

CANADIAN STRATEGY ON HIV/AIDS
1999-2000
ANNUAL MONITORING REPORT
TECHNICAL REPORT 2:
KEY TRENDS IN HIV/AIDS IN CANADA

Prepared
for Health Canada
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Technical Report 2: Key Trends in HIV/AIDS in Canada

Introduction

A number of evaluation studies that are in the planning or implementation stages will help inform Canadians about the impacts of key Canadian Strategy on HIV/AIDS (CSHA) activities and components in the years ahead. Nevertheless, the ultimate measures of progress toward the CSHA's goals are:

- the incidence and prevalence of HIV;
- the incidence and prevalence of AIDS;
- AIDS-related premature mortality; and
- the quality of life of people living with HIV/AIDS.

These indicators have been used historically to monitor changes in the epidemic in Canada and, as such, can provide a framework for measuring the impact and success of the current CSHA. The intent of this technical report is to update baseline data reported in the first annual monitoring report for the CSHA.

The epidemic continues to evolve, resulting in constantly changing needs for the different groups affected by HIV/AIDS, as well as new challenges for policy makers, physicians and caregivers, researchers and others.

HIV Diagnoses (Positive Test Reports)

A cumulative total of 45 910 positive HIV tests were reported in Canada up to December 31, 1999 (this number had risen to 48 014 by December 31, 2000). Although the cumulative number of diagnoses continues to increase, the number of new diagnoses has shown signs of abating somewhat in recent years. In 1999, 2 240 positive HIV tests were reported, compared with 2 983 positive test reports in 1995.

During 1999, the largest proportion of HIV positive tests among adults — 37.2 per cent — was attributed to men who have sex with men (MSM), followed by injection drug use (IDU) at 28.5 per cent and heterosexual transmission at 28.5 per cent. From 1996 to 1999, the proportion of positive tests accounted for by MSM and IDU continued to decline steadily, while the proportion of new diagnoses attributed to heterosexual contact increased. There were also increases in the proportion of positive tests accounted for by women.

HIV Incidence

The true incidence of HIV in Canada remains unknown. Positive HIV test reports (reported cases of HIV diagnoses) understate the magnitude of the problem since not all people who are infected with HIV have been tested for HIV. The number of HIV test reports in a given year is composed partly of individuals infected in that year, but mostly of individuals infected in previous years. Furthermore, some individuals infected in a given year will be diagnosed (tested positive for HIV) in that year, but the majority will not be diagnosed until some time later. Therefore, the relationship between HIV incidence and HIV test reports is determined by HIV testing behaviour, which is influenced by many factors and is not well understood in quantitative terms.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) has described this dilemma as follows: “HIV case reports are even harder to interpret than AIDS case reports, since it is not possible to know how representative those who are tested are of the whole population. Even trends over time are hard to interpret, since changes in access to testing, access to therapy, perceived effectiveness of therapy, reporting regulations and other factors may affect people’s willingness to be tested for HIV.”

Despite these difficulties, HIV test report data may be combined with data on HIV testing behaviour as one method to estimate HIV incidence. Health Canada’s Bureau of HIV/AIDS, STD and TB has used this method together with other methods to produce estimates of HIV incidence at the national level. The Bureau estimates that 4 190 new HIV infections occurred in Canada in 1999 (with a range of uncertainty, or RU, of 3 310 to 5 510), compared with the estimated 4 200 new infections that occurred during 1996 (RU: 3 700 to 4 750). This appears to be a substantial increase over the estimated 2 500 to 3 000 new infections per year during the period 1989-1994.¹

Changes in Incidence Among Different Groups and by Modes of Transmission

Between 1996 and 1999, there was a 30 per cent increase in the estimated number of new HIV infections attributable to MSM. In 1996, an estimated 1 240 new infections were attributed to MSM, with an associated range of uncertainty of 1 050 to 1 460. In 1999, an estimated 1 610 new infections were attributed to MSM (RU: 1 190 to 2 060). Together with the results of more localized studies, this suggests a possible interruption in the steady reductions in infection rates attributable to MSM dating back to the 1980s.

The estimated number of new infections attributable to IDU declined from 1 970 in 1996 (RU: 1 600 to 2 400) to 1 430 in 1999 (RU: 1 030 to 1 860). Together with the results of more localized studies, this suggests a possible abrupt departure from the continued increases in infection rates attributable to IDU dating back to the 1980s.

The estimated number of new infections attributed to heterosexual exposure increased from 700 in 1996 (RU: 540 to 910) to 880 in 1999 (RU: 610 to 1 170). This increase appears to be consistent with the historical increases in infection rates (and positive HIV test results) reported earlier.

Between 1996 and 1999, there was a slight reduction in the estimated number of new infections among women, from 950 in 1996 (RU: 780 to 1 150) to 920 in 1999 (RU: not available).

During 1999, there were an estimated 370 new infections among Aboriginal people (9 per cent of new infections), compared with the estimated 310 new infections among Aboriginal people in 1996. Unfortunately, there are no published ranges of uncertainty by which to assess the stability of these estimates.

While the above estimates suggest that some very important changes may be occurring at the leading edge of the HIV epidemic in Canada, it would be premature to draw any conclusions regarding the success or failure of current CSHA activities for several reasons, particularly given the high degree of uncertainty associated with these estimates. Nevertheless, these changes should be monitored closely, both nationally and in community-based studies. They will be updated in future reports.

HIV Prevalence

There can be little doubt that HIV prevalence — the number of people living with HIV/AIDS in Canada — continues to rise, and that more people are living longer with HIV/AIDS. This can be deduced by the fact that the number of AIDS-related deaths in Canada has dropped substantially in recent years, to numbers much lower than the estimated number of new HIV infections.

The most recent national estimates of HIV prevalence in Canada are for the year 1999. At the end of that year, it is estimated that 49 800 Canadians were living with HIV (RU: 45 000 to 54 600). This is a substantial increase over the estimated 40 100 Canadians who were living with HIV at the end of 1996² (RU: 37 100 to 43 300). It is also estimated that as many as 15 000 or 30 per cent of HIV-infected individuals were alive but undiagnosed as of the end of 1999.³

According to the most recent national estimates, MSM accounted for 59 per cent of those living with HIV/AIDS at the end of 1999, followed by users of injection drugs (19 per cent) and heterosexuals (16 per cent). Women accounted for 14 per cent of those living with HIV at the end of 1999, while Aboriginal persons accounted for 5.5 per cent.

Changes in Prevalence by Population Group and Mode of Transmission

There is relatively strong evidence that the population living with HIV/AIDS continues to become more diverse. The epidemic is shifting from one that primarily affected MSM in its early stages to one that increasingly involves other groups.

