

\_\_\_\_\_ **Research Report** \_\_\_\_\_

**Summary of Emerging Findings from the  
2007 National Inmate Infectious Diseases  
and Risk-Behaviours Survey**

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**Summary of Emerging Findings from the 2007  
National Inmate Infectious Diseases and Risk-Behaviours Survey**

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## EXECUTIVE SUMMARY

Essential to optimizing Correctional Service Canada's (CSC) strategy for preventing, controlling and managing infectious diseases is detailed information about inmates' risk-behaviours, utilization of testing, treatment and programs, and knowledge of human immunodeficiency virus (HIV) and hepatitis C virus (HCV). To this end, CSC conducted the 2007 National Inmate Infectious Diseases and Risk-Behaviours Survey (NIIDRBS), a self-administered paper questionnaire completed by a large sample of Canadian federal inmates (n = 3,370). Major findings are summarized below.

Offenders entering federal penitentiaries report a high rate of drug- and sex-related risk-behaviours during their last months in the community: 57% of men and 60% of women used non-injection drugs, 22% of men and 29% of women injected drugs, and 83% of men and 84% of women had oral, vaginal, or anal sex. Despite the high-risk characteristics of the population entering federal penitentiaries, a minority of inmates report engaging in risk-behaviours during the past six months in prison: 34% of men and 25% of women used non-injection drugs, 17% of men and 14% of women injected drugs, and 17% of men and 31% of women had oral, vaginal, or anal sex. In-prison risk-behaviours, however, differed by gender. Men were more likely than women to report risky injecting practices while women were almost twice as likely as men to report having sex (31% vs. 17%) and were more likely to report risky sexual behaviour while incarcerated.

Inmates' awareness of CSC's policy about access to harm-reduction items was high. Eighty-nine percent of inmates were aware of CSC's policy to provide condoms; and, 87% were aware of the policy with respect to bleach. In regards to demand for harm-reduction items over the past six months in prison, 57% of sexually active inmates reported an attempt (successful or unsuccessful) to get condoms, lubricant and/or dental dams, and 57% of all inmates reported an attempt (successful or unsuccessful) to get bleach. The majority of inmates who reported injecting drugs, being tattooed, and/or being pierced in CSC used bleach to clean the equipment. Further, among those who had sex or injected drugs, risky sexual or injecting behaviour was associated with greater demand for harm-reduction items. These findings suggest that harm-reduction items are being utilized as intended by inmates. There is an opportunity, however, to optimize use by reducing access issues (i.e., problems with dispensing machines, privacy, and other inmates' behaviour) and determining, through future research, why some inmates do not use harm-reduction items that are available in CSC institutions.

An examination of inmate knowledge of HIV and HCV revealed some deficiencies. Since greater knowledge was associated with behaviour that could reduce the transmission of HIV and HCV, efforts to increase inmate knowledge should continue. The NIIDRBS indicated that increasing inmate awareness of the various health education programs would be a good first step to increasing program participation and knowledge.

A substantial proportion of inmates were tested for HIV (men 71%, women 85%) and HCV (men 74%, women 83%) during their most recent incarceration at CSC. Among those not tested, the most frequently reported reason was not being offered the test; few cited fear of being reported and/or discriminated against at CSC as reasons for not being tested. This suggests that the rate of testing could be increased by further promoting screening and testing throughout incarceration. Additional research is necessary, however, to provide evidence for policy options available for optimizing infectious disease screening and testing among inmates.

Among inmates ever tested for HIV and/or HCV infections, 4.6% (men 4.5%, women 7.9%) reported being HIV-positive and 31% (men 30.8%, women 37.0%) reported being HCV-positive. Aboriginal women were identified as a particularly high-risk group because they reported the highest rates of HIV (11.7%) and HCV infections (49.1%). These data highlight the need to ensure that culturally appropriate, effective interventions that decrease risk-behaviours and increase utilization of harm-reduction measures are offered to meet the needs of Aboriginal women.

The NIIDRBS identified opportunities to improve the care of HIV-positive inmates. First, 67% were worried about discrimination in federal prison. Second, among those who had started treatment, 60% reported past treatment interruptions at CSC. To alleviate fears among all inmates, particularly HIV-positive inmates, awareness should be increased about HIV transmission pathways (i.e., how HIV can and cannot be transmitted) and CSC's policies regarding privacy, confidentiality, and the intolerance of discrimination. Particular attention to privacy and confidentiality must be paid when delivering health care in the correctional environment, as inmates are often aware of other's movements to health care. According to the NIIDRBS, HIV treatment interruptions at CSC could be reduced through increased efforts to ensure: awareness of institutional pharmacy policies regarding anti-retroviral supply and prescription refills; treatments are not interrupted during transfers between institutions; and, inmates are aware of the consequences of their non-compliance with treatment.

Although it is not possible to definitively attribute reported infections since admission to risk-behaviours in the correctional environment, rates of self-reported infections since admission to CSC institutions were estimated and characteristics associated with these infections were explored. The number of self-reported new HIV cases were too few to examine (i.e., less than 5). In regards to HCV, no women reported an infection since admission, but the rate among men was about 16 HCV infections per 1,000 person-years. Put differently, if 1,000 uninfected men were followed for a one year period after admission, an estimated 16 or 1.6% would report an HCV infection. Having served a longer duration of one's current sentence and injecting with someone else's used needle in prison were associated with an increased likelihood of reporting an HCV infection since admission. Similarly, the overall rate of a sexually transmitted infection (STI)<sup>1</sup> since admission was approximately 16 per 1,000 person-years. That is, if 1,000 inmates were followed for one year after admission, approximately 16 or 1.6% would report at least one

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<sup>1</sup> In the NIIDRBS, STIs included chlamydia, gonorrhoea, syphilis, genital herpes, genital warts, and other non-specific STIs.

STI. Substantial differences, however, existed by gender. Specifically, the rate was 4.5 times greater among women than men (67 vs. 15 per 1,000 person-years). Higher security level, greater cumulative time served, engaging in exchange-sex (i.e., the exchange of sex for money, drugs, injecting equipment or goods) and having unprotected sex with casual partners were associated with an increased likelihood of reporting an STI since admission. Although security level and time served are not modifiable risk-factors, risky injecting and sexual practices are modifiable making continued education and optimizing use of harm-reduction items key prevention strategies.

The primary limitations of this research, such as measurement error and social desirability bias, are typical of cross-sectional self-report surveys that attempt to capture information about sensitive or illicit activities over time. Other research designs, such as longitudinal research employing biosampling (e.g., urine and blood tests), may have been more effective but are difficult to conduct in correctional settings and were precluded in this instance due to competing operational issues. Notwithstanding these limitations, survey findings are generally consistent with other studies suggesting that, for most questions, inmates were answering honestly.



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## INTRODUCTION

Health and correctional professionals recognize that risky behaviours, such as injection drug use and unprotected sex, and communicable diseases, such as human immunodeficiency virus (HIV) and hepatitis C virus (HCV) infections, are concentrated among people entering the correctional system. This makes the correctional system an efficient environment for public health interventions such as medical assessment and treatment, and providing education and counselling on high-risk behaviours (Niveau, 2006). Since the majority of the incarcerated will return to the community, optimization of inmate health and lifestyle increases safety and security within both correctional facilities and communities.

Correctional Service of Canada (CSC) contributes to public health, and a safe and healthy institutional environment through a comprehensive infectious diseases program (CSC, 2004). Essential to optimizing CSC's strategy for preventing, controlling and managing infectious diseases is detailed information about inmates' risk-behaviours, utilization of testing, treatment and programs, and knowledge of HIV and HCV. In 1995, CSC conducted a national survey of male inmates but it was broader in scope, examining issues such as living conditions, security, and programming in addition to a limited number of questions on health (Price Waterhouse, 1996). Since then, CSC has undertaken new health promotion and harm-reduction programs. Specifically, additional health education programs were implemented; methadone maintenance treatment was made available to opiate addicted inmates; the harm-reduction item of bleach was made available in addition to condoms, dental dams, and lubricant; and, an Infectious Disease Surveillance System was launched.

In light of the health programs implemented since 1995 and the lack of detailed information on the health status of inmates, particularly women, CSC conducted the 2007 National Inmate Infectious Diseases and Risk-Behaviours Survey (NIIDRBS), a self-administered paper questionnaire focussing on issues relevant to blood-borne and sexually transmitted infections (BBSTIs), particularly HIV and HCV. The primary objectives of the survey were to obtain information regarding:

- 1) the occurrence of risk-behaviours associated with the transmission of BBSTIs;
- 2) awareness and accessing of harm-reduction items and methadone maintenance treatment;
- 3) participation in health education programs;

- 4) knowledge of HIV and HCV; and,
- 5) testing and treatment for HIV and HCV infections.

This publication summarizes the emerging findings of more detailed NIIDRBS reports in progress. After reviewing the NIIDRBS methodology and describing the sociodemographic and incarceration characteristics of the inmate population, major findings are presented as follows:

- 1) For a subsample of more recently admitted inmates, risk-behaviours in the community, just prior to admission, are detailed to establish the high rate of drug- and sex-related risk-behaviours among offenders entering federal penitentiaries. Risk-behaviours in the community are then contrasted with in-prison risk-behaviours to demonstrate how the majority of risk-behaviours decline in the correctional environment.
- 2) Risk-behaviours for all inmates over their past six months in prison are provided as a context for the health needs of inmates and the risk of acquiring BBSTIs in penitentiaries.
- 3) Barriers to and use of CSC's harm-reduction measures, such as condoms, dental dams, lubricant, bleach and the methadone maintenance treatment program (MMTP), are summarized.
- 4) Inmates' participation in health education programs and their knowledge of HIV and HCV is quantified. Thereafter, the relationship between knowledge and risk- and harm-reducing behaviours is explored.
- 5) Barriers to and use of HIV and HCV testing and treatment at CSC are detailed.
- 6) And finally, since some inmates continue to engage in risk-behaviours in penitentiaries, the risk of self-reported BBSTIs since admission to prison are estimated. In addition, incarceration characteristics and risk-behaviours associated with these infections are identified.

Findings from the NIIDRBS provide a recent profile of the risk-behaviours of inmates and information to assess the need for enhancing current public health programs including education, prevention and treatment interventions.

## **METHOD**

### **Development of Survey Instrument**

To obtain the data to meet the study objectives, a project team drawn from several federal government departments<sup>2</sup> opted to use a self-administered paper and pencil questionnaire (Zakaria, Thompson, & Borgatta, in press) as the data collection instrument. Questionnaire development included consultations with inmates in five different penitentiaries, including a women's facility and an Aboriginal inmate group, through focus groups. To maximize comprehension, the questions did not exceed a Grade 8 literacy level. Further, inmates could choose between the English or French version of the questionnaire.

The final questionnaire was 50 pages long and took inmates approximately 45 to 55 minutes to complete. The questionnaire captured information on risk-behaviours associated with the spread of BBSTIs in both the community and prison; inmate awareness and use of health education and harm-reduction programs; inmate testing and treatment for HIV and HCV infections; and, inmate knowledge of HIV and HCV. To optimize recall accuracy, only inmates admitted within the past three years reported on their risk-behaviours during the last six months in the community prior to their current incarceration.

Prior to data collection, Health Canada's Research Ethics Board reviewed and approved the survey methodology.

### **Sampling**

#### ***Survey Design and Sample Size Estimation***

The sample frame was all inmates in federal penitentiaries, numbering approximately 13,749 just prior to the time of the survey (March, 2007). Excluded from the frame were inmates unable to understand, orally or in writing, English or French (less than 0.5% of the inmate population). Each penitentiary served as a stratum, the size of which varied from stratum to stratum. For each male penitentiary, a sample size was calculated to ensure estimated proportions

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<sup>2</sup> CSC Research Branch, CSC Public Health Branch, and the Public Health Agency of Canada HIV/AIDS Policy, Coordination and Programs Division and Community Acquired Infections Division.

had a small margin of error ( $\pm 5\%$ ), 8 times out of 10 [ $\alpha = 0.20$  (two-tailed),  $\sigma^2 = 0.25$ , finite population correction factor applied] (Cochran, 1977, p. 75). If the estimated sample size for a specific institution was 80% or more of the institution's population, the whole population of the institution was invited to participate. This occurred with small penitentiary populations so the extra survey cost was minimal. Given the small number ( $N = 479$ ) of women inmates, all were invited to participate. The final sample size estimate for the entire federal population, including both men and women, was 4,981 inmates.

### ***Institutional Sample Lists***

For each male penitentiary, simple random sampling without replacement from the sample frame generated a primary list. Two or more replacement lists (secondary lists) helped maintain required sample sizes in the event an inmate refused to participate in the study or was not in the institution. Lists sorted by Aboriginal self-identification, primary official language (English or French), and aggregate sentence length facilitated substitutions. If an inmate on the primary list declined to participate or was not in the penitentiary for any reason, another inmate from the secondary list with the same characteristics could substitute for the originally sampled inmate.

## **Survey Implementation**

### ***Selection and Training of Survey Coordinators***

Regional (Atlantic, Quebec, Ontario, Prairies, and Pacific) survey coordinators were nominated by the Assistant Deputy Commissioners for Institutional Operations. In addition, each institution's warden nominated an institutional survey coordinator. Regional coordinators acted as liaisons with institutional coordinators and held weekly teleconferences with the Research Branch to resolve logistical issues during survey implementation. The Research Branch prepared an extensive survey training manual for the coordinators and conducted face-to-face training sessions to encourage survey ownership and standardize approaches and messaging.

### ***Promoting Awareness of the Survey***

Regional Management Committees, wardens, security staff and unions were briefed regarding the survey and indicated their support. To raise awareness in institutions about the survey, a general communication and frequently asked questions were sent to all CSC employees, and posters announcing the survey were posted in all institutions (Zakaria et al., in press). These posters emphasized the voluntary nature of the survey; guaranteed participants anonymity and confidentiality; and, reinforced that the overall purpose of the survey was to improve inmate health. Wardens also assisted by informing institutional management committees, inmate committees and local unions.

### ***Inmate Recruitment***

Institutional coordinators received lists of eligible inmates two to three weeks prior to the scheduled data collection period. Before inmates were approached, both primary and secondary lists were reviewed by an institution's Warden or his/her designate to identify security risks. Inmates deemed security risks were either excluded from further consideration or remained eligible to complete the questionnaire in their cell.

Institutional survey coordinators invited inmates on the sample list to participate in the study and to sign a consent form if they agreed (Zakaria et al., in press). For efficiency, group information sessions were organized with eligible inmates to describe the survey and review the consent form. Consent, however, was not obtained in a group setting but privately from each inmate. Inmates in segregation were recruited individually. Educational attainment information and experiences interacting with an inmate were used to decide whether to ask an inmate if he/she would like assistance completing the questionnaire. A small version (13.9 cm by 21.6 cm) of the survey poster was left with each inmate approached for participation (Zakaria et al., in press).

After scheduling was complete, CSC Security reviewed the list of inmates scheduled to complete the survey in a group setting to ensure compatibility among inmates scheduled for the same group session. Thereafter, each inmate was informed of when and where they were to complete the questionnaire and were reminded the day before. Recruitment activities continued, as necessary, until the end of the data collection period for a specific institution. This allowed replacement of inmates who were unable to complete the questionnaire for any reason.

## ***Data Collection***

From May 22 to July 6, 2007, a private firm administered the questionnaire in each institution to those inmates with a signed consent form. The survey coordinator was responsible for organizing inmates for the day and time the survey contractor arrived to distribute questionnaires. Since the contractor did not have the sample list and inmates were specifically instructed not to put their name or the name of anyone else on the questionnaire, it was impossible to link the consent form with the completed questionnaire. In this manner, inmates could be assured of their anonymity and confidentiality.

Each inmate completed a self-administered questionnaire: behind a privacy screen when completed in a group setting; in his/her cell if in segregation; or through private one-on-one interviews if an inmate requested assistance. All participating inmates received the answers to the questionnaire's HIV and HCV knowledge questions after data collection was complete within their institution (Zakaria et al., in press).

Several factors limit inmate recruitment and survey completion in the correctional environment including the transfer of inmates between institutions, the departure of inmates at warrant expiry, and inmates on conditional leave during the survey period. In total, 3,370 inmates (3,006 men, 351 women, 13 transgendered) completed a questionnaire. Operational issues limited the majority of facilities from maintaining detailed records of the total number of inmates asked to participate; however, 13 institutions, accounting for approximately 27% of the total federal inmate population at the time of the survey, provided adequate detail to estimate a survey consent and response rate. Across these 13 institutions, which included inmates residing in minimum to maximum security levels, 1,687 inmates were asked to participate, 996 consented (consent rate = 59%) and 811 completed a questionnaire (response rate = 48%). In comparison, the 1995 National Inmate Survey reported a response rate of 64.2% [response rate = number who completed a questionnaire/(number who completed a questionnaire + number who refused)]. If inmate illnesses, releases, and transfers are included in the denominator, however, the response rate declines to 59.7% (Price Waterhouse, 1996, derived from Exhibit 1.3 on p.12). The difference in the response rates across the two surveys could be due to several factors, such as a change in the inmate profile over time or the greater sensitive content of the NIIDRBS.

The contractor retained all completed questionnaires and provided a database of

anonymous survey records in August 2007. Preliminary analyses to test the integrity of the data were conducted in the fall and winter of 2007/08. The contractor destroyed all completed questionnaires in June 2008 after all data integrity issues were resolved.

## **General Analytical Approach**

### ***Statistical Procedures for Complex Sample Surveys***

Typically, statistical procedures assume data were obtained through a simple random sample. Under such circumstances each inmate in the sample represents one inmate from the population and estimates derived from the sample relate to the population. In the NIIDRBS, inmates were randomly selected, but the sampling fraction was not consistent across institutions ranging from approximately 8% to 94%. Consequently, each inmate in the sample represented anywhere from about 1 to 13 inmates. Analyzing the NIIDRBS data as if it were obtained through simple random sampling (i.e., each inmate in the sample represents one inmate in the population) would produce incorrect population estimates and variances (Lee & Forthofer, 2006). All statistical estimates shown in this report acknowledge the NIIDRBS' complex sample design by incorporating weights that convey the number of inmates in the population represented by each inmate in the sample. The inverse of the institution's sampling fraction formed the weight for a record. Thus, estimates presented in this report relate to the Canadian federal inmate population.

All analyses used SAS<sup>®</sup> 9.1 or 9.2 survey procedures (SAS Institute Inc., 2004, 2008) that take the complex sampling design into account. Inferences to the population use common decision criteria (e.g., two-tailed alpha of 0.05). To calculate the variance of an estimate, Taylor series (linearization)<sup>3</sup> was used with the finite population correction factor. During bivariate analyses, we used the Rao-Scott chi-square test<sup>4</sup> for association if the data were categorical and the Wald F statistic<sup>5</sup> for continuous data.

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<sup>3</sup> See SAS Institute Inc. (2004, p. 166) for details and related references.

<sup>4</sup> See SAS Institute Inc. (2004, p. 4216) for details and related references.

<sup>5</sup> See SAS Institute Inc. (2008, p. 6558) for details.

### ***Question Non-Response and Small Subpopulations***

Question non-response is a limitation of most self-report surveys that probe personal or private matters such as sexual behaviour. Although sophisticated procedures exist for addressing low response rates on certain questions, this report used an approach similar to other studies found in the survey literature: on any given question we assume that non-responders and responders share similar characteristics. When item non-response exceeded 50%, however, we chose to suppress the reporting of estimates. For reasons of confidentiality and privacy, we do not report estimates where there are fewer than five inmates sharing a characteristic. Finally, due to their small number ( $n = 13$ ), results for the transgendered are not presented in this report.

## **REPRESENTATIVENESS OF THE SAMPLE AND POPULATION CHARACTERISTICS**

A comparison of inmate characteristics derived from the NIIDRBS and CSC administrative data indicated the sample was representative of the population (see Table 1). Based on the NIIDRBS, the majority of inmates were English-speaking (78%), non-Aboriginal people (79%), born in Canada (89%), who had a high school diploma or greater at the time of the survey (54%), and were not in committed relationships (69%). Gender differences existed. On average, men were older (38 vs. 34 years), had served a longer duration of their current sentence (4.8 vs. 2.2 years), and were less likely to be Aboriginal (21% vs. 36%) compared to women.

