BRITISH COLUMBIA'S YOUTH IN CUSTODY: GENDER DIFFERENCES IN SEXUAL AND SUBSTANCE USE RISK BEHAVIOURS

by

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OBJECTIVES:

- To characterize the profile of British Columbia’s youth in custody
- To describe risk taking behaviour among male and female youth in custody
- To estimate prevalence of sexual and substance use risk behaviours among male and female youth in custody
- To determine if there are differences in sexual and substance use risk taking behaviour between male and female youth in custody
- To explore the mechanisms through which gender may impact on sexually transmitted infections (self report) and injection drug use (self report) outcomes

METHODS:

From January to August 2006, youth aged 14-19 years residing in or entering into British Columbia’s three youth custody centers (Prince George, Victoria, Burnaby) were invited to participate. A confidential interviewer-administered questionnaire collecting demographic and risk factor information was completed on 414 youth; with known gender and whose anonymity was maintained. Descriptive statistics were utilized to characterize British Columbia’s Youth in Custody while prevalence estimates were calculated for risk behaviours. Odds ratios with 95% confidence intervals were utilized as a measure of effect size of gender on sexual and substance use risk taking behaviour. Logistic regression modeled the association between select risk behaviours, gender, age and ethnicity, on self report of sexually transmitted infections and injection drug use outcomes.
Conclusion:

This exploratory study provides documentation suggesting sexual and substance use health risk behaviours are found in high proportions among British Columbia youth in custody. Gender differences and patterns exist, with females disproportionately carrying the greater burden of risk taking behaviour. Such risk behaviours render youth in custody vulnerable to not only the acquisition of sexually transmitted infections and blood borne viruses, but also to obstacles impeding healthy adolescent development. Identification of risk factors and behaviours addressing specific determinants of health can be utilized to develop and inform current public health efforts to address the needs of British Columbia's vulnerable youth in custody.
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CHAPTER 1 INTRODUCTION

1.1 Background

As a group, adolescents experience higher rates of health problems associated with violence, substance use, and sexual behaviour than do children and adults (1). Young people living in difficult circumstances, those from a range of disadvantaged backgrounds, and those from less privileged families, have been identified as especially vulnerable (2-4). Such youth often exhibit a broad range of involvement in risk-taking behaviour (2-4). Because these youth often lack personal as well as external resources, their involvement in sexual and substance use risk behaviours may escalate and become a source of further problems (2). In addition, these youth are often outside the reach of mainstream services, and many go on to enter detention having lacked comprehensive health care and as a consequence have long-term neglected health needs (2) (5).

The majority of youth in custody have participated in documented high-risk behaviours leading to arrest (6). While fewer youth are being detained in British Columbia (BC) than previously, those who are represent the most troubled youth committing the most serious crimes (7). These are some of the highest risk youth in BC, who place the heaviest demands on judicial, social, health, educational, and community services; despite representing a small proportion of all adolescents in the province (7). Custody remains the most serious sentence for these youth, and is reserved primarily for violent offenders, serious repeat offenders, and youth who fail to comply with non-custodial sentences (7).

Survey results have shown that these youth are more involved in risky activities (alcohol and drug use, and risky sexual behaviour) as compared to youth in school (7-11). In addition, youth in custody engage in these risky behaviours at a younger age than do their in-school counterparts (7) (8) (10) (11). The consequences of high-risk behaviours place detained youth at an increased risk of sexually transmitted infections (STI’s) and blood borne viruses (BBV’s) (4); in addition to obstacles impeding healthy adolescent development (7).

Sex and gender differences (Appendix II) have also been shown to profoundly impact health status; as well as access to and utilization of health services (12). Sex is
defined as the biologic differences between genetic males and females; while gender is defined as the socially and culturally constructed differences between males and females. "Gender differences" are often used as a "blanket term" for either sex and/or gender difference when speaking about males or females as it is often difficult to separate the two from their environment (Appendix II). Another way to think about this is being genetically imprinted, but socially or culturally defined. Health is defined and determined by numerous factors: health care and personal health choices, income, social status, employment, education, social environments, physical environments, healthy child development, personal health practices, coping skills, health services, social support networks, biology and genetic endowment, gender, and culture (12). Any upset of balance in these determinants influences the overall health status of adolescent males and females at a time when their development of self (be it physical, cognitive or emotional) is most vulnerable.

1.2 Significance of Research Topic

The population of youth in custody, despite being more vulnerable to detrimental consequences of risk behavior, remains understudied and particularly underserved in the community (13). Over ten years have passed since an analytic look at human immunodeficiency virus (HIV) associated risk behaviors and outcomes have been investigated in this population of BC youth in custody (14). Through the support and initiative of the Ministry of Children and Family Development, in collaboration with the British Columbia Center for Disease Control (Hepatitis Services) and the First Nations and Inuit Health Branch, a present day survey of BC youth in custody was undertaken to provide an overview and determine current sexual and substance use behaviour patterns and outcomes for this population.

The physical and mental health of youth in custody is of crucial importance to both the community involved with reducing the burden of juvenile offending, and to those who are committed to working with them in addressing their offending behaviour and the factors that contribute to offending (15). Information derived from this study will enable us to gain further knowledge and insight into the health status of male and female
youth in custody, and allow for the study of links between gender, health status, and risk taking behaviour. In addition, it is hoped that this study will inform the development of further programs and services for young people; not only for those currently residing in custody, but also for early intervention programs targeting those youth at risk of becoming entrenched in the criminal justice system.

Current surveillance efforts suggest that the increasing prevalence and moderate increase in incidence of HIV in Canada, coupled with the persistence of acute and chronic hepatitis C virus (HCV) infections, are not likely to change in the near future; thus they will continue to create an increasing burden of suffering for youth as well as on our health care system (16-18). Incarcerated youth are of particular importance with respect to HIV and/or HCV acquisition, not only because they actively engage in sexual and substance use risk behaviours placing them at immediate risk for infection, but rather it is during this period of life when many behaviour patterns are established that will affect their future risk of infection (19).

Rates of HIV and/or HCV among women in particular continue to increase (20) (21). As the number of women jailed in proportion to men steadily increases (22), and close to half of adult women held in federal Canadian prisons had previously spent time in youth custody (23), investigating sexual and substance use risk behaviours among young females in custody becomes increasingly important. Since most youth in custody return to the community within a few days (7) (24), the window of opportunity for intervention is small, and linkage to community based programs becomes more crucial.

Despite females making up a small proportion of all youth in custody, the problem of delinquency among female youth is growing faster than the problem of delinquency among male youth (25). Present day threats to the health of adolescent girls are primarily the consequence of risk behaviours (26). As evidence suggests that adjudicated female youth in custody may be an especially high-risk population, bearing a disproportionate burden of medical and emotional disorders (26), it would be prudent to examine whether such threats do in fact differ by gender, and/or whether females are carrying the greater burden of disease. Research should be established to contribute to and further explore this question so that intervention and prevention programs can be targeted appropriately.
It has been demonstrated that research needs to be conducted in ways that are sensitive to manifestations of sex and gender (12). Without this perspective, distinctions in health status between male and female youth cannot be properly defined, policy and program development cannot be properly informed, and the distinct health needs of diverse groups cannot be met (12).

1.3 Study Objectives

- To characterize the profile of British Columbia’s youth in custody
- To describe risk taking behavior among male and female youth in custody
- To estimate prevalence of sexual and substance use risk behaviours among male and female youth in custody
- To determine if there are differences in sexual and substance use risk taking behaviour between male and female youth in custody
- To explore the mechanisms through which gender may impact on sexually transmitted infections (self report) and injection drug use (self report) outcomes

1.4 Statement of Purpose

The identification of sexual and substance use risk behaviours and distinct health outcomes (sexually transmitted infections and injection drug use) for BC’s vulnerable youth in custody, can be utilized to develop and inform current public health efforts. Coupled with knowledge gained in relation to gender differences, the information derived from this study can serve to create relevant and gender sensitive harm reduction strategies to address the distinct health needs of this population.

1.5 Hypothesis Statement

Following a review of the literature, it is hypothesized that the results of this study will demonstrate that female youth in custody are at a greater risk of engaging in sexual and substance use related risk behaviours than are their male counterparts.
1.6 Summary

Adolescence is a transitory period characterized and affected by important physiological and psychological changes, societal, cultural, and gender norms and influences, and one’s ability to cope effectively within these contexts and potential obstacles. All combined, such factors inevitably will have long-term consequences on not only the physical and mental health of the individual (3), but also on his/her life course.

By contributing to the paucity of existing research in this area of youth in custody, and more importantly the impact of gender on risk taking behaviors and STI and IDU outcomes (within this vulnerable population), it is hoped that the knowledge gained can assist to inform researchers, government policy makers, and social service and educational agencies. In expanding the knowledge base around this topic, and by highlighting specific determinants of health and their outcomes, we can provide relevant and current information to assist in the creation of resources and opportunities to support youth in custody in their development of healthier personal practices, coping skills, and support networks—all factors that help protect youth from risk and provide stability (7).
CHAPTER 2 LITERATURE REVIEW

2.1 Introduction and Limitations

Risk taking behaviour is a normal part of adolescence; but while adolescents in the general community evidence high rates of risky health behaviours, these risky behaviours are particularly inflated among certain populations (1) (10) (27). Youth in custody are one such high-risk group. High rates of sexual and substance use risk behaviours prior to incarceration have been well documented, placing these adolescents at increased risk for HIV, HCV, and STI's (1) (10) (27).

Evidence of multiple sexual and substance use risks (many from an early age), transiency, life on the street, and truancy, are all forms of risk behaviour which play a role in the development of juvenile delinquency, disruption of social development, and health related risks (28) (29). In addition, engaging in risk behaviours makes it more difficult for youth to stay connected with supportive adults and school, and to maintain positive friendships with peers (30).

Differences between male and female youth extend beyond biological factors (31). Gender differences, particularly those that are socially and culturally influenced, have also been shown to be important. Such differences determine whether male and female youth are able to realize their potential for a healthy and productive life; as they play a part in shaping unique male and female patterns of health and its determinants (31).

While risk behaviours differ between genders, there persists variance in the literature regarding the extent of difference, whom remains more at risk, for which risks, and which factors are associated with given outcomes. For example, Halpern et al.'s (32) findings from the National Longitudinal Study of Adolescent Health (school based United States sample), looking at patterns of sexual activity and drug use behaviours, concluded that adolescent risk behaviour co-variation differs between genders; engagement in risk behaviours, and in multiple risk behaviours, is more likely among males than among females. Conversely, several other authors have found incarcerated and non incarcerated females to be a particularly high risk group; especially for the acquisition of STIs and engagement in illicit drug use (1) (6) (9) (13-15) (26) (33-38).
High sexual and substance use risk behaviours are common, and in many cases, females are engaging in these behaviours at a higher rate than are males.

A comprehensive review of the youth in custody and related literature was undertaken for this thesis. The literature search strategy first involved identifying literature pertaining to youth in custody using the electronic bibliographic database Pubmed (1950's – present) as the main source. The following terms, which also mapped to MESH headings were used for the initial search strategy: youth in custody, detention, incarcerated, adolescents, risk behaviours, sexually transmitted infections, injection drug use, drug use, gender. The second step of the search strategy involved pulling relevant articles and reading for appropriateness. For those articles deemed to be relevant for this thesis, bibliographies were hand searched for any additional pertinent articles. Further to this initial search, additional resources incorporated into the search strategy included utilizing: Google Scholar, Public Health Agency of Canada (PHAC) website, World Health Organization (WHO) website, and a well know local resource – The McCreary Centre Society. Given the deficit of literature on youth in custody, the search strategy was expanded to include street youth and adolescent injection drug user populations. Documents were found, reviewed, analyzed, and critically appraised. In their review, and in the development of a literature review matrix for all studies, several limitations from the literature arose.

First and foremost, there persists a paucity of literature on the topic of youth in custody. Secondly, the scarcity of such literature increases as one begins to search for gender comparisons. The vast majority of literature targeting the population of youth in custody does not delve into the multi-faceted, but essential, world of gender. Rather, when reporting differences or outcomes, authors report on biological differences (sex), while others may use the term sex or gender loosely. Others may neglect to report on differences at all; whether sex or gender driven and solely report crude numbers.

In addition, many studies are limited by the fact that they contain either all male or all female detainees; and thus solely report prevalence with no possibility for gender comparisons. In actual fact, the majority of literature on youth in custody is predominantly male oriented; with males being over-represented in studies than are
females. The literature does little to shed light on the factors that clearly impact and that are clearly different for male and female youth in custody.

To enrich the review of the literature, one is obliged to look at similar populations of vulnerable youth; youth who may not currently be in custody, but may have spent time in custody and who represent a small proportion of youth in custody (street youth, or populations of adolescent injection drug users). Comparing studies on actual youth in custody with each other, or with other vulnerable populations of youth is often challenging as age intervals vary; the latter often having youth classified as up to 24 years of age. Furthermore, life situations or choices may vary between such groups of youth thus impacting any clear comparisons.

Several useful and relevant studies were widely cited in this review, but they too are not without the above aforementioned limitations. The most frequently cited study for this thesis was the 2005 McCreary study for BC youth in custody (7). Offering the most current and relevant information, with which to highlight and compare the thesis population under study with, it is restrictive in that having taken place in a one month period, it is cross sectional in nature and thus offers only a snapshot of the youth in custody. Furthermore, it is limited by a small sample size; especially with respect to females (male = 123, female = 14), and consequently rates may be unstable.

2.2 Youth in Custody

2.2.1 BC/Canada Statistics

The number of youth in custody has significantly declined since the Youth Criminal Justice Act came into effect on April 1, 2003 (7). This Act encourages moderate sentences and alternatives to imprisonment for less serious crimes; while also changing the provisions regarding adult sentences for young people who commit serious violent crimes (7). Under this Act, a young person is defined as someone at least 12 years of age, but less than 18 at the time an offence is committed (7). BC has the lowest rate of youth incarceration in Canada. In 2002/03 the incarceration rate for BC youth was 6.7 per 10,000 population, compared to the national average of 12.5 (7). In 2003/04 BC’s youth custody rate was 4.7 per 10,000, and in 2004/05 the rate was 4.8 (7). As custody is used
less frequently in BC, given the encouragement of moderate sentences and alternatives to imprisonment for less serious crimes, youth in custody here may actually be a more troubled population than youth in custody elsewhere in Canada (7).

More than 84,000 Canadian youths were charged with Criminal Code offences in 2003, while 100,000 were cleared (7). Most youth in the Canadian justice systems are on supervised probation (7), and for those that are sentenced, the average duration of time spent in custody is often brief (24). Significant portions of youth spend time in remand (in custody awaiting a court hearing or sentencing) and do not receive a custodial sentence. In Canadian federal institutions, as noted elsewhere in the literature, the proportion of female inmates to male inmates is on the rise (22) (23) (25).

### 2.2.2 Demographics

On average, in 2004/05 the BC youth custody population was 85% male and 15% female (7). The majority of these youths were 16-17 years of age, with the age range generally being 14-19 (7). A small proportion of youth in custody are younger and/or older than this range (7). Numerous studies in the United States (US), Australia, and the United Kingdom (UK), also found consistently higher rates of males than females in custody, with an average age of 16-17 years (4) (6) (8) (14) (15) (29) (34) (36) (39-43).

Justice statistics illustrate a significant over-representation of Aboriginal people in both the youth and the adult criminal justice systems (22-25) (44). McCreary’s cross sectional sample of BC youth in custody (2005) found that more youth in custody reported being Aboriginal than any other single ethnic background; and much higher than the proportion of Aboriginal youth in the general population (7) (24). Aboriginal youth accounted for 47% of youth in custody in 2004/05 (7), while Aboriginal youth represent only 8% of the youth in BC (44). Of the Aboriginal youth in custody, McCreary found 76% reported having First Nations status, and most have never lived on reserve (7).
2.2.3 Characteristics

Youth in custody are often characterized by: being from disadvantaged backgrounds, having low educational attainment, coming from disrupted families, and regularly engaging in high risk behaviours (15) (24). Such youth experience less connection to, and involvement in, families and school, and have fewer social supports to guide them in making healthy choices and give them a sense of belonging (7) (24) (29). More than half of youth in custody lack stability at home; 56% had moved three or more times in the year before being in custody, and some youth moved between living with their parents and other situations during the year (7) (42) (44).

The majority (73%) of BC youth in custody have lived in government care at some time (7); as compared to only 2% of school based youth surveyed for the Adolescent Health Survey III being involved in government care in the past year (45). The data indicates that youth in custody may be especially vulnerable; as moving frequently, running away from home, and/or being in government care are generally associated with being at higher risk for poor adolescent development (30) (44).

In the US, Canada, and Australia, comparative studies of incarcerated youth and the general population of school based sample teens, have consistently documented that youth in custody have substantially higher rates of drug and alcohol use and sexual risk behaviours (15) (29) (41) (42) (44) (46). High risk behaviours are commonly reported in this population, with a substantial number of youth in custody having initiated one or more risky behaviours at an early age (14) (15) (34) (40) (41) (44).

Street youth, which represent a significant percentage of youth in custody in many parts of the world, have been shown to engage in multiple risk behaviours often associated with surviving on the street: they initiate sex at a young age, have multiple sexual partners, engage in “survival sex”, and have high rates of injection drug use (47-50). McCreary’s profile of youth in custody in British Columbia, found that at least 19% of youth have spent time on the street (7).

Most youth in custody obtain income from illegal and street activities prior to being detained; drug dealing, theft or robbery, other illegal activities, panhandling, and engaging in sexual activity in exchange for money or goods while living in the community is commonplace (42) (44).
Finally, most youth in custody have a prior history of involvement with the youth justice system. Multiple admissions are common among this population of youth, as the majority has been incarcerated more than once and often for a variety of different offences (7) (26) (41-44) (51).

2.3 Risk Behaviors

2.3.1 Sexual Health

2.3.1.1 Introduction

Age, pubertal development, gender, and ethnicity are all variables that have been shown to be associated with adolescent sexual risk behaviour (6) (10) (34) (38) (52-54). While the literature suggests that both male and female youth appear to be at risk for engaging in sexual risk-taking behaviours, there is dissonance on who appears to be more at risk, and which factors may influence STI acquisition as an outcome. While the literature presents the social, demographic, individual, and psychologic factors that influence sexual risk-taking and outcomes, and the difference for juvenile offender and non-offender populations, it does little to shed any explicit light on these factors that impact and that are different for male and female youth; especially for those in custody.