Although MSM still constitute the majority of Canadians living with HIV/AIDS (59 per cent), the proportion of persons living with HIV/AIDS continues to increase among women, Aboriginal persons and among those whose mode of transmission was classified as IDU or heterosexual sex — a pattern of ongoing change that predates the current CSHA.

Morbidity and Premature Mortality

As of December 31, 2000, an estimated 19 153 AIDS cases and 12 419 AIDS-related deaths had been reported in Canada. However, strong evidence also exists of an ongoing decline in reported AIDS cases and AIDS-related deaths in Canada (this decline has occurred to a greater extent among some communities than others).

In 2000, an estimated 644 AIDS cases and 127 AIDS-related deaths were reported in Canada, compared with 1 727 reported AIDS cases and 1 485 AIDS-related deaths in 1995 (all results have been adjusted for reporting delays). There is insufficient evidence to determine whether this downward trend can be sustained. Relative to other ethnic communities in Canada, reported AIDS cases appear to be diminishing the least among Aboriginal people.

Quality of Life Issues

Emerging information suggests the quality of life of people living with HIV/AIDS may be improving. At the same time, new quality of life issues are arising due to the fact that more people are living longer with HIV.

Determinants of Health

A growing body of evidence suggests that members of socio-economically disadvantaged groups are:

- more likely to experience living and working conditions that increase their vulnerability to the risk of HIV infection;
- more likely to become HIV-positive;
- less likely to follow treatment regimens; and
- more likely to die prematurely than are members of less disadvantaged groups.

Data Sources and Gaps

Impressive baseline data exist to permit ongoing monitoring of the HIV/AIDS epidemic in Canada. Data sources include national surveillance systems, positive HIV test reports, imputed estimates of HIV incidence and prevalence, results from large-scale national surveys, targeted prevalence and incidence studies, community-based studies (including studies of special populations), AIDS case reports, AIDS-related death reports, and studies of the broader determinants of health.

At the same time, there are significant gaps in Canada's HIV/AIDS information base, and several emerging issues need to be further researched to enhance our ability to monitor and respond to changes in the epidemic. Specifically, there is a need for

- continued improvements in the measurement of HIV incidence and prevalence. Canada's surveillance and epidemiologic databases, although impressive in scope, vary substantially in their level of precision, especially from group to group. Reported HIV test results need to be supplemented with better information about HIV testing behaviour. As well, estimates of HIV incidence and prevalence need to become more precise to guide efforts in prevention, treatment and care.
- databases that better reflect shifts in the epidemic itself. There is a particular need for better information on prison populations, users of injection drugs, women, Aboriginal peoples and members of other ethnic, racial and cultural communities.
- more focus on intermediate indicators and evaluation studies of the impacts of CSHA activities (particularly studies that focus on interventions in key communities).
- better information about HIV/AIDS from major national surveys, such as the National Population Health Survey, the First Nations and Inuit Regional Health Surveys and the planned Canadian Community Health Survey.
- more attention to broad determinants of health related to HIV/AIDS, including income, education, shelter and security.
- additional research related to the quality of life of people living with HIV/AIDS.

Background: Historical Trends in HIV/AIDS in Canada

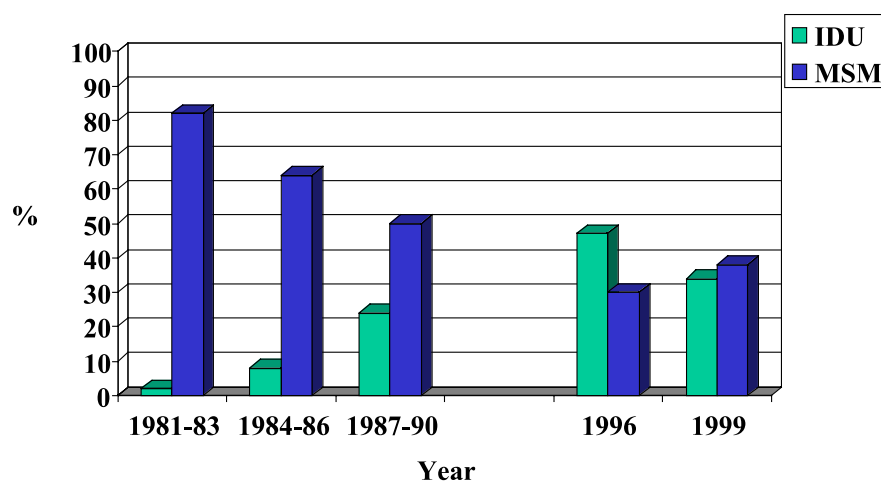
This section provides a brief overview of epidemiological trends that influenced the development of the renewed CSHA. This information will also provide a context for monitoring the future impact and success of the CSHA.

In 1996 (the most recent pre-CSHA year for which estimates of HIV incidence and prevalence are available), an estimated 4 200 people in Canada became infected with HIV (RU: 3 700 to 4 750) and an estimated 40 100 people in Canada were living with HIV/AIDS (RU: 37 100 to 43 300).

Although HIV/AIDS reports commonly refer to a “rapidly shifting” epidemic, an examination of available information suggests that the epidemic in Canada has been evolving steadily over at least the past decade. Reports from Health Canada suggest that from the early 1980s to 1996, there was a progressive and relatively continuous decline in the predominance of new infections among MSM, accompanied by increasing rates of infection in other at-risk groups. Specifically:

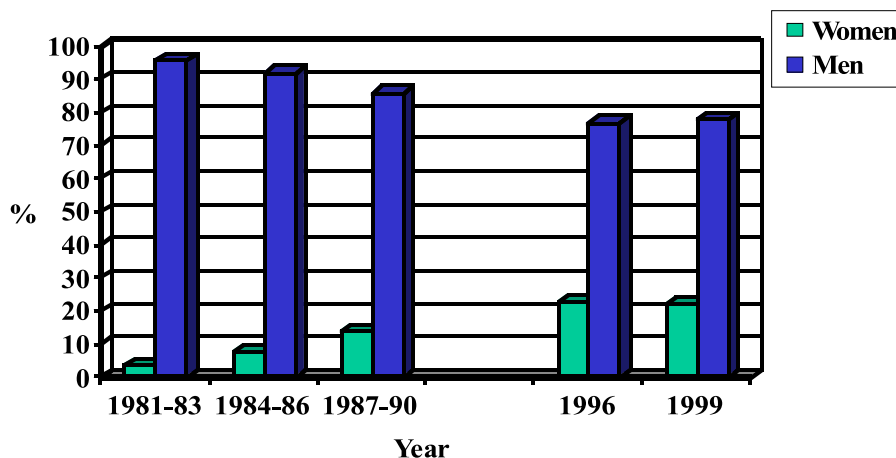
- the estimated proportion of new infections accounted for by MSM declined from more than 80 per cent in 1981-83 to 29.5 per cent in 1996;
- the estimated proportion of new infections accounted for by users of injection drugs increased from less than 10 per cent before 1986 to 46.9 per cent in 1996; and
- the estimated proportion of new infections accounted for by women increased from less than 10 per cent before 1986 to 22.6 per cent in 1996.⁴