Table 1:

*Characteristics of Canadian Federal Inmates by Data Source*

Characteristics	NIIDRBS (n=3,357) (N=13,701)				CSC Administrative Data (N=13,041)			
	Men (n=3,006) (N=13,222)		Women (n=351) (N=479)		Men (N=12,574)		Women (N=467)	
	n	mean or % (95% CI)	n	mean or % (95% CI)	N	mean or %	N	mean or %
Age (years)	2,899	38 (38, 39)	335	34 (34, 35)	12,554	38	466	35
Highest level of education at time of survey (%)								
Less than highschool diploma	1,252	46 (44, 48)	156	48 (45, 51)	-	-	-	-
Highschool diploma or greater	1,533	54 (52, 56)	176	52 (49, 55)	-	-	-	-
Marital status (%)								
Married/common law	884	31 (29, 32)	121	35 (32, 38)	4,839	39	165	36
Single/separated/divorced/widowed	2,043	69 (68, 71)	224	65 (62, 68)	7,654	61	297	64
Country of birth (%)								
Canada	2,622	89 (88, 90)	320	92 (91, 94)	11,175	89	412	89
Other	305	11 (10, 12)	26	8 (6, 9)	1,386	11	53	11
Aboriginal self-identification (%)								
Aboriginal	612	21 (19, 22)	129	36 (33, 38)	2,466	20	147	32
Non-Aboriginal	2,281	79 (78, 81)	212	65 (62, 67)	10,023	80	310	68
Race (%)								
White/caucasian	1,852	65 (63, 67)	179	55 (52, 58)	8,482	68	258	56
Aboriginal	612	21 (20, 23)	129	36 (34, 38)	2,466	20	147	32
Other visible minority	356	14 (13, 15)	28	9 (7, 11)	1,541	12	52	11
Language most comfortable speaking (%)								
English	2,154	78 (77, 79)	302	84 (83, 86)	8,425	74	317	79
French	719	20 (20, 21)	37	14 (13, 15)	2,342	21	62	15
Other	54	2 (1, 2)	6	2 (1, 2)	642	6	22	5
Years served of present sentence	2,702	4.8 (4.6, 5.1)	318	2.2 (2.0, 2.4)	12,554	4.4	466	3.0
Region (%)								
Atlantic	317	10 (10, 10)	50	13 (13, 13)	1,297	10	62	13
Quebec	868	24 (24, 24)	42	16 (16, 16)	2,990	24	73	16
Ontario	627	27 (27, 27)	84	26 (26, 26)	3,344	27	123	26
Prairie	847	25 (25, 25)	137	33 (33, 33)	3,168	25	151	32
Pacific	347	15 (14, 15)	38	13 (12, 13)	1,772	14	58	12
Security level (%)								
Maximum	581	21 (21, 21)	0		3,199	25	102	22
Medium	1,488	60 (60, 60)	0		6,934	55	196	42
Minimum	869	18 (18, 18)	4	1 (1, 1)	1,907	15	161	34
Unknown	68	1 (1, 1)	347	99 (99, 99)	534	4	8	2

*Note.* Percentages may not add to 100 due to rounding. Education level derived from administrative data is not comparable to NIIDRBS estimates because of inconsistency in method of capture (i.e., standardized testing at admission versus self-report at time of survey). Since NIIDRBS security level is based on institutional security level, it is unknown for the majority of women inmates who reside in multi-level security institutions. NIIDRBS = 2007 National Inmate Infectious Diseases & Risk-Behaviours Survey; CSC = Correctional Service Canada; n = sample size; N = estimated population size.

## COMPARISON OF RISK-BEHAVIOURS IN THE COMMUNITY AND PRISON

In this section of the report, risk-behaviours in the community, just prior to admission, are detailed to establish the high rate of drug- and sex-related risk-behaviours among offenders entering federal penitentiaries. Risk-behaviours in the community are then contrasted with in-prison risk-behaviours to demonstrate how the majority of risk-behaviours decline in the correctional environment.

The NIIDRBS asked inmates admitted within the past three years about their drug- and sex-related behaviours during their last six months in the community, prior to starting their current sentence, and past six months in prison. This allowed an examination of risk-behaviour changes as people moved from the community into prison.

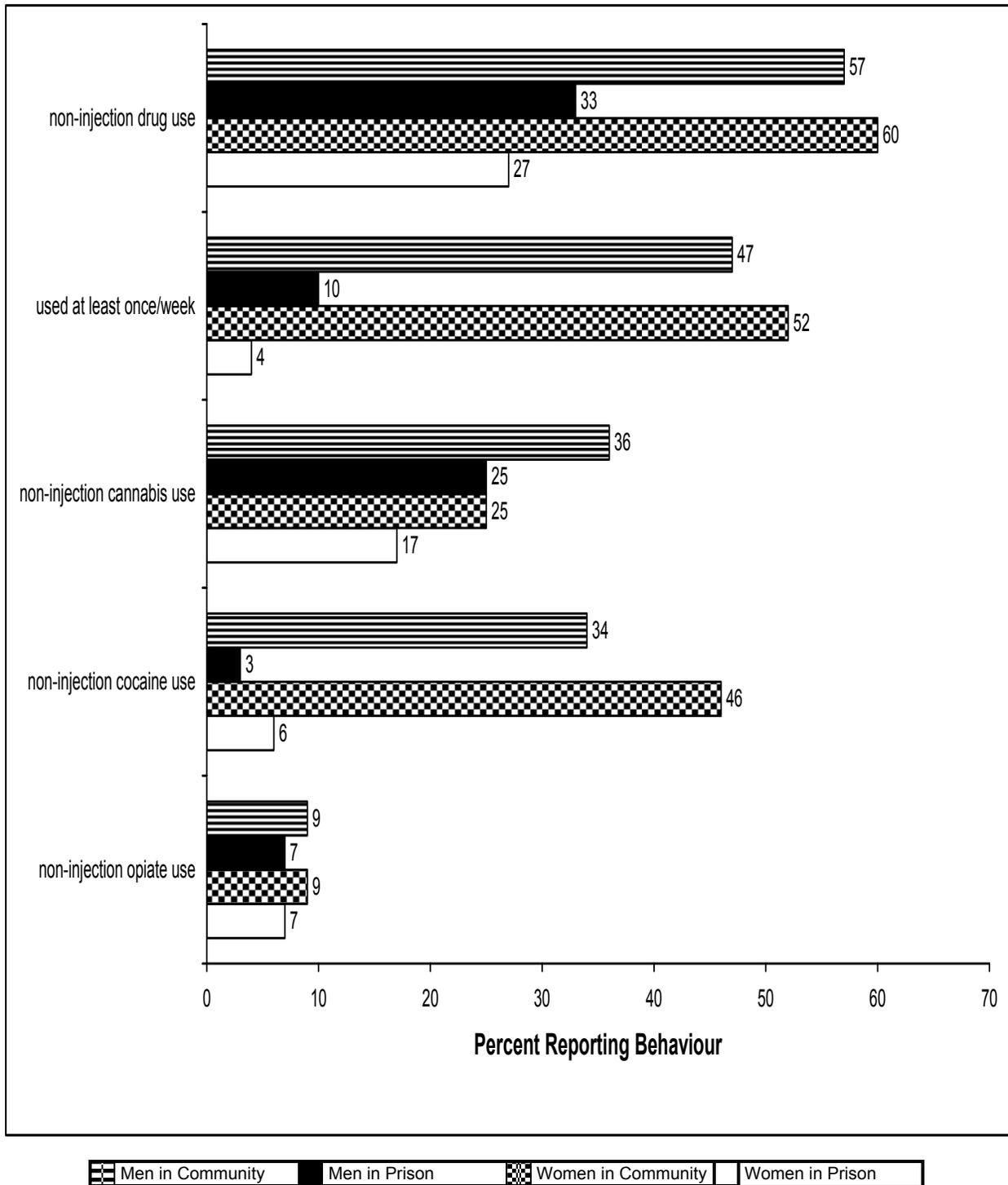
### Drug Use

#### *Non-Injection Drug Use*

Non-injection drug use (i.e., snorting, sniffing, smoking or swallowing) significantly declined by about 50% in prison compared to the community for both men (33% vs. 57%) and women (27% to 60%) (see Figure 1). More dramatically, the proportion of inmates using non-injection drugs at least once per week in prison substantially declined to approximately 1/5 or less of that reported in the community for both men (10% vs. 47%) and women (4% vs. 52%).

Although cannabis, cocaine, and opiates were the three non-injected drugs used most frequently in the community and prison, their relative ranking changed. Most notably, the proportion who reported cocaine as one of their most frequently used drugs declined considerably in prison compared to the community for both men (3% vs. 34%) and women (6% vs. 46%). Opiate use showed the least decline in prison compared to the community (7% vs. 9%).

Figure 1. Non-Injection Drug Use Behaviours during the Last Six Months in the Community and Past Six Months in Prison for Canadian Federal Inmates Admitted within the Past Three Years by Gender



Previous research has also found a greater tendency to use depressants rather than stimulants in prison, and that the most frequently cited reasons for using depressants were relaxation and relief of boredom (Bullock, 2003; Calzavara, Myers, Millson, Schlossberg, & Burchell, 1997).

### ***Injection Drug Use***

The proportion of inmates who reported injecting drugs in prison compared to the community declined by about 30% for men (16% vs. 22%) and 50% for women (15% vs. 29%) (see Figure 2). Furthermore, the proportion injecting at least once per week and “often or always” binge-injecting (i.e., injecting many times over a short period) significantly declined by at least 70% in prison compared to the community. Although cocaine and opiates were the most frequently injected drugs in the community and prison, their relative ranking changed. In particular, the proportion who reported cocaine as one of their most frequently injected drugs declined substantially in prison compared to the community. Similarly, in a study involving inmates of Ontario provincial correctional centres, the most commonly injected drug in the community was cocaine followed by opiates while the most commonly injected drug in prison was opiates followed by cocaine (Calzavara et al., 2003). According to Calzavara et al. (2003), possible explanations include the nature of addiction to opiates; a preference for the high from opiates, a sedative and pain-killer with an effect that lasts hours, rather than cocaine, a stimulant with an effect that lasts minutes; and, that opiates may be more accessible in correctional facilities.

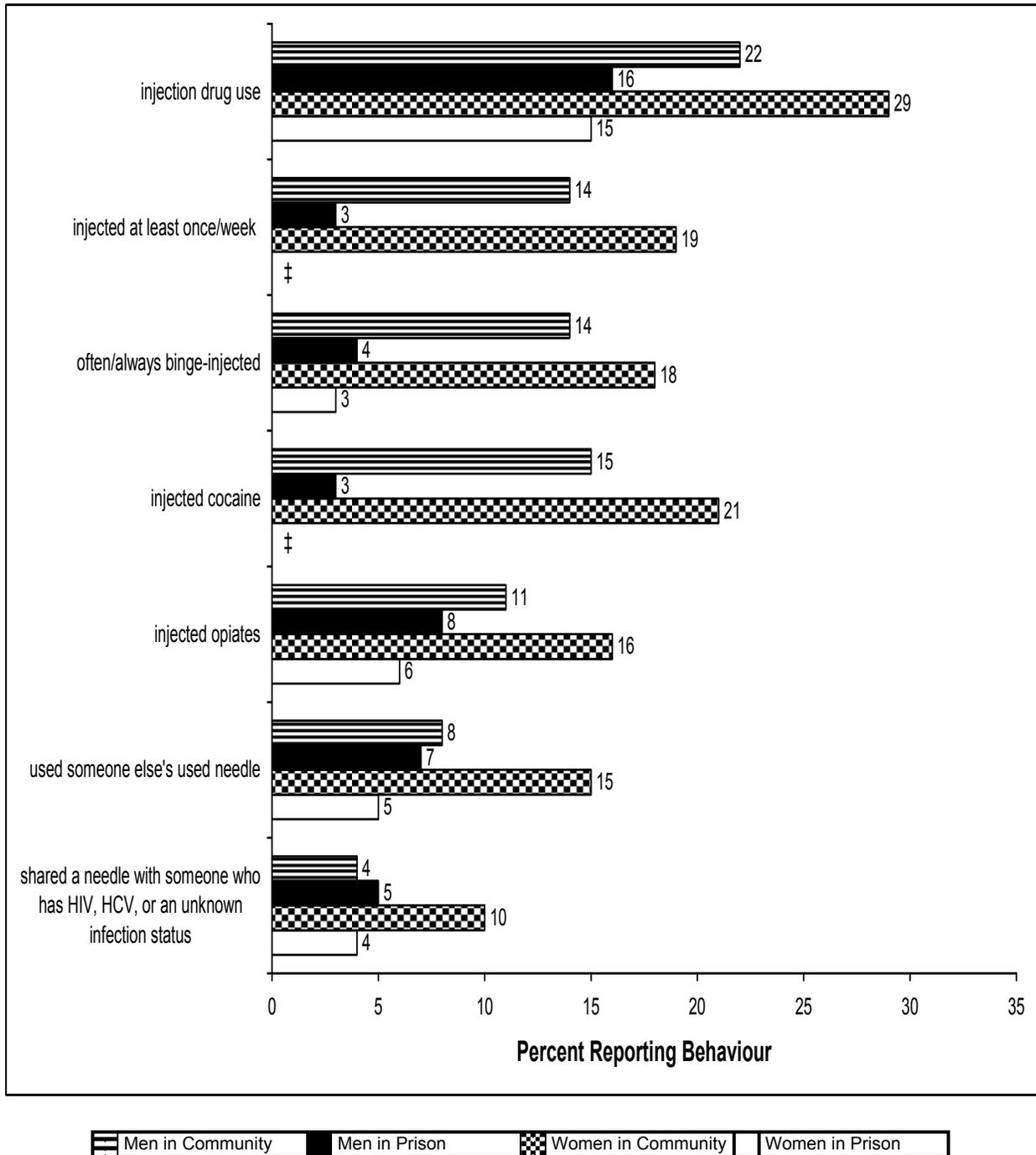
In the transition from the community to prison, women demonstrated a decline in needle-sharing behaviours that was proportional to their decline in injection drug use. Among men, however, needle-sharing behaviours did not significantly decline in prison compared to the community. For example, even though the proportion of men injecting drugs declined from 22% in the community to 16% in prison, the proportion who injected with someone else’s used needle was about the same in the community and prison (8% vs. 7%). Thus, among men who injected drugs, 36% used someone else’s used needle in the community ( $36\% = 8\% \text{ used someone else’s used needle} / 22\% \text{ injected drugs}$ ) compared to 44% in prison ( $44\% = 7\% \text{ used someone else’s used needle} / 16\% \text{ injected drugs}$ ).

Detailed comparisons with other studies are limited because researchers have not

consistently used the same time frame for quantifying risk-behaviours in both the community and prison. Nonetheless, all have reported substantial declines in the proportion of men and women who inject drugs in prison compared to the community (Bullock, 2003; Calzavara et al., 2003; Calzavara et al., 1997; Martin et al., 2005; Poulin et al., 2007). As examples, a study involving Quebec provincial inmates in 2003 found that 28% of men and 43% of women reported ever injecting drugs outside of prison compared to about 4% and 1%, respectively, ever injecting inside prison (Poulin et al., 2007). An earlier study involving Ontario provincial inmates in 1996/97 found the proportion injecting drugs declined from 17% during the year prior to incarceration to 3% during the past year in prison (Calzavara et al., 2003). Finally, a small study (n=39) involving Ontario federal inmates in 1995 found the proportion injecting drugs declined from 31% in the year prior to incarceration to 5% during the past year in prison (Calzavara et al., 1997).

In addition, elevated rates of needle-sharing among people who inject drugs in prison compared to the community has also been previously observed (Allwright et al., 2000; Calzavara et al., 1997; Poulin et al., 2007; Rotily et al., 2001). One of these studies found gender differences in needle-sharing within Quebec provincial correctional facilities. Specifically, among those who inject drugs, the proportion sharing needles increased from 53% in the community to 63% in prison for men; for women, the proportion declined from 56% in the community to 50% in prison (Poulin et al., 2007). Elevated rates of needle-sharing in prison compared to the community may reflect the reduced availability of needles in prison. Further research is necessary, however, to validate and explain the gender differences observed.

Figure 2. Injection Drug Use Behaviours during the Last Six Months in the Community and Past Six Months in Prison for Canadian Federal Inmates Admitted within the Past Three Years by Gender



Note. Binge-injecting is injecting many times over a short period. HIV = human immunodeficiency virus; HCV = hepatitis C virus.

‡ Suppressed because fewer than five inmates reported the characteristic.

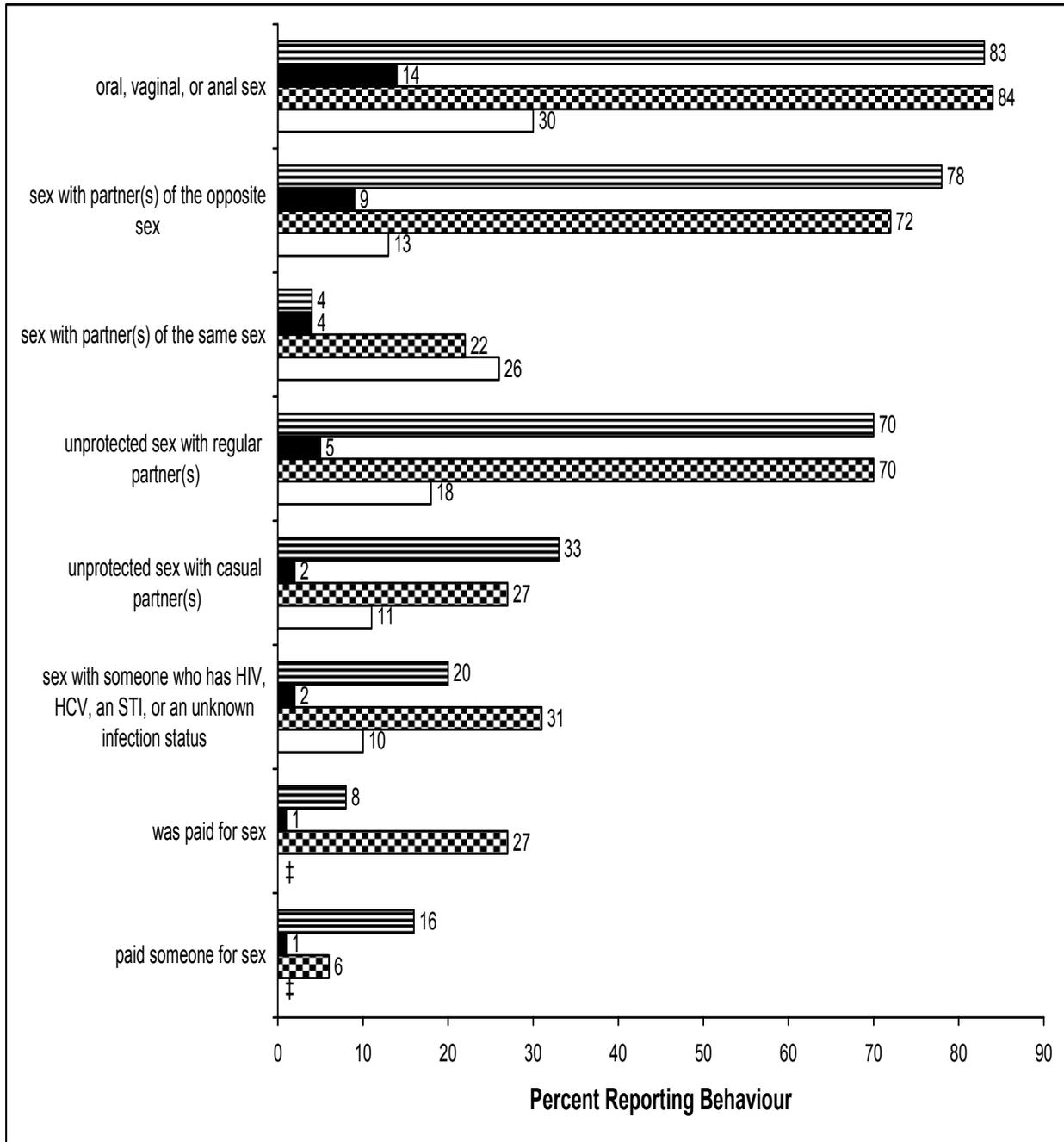
## Sexual Activity

The proportion of inmates reporting oral, vaginal, or anal sex substantially declined in prison compared to the community for men (14% vs. 83%) and women (30% vs. 84%) (see Figure 3). Similarly, the proportion of inmates reporting specific sexual behaviours declined in prison compared to the community except in regards to sex with a partner of the same sex. Specifically, the proportion of men reporting sex with males (4%) did not significantly differ across environments while the proportion of women reporting sex with females increased in prison compared to the community (26% vs. 22%).

Among male inmates, the proportion reporting high-risk sexual behaviours (i.e., unprotected sex with a casual partner, sex with someone who is or may be infected, being paid for sex, or paying someone else for sex) declined even more so than the proportion reporting sex. For example, there was an 83% decline in the proportion of men reporting sex in prison compared to the community while the proportion reporting unprotected sex with a casual partner declined by 94%.

These findings are consistent with previous research examining the sexual behaviours of a small sample ( $n = 39$ ) of Canadian federal inmates during their last 12 months in the community and past 12 months in prison (Calzavara et al., 1997). This study found that the proportion of inmates reporting sexual activities with a partner decreased from 97% in the community to 38% in prison. Further, the proportions reporting sexual activity with a partner of the same sex increased in prison compared to the community for both men (15% vs. 10%) and women (37% vs. 21%).

Figure 3. Sexual Behaviours during the Last Six Months in the Community and Past Six Months in Prison for Canadian Federal Inmates Admitted within the Past Three Years by Gender



Men in Community    Men in Prison    Women in Community    Women in Prison

Note. HIV = human immunodeficiency virus; HCV = hepatitis C virus; STI = sexually transmitted infection.  
 ‡ Suppressed because fewer than five inmates reported the characteristic.