A primary consideration for the reviewed literature is the limitation that neither the usage of the terms sexual activity (oral, anal, vaginal) nor sexual intercourse was ever adequately defined. Whether sexual activity or sexual intercourse was consensual or abuse in nature was never identified. Such concepts were not defined in the written papers, nor were they defined for survey respondents when applicable.

Despite this constraint, engagement in any sexual risk should not be overlooked in the study of youth in custody and in the planning and delivery of care; as any sexual risk often precedes serious consequences in the health of an individual, including possible future entrenchment in other risky behaviours.
2.3.1.2 Age of Sexual Debut

For both American and Canadian adolescents, "sexual activity" has increased dramatically over the past two decades (10) (55) (56). Youth in custody however still report higher rates of sexual activity overall (4) (6) (15) (36); with large differences existing in the sexual experiences between youth in custody and their in-school counterparts (34). Almost all youth in custody are sexually active, and most started having sex much younger than youth in school (7) (10) (11) (55) (56). Among sexually active youth in BC custody McCreary found 66% first had sexual intercourse before the age of 14, compared to 20% of youth in school (7) (45).

Additional studies in the US, Canada, and Australia have also found this young age of sexual debut and increased rate of sexual activity for incarcerated youth. Rates of sexual activity for populations of youth in custody consistently report over 85% of such youth having engaged in previous sexual activity (1) (15) (34) (36). The average age of sexual debut for males ranged from approximately 11-13 (15) (27) (36) and 12-14 for females (15) (26) (27). In comparison, the American Youth Risk Behavior Survey (YRBS), demonstrated that nationwide only 8.3% of US students had initiated sexual intercourse before 13 years of age (10) (11). For a sample of Toronto street youth 77% of females and 78% of males became sexually active between 11 and 16 years of age (48). For females aged 11-13, 21% had been sexually active while 33% of males within this age group were sexually active (48).

And while little, if only a modest difference exists between genders with respect to actual age of sexual debut, age at first intercourse has been linked to many risk taking behaviours and can be used as a marker for risky sexual behaviour (33). Adolescents with early onset of sexual activity tend to have more recent partners, more lifetime partners, and are less likely to use condoms, than those with later onset of sexual debut (33) (57). Moreover, it has been demonstrated that earlier age at first intercourse is a well-established STI risk factor among adolescents (7) (33) (56) (58), and has been independently associated with a positive STI history among sexually active females (33). For Toronto street youth, the younger a person had been at sexual initiation, the more likely he or she had engaged in prostitution (48); similarly Weber et al.’s street youth
population (59) found that girls involved in prostitution had initiated sexual activity at a younger age.

2.3.1.3 Condom use

Despite findings from the McCreary Centre Society that condom use in BC adolescents has increased overall when asked if they used a condom the last time they had sex (58% in 1998 to 68% in 2003) (45), the population of youth in custody and youth at risk consistently continue to report low usage of condoms with both regular and casual partners (1) (4) (10) (34) (43) (45) (51). Of sexually active BC youth in custody only 59% reported having used a condom the last time they had sex (7).

A number of studies have consistently found that females were more likely than males to have intercourse without a condom, or were less likely to report consistent condom usage with partners (15) (25) (26) (47) (49) (59) (60). Detained and at risk adolescent women report more risky behaviours than men in the engagement of unprotected intercourse (37). In a study of juvenile offenders in the US (N=523; 328 males and 195 females), when females were compared with males, they reported significantly greater knowledge, less peer influence, higher perceived risk of infection, more positive condom attitudes, and more self efficacy, but yet they reported less condom use (60). Findings from Statistics Canada reported the odds of not using a condom were higher for females who started having sexual intercourse at the beginning of their teens (57). This was related to age of first intercourse (57). Nearly 60% of those who started having sex by age 13 reported not using condoms the last time they had intercourse (57). Furthermore, in marginalized populations of women, especially adolescents, and women who exchange sex directly for drugs (crack in particular), control over sexual decision making is greatly reduced; this includes negotiating condom use with their male partners (49).

2.3.1.4 Sex for Trade

Several US, Canadian, and Australian studies on youth in custody have reported on their engagement in sex for trade (money, drugs, food, or shelter). Though the
proportion of youth engaging in such behaviours remains low, it is wide ranging (1% to 16%) (1) (4) (6) (7) (14) (15) (26) (36).

For all the literature reviewed on youth in custody of particular note is that for BC youth; wherein McCreary found 16% had engaged in sexual activity in exchange for goods or money while living in the community (7). A quarter of the females, and 15% of the males in this study reported exchanging sexual favors; most for money, drugs or alcohol (7). This is considerably higher than the remainder of the published literature on youth in custody. In a 1994 representative sample of BC youth in custody, Rothon et al. (14) found that the overall proportion of youth reporting engaging in “sex for trade” was 6.7% (females 21.2% vs. 3.7% for males).

The implications and consequences of engaging in sex in exchange for a commodity—be it drugs, money, or housing—remains significant. Whether it is used as a measure of risk, or an outcome of risk behaviours, it addresses a culmination of previously existing sexual and substance use behaviours. In addition, sex for trade can serve as a catalyst to further entrenchment in an “at risk lifestyle” leading to possible acquisition of STIs, HIV, and HCV.

The literature does not fully address this topic with respect to youth in custody; primarily because exchanging sex for drugs or money remains predominantly a phenomenon of youth already entrenched fully in high risk behaviours – street or homeless youth for example (20) (47) (49) (61). Young women that are homeless or live on the street, or women that are IDU have been shown to be especially vulnerable – often engaging in sex to survive or to feed a substance use habit (19) (59) (62). Of consideration is that such people, whether they be adults, or youth, often have had a history of having spent time in the custody system at one point or another (23) (47), or may spend time there in the future.

2.3.1.5 History of Sexually Transmitted Infections

The risk of acquiring STI’s, much like age of sexual debut, incorporates biological, behavioral, and social factors (33). STI acquisition is an outcome of multiple risk behaviours; addressing factors such as age of sexual debut, condom use, multiple
partners, and sex for trade. In addition, it can serve to act as a risk, in that it has been demonstrated to lead to acquisition of future STI's (including HIV) and complications in reproductive health (62).

While STI prevalence is consistently high for adolescent samples, with Chlamydia and Gonorrhea by far being the most commonly reported STI's diagnosed in adolescents (63-69); youth in custody remain especially vulnerable in this population. Findings from Canadian and US surveys in populations of school based youth report rates of STI diagnosis ranging from 4%-7% (32) (33) (57). Numerous other studies support the fact that youth in custody are actually more at risk for acquiring STI's, including HIV, than their non-incarcerated peers (6) (7) (27) (34) (43). For example, McCreary’s study of BC youth in custody found that a health professional had told 13% of youth that they had a sexually transmitted infection, compared to only 1% of youth in school (self report data) (7). In a study of 39 juvenile correctional facilities in the US, the incidence of STIs was about double for the detained group compared to the high school group, with being of Black or Hispanic race, female gender, and drug use increasing the risk of STI’s (34).

What remains more significant however, is the disproportionate burden of STI's present in young girls (incarcerated or not) (1) (13) (26) (32-37) (57) (63-67). Of 201 adolescent detainees in the US for example, almost 1/5 of all respondents reported having been told that they had an STI (1). The prevalence of ever having a STI among females for this study was more than two and a half times that of males (1). Being female was independently associated with being at greater risk of acquiring a STI (adjusted RR = 3; 95% CI 2-4.5) in a sample of 39 juvenile correctional facilities in the US (34).

Consistently overall, it has been demonstrated that STI positivity is consistently higher for young women in juvenile correctional facilities. A plausible reason for this increase in STI's among women is noted by Voisin et al. (13), in a population of detained female adolescents—“Sexually active female adolescents who had stronger risk taking attitudes, used substances, reported less parental monitoring, experienced lower levels of familial support, supported gender norms favoring male dominance, had risky peer norms, or perceived less student-teacher connectedness were more likely to report higher levels of STI risk behaviours; behaviours which lead to the acquisition of STI’s.” In DiClemente’s (63) study of sexually active adolescent females (14-18 years of age),
adolescents who had ever had an STI diagnosed were more likely to report current high-risk sexual behaviours.

Because of the lack of symptoms and/or lack of awareness for both males and females, these figures likely represent only a fraction of the actual number of infections in this age group. In addition, the majority of vulnerable youth may not routinely seek out regular health care and therefore do not receive STI services that can accompany regular checks (35).

By and large, incarcerated adolescents are at a particularly high risk for STI infection because they frequently have multiple partners, have unprotected sex or use condoms inconsistently, initiate sex at an early age, engage in substance use, and do not always access health care (7) (33)(35) (56) (58)(60). Moreover, adolescents who exchanged sex for money or drugs, and those who used injection drugs have been linked to previous STI diagnosis (32).

Why is having ever had a STI important?

- Having a previous history of STI remains strongly associated with an increased risk of subsequent STI (33).
- In a sample of IDU, the incidence of HIV was double among women who reported an STI in the prior 6 months compared with those who did not (70).
- Incarcerated youth who had a previous history of STIs, were also at a significantly increased risk for having HCV (RR 14.5; 95% CI 2.5-76.4) (27).

And so it would appear that ever having had an STI serves not only as a marker for current risk, but also plausibly that of future risk.

### 2.3.2 Alcohol and Illicit Drug Use

#### 2.3.2.1 Introduction

People use substances to satisfy a need or to serve a function. Ongoing and continued use of one or more substances has been shown to increase the likelihood that associated harm will occur (2). Some youth who engage in heavy substance use will continue to do so well into adulthood, and as a result, will experience varied and numerous longer-term health and social problems (2) (71). Heavy continued use of
substances throughout adolescence can have the effect of stalling psychosocial development; impairing a youth’s ability to complete school, maintain employment, develop adequate coping skills, or even engage in healthy relationships (30). Though longer term health consequences of alcohol and drug use generally appear well into adulthood, it has been found that early initiation can lead to earlier problems. Anthony and Petronis (71) found that within seven years of onset of drug use, those who had started using drugs earlier in adolescence reported more health problems than those who began use later.

Substance use in adolescents is a universal and significant public health concern. Among troubled youth—homeless and street youth, school dropouts, and those with mental health disorders (many of whom may eventually cycle through the juvenile justice system)—risk of substance use is even higher (9). Substance use is one of the many issues faced by these young people, who often use drugs as a means of coping with negative experiences (2); as well as a means of survival (72).

Age of onset and frequency of use vary for the different substance use behaviours; with patterns of drug use and outcomes not necessarily sharing the same trajectories. The inter-relationships between substance use and gender are complex and dynamic, influenced by past circumstance and present social and cultural factors, norms, experiences, and expectations.

2.3.2.2 Prevalence of use

It is well documented that youth in custody are more likely to have used a variety of substances (illicit and non-illicit drugs), to begin using at an early age, and to use more frequently, regularly, and intensively, than their adolescent counterparts in the general population (1) (7) (24) (73). Information from the McCreary’s Society Adolescent Health Survey (74) for example found that almost a quarter of BC adolescents (23%) had ever used illegal drugs, as compared to McCreary’s findings that most youth (90%) in BC custody have used illegal drugs (7).

The World Youth Report on “Youth and Drugs” found that in most regions male youth were more likely than female youth to use all substances and were more likely to
use them in risky ways (2). This is contrary to several bodies of research that point to female youth using alcohol, illicit drugs, and injection drugs more so than male youth (1) (2) (15) (34) (53) (75). The likely explanation for this conclusion on the World Health Organization (WHO) report is that tobacco consumption was included in their list of used substances. They also looked at substance use across the spectrum, and reported on all youth worldwide, not just vulnerable youth.

Throughout studies of incarcerated youth the two most common misused substances remain alcohol and marijuana; often with a prevalence of regular use exceeding 50% (1) (4) (7) (24) (26) (36).

2.3.2.3 Alcohol and Marijuana

Though findings from the adolescent health survey of BC youth found that youth of all ages in school were waiting longer to try alcohol, and alcohol use among these youth has decreased in recent years (45), virtually all youth in BC custody (99%) have tried alcohol at least once in their lives; with 49% having had their first drink by the age of 10 (7). Across several studies, alcohol drinking has been found to be universal by the time youth in custody reached their mid teens (1) (4) (7) (24) (34). McCreary (76) found that adolescents who tried alcohol were more likely to: be current smokers, have used marijuana in the past month, and to have used other illegal drugs three or more times in their lifetime (76).

American, Canadian, and Australian youth in custody studies consistently found the prevalence of marijuana use to be high in this population (ranges 90% - 100%); with many youth using marijuana frequently (7) (15) (24) (34) (36), and to have done so at a young age (77). Of BC youth in custody, 74% had tried marijuana by the age of 12, compared to just 8% of youth in school (7).

For adolescents who abuse substances, multiple substance abuse disorders are common (1) (2) (9). In a randomly sampled population of 1829 juvenile detainees in the US, nearly a quarter of them had multiple substance use disorders in the past six months (9). Nearly 40% had both alcohol and marijuana use disorders; the most common
combination (9). Among homeless and runaway youth, marijuana had some of the strongest bivariate relationships with measures of risky behaviours (49).

Abuse of illicit drugs, either in combination with each other, or in combination with marijuana and/or alcohol suggests a progression of serious and problematic use. Not only does using two or more drugs at a time make it difficult to predict the nature and intensity of their effects, but it also places youths at great risk of continued dysfunction, delinquency, and further entrenchment in riskier sexual and substance use behaviours (2) (9).

2.3.2.4 Other Illicit Drugs

It is well established that high prevalence rates for the use of alcohol and marijuana exists across the board for youth in custody regardless of gender. Though rates of use for illicit drugs are lower than that for alcohol and marijuana, high risk behaviours for illicit substance use is still commonly reported in this population; with prevalence of use once again being higher than that of their in-school counterparts (7) (40) (45). Drugs commonly found to be used in this population include ecstasy, amphetamines, crack, heroin, and cocaine (2) (24) (36) (40).

Across most studies reviewed, “at risk” females were consistently more likely to engage in illicit drug use (excluding marijuana) than were males. The New South Wales survey found the overall prevalence of cocaine, heroin, and ecstasy and amphetamine type substances to be 21%, 20%, and 34% respectively (15). For all three categories of substances, females were more likely to have ever used such drugs than were males as per raw numbers—no statistical tests were completed on this data to ascertain if gender was in fact associated with use. Female youth reported more drug use in 39 juvenile correctional facilities sampled in the US (34). For example, 42% of female youth used cocaine compared to 30% of male youth; while female youth also used cocaine earlier and did so much more frequently than male youth (34). McClelland et al (9), in a randomly sampled population of 1829 juvenile detainees, found significantly more females than males had disorders involving illicit drugs other than marijuana. This is in accordance with other studies that have found female youth enter the juvenile justice
system with higher rates of disorder than do male youth (15) (34). Castrucci and Martin’s (1) US sample of 210 incarcerated youth found that despite the prevalence of substance use not being significantly different for males and females in most cases, regular cocaine use was almost four times as high among females as compared with males.

Adolescent females may in fact be more vulnerable to becoming dependent on these illicit drugs than do adolescent males. This is of considerable note since the use of illicit drugs has been linked with increased sexual risk (including sex for trade), multiple sex partners, unprotected sexual encounters, violence, crime, exploitation of users (in particular women), and injection drug use transmitted HIV and HCV infection (20) (27) (59) (78).

2.3.3 Injection Drug Use

2.3.3.1 Introduction

Injection drug use (IDU) is much more common among street and incarcerated youth than among school based youth (7) (11) (79). High-risk youth who progress into injection drug use from other forms of drug use, and who are younger than already established users, are more likely to experience early and sustained sex trading, to have more casual sexual partners, use condoms inconsistently, to demonstrate a low level of commitment to school, and to be a victim of violence at the time of onset (2) (59) (80). Young females in this population are more likely than young males to be injectors, and to be more harmfully involved (2).

Injection drug use poses serious risks with respect to overdose, HIV, and HCV acquisition. Young people may be particularly susceptible because of their relative inexperience, faulty and/or lack of knowledge of risk factors, and the fact that they generally do not take advantage of standard health services (2) (80).

2.3.3.2 Prevalence of Use

Rates of injection drug use among incarcerated youth are lower than that for non injection illicit drug use. Among youth in custody, higher rates of IDU have been reported in UK and Australian studies than with those from the US and Canada. The New
South Wales department of juvenile justice found that in their sample of detained youth, 19% had injected drugs in the 12 months prior to custody (15); while young offenders in an institution in Scotland (male youth) had 17% admitting misuse of injection drugs (81). Of male youth in a Melbourne facility 61% remarkably had used injection drugs at some point (51). The age groups for participants across all three studies were comparable. American and Canadian studies report less prevalence of IDU, with rates generally in the range of 1% to 6% (6) (14) (27) (36) (40) (41) (82). McCreary’s report on BC youth in custody had one of the highest rates, with 11% of youth reporting having ever injected an illegal drug in 2004 (7). This is more than double Rothon et al.’s (14) 1994 study on BC youth in custody where the proportion was 4.6%.

For the studies that actually did look at gender and injection drug use relationships, engagement in IDU practices has been found to be significantly more prevalent among female youth than among male youth for this population (14) (15) (27) (34).

2.3.3.3 Age of onset

For most injection drug users, injecting begins at a young age; often associated with experiences of homelessness and incarceration, and beginning at the time of or after leaving school (2) (79). The average age at which young people had first injected themselves, or been injected by someone else, ranged from 14.5 -19.5 (27) (48) (79) (83). Variance remains in the literature as to whether males or females inject earlier, or if there is even a difference between genders (48) (53) (79) (83). It has been demonstrated that the younger the age of first injection, the more strongly correlated is the risk of sharing syringes and the development of high-risk injection behaviours (84).

