused ☐Incomplete

Urine CPL Requisition _____ ☐Refused ☐Incomplete

I would like to begin our interview by asking you some questions about your background.

1. **What is your gender?**
   (1) Male (2) Female (3) Transgender (88) Don't Know (99) Refused

2. **How old are you?**
   _____ years (88) Don't Know (99) Refused

3. **To what racial background do you belong?**
   (1) Aboriginal (4) Caucasian/White
   (2) Asian (5) Latino
   (3) Black (6) Other: _____
   (88) Don't Know (99) Refused

If NOT ABORIGINAL, skip to question 4…

3b. If Aboriginal, do you consider yourself:
(1) First Nations Treaty (2) First Nations Non-Treaty (3) Inuit
(4) Métis (5) Other
(88) Don't Know (99) Refused

4. **Where were you born?**
   (1) Canada (2) Outside of Canada (specify country)_____
   (88) Don't Know (99) Refused

5. **Point to the area on the map where you lived before this incarceration.** *(Refer to maps 1 and 2)*

5a. Regional Health Authority:	5b. Tribal Council (if applicable)
(1) Assiniboine	(1) Dakota Ojibway
(2) Brandon	(2) Four Arrows
(3) Burntwood	(3) Keewatin
(4) Central	(4) Swampy Cree
(5) Churchill	(5) Southeast Resource Development Council
(6) Interlake	(6) Parkland
(7) Norman	(7) West Region
(8) North Eastman	(8) Independent
(9) Parkland	
(10) South Eastman	
(11) Winnipeg	
(12) Out of province (specify) _____	
(88) Don't Know	(99) Refused

6. **Where did you mainly live/grow up as a child?**
   (1) City (2) Rural (3) On reserve
   (4) Other _____ (88) Don't Know (99) Refused

7. Where did you mainly live right before you were incarcerated?
(1) City (2) Rural (3) On reserve
(4) Other _____ (88) Don't Know (99) Refused

8. What is the highest level of education that you have completed?
(1) Grade 8 or less
(2) Some high school (gr. 9-12)
(3) High school diploma or GED
(4) Some college or university course work
(5) College or university diploma/degree
(6) Other _____
(88) Don't Know (99) Refused

9. What is your marital status?
(1) Single (2) Married (3) Common-Law
(4) Separated (5) Divorced (6) Widowed
(7) Other _____ (88) Don't Know (99) Refused

10. Before your current incarceration, how many times have you been:
In provincial correctional centres: _____
In federal penitentiaries:_____
(88) Don't Know (99) Refused

11. Including your current incarceration, how much time have you spent in a federal or provincial correctional centre:
_____years or _____months (88) Don't Know (99) Refused

12. How old were you when you were first incarcerated in a provincial or federal correctional centre?
_____ years (88) Don't Know (99) Refused

13. Do you live in a cell, dorm or housing unit?
(1) Cell (2) Dorm (3) Housing unit (e.g., Cottage)
(88) Don't Know (99) Refused

14. Do you share a cell with another inmate/other inmates?
(0) No (1) Yes (2) Sometimes
(88) Don't Know (99) Refused

15. Have you ever been diagnosed with any mental health concerns? (For example; depression, anxiety, schizophrenia, foetal alcohol syndrome).
(0) No (1) Yes (88) Don't Know (99) Refused

I would like to ask you some questions about your tattooing and body piercing practices, before your incarceration and during this current incarceration.

16. Do you have any tattoos? (0) No (1) Yes (99) Refused

If NO, skip to question 23…

17. Did you have a tattoo before your CURRENT incarceration?
(0) No (1) Yes (99) Refused

If NO, skip to question 19…

18. Where did you go to get your tattoo/tattoos done? *(Check all that apply.)*
(1) Did it myself
(2) At a professional tattoo parlour
(3) In jail, during a previous incarceration
(4) Other (please specify) _____
(88) Don't know (99) Refused

19. Did you get any new tattoos DURING your CURRENT incarceration?
(0) No (1) Yes (99) Refused

If NO, skip to question 23…

The following questions refer to any tattoos you got during this CURRENT incarceration.

20. Who gave it to you? *(Check all that apply.)*
(1) Did it myself
(2) Another inmate
(3) Other (please specify) _____
(88) Don't know (99) Refused

21. Was the equipment new, sterilized or cleaned?
(1) Never (2) Sometimes (3) Usually (4) Always
(88) Don't know (99) Refused

If NEVER, skip to question 23…

22. What did you use to sterilize the equipment?
(1) Bleach (2) Cold water (3) Boiling water
(4) Alcohol (5) Hot water (6) Other _____
(88) Don't know (99) Refused

23. Would you use a professional tattoo parlour in the correctional centre if there was one?
(0) No (1) Yes (88) Don't know (99) Refused

24. Do you have any body piercings? (0) No (1) Yes (99) Refused

If NO, skip to question 31…

25. Did you have a body piercing before your CURRENT incarceration?
(0) No (1) Yes (99) Refused

If NO, skip to question 27…

26. Where did you go to get your body piercing? *(Check all that apply.)*
(1) Did it myself
(2) At a professional piercing parlour
(3) In jail, during a previous incarceration
(4) Other (please specify) _____
(88) Don't know (99) Refused

27. Did you get any new body piercing DURING your CURRENT incarceration?
(0) No (1) Yes (99) Refused

If NO, skip to question 31…

The following questions refer to body piercing you had done during your CURRENT incarceration.