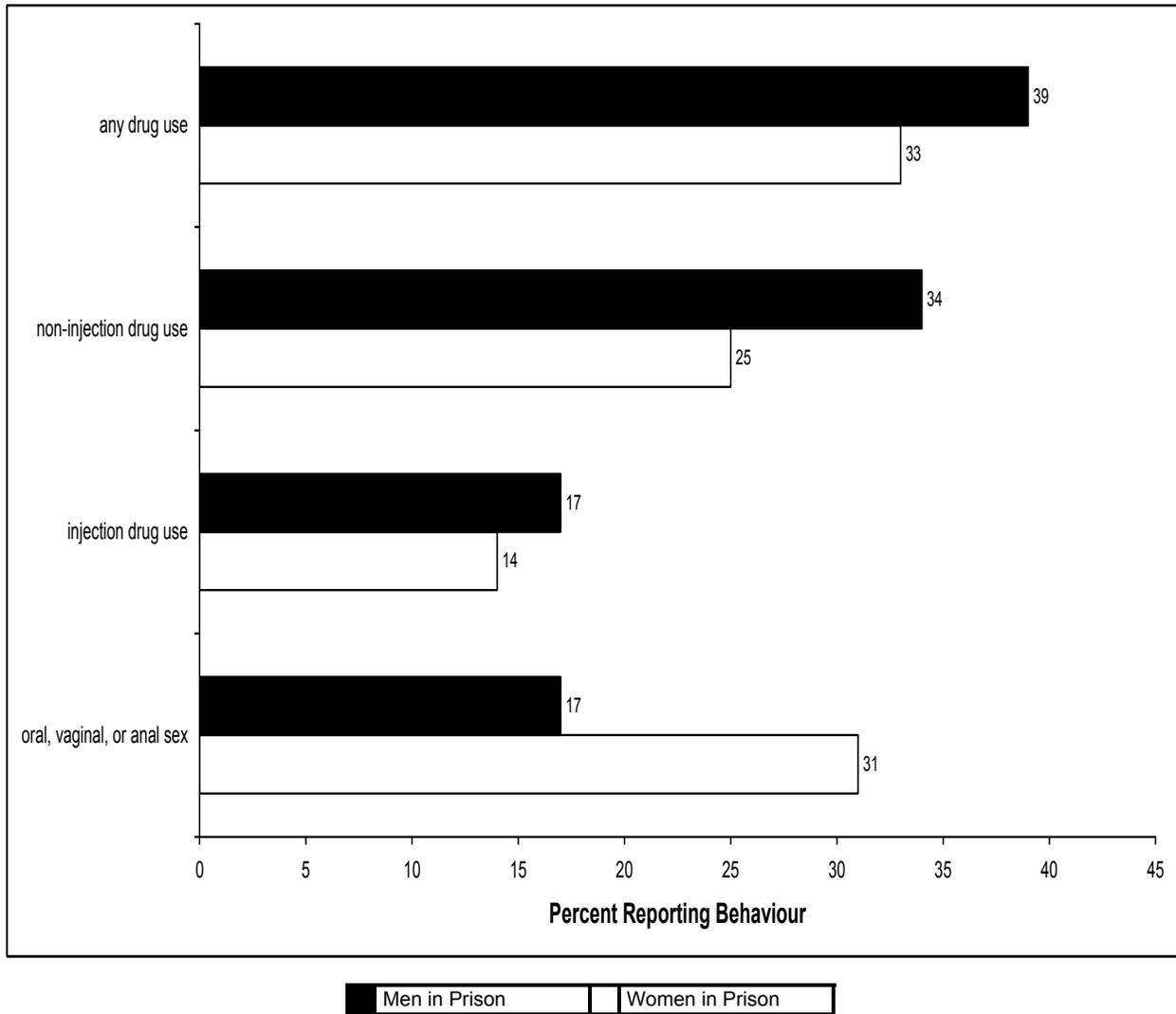
## **RISK-BEHAVIOURS DURING THE PAST SIX MONTHS IN PRISON FOR ALL CANADIAN FEDERAL INMATES**

In this section of the report, drug- and sex-related risk-behaviours for all inmates over their past six months in prison are provided as a context for the health needs of inmates and the risk of acquiring BBSTIs in penitentiaries.

The majority of inmates did not report drug- or sex-related risk-behaviours during the past six months in prison (see Figure 4). Specifically, about 39% of men and 33% of women reported using illicit drugs while less than half as many (men 17%, women 14%) reported injecting drugs at least once. Consistent with these findings, previous research involving Canadian federal inmates found non-injection drug use rates that ranged from 36% to 56% (Calzavara et al., 1997; Price Waterhouse, 1996; Martin et al., 2005), and injection drug use rates that ranged from 5% to 24% (Calzavara et al., 1997; Ford et al., 2000; Martin et al., 2005; PASAN, 2003; Price Waterhouse, 1996). Internationally, European, American and Australian studies estimate the proportion of inmates ever injecting in prison as ranging from a low of 0% in the Netherlands to a high of 52% in Victoria, Australia (Butler, Kariminia, Levy, & Kaldor, 2004; Christensen, Krarup, Niesters, Norder, & Georgsen, 2000; Hellard, Hocking, & Crofts, 2004; Khan et al., 2005; Koulierakis, Gnardellis, Agrafiotis, & Power, 2000; Rotily et al., 2001; Weild et al., 2000).

In regards to sexual behaviour, less than one in five men (17%) and one in three women (31%) reported oral, vaginal, or anal sex. Similarly, Canadian, American, European and Australian studies have produced sexual activity estimates that range from 0% to 29% for men (Allwright et al., 2000; Dolan, Bijl, & White, 2004; Dolan, Lowe, & Shearer, 2004; Frost & Tchertkov, 2002; Gyarmathy, Neaigus, & Szamado, 2003; Khan et al., 2005; Price Waterhouse, 1996; Rotily et al., 2001; Weild et al., 2000) and 10% to 37% for women (Frost & Tchertkov, 2002; Gyarmathy et al., 2003; Hogben, St. Lawrence, & Eldridge, 2001; PASAN, 2003; Weild et al., 2000). Further, consistent with our findings, studies producing gender-specific estimates have found higher rates of sexual activity among women (Frost & Tchertkov, 2002; Gyarmathy et al., 2003; Weild et al., 2000).

Figure 4. Risk-Behaviours during the Past Six Months in Prison for Canadian Federal Inmates by Gender



### Injecting Behaviours of Inmates who Reported Injecting Drugs during the Past Six Months in Prison

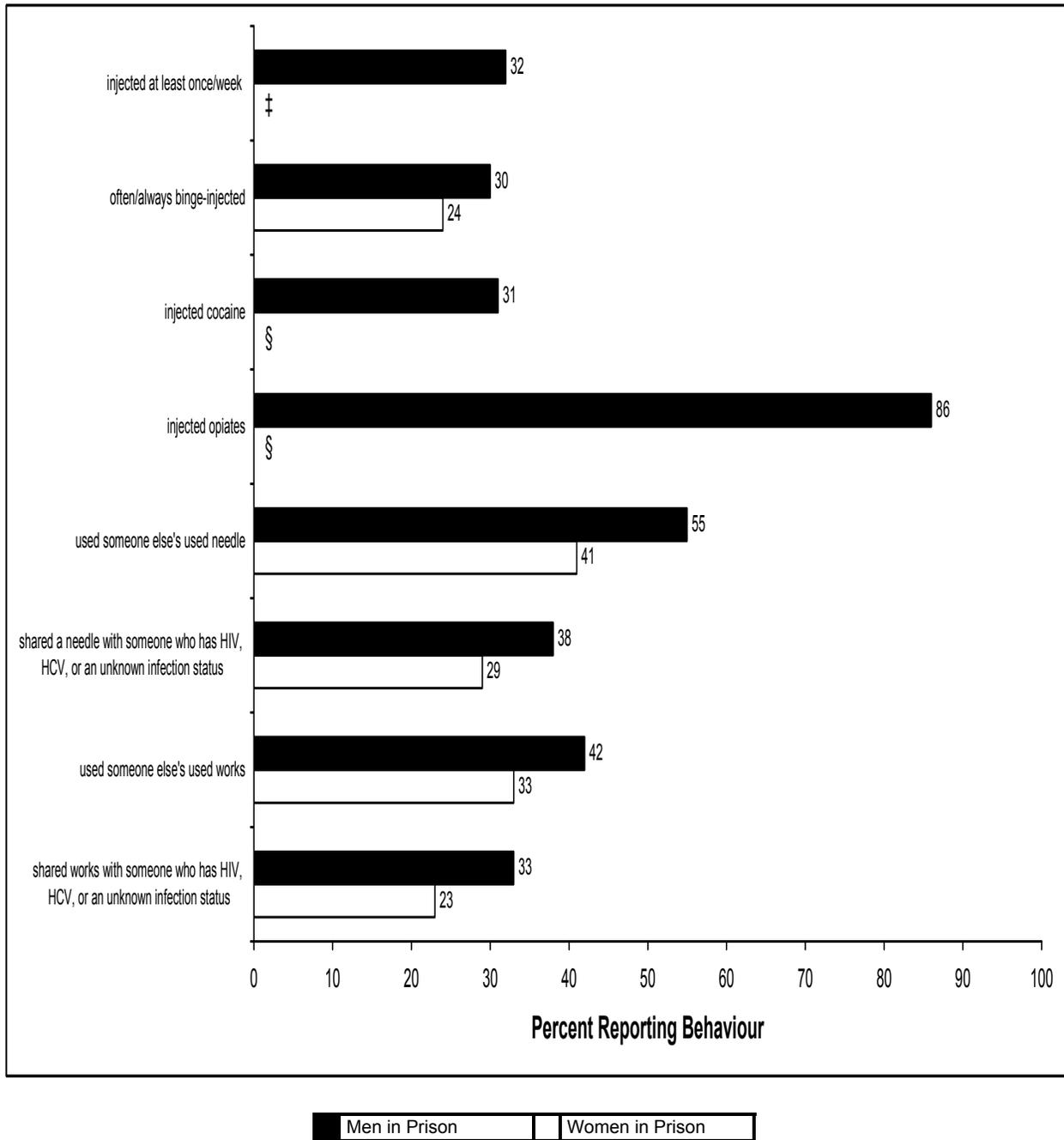
Certain behaviours, such as frequent injecting and sharing injecting equipment, increase the risk of infectious disease transmission. Among inmates who injected drugs during the past six months in prison, less than one-third reported injecting at least once per week (31%) and binge-injecting often (men 30%, women 24%) (see Figure 5). The most frequently injected drugs were opiates and cocaine, injected by 87% and 31% respectively. This is consistent with previous research involving federal male inmates which found the most frequently injected drugs

in prison were heroin and cocaine, injected by 88% and 29% respectively (Ford et al., 2000).

Inmates who injected drugs reported sharing injection equipment. For example, 55% of men and 41% of women used someone else's used needle, and 38% of men and 29% of women shared a needle with someone who has HIV, HCV, or an unknown infection status. Sharing differed by gender. Specifically, women were less likely than men to use someone else's used needle and to share needles and works (i.e., water, filter, cooker/spoon) with someone who has HIV, HCV, or an unknown infection status.

NIIDRBS findings are consistent with previous Canadian and European studies which have estimated the rate of injection equipment sharing at 50% to 86% among inmates injecting drugs in prison (Ford et al., 2000; Koulierakis et al., 2000; Martin et al., 2005; Rotily et al., 2001; Weild et al., 2000). Hence, the NIIDRBS and previous research have identified injection equipment sharing as a potential source of infection transmission among inmates who inject drugs.

Figure 5. Injecting Behaviours by Gender for Canadian Federal Inmates who Injected Drugs during the Past Six Months in Prison<sup>a</sup>



Note. Binge-injecting is injecting many times over a short period. Works include water, filter, and cooker/spoon. HIV = human immunodeficiency virus; HCV = hepatitis C virus; STI = sexually transmitted infection.

§ Suppressed because greater than 50% missing data (based on weighted distribution).

‡ Suppressed because fewer than five inmates reported the characteristic.

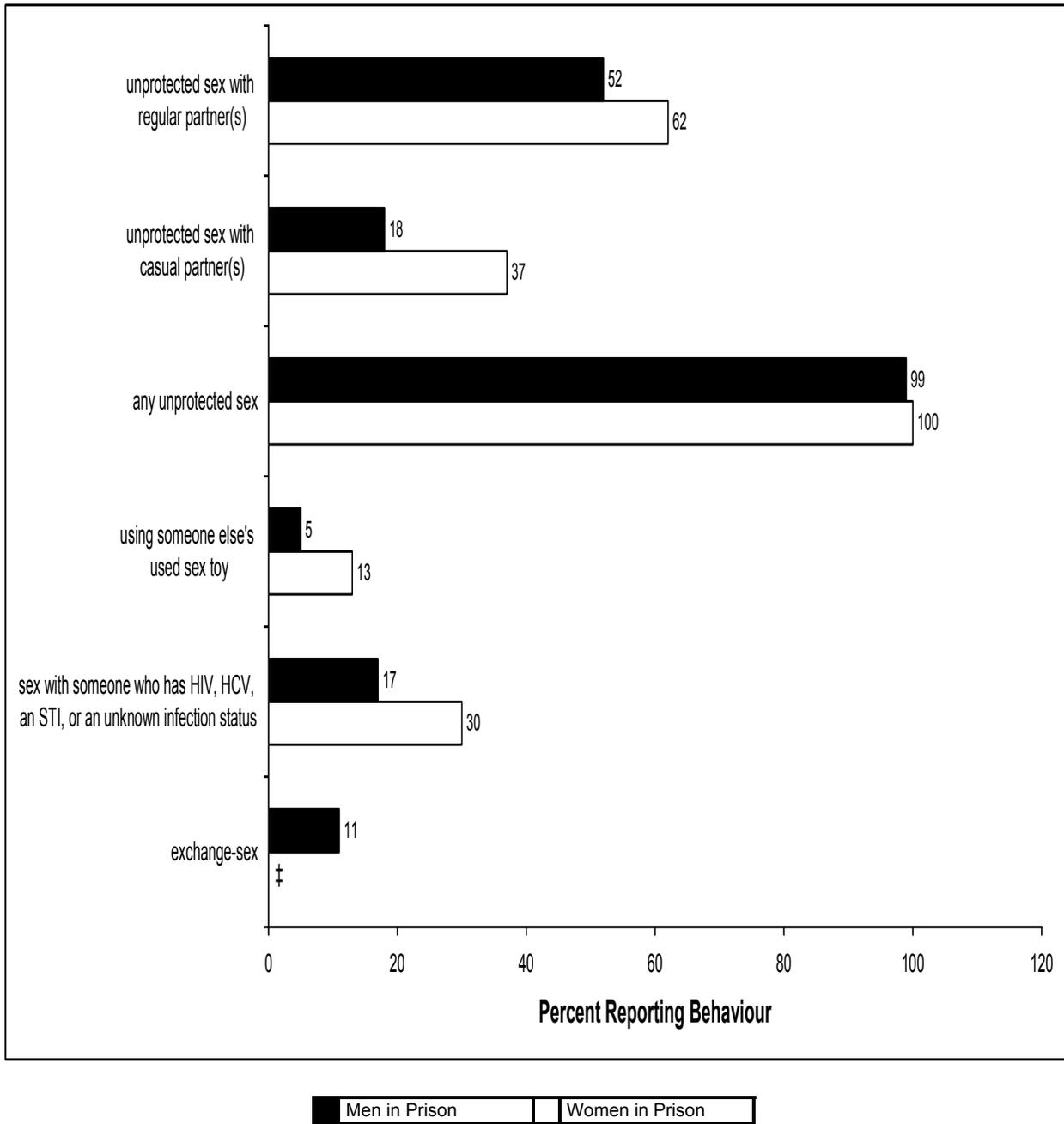
<sup>a</sup> Figure presents results for the 17% of men and 14% of women who reported injecting drugs during the past six months in prison.

## **Sexual Behaviours of Inmates who Reported having Sex during the Past Six Months in Prison**

Unprotected sex, particularly with high-risk partners, increases the risk for STIs. Among inmates who reported having sex during the past six months in prison, 99% to 100% reported at least one instance of unprotected oral, vaginal, or anal sex; and, gender differences existed for several sexual risk-behaviours (see Figure 6). Compared to men, women were significantly more likely to report unprotected sex with regular (62% vs. 52%) and casual partners (37% vs. 18%), using someone else's used sex toy (13% vs. 5%), and having sex with someone who has HIV, HCV, an STI, or an unknown infection status (30% vs. 17%).

Consistent with these findings, previous Canadian, American, European and Australian studies found rates of unprotected sex that ranged from 40% to 100% among sexually active inmates (Calzavara et al., 1997; Dolan, Bijl, et al., 2004; Dolan, Lowe, et al., 2004; Frost & Tchertkov, 2002; Hogben et al., 2001; PASAN, 2003; Price Waterhouse, 1996; Rotily et al., 2001). Thus, both the NIIDRBS and previous research have identified unprotected sex as a source of infection transmission among inmates who have sex in prison.

Figure 6. Sexual Behaviours by Gender for Canadian Federal Inmates who had Sex during the Past Six Months in Prison<sup>a</sup>



Note. Exchange-sex involves the exchange of sex for money, drugs, injecting equipment or goods. HIV = human immunodeficiency virus; HCV = hepatitis C virus; STI = sexually transmitted infection.

‡ Suppressed because fewer than five inmates reported the characteristic.

<sup>a</sup>Figure presents results for the 17% of men and 31% of women who reported having sex during the past six months in prison.

## **AWARENESS OF AND USE OF HARM-REDUCTION ITEMS FOR STIs**

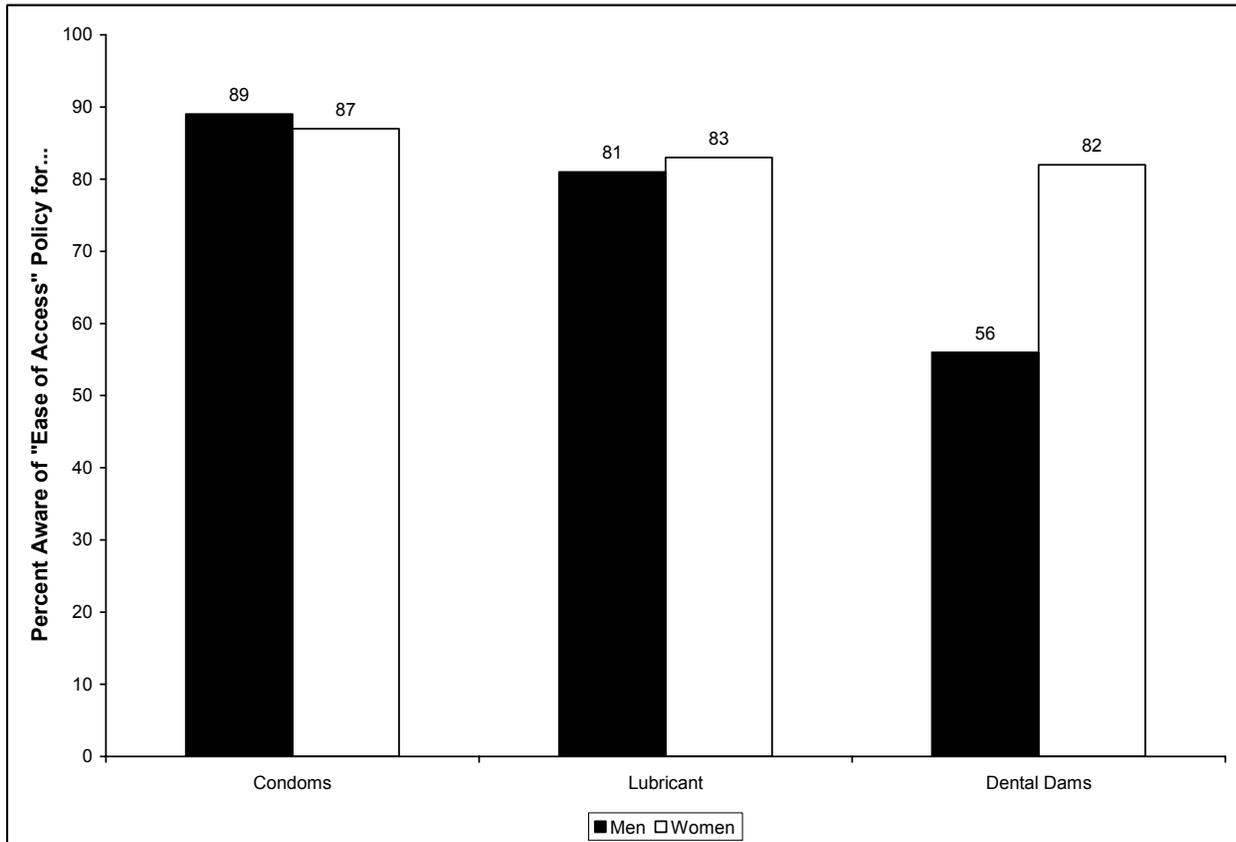
STIs can cause serious health and reproductive complications. Because STIs are commonly asymptomatic, they frequently go undetected and untreated. Consequently, transmission can unknowingly continue through unprotected sexual activity (PHAC, 2006, 2007b; CDC, 2005, 2006a, 2006b). Moreover, the risk of acquiring and transmitting HIV through sexual contact is increased in the presence of other STIs (PHAC, 2007a, 2007b).

Since some inmates engage in sexual activity while in prison, CSC policy directs that condoms, lubricant, and dental dams be “readily and discreetly” accessible to inmates to prevent the spread of STIs (CSC, 2004). This section of the report provides information on inmate awareness of CSC’s policy regarding harm-reduction items for STIs. Further, it details the use of and barriers to harm-reduction items among inmates having sex during the past six months in prison.

### **Awareness of Harm-Reduction Items for STIs**

Eighty-nine percent of inmates (men 89%, women 87%) were aware of CSC’s policy to provide condoms which are key to preventing STIs, and 81% (men 81%, women 83%) were aware of the policy to provide lubricant. Men, however, were less aware than women of the policy in regards to dental dams (men 56%, women 82%) (see Figure 7).