Figure 1
Percentage of IDU and MSM among estimated new HIV infections in Canada, by time period



Note: Estimates before 1996 by back-calculation
Source: Health Canada, Bureau of HIV/AIDS, STD and TB

Figure 2
Percentage of women and men among estimated new HIV infections in Canada, by time period



Note: Estimates before 1996 by back-calculation

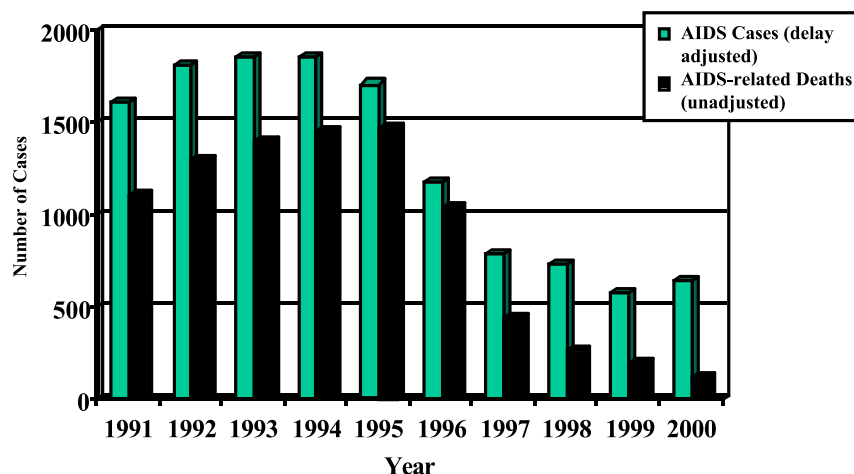
Source: Health Canada, Bureau of HIV/AIDS, STD and TB

This is confirmed by Albert and Williams, who in 1998 described two significant waves of the Canadian epidemic: “The first significant wave of the epidemic was driven by very high rates of infection among MSM, and the second driven by high rates of infection among the IDU population ... Intensive infections in the IDU population did not probably begin until 1985, at which point infections among MSM had already peaked.”⁵

As well, although data on infection rates are less plentiful for other population groups, during development of the CSHA concerns were being voiced about possible major increases of HIV/AIDS incidence among Aboriginal peoples and prison populations.^{6,7}

Another significant trend, illustrated in Figure 3, is the major decline in reported AIDS cases and AIDS-related mortality in Canada in recent years. Despite important limitations with these data sources and potential problems of under-reporting, it is clear that the annual number of reported AIDS cases and AIDS-related deaths has declined in recent years. The number of AIDS diagnoses declined from 1 859 in 1993 to 584 in 1999 and increased slightly in 2000 to 644. The number of reported AIDS-related deaths also declined, from 1 405 in 1993 to 127 in 2000.⁸ Even after adjusting for reporting delays, these declines are significant and are attributed in part to new antiretroviral treatment regimens and perhaps also to more effective secondary prevention efforts.^{9,10}

Figure 3
Reported AIDS Cases and AIDS-related Deaths, by Year,
Canada, 1991-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Current National Trends in HIV/AIDS in Canada

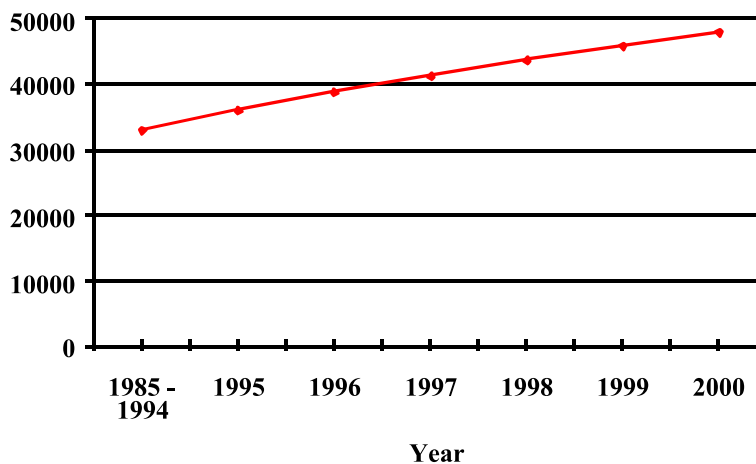
This section describes current national HIV/AIDS trends in Canada. To the extent possible, the same data sources (national surveillance systems, supplemented occasionally with information from community-based studies) have been used for determining both current and historical trends.

Considerable uncertainty remains about the true incidence and prevalence of HIV, particularly among certain groups. Nevertheless, this report summarizes some current evidence that raises the possibility of an important recent departure from the historical trends noted above. Later in the chapter, changes in the epidemic are described in some detail to better illustrate key national trends and emerging challenges.

New Diagnoses: Positive HIV Test Reports

The number of positive HIV test reports provides an important estimate of the number and characteristics of Canadians *known* to be HIV-positive. It reflects the number of people who have been tested, diagnosed and reported to be HIV-positive. However, it must be noted that the number of people *known* to be HIV-positive does not necessarily provide an accurate estimate of the number of people who are, in fact, infected with HIV, since some infected people have not yet been tested for HIV (this important caveat will be discussed later in this technical report).

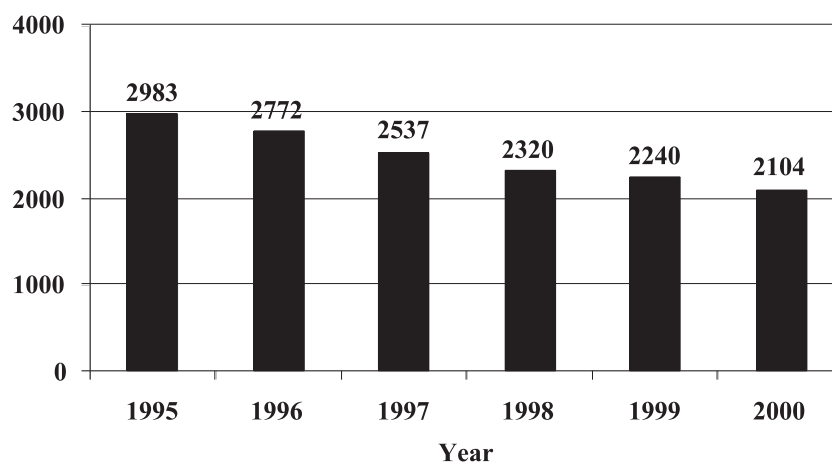
Figure 4
Cumulative Number of Positive HIV Tests Reported in
Canada, to December 31, 2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

As illustrated in Figure 4, a cumulative total of 45 910 positive HIV tests had been reported in Canada as of December 31, 1999. This number increased to 48 014 by December 31, 2000.¹¹ Approximately 95 per cent of the reported HIV-positive tests, reported AIDS cases and reported AIDS-related deaths in Canada are accounted for by the four largest provinces (as measured by population) — Ontario, Quebec, British Columbia and Alberta — which together represent 85 per cent of Canada's population. It should be noted, however, that despite recent improvements in reporting practices, the number of reported HIV diagnoses from Quebec as of the end of 1999 underestimates the actual number of HIV infections, since the process to rule out duplicate reports is still being developed. By extension, the number of HIV diagnoses reported for Canada as a whole underestimates the true number.