2.3.3.4 Sharing needles and/or equipment

Injection risk behaviour has a direct relationship with HIV and HCV prevalence. Ever sharing injection equipment has been identified as a principal risk factor associated with the transmission of HIV and HCV in IDU populations (12) (27). Sharing of injecting paraphernalia is commonly reported in the literature among youth in custody; whether the
sharing is that of using a needle after someone else has used it, or giving a needle to someone else after having used it. Reports of ever having shared equipment range from “few” to as high as 33% (4) (7) (27) (43). In a sample of young injection drug users in San Francisco female IDU’s had been observed to have greater frequency of injecting with used syringes and other injection equipment than their male counterparts (53).

2.3.3.5 Women and IDU

Women at particular risk for HIV and HCV infection—those who use drugs, those who inject drugs, women who engage in sex trade work, homeless women, and women with mental illness (many of whom will eventually cycle through jail)—remain an often overlooked population (20) (62) (85). Of this group, female IDUs are more likely to have had a sexual partner who is also a drug user than a male IDU, and to have been initiated into injection use by a partner or lover (14) (53) (62) (79). Females involved in prostitution were also more likely to have reported a history of injection drug use compared with females with no history of prostitution (59).

Female IDUs have been shown to significantly differ in their sociodemographic, sex and drug related profiles, and vulnerabilities when compared to those faced by their male counterparts living in the same geographic area (86) (87). There is reason to believe that there may be a number of specific risk factors for women, given their biologic and gender differences, differences in drug injecting practices, their involvement in the exchange of sex for money or drugs, their typically weakened sense of power in decision making within their sexual and drug relationships, and their willingness to enter treatment, that make them expressly more vulnerable to injection drug use and continued engagement in risks that are detrimental to their health (62).

2.3.3.6 Implications for HIV, HCV and Co-infection

HCV and/or HIV infection pose a major public health challenge worldwide. As some similarities exist in viral acquisition of HIV and HCV, coinfection will likely become a universal problem.
Higher rates of injection drug use among females bears with it the likelihood of future risk of HIV and HCV infection (86) (88). The proportion of women among positive HIV test reports is highest for adolescents and young adults (21). Of all new HIV infections among Canadian women in 2002, 37.2% were attributed to injection drug use (21). Throughout studies women had a significantly higher HIV prevalence and risk of seroconversion than men (83) (86) (88); thus demonstrating that HIV is increasingly affecting women in Canada (21).

For adult federal prisons in Canada, HIV infection rates are much higher in female offenders than in males (4.7% vs 1.7%); while overall, 23.6% of inmates are reported to be HCV positive (22). The prevalence of HIV infection in youth in custody in BC was last estimated to be at 0.25% (14); while the prevalence of HCV antibody among detainted or incarcerated juveniles in the US has been estimated to be at 2%-3.5% comparatively (82). A history of IDU is the predominant risk behavior for HCV infection in youth and adults (19) (27) (40) (80) (89), and regardless of reported risk behaviours, the prevalence is higher among females than among males (27) (82).

Studies have shown that an average of 30% of new drug injecting individuals become infected with HCV within the first 36 months of commencing IDU (40). Another study showed that among high risk youth, half of those who became HCV positive did so within the first two years of their injection career (16). As HCV infection is likely to be acquired early in an injecting career (53) (84), and younger age, and more recent initiation into injection are associated with increased risk for HIV (19) (84) young or recent injection initiates represent an important group for prevention of HCV and HIV infection (80).

2.4 Summary

The population of young people in custody appears to be a fairly consistent group: predominantly male, multiple contacts with the justice system, instability in their lives, problems at school, sexually active, misuse of substances (7). Of little surprise, but of high consequence, is the reporting of high rates of risky sexual and substance use behaviours amongst this population, and their early age of onset; factors that are detrimental to their own health status and healthy adolescent development.
The reviewed literature supports the following conclusions:

- Substance use and sexual behaviours exist in one form or another among the majority of adolescents; but youth in custody exhibit these behaviours on a larger scale than their school age counterparts.

- Some relationship between substance use, STI and IDU risk behaviors, and gender assuredly exists. However, such relationships are not consistently identified either individually or together, and their magnitude remains variable.

- Clearly, no single risk factor, can likely explain acquisition of STI’s or involvement in injection drug use.

- With such classic risk behaviours permeating most aspects of these youth’s lives, youth in custody are at high risk of premature morbidity and mortality.
CHAPTER 3 METHODS

3.1 Research Design

The study design incorporated a population based, cross sectional study on British Columbia’s youth in custody between January and August 2006.

3.2 Study Setting

The study occurred across all three Youth Custody Centres in British Columbia--Prince George, Victoria, and Burnaby.

Prince George: (90)

Prince George Youth Custody Centre (PGYCC) is a co-ed facility, which opened in 1989. PGYCC’s current capacity is 36 consisting of 12 Secure Custody and 24 Open Custody beds. Twelve of the Open Custody beds are located at Bowron House. Bowron is available for those residents willing to demonstrate a suitable level of personal responsibility and to engage in supervised community service. All youths admitted to the Centre are between 12 and 17 years of age. Prince George is responsible for the custody arrangements for Northern B.C. and the northern parts of the Interior region.

Victoria: (90)

Victoria Youth Custody Centre (VYCC) is a co-ed facility, which opened in 2002 at its current location. VYCC’s current capacity is 48 consisting of 24 Secure Custody and 24 Open Custody beds. All youths admitted to the Centre are between 12 and 17 years of age. Victoria is responsible for the custody arrangements for Vancouver Island.

Burnaby: (90)

Burnaby Youth Custody Centre (BYCC) is a co-ed facility, which opened in 1954 and will be relocated to a renovated facility in 2007. BYCC’s current capacity is 84, consisting of 60 Secure Custody and 24 Open Custody beds. All youths admitted to the Centre are between 12 and 17 years of age. Burnaby is the largest remand and sentenced
facility serving the province of BC, and is principally responsible for the custody arrangements for the lower mainland and the southern interior of the province.

3.3 Study Participants

3.3.1 Selection

The study targeted youth 14-19 years of age residing in and admitted to the three BC Youth Custody Centres during the study period. The Criminal Youth Justice Act defines a young person as being at least 12 years of age, but less than 18 at the time an offence is committed (7). Children under the age of 12 cannot be charged with a crime in Canada (7). Youth 12 to 17 years of age can be charged with criminal code offences, and some youth may be held past the age of 18, if they were 18 or younger when the crime was committed (7); hence why some youth may be older than the 17 years noted above.

3.3.2 Recruitment

All nurses at each of the three Youth Custody Centre sites were trained in recruitment and in obtaining informed consent from eligible youth by the study coordinator prior to study commencement. Youth were eligible if: they were between 14-19 years of age, could speak and comprehend English, were not “high” or intoxicated at the time of the interview, did not have any cognitive impairments that may have impeded the ability to provide informed consent. All three Youth Custody Centres were “blitzed” at study commencement to capture youth currently residing in those sites. Following this, nursing staff at Victoria and Prince George Youth Custody Centres invited all eligible youth upon admission to their facility. Due to their high volume of admissions, nurses at Burnaby Youth Custody Centre were assisted by the study coordinator in inviting youth admitted to the facility to participate.

3.3.3 Sample Size

Upon study completion, 414 consenting youth from across all three sites were eligible for inclusion and data analysis.
3.3.4 Non Participant Log

A log of youth ineligible to participate due to their age or lack of competence to consent was maintained throughout the study. Youth who declined, and/or were missed, were also included on this log.

3.4 Study Activities and Data Management

3.4.1 Data Collection

A structured interviewer administered questionnaire was completed by all youth consenting to participate. The questionnaire was administered in a private location (away from distractions and other youth and adults) so as to maintain the confidentiality and anonymity of participants and their responses.

3.4.2 Software

The data was entered into EpiData (a public health software program), cleaned and recoded in Excel, and later analyzed in SPSS.

3.4.3 Questionnaire

The survey instrument was developed following review of: The Vancouver Injection Drug Users Study (VIDUS) Baseline Questionnaire (91), Ontario Remand Study Survey Version 1.3 (92), Enhanced STD Surveillance in Canadian Street Youth Phase V Questionnaire (93).

The final questionnaire (Appendix I) consisted of 13 introductory questions which laid the foundation for demographic and social variables. Further to this, the instrument was divided into either:

a) those youth who answered “yes” to being of aboriginal descent and had stayed overnight on a reserve more than once in the year before incarceration = “on reserve” (Appendix II)

b) the remainder of youth = “off reserve”
The following 23 questions for both groups were identical; addressing primarily sexual and substance use behaviours, and access to and utilization of services. Eight additional questions were asked of the "on reserve" youth. These questions reflected time spent on reserve, life on reserve, and access to and availability of services on reserve.

Figure 3.1 Break-down of Youth in Custody Questionnaire.

![Diagram showing the breakdown of questions for "On Reserve" and "Off Reserve" youth.]

The duration of the interview, including obtaining consent, ranged from 15-30 minutes.

Prior to actual study data collection the questionnaire was field-tested to evaluate comprehension and ease of use to 12 youth (6 male and 6 female) between the ages of 14-19. Of these youth, 6 were of Aboriginal descent (having been interviewed "face to face" at a local Aboriginal community centre), and the remaining 6 were Caucasian adolescents who were interviewed over the telephone and who regularly attended school. All youth found the survey easy to understand, and only minor changes such as using more vernacular terms that were more socially acceptable and appropriate to the adolescents were made.

3.5 Variables and Variable Selection

This thesis was nested among a larger study which looked at the outcomes of HIV and HCV and associated risk factors in youth in BC custody. Not all variables from the
questionnaire for the primary study were utilized for this thesis. The variables that were pre-selected to reflect the objectives of this thesis were: response variables (STI and IDU), explanatory variables (socio-demographic factors, transiency, sexual and substance use risk behaviours) (Appendix II).

3.6 Overview of Methodological Approaches

3.6.1 Descriptive Analysis

Descriptive statistics were utilized to provide an overview of the data for the entire study population of male and female youth in custody. Such statistics described the population of youth in custody with frequencies and percentages calculated for variables measured on a categorical scale (e.g., gender, ethnicity, etc...), and mean and standard deviation calculated for those measured on a continuous scale (e.g., age). Prevalence estimates (proportions) were utilized to assess sexual and substance use risk taking behaviours by total population and gender.

3.6.2 Univariate Analysis

Odds ratios with 95% confidence intervals were calculated for select sexual and substance use risk taking behaviours as a measure of the effect size of gender on such variables. Risk behaviours were ranked according to effect size and any trends noted. Behaviours with a confidence interval not including one were considered significant.

3.6.3 Multivariate Analysis

Logistic regression was used to model the association of gender, age, ethnicity and select risk behaviour variables on the outcomes of sexually transmitted infections (self report) and injection drug use (self report). The aim of this modeling was to assess potential pathways through which gender impacts on the response variables STI and IDU. The approach utilized for the regression modeling was as follows
Does a basic association exist between gender and STI?
Does a basic association exist between gender and IDU?
(Odds ratio results with confidence interval not including one will indicate significance and hence an association)

↓

YES

↓

Proceed with regression modeling

↓

Put in gender as explanatory variable

Put in, and adjust for, what are believed to be true confounders
(age and ethnicity)

IDU and STI as outcomes (separate models)

↓

Note coefficients, SE's, p-values etc...

↓

Is gender still significant after these adjustments (i.e. have we verified that an association does in fact exist between gender and the outcome)?

↓

YES

↓

Is there a pathway through which gender may predispose one to the outcomes of STI or IDU?

↓

Add potential mediators (each one in a separate model) to the basic model of gender + age + ethnicity and the outcome of either STI or IDU
### Table 3.1 Variables pre-selected for STI Regression.

<table>
<thead>
<tr>
<th>Potential Confounders</th>
<th>Basic Model</th>
<th>Potential Mediators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Gender</td>
<td>*Made money in past 6 months through pimping, sex work, or prostitution</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>↓</td>
<td>*Ever exchanged sex for money, drugs, food or shelter</td>
</tr>
<tr>
<td></td>
<td>STI</td>
<td>*Ever had sex with an IDU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Age of sexual debut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Condom use in past year</td>
</tr>
</tbody>
</table>

### Table 3.2 Variables pre-selected for IDU Regression.

<table>
<thead>
<tr>
<th>Potential Confounders</th>
<th>Basic Model</th>
<th>Potential Mediators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Gender</td>
<td>*Made money in past 6 months through pimping, sex work, or prostitution</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>↓</td>
<td>*Ever exchanged sex for money, drugs, food or shelter</td>
</tr>
<tr>
<td></td>
<td>IDU</td>
<td>*Ever had sex with an IDU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Age of sexual debut</td>
</tr>
</tbody>
</table>
Each potential mediator was fit into the basic model (gender + age + ethnicity) separately. A pathway was indicated if a decrease in the effect of gender was observed when one of the variables was added to the model. In addition, consideration was given to whether the added variable independently (i.e., not due to gender) impacted on the outcomes. Figure 3.3 diagrams the pathway that is implicitly assumed in these models.

**Figure 3.3 Gender Pathway to be Explored.**

```
Mediator

Gender → Outcome (STI or IDU)
```

Because this study is cross-sectional, this pathway assumption is not testable and it is possible that the potential mediator in some cases is not in fact a mediator, but rather a common effect of gender and outcome as shown in Figure 3.4.

**Figure 3.4 Alternate Pathway.**

```
STI or IDU

Gender → "Mediator" that is in fact a Common Effect.
```

In this situation, including the "mediator" in the model could introduce bias in the assessment of the effect of gender on STI or IDU. Thus the results from this modeling do not allow one to make definitive conclusions regarding causes and effects. Rather the intent is to provide a framework within which such issues can be conceptualized and a
basis for identifying what kind of information needs to be collected in future research to address causality questions. The relevance of these issues to specific potential mediators is considered in the Discussion section.

The interaction term gender/ethnicity was chosen a priori based on what one might expect from the literature. Collinearity (standard errors suddenly increasing when highly correlated variables are placed in to the model) was to be noted as a limitation if present as it prevents obtaining a precise assessment for the variables of interest.

3.7 Ethical Considerations

Ethical approval was obtained by the UBC Clinical Ethical Review Board prior to study commencement (Appendix III).

All nurses were trained by the study coordinator in obtaining informed consent from participants.
CHAPTER 4 RESULTS

4.1 Introduction

This chapter will outline the findings from the analysis of the youth in custody questionnaire. Descriptive statistics will be presented to characterize BC’s youth in custody, while prevalence estimates will summarize sexual and substance use risk taking behaviours. Odds ratios with 95% confidence intervals will demonstrate the effect size of gender on select sexual and substance use risk taking behaviours; while a rank of these findings will be presented together with any noted trends. Logistic regression findings will be presented as per the plan of analysis to outline the association between pre-selected risk behaviours, gender, age, and ethnicity on self report of STI’s and IDU outcomes. Males were utilized as the reference category for the odds ratios calculations. Though 414 is the total number of youth eligible and included in analysis, not all youth responded to every single question asked of them (either declining to answer, or indicating “don’t know”). This is reflected in the denominator crude numbers which are presented in each of the tables. Any deviation from using the entire target population as a denominator will be noted in the findings. Appendix II clearly outlines the selected variables and their definitions. Any significant findings are illustrated in bold text.

4.2 Descriptive/Univariate Analysis

4.2.1 Characterization of Youth in Custody

A profile of youth who were included in this study can be found in Tables 4.1-4.5. From January to August 2006, 635 discrete/individual youth entered the three BC youth custody service centres. Of these youth, 40 were deemed ineligible: due to age (<14 or >19), lack of English fluency, low functioning, being “high” or intoxicated at time of admission. Consequently 595 youth were potentially eligible for study inclusion.

As youth are often in and out of custody (often within a 24 hour period), a number of youth were missed before they could be invited to participate. Of the total of potentially eligible youth during the study period 129 were missed. Consequently only 466 youth were invited to partake in the study. Of the 466 youth invited, 52 declined.
The final count of youth invited and participated was 414; for a participation rate of 69.6% (of those potentially eligible), and 88.8% for those youth invited.

The profile of youth not participating in the study is as follows. In total, 40 youth were ineligible due to their age (<14 or >19) or deemed not competent to consent (e.g. low functioning, under the influence of substances upon admission, lack of English comprehension), and consequently were not invited to participate. Of these youth, 32 were from BYCC and 8 from VYCC; none were from PGYCC, two-thirds were male.

Upon invitation, 52 youth declined study participation. BYCC hosted 34 of these youth, while the remaining 18 were from VYCC; none were from PGYCC. Males accounted for 82.7% of those declining participation, and 80.4% of those declining were non-Aboriginal; only 19.6% were of Aboriginal descent. The majority of those declining were 16 and 17 years of age.

Missed for inclusion in study participation were 129 youth. As the youth population in custody is constantly in flux, with youth being released, admitted or attending court on any given day, “missed youth” were in and out of custody prior to being invited to participate. No youth was counted more than once despite possible multiple admissions. A record was maintained of these youth and it was found that 97.7% of these youth came from BYCC, while the remainder was from VYCC. No youth from PGYCC were missed. Of these missed youth 79.1% were male, 76% were non-Aboriginal, 24% were Aboriginal, and the majority were 15 to 17 years of age.

Table 4.1 Log of Youth in Custody.

<table>
<thead>
<tr>
<th>Total Number of Youth Entering BC Custody during study period</th>
<th>635</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineligible*</td>
<td>40</td>
</tr>
<tr>
<td>Potentially Eligible</td>
<td>595</td>
</tr>
<tr>
<td>Missed**</td>
<td>129</td>
</tr>
<tr>
<td>Declined</td>
<td>52</td>
</tr>
<tr>
<td>Total Participated</td>
<td>414</td>
</tr>
</tbody>
</table>

*< 14 or > 19 years of age
Low functioning
Lack of English fluency
“High” or Intoxicated at time of admission
**Out of Custody prior to being invited to participate.
The total number of youth in custody invited and eligible to participate during the study period January-August 2006 was 414; 57% from Burnaby, 17.9% from Prince George, 25.1% from Victoria. Of these 414, 77.8% were males, and 22.2% were females. The average age of the youth was 16.18 (1.21); males 16.25 (1.17) and females 15.95 (1.31)-differences in age between males and females was found not to be statistically significant.