Figure 7. Percent of Canadian Federal Inmates Aware of CSC's Policy about Ease of Access to Condoms, Lubricant and Dental Dams by Gender

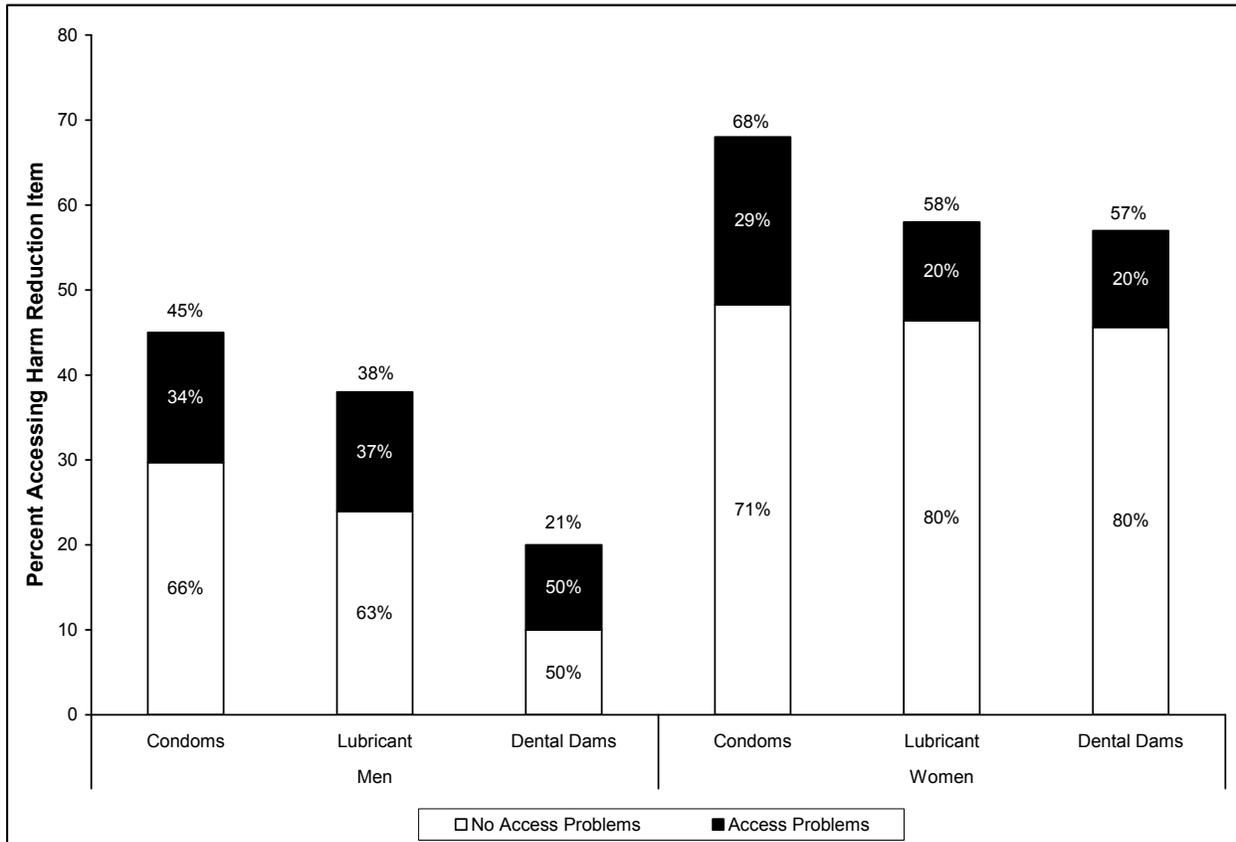


Among sexually active inmates, 57% had tried to access at least one harm-reduction item; and, a greater proportion of women than men had tried to access each of the harm-reduction items (see Figure 8).

### **Access Issues for Harm-Reduction Items for STIs**

Some sexually active inmates who tried to get harm-reduction items reported access issues, with men experiencing more problems accessing lubricant and dental dams than women (see Figure 8). For example, among sexually active inmates who tried to get dental dams, 50% of men reported access issues compared to 20% of women. This finding is consistent with previous CSC research which found that access to dental dams was restricted to Health Care Centres and Visits and Correspondence areas in male institutions, but were available throughout women's institutions (CSC, 1999).

Figure 8. Percent of Sexually Active Inmates<sup>a</sup> Accessing Condoms, Lubricant and Dental Dams in Canadian Federal Prisons by Gender

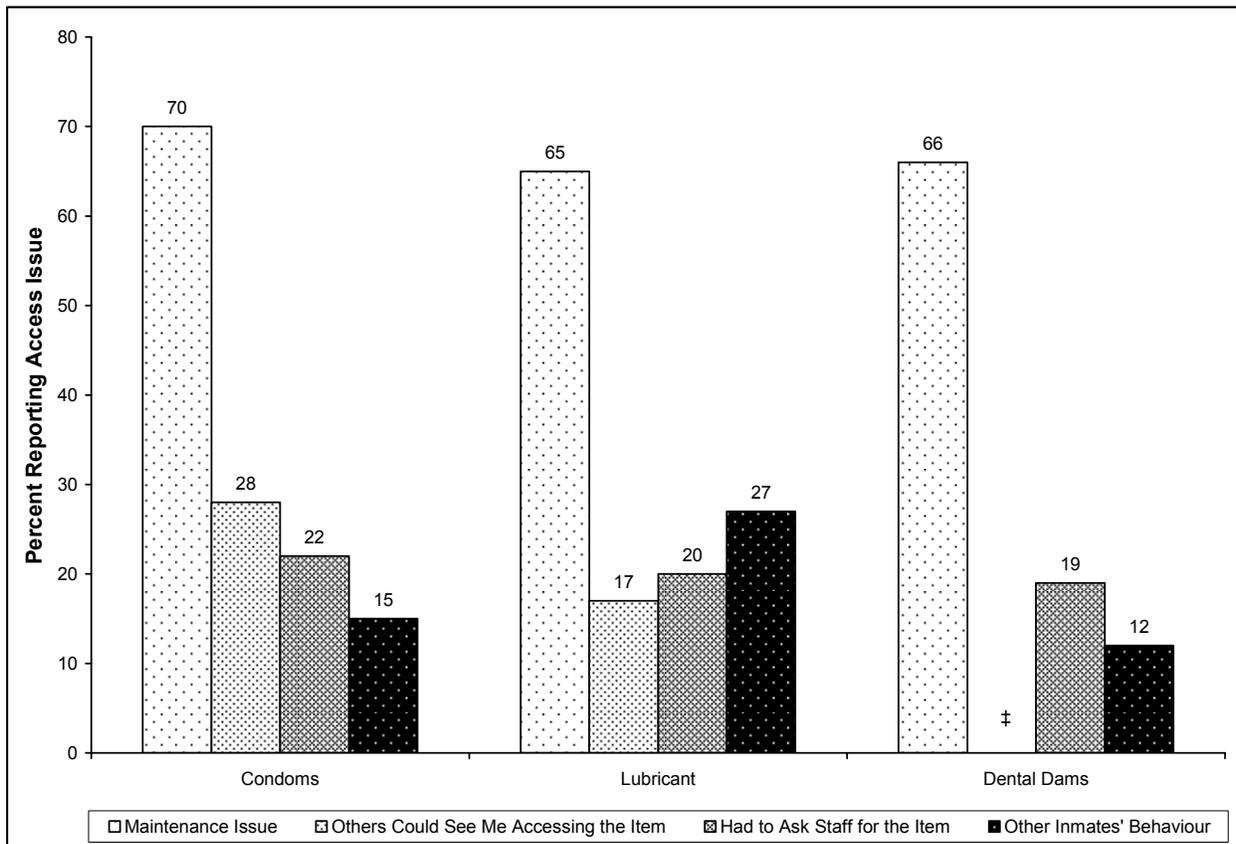


<sup>a</sup> Figure presents results for the 17% of men and 31% of women who reported having sex during the past six months in prison.

For each of the harm-reduction items, the primary access problem was generally a maintenance issue (i.e., dispensers<sup>6</sup> that were broken, empty, or providing damaged items) (see Figure 9). Among women, having to ask staff for condoms was also a primary access issue (42%, data not shown). CSC (1999) and PASAN (2003) have previously identified maintenance issues in federal penitentiaries, but they did not quantify their magnitude.

<sup>6</sup> In many institutions bowls are used as dispensers.

Figure 9. Access Issues Experienced by Sexually Active Inmates Reporting Problems Getting Condoms, Lubricant, and Dental Dams<sup>a</sup> in Canadian Federal Prisons



Note. Inmates could choose multiple reasons. Maintenance issues include dispensers that were empty, broken and/or providing damaged goods. Other inmates' behaviour includes other inmates hoarding and/or limiting access.

‡ Suppressed because fewer than five inmates reported the access issue.

<sup>a</sup> Figure presents results for inmates reporting problems getting condoms (3%), lubricant (2%), and dental dams (2%).

### Association between Demand for Harm-Reduction Items for STIs and Risk-Behaviours

Among sexually active inmates, demand for harm-reduction items was associated with several sexual risk-behaviours. First, inmates who reported sex with someone who had a positive or unknown STI status were more likely to try to get harm-reduction items than inmates not reporting this behaviour (81% vs. 56%). Second, compared to inmates who did not report exchange-sex (i.e., the exchange of sex for money, drugs, injecting equipment or goods), those who did were more likely to try to get harm-reduction items (54% vs. 94%). Finally, inmates reporting at least one instance of unprotected sex with a casual partner were more likely to try to get harm-reduction items compared to inmates not reporting this behaviour (73% vs. 58%).

These findings suggest that inmates who engage in high-risk sexual behaviours are more likely to access harm-reduction items than inmates who do not. That is, harm-reduction items for STIs are being used as intended by inmates. There is, however, an opportunity to optimize use by reducing access issues and determining, through future research, why some inmates do not use harm-reduction items that are available.

## **AWARENESS OF AND USE OF BLEACH FOR NON-STERILE INJECTING, TATTOOING AND PIERCING EQUIPMENT**

The use of non-sterile equipment for injecting drugs, tattooing, and piercing is a risk factor for the transmission of blood-borne infections such as HIV and HCV. Since some inmates engage in these risk-behaviours in prison, CSC directs that bleach be “readily and discreetly” accessible to inmates for the cleaning of their non-sterile equipment (CSC, 2004). This section of the report provides information on inmate awareness of CSC’s policy regarding bleach, and details the use of and reported barriers to bleach in CSC facilities.

### **Awareness of and Use of Bleach**

Eighty-seven percent of inmates were aware of CSC’s policy regarding bleach, and 57% (men 57%, women 63%) had tried to get bleach at least once during the past six months in prison (see Figure 10). The disproportionately high demand for bleach in comparison to the proportion of inmates injecting, tattooing and/or piercing in prison is often explained by its use as a personal hygiene and general cleaning agent (PASAN, 2003).

### **Access Issues for Bleach**

Thirty-seven percent of men and 28% of women who tried to get bleach reported an access issue (see Figure 10). Among inmates reporting access issues, the primary problem was maintenance issues such as empty or broken dispensers or diluted bleach (Men 69%, Women 48%) (see Figure 11). Additionally, 48% of women reported having to ask staff for bleach. These problems have been noted in other examinations of bleach use by inmates in Canadian prisons (CSC, 1999; PASAN, 2003; Small et al., 2005).

Figure 10. Demand for and Problems Accessing Bleach among Canadian Federal Inmates by Gender

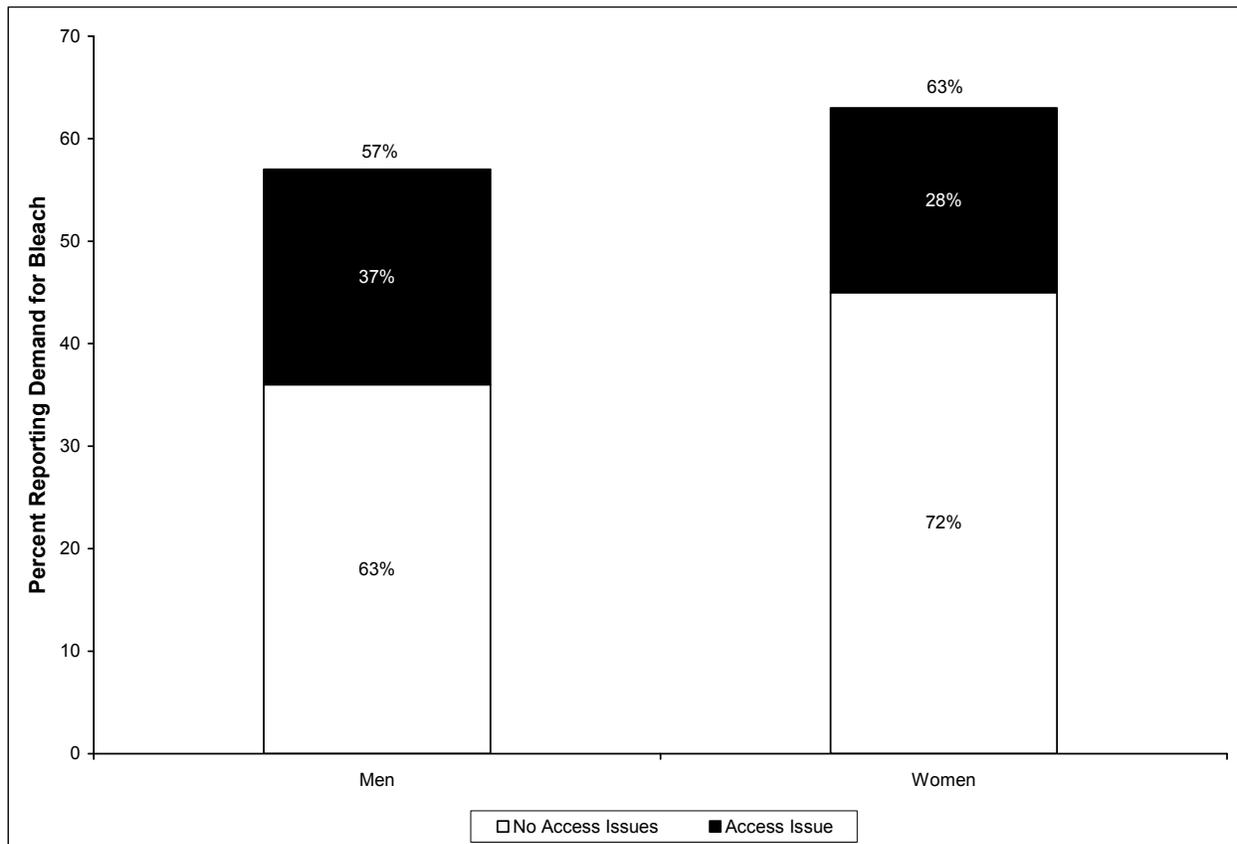
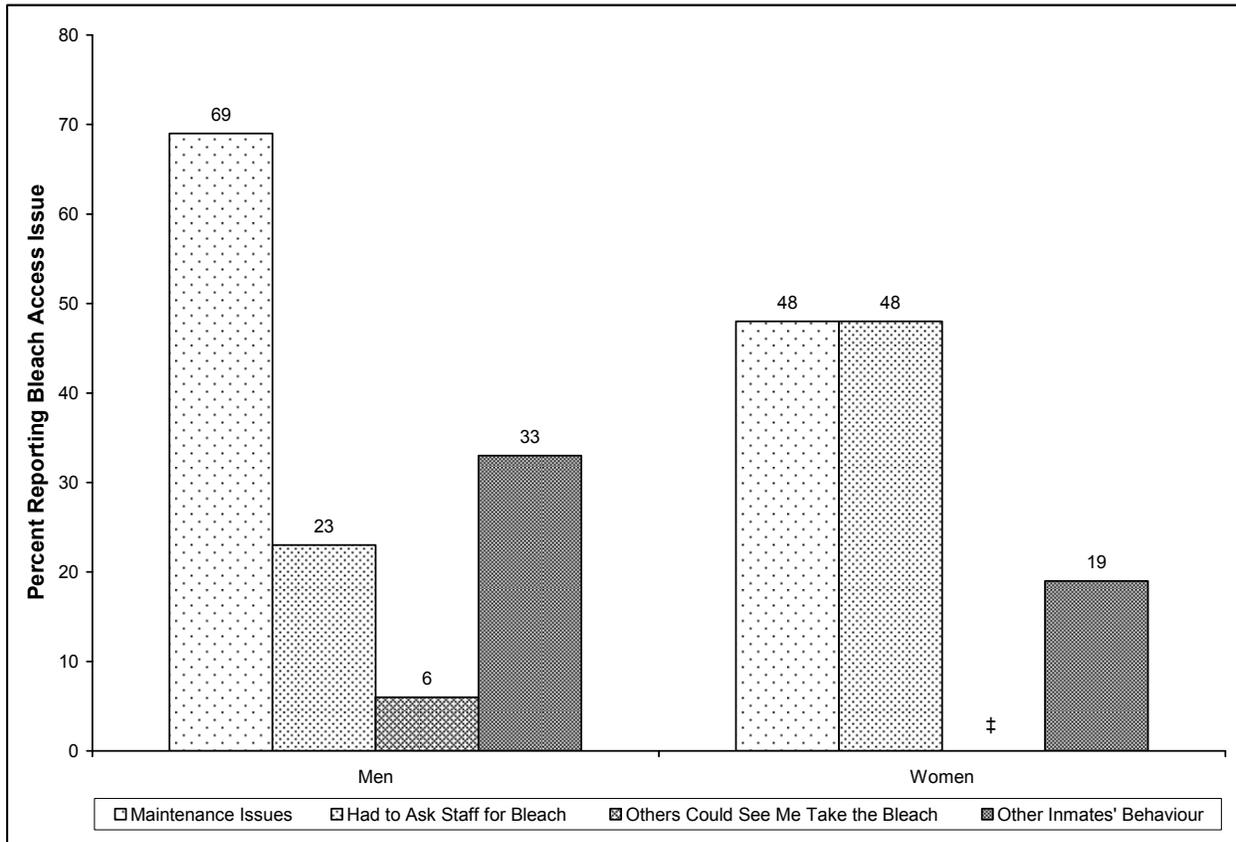


Figure 11. Access Issues Experienced by Gender among Canadian Federal Inmates Reporting Problems Getting Bleach

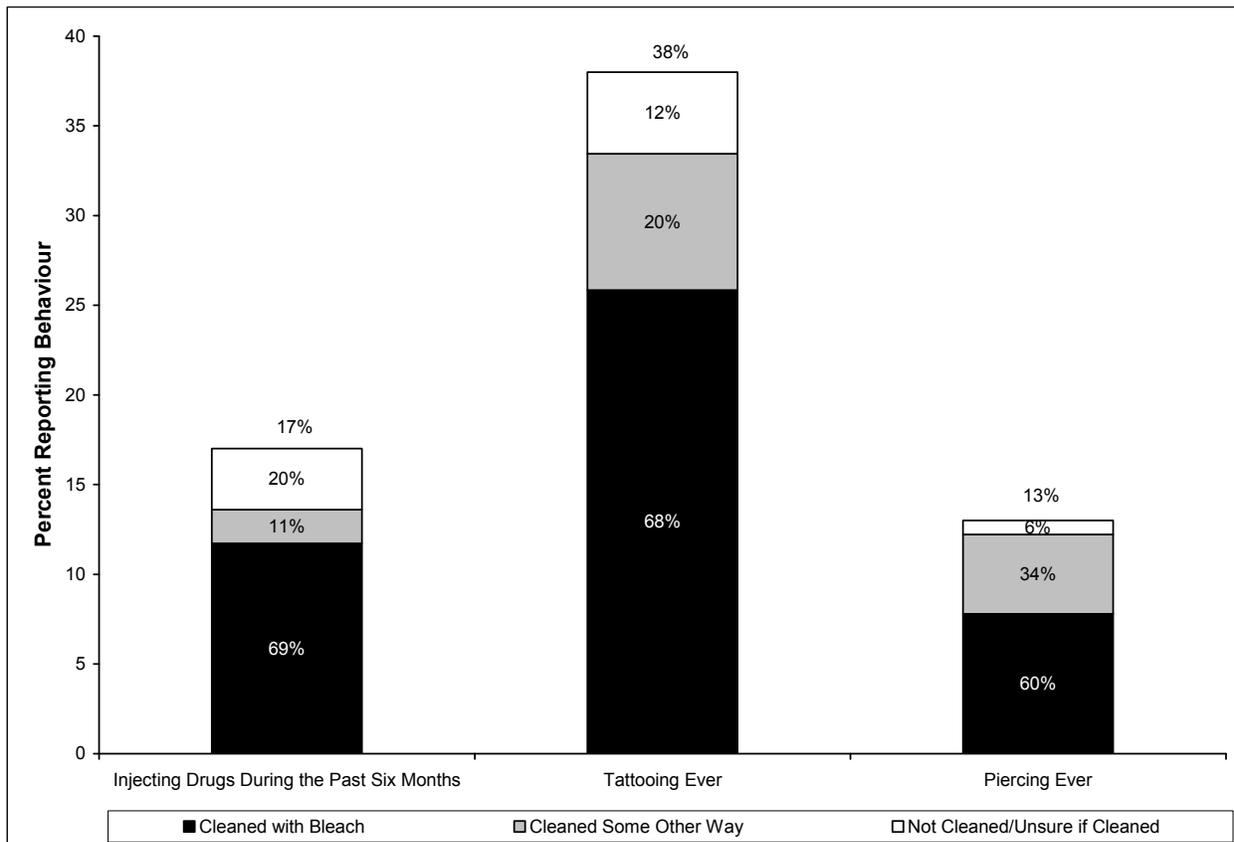


Note. Inmates could choose multiple reasons. Maintenance issues include dispensers that were empty, broken and/or providing diluted bleach. Other inmates' behaviour includes other inmates hoarding and/or limiting access. ‡ Suppressed because fewer than five inmates reported the access issue.

### Bleach Use for Injecting, Tattooing and/or Piercing Equipment

In regards to using bleach as a cleaning agent for injecting, tattooing and/or piercing equipment, the majority of inmates who engaged in these activities at CSC reported cleaning the equipment with bleach (see Figure 12). Sixty-nine percent of inmates who injected drugs during the past six months in prison cleaned the needle with bleach at last injection. This is consistent with the findings of Calzavara et al. (2003) and Martin et al. (2005) who observed that the majority of inmates who injected drugs cleaned the equipment with bleach. The tendency to clean needles, however, increased with time served. Inmates who had served more than a year of their current sentence were more likely to clean their needles with bleach at last injection compared to those who had served less time (77% vs. 54%).

Figure 12. Reported Injecting, Tattooing, or Piercing in Prison by Equipment Cleaning Practices for Canadian Federal Inmates



Note. Inmates were asked about injection drug use during the past 6 months in federal prison and about ever obtaining a tattoo or piercing on a federal prison range.

Among inmates who ever obtained a tattoo and/or piercing on a CSC prison range, 68% and 60%, respectively, reported the equipment was cleaned with bleach each time they used it. These findings are consistent with previous Canadian research that found approximately 70% of inmates receiving tattoos or piercing(s) in a federal or provincial correctional facility used cleaned equipment (Alary, Godin, & Lambert, 2005; Calzavara et al., 1997; Price Waterhouse, 1996).