28. Who gave it to you? *(Check all that apply.)*
(1) Did it myself
(2) Another inmate
(3) Other (please specify) _____
(88) Don't know (99) Refused

29. Was the equipment new, sterilized or cleaned?
(1) Never (2) Sometimes (3) Usually (4) Always
(88) Don't know (99) Refused

If NEVER, skip to question 31…

30. What did you use to sterilize the equipment?
(1) Bleach (2) Cold water (3) Boiling water
(4) Alcohol (5) Hot water (6) Other _____
(88) Don't know (99) Refused

31. Would you use professional body piercing services in the correctional centre if they were provided?
(0) No (1) Yes (88) Don't know (99) Refused

I would like to ask you some questions about alcohol use before you were incarcerated and during this current incarceration.

32. At what age did you drink your first alcoholic beverage?
_____ years (77) Never had alcohol (88) Don't Know (99) Refused

If NEVER, skip to question 39...

33. In the year before you were incarcerated, did you ever drink alcoholic beverages?
(0) Never (1) Less than once a week (2) One to two times a week
(3) Three to five times a week (4) Everyday
(88) Don't Know (99) Refused

If NEVER, skip to question 36...

34. When you drank, how many drinks did you usually have at one time?
(1) 1 - 2 (2) 3 – 5 (3) more than 5
(88) Don't know (99) Refused

35. In the last year before you were incarcerated, had you ever been drunk for more than one day in a row?
(0) No (1) Yes (88) Don't know (99) Refused

36. During this CURRENT incarceration, have you EVER used alcohol in prison?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 39…

The following questions refer to alcohol use during your CURRENT incarceration.

37. How often do you drink alcohol?
(1) Less than once a week (2) One to two times a week
(3) Three to five times a week (4) Everyday
(88) Don't Know (99) Refused

38. Do you get drunk for one or more days in a row?
(0) No (1) Yes (88) Don't know (99) Refused

I would like to ask you some questions about street drugs, including drugs that are injected, before your incarceration and during this current incarceration.

39. Before you were incarcerated, did you ever use street drugs that weren't injected by needle, that is you snorted, smoked or took pills?
(0) No (1) Yes (88) Don't Know (99) Refused

If NO, skip to question 41…

40. At what age did you first snort, pop or smoke street drugs?
_____ years (88) Don't know (99) Refused

41. Before you were incarcerated, did you ever use injection drugs for recreational purposes? (i.e. not for medical reasons)
(0) No (1) Yes (88) Don't Know (99) Refused

If NO, skip to question 43…

42. At what age did you first inject drugs?
_____ years (88) Don't know (99) Refused

43. **In <u>the year before</u> you were incarcerated, did you use street drugs?**
(0) No (1) Yes (88) Don't Know (99) Refused

If NO, skip to question 46…

44. Below is a list of drugs; please check off which ones you used for recreation (not prescribed) in the year before you were incarcerated *(Check all that apply and indicate which, if any were injected). Refer to table 1.*
Are there some that you used more often than others? *(Check up to 3 drugs).*

Drug Type	Never Used	Used	Check if Injected	Don't Know	Refused	When I used, I most often used … (check up to 3 drugs)
Acid L.S.D.	(0)	(1)		(88)	(99)	
Amphetamines (speed, uppers, bennies)	(0)	(1)		(88)	(99)	
Anabolic Steroids	(0)	(1)		(88)	(99)	
Barbiturates (downers)	(0)	(1)		(88)	(99)	
Benzodiazepines (Xanax, valium, ativan, rivotril, serax, nerve pills)	(0)	(1)		(88)	(99)	
Cocaine	(0)	(1)		(88)	(99)	
Codeine (T1, T2 or T3)	(0)	(1)		(88)	(99)	
Crack	(0)	(1)		(88)	(99)	
Demerol	(0)	(1)		(88)	(99)	
Dilaudid	(0)	(1)		(88)	(99)	
Ecstacy (E, X, MCMA)	(0)	(1)		(88)	(99)	
Fentanyl	(0)	(1)		(88)	(99)	
Heroin	(0)	(1)		(88)	(99)	
Ketamine	(0)	(1)		(88)	(99)	
Marijuana/Hash	(0)	(1)		(88)	(99)	
Methadone	(0)	(1)		(88)	(99)	
Methamphetamine (crystal meth, ice, rock)	(0)	(1)		(88)	(99)	
Morphine	(0)	(1)		(88)	(99)	
Percocet (acetaminophen, oxycontin/ oxycodone)	(0)	(1)		(88)	(99)	
PCP (angel dust)	(0)	(1)		(88)	(99)	
Psych meds (Seroquel)	(0)	(1)		(88)	(99)	
Ritalin alone	(0)	(1)		(88)	(99)	
Solvents or sniff (lysol, gas)	(0)	(1)		(88)	(99)	
Speedballs - heroin + cocaine	(0)	(1)		(88)	(99)	
Talwin and Ritalin (T's and R's)	(0)	(1)		(88)	(99)	
Other						
	(0)	(1)		(88)	(99)	
	(0)	(1)		(88)	(99)	