Figure 5
Annual Number of Positive HIV Tests Reported,
Canada, 1995-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Figure 5 reveals that the number of HIV-positive tests has shown signs of moderating in recent years. In 1995, 2 983 positive tests were reported; by December 31, 1999, this had declined to 2 240 reported positive tests. Of the 2 240 reported positive tests in 1999, 39 (1.7 per cent) were among children under 15 years of age — a substantial decline from the 87 positive tests reported in 1996.

In 2000, 2 104 positive HIV tests (with duplicates removed to the degree possible) were reported to Health Canada's Centre for Infectious Disease Prevention and Control, including 18 among children.¹²

Positive HIV Tests Among Different Populations

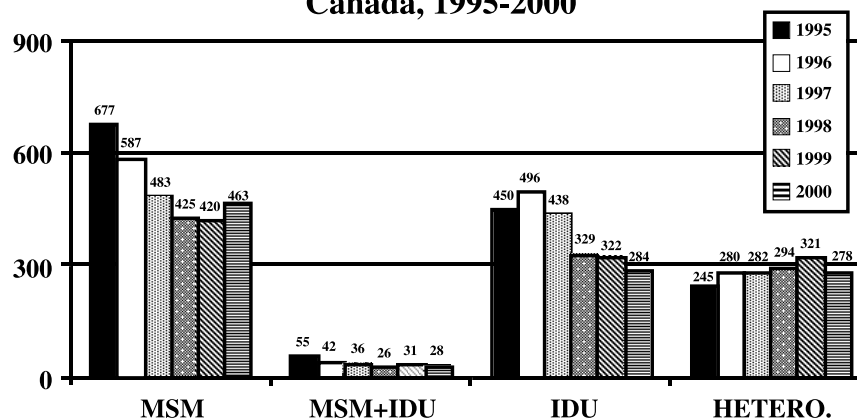
The frequency of HIV testing is believed to vary among different population groups and by mode of transmission. This section provides a brief description of trends in positive HIV tests in Canada:

- by mode of transmission;
- among men and women; and
- among Aboriginal people.

Mode of Transmission

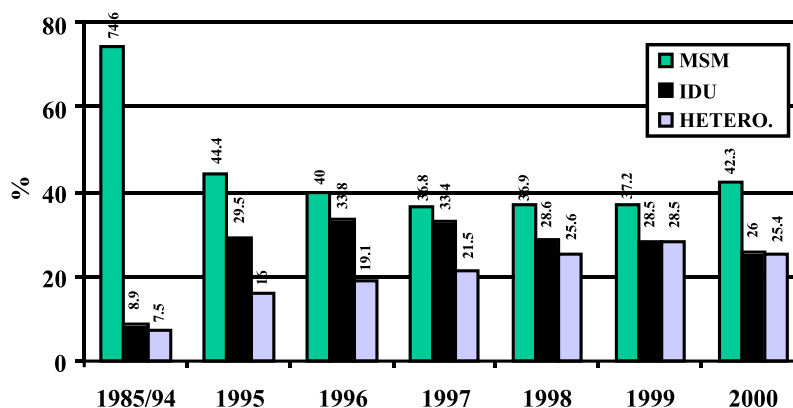
Figures 6 and 7 provide data on the number and proportion of HIV-positive test results among adults by mode of transmission. These estimates must be treated with caution since changes in the number of positive tests may reflect changes in the frequency of testing among certain groups. As well, information on mode of transmission was not available for more than half of the positive test reports during 2000.¹³

Figure 6
Annual Number of Positive HIV Tests Reported
Among Adults By Mode of Transmission,
Canada, 1995-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Figure 7
Percentage of all Positive HIV Test Reports Among Adults,
Selected Populations, Canada, 1985/94-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Among MSM, the number of HIV-positive test reports per annum declined steadily, from 677 in 1995 to 463 in 2000. Nevertheless, MSM still accounts for the highest number of positive tests for any of the reported modes of transmission.

The number of HIV-positive tests attributed to IDU also declined throughout this period, from a peak of 496 cases in 1996 to 284 cases in 2000.¹⁴ To some extent, this trend is consistent with a recent major decline in IDU incidence rates reported in the Vancouver cohort.¹⁵ The causal factors underlying this apparent decline in HIV incidence among users of injection drugs, particularly in Vancouver, have been the subject of considerable debate.¹⁶ Better understanding of these factors will assist future prevention efforts.

While the number of positive tests attributed to MSM and IDU declined during this period, the number of positive tests attributed to heterosexual contact increased steadily, from 245 in 1995 to 321 in 1999.

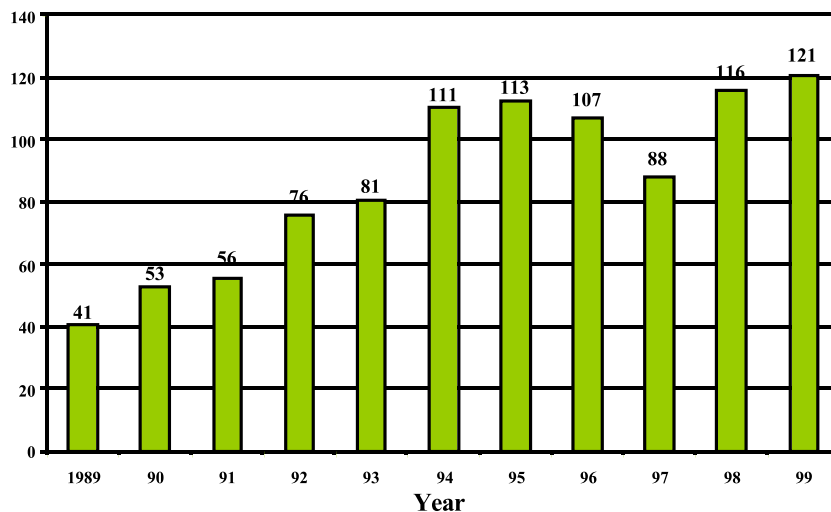
Despite the intrinsic limitations to using test results to monitor changes in the HIV epidemic, the results noted above suggest a continued evolution of the epidemic in recent years. From 1985 to 1994, MSM accounted for 74.6 per cent of adult positive test results; by 1999, this mode of transmission accounted for 37.2 per cent of adult positive test reports. By contrast, IDU accounted for 8.9 per cent of adult positive test reports during the period 1985 to 1994, but had increased to 33.4 per cent of new diagnoses among adults in 1997, and then declined to 28.5 per cent of new diagnoses in 1999. Heterosexual transmission accounted for only 7.5 per cent of newly reported infections among adults in the 1985-1994 period, but had increased to 28.5 per cent of new diagnoses by 1999.