Close to half (48.2%) of the youth self reported as being of aboriginal descent. Of these youth that self reported as being of aboriginal descent, 46.4% were males and
54.3% were females (differences in aboriginal ethnicity were found not to be statistically significant between male and female youth). Furthermore, of these youth self reporting as being of aboriginal descent, 61.4% reported having status and 61.7% reported having ever been “on reserve” (Appendix II).

The vast majority of youth in custody had been in custody services prior to the current admission (72.1%; 74 % males, 65.5% females). Currently serving a sentence was 36.9% of the youth, while the remainder was remanded to custody.

The findings revealed that 45.7% of youth in custody had lived in more than one location in the six months prior to entering custody, and 14.7% of the youth self reported as having lived on the street in the six months prior to entering custody. Of the males in custody, 11.8% reported having lived on the street in the six months prior to custody, while 25 % of the females self reported this. This was found to be significant with females being more likely than males at an OR = 2.49 (95% CI: 1.39-4.45).

The majority of youth in custody have been in government care at some time in their lives; 76% self reported ever having had a social worker, 59.8% had ever been in foster care, and 43.8% had ever lived in a group home. Of those youth having been in foster care or group homes, having been in multiple homes were common.

Table 4.3 Sociodemographic Factors of Youth in Custody Participants.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals</td>
<td>414</td>
<td>77.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td></td>
<td>(322)</td>
<td>(92)</td>
<td></td>
</tr>
<tr>
<td>Age (mean) (sd)</td>
<td>16.18 (1.21)</td>
<td>16.25 (1.17)</td>
<td>15.95 (1.31)</td>
</tr>
<tr>
<td>Sites:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burnaby</td>
<td>57.0% (236)</td>
<td>60.2% (194)</td>
<td>45.7% (42)</td>
</tr>
<tr>
<td>Prince George</td>
<td>17.9% (74)</td>
<td>19.3% (62)</td>
<td>13% (12)</td>
</tr>
<tr>
<td>Victoria</td>
<td>25.1% (104)</td>
<td>20.5% (66)</td>
<td>41.3% (38)</td>
</tr>
<tr>
<td>Aboriginal*</td>
<td>48.2%</td>
<td>46.4%</td>
<td>54.3%</td>
</tr>
<tr>
<td></td>
<td>(199/413)</td>
<td>(149/321)</td>
<td>(50/92)</td>
</tr>
<tr>
<td>Status</td>
<td>61.4%</td>
<td>61.0%</td>
<td>62.8%</td>
</tr>
<tr>
<td></td>
<td>(113/184)</td>
<td>(86/141)</td>
<td>(27/43)</td>
</tr>
<tr>
<td>On Reserve*</td>
<td>61.7%</td>
<td>62.5%</td>
<td>62.5%</td>
</tr>
<tr>
<td></td>
<td>(119/193)</td>
<td>(90/144)</td>
<td>(29/49)</td>
</tr>
</tbody>
</table>

* Appendix II
Table 4.4 Custody History For Youth.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Been in Custody prior to this admission</td>
<td>72.1% (279/387)</td>
<td>74% (222/300)</td>
<td>65.5% (57/87)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentenced</td>
<td>36.9% (147/398)</td>
<td>34.7% (107/308)</td>
<td>44.4% (40/90)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Remand</td>
<td>63.1% (251/398)</td>
<td>65.3% (201/308)</td>
<td>55.6% (50/90)</td>
</tr>
</tbody>
</table>

Table 4.5 Variables Reflecting Potential Transiency Among Youth.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lived solely in 1 Location*</td>
<td>54.3% (225/414)</td>
</tr>
<tr>
<td>Lived in &gt; 1 Location*</td>
<td>45.7% (189/414)</td>
</tr>
<tr>
<td>Lived on Street*</td>
<td>14.7% (61/414)</td>
</tr>
<tr>
<td>Ever had a Social Worker</td>
<td>76.0% (311/409)</td>
</tr>
<tr>
<td>Ever been in Foster Care</td>
<td>59.8% (247/413)</td>
</tr>
<tr>
<td>Number of Times had Ever been in Foster Care</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.62</td>
</tr>
<tr>
<td>Median</td>
<td>3.00</td>
</tr>
<tr>
<td>Ever lived in a Group Home</td>
<td>43.8% (181/413)</td>
</tr>
<tr>
<td>Number of Times had Ever lived in a Group Home</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.90</td>
</tr>
<tr>
<td>Median</td>
<td>2.00</td>
</tr>
</tbody>
</table>

*In 6 months prior to Custody. See also Appendix II.
4.2.2 Prevalence and Odds Ratios (95% Confidence Intervals) of Sexual Risk Taking Behaviours (Table 4.6)

Of the total population of youth participating in this study, 94.9% self reported as having ever had sex in their lives. Of the total population of female youth in custody 97.8% self reported having ever had sex, while 94.1% of males self reported this. The average age of first sexual intercourse (vaginal or anal) was 13.13 (1.55) for the study population. Females were slightly younger than males (13.05 vs. 13.16) but this was found not to be significant.

Of the sexually active youth in custody 73.6% reported having had unprotected sex in the past year. Though females reported having had unprotected sex in the past year more often than their male counterparts (80.9% vs. 71.5%), this was found to not be significant (OR=1.69; 95% CI=.94-3.04).

Despite self reporting of sex for trade being low in this population of youth, females were found to be more likely engaging in this behaviour than were the male youth. Of all youth in custody, 6.9% self reported as having made money in the past six months through pimping, sex work, or prostitution; 19.6% of females and 3.2% of males in the population of youth in custody self reported this behaviour (OR=7.42; 95% CI=3.29-16.74). When asked if they had ever had sex in exchange for drugs/money/food or shelter, 9% of sexually active youth self reported this behaviour. Of the sexually active females in custody 27% had done so, while 3.7% of males indicated this (OR=9.73; 95% CI=4.54-20.87).

Having ever had sex with an IDU was reported by 12.6% of sexually active youth. Sexually active females were at greater odds of reporting this behaviour than were males; 32.5% of females and 6.8% of males (OR=6.60; 95% CI=3.36-12.97).

Finally, 15.8% of sexually active youth in custody self reported as having ever been told by a doctor or a nurse that they had had an STI in the past. The odds of being female and being told they had had an STI in the past was 6.07 (95% CI=3.41-10.82), as 38.2% of sexually active females had been told they had an STI in the past, while 9.2% of males had been told.
Table 4.6 Variables Reflecting Sexual Risk Behaviours between Male and Female Youth.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made money in pimping/sex work/prostitution*</td>
<td>6.9%</td>
<td>3.2%</td>
<td>19.6%</td>
<td>7.42</td>
<td>3.29-16.74</td>
</tr>
<tr>
<td></td>
<td>(28/407)</td>
<td>(10/315)</td>
<td>(18/92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever had sex</td>
<td>94.9%</td>
<td>94.1%</td>
<td>97.8%</td>
<td>2.79</td>
<td>.64-12.21</td>
</tr>
<tr>
<td></td>
<td>(392/413)</td>
<td>(303/322)</td>
<td>(89/91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age First Had Sex (Mean) (sd)</td>
<td>13.13</td>
<td>13.16</td>
<td>13.05</td>
<td>p = .55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.55)</td>
<td>(1.50)</td>
<td>(1.71)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprotected Sex past year</td>
<td>73.6%</td>
<td>71.5%</td>
<td>80.9%</td>
<td>1.69</td>
<td>.64-3.04</td>
</tr>
<tr>
<td></td>
<td>(285/387)</td>
<td>(213/298)</td>
<td>(72/89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever had sex for money/drugs/food or shelter</td>
<td>9.0%</td>
<td>3.7%</td>
<td>27.0%</td>
<td>9.73</td>
<td>4.54-20.87</td>
</tr>
<tr>
<td></td>
<td>(35/390)</td>
<td>(11/301)</td>
<td>(24/89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever had sex with an IDU</td>
<td>12.6%</td>
<td>6.8%</td>
<td>32.5%</td>
<td>6.60</td>
<td>3.36-12.97</td>
</tr>
<tr>
<td></td>
<td>(43/342)</td>
<td>(18/265)</td>
<td>(25/77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever told had STI</td>
<td>15.8%</td>
<td>9.2%</td>
<td>38.2%</td>
<td>6.07</td>
<td>3.41-10.82</td>
</tr>
<tr>
<td></td>
<td>(62/392)</td>
<td>(28/303)</td>
<td>(34/89)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Past 6 months prior to Custody. See also Appendix II.

4.2.3 Prevalence and Odds Ratios (95% Confidence Intervals) of Substance Use Risk Taking Behaviours (Tables 4.7-4.9)

The use of non injection drugs in this population of youth in custody is extensive. Of all youth in this study, 99.5% had self reported as having ever tried alcohol; with the mean age of first trying being 11.10 years (11.19 males; 10.78 females). Excluding alcohol, 98.3% of youth self reported having ever tried non injection drugs. The mean age of trying non injection drugs was 11.17 years (11.09 males; 11.45 females). This age difference was found not to be significant between males and females.

When asked by the nurse if they had ever tried any of the following drugs (read from an extensive list. See Appendix II); the most commonly reported drugs were: marijuana (99.5%), mushrooms (84.0%), ecstasy (81.1%), powder cocaine (72.2%), crack (60.0%), crystal methamphetamine (53.8%), and acid (45%). Heroin (20.6%) was included in this list as it was significant for females being at greater odds of using this...
substance (OR = 2.96; 95% CI = 1.75-4.98). Other substances for which females were significantly at greater odds of using them were: crack (OR = 2.72; 95% CI = 1.59-4.65) and crystal methamphetamine (OR = 2.63; 95% CI = 1.59-4.36).

When asked if they had ever shared non injection drug equipment, 68.8% of youth who had ever tried non-injection drugs self reported this; 80.2% were females and 65.5% were males; demonstrating females being significantly at greater odds of self reporting this behaviour than males (OR = 2.14; 95% CI = 1.21-3.76).

Table 4.7 Variables Reflecting Non Injection Substance Use Risk Behaviours between Male and Female Youth.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>99.5%</td>
<td>99.7%</td>
<td>98.9%</td>
<td>.37</td>
</tr>
<tr>
<td>Age tried first Alcohol</td>
<td>11.10</td>
<td>11.19</td>
<td>10.78</td>
<td>.23</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(2.78)</td>
<td>(2.79)</td>
<td>(2.75)</td>
<td></td>
</tr>
<tr>
<td>Ever tried Non Injection Drugs</td>
<td>98.3%</td>
<td>98.1%</td>
<td>98.9%</td>
<td>.62</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(407/414)</td>
<td>(316/322)</td>
<td>(91/92)</td>
<td></td>
</tr>
<tr>
<td>Age First tried Non Injection Drugs</td>
<td>11.17</td>
<td>11.09</td>
<td>11.45</td>
<td>.23</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(2.47)</td>
<td>(2.51)</td>
<td>(2.30)</td>
<td></td>
</tr>
<tr>
<td>Marijuana</td>
<td>99.5%</td>
<td>99.4%</td>
<td>100%</td>
<td>1.00</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(405/407)</td>
<td>(314/316)</td>
<td>(91/91)</td>
<td></td>
</tr>
<tr>
<td>Mushrooms</td>
<td>84.0%</td>
<td>82.9%</td>
<td>87.9%</td>
<td>1.50</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(342/407)</td>
<td>(262/316)</td>
<td>(80/91)</td>
<td>.75 - 3.00</td>
</tr>
<tr>
<td>Ecstasy</td>
<td>81.1%</td>
<td>80.7%</td>
<td>82.4%</td>
<td>1.12</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(330/407)</td>
<td>(255/316)</td>
<td>(75/91)</td>
<td>.61 - 2.06</td>
</tr>
<tr>
<td>Powder Cocaine</td>
<td>72.2%</td>
<td>70.3%</td>
<td>79.1%</td>
<td>1.61</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(294/407)</td>
<td>(222/316)</td>
<td>(72/91)</td>
<td>.92 - 2.81</td>
</tr>
<tr>
<td>Crack</td>
<td>60.0%</td>
<td>55.1%</td>
<td>76.9%</td>
<td>2.72</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(244/407)</td>
<td>(174/316)</td>
<td>(70/91)</td>
<td>1.59 - 4.65</td>
</tr>
<tr>
<td>Crystal Meth</td>
<td>53.8%</td>
<td>48.7%</td>
<td>71.4%</td>
<td>2.63</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(219/407)</td>
<td>(154/316)</td>
<td>(65/91)</td>
<td>1.59 - 4.36</td>
</tr>
<tr>
<td>Acid</td>
<td>45.0%</td>
<td>44.3%</td>
<td>47.3%</td>
<td>1.13</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(183/407)</td>
<td>(140/316)</td>
<td>(43/91)</td>
<td>.71 - 1.80</td>
</tr>
<tr>
<td>Heroin</td>
<td>20.6%</td>
<td>16.1%</td>
<td>36.3%</td>
<td>2.96</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(84/407)</td>
<td>(51/316)</td>
<td>(33/91)</td>
<td>1.75 - 4.98</td>
</tr>
<tr>
<td>Ever Shared Non Injection Drug Equipment</td>
<td>68.8%</td>
<td>65.5%</td>
<td>80.2%</td>
<td>2.14</td>
</tr>
<tr>
<td>(mean) (sd)</td>
<td>(280/407)</td>
<td>(207/316)</td>
<td>(73/91)</td>
<td>1.21 - 3.76</td>
</tr>
</tbody>
</table>
The proportion of youth in this study population who self reported having ever tried injection drugs was small (7.5%); with 14.1% of the females self reporting this behaviour and 5.6% of males self reporting it. This was however found to be significant for females having a greater odds of injecting than males (OR=2.78; 95% CI=1.31-5.91). The average age of first injecting was 14.24 (14.41 males; 14.00 females).

The most commonly used substances for injecting were: heroin (63.3%), cocaine (61.3%), morphine (43.3%), crystal methamphetamine (40.0%), speedballs (34.5%) and downers/tranquilizers (40%). Four youth (all males) self reported having injected steroids. Of these, one had injected other substances in addition to steroids, and the remaining three had only injected steroids.

Of youth who had injected drugs, 26.7% self reported as having used someone’s needle, while 21.4% had actually given their needle to someone else after they had used it. Despite females self reporting this behaviour more often than males, it was found to not be significant in both situations.

Table 4.8 Variables reflecting Injection Drug Use Risk Behaviours between Male and Female Youth.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>OR = 2.78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever Injected</td>
<td>7.5% (31/414)</td>
<td>5.6% (18/322)</td>
<td>14.1% (13/92)</td>
<td>95% CI = 1.31 - 5.91</td>
</tr>
<tr>
<td>Age First Inject (mean) (sd)</td>
<td>14.24 (1.77)</td>
<td>14.41 (1.58)</td>
<td>14.00 (2.05)</td>
<td>p = .55</td>
</tr>
<tr>
<td>Ever Used Someone’s Needle After It Was Used</td>
<td>26.7% (8/30)</td>
<td>22.2% (4/18)</td>
<td>33.3% (4/12)</td>
<td>OR = 1.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95% CI = .34 – 8.98</td>
</tr>
<tr>
<td>Ever Given Your Needle to Someone After Using it</td>
<td>21.4% (6/28)</td>
<td>18.8% (3/16)</td>
<td>25% (3/12)</td>
<td>OR = 1.44</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95% CI = .24 – 8.84</td>
</tr>
</tbody>
</table>
Table 4.9 Drugs Reported to be Injected by Youth.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heroin</td>
<td>63.3%</td>
<td>(19/30)</td>
</tr>
<tr>
<td>Cocaine</td>
<td>61.3%</td>
<td>(19/31)</td>
</tr>
<tr>
<td>Morphine</td>
<td>43.3%</td>
<td>(13/30)</td>
</tr>
<tr>
<td>Crystal Meth</td>
<td>40.0%</td>
<td>(12/30)</td>
</tr>
<tr>
<td>Speedballs</td>
<td>34.5%</td>
<td>(10/29)</td>
</tr>
<tr>
<td>Downers/tranquilizers</td>
<td>30.0%</td>
<td>(9/30)</td>
</tr>
<tr>
<td>Dilaudid</td>
<td>27.6%</td>
<td>(8/29)</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>26.7%</td>
<td>(8/30)</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>23.3%</td>
<td>(7/30)</td>
</tr>
<tr>
<td>Methadone Street</td>
<td>16.7%</td>
<td>(5/30)</td>
</tr>
<tr>
<td>Crack</td>
<td>13.3%</td>
<td>(4/30)</td>
</tr>
<tr>
<td>Steroids/Hormones*</td>
<td>13.3%</td>
<td>(4/30)</td>
</tr>
<tr>
<td>Barbituates</td>
<td>6.7%</td>
<td>(2/30)</td>
</tr>
<tr>
<td>Talwin &amp; Ritalin</td>
<td>3.3%</td>
<td>(1/30)</td>
</tr>
</tbody>
</table>

*all males
### 4.2.4 Rank of Findings (Table 4.10)

#### Table 4.10 Rank of Findings from Odds Ratios of Selected Sexual and Substance Use Behaviour Variables

<table>
<thead>
<tr>
<th>Rank of Variable</th>
<th>Sexual Risk Behaviour</th>
<th>Substance Use Risk Behaviour</th>
<th>OR Females vs. Males</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ever had sex for money/drugs/food or shelter</td>
<td></td>
<td>9.73</td>
<td>4.54 - 20.87</td>
</tr>
<tr>
<td>2</td>
<td>Made money in pimping/sex work/prostitution*</td>
<td></td>
<td>7.42</td>
<td>3.29 - 16.74</td>
</tr>
<tr>
<td>3</td>
<td>Ever had sex with an IDU</td>
<td></td>
<td>6.60</td>
<td>3.36 - 12.97</td>
</tr>
<tr>
<td>4</td>
<td>Ever told had STI</td>
<td></td>
<td>6.07</td>
<td>3.41 - 10.82</td>
</tr>
<tr>
<td>5</td>
<td>Non Injection Heroin Use</td>
<td></td>
<td>2.96</td>
<td>1.75 - 4.98</td>
</tr>
<tr>
<td>6</td>
<td>Ever Injected</td>
<td></td>
<td>2.78</td>
<td>1.31 - 5.91</td>
</tr>
<tr>
<td>7</td>
<td>Non Injection Crack Use</td>
<td></td>
<td>2.72</td>
<td>1.59 - 4.65</td>
</tr>
<tr>
<td>8</td>
<td>Non Injection Crystal Meth. Use</td>
<td></td>
<td>2.63</td>
<td>1.59 - 4.36</td>
</tr>
<tr>
<td>9</td>
<td>Ever Shared Non Injection Drug Equipment</td>
<td></td>
<td>2.14</td>
<td>1.21 - 3.76</td>
</tr>
<tr>
<td>10</td>
<td>Ever used Someone’s Needle After it was used</td>
<td></td>
<td>1.75</td>
<td>.34 - 8.98</td>
</tr>
<tr>
<td>11</td>
<td>Unprotected Sex past year</td>
<td></td>
<td>1.69</td>
<td>.94 - 3.04</td>
</tr>
<tr>
<td>12</td>
<td>Non Injection Powder Cocaine Use</td>
<td></td>
<td>1.61</td>
<td>.92 - 2.81</td>
</tr>
<tr>
<td>13</td>
<td>Non Injection Mushroom Use</td>
<td></td>
<td>1.50</td>
<td>.75 - 3.00</td>
</tr>
<tr>
<td>14</td>
<td>Ever Given your Needle to Someone After Using it</td>
<td></td>
<td>1.44</td>
<td>.24 - 8.84</td>
</tr>
<tr>
<td>15</td>
<td>Non Injection Acid Use</td>
<td></td>
<td>1.13</td>
<td>.71 - 1.80</td>
</tr>
<tr>
<td>16</td>
<td>Non Injection Ecstasy Use</td>
<td></td>
<td>1.12</td>
<td>.61 - 2.06</td>
</tr>
</tbody>
</table>

*6 months prior to entering custody. See also Appendix II.
4.2.5 Trends Noted

The sexual risk behaviours rank higher than the substance use risk behaviours, with females consistently having a greater odds of engaging in sexual and substance use risk behaviours as compared to males overall.

