



## HIV/AIDS Among Women in Canada

### At a Glance

- In Canada, a total of 2,001 AIDS cases and 10,799 positive HIV tests were reported among adult females up to December 31, 2008.
- Women represent an increasing proportion of those with positive HIV test reports in Canada, and in 2008 they accounted for 26.2% of such reports.
- Heterosexual contact and injection drug use are the two main risk factors for HIV infection in women.

### Introduction

While HIV and AIDS affect both women and men, there are important differences between the sexes in the physical mechanisms, as well as in socio-economic factors and consequences associated with HIV infection. These stem from biology, sexual behaviour and socially constructed gender differences between men and women, roles and responsibilities, access to resources and decision-making power.<sup>1</sup>

Worldwide, females aged 15-24 are 1.6 times more likely to be infected with HIV than their male peers.<sup>2</sup> In Canada, women now account for both a significantly larger number and proportion of people living with HIV and AIDS relative to the beginning of the epidemic. This *Epi Update* chapter will examine the current status and trends of women living with HIV/AIDS in Canada through routine and enhanced surveillance data. It will provide estimates of the HIV prevalence and incidence among women and will also highlight relevant research pertaining to HIV/AIDS. For the purposes of this chapter, “women” is defined as adult females aged 15 and over, unless explicitly defined otherwise.

The following are definitions and distinctions relating to sex and gender:

- Sex refers to the biological characteristics, such as anatomy (e.g. body size and shape) and physiology (e.g. hormonal activity or functioning of organs), that distinguish males and females. Sex differences may occur at the genetic/molecular, cellular, organ or organism level and result from complex interactions between genetic, hormonal and environmental factors that commence in the genetic and intrauterine environment and continue throughout the lifespan of the individual. Sex differences begin with the observation that every animal-derived cell has a sex.
- Gender refers to the array of socially constructed roles and relationships, personality traits, attitudes, behaviours, values, relative power and influence that society ascribes to two sexes on a differential basis.

In this *Epi Update* chapter, the data refer to biological sex as recorded by the health care practitioners who complete the case report forms. Where the results of research studies are discussed, the terminology used in the original research documentation is maintained in this *Epi Update*.

## Routine Surveillance

The Public Health Agency of Canada's Centre for Communicable Diseases and Infection Control (CCDIC) collects surveillance data on positive HIV test reports and reported AIDS cases in Canada. Epidemiologic information includes (but is not limited to) age, sex, risks associated with the transmission of HIV and self-reported ethnicity. For AIDS cases, death data are also collected.

Health care providers and/or laboratories forward this information to provincial and territorial public health officials, who, in turn, voluntarily submit positive HIV test reports and AIDS diagnoses to the Centre, where the data are synthesized and analyzed at the national level. There are several limitations regarding surveillance data, including reporting delays, under-reporting, missing information and undiagnosed individuals. (Please refer to Chapter 3, entitled "HIV Testing and Surveillance Systems", for a full description of HIV/AIDS surveillance in Canada).

## AIDS surveillance data

In Canada there have been 21,300 cumulative AIDS cases reported to the Public Health Agency of Canada (PHAC) as of December 31, 2008. Of these, 21,046 were adults (15 years and older) with known sex, and 2,001 cases or 9.5% of all adult cases were female. Between 1979 and 1998, 8.1% of AIDS diagnoses were made among females (all ages); this has increased over time, and in 2008 females accounted for 24.7% of total diagnoses. The number of women whose condition was diagnosed as AIDS in 2008 represents an 18.9% increase from the previous year.

### Age groups

The 30-39 year age group has accounted for the largest proportion of AIDS cases among women throughout the epidemic, with nearly double the number of reports compared with the next most reported age group (20-29 years) (Table 1). This pattern is similar to that of AIDS case reports among men in Canada, of which the 30-39 year age group also made up the largest proportion of cases; however, in contrast to women, the second most reported age category was the 40-49 age group.