45. Before you were incarcerated, when you smoked or snorted drugs, did you use clean pipes or equipment?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

46. During this incarceration, have you EVER used any kind of street drugs?
(0) No (1) Yes (88) Don't Know (99) Refused

If NO, skip to question 49…

The following questions refer to drugs used during this CURRENT incarceration.

47. What type of drugs have you used that weren't prescribed to you by a doctor?
(Check all that apply and indicate which, if any were injected). Refer to table 1.
Are there some that you used more often than others? *(Check up to 3 drugs).*

Drug Type	Never Used	Used	Check if Injected	Don't Know	Refused	When I used, I most often used … (check up to 3 drugs)
Acid L.S.D.	(0)	(1)		(88)	(99)	
Amphetamines (speed, uppers, bennies)	(0)	(1)		(88)	(99)	
Anabolic Steroids	(0)	(1)		(88)	(99)	
Barbiturates (downers)	(0)	(1)		(88)	(99)	
Benzodiazepines (Xanax, valium, ativan, rivotril, serax, nerve pills)	(0)	(1)		(88)	(99)	
Cocaine	(0)	(1)		(88)	(99)	
Codeine (T1, T2 or T3)	(0)	(1)		(88)	(99)	
Crack	(0)	(1)		(88)	(99)	
Demerol	(0)	(1)		(88)	(99)	
Dilaudid	(0)	(1)		(88)	(99)	
Ecstacy (E, X, MCMA)	(0)	(1)		(88)	(99)	
Fentanyl	(0)	(1)		(88)	(99)	
Heroin	(0)	(1)		(88)	(99)	
Ketamine	(0)	(1)		(88)	(99)	
Marijuana/Hash	(0)	(1)		(88)	(99)	
Methadone	(0)	(1)		(88)	(99)	
Methamphetamine (crystal meth, ice, rock)	(0)	(1)		(88)	(99)	
Morphine	(0)	(1)		(88)	(99)	
Percocet (acetaminophen, oxycontin/ oxycodone)	(0)	(1)		(88)	(99)	
PCP (angel dust)	(0)	(1)		(88)	(99)	
Psych meds (Seroquel)	(0)	(1)		(88)	(99)	
Ritalin alone	(0)	(1)		(88)	(99)	
Solvents or sniff (lysol, gas)	(0)	(1)		(88)	(99)	
Speedballs - heroin + cocaine	(0)	(1)		(88)	(99)	
Talwin and Ritalin (T's and R's)	(0)	(1)		(88)	(99)	
Other						
	(0)	(1)		(88)	(99)	
	(0)	(1)		(88)	(99)	

48. When you smoked or snorted drugs, did you use clean pipes or equipment?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

49. Does prison security stop you from using drugs in prison?

(0) No (1) Yes (88) Don't Know (99) Refused

Explain_____

(1) I don't use drugs, so it's not a problem for me
(2) I won't do drugs in prison for fear of being caught
(3) I changed the drugs I use so I don't get caught
(4) I have refused random testing to avoid testing positive
(5) There are ways of getting around it
(6) Other (please specify) _____
(88) Don't know
(99) Refused

I would like to ask you some questions about <u>injection drug use</u> before you were incarcerated and during this current incarceration.

If NO injection drugs used in year before incarceration, skip to question 54…
If NO injection drugs used during current incarceration, skip to question

The following questions refer to injection drugs used for recreational purposes in the year before you were incarcerated.

50. Did you ever share needles or syringes with someone else?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

51. Did you ever share cooking equipment (spoons, water, filters) with someone else?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

52. Did you inject drugs (check all that apply):
(1) Alone (2) With one other person (3) With more than one person # _____
(88) Don't know (99) Refused

53. Did you inject yourself or did someone else inject you with drugs? *(Check all that apply)*
(1) Myself (2) Sexual partner (3) Friend
(4) Stranger/John (5) Other (please specify) _____
(88) Don't know (99) Refused

The following questions refer to injection drug use during this CURRENT incarceration.