4.3 Multivariable Logistic Regression

The subsequent results from the multivariable logistic regression analysis follow the regression approach flow chart outlined previously in Figure 3.2. The referent categories are as follows: gender = male, ethnicity = non aboriginal, pre-selected mediator/confounding variables = response of no.

4.3.1 Model I – Sexually Transmitted Infections

4.3.1.1 Findings

Figure 4.1 STI Multiple Logistic Regression Findings Flow-chart

Does a basic association exist between gender and STI?

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Gender} & \beta & \text{S.E.} & \text{Sig.} & \text{OR} & 95\% \text{ CI} \\
\hline
1.82 & .29 & .00 & 6.16 & 3.47 - 10.93 \\
\hline
\end{array}
\]

YES

Gender was put in as an explanatory variable; while age and ethnicity were put into the model (adjusted for) as they are believed to be true confounders.

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{Gender} & \beta & \text{S.E.} & \text{Sig.} & \text{OR} & 95\% \text{ CI} \\
\hline
2.12 & .32 & .00 & 8.31 & 4.43 - 15.62 \\
\hline
\text{Age} & .63 & .14 & .00 & 1.87 & 1.43 - 2.45 \\
\hline
\text{Ethnicity} & .16 & .31 & .60 & 1.17 & .65 - 2.13 \\
\hline
\end{array}
\]
Gender was still significant after these adjustments (i.e. we have verified that an association does in fact exist between gender and STI). Age was also found to be independently significant and did not impact the OR for gender on the outcome. Ethnicity was not significant and does not confound.

What mediator/variable might be involved in the pathway through which gender may predispose one to the outcome of STI? Place each pre-selected explanatory variable into the model separately.

Made money in the past 6 months through pimping/sex work/prostitution

<table>
<thead>
<tr>
<th></th>
<th>( \beta )</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.93</td>
<td>.34</td>
<td>.00</td>
<td>6.92</td>
<td>3.58-13.37</td>
</tr>
<tr>
<td>Age</td>
<td>.60</td>
<td>.14</td>
<td>.00</td>
<td>1.82</td>
<td>1.37-2.40</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.15</td>
<td>.32</td>
<td>.64</td>
<td>1.16</td>
<td>.62-2.15</td>
</tr>
<tr>
<td>Made money in the past 6 months...</td>
<td>1.41</td>
<td>.47</td>
<td>.00</td>
<td>4.10</td>
<td>1.632-10.30</td>
</tr>
</tbody>
</table>

The effect of gender and age remained significant, with the new added variable also being significant. A slight decline in the value of the OR was noted for gender. The value of the OR for age remained the same.
Ever exchanged sex for money/drugs/food or shelter

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.84</td>
<td>.34</td>
<td>.00</td>
<td>6.27</td>
<td>3.21 – 12.25</td>
</tr>
<tr>
<td>Age</td>
<td>.60</td>
<td>.14</td>
<td>.00</td>
<td>1.82</td>
<td>1.38 – 2.39</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.23</td>
<td>.31</td>
<td>.46</td>
<td>1.26</td>
<td>.68 – 2.33</td>
</tr>
<tr>
<td>Ever exchanged</td>
<td>1.08</td>
<td>.44</td>
<td>.01</td>
<td>2.96</td>
<td>1.24– 7.02</td>
</tr>
<tr>
<td>sex for money/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>drugs/food or</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>shelter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The effect of gender and age remained significant with the new added variable also being significant. A slight decline in the value of the OR was noted for gender. The value of the OR for age remained the same.

Ever had sex with an IDU

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.59</td>
<td>.37</td>
<td>.00</td>
<td>4.90</td>
<td>2.36 – 10.18</td>
</tr>
<tr>
<td>Age</td>
<td>.59</td>
<td>.15</td>
<td>.00</td>
<td>1.81</td>
<td>1.341 – 2.44</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.28</td>
<td>.35</td>
<td>.42</td>
<td>1.32</td>
<td>.670– 2.61</td>
</tr>
<tr>
<td>Ever had sex</td>
<td>1.06</td>
<td>.43</td>
<td>.01</td>
<td>2.89</td>
<td>1.24 – 6.77</td>
</tr>
<tr>
<td>with IDU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The effect of gender and age remained significant with ever having had sex with an IDU also being significant. A slight decline in the value of the OR was noted for gender. The value of the OR for age remained the same.

Age of sexual debut

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>2.10</td>
<td>.33</td>
<td>.00</td>
<td>8.20</td>
<td>4.28 – 15.71</td>
</tr>
<tr>
<td>Age</td>
<td>.64</td>
<td>.14</td>
<td>.00</td>
<td>1.90</td>
<td>1.44 – 2.52</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.17</td>
<td>.31</td>
<td>.59</td>
<td>1.18</td>
<td>.64 – 2.19</td>
</tr>
<tr>
<td>Age of sexual</td>
<td>-.15</td>
<td>.10</td>
<td>.14</td>
<td>.87</td>
<td>.71 – 1.05</td>
</tr>
<tr>
<td>debut</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When age of sexual debut was placed into the model, there was no change in the value of the OR for gender; wherein that for age stayed relatively the same. This added variable was not significant and does not seem to confound or mediate in this model.

### Condom use past year

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>2.08</td>
<td>.33</td>
<td>.00</td>
<td>8.04</td>
<td>4.20 – 15.38</td>
</tr>
<tr>
<td>Age</td>
<td>.60</td>
<td>.14</td>
<td>.00</td>
<td>1.82</td>
<td>1.38 – 2.40</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.17</td>
<td>.32</td>
<td>.59</td>
<td>1.18</td>
<td>.64 – 2.19</td>
</tr>
<tr>
<td>Condom use past year</td>
<td>.77</td>
<td>.43</td>
<td>.07</td>
<td>2.16</td>
<td>.94 – 4.97</td>
</tr>
</tbody>
</table>

When the variable reflecting unprotected sex in the past year was placed into the model, there was no change in the value of the OR for gender; wherein that for age stayed relatively the same as well. The new variable was not significant and does not seem to confound or mediate in this model.

### 4.3.1.2 Interaction Terms

Gender/ethnicity was pre-selected as a potential interaction term. It was hypothesized that these two variables may actually have a relationship with each other, as well as with the outcome. Consequently, their effect may not be simply additive in a model, but rather multiplicative. This interaction term served to ask the question of whether the effect of gender on the outcome varied by ethnicity. When added to the model, in all of the above steps, this term was found to not be significant in any of them. Perhaps a clearer view of this might be:
Table 4.11 Interaction Term Gender/Ethnicity for STI.

<table>
<thead>
<tr>
<th></th>
<th>Male No STI</th>
<th>Male STI</th>
<th>Female No STI</th>
<th>Female STI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Aboriginal</td>
<td>159</td>
<td>13</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>Aboriginal</td>
<td>134</td>
<td>15</td>
<td>32</td>
<td>18</td>
</tr>
<tr>
<td>OR = 1.37</td>
<td></td>
<td></td>
<td>OR = .91</td>
<td></td>
</tr>
<tr>
<td>95% CI = .63 - 2.98</td>
<td></td>
<td></td>
<td>95% CI = .39 - 2.14</td>
<td></td>
</tr>
<tr>
<td>Confidence Intervals overlap. Not significant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.3.1.3 Collinearity

This phenomenon can occur when two or more explanatory variables are correlated to the extent that they convey essentially the same information about the observed variation in the outcome. For the above models, age and age of sexual debut were checked for collinearity. A scatterplot demonstrated that the two variables were not correlated at all. For the remaining models, no collinearity was observed as standard errors remained constant throughout.

4.3.2 Model II – Injection Drug Use

4.3.2.1 Findings

Figure 4.2 IDU Multiple Logistic Regression Findings Flow-chart.

Does a basic association exist between gender and IDU?

\[ \downarrow \]

<table>
<thead>
<tr>
<th>Gender</th>
<th>( \beta )</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.02</td>
<td>.39</td>
<td>.01</td>
<td>2.78</td>
<td>1.31 - 5.91</td>
</tr>
</tbody>
</table>

YES

\[ \downarrow \]
Gender was put in as an explanatory variable; while age and ethnicity were put into the model (adjusted for) as they are believed to be true confounders.

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.11</td>
<td>.39</td>
<td>.01</td>
<td>3.03</td>
<td>1.41 – 6.52</td>
</tr>
<tr>
<td>Age</td>
<td>.20</td>
<td>.16</td>
<td>.21</td>
<td>1.22</td>
<td>.90 – 1.65</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.35</td>
<td>.38</td>
<td>.37</td>
<td>.71</td>
<td>.33 – 1.50</td>
</tr>
</tbody>
</table>

Gender was still significant after these adjustments (i.e. we have verified that an association does in fact exist between gender and IDU). Age and ethnicity were found to not be significant, nor did they confound any results.

What mediator/variable might be involved in the pathway through which gender may predispose one to the outcome of IDU? Place each pre-selected explanatory variable into the model separately

<table>
<thead>
<tr>
<th>Made money in the past 6 months through pimping/sex work/prostitution</th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.72</td>
<td>.43</td>
<td>.09</td>
<td>2.05</td>
<td>.89 – 4.75</td>
</tr>
<tr>
<td>Age</td>
<td>.18</td>
<td>.16</td>
<td>.25</td>
<td>1.20</td>
<td>.88 – 1.64</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.29</td>
<td>.39</td>
<td>.46</td>
<td>.75</td>
<td>.35 – 1.61</td>
</tr>
<tr>
<td>Made money in the past 6 months.</td>
<td>1.50</td>
<td>.51</td>
<td>.00</td>
<td>4.48</td>
<td>1.65 – 12.19</td>
</tr>
</tbody>
</table>

When the variable made money in the past 6 months through pimping/sex work/prostitution was placed into the model, there was a decline in the value of the OR for gender and it was no longer significant despite still showing and OR >2. The new variable was significant.
Ever exchanged sex for money/drugs/food or shelter

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.65</td>
<td>.44</td>
<td>.14</td>
<td>1.92</td>
<td>.81 – 4.57</td>
</tr>
<tr>
<td>Age</td>
<td>.15</td>
<td>.16</td>
<td>.36</td>
<td>1.16</td>
<td>.85 – 1.58</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.26</td>
<td>.39</td>
<td>.51</td>
<td>.77</td>
<td>.36 – 1.67</td>
</tr>
<tr>
<td>Ever exchanged</td>
<td>1.31</td>
<td>.50</td>
<td>.01</td>
<td>3.71</td>
<td>1.40 – 9.81</td>
</tr>
</tbody>
</table>

The mechanism of action/effect for the variable ever exchanged sex for money/drugs/food or shelter is the same as that noted for the above variable.

Ever had sex with an IDU

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-.08</td>
<td>.49</td>
<td>.87</td>
<td>.92</td>
<td>.35 – 2.42</td>
</tr>
<tr>
<td>Age</td>
<td>.10</td>
<td>.18</td>
<td>.58</td>
<td>1.11</td>
<td>.78 – 1.58</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.04</td>
<td>.43</td>
<td>.93</td>
<td>.96</td>
<td>.41 – 2.24</td>
</tr>
<tr>
<td>Ever had sex</td>
<td>2.92</td>
<td>.48</td>
<td>.00</td>
<td>18.61</td>
<td>7.25 – 47.74</td>
</tr>
</tbody>
</table>

When the variable ever had sex with an IDU was placed into the model, there was a large decline in the value of the OR for gender and it was no longer significant. The new variable was significant with a very large OR.

Age of sexual debut

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.00</td>
<td>.41</td>
<td>.02</td>
<td>2.72</td>
<td>1.21 – 6.12</td>
</tr>
<tr>
<td>Age</td>
<td>.29</td>
<td>.16</td>
<td>.08</td>
<td>1.33</td>
<td>.97 – 1.83</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.29</td>
<td>.40</td>
<td>.48</td>
<td>.75</td>
<td>.34 – 1.65</td>
</tr>
<tr>
<td>Age of sexual</td>
<td>-.32</td>
<td>.11</td>
<td>.00</td>
<td>.73</td>
<td>.59 – .90</td>
</tr>
<tr>
<td>debut</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When age of sexual debut was placed into the model, there was a little change in the value of the OR for gender and it still remained significant. The new variable was significant and demonstrated that the younger age of sexual debut is associated with IDU. For this model, gender and age of sexual debut are likely acting independently of one another.

4.3.2.2 Interaction Terms

Gender/ethnicity was pre-selected as a potential interaction term for this model as well. However, when added to the model, in all of the above steps, it was found to not be significant in any of them. Perhaps a clearer view of this might be:

Table 4.12 Interaction Term Gender/Ethnicity for IDU.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Male</th>
<th>Female</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No IDU</td>
<td>IDU</td>
<td>No IDU</td>
<td>IDU</td>
</tr>
<tr>
<td>Non-Aboriginal</td>
<td>161</td>
<td>11</td>
<td>35</td>
<td>7</td>
</tr>
<tr>
<td>Aboriginal</td>
<td>142</td>
<td>7</td>
<td>44</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>OR = .72</td>
<td>95% CI = .272 - 1.91</td>
<td>OR = .68</td>
<td>95% CI = .21 - 2.21</td>
</tr>
</tbody>
</table>

Confidence Intervals overlap. Not significant

4.3.2.3 Collinearity

This phenomenon can occur when 2 or more explanatory variables are correlated to the extent that they convey essentially the same information about the observed variation in the outcome. For the above models, age and age of sexual debut were checked for collinearity. A scatterplot demonstrated that the two variables were not correlated at all. For the remaining models, no collinearity was observed as standard errors remained constant throughout.
CHAPTER 5 DISCUSSION

5.1 Introduction

The objectives for this thesis were to characterize the profile and describe risk taking behaviour among male and female youth in custody. Prevalence estimates of sexual and substance use risk behaviours were calculated and presented in the previous chapter; and differences between male and female youth were noted along with their trends. Finally, multiple logistic regression provided findings to explore the mechanisms through which gender may impact on sexually transmitted infections (self report) and injection drug use (self report) outcomes.

5.2 Summary of Findings

5.2.1 Demographics and Characteristics

By and large, the findings from this study support the majority of youth in custody literature as it pertains to the overall profile of such youth. The youth in BC custody population from this study establishes that there are more males than females in custody, that the average age is approximately 16 for both males and females, and not unexpectedly the proportion of aboriginal (minority) youth is high (relative to the proportion they represent in the general population). McCreary’s study (7), which last profiled this population, did not report the proportion of female aboriginal youth in custody; while this study in contrast found that there is a slightly higher proportion of female aboriginal youth than male youth in custody. Despite the high proportion of aboriginal youth in custody, and the links between aboriginal ethnicity and risk taking behaviour, aboriginal ethnicity was not found to be a significant variable for any of the models in this study. This finding suggests that the population of youth in custody in BC is likely homogenous in nature.

Multiple admissions for youth in custody are common throughout all the literature, and remains consistent with this study. Novel to this study however were the findings that: 1) of the sampled youth in custody population, more males than females had self reported having been in custody prior to this current admission 2) more females than males in the sampled population self reported that they were currently serving a
sentence. Such findings are not presented in any reviewed youth in custody literature. Given the nature of the questionnaire however, limitations arise as to determining why these differences exist (i.e. is it the nature of the crimes being committed?).

Like many youth in custody, most youth in this study have lived in, or been under, government care at some time in their lives. Transciency, defined in this thesis as living in more than one location in a six-month period, and/or lack of stability at home was also identified.

The percentage of youth in BC custody that have lived on the street in the six months prior to entering custody services was comparatively small (14.7%); when measured against youth in custody populations throughout other parts of the world (47-50). For a recent and comparable population of youth in custody, McCreary (7) found that 19% of their study population had slept on the street in the year prior to admission. The higher proportion of youth found to have slept on the street in the McCreary study is likely due in part to the time span of their question – one year as opposed to six months. Of considerable interest is that this study found the proportion of females having lived on the street in the past six months was significantly greater than the proportion of males having done so.