**Table 1. AIDS case reports among women by age group, cumulative cases as of December 31, 2008**

Age group (years)	Total female AIDS cases	% of total female AIDS cases
15-19	19	0.9%
20-29	489	24.4%
30-39	810	40.5%
40-49	424	21.2%
50-59	150	7.5%
60+	109	5.4%

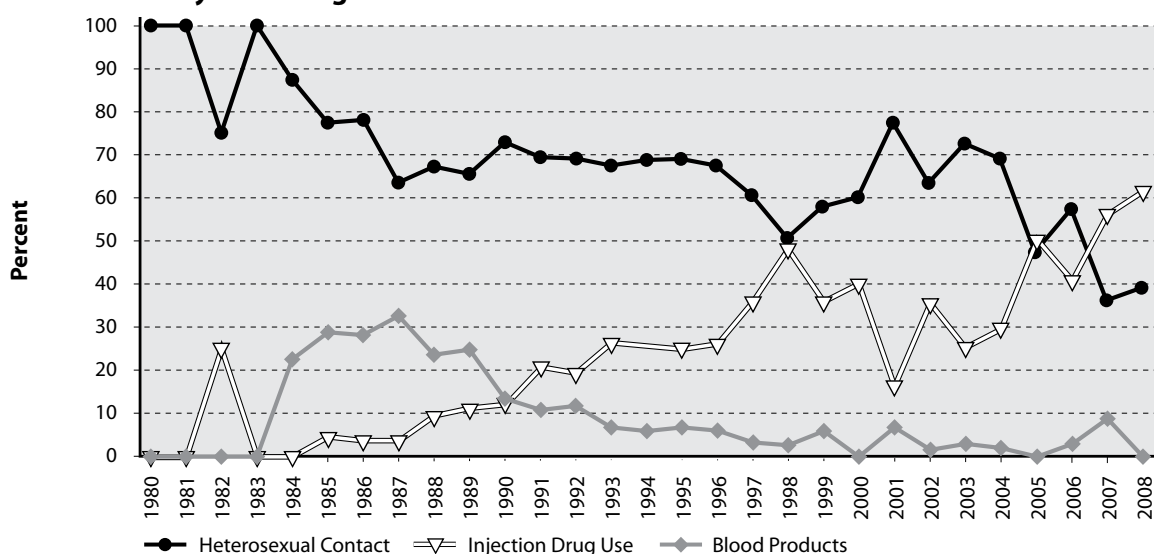
Over the past 10 years, the 30-39 year age group accounted for 39.9% of AIDS diagnoses among women, which is comparable to the group's average from 1985-1998. A significant change in the proportion was evidenced over the last 10 years, however, in the 20-29 year age group, which dropped to an average of 17.9%, 6.5% below the group's historical average over the whole epidemic. The 40-49 year age group, by contrast, rose to 28.3% of AIDS diagnoses among women, an increase of 7.1% above its historical average.

### Exposure category

Among AIDS case reports for women with known exposure category, the primary reported risk factor since the beginning of the epidemic has been heterosexual contact, which as recently as 2001 accounted for over 75% of all AIDS cases among women. Over the duration

of the epidemic, heterosexual contact has accounted for a cumulative 1,168 reported cases or 65.5% of all AIDS cases among women. Injection drug use exposure is attributed to 26.0%, and the receipt of blood or blood products, occupational exposure, or other exposures have represented 8.5% of all AIDS cases among women to date. Over the past 10 years, there has been a steady rise in the percentage of cases attributed to injection drug use exposure among women. In 2001, this risk exposure was attributed to 16.4% of reported AIDS cases among women.

In 2005, it surpassed heterosexual contact as the most reported exposure category, dipping back below in 2006 before peaking in 2008, when this exposure category reached an all-time high of 60.9% of all cases (Figure 1).

**Figure 1. Percent distribution of AIDS cases in women by exposure category and year of diagnosis****Ethnicity/race**

Black and Aboriginal women are disproportionately affected by AIDS relative to women of other ethnic or racial background. Between 1979 and 2008, of cases (all ages) reported as Black or Aboriginal, 35.2% and 29.0% respectively were female. This is in comparison with the 9.9% overall proportion of females among all AIDS cases. Among White, Asian/Arab and Latin American AIDS cases, 6.2%, 8.1% and 8.4% of cases respectively were female.

**HIV surveillance data****Trends**

The trend in sex distribution since the beginning of the HIV/AIDS epidemic has been one of a steady increase in the proportion of positive HIV test reports for women.