54. How easy has it been to obtain a needle/syringe during this incarceration in order to inject?
(1) Impossible (2) Very difficult (3) Somewhat difficult
(4) Easy / No problem (88) Don't know (99) Refused

55. Where have you obtained your injecting equipment? *(Check all that apply)*
(1) Other inmates (2) Facility staff
(3) Visitors – family/friends (4) Visitors – professional (e.g. social worker, lawyer)
(5) Other _____ (88) Don't know (99) Refused

56. When you use injection drugs in prison, do you ever share needles or syringes with someone else?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

57. Do you ever share cooking equipment (spoons, water, filters) with someone else?
(0) Never (1) Sometimes (2) Often (3) Always
(88) Don't know (99) Refused

If NEVER shared needles, syringes, or cooking equipment (never to questions 63 AND 64), skip to question 59…

58. What cleaning methods have you used? *(Check all that apply.) Refer to table 2*

Method	Never	Sometimes	Often	Always	Don't Know	Refused
Cold water	(0)	(1)	(2)	(3)	(88)	(99)
Hot water	(0)	(1)	(2)	(3)	(88)	(99)
Boiling water	(0)	(1)	(2)	(3)	(88)	(99)
Bleach	(0)	(1)	(2)	(3)	(88)	(99)
Alcohol	(0)	(1)	(2)	(3)	(88)	(99)
Gas line antifreeze	(0)	(1)	(2)	(3)	(88)	(99)
Other:						
	(0)	(1)	(2)	(3)	(88)	(99)
	(0)	(1)	(2)	(3)	(88)	(99)

59. Since you were incarcerated, did you inject drugs *(check all that apply)***:**
(1) Alone (2) With one other person (3) With more than one person # _____
(88) Don't know (99) Refused

60. Did you inject yourself or did someone else inject you with drugs? *(Check all that apply)*
(1) Myself (2) Inmate - sexual partner (3) Inmate - friend
(4) Inmate – other _____
(5) Other _____
(88) Don't know (99) Refused

61. How do you dispose of your injecting equipment? *(Check all that apply)*
(1) Hide it in my cell (2) Hide it somewhere else (3) Garbage
(4) Other _____(88) Don't know (99) Refused

62. Since being incarcerated, did you want to reduce/quit using alcohol or drugs?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 64…

63. What do you need to help you reduce/quit? *(Check all that apply.)*

_____

(1) Residential (24/7) treatment program
(2) Day treatment program
(3) Alcoholics/Narcotics Anonymous
(4) Housing
(5) Drop-in centres
(6) Drug maintenance therapy (methadone)
(7) Family/friends support
(8) Counselling
(9) Job training
(10) Street outreach workers
(11) Peer/buddy support
(12) Being in jail
(13) Other supports: _____
(88) Don't know
(99) Refused

64. Does prison security stop you from using injection drugs in prison?
(0) No (1) Yes (88) Don't know (99) Refused

Explain:_____
(1) I don't inject drugs, so it's not a problem for me
(2) I won't inject drugs in prison for fear of being caught
(3) I changed the drugs I use so I don't get caught
(4) I have refused random testing to avoid testing positive
(5) There are ways of getting around it
(6) Other (please specify) _____
(88) Don't know
(99) Refused

I would like to ask you some questions about sexual behaviours before you were incarcerated and during this current incarceration.

65. Have you EVER had sexual intercourse - vaginal, oral or anal sex - with men or women?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 90…

66. At what age was your first consensual sexual encounter, i.e., no one forced you?
_____ years (0) Never (88) Don't know (99) Refused

67. Before you were incarcerated, had anyone ever forced you to perform a sexual act (like touching genitals, oral, vaginal or anal sex)?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 69…

68. At what age was the first time this happened to you?
_____ years (88) Don't know (99) Refused

Questions 69-76 relate to CONSENSUAL sex only

69. Before you were incarcerated, how many MALE sexual partners have you had?
_____ partners (2) not applicable (88) Don't Know (99) Refused

70. Before you were incarcerated, how many FEMALE sexual partners have you had?
_____ partners (2) not applicable (88) Don't Know (99) Refused

71. In the year before you were incarcerated, did you have sex with:

Partner type	No	Yes	Don't know	Refused	Number of partners
A regular partner	(0)	(1)	(88)	(99)	
A casual/anonymous partner	(0)	(1)	(88)	(99)	
Somebody you paid* for sex	(0)	(1)	(88)	(99)	
Somebody who paid* you for sex	(0)	(1)	(88)	(99)	

(*payment can include money, drugs, food, shelter and so on)

72. In the year before you were incarcerated, how often did you use a barrier method with your sexual partner for vaginal, oral or anal sex? (Barrier methods include male condoms, female condoms and dental dams)

Partner Type	Never	Sometimes (less than half the time)	Often (more than half the time	Always	Don't Know	Refused
Regular Partner	(0)	(1)	(2)	(3)	(88)	(99)
Casual/Anonymous Partner	(0)	(1)	(2)	(3)	(88)	(99)
Sex Trade Worker	(0)	(1)	(2)	(3)	(88)	(99)
Paying Partner	(0)	(1)	(2)	(3)	(88)	(99)

If NEVER to all of the above, skip to question 74…
If ALWAYS to all of the above, skip to question 75…

73. In the year before you were incarcerated, how often did you use a barrier method for these types of sexual encounters:

Sexual encounter	Gender of partner	Not Applicable	Never	Sometimes	Always	Don't Know	Refused
Oral	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)
Vaginal	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)
Anal	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)

74. The times that you didn't use a condom, why not? *(Check all that apply)*

(1) Didn't like how they felt
(2) Didn't know where to get them
(3) Couldn't afford to buy them
(4) Partner refused
(5) Didn't need to – I trusted my partner
(6) I had one regular partner
(7) Scared to ask my partner to use them
(8) I or my partner used birth control
(9) I am allergic
(10) Didn't think they were effective
(11) Other _____
(88) Don't know
(99) Refused

75. In the year before you were incarcerated, did you ever use alcohol or drugs within 2 hours before having sex (vaginal, oral or anal) or while having sex?

(0) No (1) Yes (88) Don't Know (99) Refused

76. Before you were incarcerated, had you EVER… *(please shade no or yes for each)*

	No	Yes	Don't Know	Refused
Had unprotected sex with a partner you knew was HIV positive	(0)	(1)	(88)	(99)
Had unprotected sex with a partner you knew had a sexually transmitted infection	(0)	(1)	(88)	(99)
Had unprotected sex with a partner you knew injected drugs	(0)	(1)	(88)	(99)

The following questions refer to sexual behaviours during this CURRENT incarceration.

77. Have you had consensual sexual intercourse (vaginal, oral or anal sex) with men or women while incarcerated?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 89; Questions 78-88 relate to CONSENSUAL sex only …

78. How many MALE sexual partners have you had?
# of partners_____ (2) not applicable (88) Don't Know (99) Refused

79. How many FEMALE sexual partners have you had?
# of partners_____ (2) not applicable (88) Don't Know (99) Refused

80. Have you had sex with:

Partner type	No	Yes	Don't know	Refused	Number of partners
A regular partner	(0)	(1)	(88)	(99)	
A casual/anonymous partner	(0)	(1)	(88)	(99)	
Somebody you paid* for sex	(0)	(1)	(88)	(99)	
Somebody who paid* you for sex	(0)	(1)	(88)	(99)	

(*payment can include money, drugs, cigarettes, and so on)

81. How often have you used a barrier method with your sexual partner for vaginal, oral or anal sex? (Barrier methods include male condoms, female condoms and dental dams)

Partner Type	Not Applicable	Never	Sometimes	Always	Don't Know	Refused
Regular Partner	(77)	(0)	(1)	(3)	(88)	(99)
Casual/Anonymous Partner	(77)	(0)	(1)	(3)	(88)	(99)
Sex Trade Worker	(77)	(0)	(1)	(3)	(88)	(99)
Paying Partner	(77)	(0)	(1)	(3)	(88)	(99)

82. If you used another type of barrier method for oral, anal or vaginal sex, what was it?

_____

83. How often have you used a barrier method for these types of sexual encounters:

Sexual encounter	Gender of partner	Not Applicable	Never	Sometimes	Always	Don't Know	Refused
Oral	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)
Vaginal	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)
Anal	M	(77)	(0)	(1)	(3)	(88)	(99)
	F	(77)	(0)	(1)	(3)	(88)	(99)

84. How easy has it been to obtain condoms or other barriers during this current incarceration?

(1) Impossible (2) Very difficult (3) Somewhat difficult
(4) Easy / No problem (88) Don't know (99) Refused

If IMPOSSIBLE, skip to question 86…

85. Where have you gotten condoms or other barrier methods? *(Check all that apply)*

(1) Other inmates (2) Facility staff, e.g., public health nurse
(3) Visitors – family/friends (4) Visitors – professional (e.g. social worker, lawyer)
(5) Other _____(6) N/A – cannot get condoms or other barrier methods here
(88) Don't know (99) Refused

86. The times that you didn't use a condom or other barrier method, why not? *(Check all that apply)*

(1) Didn't like how they felt (2) Didn't know where to get them
(3) Couldn't afford to buy them (4) Partner refused
(5) Didn't need to – I trusted my partner (6) I had one regular partner
(7) Scared to ask my partner to use them
(8) I or my partner used birth control (e.g., pill)
(9) I am allergic (10) Didn't think they were effective
(11) They aren't available here (12) Other _____
(88) Don't know (99) Refused

87. Have you ever used alcohol or drugs within 2 hours before having sex (vaginal, oral or anal) or while having sex?

(0) No (1) Yes (88) Don't Know (99) Refused

88. Since being incarcerated, had you EVER… *(please shade no or yes for each)*

	No	Yes	Don't Know	Refused
Had unprotected sex with a partner you knew was HIV positive	(0)	(1)	(88)	(99)
Had unprotected sex with a partner you knew had a sexually transmitted infection	(0)	(1)	(88)	(99)
Had unprotected sex with a partner you knew injected drugs	(0)	(1)	(88)	(99)

89. During your incarceration, have you ever have sex (oral, vaginal or anal) forced on you when you didn't want it?

(0) No (1) Yes ⟶ By how many different people? _____
(88) Don't Know (99) Refused

90. What is your current sexual orientation?

(1) Homosexual or gay (2) Heterosexual or straight
(3) Bisexual (4) None of the above (specify):_____
(88) Don't Know (99) Refused

Now I would like to ask you some questions about your knowledge of sexually transmitted infections, HIV and Hepatitis C.