Finally, among inmates injecting drugs in prison, those engaging in risky injecting practices were more likely to try to get and use bleach. Specifically, compared to inmates who did not inject with someone else’s used needle, those who did were more likely to try to get bleach (70% vs. 89%) and clean their needle with bleach at last injection (44% vs. 83%).

Thus, the majority of inmates injecting, tattooing and/or piercing in prison are using bleach to clean their equipment. Further, among inmates injecting drugs in prison, those

engaging in risky injecting practices are more likely to use bleach than those who do not report risky injecting practices. These findings suggest that bleach is being used as intended by inmates. There is, however, an opportunity to optimize use by reducing access issues and determining, through future research, why some inmates do not use bleach that is available.

## **IN-PRISON USE OF THE METHADONE MAINTENANCE TREATMENT PROGRAM (MMTP)**

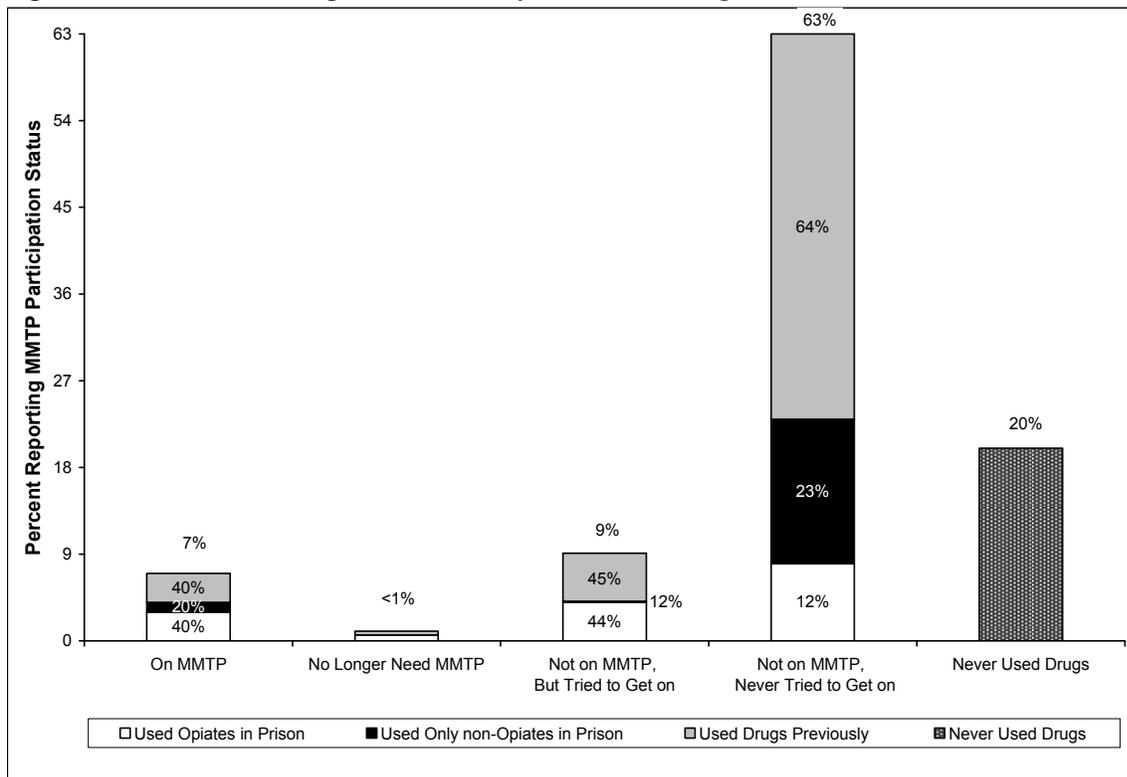
Consistent with the addictive nature of opiates, previous research has found that injecting opiates in the community is strongly associated with injecting drugs in prison; and, that the most commonly injected drugs in prison are opiates (Calzavara et al., 2003). The NIIDRBS found that a minority of inmates (men 17%, women 14%) injected drugs during the past 6 months in prison, but that the majority of those who injected (87%) reported opiates as one of their most frequently injected drugs. Further, opiate use was associated with using non-sterile injecting equipment. For example, compared to inmates injecting other drugs, those injecting opiates were more likely to use someone else's used needle (48% vs. 81%) and works (36% vs. 59%). These high-risk behaviours associated with opiate injection can transmit blood-borne infections such as HIV and HCV. To attenuate this risk, CSC's MMTP provides methadone, an approved treatment for people severely addicted to opiates. CSC's MMTP complies with all provincial Colleges of Physicians and Surgeons and Health Canada Standards.

This section of the report provides information on MMTP participation and associated drug use in federal penitentiaries. Further, for those inmates not currently on MMTP but previously trying to access the program at CSC, reasons for not being on MMTP in CSC are explored.

### **In-Prison Use of MMTP**

Seven percent of all inmates reported being on MMTP (see Figure 13), a rate consistent with CSC's estimate at the time of the survey. Additionally, 9% of inmates reported not being on MMTP but previously trying to get on the program at CSC. The remaining inmates reported no longer needing the program (less than 1%), never trying to get on the program at CSC (63%), or never using drugs (20%).

Figure 13. MMTP Participation Status by In-Prison Drug Use for Canadian Federal Inmates



Note. MMTP = methadone maintenance treatment program.

### Relationship between MMTP Participation Status and In-Prison Drug Use

MMTP participation status was associated with in-prison drug use. Among inmates on MMTP, 60% had not used opiates in the past six months while 40% continued to use (see Figure 13). The continued but less frequent use of opiates among MMTP participants has been noted in other incarcerated populations (Dolan, Hall, & Wodak, 1996; Dolan et al., 2003; Heimer et al., 2006; Magura, Rosenblum, Lewis, & Joseph, 1993) and in the community. Similarly, of those who were not on MMTP but had tried to get on the program, about 44% used opiates in the past six months in prison. Conversely, among inmates who never tried to get on MMTP at CSC, 12% reported opiate use. This subgroup of opiate users who have never tried to get on MMTP at CSC represent about 8% of the total inmate population (8% = 12% who used opiates X 63% who have never tried to get on MMTP at CSC). It is important to note that this examination of MMTP participation and drug use is limited by the cross-sectional design of the survey. This design makes it difficult to assess how drug use affects MMTP participation and how program

participation affects subsequent drug use.

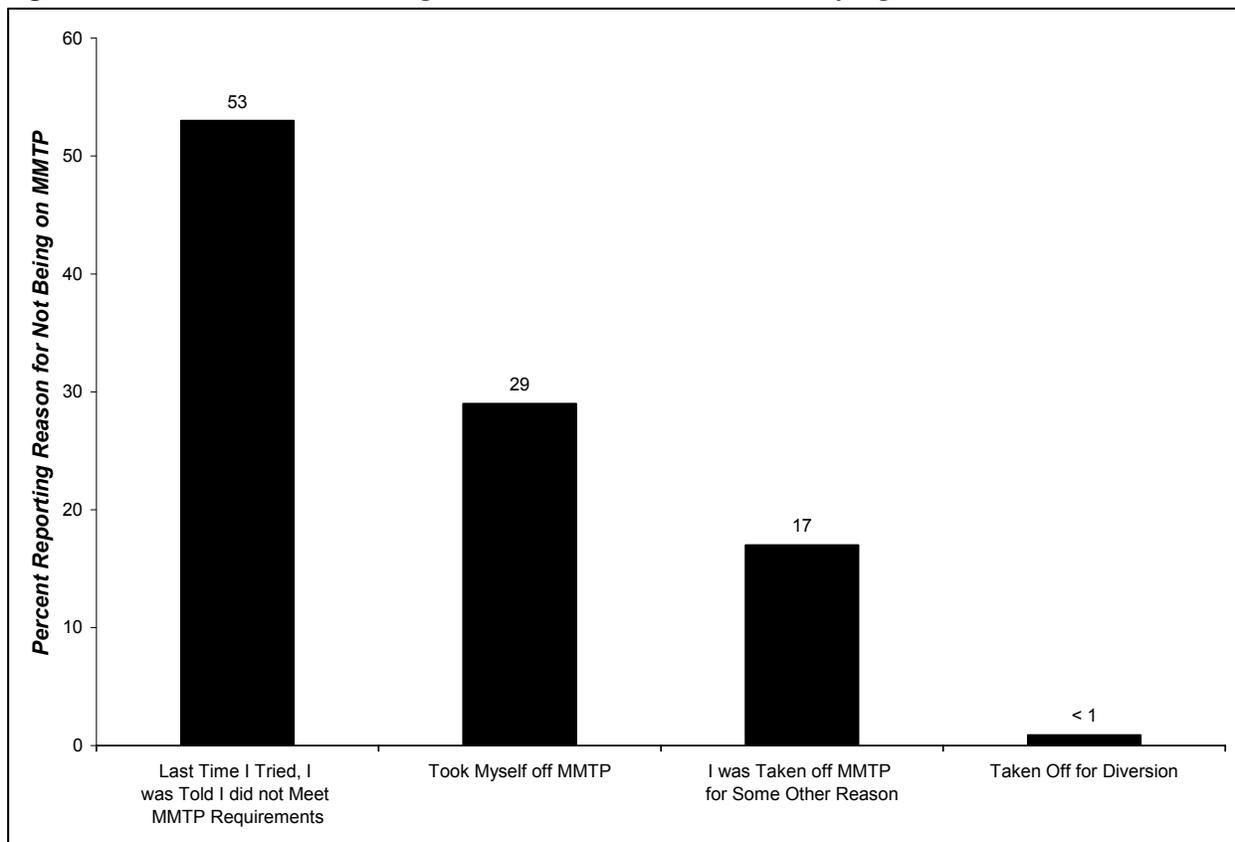
### **Reasons for Not Being on MMTP among Inmates Ever Trying to Get on MMTP at CSC**

Inmates who were not on MMTP at the time of the survey but had tried to get on the program at CSC fell into two main groups:

- 1) those who failed to satisfy the requirements of MMTP (53%); and,
- 2) those who were previously on MMTP and either took themselves off or were taken off (47%) (see Figure 14).

The proportion failing to satisfy requirements should be interpreted cautiously because the NIIDRBS did not enquire as to why requirements were not met. Possible reasons include the gradual introduction of MMTP at CSC and a lack of opiate addiction. MMTP was implemented in two phases at CSC. The first phase, started in 1997, restricted MMTP to inmates who had been on it in the community. Since 2002, CSC has been initiating MMTP for eligible inmates. Among inmates failing to satisfy MMTP criteria, only 40% reported in-prison use of opiates at the time of survey completion. This subgroup of present opiate users who failed to satisfy MMTP requirements represent less than 2% of the total inmate population or approximately 260 inmates (1.9% of 13,701 inmates). To identify access issues, future research should examine why some inmates who use opiates fail to satisfy program requirements.

Figure 14. Reasons for Not Being on MMTP for Inmates Ever Trying to Get on MMTP at CSC<sup>a</sup>



Note. MMTP = methadone maintenance treatment program; CSC = Correctional Service Canada.

<sup>a</sup> Figure presents results for the 9% of inmates who were not on MMTP but had tried to get on the program at CSC.

## **RELATIONSHIP BETWEEN HEALTH EDUCATION PROGRAMS, KNOWLEDGE OF HIV AND HCV, AND RISK AND HARM-REDUCING BEHAVIOURS**

For inmates to make informed decisions about risk-behaviours, such as injection drug use and unprotected sex, they require knowledge regarding how infectious diseases are transmitted and prevented. Such knowledge is particularly important in penal environments where an elevated prevalence of BBSTIs (CSC, 2008; De, Connor, Bouchard, & Sutherland, 2004; Ford et al., 2000; PHAC, 2005; UNAIDS, 2006; Zou, Tepper, & Giulivi, 2001) increases the risk of transmission should inmates engage in these risky behaviours.

At CSC, there are several avenues whereby inmates can learn about infectious diseases, such as guest speakers from community organizations, one on one counselling from nurses, and participation in health education programs. In this section of the report, inmates' participation in health education programs is detailed and their knowledge of HIV and HCV is quantified. Thereafter, the relationship between knowledge and risk and harm-reducing behaviours is explored.

### **Participation in Health Education Programs**

CSC provides inmates with several health education programs: Reception Awareness Program, Choosing Health in Prisons Program, and the National HIV/AIDS Peer Education and Counselling Program (see Appendix A for details). In addition to a variety of other topics, these programs provide information regarding infectious diseases and health services offered at CSC.

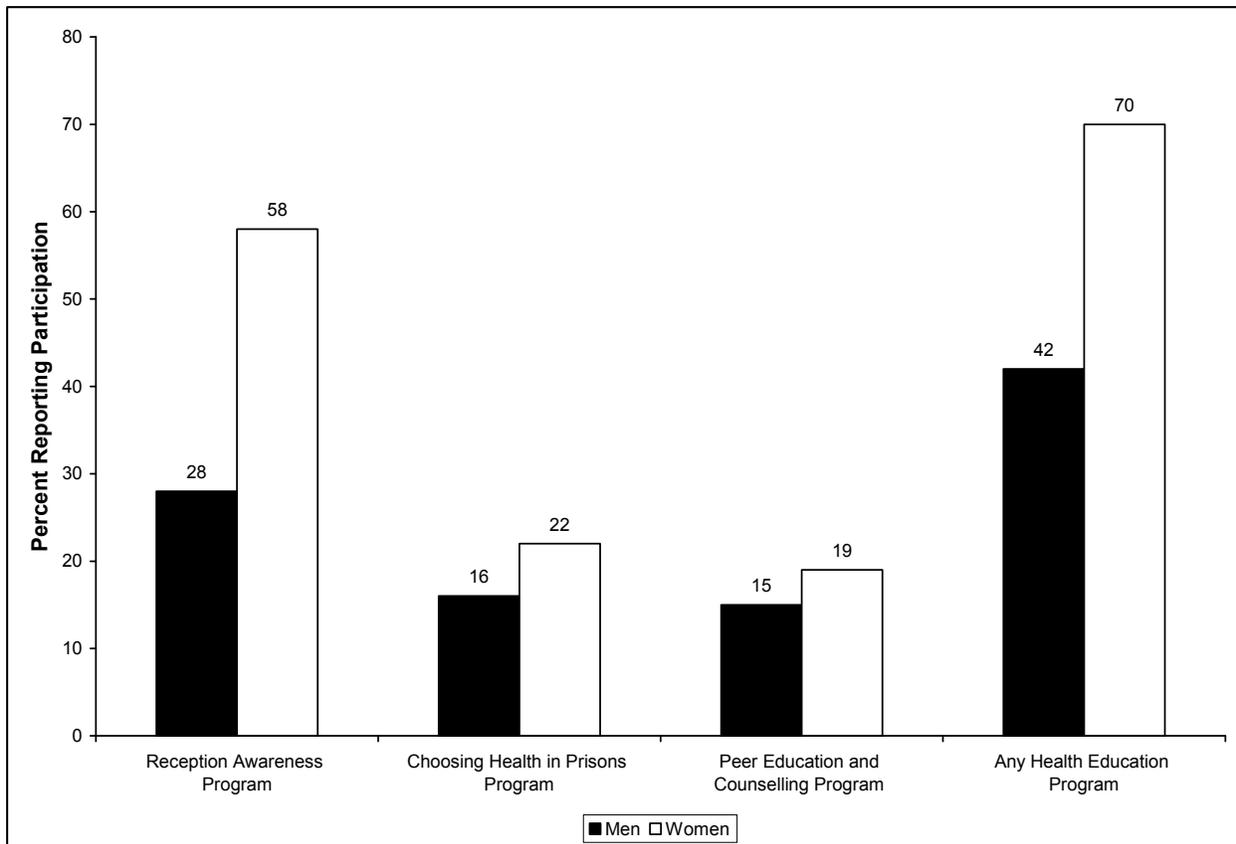
The NIIDRBS asked inmates if they had ever participated in each of these health education programs. Twenty-eight percent of men and 58% of women reported participating in the Reception Awareness Program (see Figure 15). Unfortunately, this may be an underestimate of participation as the program is sometimes offered under different names so some inmates may not have realized they had participated. CSC surveillance data suggests the participation rate in the Reception Awareness Program may be as high as 73% for new admissions in 2007 (personal communication with CSC Public Health Branch).

Since the Choosing Health in Prisons Program is not available in all institutions and the Peer Education and Counselling Program trains only a select number of inmates to become peer educators, low national participation rates were anticipated. Overall, 42% of men and 70% of

women reported participating in at least one of the programs offered at CSC.

Among inmates who reported not attending a program, the most frequently cited reason (cited by more than 50%) was lack of awareness of program availability. This suggests an opportunity to increase program participation by increasing program awareness, particularly among men. Other logistical considerations, however, may be limiting program participation, such as access to inmates during the admission process, competing clinical demands on nursing staff, and the availability of space for programs.

Figure 15. Participation in Health Education Programs among Canadian Federal Inmates by Gender

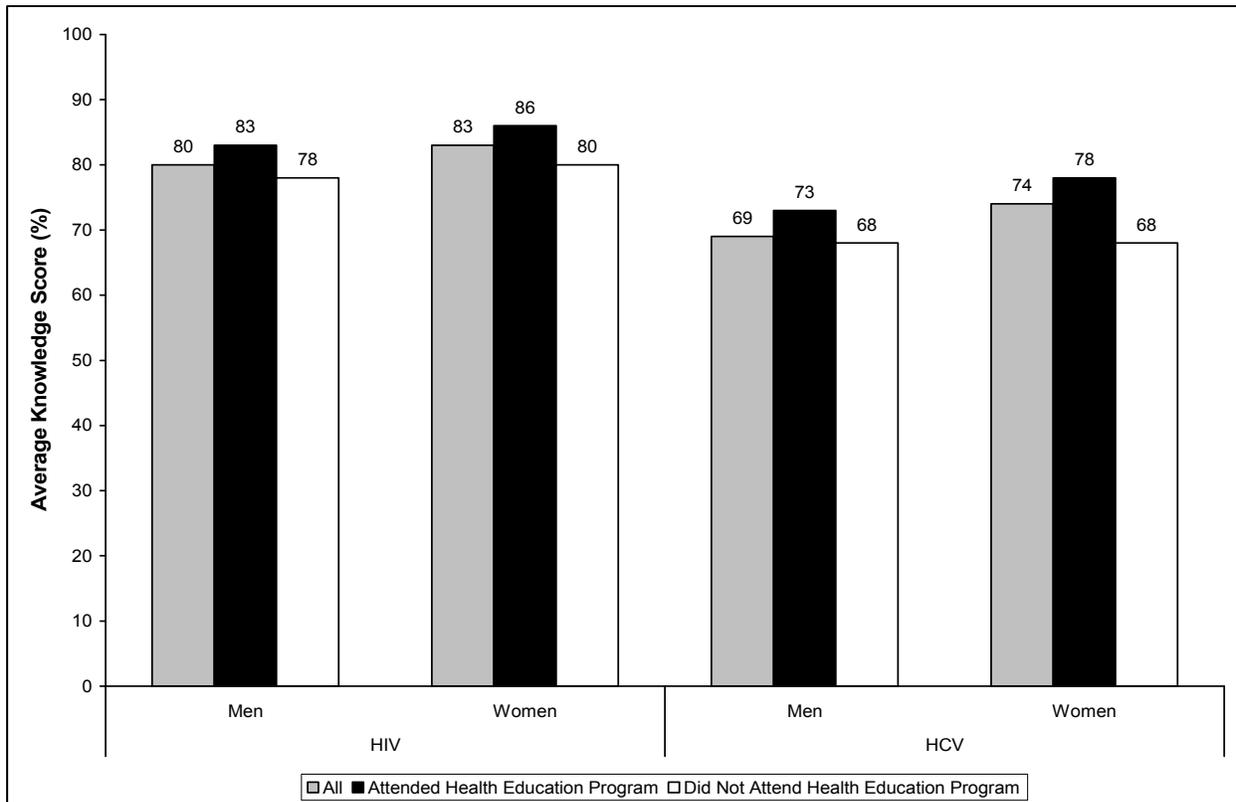


## Knowledge of HIV and HCV

The NIIDRBS examined knowledge by asking inmates 14 questions on each of HIV and HCV. These questions covered the major modes of transmission, casual contact transmission, prevention, and testing and treatment.

On average, men and women correctly answered 80% and 83% of the HIV questions and 69% and 74% of the HCV questions, respectively, suggesting greater HIV knowledge among inmates (see Figure 16). This HIV-HCV knowledge differential has been previously noted among federal women inmates (PASAN, 2003), and may reflect a greater emphasis on HIV education in both federal prison and the community.