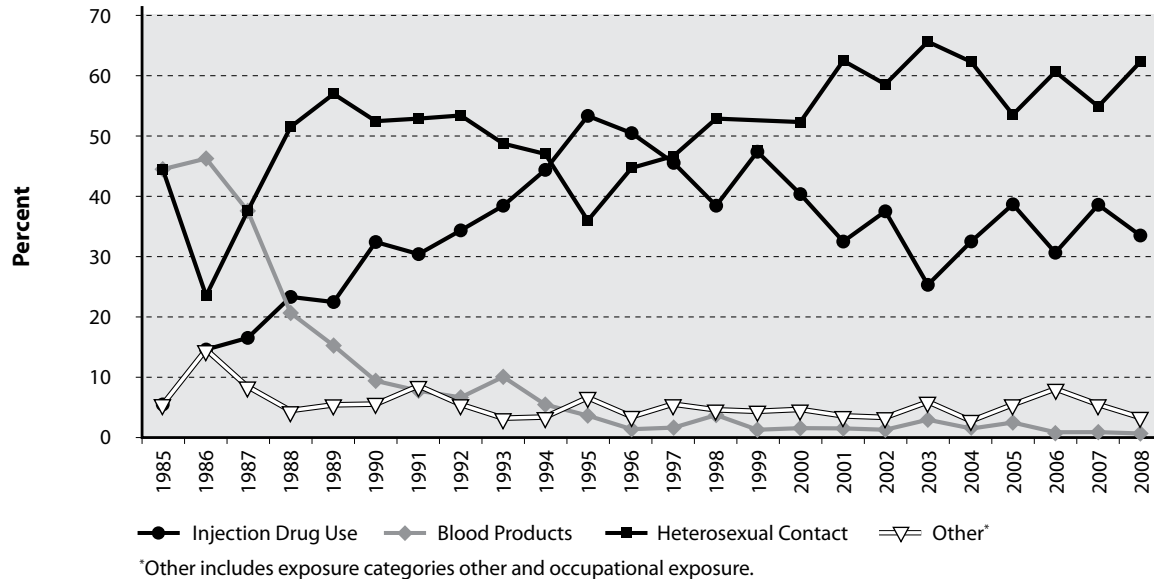
Prior to 1999, females represented 11.7% of all positive HIV test reports. By 2006, this figure had risen to 27.8%, the highest percentage since the start of the epidemic. Surveillance data for 2008 demonstrated a slight decline in the number and proportion of positive HIV tests reported among women compared with 2006. Among adults (15 years of age and older) in 2008 with reported sex information, 669 (26.2%) of all positive tests were among females.

**Exposure category**

Since the beginning of the epidemic, heterosexual contact and injection drug use have been the two largest exposure categories among women. Reported heterosexual contact accounted for the largest proportion of adult female HIV case reports for all years, except during a 4-year period (1994-1997) when it was surpassed by injection drug use exposure (Figure 2).

During the period 1999 to 2008, the proportion of cases attributed to heterosexual contact exceeded the proportion attributed to injection drug use. For heterosexual contact the proportion ranged from 47.2% in 1999 to a high of 65.8% in 2003, with an average of 58.2%. The cumulative average for this exposure category for the period 1999 to 2008 was 53.6%. The proportion for the injection drug use exposure category fluctuated over the same 10-year period, reaching a high of 47.2% in 1999 and a low of 25.2% in 2003, with an average of 35.5% over the decade (Figure 2).

**Figure 2. Percent distribution of HIV case reports in women by exposure category and year of diagnosis**



Between 1999 and 2008, among positive HIV tests reported for females between 15 and 19 years of age, injection drug use exposure accounted for 49.3% of the cases compared with 17.6% among men in the same age group, highlighting the significance of injection drug use in the transmission of HIV among young women. In 2008, women accounted for 41.9% of all HIV test reports attributed to injection drug use exposure.