5.2.2 Sexual Health

5.2.2.1 Prevalence of Sex and Age of Sexual Debut

The majority of youth in this study have had sex, and most have done so at an early age; with their reported age of sexual debut being consistent with the reviewed literature on youth in custody. Several studies amongst the reviewed literature favor males engaging in sexual activity at a slightly younger age than females, and males exhibiting higher rates of sexual activity than females (15) (26) (27) (36). On the contrary, this study found females engaging slightly younger than males and having reported ever having had sex more often. Despite these findings not having been found to be significant (e.g. actual age of sexual debut demonstrates only a modest difference between male and female youth for all findings in the literature and for this study), it remains a new finding and necessitates further exploration. As age of sexual debut and frequency of sexual activity can pose serious consequences in the sexual health of an
individual, future emphasis should be placed on the actual circumstances surrounding onset of sexual initiation at an early age, and its related social, biological, cultural, and psychological factors. Such factors may in fact drive current and future individual and gender differences and engagement in risk behaviours.

5.2.2.2 Condom Use

Despite a high reporting of unprotected sex for this study population (consistent with the remainder of the youth in custody literature), and females self reporting this behaviour more often than males, this study did not find this gender difference to be significant; unlike the remainder of the published literature. The question asked of youth in this study that reflects condom use has several limitations inherent in it; which will impact comparisons made with the studies reviewed in the literature. First and foremost, the time period framed for this study’s question was over the course of a year (Appendix I and II); wherein that for the reviewed literature was either regarding a last sexual encounter, or in the months preceding the time of interview. A year in the course of any sexually active individual’s life (especially adolescents) is rather a long period of time; and so provides ample time for someone not to wear a condom or have it fall off or break….even just once. Furthermore, the questionnaire did not ask about the frequency of sex, or if sex was with a steady or casual partner or both; or if condoms were used with steady or casual partners or both. It is not unheard of for any sexually active individual to use condoms solely with casual partners and not with steady partners.

Given the length of time over which this question spans, the lack of clarity regarding frequency of sexual contact, steady and/or casual partners, it is not surprising that we saw not only a high proportion of youth self reporting “yes” to this question, but also that we did not detect any gender differences. The question asked in this questionnaire did also not delve in to the specifics and intricacies of condom use, knowledge, sexual decision making etc...that most articles that delve into gender differences on this subject look at.
5.2.2.3 Sex for Trade

The findings from this study reflecting sex for trade (making money in the past six months through pimping/sex work/prostitution and having ever had sex in exchange for drugs/money/food/ or shelter) were consistent with the reviewed literature in that though youth in custody do not engage in these behaviours in high proportions, females are significantly more likely to be engaging than are males. The prevalence of sex for trade from this study are lower than McCreaary’s (7) of 16%, but match very closely with that of Rothon et al’s (14) 1994 population of BC youth in custody study. The dissonance in findings between this study’s population and that of McCreaary’s (7) is due to the difference noted in the male youth in custody population; the proportion of male youth in this study reporting sex for trade was 3.5%, wherein McCreaary (7) found 15%. As with other studies of youth at risk, this study found that females were more likely than males of having ever had sex with an injection drug user.

5.2.2.4 History of Sexually Transmitted Infections

This study found that the proportion of youth self reporting having ever had an STI is consistent with the reviewed literature. Females are significantly more likely than males to self report having ever had an STI.

5.2.3 Alcohol and Illicit Drug Use

5.2.3.1 Prevalence of Use

As per the reviewed literature, this study found that the majority of BC youth in custody have tried non injection drugs and/or alcohol, have done so by an early age, and have tried marijuana as their first non injection drug. The primary limitation of this study is that frequency of use was not included in the questionnaire, but rather if youth had ever tried any non injection drugs (Appendix I and II). By not asking about frequency of use, possible abuse or addiction related concerns cannot be adequately addressed and thus no definitive conclusions about these issues can be made from this study. It is not uncommon for adolescents to experiment with drugs. What does not seem to be shared
between youth in custody and their “in-school” counterparts is the young age of first use, and the variety and types of drugs being used and accessed.

5.2.3.2 Other Illicit Drugs

The use of non injection heroin and crack for this study population demonstrated that females were at greater odds of engaging than males in this risk behaviour. This is consistent with the New South Wales study (15) which found that females were more likely than males to have engaged in this type of illicit drug use—they however did not do any statistical tests on their population.

For both male and female youth in custody, self reporting of having ever tried cocaine was high for this study. Despite females self reporting use of powder cocaine more so than males, this was found to be not significant for this population of youth; contrary to two US samples of incarcerated youth who found females to be more likely than males to have used cocaine, and to have used more frequently and at a much younger age (1) (34). The youth in custody population sampled for this study were not asked about frequency of use, or age of first use with respect to these drugs.

Over half of youth in BC custody self reported having ever tried crystal methamphetamine; with females being significantly more likely to have tried crystal methamphetamine than males. The only other study reporting this is the New South Wales study (15) that found that females were more likely than males to have reported use of “amphetamine like substances”. This is not clear if it was crystal methamphetamine, speed etc…

Females self report sharing non injection drug equipment significantly more so than males; which raises future questions about entrenchment, frequency of use, and addiction, that were not able to be addressed by this study.

5.2.4 Injection Drug Use

5.2.4.1 Prevalence of Use

A small proportion (7.5%) of BC youth in custody has ever injected drugs. This is consistent with other US and Canadian studies, but not so with McCreary (7) who found
a higher proportion of youth (11%), and Rothon et al. (14) who found much lower (4.6%). Across all studies, this one included, females self report injecting behaviours more often than males.

This study found that four youth had injected steroids. Of these four youth all were male, and three had only ever injected steroids. As steroids may not be considered an illicit drug (i.e. does not make people “high”), but rather is used for body building purposes, this may not be considered a risk in the standard IDU population.

The likely rationale for low prevalence of IDU in the population of youth in custody could be explained by findings that youth who inject began to use injection drugs at an older age, after years of trying other non injection illicit drugs (20). Studies have also demonstrated that the transition from intranasal to injection drug use may take up to two years (83). As the majority of youth in custody are 14-19 years of age, they may not have yet reached the point of initiation. For those youth currently using, they are likely those already most at risk, most entrenched in risk behaviours, and most involved in life on the street and in feeding the street economy.

5.2.4.2 Age of Onset

This population of BC youth in custody is self reporting a younger age of first injection (for those that have injected) compared to the population of standard IDU youth (street, homeless and/or marginalized) who report 14.5 or even 19.5 as their starter age (27) (48) (79) (83). This study could not detect an age difference in the start of injection drug use for our sample of male and female youth. The small sample size may have not been powerful enough to detect a change if one exists; variance thus still remains in the literature as to whether there are gender differences in the age of first injection (48) (53) (79) (83).

5.2.4.3 Sharing needles and/or equipment

The overall rate of sharing needles and/or equipment is high for this study population as compared to the literature who report rates as low as “few” to as high as 33% (4) (7) (27) (43). This sample however did not detect any difference in sharing between male and female youth in custody, which is unlike some of the published
literature who demonstrate that females are more likely to share than males (53). The low sample size for this subset of the youth in custody population could limit the detection of any significant findings.

5.2.5 Regression Results:

The following results and ensuing discussion from the regression modeling outline the role/contribution of each added pre-selected variable to the basic model (Tables 3.1 and 3.2). This will be illustrated in the context of Figure 3.3: Gender Pathway to be Explored.

5.2.5.1 Model I – Sexually Transmitted Infections

5.2.5.1.1 Basic Model

Figure 5.1 Basic Model for Outcome STI

Given the logistic regression results noted in the previous chapter, most important of which are changes noted to the OR for gender, the best diagrammatic interpretation outlining the findings would be:

Figure 5.2 Basic Model Pathway for Outcome STI

This figure illustrates female gender, and advancing age are likely acting independently of one another on the outcome. Both female gender and advancing age
have direct effects on the outcome STI and do not influence each other. In light of the reviewed literature, this finding is not surprising as the literature does not in fact tie gender and advancing age together as a risk for acquisition of STI.

5.2.5.1.2 Sex for Trade

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.3 Sex for Trade Pathway for Outcome STI

Made money in past six months through pimping/sex work/prostitution
Ever exchanged sex for money, drugs, food, or shelter

Gender → STI

Age

The effect of these added variables (each in separate models) could be to mediate the pathway through which gender is associated with STI. The assumption necessary for mediation to occur in this scenario is that temporality is taken into consideration; sex for trade precedes STIs in time (i.e. cause precedes effect). For mediation to be established, not only do gender and STI have to be associated, but also gender and sex for trade. If the assumption and associations exist, then partial mediation can be attributed to the addition of these two variables. The rationale supporting this is that if one is engaging in sex for trade, then one is more likely to be at risk for STI’s (32). As at risk sexually active
females have been shown to have more frequent and higher risk sexual contacts, more casual partners, and demonstrate a lower usage of condoms (49) (63) (all factors that contribute to the acquisition of STI's) it is plausible that not only is gender associated with STI's, but also sex for trade serves as a mediator to female gender in achieving this outcome. The variable ever had sex in exchange for money, drugs, food or shelter may actually be a slightly more meaningful variable in this model as it reflects a longer period of time in which someone has the opportunity to actually acquire and STIs and also become fully entrenched in risks.

5.2.5.1.3 Sex with IDU

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.4 Sex with IDU Pathway for Outcome STI

```
        Ever had sex with an IDU
          /                     \
         /                       \
   Gender          STI         Age
```

The effect of this added variable could be to mediate the pathway through which gender is associated with STI. The assumption necessary for mediation to occur in this scenario is that temporality is taken into consideration; ever had sex with an IDU precedes STIs in time (i.e. cause precedes effect). For mediation to be established, not only do gender and STI have to be associated, but also gender and ever had sex with an IDU. If the assumption and associations exist, then partial mediation can be attributed to the addition of this added variable.
The rationale supporting this pathway would be that females who had ever had sex with an IDU are more likely to be engaged in prostitution (sex for trade) and other high risk behaviours (14) (53) (62) (79). These factors, make them more susceptible to other behaviours that than place them on a course of STI acquisition. These are likely women already fully entrenched in at risk behaviours.

5.2.5.1.4 Age of Sexual Debut

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.5 Age of Sexual Debut Pathway for Outcome STI

The effect of this new variable is to neither mediate nor confound the pathway through which gender is associated with STI; as the value of the OR for gender remained unchanged when this variable was added to the model. This is contrary to the reviewed literature as earlier age of first intercourse is a well established STI risk factor among adolescents (7) (33) (56) 58). Accordingly, at the very least, one would expect to see this variable acting independently. Furthermore, age of sexual debut (i.e. the younger the age) has been linked to engagement in sex for trade (48) (59), and so it would have been plausible for gender to be mediated by this variable through this fashion. However, despite gender being associated with STIs, this study did not show that gender and age of sexual debut were associated; consequently this could be why a mediating effect is not
being seen. The homogeneity of this sample of youth, together with any limitations inherent in the questionnaire may lend itself to difficulty in teasing out any association between age of sexual debut, gender, and STI’s. Age of sexual debut may very well predict acquisition of STI’s in other models; either as a mediator to gender, or acting independently.

5.2.5.1.5 Condom use past year

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.6 Condom Use Pathway for Outcome STI

\[\text{Condom use past year} \rightarrow \times \xrightarrow{\times} \text{Gender} \rightarrow \text{STI}\]

The effect of this new variable is to neither mediate nor to confound the pathway through which gender is associated with STI. This finding is contrary to the literature as one would expect that a decrease in the use of condoms may lead to greater frequency of STI’s (cause preceding effect). Furthermore, women have been shown to use condoms less frequently than males (15) (25) (26) (37) (47) (49) (59) (60), thus it would seem to be plausible that this variable could mediate the effect of gender. In this pathway no effect is likely seen, because though gender and STI were associated, a gender difference was not noted between gender and condom use for this study; possibly due to the aforementioned limitations of the question reflecting this issue. Unprotected sex may likely predict
acquisition of STI’s in other models; either acting independently or as a mediator to gender.

5.2.5.2 Model II – Injection Drug Use

5.2.5.2.1 Basic Model

Figure 5.7 Basic Model for Outcome IDU

\[ \text{Gender} \rightarrow \text{IDU} \]
\[ \text{Gender} + \text{Age} + \text{Ethnicity} \rightarrow \text{IDU} \]

Given the logistic regression results noted in the previous chapter, most important of which are changes noted to the OR for gender, the best diagrammatic interpretation outlining the findings would be:

Figure 5.8 Basic Model Pathway for Outcome IDU

\[ \text{Gender} \rightarrow \text{IDU} \]

For this model, gender is acting independently; wherein age and ethnicity are serving neither to confound nor mediate. This is reflected in the findings as when age and ethnicity were added to the basic model, the effect of gender did not decline and they were found not to be significant.

5.2.5.2.2 Sex for Trade

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:
The effect of these added variables (each in separate models) could be to mediate the pathway through which gender is associated with IDU. The assumption necessary for mediation to occur in this scenario is that temporality is taken into consideration; sex for trade precedes IDU in time (i.e. cause precedes effect). For mediation to be established, not only do gender and IDU have to be associated, but also gender and sex for trade. If the assumption and associations exist, then partial mediation can be attributed to the addition of these two variables. The rationale supporting this is that if females are engaging in sex for trade, then they are more likely to be at risk for IDU as they are often engaging in sex for trade to survive or to feed a substance use habit (19) (59) (62).

Conversely, the drug habit may necessitate the need to engage in sex for trade, so the pathway may also be represented by:
In this scenario, IDU would serve as a mediator. Both scenarios are plausible and may provide the rationale behind the change in the coefficient noted for gender.

5.2.5.2.3 Sex with IDU

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature into consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.11 Sex with IDU Pathway for Outcome IDU

The effect of this new variable could be to mediate the pathway through which gender is associated with IDU. The assumption necessary for mediation to occur in this scenario is that temporality is taken into consideration; sex with IDU precedes IDU in time (i.e. cause precedes effect). For mediation to be established, not only do gender and IDU have to be associated, but also gender and sex with IDU. If the assumption and associations exist, then partial mediation can be attributed to the addition of this variable. The rationale supporting this is that female IDUs are more likely to have had a sexual partner who is also a drug user than a male IDU, and to have been initiated into injection use by a partner or lover (14) (53) (62) (79). Given that sex with IDU demonstrated such a drastic change in the Exp OR for gender, it is also plausible that the mediation is not only partial, but also complete.
5.2.5.2.4 Age of sexual debut

Given the logistic regression results noted in the aforementioned basic model and previous chapter, any noted changes to the OR for gender, and taking the reviewed literature in to consideration, the most plausible diagrammatic interpretation of such findings would be:

Figure 5.12 Age of Sexual Debut Pathway for Outcome IDU

When age of sexual debut was placed into the model, little change in the value of the OR for gender was noted. The age of sexual debut variable was significant and demonstrated that the younger age of sexual debut is associated with IDU. For this model, gender and age of sexual debut are likely acting independently of one another.

Overall, the results from the above regression modeling suggest that it cannot be easily inferred that one risk determinant “causes” another, but rather that there are likely clusters or a series of pathways of mediation that occurs to lead to a given effect. The intent of the above findings is to provide a framework within which relevant issues can be conceptualized and to provide a basis for identifying what kind of information needs to be collected in future research to address causality questions.
5.3 Study Limitations

5.3.1 Generalizability

5.3.1.1 External Validity

This study population was drawn from a group of BC youth in custody and thus it may be difficult to generalize to youth in custody in other provinces, states or countries due to judicial, societal and cultural norms that differ among them. It may also be difficult to generalize to youth who are vulnerable or marginalized (street youth for example), or youth in the “in-school” adolescent population who are not part of the usual youth custody population, may have never spent time in custody, or whose population may include youth up to the age of 24.

This sample is only on a group 14-19 years of age. It would not reflect populations in custody who are older than this as their developmental stage would be different, and they in all likelihood would have different histories and cultural/societal influences for their generation.

5.3.1.2 Internal Validity

This was a population based study in that we sampled from all male and female youth in the defined community of “youth in BC custody”. The approach of sampling from an inclusive population over a prolonged period of time, rather than a small subset of this population, should have served to increase internal validity for this group.

5.3.2 Self Report

Participants may under-report certain behaviors; particularly those that may be illegal or socially unacceptable. Social desirability could also lead to over reporting of certain behaviors. The veracity of self reporting cannot be established; however, interviewers were: trained to “stick to the script” and structure provided in the questionnaire itself, to provide a confidential location in which to conduct the interview, and to maintain a professional and non-judgemental demeanor throughout.
5.3.3 Recall

Given that the questionnaire asked respondents to recall behaviors or events in the days or months prior to incarceration, the opportunity to make errors in responses with respect to time frames is possibly increased.

5.3.4 Sampling Bias

The cross sectional design of this study limits the ability to infer causal relationships and as such the analyses must be viewed as exploratory. This study sampled youth currently residing in custody, and those entering during the study period. It is plausible that those youth currently serving a sentence in Custody Services versus those strictly remanded to Custody are youth who have engaged in more serious offences or have offended more often, and thus may exhibit either different, or more frequent and riskier sexual and substance use risk behaviours.

5.3.4.1 Response rate

The youth population in the custody centres is constantly in flux, with youth being released, admitted or attending court on any given day; as a consequence numerous youth were missed and not given the opportunity to participate in the study. A record was maintained of these youth and it was found that they closely resembled the population of youth who actually participated in this study with respect to male/female breakdown and age. Of particular note however is within this population of missed youth, only 24% were actually aboriginal. This represents a smaller proportion of aboriginal youth than in the actual population of youth who participated and who reflect the normal youth custody population. It is also possible that the most risky youths opted out of the study (declined), or that the least risky youths were among those who were quickly released because they had less serious charges pending.
5.4 Recommendations/Implications

The design of this study was intended to be exploratory in nature. As the variables selected for this study were derived from a questionnaire whose primary intent was that of determining the associated risk factors of HIV and HCV acquisition for this study population, limitations arise in recommending any concrete and immediately tangible strategies to address the issue of gender and sexual and substance use risk taking behaviour and outcomes. To improve the future health status of youth in custody, and before any concrete and definitive prevention programs and policy changes can be made, research should be broadened to include not only the problems of substance use and risky sexual behaviors among male and female youth in custody, but also the cultural, social, and psychological issues that may contribute to such behaviours. The following recommendations/implications are taken primarily from the literature and are intended to serve not only as plausible suggestions to immediate concerns, but more importantly as a platform from which future research and ideas can be generated.