*Figure 16. Average Knowledge Scores for HIV and HCV by Gender and Education Program Attendance for Canadian Federal Inmates*



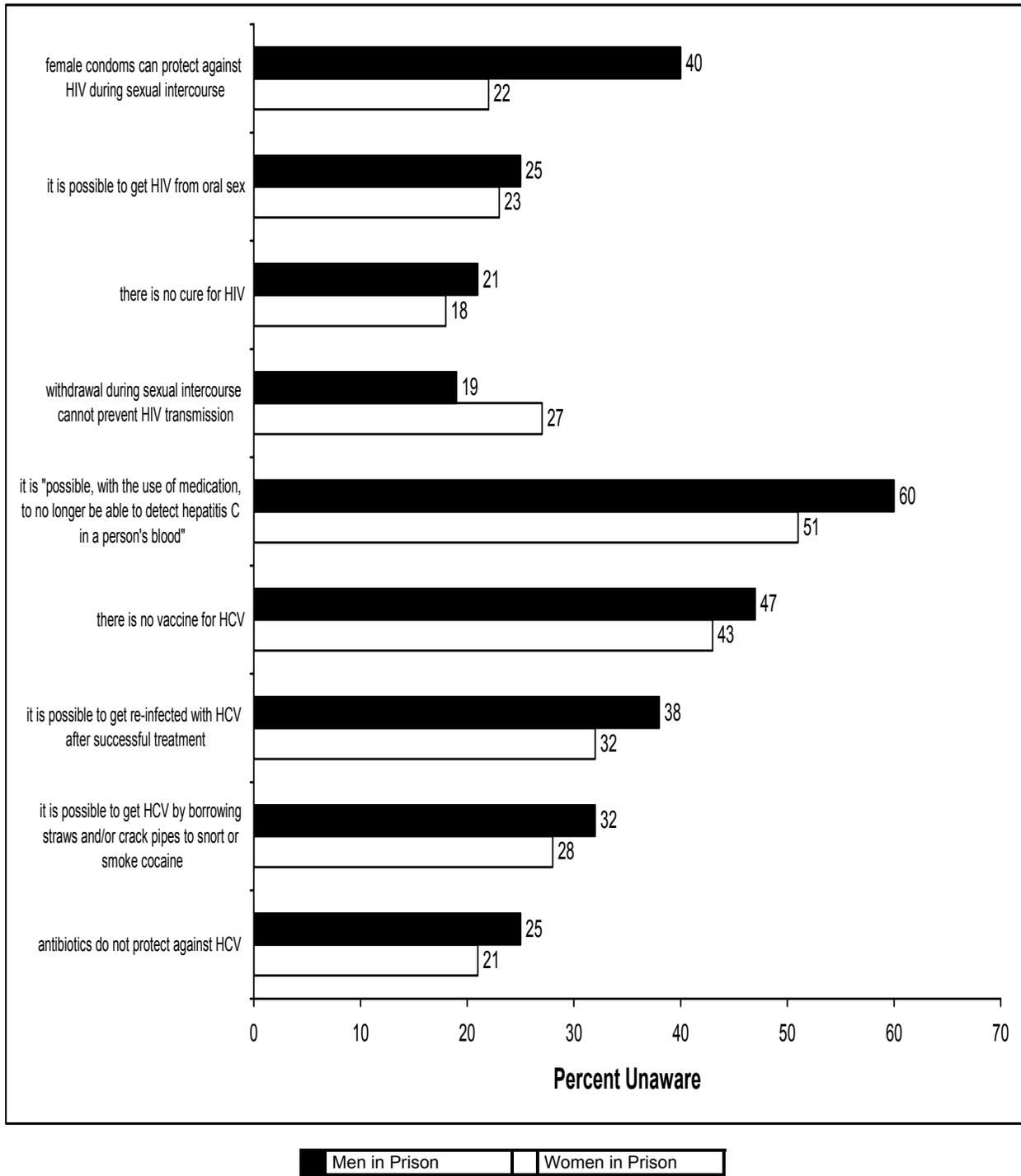
*Note.* Health education programs include: Reception Awareness Program, Choosing Health in Prisons Program, and Peer Education and Counselling Program. HIV = human immunodeficiency virus; HCV = hepatitis C virus.

Figure 16 also indicates that inmates who attended health education programs were slightly more knowledgeable than those who did not. This is consistent with American studies

demonstrating small increases in HIV knowledge among inmates after health education interventions (Bryan, Robbins, Ruiz, & O'Neill, 2006; Grinstead, Faigeles, & Zack, 1997; Ross, Harzke, Scott, McCann, & Kelley, 2006; Scott, Harzke, Mizwa, Pugh, & Ross, 2004).

Although average knowledge scores were moderate to high, examination of the individual items indicated specific knowledge deficiencies for both HIV and HCV (see Figure 17). These deficiencies, however, may not be substantially greater than that found in the general population. A 2006 community-based telephone survey conducted in Canadians older than 15 years found that approximately 11% were unaware that HIV/AIDS could not be cured. Among Aboriginal peoples, this proportion reached as high as 26% in the Inuit subpopulation (EKOS Research Associates, 2006a, 2006b). The NIIDRBS indicated that 21% of inmates were unaware there is no cure for HIV and this proportion was 24% for Aboriginal males and 19% for Aboriginal females. Furthermore, comparisons with past research involving federal women inmates suggest knowledge of transmission of HIV and HCV may have increased over time. For example, in 2001/02, approximately 54% of women were aware that HCV could be transmitted through tattooing and body piercing (PASAN, 2003) whereas the NIIDRBS indicated that 91% of women were aware of this mode of transmission. Nonetheless, the NIIDRBS has identified specific knowledge deficiencies that can be addressed in CSC's health education programs.

Figure 17. Percent of Canadian Federal Inmates Unaware of HIV and HCV Facts by Gender

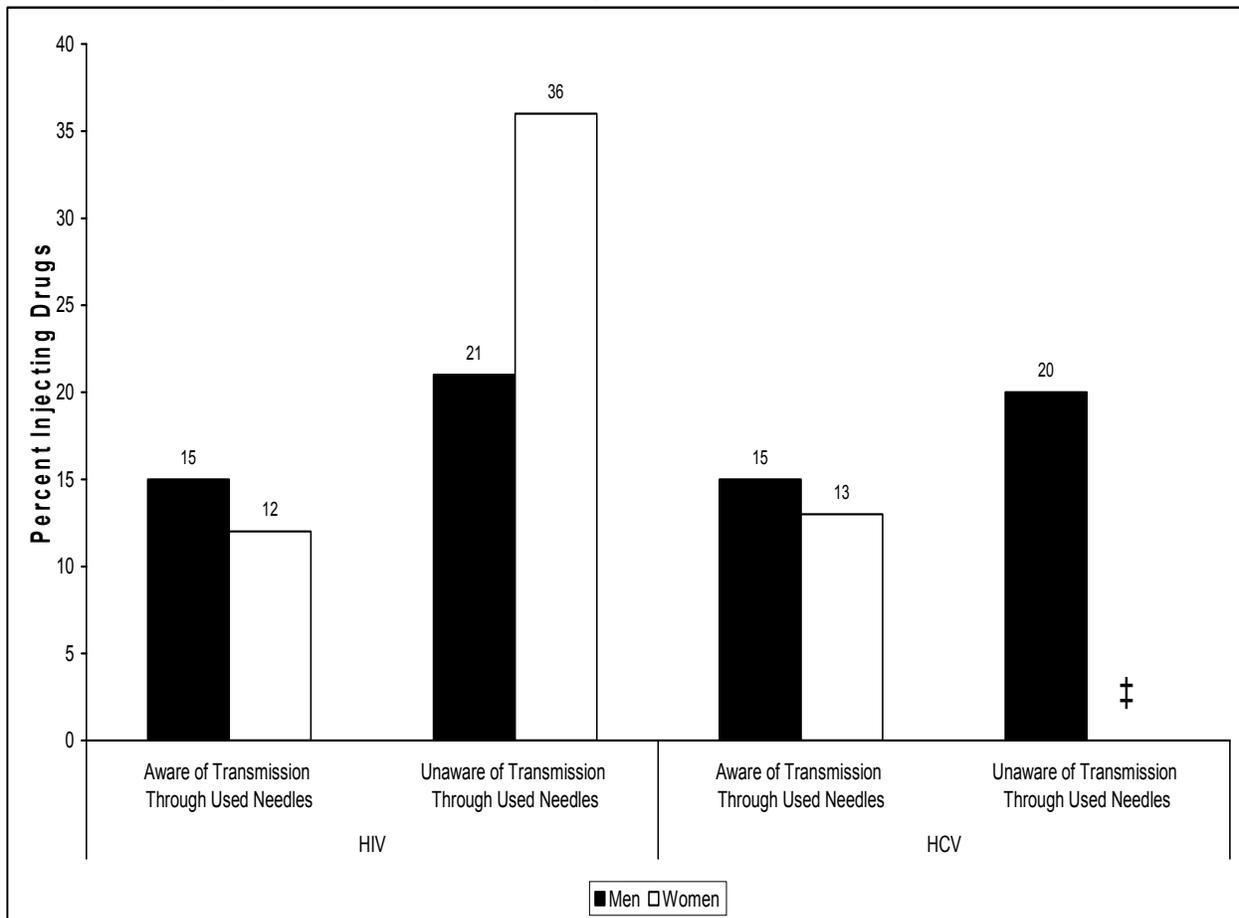


Note. HIV = human immunodeficiency virus; HCV = hepatitis C virus.

## Association between Knowledge and Behaviour

There were instances where knowledge of HIV and HCV transmission was associated with less risky behaviour. For example, inmates who were aware that HIV could be transmitted by using someone else’s used needle were significantly less likely to report injecting drugs (men 15%, women 12%) during the past six months in prison compared to those who were unaware (men 21%, women 36%) (see Figure 18). A similar, non-significant trend was observed between knowledge of HCV transmission through used needles and injecting drugs in prison.

*Figure 18.* Relationship between Knowledge of HIV and HCV Transmission and Injecting Behaviour among Canadian Federal Inmates by Gender

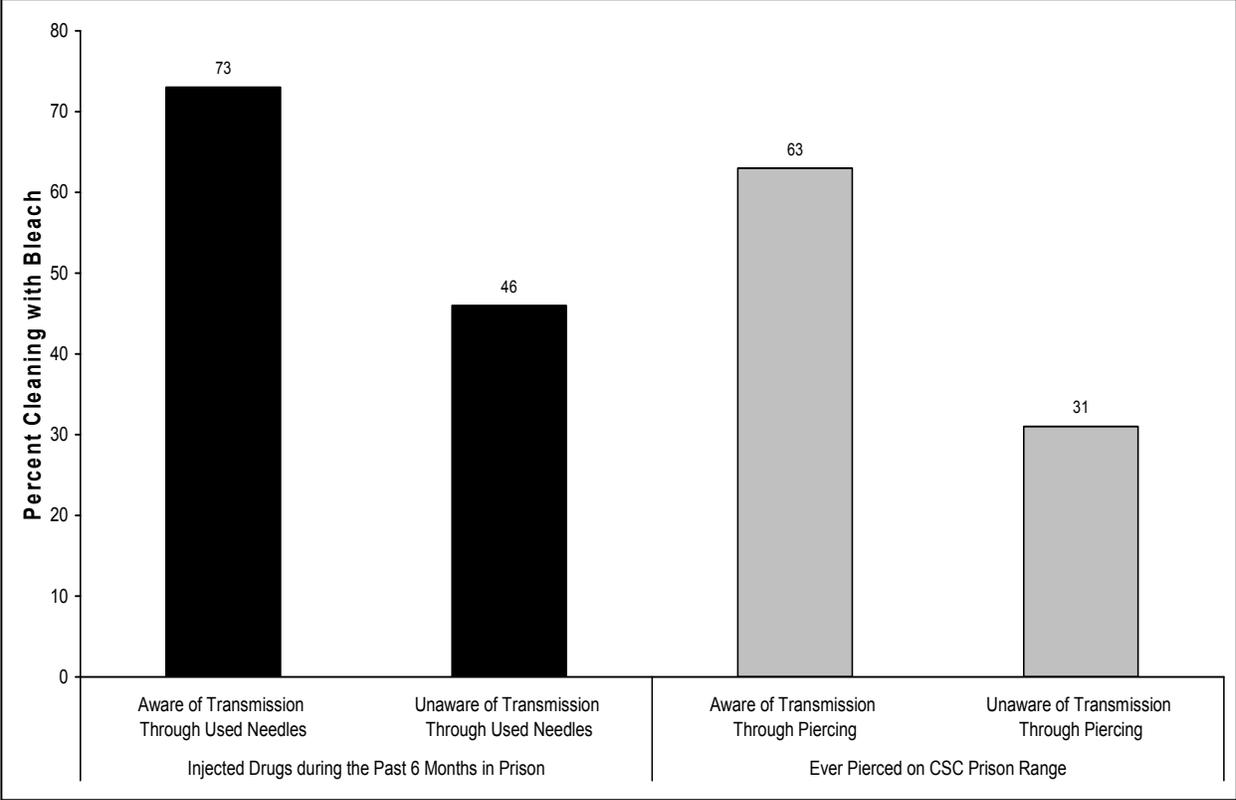


*Note.* HIV = human immunodeficiency virus; HCV = hepatitis C virus.  
 ‡ Suppressed because fewer than five inmates reported the characteristic.

Relationships were also observed between knowledge of HCV transmission and use of bleach as a disinfectant. Specifically, among men who reported injecting drugs during the past

six months in prison, 73% of those aware of the HCV transmission risk last injected with a needle cleaned with bleach compared to 46% of those who were unaware (see Figure 19). Similarly, among men ever pierced on a CSC prison range, the proportion consistently using piercing equipment cleaned with bleach was twice as high for those aware of the HCV risk compared to those unaware (63% vs. 31%). Small sample sizes prevented an assessment of these relationships among women.

Figure 19. Relationship between Knowledge of HCV Transmission and Bleach Use among Canadian Federal Male Inmates



Note. HCV = hepatitis C virus.

Hence, the NIIDRBS indicated that knowledge of HIV and HCV transmission was associated with less risky behaviour and, among those engaging in risk-behaviour, greater use of harm- reduction items.

## **HIV AND HCV TESTING AND TREATMENT AT CSC**

Testing for HIV and HCV infections ensures that those who are infected receive appropriate treatment and education, including information about how to prevent further transmission of their infection. Since incarcerated adults commonly have a higher prevalence of HIV and HCV infections than that found in the community, a public health opportunity exists to provide testing, treatment and education in a stable environment.

During the reception process at CSC, all newly admitted inmates undergo a thorough health assessment which involves screening for risk-behaviours and ascertaining infectious disease testing history. Based on this assessment of risk of infection and previous testing history, the infectious disease nurse makes recommendations regarding testing for infectious diseases. Furthermore, throughout an inmate's sentence, infectious disease testing is available upon request by the inmate or by recommendation of a healthcare professional. As is the case in the community, all testing is voluntary but strongly encouraged for those identified to be at risk of infection.

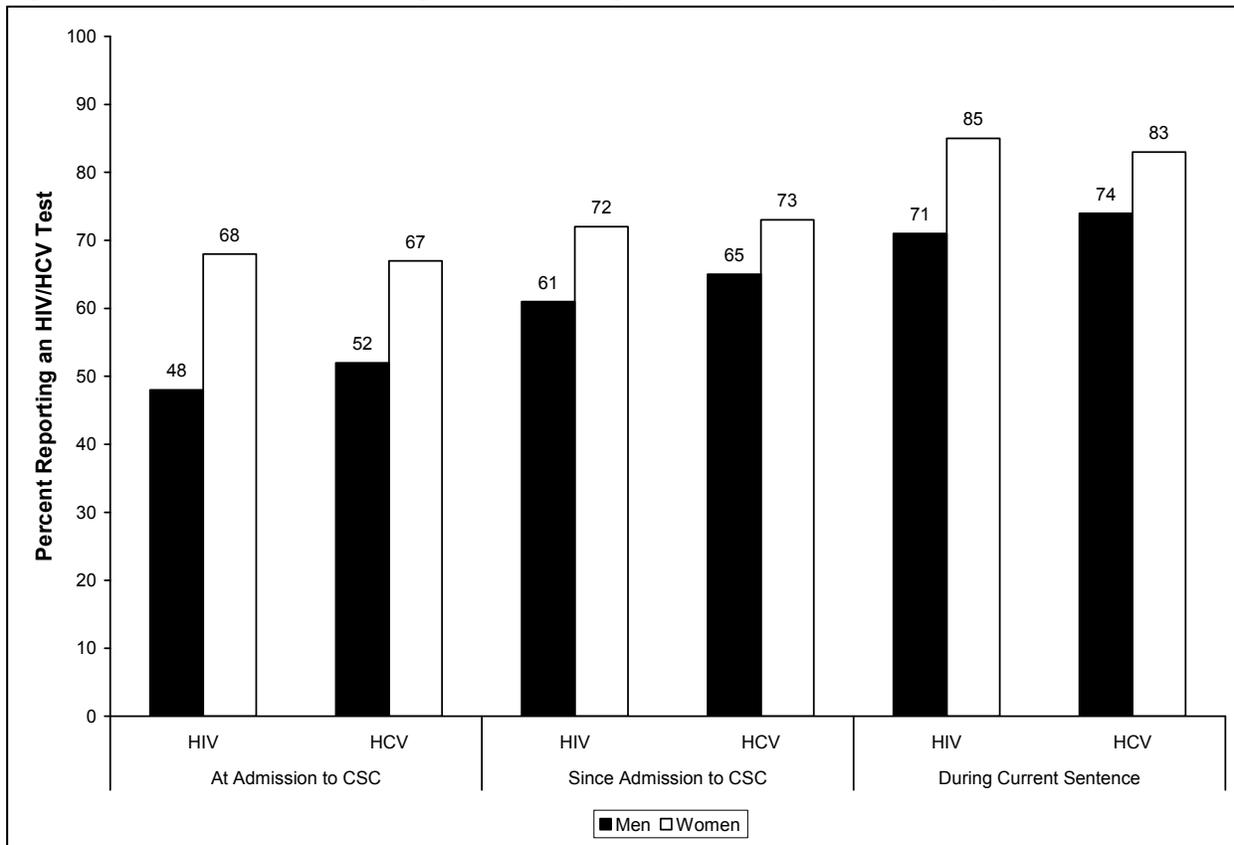
In this section of the report, barriers to and use of HIV and HCV testing and treatment at CSC are detailed. The NIIDRBS asked inmates about their HIV and HCV testing at and since admission to CSC for their current sentence, and about their HIV and HCV treatment experiences at CSC.

### **Testing at CSC**

About half of all inmates reported being tested for HIV (49%) and HCV (53%) at their most recent admission to CSC, but differences existed by gender and Aboriginal self-identification (see Figure 20). At admission, testing was more common among women (HIV 68%, HCV 67%) than men (HIV 48%, HCV 52%), and more common among non-Aboriginal women (HIV 73%, HCV 71%) than Aboriginal women (HIV 58%, HCV 61%).

About two-thirds of all inmates reported being tested for HIV (62%) and HCV (65%) since admission to federal prison, and gender differences continued. Again, women were more likely than men to be tested for HIV (72% vs. 61%) and HCV (73% vs. 65%).

Figure 20. HIV and HCV Testing at CSC among Canadian Federal Inmates by Gender



Note. HIV = human immunodeficiency virus; HCV = hepatitis C virus; CSC = Correctional Service Canada.

### ***Reasons for Not Being Tested at or since Admission to CSC***

Inmates who were not tested for HIV and HCV were asked their reasons for not being tested (see Figure 21). Although the proportion citing they were not offered a test declined after admission for both HIV (65% to 44%) and HCV (63% to 46%), it was still the most frequently reported reason for not being tested since admission. Further, men were more likely than women to report this reason for both HIV and HCV at and since admission.

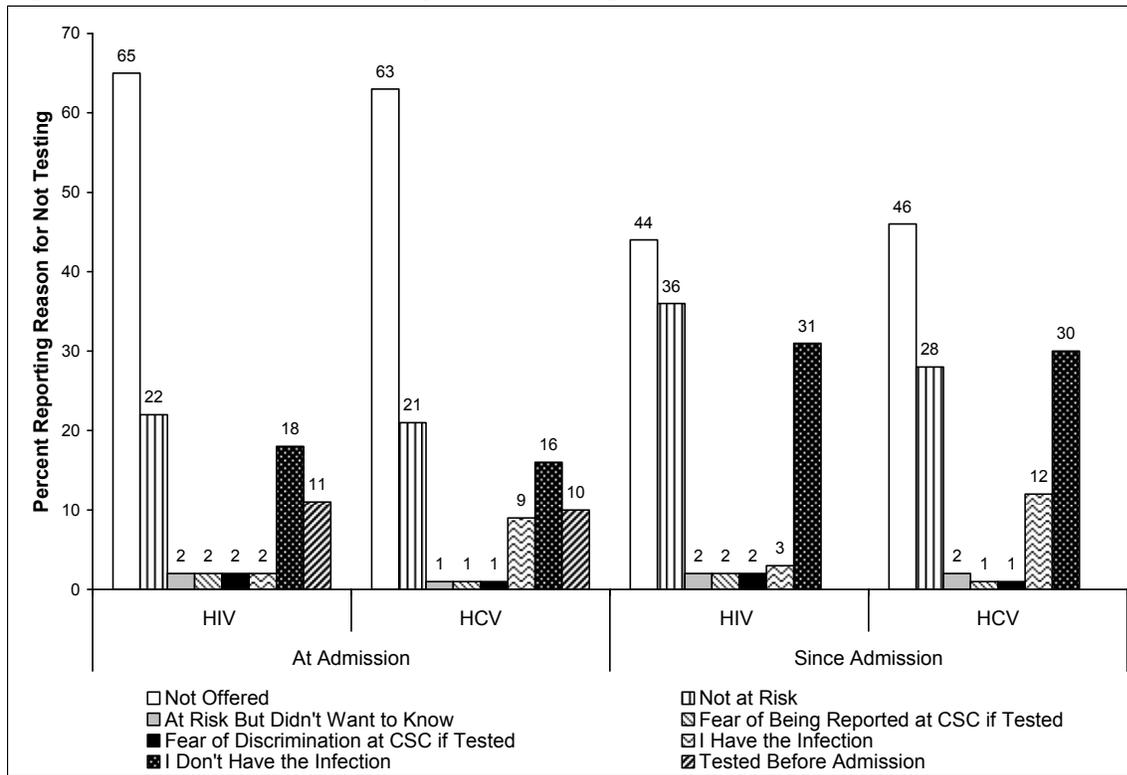
Another frequently cited reason for not being tested for HIV or HCV at CSC was perceived lack of risk. Approximately one in five cited this rationale at admission and this increased to about one in three since admission. The increased reporting of this item over time may reflect the decrease in risk-behaviours as people move from the community to prison. Knowledge of one’s negative infection status was also indicated relatively often as a reason for not being tested. About 16% to 18% cited this reason at admission and it increased to 30% to 31% since admission. Approximately 10% of untested inmates reported testing prior to

admission as a reason for not being tested at admission. This reason was reported by more women than men for both HIV (18% vs. 11%) and HCV (16% vs. 10%). Finally, few (2% or less) indicated “fear of being reported at CSC” and “fear of discrimination at CSC” as reasons for not being tested at either point in time.