Case reports in the heterosexual contact exposure category can be broken down to reveal trends among different subcategories. Surveillance data for 2008 demonstrated that females made up 53.1% of positive HIV reports attributed to the heterosexual/endemic subcategory, which indicates the heightened vulnerability of females born in HIV-endemic countries\* relative to their male peers. The heterosexual/non-endemic subcategory includes people who test positive for HIV and report heterosexual contact with someone who is either HIV positive or at increased risk of HIV infection; in 2008, 48.7% of cases in this sub-

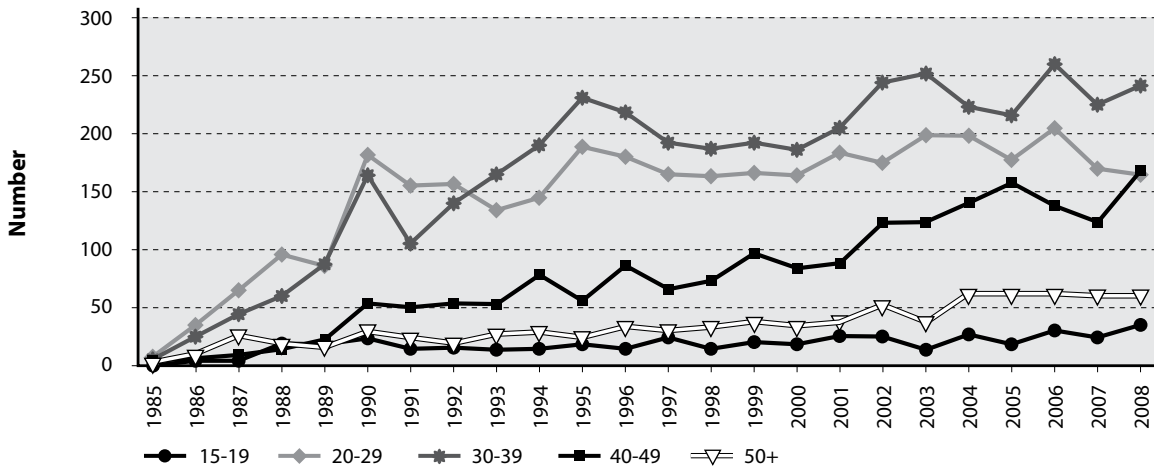
category were women. Within the heterosexual/no identified risk subcategory, which comprises people infected with HIV for whom heterosexual contact is the only risk factor reported and nothing is known about the HIV risk of the partners, women accounted for 43.2% of test reports in 2008.

### Age group

There has been a steady rise in the number of HIV case reports among women of almost all age categories in Canada since the beginning of the epidemic. The number of positive HIV tests reported for women in the 20-29 age group rose over a 10-year period from 1985 to 1995 and then levelled off. There was a similarly notable rise in the number of reports for women in the 30-39 age group during this period; after 1995 the rate of increase continued but was less pronounced. Since 1995, the steepest increase has occurred among women in the 40-49 age group, which rose from 56 reported cases in 1995 to a high of 168 in 2008 (Figure 3).

\* Refer to Chapter 12 for more information on HIV/AIDS among persons who originate from countries where HIV is endemic.

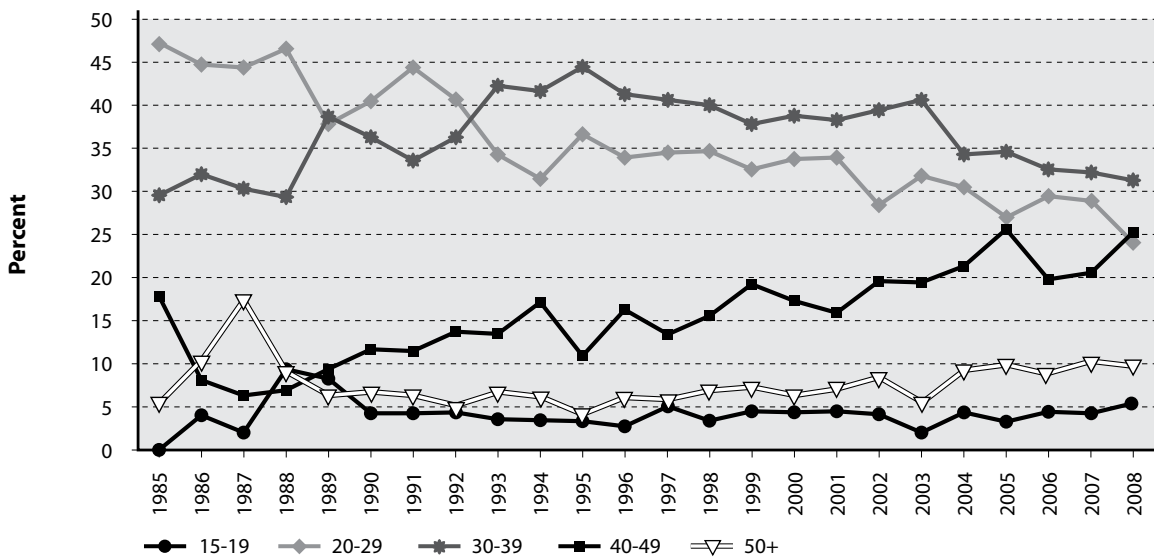
**Figure 3. HIV case reports among women by age group and year**