5.4.1 For Youth Custody Services and Community Based Services

Efficient and reliable access to medical care and prevention services for youth currently in custody, and for those who have been released to the community, can benefit communities by reducing potential disease transmission and consequent medical costs (82). The repetitive and rapid turnover of incarcerated youth however severely limits the correctional system in providing both curative and preventative care (82) (26). If “missed” opportunities exist (both within and outside Custody Services) to establish links within the community, there is a potential for these youth to under-utilize health and prevention based services; as once released, many youths return to the same high-risk environment where substance and sexual risk behaviours began (82). Both correctional and community based programs must be offered sequentially to ensure a continuum of care. Active and continuous dialogue between the two realms of services needs to occur so that: links between services can be made, each service is kept up to date on what the other has to offer, and youth are made aware of and encouraged to use such resources. In
turn, such services should be easy to access, available, and both youth and gender directed.

5.4.2 School and Community Connectedness

Risky behaviors tend to begin simultaneously and at an early age (34). Because of the early age of onset, prevention strategies targeting school and community connectedness must begin well before the teenage years. Research has suggested that school and teacher connectedness, that is, interactions of the individual with the school environment, may serve as a protective factor against health risk behaviors among youth (46). The adolescent health surveys have shown that strong connections with family, school and the community promote healthy youth development (45). Youth who feel connected and safe have better health, take fewer risks, and have higher educational aspirations. The link between youth and school and community connectedness should be investigated further as this may very well be a preventative avenue through which youth can begin to learn the skills necessary to empower themselves to make healthy choices and foster a sense of value and belonging.

5.4.3 Building on Protective factors

Perhaps an aspect of prevention that has often been overlooked is that of building on protective factors; rather than focusing only on reducing risk factors in prevention work. Given the opportunity to generate and explain their own solutions, youth in a poor neighborhood in the United States judged the best preventative mechanism to be “more jobs, more education, and more scholarships for teenagers” rather than more prevention programs focusing on risk behaviors (2) (7). Street youth indicate that basic needs such as food and stable housing are their priorities, while job training, educational upgrading and personal counseling are also important (2).

Community based programs aimed at a broader life-skills approach may produce better results than a narrower focus aimed at solely reducing risk factors. Based on social learning theory, a broad life-skills program includes activities aimed at facilitating the development of decision-making, goal setting, stress management, leadership skills,
assertiveness and communication skills; which are intended for more generalized application to various situations and health-related behaviors (13). Empowering youth to master such skills can enhance the adolescents’ self-confidence in dealing with challenging situations.

5.4.4 Specific Targeted Approaches

Programs for youths must target the specific needs of adolescents as well as factors from multiple systems of influence: level of cognitive development, family situation, educational needs, gender, peers, teachers, and the broader context in which the adolescent lives (9) (10) (13) (23) (26).

The gender differences that emerged from this study of incarcerated adolescents have implications for STI risk reduction interventions. If different factors and manifestations of disease or symptoms likely predict acquisition or diagnosis of an STI for male and female youth, then this may indicate that individual-level interventions may be more effective when they are organized for gender-specific groups rather than in gender-neutral interventions as noted by both Robertson et al. (38) and Canterbury et al. (6).

Miller et al (19) surmised that targeted interventions are required among young female and aboriginal injectors; this can likely be extended to include not just youth who are IDU, but also youth at risk for any substance abuse. Prevention programs aimed at such youth should be gender specific and take into account sexual, parenteral, and drug related risks (70).

The importance of sexual and social network dynamics incorporating gender specific interventions for risk of STIs and BBVs, should also be emphasized (63). Early interventions are needed for detained youths, which target specific patterns of risk based on gender, race/ethnicity, and age (54).
5.4.5 Policy and Program Planning

There is no disputing that the short term most youth spend in custody limits the type of programs implemented. This only serves to highlight the need for continuity upon release and engagement with appropriate services.

For those youth spending a longer term in custody, custody-based intervention programs may access youth who are otherwise hard to reach in their communities. In addition, custody based prevention programs should provide both male and female youth the opportunity to link services within custody to those that are community based; in particular, HIV/HCV/STI prevention, social, and drug treatment programs. This is of the utmost importance, as once youth are released from prison, they face circumstances that otherwise may make the adoption of preventive behaviors difficult.

5.5 Future Research

The existence of what appears to be gender specific behavioral patterns suggests that there likely are different pathways underlying any sexual and drug related risk outcomes; pathways that must be recognized and better understood before appropriate and effective prevention efforts can be developed (32). Clues to these pathways can be identified in research that simultaneously considers gender driven behavioral patterns and the social networks in which they are embedded. (32)

Research is needed to examine how psychosocial factors common among delinquent youths—sexual abuse, poor family functioning, social environments, mental disorders, lifetime trauma, and cognitive and functional impairment—affect the development of STI, HIV and HCV risk behaviors. (2) (54).

Keeping in line with these ideas, plausible future research questions may include:

➢ How many youth in custody go on to become adults in custody?
➢ Of those that go on to become adults in custody do their risk factors change? (eg. start IDU, harsher more violent and severe crimes, increased sexual risk taking, social factors)
➢ What is different for those youth that do not go on to adult custody? How and where does resiliency play and factor?
How do the males and females in adult custody differ?

At what age did they start injecting for those that do?

Does school connectedness make a difference? Does it fill a void where the family can’t contribute? Should more school programs be developed at a younger age? What would be effective?

What are the peer/drug/family dynamics at play with taking risks?

What may be the time sequence of events for risk taking behavior?

While it is important to ascertain where the risk differences may lie for genders, it is also key that researchers investigate patterns of relationships between risk behaviors, gender, and outcomes. As these patterns vary for male and female youth, implications for prevention, intervention, and treatment should also vary.

5.6 Conclusions

A comprehensive population based study on this specific cohort of vulnerable youth had never been accomplished in British Columbia until now. This exploratory study provides documentation suggesting that sexual and substance use health risk behaviours are found in high proportions among BC youth in custody, with female youth in custody carrying the bigger burden of risk engagement across the spectrum.

Regardless of gender, such risk behaviours render youth in custody vulnerable to not only the acquisition of STIs and BBVs but also to obstacles impeding healthy adolescent development. In identifying both sexual and substance use risk factors, and coexisting gender differences among male and female youth in custody, these findings can be utilized to develop and inform current public health efforts to address the needs of British Columbia’s vulnerable youth in custody.

It has been demonstrated that complex links between gender and certain select variables on the outcomes of STI and IDU exists. If health services are to be equitable and efficient, greater sensitivity will need to be given to gender (and likely sex) concerns. This will need to be reflected in future research, in patterns of service delivery, in harm reduction interventions, and in wider social and economic policies. New gender specific approaches for encouraging both sexual and drug using risk reduction are greatly needed with special emphasis being placed on links with the community after release.
No simple solution exists. Youth in custody will require considerable support to make a healthy transition through adolescence and into adulthood (7). Prevention and intervention strategies must occur early, respond to health problems, be gender sensitive, and provide opportunities for positive growth to promote healthy development of both male and female youth in custody, and those at risk of becoming involved in the criminal justice system (7).
Bibliography


89. Hellard ME, Hocking JS, Crofts N. The prevalence and the risk behaviors associated with the transmission of Hepatitis C virus in Australian correctional facilities. Epidemiology and Infection 2004; 132: 409-415.

91. The Vancouver Injection Drug Users Study (VIDUS) Baseline Questionnaire. Provided as a personal communication.


Appendix I

Date: ____________________________
(DD/MM/YY)  

Interviewer: ____________________________
(Please print)  

Location: ☐ Burnaby ☐ Victoria ☐ Prince George

Youth in Custody HIV/HCV Prevalence Study

INTERVIEWER ADMINISTERED SURVEY

December 29, 2005

Investigators: Dr Jane Buxton, Dr Diane Rothon, Dr Mel Krajden, Valencia Remple, Monica Durigon

British Columbia Center for Disease Control:
Hepatitis Services
Communicable Disease Epidemiology Services
Laboratory Enterprises
BC Provincial Youth Custody Services

Checklist

☐ Eligible
☐ Study Consent form given
☐ Verbal consent obtained

Interviewer Signature__________________________________________
INTERVIEWER (Please Read):
"You’ve agreed to be part of a study looking at risk factors for HIV and Hepatitis C infection in Youth. In this interview I will be asking you questions about yourself, your drug use, and your lifestyle. Anything you tell me during this interview will be kept TOTALLY CONFIDENTIAL. At no time will your name ever appear on any materials. This interview is TOTALLY VOLUNTARY. You can decide NOT to answer some of the questions if you want to. If at any time you wish to stop the interview, please tell me and we will stop.
The first set of questions asks a bit about your background.”

1. Date of admission to Youth Custody: ____/____/____ (dd/mm/yy)

2. Have you ever been in a Youth Custody Center before this? For example, a remand centre, provincial correctional center or federal facility. (check ONE)
0. □ No
1. □ Yes → 2.1 How many times, before this time? ___________ (or) 99. □ Don’t Remember
99. □ Don’t know
88. □ Declined

3. How long is your current sentence? ____________________________ (time in days or months)
0. □ In Remand, so I don’t know yet
99. □ Don’t know
88. □ Declined

4. How old are you? ___________ years

5. Gender
1. □ Male 2. □ Female 3. □ Transgendered

6. In which city or town did you live before being arrested?

________________________

7. In the six months before coming here, where did you live? (do not read, check all that apply. If needed, use list for prompts).
1. □ Relative’s home 8. □ Transition houses
2. □ Group home 9. □ Street
3. □ Foster home 10. □ Squats
5. □ Hostel/shelter 12. □ Psychiatric institution
6. □ Hotel room 13. □ Friend’s house
7. □ Alone 14. □ Roommates or dorm
55. □
Other
88. □ Declined

8. What was the highest level of school you completed? (check ONE)
1. □ Grade school only (e.g., grade 7 or less)
2. □ Some high school (but have not graduated)
3. □ Finished high school
4. □ Some post-secondary (e.g., college, technical school, university)
55. □
Other
88. □ Declined

9. Have you ever had a social worker?
0. □ No
1. □ Yes → 9.1 How old were you when you first had one? _______ yrs (or) 99. □
Don’t Remember
99. □ Don’t know
88. □ Declined

10. Have you ever been in foster care?
0. □ No
1. □ Yes → 10.1 How old were you the first time? _______ yrs (or) 99. □
Don’t Remember
→ 10.2 How many homes have you been in? _______ (or) 99. □ Don’t Remember
99. □ Don’t know
88. □ Declined
11. Have you ever been in a group home?

0. □ No
1. □ Yes → 11.1 How old were you the first time? __________ yrs (or) 99. □ Don’t Remember

→ 11.2 How many homes have you been in? ______________ (or) 99. □ Don’t Remember

99. □ Don’t know
88. □ Declined

12. In the last 6 months, did you get money from (read list, check YES or NO for each)?

12.1 Social welfare/disability pension/family allowance/GST check/Income Tax 0. □ NO 1. □ YES
12.2 Employment insurance or U.I.C. 0. □ NO 1. □ YES
12.3 Occasional work 0. □ NO 1. □ YES
12.4 Regular work (part-time or full-time) 0. □ NO 1. □ YES
12.5 Family 0. □ NO 1. □ YES
12.6 Friends 0. □ NO 1. □ YES
12.7 Stealing/robbery/scams 0. □ NO 1. □ YES
12.8 Selling drugs or doing drug runs 0. □ NO 1. □ YES
12.9 Panhandling/selling belongings 0. □ NO 1. □ YES
12.10 Social worker, or youth centre (personal needs allowance) 0. □

NO 1. □ YES

12.11 Squeegee 0. □

NO 1. □ YES

12.12 Gambling 0. □

NO 1. □ YES

12.13 Pimping/sex work/prostitution 0. □

NO 1. □ YES

55. □ Other: __________________________________________

99. □ Don’t remember

88. □ Declined

13. How would you describe your ethnicity/family background?
   (do not read, check all that apply: If Aboriginal, determine status and whether (s)he has EVER been on-reserve)

1. □ Caucasian/White
2. □ First Nations
3. □ Metis
4. □ Inuit

PAGES ONLY

13.1 Status? □ Yes □ No

13.2 On-reserve (ever)? □ Yes → PINK PAGES

ONLY

5. □ Indian (South Asian)
6. □ Pakistani
7. □ Korean
8. □ Japanese

9. □ Filipino/a
10. □ Bangladeshi
11. □ Middle Eastern
12. □ Hispanic

13. □ Black
14. □ Thai
15. □ Chinese
16. □ Vietnamese

55. □ Other: __________________________________________

99. □ Don’t know

88. □ Declined
14. In the year before you got arrested, how much time did you live on reserve (read list, check ONE):
0. □ None of the time
1. □ Less than half of the time
2. □ About half of the time
3. □ More than half of the time
4. □ All of the time
88. □ Declined

INTERVIEWER (Please read): “This part deals with questions about your health. If you have any questions at all, please ask, and don’t forget that everything you tell me is confidential.”

15. Has a doctor or nurse ever told you that you had a sexually transmitted disease (STD), such as Chlamydia, gonorrhea, genital warts, herpes, hepatitis B?
0. □ No → 15.1 Have you ever been tested? 0. □ NO 1. □ YES 99. □ Don’t Remember
1. □ Yes → 15.2 When was the LAST TIME?

(please wait N.P. 10. □ Don’t remember)
99. □ Don’t know → 15.3 Have you ever been tested? 0. □ NO 1. □ YES 99. □

16. Have you ever been tested for STD on reserve?
0. □ No → 16.1 What was your reason for not getting tested on reserve (Do not read, check all that apply)
1. □ Wasn’t on reserve at the time
2. □ Lack of privacy, small community, social stigma, etc.
3. □ No testing available, or unaware of it
88. □ Other:

1. □ Yes 99. □ Don’t know 88. □ Declined
17. Has a doctor or nurse ever told you that you have hepatitis C?
0. □ No ➔ 17.1 Have you ever been tested? 0. □ NO 1. □ YES 99. □ Don’t Remember
1. □ Yes ➔ 17.2 When was the FIRST TIME?
                      99. □ Don’t Remember
  (may require prompting: see previous)
99. □ Don’t know ➔ 17.3 Have you ever been tested? 0. □ NO 1. □ YES 99. □ Don’t Remember
88. □ Declined

18. Have you ever been tested for hepatitis C on reserve?
0. □ No ➔ 18.1 What was your reason for not getting tested on reserve (Do not read, check all that apply)

1. □ Wasn’t on reserve at the time
2. □ Lack of privacy, small community, social stigma, etc.
3. □ No testing available, or unaware of it
88. □ Other :

1. □ Yes 99. □ Don’t know 88. □ Declined

19. Has a doctor or nurse ever told you that you have HIV or AIDS?
0. □ No ➔ 19.1 Have you ever been tested? 0. □ NO 1. □ YES 99. □ Don’t Remember
1. □ Yes ➔ 19.2 When was the FIRST TIME?
                      99. □ Don’t Remember
  (may require prompting: see previous)
99. □ Don’t know ➔ 19.3 Have you ever been tested? 0. □ NO 1. □ YES 99. □ Don’t Remember
88. □ Declined
20. Have you ever been tested for HIV or AIDS on reserve?

0. □ No — 20.1 What was your reason for not getting tested on reserve *Do not read, check all that apply*

   1. □ Wasn’t on reserve at the time
   2. □ Lack of privacy, small community, social stigma, etc.
   3. □ No testing available, or unaware of it
   88. □ Other:

1. □ Yes 99. □ Don’t know 88. □ Declined

**INTEVEREVIEWER (please read): The next several questions ask about reasons why people may have an increased chance of getting HIV or Hepatitis C.**

21. Have you ever been pierced, including ears?

0. □ No

1. □ Yes — 21.1 By a non-professional (e.g., a friend)? 0. □ NO 1. □ YES 99. □ Don’t Remember

   21.2 While in Custody? 0. □ NO 1. □ YES 99. □ Don’t Remember

99. □ Don’t know

88. □ Declined

22. Have you ever been tattooed?

0. □ No

1. □ Yes — 22.1 By a non-professional (e.g., a friend)? 0. □ NO 1. □ YES 99. □ Don’t Remember

   22.2 While in Custody? 0. □ NO 1. □ YES 99. □ Don’t Remember

99. □ Don’t know

88. □ Declined
23. Have you ever tried any alcohol?

0. □ No (not even once)

1. □ Yes → 23.1 How old were you the first time? __________ yrs (or) 99. □

Don’t Remember

23.2 Were you on reserve the first time? 0. □ NO 1. □ YES 99. □

Don’t Remember

23.3 When was the last time?

______________________________ 99. □ Don’t Remember

(may require prompting: see previous)

99. □ Don’t know 88. □ Declined

24. Have you ever tried any of the following NON-INJECTION drugs, even just once? (read list, check YES, NO, or DON’T KNOW for each)

24.1 Powder Cocaine (uptown, up) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.2 Crack 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.3 Downers 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.4 Ectasy (X-tasy, E, X) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.5 Heroin (dust, horse, junk, down, downtown) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.6 Methadone (from treatment program) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.7 Methadone (from street) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.8 Marijuana (pot, weed, hash, trees, ganja) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.9 Crystal Meth 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.10 Talwin and Ritalin (T’s & R’s) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.11 T3’s, T4’s (from street) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.12 Acid (LSD, sid) 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.13 Gasoline 0. □ NO 1. □ YES 99. □

DON’T KNOW

24.14 Glue 0. □ NO 1. □ YES 99. □

DON’T KNOW
24.15 Mushrooms
DON'T KNOW
24.16 MDA
DON'T KNOW
24.17 Prozac (non-prescription)
DON'T KNOW
24.18 Solvents (paint thinner, Lysol, Pam, Aqua Velva)
DON'T KNOW
24.19 Speed (amphetamines, uppers)
DON'T KNOW
24.20 Valium
DON'T KNOW
55. □ Other: ______________________________

0. □ None of the above (i.e., has NEVER tried any non-injection drugs) – SKIP TO #30
88. □ Declined

25. What did you try the FIRST TIME? ______________________________ (or) 99. □

Don't Remember

(NOTE: may need to repeat those items they said “yes” to from the above list)

26. How old were you the first time? ___________ yrs (or) 99. □ Don’t Remember

27. Were you on reserve the first time? 0. □ NO 1. □ YES 99. □ Don’t Remember

88. □ Declined

28. When was the LAST TIME? ______________________________ (may require prompting: see previous)

29. Have you ever used someone else’s non-injection drug equipment or works after they used it - e.g., cookers, spoons, bills, straws, pipes, tinfoil, etc?