The above findings are consistent with CSC’s screening and risk-based testing practices. Specifically, on admission, tests would not routinely be offered to inmates who recently tested negative and did not report risk-behaviours that could result in a subsequent change in infection status. Inmates who test negative on admission and do not report engaging in risk-behaviours would not necessarily need retesting on an ongoing basis. Inmates, however, are free to request testing for HIV or HCV infections at any time during their incarceration.

Comparatively, Burchell et al. (2003) reported that among inmates not tested for HIV in Ontario provincial correctional centres in 1996/97: 50% didn’t think they were at risk; 24% reported there is no confidentiality among prison staff; and, 18% feared the reaction of other inmates. The estimates provided by Burchell et al. (2003) are higher than in the NIIDRBS. Several reasons may account for the differences. First, risk-behaviours or awareness of risk-behaviours may have increased over time. Second, confidentiality and privacy standards and practices may have increased over time. Finally, awareness that HIV and HCV cannot be transmitted through casual contact may have increased over time.

Figure 21. Reasons for Not Being Tested among Canadian Federal Inmates Not Tested at CSC



Note. Inmates could choose multiple reasons. The option “Tested Before Admission” was not available for since admission. HIV = human immunodeficiency virus; HCV = hepatitis C virus; CSC = Correctional Service Canada.

### Testing Patterns over Time

More than 70% of men and 80% of women had been tested for HIV and HCV while in federal prison for their current sentence (see Figure 20). Compared to men, women were more likely to have been tested for HIV (71% vs. 85%) and HCV (74% vs. 83%). Similarly, PASAN (2003) found that 89% and 78% of federally sentenced women reported ever being tested in prison for HIV and HCV, respectively. These testing rates compare favourably to the general Canadian population (aged 15 years and older) where only 29% of women and 24% of men have ever been tested for HIV (PHAC, 2007a).

## Test Results among the Ever Tested

### *HIV Test Results*

Among inmates ever tested for HIV infection,<sup>7</sup> 4.6% reported an HIV-positive result. This self-reported rate of HIV infection is approximately 15 times greater than the rate of 0.3% in the Canadian adult population (15-49 years old) (UNAIDS, 2006). Aboriginal women reported the highest rate of 11.7%, more than two times greater than the rates in non-Aboriginal women (5.5%) and all men (4.5%) (see Figure 22).

Comparisons with other studies are limited by differences in methodology. For example, the NIIDRBS relied on self-report from **ever** tested inmates sampled from the entire inmate population, including entrants. In comparison, previous research has predominantly relied on the testing of blood or saliva (biosampling) and has often limited its participants to offenders entering correctional institutions. Estimates based on self-report are less reliable than those based on biosampling (Thornton et al., 2000). Further, inmates who have previously been tested for HIV and/or HCV may represent a higher risk population often targeted by public health initiatives. For example, Thornton et al. (2000) found that inmates who injected drugs were about four times more likely to have been tested for HIV and about eight times more likely to have been tested for HCV compared to inmates never injecting drugs. Thus, infection rates based on previously tested inmates may overestimate the rate of infections in the total inmate population.

Recent Canadian, American, European, and Australian research using biosampling has produced HIV-positive rates which range from 0% to 8.8% (Allwright et al., 2000; Altice et al., 2005; Babudieri et al., 2005; Butler & Papanastasiou, 2008; CDC, 2006c; Christensen et al., 2000; de Ravello et al., 2005; Ford et al., 2000; Harrison, Bachman, Freeman, & Inciardi, 2001; Kassira et al., 2001; Long et al., 2001; Macalino et al., 2004; Poulin et al., 2007; Rotily et al., 2001; Weild et al., 2000; Wu, Baillargeon, Grady, Black, & Dunn, 2001). Further, in those studies producing gender-specific estimates, HIV-positive rates were always higher among women (Butler & Papanastasiou, 2008; Kassira et al., 2001; Poulin et al., 2007; Weild et al., 2000; Wu et al., 2001). Thus, considering the methodological differences, self-reported rates among Canadian federal inmates are generally consistent with previously reported rates based on biosampling.

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<sup>7</sup> Includes inmates tested prior to admission, at admission, and since admission to CSC.

### ***HCV Test Results***

Among those ever tested for HCV infection, 31.0% reported an HCV-positive result. This self-reported rate of HCV infection is approximately 39 times greater than the rate of 0.8% in the Canadian population (Zou et al., 2001). Again, Aboriginal women reported the highest rate of 49.1%, more than 50% greater than the rates among non-Aboriginal women (30.3%) and all men (30.8%) (see Figure 22).

As per HIV, comparisons with other studies are limited by differences in methodology. A recent meta-analysis of international research involving adults from the general inmate population found HCV infection rates ranged from 2% to 58%. In most studies, however, 30% to 40% of inmates were HCV-positive (Vescio et al., 2008). Furthermore, Vescio et al. (2008) noted that the rate was greater for women than men. The authors found that the variability in study estimates was largely explained by differences in the proportion of inmates injecting drugs and partly by differences in the HCV seroprevalence<sup>8</sup> among people who inject drugs in the community. Again, despite the methodological differences, self-reported rates among Canadian federal inmates are consistent with previously reported rates based on blood samples from general inmate populations.

### **Comparing NIIDRBS Findings with CSC Surveillance Data**

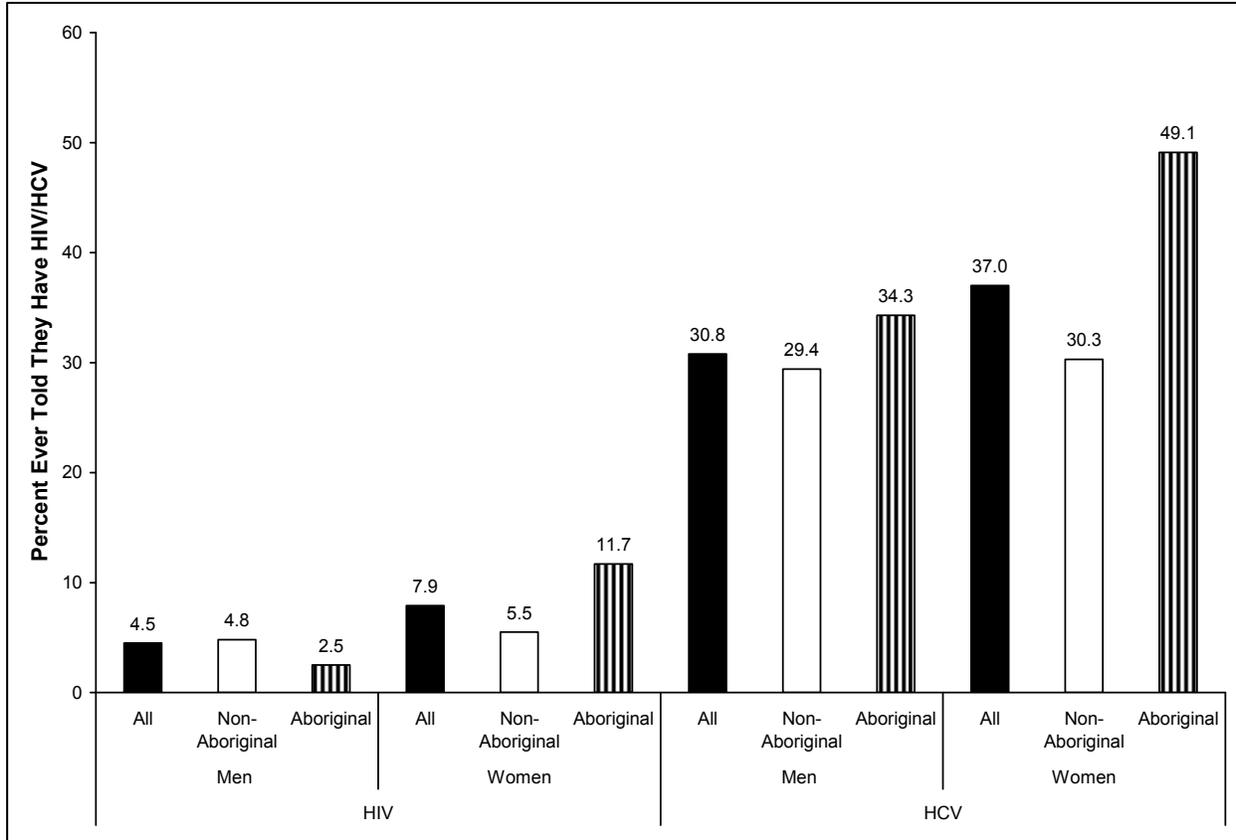
Methodological differences preclude comparisons between the NIIDRBS and CSC's surveillance data (CSC, 2008). Specifically, the NIIDRBS provided self-report estimates of testing and infection status for a sample of inmates who were admitted over a range of years and still resided within the penitentiary at the time of the study. Further, rates of infection were calculated among inmates who had ever been tested in or outside of CSC. Conversely, CSC surveillance estimates are based on biosampling within CSC; the proportion of inmates tested at admission is compiled and presented for all admissions by calendar year of admission; and, estimates of the proportion of inmates infected with HIV and/or HCV are calculated for the entire inmate population (tested and not). CSC Health Services, however, has implemented an enhanced surveillance program which may allow more direct comparisons in the future (personal

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<sup>8</sup> Prevalence based on biological testing.

communication with CSC Public Health Branch).

*Figure 22. Percent Reporting a Positive HIV/HCV Test Result by Gender and Aboriginal Self-Identification among Canadian Federal Inmates who have Ever Been Tested*



Note. HIV = human immunodeficiency virus; HCV = hepatitis C virus.

### Relationship between Infection Status and Fear and Discrimination

Among inmates ever told they have HIV, 67% were worried about discrimination in federal prison. These concerns were much less prevalent among inmates ever told they have HCV; only 19% worried about discrimination in federal prison.

Among inmates never told they have HIV or HCV<sup>9</sup>, a minority indicated they were worried about being discriminated against (HIV 17%, HCV 12%) and/or having their name reported (HIV 17%, HCV 12%) in federal prison as a result of testing positive. Few included fear of test result as a reason for not being tested at CSC (HIV 5%, HCV 4%). Conversely, roughly

<sup>9</sup> This can include inmates who have never been tested for HIV and/or HCV.

40% indicated an increased willingness to be tested compared to when they were first admitted.

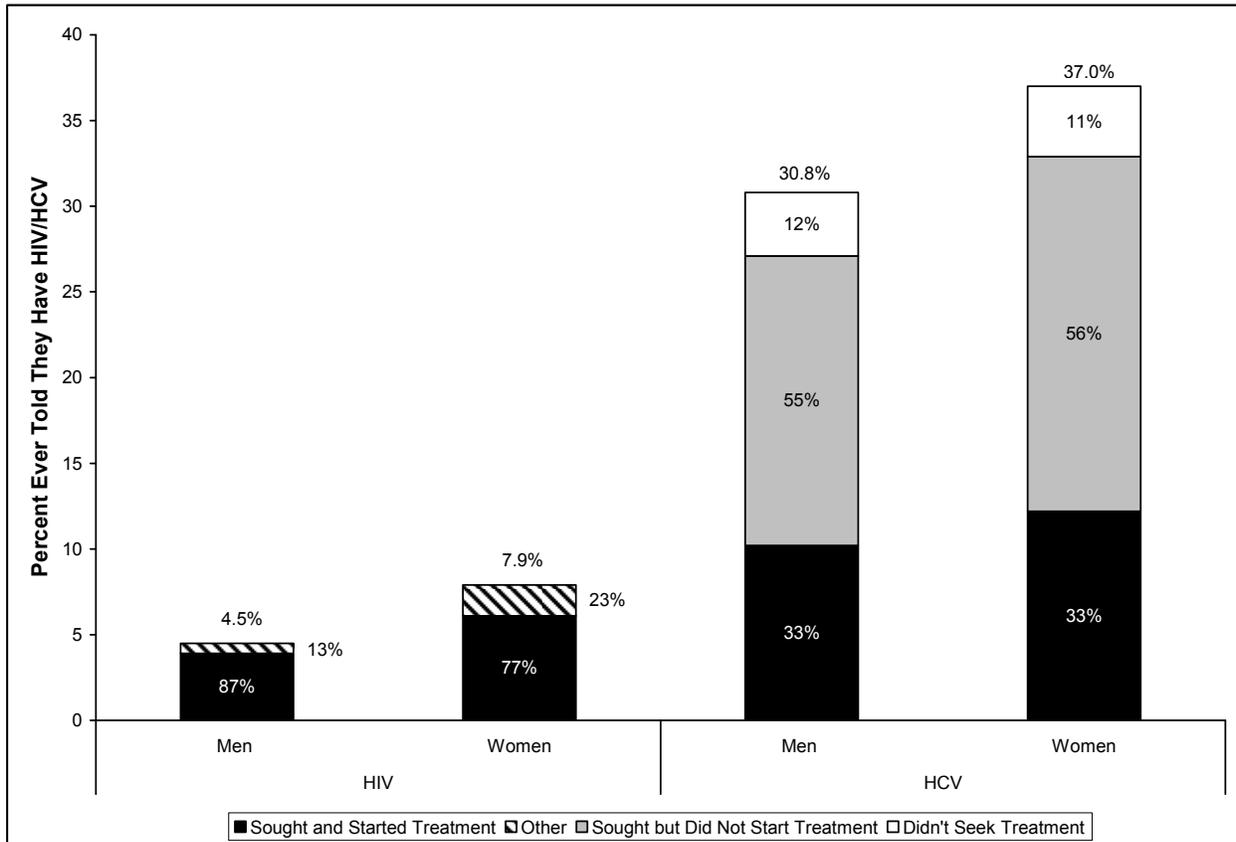
### **HIV Treatment**

Among inmates ever told they have HIV, 87% of men and 77% of women had seen a medical professional and started treatment with anti-retroviral medication (see Figure 23). The majority of HIV-positive inmates who had seen a medical professional but had not yet started treatment were following the counsel of their doctor. At the time of the survey, approximately 61% of those who had started treatment were taking their HIV medication.

Similarly, CSC surveillance data indicated that, on average, approximately 59% of HIV-positive inmates received anti-retroviral treatment in a typical month during 2004 (CSC, 2008). Since treatment approaches have included delayed initiation of highly active anti-retroviral treatment and planned treatment interruptions, an HIV-positive inmate not taking medication does not necessarily indicate lack of medical management (CSC, 2008).

Among those who had started HIV treatment, 60% reported a previous occasion when they were off their HIV medication for at least one day while at CSC. Most frequently reported reasons for previous treatment interruptions included a temporary unavailability of medication at the institutional pharmacy (44%), transfers between institutions (33%), discontinuation of treatment by the respondents (36%), and not asking for a new prescription in time (16%).

Figure 23. Percent of Inmates Ever Told They Have HIV/HCV by Treatment Status for Canadian Federal Inmates who have Ever Been Tested



Note. For HIV, inmates not seeking treatment and inmates who sought but did not start treatment were combined in “Other” due to small numbers. HIV = human immunodeficiency virus; HCV = hepatitis C virus.

### HCV Treatment

Among inmates ever told they have HCV, 33% reported having seen a CSC medical professional and taking medication for it (see Figure 23). Most (55% to 56%) reported seeking medical advice at CSC, but not taking HCV medication. Reasons for not taking the medication included: told ineligible (20%), feeling fine (17%), on waiting list (15%), heard that it makes you sick (14%), in the process of starting (11%), not interested (10%), did not feel safe taking it in prison (6%), told the medication wouldn’t work for me (5%) and did not want people in CSC to know (1%). Although the proportion of infected inmates receiving treatment appears low, it is consistent with recently published research which indicates that 23% to 42% of infected inmates initiate antiviral treatment (Allen et al., 2003; Batey, Jones, & Mcallister, 2008; Farley, Wong, et al., 2005; Sabbatani, Giuliani, & Manfredi, 2006; Strock, Mossong, Hawotte, & Arendt, 2009).

Further, it compares favourably with general population treatment rates ranging from 17.4% for two communities within France between 1994 and 2001 (Hatem et al., 2005) to 25% for consecutive patients referred to a liver clinic in Cleveland, Ohio during 1998 and 1999 (Falck-Ytter et al., 2002).

### ***Outcome of Treatment***

Among those who sought and started HCV treatment, 51% reported that the medication had worked and 15% indicated that it had not worked. An additional 21% were still taking the medication. For others, treatment was discontinued because of side effects (12%). These findings are consistent with previous research indicating 21% to 56% of inmates who initiate treatment experience initial or prolonged undetectable HCV levels (Allen et al., 2003; Batey et al., 2008; Farley, Vasdev, et al., 2005; Sabbatani et al., 2006; Strock et al., 2009).

## **RATES OF REPORTED HIV AND HCV INFECTIONS SINCE ADMISSION**

Some inmates are at risk of acquiring HIV and/or HCV infections in prison because they engage in risk-behaviours associated with the transmission of BBSTIs, such as unprotected sex and injection drug use. Although CSC provides harm-reduction measures, such as condoms, dental dams, lubricant, bleach and MMTP, inmates may not access them or may use them inconsistently.

In this section of the report, the risk of reported HIV and HCV infections since admission to prison are estimated, and incarceration characteristics and risk-behaviours associated with infection are identified. The NIIDRBS asked inmates about HIV and HCV testing and results at admission and since admission to CSC for their current sentence. The subgroup of inmates who tested negative on admission and reported follow-up testing and results since admission provided an opportunity to estimate the rates of reported HIV and HCV infections since admission. It should be noted, however, that infections reported since admission cannot be definitively attributed to risk-behaviours in the correctional environment because of the seroconversion periods<sup>10</sup> for HIV and HCV.

With respect to HIV, privacy and confidentiality guidelines prevent presentation of results because too few cases were identified (i.e., less than five). In regards to HCV, none of the women reported an HCV infection since admission, but this may be the consequence of a small sample followed for a short period rather than a true lack of risk. Of the men who reported testing negative for HCV on admission, approximately 4.4% reported an HCV infection over an average follow-up period of 2.9 years. Assuming results among the tested are generalizable to the untested, the estimated population size for men testing negative for HCV on admission would be 10,121. Of these, an estimated 447 (4.4% of 10,121) reported an HCV infection since admission.

An alternative method of conveying the rate of reported HCV infections since admission involves expressing the number of self-reported cases relative to the number of person-years served between test dates (i.e., one inmate incarcerated for one year between test dates contributes one person-year). Based on the NIIDRBS, approximately 138 men reported an HCV

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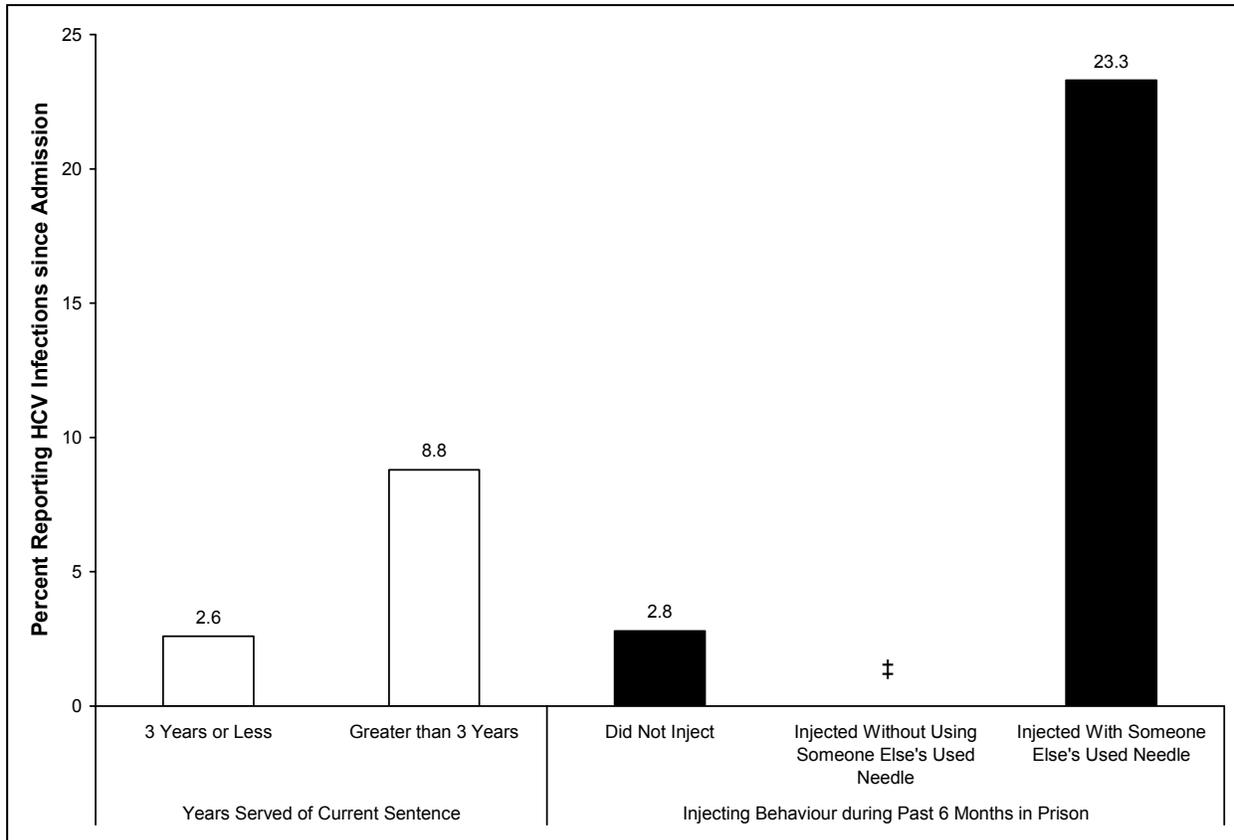
<sup>10</sup> The seroconversion period refers to the time period between being infected and developing antibodies that can be detected with biological tests (Canadian AIDS Society and Health Canada, 2002). Almost all people produce antibodies within 14 weeks of HIV infection (Canadian AIDS Society and Health Canada, 2002) and the mean seroconversion period is 10 weeks for HCV infection (Surveillance Working Group, 1999).

infection over a total of 8,722 person-years producing an overall rate of about 16 HCV infections per 1,000 person-years  $[(138/8,722)1,000]$ . Put differently, if 1,000 uninfected men were followed for a one year period after admission, an estimated 16 or 1.6% would report an HCV infection.