Shifting from absolute numbers to proportions of each age group among female HIV case reports, the trend varies somewhat. In 1985, the highest proportion of positive HIV test reports were for women in the 20-29 age group, but the trend has been downwards ever since. In 1993, the highest proportion of positive HIV test reports were for women in the 30-39 age group, and this group

has since accounted for the greatest proportion of all HIV positive test reports among females. This age group peaked in 1995 at 44.7% and since then decreased to 36.0% in 2008. Women aged 40-49 years continue to account for an increasing percentage of positive HIV test reports among women, reaching the same level as the 20-29 group for the first time in 2008, at just over 25.0% (Figure 4).

**Figure 4. Percent distribution of HIV case reports in women by age group and year**



Females account for a substantial proportion of positive HIV test reports among the youngest adults (15-19 yrs.). In 2008, young females between 15 and 19 years of age represented the majority (59.3%) of all test reports in this age group, a trend noted since 1997. This trend is in contrast to all other age groups, in which males were the majority: of all positive test reports in those aged 20 to 39 years old females represented 30.8%, and of those aged 40 years and over they represented 19.3%.

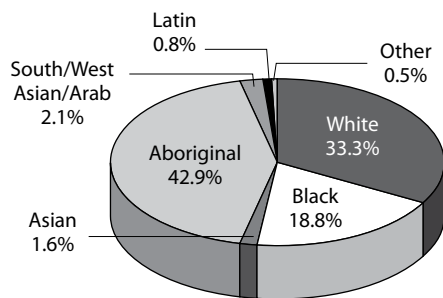
**Race/ethnicity**

There are several limitations associated with reported race/ethnicity, and thus caution is recommended in interpreting these data. Information on race/ethnicity is not available for all provinces and territories, most notably Ontario and Quebec. As a result of the variation in report-

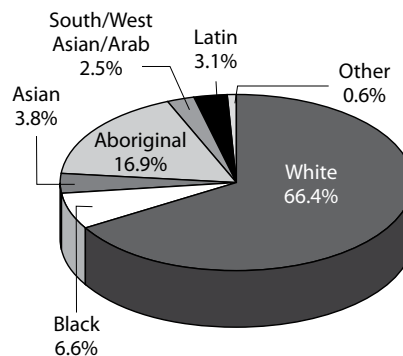
ing, race/ethnicity data reflected in positive HIV test reports should not be viewed as representative of Canada. Other issues to consider include a limited choice for identification of race/ethnicity on case report forms, misclassification and underreporting.

Of positive HIV test reports from 1998 to 2008 (all ages) with reported sex information, the majority of adult male cases (15 years and over) were identified as White (66.4%) and a minority as Aboriginal people (16.9%) and Black Canadians (6.6%) (Figure 6). Among women, on the other hand, the race/ethnicity distribution was different, the highest proportion of positive HIV tests being reported for cases identified as Aboriginal (42.9%), followed by White (33.3%); Black Canadians represented (18.8%) of total reported cases (Figure 5).