91. Do you know what HIV is?
(0) No (1) Yes (99) Refused

If NO, skip to question 96…

92. Please tell me if you agree with the following statements <u>about HIV</u>. *(Please provide one answer for each statement.)*

	No	Yes	Don't know	Refused
Showering or washing one's genitals/private parts after sex keeps a person from getting HIV.	(0)	(1)	(88)	(99)
There is a vaccine that can stop adults from getting HIV.	(0)	(1)	(88)	(99)
A person will not get HIV if he/she is taking antibiotics.	(0)	(1)	(88)	(99)
If sexual partners are both HIV positive condoms are no longer needed.	(0)	(1)	(88)	(99)
I would always have symptoms if I was infected with HIV.	(0)	(1)	(88)	(99)
There are treatments currently available for HIV.	(0)	(1)	(88)	(99)
HIV is curable.	(0)	(1)	(88)	(99)

93. Please indicate how well you think the following ways might protect you from HIV infection *(Check the one answer that best fits.) Refer to table 3.*

	Well protected	Somewhat protected	Not at all protected	Don't know	Refused
Always using condoms for vaginal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for anal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for oral sex	(1)	(2)	(3)	(88)	(99)
Using bleach to clean your needles	(1)	(2)	(3)	(88)	(99)
Keeping your cell/residence clean	(1)	(2)	(3)	(88)	(99)
Snorting instead of injecting	(1)	(2)	(3)	(88)	(99)
Smoking instead of injecting	(1)	(2)	(3)	(88)	(99)
Always using a clean needle or rig	(1)	(2)	(3)	(88)	(99)
Wearing a mask	(1)	(2)	(3)	(88)	(99)

94. If you thought you might have HIV/AIDS, how could you find out? *(Check all that apply)*

(1) Blood test (2) Urine test (3) Physical examination
(4) X-ray (5) Self-diagnosis (6) Genital swab
(7) Other _____ (88) Don't know (99) Refused

95. In terms of YOUR risk of getting HIV/AIDS, what do you think your risk is?

(1) No risk at all (2) Low or little risk (3) Somewhat at risk
(4) High risk (5) N/A – I already have HIV
(88) Don't Know (99) Refused

96. Do you know what Hepatitis C is?

(0) No (1) Yes (99) Refused

If NO, skip to question 101…

97. Please tell me if you agree with the following statements <u>about Hepatitis C</u>. *(Please provide one answer for each statement.)*

	No	Yes	Don't know	Refused
Showering or washing one's genitals/private parts after sex keeps a person from getting Hepatitis C.	(0)	(1)	(88)	(99)
There is a vaccine that can stop adults from getting Hepatitis C.	(0)	(1)	(88)	(99)
A person will not get Hepatitis C if he/she is taking antibiotics.	(0)	(1)	(88)	(99)
If sexual partners are both Hepatitis C positive condoms are no longer needed.	(0)	(1)	(88)	(99)
I would always have symptoms if I was infected with Hepatitis C.	(0)	(1)	(88)	(99)
There are treatments currently available for Hepatitis C.	(0)	(1)	(88)	(99)
Hepatitis C is curable.	(0)	(1)	(88)	(99)

98. Please indicate how well you think the following ways might protect you from Hepatitis C infection. *(Check the one answer that best fits.) Refer to table 3.*

	Well protected	Somewhat protected	Not at all protected	Don't know	Refused
Always using condoms for vaginal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for anal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for oral sex	(1)	(2)	(3)	(88)	(99)
Using bleach to clean your needles	(1)	(2)	(3)	(88)	(99)
Keeping your cell/residence clean	(1)	(2)	(3)	(88)	(99)
Snorting instead of injecting	(1)	(2)	(3)	(88)	(99)
Smoking instead of injecting	(1)	(2)	(3)	(88)	(99)
Always using a new needle or rig	(1)	(2)	(3)	(88)	(99)
Wearing a mask	(1)	(2)	(3)	(88)	(99)

99. If you thought you might have Hepatitis C, how could you find out? *(Check all that apply)*

(1) Blood test (2) Urine test (3) Physical examination
(4) X-ray (5) Self-diagnosis (6) Genital swab
(7) Other _____ (88) Don't know (99) Refused

100. In terms of YOUR risk of getting Hepatitis C, what do you think your risk is?

(1) No risk at all (2) Low or little risk (3) Somewhat at risk
(4) High risk (5) N/A – I already have HIV
(88) Don't Know (99) Refused

101. Do you know what sexually transmitted infections are? (For example gonorrhea, chlamydia, syphilis, V.D., clap, lice, etc.)