The small number of inmates reporting an HIV infection since admission is consistent with previously published European and American studies reporting zero cases (Christensen et al., 2000; Macalino et al., 2004). Similarly, our estimated rate of reported HCV infections since admission among male inmates (16 per 1,000 person-years) is within the range produced by American (4 per 1,000 person-years), European (27-33 per 1,000 person-years), and Australian (45 per 1,000 person-years) studies involving predominantly adult male inmates monitored with blood or saliva samples (Butler et al., 2004; Champion et al., 2004; Christensen et al., 2000; Macalino et al., 2004). Butler et al. (2004) also estimated HCV incidence rates among inmates not continuously detained (i.e., they had re-entered prison following release into the community). For this group, the incidence of HCV infections was 108 per 1,000 person-years suggesting that incidence was lower among the continuously detained (45 per 1,000 person-years). The authors hypothesized that the lower rate among those continuously detained was likely due to reduced injecting in prison because of a limited drug supply or abstinence.

Among male inmates, the NIIDRBS identified two characteristics as being strongly associated with reportedly acquiring HCV since admission: years served of current sentence and injecting behaviours over the past six months in prison (see Figure 24). Men who had served more than three years of their current sentence were 3.4 times more likely to report an HCV infection compared to men who had served less time (8.8% vs. 2.6%). Serving time does not cause an HCV infection; however, time-served may be a surrogate for magnitude of exposure (e.g., number of drug injections using someone else's used needle). In regards to injecting behaviours, men who reported injecting with someone else's used needle were about eight times more likely to report an HCV infection compared to men who did not inject (23.3% vs. 2.8%). The proportion reporting an HCV infection among men who injected without using someone else's used needle could not be reported because too few HCV infections occurred (i.e., less than five).

Figure 24. Percent Reporting an HCV Infection since Admission by Incarceration Characteristics and Injecting Behaviour for Canadian Federal Male Inmates



Note. HCV = hepatitis C virus.

‡ Suppressed because fewer than five inmates reported the characteristic.

Previous research has identified both longer duration of incarceration (Allwright et al., 2000; Fox et al., 2005; Long et al., 2001) and injecting illicit drugs (Allwright et al., 2000; Babudieri et al., 2005; Butler et al., 2004; Butler & Papanastasiou, 2008; Champion et al., 2004; Christensen et al., 2000; Fox et al., 2005; Long et al., 2001; Macalino et al., 2004; Poulin et al., 2007; Vescio et al., 2008; Weild et al., 2000) as being associated with an increased likelihood of HCV infection in offenders. The NIIDRBS, however, further focuses the elevated risk among those who inject with the used needles of others.

## RATES OF REPORTED STIs SINCE ADMISSION

According to the NIIDRBS, a minority of inmates (men 17%, women 31%) report having sex in prison and the majority of these sexually active inmates (57%) access harm-reduction items such as condoms, dental dams, and lubricant. Sexually active inmates, however, are at risk for STIs because they engage in unprotected sex at least some of the time.

In this section of the report, the risk of self-reported STIs<sup>11</sup> since admission to prison is estimated and those incarceration characteristics and risk-behaviours associated with infection are identified. Since the NIIDRBS captured whether an inmate had been told they had an STI since admission to CSC for their current sentence, an opportunity existed to estimate the rate of reported STIs since admission. Because of differences in the duration of incarceration by gender and Aboriginal self-identification, rates for STIs were calculated using person-years served (one inmate incarcerated for one year contributes one person-year served) to allow more valid comparisons between subgroups. Basically, the number of inmates told they had an STI since admission was expressed relative to their aggregate person-years served. It should be noted that infections reported since admission may have been diagnosed at admission and thus cannot be definitively attributed to risk-behaviours in the correctional environment.

The overall rate of an STI since admission to federal prison was approximately 16 per 1,000 person-years served. Put differently, if 1,000 inmates were followed for one year after admission, approximately 16 or 1.6% would report at least one STI. Differences were observed by gender and Aboriginal self-identification (see Figure 25). Specifically, the rate of an STI since admission was 4.5 times greater among women than men (67 vs. 15 per 1,000 person-years); and, among men, the rate was approximately 1.6 times greater in Aboriginals than non-Aboriginals (22 vs. 14 per 1,000 person-years). With respect to specific STIs only the rate of chlamydia significantly differed by Aboriginal self-identification among men. Aboriginal men were 4.4 times more likely than non-Aboriginal men to report at least one episode of chlamydia since admission to prison (10.6 vs. 2.4 per 1,000 person-years).

Caution should be exercised when interpreting these results. Although the suggestion is that women are a high-risk population for reporting an STI diagnosed since admission, other factors could account for the observed elevated risk. In particular, since the questionnaire did not

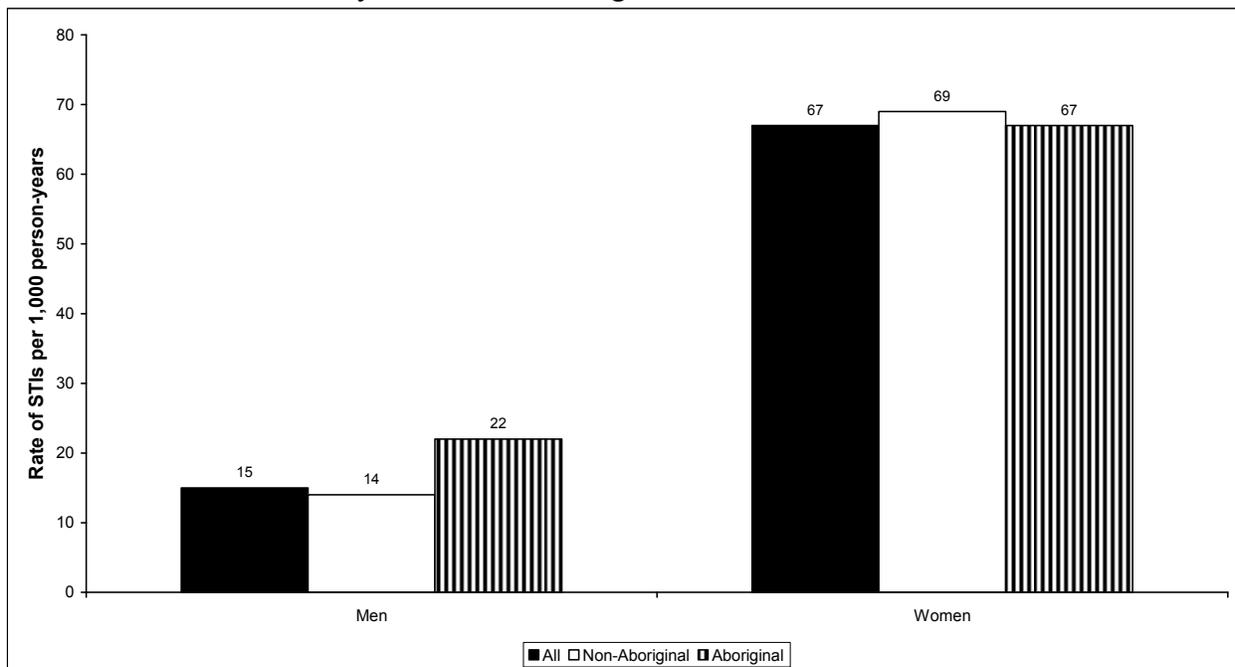
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<sup>11</sup> In the NIIDRBS, STIs included chlamydia, gonorrhoea, syphilis, genital herpes, genital warts, and other non-specific STIs.

enquire if inmates had been tested for STIs since admission, rates of STIs were calculated among all inmates (i.e., tested and not). If women are more rigorously targeted for testing or are more likely to seek testing at CSC, then they are more likely to have STIs diagnosed compared to men.

Comparisons of STI rates derived from the NIIDRBS with CSC’s surveillance rates and Canadian general population rates are limited because of methodological differences. Nonetheless, the gender differential in the rate of STIs is consistent with CSC’s surveillance data (CSC, 2008). According to 2004 surveillance data, the rate of chlamydia, gonorrhoea and syphilis was 3.2, 16.3 and 3.6 times greater in women than men, respectively.

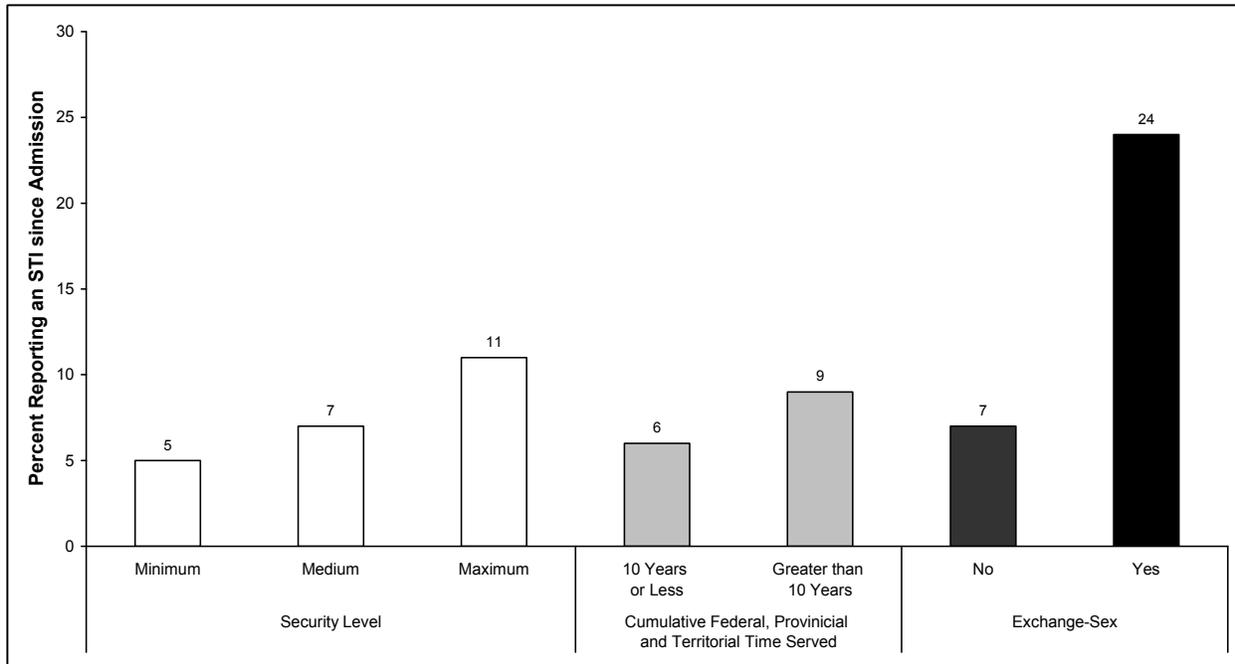
*Figure 25. Rates of Reported Sexually Transmitted Infections (STIs) since Admission among Canadian Federal Inmates by Gender and Aboriginal Self-Identification*



Incarceration characteristics and in-prison sexual behaviours were associated with reporting an STI since admission. Among men, a higher security level, greater cumulative federal, provincial and territorial time served, and exchange-sex were associated with a greater risk of reporting an STI. Specifically, the proportion of males reporting an STI increased from 5% in minimum to 11% in maximum security (see Figure 26); from 6% in those serving 10 years or less to 9% in those serving more years; and, from 7% in those not having exchange-sex to 24% in those who did. Among women, the proportion reporting an STI was greater among those

having unprotected sex with a casual partner compared to those who did not (25% vs. 13%).

Figure 26. Percent Reporting an STI since Admission by Incarceration Characteristics and Sexual Behaviour for Canadian Federal Male Inmates



Note. Exchange-sex involves the exchange of sex for money, drugs, injecting equipment or goods. STI = sexually transmitted infection.

Previous American research has found that men participate in more sexual encounters with other men in maximum security than in minimum security (Garland, Morgan, & Beer, 2005). This may, at least in part, explain the NIIDRBS findings. Specifically, a greater number of sexual encounters in maximum security facilities may lead to elevated rates of STIs if the sex is unprotected. Unfortunately, sex with male partners in prison could not be thoroughly evaluated using the NIIDRBS because of non-response. Findings from the 1995 Canadian federal male inmate survey, however, corroborate Garland et al.'s (2005) findings. The 1995 survey found that the proportion of men reporting sex with another inmate increased with security level from 3% in minimum to 7% in maximum. Further, among men reporting sex with another inmate, the proportion reporting condom use decreased from 51% in minimum security to 30% in maximum security (Price Waterhouse, 1996).

Exchange-sex and unprotected sex with casual partners are established risk-behaviours for STIs (Expert Working Group on the Canadian Guidelines on Sexually Transmitted

Infections, 2008) and were associated with reporting an STI since admission to federal prison among men and women, respectively. The NIIDRBS indicated that less than 2% of men reported engaging in exchange-sex and 11% of women reported unprotected sex with a casual partner during the past six months in prison.

## **SUMMARY OF MAJOR FINDINGS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH**

Overall, the results show that Canadian federal inmates have access to, and make use of harm-reduction items, such as condoms and bleach, and HIV/HCV testing and treatment services. Information on how to enhance programs and services was gained, and Aboriginal women were identified as a group requiring increased public health attention. There is some evidence that knowledge of risks was associated with behaviour that reduces the transmission of HIV and HCV, such as less injecting and greater use of bleach. Finally, while drug use continues in prison, it dramatically declines from use in the community. More detailed findings are summarized below.

Inmates' awareness of CSC's policy about access to harm-reduction items was high. In regards to demand for harm-reduction items, approximately 57% of sexually active inmates reported an attempt (successful or unsuccessful) to get condoms, lubricant and/or dental dams during the past six months in prison; and, the majority of inmates who reported injecting drugs, being tattooed, and/or being pierced in CSC used bleach to clean the equipment. Further, among those who had sex and/or injected drugs, risky sexual and injecting behaviour was associated with greater demand for harm-reduction items. These findings suggest that harm-reduction items are being utilized as intended by inmates. There is an opportunity, however, to optimize use by reducing access issues and determining, through future research, why some inmates do not use harm-reduction items that are available.

The NIIDRBS indicates a substantial proportion of inmates were tested for HIV (men 71%, women 85%) and HCV (men 74%, women 83%) during their most recent incarceration at CSC, and that the rate of testing could be increased by further promoting screening and testing throughout incarceration. Additional research is necessary, however, to provide evidence for policy options available for optimizing infectious disease screening and testing among inmates.

Among inmates ever tested for HIV and/or HCV infections, Aboriginal women were identified as a particularly high-risk group because they reported the highest rates of HIV (11.7%) and HCV infections (49.1%). Consequently, CSC needs to ensure that culturally appropriate, effective interventions that decrease risk-behaviours and increase harm-reducing behaviours are offered to meet the needs of Aboriginal women.

Opportunities were identified to improve the care of HIV-positive inmates. First, to alleviate fears of discrimination among all inmates, particularly HIV-positive inmates, awareness should be increased about HIV transmission pathways (i.e., how HIV can and cannot be transmitted) and CSC's policies regarding privacy, confidentiality, and the intolerance of discrimination. Particular attention to privacy and confidentiality must be paid when delivering health care in the correctional environment, as inmates are often aware of other's movements to health care. Second, among those who have started treatment for HIV, treatment interruptions at CSC could be reduced through increased efforts to ensure: awareness of institutional pharmacy policies regarding anti-retroviral supply and prescription refills; treatments are not interrupted during transfers between institutions; and, inmates are aware of the consequences of their non-compliance with treatment.

An examination of inmate knowledge of HIV and HCV revealed some deficiencies. Since greater knowledge was associated with behaviour that could reduce the transmission of HIV and HCV, efforts to increase inmate knowledge should continue. Increasing inmate awareness of the various health education programs available would be a good first step to increasing program participation and knowledge.

Although it is not possible to definitively attribute reported infections since admission to risk-behaviours in the correctional environment, rates of self-reported infections since admission to CSC institutions were estimated and characteristics associated with these infections were explored. The number of self-reported new HIV cases were too few to examine (i.e., less than 5). In regards to HCV, no women reported an infection since admission, but the rate among men was about 16 HCV infections per 1,000 person-years. Having served a longer duration of one's current sentence and injecting with someone else's used needle in prison were associated with an increased likelihood of reporting an HCV infection since admission. Similarly, the overall rate of an STI since admission was approximately 16 per 1,000 person-years. Substantial differences, however, existed by gender. Specifically, the rate was 4.5 times greater among women than men (67 vs. 15 per 1,000 person-years). Higher security level, greater cumulative time served, engaging in exchange-sex and having unprotected sex with casual partners were associated with an increased likelihood of reporting an STI since admission. Although security level and time served are not modifiable risk-factors, risky injecting and sexual practices are modifiable making continued education and optimizing use of available harm-reduction items key prevention

strategies.

The proportion of Canadian federal inmates reporting non-injection drug use, injecting drugs, and having sex significantly declined in prison compared to the community. A minority of inmates reported engaging in risk-behaviours over the past six months in prison: 34% of men and 25% of women used non-injection drugs, 17% of men and 14% of women injected drugs, and 17% of men and 31% of women had oral, vaginal, or anal sex. Gender differences, however, existed. Men were more likely than women to report risky injecting practices while women were more likely than men to report risky sexual behaviour.

### **Limitations**

The primary limitations of this research, such as measurement error and social desirability bias, are typical of cross-sectional self-report surveys that attempt to capture information about sensitive or illicit activities over time. Due to the number and complexity of issues being assessed, the questionnaire was a lengthy 50 pages. This complexity and length may have impacted the results. Events taking place in the past are more difficult to recall so results related to past risk-behaviours, testing, treatment, and program participation may be less accurate. Other research designs, such as longitudinal research employing biosampling, may have been more effective but are difficult to conduct in correctional settings and were precluded in this instance due to competing operational issues. Notwithstanding these limitations, survey findings are generally consistent with other studies suggesting that, for most questions, inmates were answering honestly.

## **Future Research**

For each of the areas covered in this publication, detailed reports are being prepared and will be made available. Future NIIDRBS analyses will explore more complex questions such as factors associated with in-prison drug use, sexual activity, and testing for HIV/HCV. Finally, this study raises questions in a number of areas that require additional research. For example, information about why inmates continue to engage in risky behaviours, despite adequate knowledge and availability of harm-reduction items, would be useful.

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## APPENDIX 1: ACRONYMS AND DEFINITIONS

AIDS	acquired immune deficiency syndrome
Aboriginal self-identification	An individual who identified themselves as Aboriginal (Inuit, Métis, First Nations –Non Treaty/Status, First Nations – Treaty/Status).
BBSTIs	blood-borne and sexually transmitted infections
binge-injecting	Injecting many times over a short period.
casual partner	Someone not known well.
CSC	Correctional Service Canada
Choosing Health in Prisons Program	This program includes information about healthy living, nutrition, stress, and infectious diseases. It is not available in all penitentiaries. As with all health education programs, participation is voluntary.
diversion of /diverting methadone	Selling and/or giving methadone, obtained through the methadone maintenance treatment program, to someone else.
exchange-sex	Involves the exchange of sex for money, drugs, injecting equipment or goods.
HCV	hepatitis C virus
HIV	human immunodeficiency virus
maintenance issues	For condoms, lubricant and dental dams, maintenance issues included dispensers that were empty, broken, and/or providing damaged goods. For bleach, maintenance issues included dispensers that were empty, broken, and/or providing diluted bleach.
MMTP	methadone maintenance treatment program
n	sample size
N	estimated population size

needle	Used interchangeably with the terms syringe and rig.
NIIDRBS	2007 National Inmate Infectious Diseases & Risk-Behaviours Survey
other inmates' behaviour	This harm-reduction access issue includes “other inmates hoarded it” and “other inmates limited my access to it”.
The National HIV/AIDS Peer Education and Counselling Program	<p>The National HIV/AIDS Peer Education and Counselling (PEC) Program trains selected inmates to become peer educators to provide information and support to other inmates, primarily around infectious diseases. PEC contains information on infectious diseases, healthy living, stress, addictions, and harm-reduction.</p> <p>There is a women’s component of PEC which provides women-specific information. Similar programs exist for Aboriginal inmates. Chee Mamuk is delivered in the Pacific Region as it is geared towards Pacific First Nations peoples. Circles of Knowledge Keepers is delivered in all CSC regions. As with all health education programs, participation is voluntary.</p>
person-years	A measurement combining persons and time, used as a denominator in rates. It is the sum of individual units of time that the persons in a population have been followed (Last, 1995). As examples, one person followed for one year contributes one person-year; 100 people followed for one year contribute 100 person-years; and, 100 people followed for 10 years contribute 1,000 person-years. Using person-years to derive rates allows more valid comparisons across populations followed for differing periods of time.
prison range	Location in prison where inmates reside. Generally includes open common areas and individual cells.
Reception Awareness Program	The Reception Awareness Program (RAP) is offered to inmates in CSC reception institutions and in all women’s institutions. RAP provides information on infectious diseases, harm-reduction measures, substance abuse treatment programs, infectious disease testing and treatment, and health services offered in all CSC institutions. As with all health education programs, participation is voluntary.
sex	Defined as oral, vaginal, or anal sex.

STI	Sexually transmitted infection. In the NIIDRBS, STIs included chlamydia, gonorrhoea, syphilis, genital herpes, genital warts, and other non-specific STIs.
transgendered	A person appearing as, wishing to be considered as, or having undergone surgery to become a member of the opposite sex (The American Heritage Dictionary of the English Language, 2009).
works	Equipment used in the preparation of drugs for injecting, i.e., water, filter, cooker/spoon.