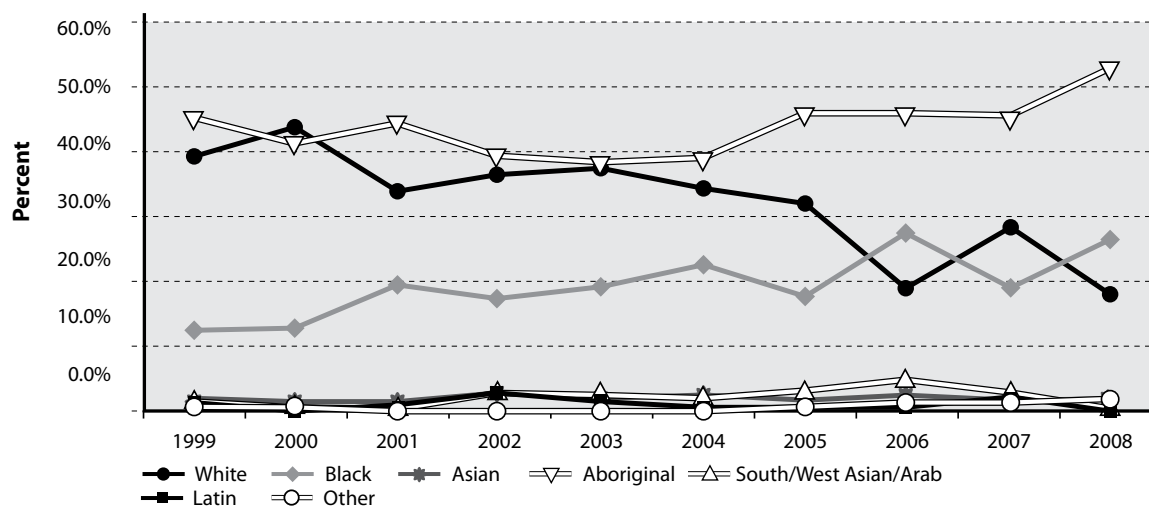
**Figure 5. Percentage of positive HIV reports among women by race/ethnicity, 1998-2008**



**Figure 6. Percentage of positive HIV reports among men by ethnicity, 1998-2008**



**Figure 7. Percent distribution of positive HIV reports race/ethnicity and year**



When race/ethnicity reporting began in 1998, the largest proportions of HIV case reports for both women and men were among cases identified as White or Aboriginal (Table 2). In 1998, 52.3% of all positive HIV test reports for women were cases identified as White; 33.5% were identified as Aboriginal. Over the next decade however, the annual proportion of HIV positive test reports for White

women declined, reaching a low of 18.7% in 2008. Over the same period, Aboriginal women represented an increasingly higher proportion of positive HIV test reports, reaching a high of 52% of all case reports among women in 2008. The other notable trend over this period was seen in Black women, among whom the proportion also increased, from 12.2% in 1999 to 26.3% in 2008 (Figure 7).

**Table 2. Comparison of HIV case reports among women by race/ethnicity, 1998 vs 2008**

1998	White	Black	Asian	Aboriginal	South/west Asian/Arab	Latin	Other	Total
Females	81	12	2	52	6	1	1	155
Males	348	22	11	68	16	13	0	478
2008	White	Black	Asian	Aboriginal	South/west Asian/Arab	Latin	Other	Total
Females	37	52	3	103	1	0	2	198
Males	265	43	31	93	8	28	6	474

## Enhanced Surveillance/Population-Specific Surveillance Data

### Description

As part of the *Federal Initiative to Address HIV/AIDS in Canada*,<sup>3</sup> PHAC monitors trends in HIV prevalence and associated risk behaviours in key vulnerable populations identified in Canada through second-generation HIV surveillance systems. The overall objectives of these systems (known as the “Track” systems) are to describe the changing patterns in the prevalence and incidence of HIV infections, risk behaviour practices and testing patterns for HIV, hepatitis C and other sexually transmitted and blood borne infections (STBBIs) in each respective population.

I-Track is the national second generation HIV surveillance system focused on people who inject drugs (IDU). This system builds on previous research studies conducted in Canada and was developed in response to the need for a consistent approach in the collection of risk behaviour information. For a more detailed description of the Track systems, please refer to Chapter 3.

### Summary of data/findings

During Phase 2 of I-Track data collection (2005-2008, 10 sentinel sites across Canada) the total sample was 3,287. The majority of participants were male (68%). The overall prevalence of HIV among I-Track Phase 2 participants was approximately 14% with no significant difference between males (14%) and females (12%). In the total sample, 91% of males and 93% of females had ever been tested for HIV.