Results for the year 2000 suggest the possibility of continuing changes in the epidemic. Among adults, MSM accounted for 42.3 per cent of new diagnoses (an increase), while IDU accounted for 26.0 per cent of new diagnoses (a decrease). In 2000, 25.4 per cent of positive HIV tests among adults were attributed to heterosexual contact (a decrease). Continued monitoring is needed to determine whether these trends are sustained.¹⁷

“Perinatal transmission” is the transmission of HIV from an HIV-infected pregnant woman to her newborn child. Transmission can occur during gestation (in utero), during delivery (when the fetus makes contact with maternal blood and mucosa in the birth canal) or after delivery, through breast milk. As noted earlier, the proportion of reported new HIV infections among women continues to increase. Evidence also suggests that the increases may be most rapid among certain subsets of young, socio-economically disadvantaged women.^{18,19,20}

The Canadian Pediatric AIDS Research Group monitors cases of infants known to have been exposed perinatally to HIV. A total of 963 infants were exposed to HIV from their mothers between 1989 and 1999; 262 of these children have since been confirmed to be HIV-positive and 110 others have indeterminate serostatus and are being monitored. It should be emphasized, however, that these statistics are based on women who were *known* to be HIV-positive in their pregnancy. They do not reflect the total number of infants who have been exposed perinatally to HIV because not all pregnant women know their HIV status.

Figure 8
Reported Number of Perinatal HIV-Exposed Infants,
by Year of Birth, Canada, 1989-1999



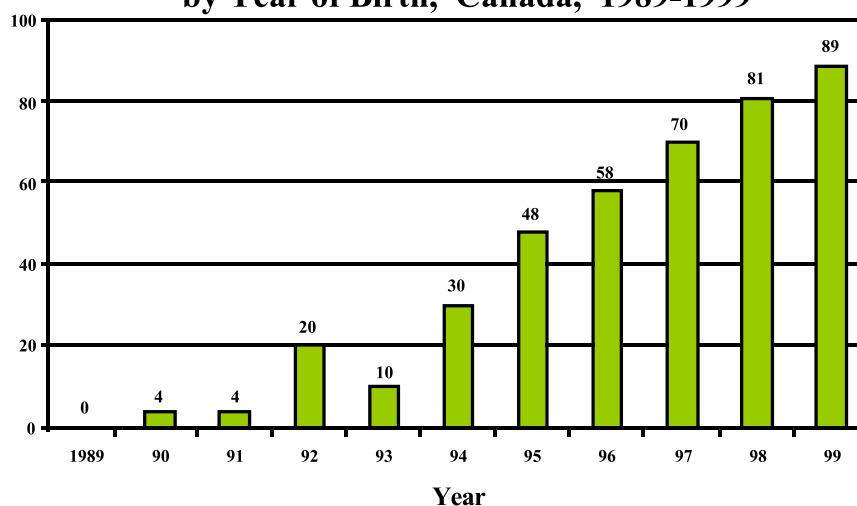
Source: HIV and AIDS in Canada: Surveillance Report to June 30, 2000. Health Canada: November, 2000.

Nationally, the number of infants born to HIV-infected mothers has increased steadily over the past decade (see Figure 8). Whether this constitutes a valid trend or is simply the result of increased HIV testing among pregnant women remains to be determined. For example, Remis (1999) reports that rates of HIV testing among pregnant women in Ontario increased by approximately 50 per cent between 1992 and 1998, while rates of testing among men remained unchanged. Moreover, the increase in HIV testing of Ontario women was almost exclusively among those aged 15 to 39. Similarly, data from Quebec show a dramatic increase between 1997 and 1999 in the number of physicians who offered or prescribed HIV testing to pregnant women.^{21,22} Questions also remain regarding subsets of women who are characterized by higher-risk living and working conditions, and the likelihood of HIV testing within these population subsets.²³

A study of all HIV pediatric centres in Canada found that 19 per cent of women known to be HIV-positive at the time of giving birth between 1995 and 1997 were Aboriginal.²⁴

An increasing proportion of infants known to have been exposed perinatally to HIV over the past decade received some treatment during the course of their gestation and after birth. Figure 9 shows that by 1999, 89 per cent of these infants were being exposed to antiretroviral therapy (ART) for prophylaxis. However, the nature of such therapy varies significantly, ranging from exposure to AZT only in the neonatal period to exposure to three or more ARTs from conception.²⁵ A recent article by King et al. (2000) confirms that increasing numbers of HIV-positive mother-infant pairs are receiving ART in pregnancy, and that perinatal HIV transmission “was reduced to 4.8 per cent with AZT monotherapy and 2.5 per cent when combination therapy was offered.”²⁶

Figure 9
Percentage of Perinatal HIV-Exposed Infants Exposed to
Antiretroviral Therapy (ART) for Prophylaxis,
by Year of Birth, Canada, 1989-1999



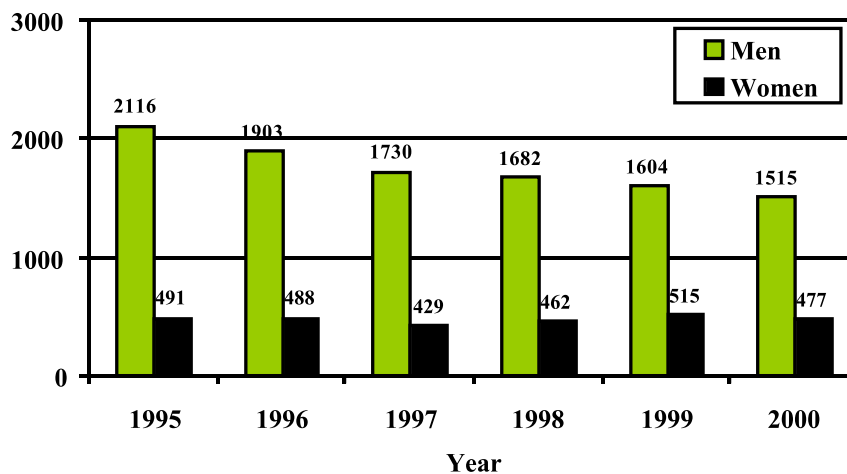
Source: HIV and AIDS in Canada: Surveillance Report to June 30, 2000. Health Canada: November, 2000.