0. □ No
1. □ Yes ➔ 29.1 When was the last time?

________________________________________ 99. □ Don’t Remember

(may require prompting: e.g., see previous)

99. □ Don’t know
88. □ Declined
30. Have you ever injected any of the following, even just once? (read list, check YES, NO, or DON'T KNOW for each)

30.1 Heroin alone (dust, horse, junk, smack, downtown) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.2 Powder Cocaine alone (uptown) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.3 Crack (injected) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.4 Heroin and Cocaine ("speedballs") 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.5 Crystal Meth 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.6 Talwin and Ritalin (T's & R's) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.7 Tranquilizers (Valium, Serax, etc) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.8 Barbiturates 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.9 Dilaudid 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.10 Oxycontin/Oxycodone 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.11 Morphine 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.12 Methadone (from treatment program) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.13 Methadone (from the street) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.14 Amphetamines (speed, uppers) 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.15 Steroids/Hormones 0. □ NO 1. □ YES 99. □
DON'T KNOW

30.16 Downers 0. □ NO 1. □ YES 99. □
DON'T KNOW

55. □ Other: ____________________________

0. □ None of the above (i.e., has NEVER tried any injection drugs) – SKIP TO #39

88. □ Declined
31. What did you try the FIRST TIME you injected? ____________________ (or)
   99. □ Don’t Remember
   (NOTE: may need to repeat those items they said “yes” to from the above list)
32. How old were you the first time you injected? ______________ yrs (or) 99. □
   Don’t Remember

33. Were you on reserve the first time you injected?
   0. □ NO
   1. □ YES
   99. □ Don’t Remember
   88. □ Declined

34. How often do you inject drugs on reserve? (read list, check one)
   0. □ None of the time
   1. □ Less than half of the time
   2. □ About half of the time
   3. □ More than half of the time
   4. □ All of the time
   88. □ Declined

35. When was the LAST TIME you injected? ____________________________ (or)
   99. □ Don’t Remember
   (may require prompting: see previous)

36. Have you ever used someone else’s NEEDLE after they used it?
   0. □ No
   1. □ Yes → 36.1 When was the last time?
   ________________________________ 99. □ Don’t Remember
   (may require prompting: see previous)

   99. □ Don’t know
   88. □ Declined
37. Have you ever given YOUR needle to someone else after you used it?
0. □ No
1. □ Yes → 37.1 When was the last time?
99. □ Don’t Remember
(may require prompting: see previous)
99. □ Don’t know
88. □ Declined

38. Have you ever given any other injection equipment to someone else after you used it – for example, rinse water, filters, cotton, rigs?
0. □ No
1. □ Yes → 38.1 When was the last time?
99. □ Don’t Remember
(may require prompting: see previous)
99. □ Don’t know
88. □ Declined

39. Have you ever had sex (e.g., vaginal, anal)?
0. □ No --- SKIP TO #43
1. □ Yes → 39.1 How old were you the first time? ______ yrs (or) 99. □ Don’t Remember
99. □ Don’t know
88. □ Declined

40. Have you had vaginal or anal sex without a condom, or had a condom break or fall off in the past year?
0. □ No
1. □ Yes
99. □ Don’t know
88. □ Declined
41. Have you ever had sex with: (read list, check YES, NO, or DON’T KNOW for each)

41.1 A female
0. □ NO  1. □ YES  99. □ DON’T KNOW

41.2 A male
0. □ NO  1. □ YES  99. □ DON’T KNOW

41.3 A bisexual male or female
0. □ NO  1. □ YES  99. □ DON’T KNOW

41.4 Someone who has ever used injection drugs
0. □ NO  1. □ YES  99. □ DON’T KNOW

88. □ Declined

42. Have you ever had sex with someone in exchange for money, drugs, food, or shelter?
0. □ No
1. □ Yes
99. □ Don’t know
88. □ Declined

INTERVIEWER (please read): “Finally, I would like to ask you some questions about services that you may have used over the past 6 months.”

43. Have you had contact with any of the following types of people or services in the past 6 months? (read list, check YES, NO, or DON’T KNOW for each)

43.1 Counsellor
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.2 Drug treatment (e.g., Detox or Rehab)
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.3 Hospital
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.4 Doctor
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.5 Nurse
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.6 Health or walk-in clinic
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.7 Needle exchange
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.8 Safe injection site
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.9 VIDUS, CEDAR, ARISE study
0. □ NO  1. □ YES  99. □ DON’T KNOW

43.10 Peer group or support group
0. □ NO  1. □ YES  99. □ DON’T KNOW
43.11 Social worker 0. □ NO 1. □ YES 99. □ DON'T KNOW
43.12 Parole officer 0. □ NO 1. □ YES 99. □ DON'T KNOW
43.13 Welfare worker 0. □ NO 1. □ YES 99. □ DON'T KNOW
43.14 Outreach programs (e.g., not Custody) 0. □ NO 1. □ YES 99. □ DON'T KNOW
43.15 Youth programs (e.g., Urban Native Youth Association, Aboriginal Friendship Centre Society) 0. □ NO 1. □ YES 99. □ DON'T KNOW
43.16 Teacher (for help other than school) 0. □ NO 1. □ YES 99. □ DON'T KNOW
55. □ Other: 

88. □ Declined

44. Have you used any of the above services on reserve?

0. □ No ——> 44.1 What was your reason for not using services on reserve (Do not read, check all that apply)

1. □ Don’t spend enough time on reserve
2. □ Lack of privacy, small community, social stigma, etc.
3. □ No services available, or unaware of them

88. □ Other:

1. □ Yes ——> 44.2 Which ones?

99. □ Don’t know
88. □ Declined

45. The survey is now finished. Do you have any questions or comments about this study?
(INTERVIEWER: please ensure that each participant is praised, thanked, and acknowledged for contributing to this important study)
### Appendix II – Definition Table

<table>
<thead>
<tr>
<th>Area</th>
<th>Question</th>
<th>Response <strong>all answers to questions are self report</strong></th>
<th>Limitations</th>
<th>Additional Definitions/Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STI—Sexually Transmitted Infection</strong></td>
<td>An infection that is passed from one person to another through sexual contact. This could occur during unprotected oral, anal or vaginal sex; or other close contact with another person. Examples are: Gonorrhea, Chlamydia (STI’s most commonly cited in the literature)</td>
<td>Has a doctor or nurse ever told you that you had a sexually transmitted disease (STD), such as chlamydia, gonorrhea, genital warts, herpes, hepatitis B?</td>
<td>Yes, No, Don't Know, Declined</td>
<td>Recall</td>
</tr>
<tr>
<td><strong>IDU—Injection Drug Use</strong></td>
<td>The act of forcing a drug into the body by means of a needle and syringe. Is a significant risk factor for blood borne viruses (BBV’S); primarily HCV and HIV infection (12) (27). Examples of drugs used: heroin, cocaine, morphine</td>
<td>Have you ever injected any of the following, even just once?</td>
<td>Nurse reads from list of drugs and checks yes/no/don't know beside each one, None of the above, Declined</td>
<td>Self Report</td>
</tr>
</tbody>
</table>

**Health**
The state of complete physical, mental, and social well-being.

**Health Status**
Term for the state of health of an individual, group or population measured again defined standards/indicators.

All study variables combined help to determine or outline the health, and consequently health status of an individual or population.
**Explanatory Variables**

**Socio-demographic factors**

**Age**

- How old are you?

**Sex**

- Biological differences between genetic males and females (chromosomes, hormonal profiles, external and internal genital organs).

**Gender**

- Socially constructed differences between males and females.
- Social, cultural, psychological traits or characteristics typically associated with one's sex.

<table>
<thead>
<tr>
<th>Nurse recorded gender of youth</th>
<th>Male</th>
<th>Female</th>
<th>Transgendered</th>
<th>Biological sex and social gender are not adequately defined, if defined at all, in the Youth in Custody literature. These terms are often used loosely and/or interchangeably.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse records what youth stated was their age at time of interview</td>
<td></td>
<td></td>
<td></td>
<td>Engagement in risk behaviours at a young age often influences engagement later on in life. <strong>&quot;Gender differences&quot;</strong> are often used as a &quot;blanket term&quot; for either sex and/or gender difference when speaking about males or females as it is often difficult to separate the two from their environment. The intent is to look at patterns of risk behaviour for males and females, as well as address who is engaging in these risk behaviours to a greater or lesser degree. Biologic sex impacts one’s health via physiological and psychological changes related to reproductive characteristics, and chromosomal and hormonal profiles. Social gender impacts one’s health related to societal, cultural, and gender norms and influences. Sex and gender differences have been shown to have a profound impact on health status, as they play a part in shaping unique male and female patterns of health and its determinants.</td>
</tr>
<tr>
<td>Ethnicity:</td>
<td>How would you describe your ethnicity/family background?</td>
<td>List of numerous ethnicities. Nurse checked all that applied as youth self reported</td>
<td></td>
<td></td>
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<td>-----------</td>
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</tbody>
</table>

**Aboriginal vs. Non-aboriginal**

Aboriginal includes: First Nations, Inuit, and Metis. Youth classified as being of Aboriginal descent if solely responded to one of the three, or if self reported First Nations, Inuit, or Metis and one of several other ethnicities (ex. First Nations and Caucasian or Metis and Black)

<table>
<thead>
<tr>
<th>“On Reserve”</th>
<th>When youth indicated they were either First Nations, Metis, or Inuit, the nurse asked if they had ever been “on reserve”</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

“On Reserve”
Youth who self identify as being of aboriginal descent and have stayed overnight on a reserve more than once in the year before incarceration

“Off Reserve”
Youth who do not meet the above criteria, even if self identifying as aboriginal

The effect of ethnicity (aboriginal vs. non aboriginal) was investigated as an explanatory variable, interaction term, and confounder in both models using STI and IDU as outcomes. The literature emphasizes this demographic as being especially vulnerable to engagement in risk behaviours; especially aboriginal women.

Addresses access to and utilization of services while on reserve
<table>
<thead>
<tr>
<th>Transcency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstable housing, family environment, and social supports.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First versus Repeat offender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever been in a Youth Custody Centre before this? For example, a remand centre, provincial correctional centre or federal facility</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Don’t know</td>
</tr>
<tr>
<td>Declined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remanded Youth versus Sentenced Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long is your current sentence?</td>
</tr>
<tr>
<td>In remand, so I don’t know yet</td>
</tr>
<tr>
<td>Don’t know</td>
</tr>
<tr>
<td>Declined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of places lived in past 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-classified into if youth lived in 1 location in the 6 months prior to entering custody, or if they lived in &gt; 1 location</td>
</tr>
<tr>
<td>In the six months before coming here, where did you live?</td>
</tr>
<tr>
<td>(check all that apply)</td>
</tr>
<tr>
<td>relatives home</td>
</tr>
<tr>
<td>group home</td>
</tr>
<tr>
<td>foster home</td>
</tr>
<tr>
<td>boarding houses</td>
</tr>
</tbody>
</table>

<p>| Places youth outside the reach of mainstream services, which often leads youth to lack comprehensive health care and as a consequence have long-term neglected health needs |
| Makes it more challenging for youth to stay connected with supportive adults and schools and to maintain positive friendships with peers |
| Can lead to a lack of ability to rehabilitate youth, or allow them to access services. Part of the “revolving door” effect. |</p>
<table>
<thead>
<tr>
<th>Having lived on the street in the past 6 months</th>
<th>In the six months before coming here, where did you live?</th>
<th>Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classified as having lived on the street in the 6 months prior to custody if selected street from above question</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Government Care:**

- Having ever been in foster care/group home
- Have you ever been in foster care?
  - No
  - Yes
  - Don't know
  - Declined

- Have you ever been in a group home?
  - No
  - Yes
  - Don't know
  - Declined

For some youth, being in government care actually may provide them with a more stable and connected living environment, than they would have otherwise living at home with family members.
**Risk Behaviours**

The manner of conducting oneself so that a particular act may create or suggest a hazard. For the purpose of this thesis, risk behaviours will be categorized into sexual and substance use risk behaviours.

### Sexual Risk Behaviours

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ever had sex</strong></td>
<td>Yes/No/Don't know/Declined</td>
<td>No distinction was made as to whether sex was consensual or abuse in nature.</td>
</tr>
<tr>
<td><strong>Age of sexual debut</strong> - Age of first sexual intercourse.</td>
<td>Yes --- How old were you the first time?</td>
<td>No distinction was made as to whether sex was consensual or abuse in nature.</td>
</tr>
<tr>
<td><strong>Making money in past 6 months in pimping/sex work/prostitution</strong></td>
<td>No distinction was made as to whether sex was consensual or abuse in nature.</td>
<td></td>
</tr>
<tr>
<td><strong>Condom use in past year</strong></td>
<td>No/Yes/Don't know/Declined</td>
<td>The survey did not ask about steady or casual partners. Youth may be more prone to not wear a condom with steady partners.</td>
</tr>
</tbody>
</table>
Condom breakage and/or falling off, or having unprotected sex at some point during the course of a year is also not uncommon for this age group.

<table>
<thead>
<tr>
<th>Ever had sex with an IDU</th>
<th>Have you ever had sex with: Someone who has ever used injection drugs</th>
<th>No</th>
<th>Yes</th>
<th>Don't know</th>
<th>May have reported &quot;no&quot; or &quot;don't know&quot; when in fact they did have sex with an IDU.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever exchanged sex for money, drugs, food, or shelter</td>
<td>Have you ever had sex with someone in exchange for money, drugs, food, or shelter?</td>
<td>No</td>
<td>Yes</td>
<td>Don't know</td>
<td>Declined</td>
</tr>
<tr>
<td>Substance Use Risk Behaviours</td>
<td></td>
<td></td>
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<tr>
<td>-------------------------------</td>
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</tr>
<tr>
<td><strong>Making money in past 6 months by selling drugs or doing drug runs</strong></td>
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</tr>
<tr>
<td>In the last six months, did you get money from:</td>
<td></td>
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<tr>
<td>Nurse read from a list, and checked “yes” or “no” for each.</td>
<td></td>
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</tr>
<tr>
<td>Selling drugs or doing drug runs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
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<tr>
<td>Yes</td>
<td></td>
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<tr>
<td>Underreporting as may not want to admit engaging in illegal activity</td>
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<tr>
<td><strong>Alcohol Use</strong></td>
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<tr>
<td><strong>Age of first alcohol use</strong></td>
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<tr>
<td>Have you ever tried any alcohol?</td>
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<tr>
<td>If response was yes... How old were you the first time?</td>
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<tr>
<td>Nurse records age</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Recall; especially if very young</td>
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<tr>
<td><strong>Non-injection drug use</strong></td>
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<tr>
<td><strong>Age of first non-injection drug use</strong></td>
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<tr>
<td>If answered yes to ever trying non injection drugs... How old were you the first time?</td>
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<tr>
<td>Nurse records age</td>
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<tr>
<td>Recall; especially if very young</td>
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<tr>
<td><strong>List of Type of Drugs</strong></td>
<td></td>
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<tr>
<td>Have you ever tried any of the following non injection drugs, even just once?</td>
<td></td>
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</tr>
<tr>
<td>Nurse reads list and checks yes/no/don’t know for each drug listed</td>
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</tr>
<tr>
<td>None of the above</td>
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<tr>
<td>Declined</td>
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<tr>
<td>Did not ask as to the frequency or duration of use</td>
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<tr>
<td><strong>Sharing of drug equipment</strong></td>
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</tr>
<tr>
<td>Have you ever used someone else’s non injection drug equipment or works after they used it— e.g. cookers, spoons, bills, straws, pipes, tinfoil etc??</td>
<td></td>
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<tr>
<td>No</td>
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<tr>
<td>Yes</td>
<td></td>
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<tr>
<td>Don’t Know</td>
<td></td>
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</tr>
<tr>
<td>Declined</td>
<td></td>
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<tr>
<td>Youth may have thought sharing of drug equipment may also mean a “joint”, which is not as risky as sharing crack pipes for example</td>
<td></td>
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<tr>
<td>Injection drug use</td>
<td>List of Type of Drugs</td>
<td>Sharing of injection drug equipment</td>
<td></td>
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</tr>
<tr>
<td>Age of first injection drug use</td>
<td>If answered yes to ever trying injection drugs... How old were you the first time you injected?</td>
<td>Nurse records age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nurse reads list and checks yes/no/don’t know for each drug listed</td>
<td>Recall; especially if very young</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>List of Type of Drugs</td>
<td>Have you ever injected any of the following, even just once?</td>
<td>Did not ask as to frequency or duration of use</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sharing of injection drug equipment</td>
<td>Have you ever used someone else’s needle after they used it?</td>
<td>No</td>
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<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Don’t know</td>
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<td></td>
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<td>Declined</td>
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</tr>
<tr>
<td></td>
<td>Have you ever given your needle to someone else after you used it?</td>
<td>No</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Don’t know</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Declined</td>
<td></td>
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</tr>
<tr>
<td><strong>Prevalence</strong></td>
<td></td>
<td></td>
<td><strong>A proportion of risk, not an indication of a current underlying disease state</strong></td>
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</tr>
</tbody>
</table>
| Considered as a proportion of risk  
The number of cases having engaged in a specified risk behaviour versus the total target population |  |  |  |

<table>
<thead>
<tr>
<th><strong>Custody</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Youth custody services centres are legally designated facilities that house young offenders who have been ordered by the court to serve a period of time in open or secure custody, or for youth who have been detained in custody pending further court appearances. Youth may be held in custody centres for all types of offences, ranging from persistent property offences to serious violent offences” (90)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Detention</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Imprisonment of youth who are guilty or suspected of a crime</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Remand</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In custody awaiting a court hearing, decision or sentencing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sentenced</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Given a term of custody as a result of an offence</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>