Sex-based analyses of the I-Track Phase 2 data<sup>4</sup> showed important sex-based differences in risk behaviours among survey participants, particularly in the pattern of lending and borrowing needle/syringes/equipment. For example, compared with males, a significantly higher proportion of females reported borrowing used needles/syringes to inject drugs (26% females versus 20% males), lending used needles/syringes (29% versus 20%) and lending used injection equipment (45% versus 35%). When asked whom they borrowed from most often, females reported borrowing used needles/syringes from their regular sex partners (59% versus 34%), whereas a higher proportion of males reported borrowing from their close friends (40% males versus 29% females), people they did not know well (19% versus 6%) and people they did not know at all (5% versus 2%). With regard to education, a higher proportion of males reported completing high school (24% males versus 18% female) and had some post-secondary education (25% versus 23%).

### **National estimates of HIV/AIDS prevalence and incidence**

PHAC uses multiple methods to provide an overall picture of the HIV epidemic among all Canadians living with HIV (including AIDS), both diagnosed and undiagnosed. Using these combined methods, PHAC produces two types of estimate: prevalence, the number of people living with HIV (including AIDS), and incidence, the number of new infections in a 1-year period. PHAC produces estimates of national HIV prevalence and incidence approximately every 3 years. Please refer to Chapter 1, “National HIV Prevalence and Incidence Estimates in Canada for 2008”.

At the end of 2008, there were an estimated 14,300 (12,200-16,400) women living with HIV (including AIDS) in Canada, accounting for about 22% of the national total. This represents a 17% increase from the 12,200 (10,400-14,000) estimated for 2005. There were 600 to 1,120 new HIV infections among women in 2008, representing 26% of all new infections. For 2005, it was estimated that 590 to 1,100 new HIV infections occurred in women, accounting for about 26% of all new infections among women. With respect to exposure category, a slightly lower proportion of new infections were attributed to the heterosexual category in 2008 compared with 2005 (71% versus 73%), whereas a slightly higher proportion were attributed to IDU (29% in 2008 and 27% in 2005).

### **Summary of Recent Research**

The following section examines recent research regarding HIV/AIDS and females/women. With a Canadian focus, it mentions some of the key issues surrounding the vulnerability of females/women to HIV transmission, including commercial sex work, sexual violence and pregnancy.

#### **HIV/AIDS and female sex workers**

Research published in a 2008 article by Shannon et al.<sup>5</sup> explored the correlates of drug sharing among female sex workers and their clients. There is a well-established association between exchanging sex and smoking crack cocaine, both in this setting and elsewhere.<sup>6-8</sup> This suggests a significant potential for sharing of drugs through a sex-for-drugs or money transaction.

In this study of female sex workers in Vancouver ( $n = 198$ ), over half (59%) of the survival sex workers reported drug sharing with clients, crack cocaine being the most common drug shared. The study found these behaviours to be associated with other factors previously linked to an increased likelihood of infectious disease transmission, including multiple unprotected sexual encounters and intensive crack cocaine smoking.

Another study by Spittal et al.<sup>9</sup> examined risk behaviours among street involved females who inject drugs. This study was conducted in Vancouver and Montreal, cities that have undergone HIV epidemics among IDU. The results indicated that female injectors, including females in the sex trade, are at heightened risk of HIV transmission because they are more likely to have multiple sex partners and have intimate partners who use injection drugs. The study, which was conducted from 1999 to 2000, found that women injectors who reported sex trade involvement had higher risk profiles but not a higher HIV prevalence rate relative to women injectors not involved in the sex trade. These findings are contrary to a number of studies in the United States, which indicate that participation in the sex trade is independently associated with HIV infection. In the Spittal et al study, the sex trade workers were found to be younger and had shorter injection careers than non-sex-trade workers, and patterns of sexual risk were similar for both groups. It was found, however, that sex trade workers engaged in higher risk injection practice and drug use patterns, including greater than once-per-day heroin use, frequent use of smokeable crack cocaine and borrowing of used syringes.

The Cedar Project conducted from 2003 to 2005<sup>10</sup> organized the only cohort study of young Aboriginal people involved in illegal drug use in North America. The objective of the study was to examine the socio-demographic characteristics, drug use patterns, injection practices, sexual experiences, and HIV and hepatitis C virus (HCV) prevalence among young Aboriginal women aged 14-30 who used illegal drugs and were involved in recent sex trade, for comparison with those women not involved in sex work. The study discovered an independent association between recent sex work involvement and lifetime experience of sexual abuse, recent daily cocaine injection use and recent daily non-injection crack use.