(0) No (1) Yes (99) Refused

If NO, skip to question 104…

102. Please tell me if you agree with the following statements <u>about sexually transmitted infections (STI)</u>. *(Please provide one answer for each statement.)*

	No	Yes	Don't know	Refused
Showering or washing one's genitals/private parts after sex keeps a person from getting an STI.	(0)	(1)	(88)	(99)
There is a vaccine that can stop adults from getting an STI.	(0)	(1)	(88)	(99)
A person will not get an STI if he/she is taking antibiotics.	(0)	(1)	(88)	(99)
If sexual partners are both STI positive, condoms are no longer needed.	(0)	(1)	(88)	(99)
I would always have symptoms if I was infected with an STI.	(0)	(1)	(88)	(99)
There are treatments currently available for STI.	(0)	(1)	(88)	(99)
Most STI are curable.	(0)	(1)	(88)	(99)

103. Please tell me how well you think the following ways might protect you from getting an STI. *(Check the one answer that best fits.) Refer to table 3.*

	Well protected	Somewhat protected	Not at all protected	Don't know	Refused
Always using condoms for vaginal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for anal sex	(1)	(2)	(3)	(88)	(99)
Always using condoms for oral sex	(1)	(2)	(3)	(88)	(99)
Using bleach to clean your needles	(1)	(2)	(3)	(88)	(99)
Keeping your cell/residence clean	(1)	(2)	(3)	(88)	(99)
Snorting instead of injecting	(1)	(2)	(3)	(88)	(99)
Smoking instead of injecting	(1)	(2)	(3)	(88)	(99)
Always using a clean needle or rig	(1)	(2)	(3)	(88)	(99)
Wearing a mask	(1)	(2)	(3)	(88)	(99)

104. These are some of the ways that some people THINK <u>HIV/AIDS, Hepatitis C or STIs</u> are spread. Please indicate whether or not you believe each of these activities can transmit HIV, Hepatitis C or STIs. *Please circle either Y if yes, N if No or DK if Don't know.*

	HIV/AIDS	Hepatitis C	STI
Getting a blood transfusion nowadays	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Giving or donating blood nowadays	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Having an operation	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing razors and toothbrushes	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Using a public toilet seat	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Using a public water fountain	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Using a public shower	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing food or drinks with an infected person	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Getting a tattoo in a professional tattoo parlour	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Getting a tattoo in jail	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Mosquitoes	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
An infected mother passing it to her unborn child	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Breastfeeding	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Body piercing done by a professional	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Body piercing done in jail	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Inheriting it genetically (hereditary)	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Fighting with blood exchange	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Massage	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Needle stick injury	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Kissing	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Kissing someone with a cold sore	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Vaginal sex with protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Vaginal sex without protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Anal sex with protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Anal sex without protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Oral sex with protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Oral sex without protection	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Having sex with someone who injects drugs	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Mutual masturbation	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Having many sexual partners	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing sex toys	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Contact with menstrual blood	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Snorting drugs	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Injecting drugs	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing injection equipment (spoons, cookers)	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing crack pipes	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)
Sharing needles	(Y) (N) (DK)	(Y) (N) (DK)	(Y) (N) (DK)

105. If you thought you might have a sexually transmitted infection, how could you find out? (*Check all that apply)*

(1) Blood test (2) Urine test (3) Physical examination
(4) X-ray (5) Self-diagnosis (6) Genital swab
(7) Other _____ (88) Don't know (99) Refused

106. In terms of YOUR risk of getting a sexually transmitted infection, what do you think your risk is?

(1) No risk at all (2) Low or little risk (3) Somewhat at risk
(4) High risk (5) N/A – I already have HIV
(88) Don't Know (99) Refused

107. PRIOR to your current incarceration, please tell me whether you have been tested for any of the infections below, the result and whether or not you received treatment or help. *Refer to table 5.*

Have you EVER been tested for				If tested, have you EVER had a positive result?				Have you received any kind of help or treatment		
	No	Yes	Don't Know	No	Yes	Refused	Don't know	No	Yes	Don't know / Not Applicable
HIV	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Hepatitis B	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Hepatitis C	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Chlamydia	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Gonorrhea	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Syphilis	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Herpes	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Genital warts	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
If you are a woman										
Cervical cancer	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Vaginal infections	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
If you are a man										
Prostitis	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)

108. During your current incarceration, were you OFFERED testing for any of the diseases listed in the table above? *(see question #116 for list of diseases).*

(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to question 110…

109. If testing was offered, was it at the time or your admission or later in your sentence?

(1) At the time of admission (2) Later on in my sentence
(88) Don't know (99) Refused

110. DURING your current incarceration, please tell me whether you have been tested for any of the infections listed below, the result and whether or not you have received treatment or help. *Refer to table 5.*