Men and Women

In all but about 10 per cent of cases, gender is identified in reports of HIV test results. As can be seen in Figures 10 and 11, the number of positive tests reported among adult men declined from 2 116 in 1995 to 1 515 in 2000. Among adult women, the number of reported positive tests increased slightly, from 491 in 1995 to 477 in 2000.

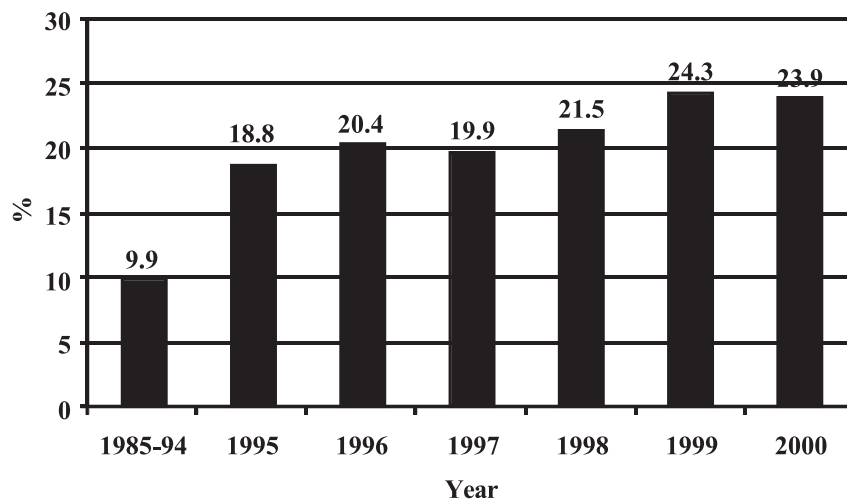
On every continent except sub-Saharan Africa, the number of HIV infections among men outnumber those among women. In Canada, there were over six times more positive HIV tests reported among adult men than among women in the cumulative data to 2000. However, the proportion of positive HIV tests among women has been increasing steadily, from 18.8 per cent in 1995 to 24.3 per cent in 1999.²⁷ Moreover, in 2000, 23.9 per cent of all positive HIV tests among adults were among women.

Figure 10
Adult Men and Women: Annual Number of Positive HIV Tests Reported, Canada, 1995-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Figure 11
Adult Women as a Percentage of Adult Positive HIV Tests, Canada, 1985/94-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

In slightly more than half of the positive HIV tests involving adult women in 2000, the mode of transmission was recorded.²⁸ In 55.9 per cent of these cases, the mode of transmission was heterosexual contact, a substantial increase from the 35.5 per cent reported in 1995. At the same time, there was a slight decrease in the number of positive tests attributed to IDU, down from 53.6 per cent in 1995 to 38.5 per cent in 2000.

Among HIV-positive adult men whose mode of transmission was recorded, 54.0 per cent of new infections in 2000 were attributed to MSM — a substantial decrease from the 55.4 per cent reported in 1995. A further 22.4 per cent of new infections among men in 2000 were attributed to IDU, and 3.3 per cent to the combined category of MSM+IDU, compared with 23.6 per cent and 4.3 per cent, respectively, in 1995. In 2000, 17.2 per cent of new infections among men were attributed to heterosexual contact, a substantial increase from 11.3 per cent in 1995.

Aboriginal People

There continues to be a marked paucity of information on test results for members of different cultural, racial or ethnic communities in Canada, including Aboriginal people. Since 1998, only 27.8 per cent of positive HIV tests have reported ethnicity.

National data on HIV test results among Aboriginal people in Canada are currently under development. However, recent data on diagnosed HIV infections from provinces and territories that report ethnicity information (British Columbia, Alberta, Saskatchewan, Manitoba, Yukon, Prince Edward Island, Nova Scotia and Newfoundland) reveal that Aboriginal persons constitute a significant proportion of positive tests when ethnicity is reported, increasing from 19.5 per cent in 1998 to 25.8 per cent in 1999 and decreasing to 17.7 per cent in 2000.^{29,30}

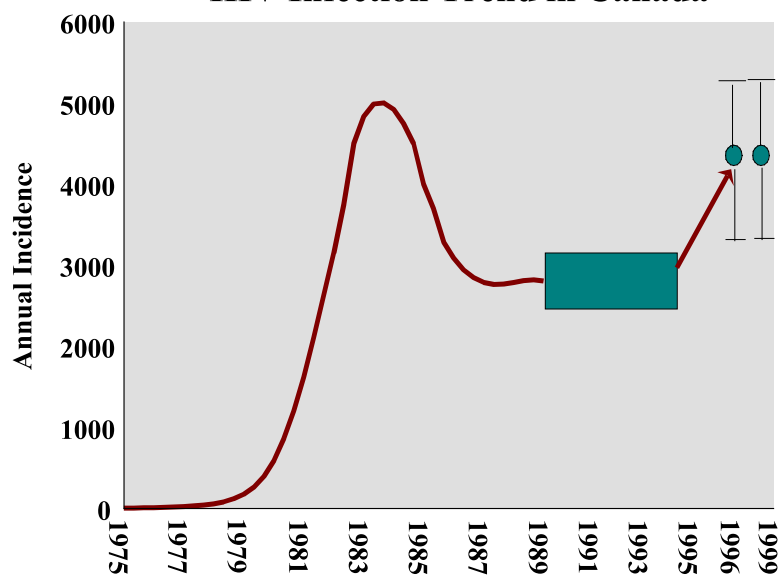
Incidence of HIV

HIV incidence refers to the rate at which new HIV infections are occurring during a given time period and is therefore an important indicator of the current dynamics of the epidemic.³¹ Knowledge of incidence, both in the general population and in vulnerable populations or “core groups,” can help Canada better target prevention initiatives. HIV incidence also has relevance for care, treatment and support programs. For example, given the high rates of HIV and hepatitis C co-infection, recent increases in HIV incidence among users of injection drugs have important implications for treatment.³² HIV incidence, according to Albert and Williams is “a high-level indicator of success or failure of epidemic control.”³³

Estimating HIV Incidence

As mentioned earlier in this technical report, the number of positive HIV test reports does not accurately represent the incidence of HIV in Canada. A variety of methods have been developed to estimate HIV incidence. From 1975 to 1989, for example, the method of back-calculating new infections from reported AIDS cases was used. However, new treatments that lengthen the interval between HIV infection and AIDS onset now prevent the use of this method. Other methods are currently used to estimate the average number of annual HIV infections for the years 1989 to 1994 as a whole (shown as a block in Figure 12) and for the years 1996 and 1999. These later estimates combine data from HIV/AIDS surveillance, vital statistics, epidemiologic studies and testing behaviour studies in a type of triangulation process to maximize the use of available information.

Figure 12
HIV Infection Trend in Canada



Source: Health Canada, Bureau of HIV/AIDS, STD and TB, 2000.