Of the 262 females who participated in the study, 154 (58.8%) reported involvement in sex work in the previous 6 months, and 185 (70.6%) reported being involved in sex work at some point in their lives. Lifetime sexual abuse was significantly associated with sex work in univariable and multivariable analysis. Sexual abuse was reported to have first occurred during early childhood, at a median age of 6 years old. Out of 260 participants, 34 (13.1%) were found to have HIV antibodies, and 109 (41.9%) had HCV antibodies. The study also found that women involved in sex work were more likely to be HCV positive than those who were not (49.0% vs. 36.0%).

When examining the structural and environmental barriers to condom use negotiations, Shannon et al.<sup>11</sup> found an association between being pressured into unprotected sexual intercourse and sex work district location, highlighting the role of working conditions in shaping women's sexual risk of HIV transmission. Women who moved their sex trade working areas away from main streets (possibly because of previous solicitation or drug charges) experienced a 3-fold increase in the odds of being pressured into unprotected sexual intercourse, and those servicing clients in cars or public spaces experienced a 2-fold increase in being pressured into unprotected sex.

The practices of clients offering more money to not use a condom and of female sex workers charging more money for unprotected intercourse have been documented, with evidence suggesting that both drug use and poverty drive these practices.<sup>12</sup>

### Women and sexual violence

It has been shown in various settings that the epidemics of HIV and violence are closely linked.<sup>13,14</sup>

Worldwide, women aged 15-24 are 1.6 times more likely to be infected with HIV than their male peers.<sup>15</sup> Between 20% and 50% of all women indicate that their first sexual experience was forced or unwanted.<sup>16</sup> Fear of violence prevents women from seeking voluntary counselling and testing for HIV, returning for their test results, getting treatment if they are HIV positive or accessing services to prevent mother-to-child HIV transmission.<sup>17</sup>

A study done by Stockman et al.<sup>18</sup> was based on a population drawn from the National Survey of Family Growth conducted by the Centers for Disease Control and Prevention in the United States. It proposed that mechanisms linking sexual violence to the engagement of HIV risk behaviours, including heightened sexual behaviour, easy arousal and/or psychopathology (e.g. depression, post-traumatic stress disorder), lead to decreased ability to negotiate safe sexual behaviours.

In bivariate and multivariate analyses, women reporting a coerced first sexual intercourse showed the highest risk of having multiple sex partners and engaging in substance abuse, followed by women reporting coerced sex after sexual debut. Among the women in the subsample reporting sexual coercion, only consuming alcohol or drugs at coerced sex was independently and significantly associated with multiple sex partners and substance abuse.

HIV prevention for women forced into sex by their partners may require different strategies according to their history, especially a coerced first time experience, as well as type of sexual coercion experienced.

### Pregnancy and HIV

Pregnancy and HIV is another pressing issue faced by women at risk of or affected by HIV. Mother-to-child transmission can occur during gestation (*in utero* transmission) or during delivery as the newborn comes into contact with maternal blood and cervical-vaginal secretions. In the absence of any intervention, it is estimated that 25.0% of pregnant women who are HIV positive will transmit the virus to their infant either during pregnancy or at birth.<sup>18</sup> Antiretroviral therapy is effective in reducing mother-to-child transmission of HIV, and yet several infants perinatally exposed to HIV are confirmed infected each year in Canada, which implies the need for further development of therapies and improved access to and uptake of treatment.

For further information regarding pregnancy and HIV, please refer to chapter 7 on perinatal transmission of HIV.

## Conclusion

Women in Canada, especially those who use injection drugs and have high-risk sexual partners, are increasingly becoming infected with HIV, and women now account for over a quarter of new positive tests annually. The evolving epidemic in this group demonstrates the need for further data on the trends, risk factors and geographic differences in HIV/AIDS among women in Canada in order to develop gender-specific prevention and care initiatives and programs. It is essential that these programs target both sexual and injection drug risk behaviour as well as the intersection between the two, in addition to the underlying factors that put women at increased risk of HIV infection.

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### Mission

To promote and protect the health of Canadians through leadership, partnership, innovation and action in public health.

*Public Health Agency of Canada*

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