During your current incarceration, have you been tested for				If tested while incarcerated, have you had a positive result?				Have you received any kind of help or treatment while incarcerated?		
	No	Yes	Don't Know	No	Yes	Refused	Don't know	No	Yes	Don't know / Not Applicable
HIV	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Hepatitis B	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Hepatitis C	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Chlamydia	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Gonorrhea	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Syphilis	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Herpes	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Genital warts	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
If you are a woman										
Cervical cancer	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
Vaginal infections	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)
If you are a man										
Prostitis	(0)	(1)	(88)	(0)	(1)	(99)	(88)	(0)	(1)	(88)

111. Since your current incarceration, have you received your Hepatitis B vaccination/immunization?

(0) No (1) Yes (77) N/A – already vaccinated
(88) Don't know (99) Refused

112. If you have <u>never</u> been tested for HIV, Hepatitis C, or a sexually transmitted infection, like gonorrhea or chlamydia, why not? *(Please check all that apply.) Refer to table 6.*

	HIV	Hepatitis C	STI
Not applicable – I've been tested			
I am scared of finding out I'm positive			
I am at low risk for infection			
If I tested positive, nothing could be done			
I am afraid of needles			
I don't think I can get HIV, Hepatitis C or an STI			
I think I am already positive			
I think I am negative			
I always have safe sex			
I never inject drugs			
I have a steady boyfriend/girlfriend (I don't sleep around)			
I never thought about it			
I am worried about the impact on my sex life			
I know that I have never had sex with an infected person			
I don't think the test is always right			
I am healthy so I don't need to be tested			
I do not know where to get tested			
I am afraid of having my name on a report			
I am worried about being harassed			
I am worried about being discriminated against			
It could affect my career or insurance			
I could affect my relationship			
Other:			
Don't know			
Refused to answer			

I would like to ask you some questions about the health services in the correctional centre.

113. What health education programs are available to you in the correctional centre? Please list all programs that you are aware of, whether you use them or not. For each program, please tell us if you have been involved in the program and if yes, how helpful you found it to be.

Name of program	Have you been involved in this program?				If yes, how helpful was this program?					If no, why not?
	No	Yes	Don't know	Refused	Poor	Fair	Good	Excellent	Refused	
1)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
2)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
3)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
4)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
5)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
6)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
7)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
8)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
9)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	
10)	(0)	(1)	(88)	(99)	(1)	(2)	(3)	(4)	(99)	

114. Are condoms provided in private/confidentially in this correctional centre?
(0) No (1) Yes (88) Don't Know (99) Refused

115. During this current incarceration, have you ever had a problem with access to condoms when you needed them?
(0) No (1) Yes (77) N/A – Never wanted one
(88) Don't Know (99) Refused

If YES, answer question 116, otherwise skip to question 117 …

116. What are some of the reasons that condoms are not always available when you need them? (Please shade all that apply)
(1) Not available in the correctional centre (2) Dispensing machines are empty
(3) Dispensing machines are broken (4) Other inmates hoard the condoms
(5) Access is limited by other inmates (6) Not provided confidentially; afraid to ask
(7) Other_____ (88) Don't know (99) Refused

117. Are water-based lubricants available to you in this correctional centre?
(0) No (1) Yes (88) Don't Know (99) Refused

If YES, skip to question 119 …

118. If water-based lubricants were available to you, would you use them?
(0) No (1) Yes (88) Don't Know (99) Refused

If MALE respondent, skip to question 121 …

119. Are dental dams available to you in this correctional centre?
(0) No (1) Yes (88) Don't know (99) Refused

If YES, skip to question 121 …

120. If dental dams were available, would you use them?
(0) No (1) Yes (88) Don't know (99) Refused

121. Do you feel that you need more help to protect yourself from HIV/AIDS, Hepatitis C or sexually transmitted infections while in this correctional centre?
(0) No (1) Yes (88) Don't know (99) Refused

If NO, skip to last page…

122. What are some things that would make it easier for you to protect yourself from HIV/AIDS, Hepatitis C or STI while in this correctional centre? *(Check all that apply)*

(1) Information (2) Risk counseling (3) Confidential testing
(4) Female condoms (5) Latex condoms (6) Dental dams
(7) Water-based lubricants (8) Dietary counseling (9) New injection equipment
(10) Bleach for sterilizing needles (11) New tattoo equipment
(12) Bleach for sterilizing tattoo equipment (13)
Other:_____
(88) Don't know (99) Refused

Those are all the questions I have for you. Thank you for your time today.

Do you have any questions for me?

Do you have any general comments about the survey/interview that you would like to make?

If you are interested in receiving more information on HIV, HCV, or STI or would like to be re-tested so that you can know your results, you should arrange to speak with the public health nurse or facility nurse.

In appreciation of your contribution today, a money order in the amount of $10.00 will be deposited into your account here. There will be no information on the money order linking the payment to this study.

If you have any questions or concerns about the study once the Research Nurse leaves, you may ask the Correctional Centre Nurse to forward your questions to the Principle Investigator, and she will provide a response back to you through the Centre Nurse.