The methodologies used to create these more recent estimates have been described in detail in a number of publications and presentations.^{34,35,36,37,38} However, a very major limitation with these methodologies is that, of necessity, they entail a relatively high range of uncertainty. Consequently, the following sections present estimates together with the appropriate range of uncertainty, where it has been reported. These estimates must be interpreted with caution, as different methods were used to calculate the ranges of uncertainty for 1999 compared with 1996.

The estimated number of incident HIV infections in Canada peaked at more than 5 000 per year during the mid-1980s and then appeared to level off at 2 500 to 3 000 new infections per year for the period 1989 to 1994, before increasing to approximately 4 200 per year in 1996 and 1999. An estimated 4 190 people in Canada became newly infected with HIV in 1999 (RU: 3 310 to 5 150), compared with approximately the same estimated number (4 200) in 1996 (RU: 3 700 to 4 750).³⁹

Although the estimate of HIV incidence in 1996 (the most recent pre-CSHA year for which estimates of HIV incidence and prevalence are available) is not substantially different from the estimate three years later (1999), this should not be construed as evidence that the CSHA lacks efficacy, especially given the high level of uncertainty in these estimates and the time it takes for program interventions to have a measurable impact.

Incidence of HIV Among Different Population Groups

This section provides a brief description of the estimated incidence of HIV in Canada:

- by mode of transmission;
- among men and women; and
- among Aboriginal people.

Trends in Mode of Transmission

Although the estimated incidence of HIV in Canada was essentially the same in 1999 as in 1996, the distribution of infections among exposure categories appears to have changed.

As shown in Table 1, between 1996 and 1999 there was a 30 per cent increase in the estimate of the number of new infections per year among MSM (from 1 240 to 1 610) and a 27 per cent decline in the number of new infections among users of injection drugs (from 1 970 to 1 430). In 1996, the leading edge of the epidemic was among users of injection drugs, whose estimated incidence rate of 1 970 new infections (RU: 1 600 to 2 400) was higher than among MSM (1 240 new infections, with an RU of 1 050 to 1 460). By 1999, however, the highest number of new infections was among MSM, with an estimated incidence rate of 1 610 new infections (RU: 1 190 to 2 060) compared with an estimated 1 430 new infections among users of injection drugs (RU: 1 030 to 1 860). Also noteworthy is the 26 per cent increase, from 700 in 1996 to 880 in 1999, in the estimate of new infections attributable to heterosexual contact.

Table 1: Estimates and Uncertainty Ranges for Number of Incident HIV Infections in Canada in 1999 and 1996, by Exposure Category

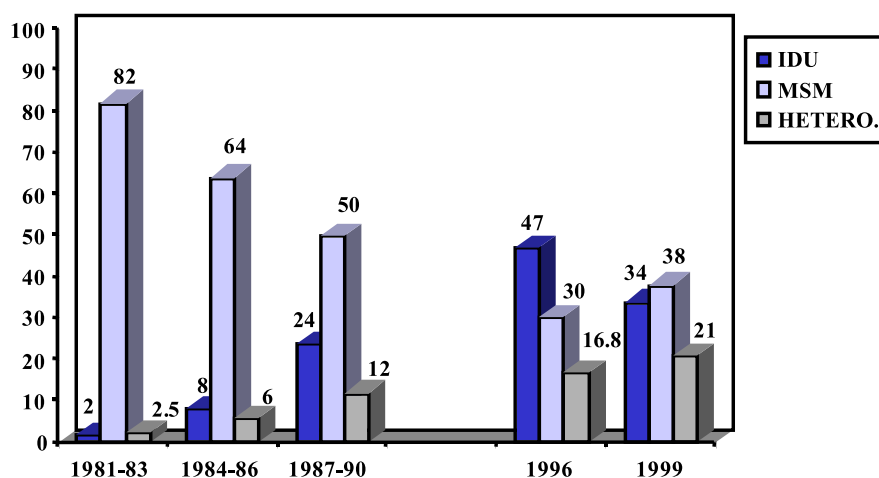
	MSM	MSM+IDU	IDU	Heterosexual	Total
1999 Estimate	1 610	270	1 430	880	4 190
1999 R.U.	1 190 – 2 060	190 – 360	1 030 – 1 860	610 – 1 170	3 310 – 5 510
1996 Estimate	1 240	290	1 970	700	4 200
1996 R.U.	1 050 – 1 460	230 – 370	1 600 – 2 400	540 – 910	3 700 – 4 750

It should be noted that these trends do not necessarily correspond directly with trends reported earlier related to positive HIV test reports. There are several possible reasons for this, including the differential rates and periodicities of HIV testing among different population groups discussed earlier. A better understanding of these differences would assist health officials and others in better distinguishing the characteristics of the “known” epidemic (those who have tested positive for HIV), the “hidden” epidemic (those who are HIV-positive but unaware of their condition) and, by extension, the “true” epidemic.

Thus, the following general statements can be made about changes in the distribution of new infections among different exposure categories, based on the estimates of HIV incidence presented in Table 1.

In 1999, MSM accounted for an estimated 38 per cent of all new HIV infections in Canada, up from 30 per cent of new infections in 1996 (see Figure 13). This appears to reverse a long-term downward trend in the proportion of new infections attributable to MSM, which declined from 82 per cent in the 1981-83, period, to 64 per cent in 1984-86, 50 per cent in 1987-90 and 30 per cent in 1996. This apparent change in the HIV infection rate among MSM warrants careful consideration by program planners and is a trend that should be monitored closely in the future.

Figure 13
Percentage of IDU, MSM and Heterosexual Transmission
among new HIV infections in Canada, by time period
(results before 1996 by back-calculation)



Source: Health Canada, Bureau of HIV/AIDS, STD and TB, 2000.

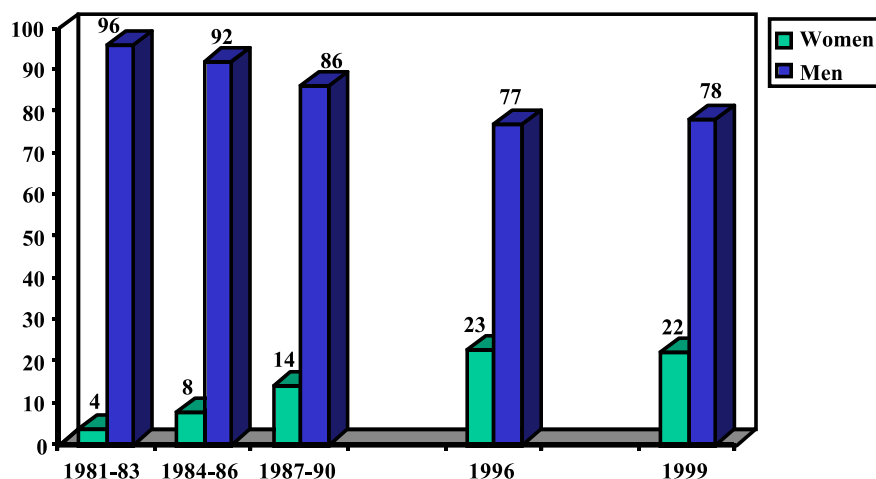
In regard to the IDU mode of transmission, the decline in the estimated number of new infections among users of injection drugs between 1996 and 1999 would also appear to reverse a long-term trend (see Figure 13). In the 1981-83 period, 2 per cent of new HIV infections were attributed to IDU. This increased to 8 per cent in 1984-86, 24 per cent in 1987-90 and 47 per cent in 1996. It would be premature to attribute this possible departure from a long-standing trend to CSHA activities per se, given the relatively high level of uncertainty implicit in these estimates (particularly in recent years). As with MSM, trends of HIV infection among injection drug users should be monitored closely in the years to come.

As shown in Figure 13, the number and estimated proportion of new HIV infections attributable to heterosexual contact appears to have increased between 1996 and 1999. This is consistent with a long-established trend of increasing rates of infection attributable to heterosexual contact. In the 1981-83 period, only 2.5 per cent of new infections were attributed to heterosexual contact. This had increased to 6 per cent in 1984-86, 12 per cent in 1987-90, 16.8 per cent in 1996 and 21 per cent in 1999. Again, it would be premature to attribute this trend to successes or failures of the CSHA. However, the apparent increasing rates of HIV infection attributable to heterosexual contact dating back to 1981 clearly warrant additional consideration.

Men and Women

In 1999, there were an estimated 920 new HIV infections among women in Canada (22 per cent of the Canadian total) and 3 270 among men (78 per cent of the total). As shown in Figure 14, these levels were virtually unchanged from 1996, when there were an estimated 950 new infections among women (23 per cent of the total) and 3 250 among men (77 per cent of the total).

Figure 14
Percentage of women and men among new HIV infections
in Canada, by time period
(results before 1996 by back-calculation)

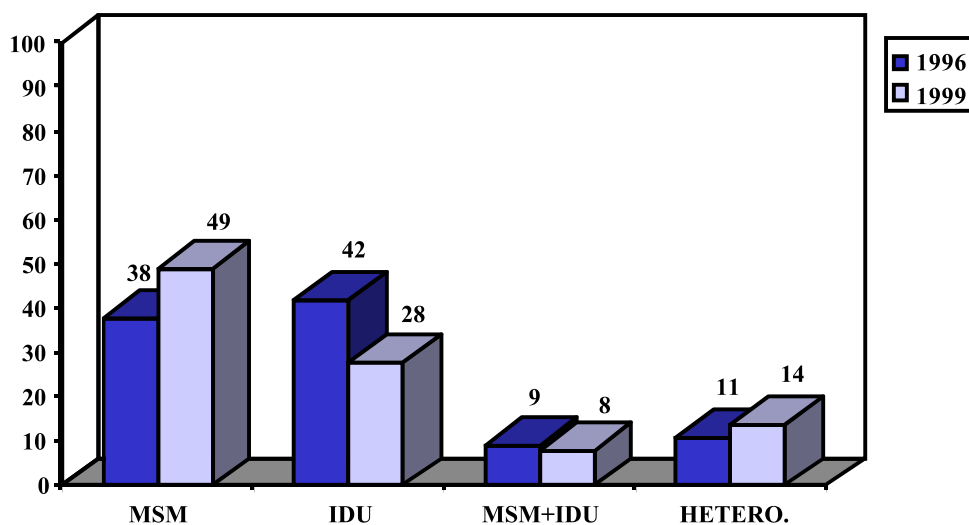


Source: Health Canada, Bureau of HIV/AIDS, STD and TB

Among women, the number of new infections attributed to IDU decreased from 600 in 1996 (RU: 460 to 770) to 492 in 1999 (RU not available). However, the number of new infections among women attributed to heterosexual transmission increased from 350 (RU: 260 to 475) in 1996 to an estimated 425 in 1999 (RU not available). Looked at another way, in 1996 63 per cent of new infections among women were attributed to IDU and 37 per cent to the heterosexual category. By 1999, 54 per cent of all new infections among women were attributed to IDU and 46 per cent were attributed to heterosexual transmission.

Among men, Figure 15 shows that the estimated number of new infections attributed to MSM increased from 1 240 (38 per cent) in 1996 to 1 610 (49 per cent) in 1999. By contrast, the number of new infections among men attributed to IDU fell from 1 370 (42 per cent) in 1996 to 930 (28 per cent) in 1999. These are potentially substantial changes that may signal a shift in the epidemic. However, given the significant uncertainty associated with the differences in these estimates, they must be interpreted with considerable caution.

Figure 15
Men: Estimated Percentage of New Infections,
by Mode of Transmission, 1996 and 1999



Source: Health Canada, Bureau of HIV/AIDS, STD and TB

Nevertheless, these changes would appear to be consistent with changes reported in incidence rates and risk behaviours in community-based studies across Canada. In any case, these trends should be monitored closely, both nationally and locally, in future years.^{40,41,42}

Aboriginal People

Despite the previously acknowledged lack of data on HIV test results for Aboriginal people, it appears that Aboriginal populations continue to be over-represented in terms of HIV incidence and prevalence in Canada. As noted earlier, Health Canada estimates there were 370 new HIV infections among Aboriginal populations in 1999 (9 per cent of all new HIV infections in that year), a slight increase over the estimated 310 new infections among Aboriginal people in 1996 (7 per cent of all new infections). Of these, 64 per cent were attributed to the IDU exposure category, 17 per cent to heterosexual contact, 11 per cent to MSM and 8 per cent to MSM-IDU.⁴³ Unfortunately, there are no published ranges of uncertainty for these estimates, so they should be interpreted with considerable caution.

Data from British Columbia, Saskatchewan and Alberta show that the proportion of Aboriginal people among new HIV diagnoses ranged from 15 per cent to 26 per cent over varying time periods from 1993 to 1998.^{44,45} In addition, recent data on diagnosed HIV infections from provinces and territories that report ethnicity found the proportion of new infections attributed to Aboriginal persons was 19.4 per cent in 1998 and 24.8 per cent in 1999.⁴⁶

Prevalence of HIV

HIV prevalence refers to the number or proportion of individuals in a specific at-risk population group who are HIV-infected at a particular point in time. Individuals with asymptomatic HIV infection and those diagnosed with an AIDS-defining illness are usually included in this number.

HIV prevalence reflects the number of people who are currently *living* with HIV/AIDS — that is, the number of people who have been infected with HIV over the course of the epidemic, less those who have died (irrespective of cause of death). Such data provide an indicator of the burden of HIV among various sub-populations and the extent to which HIV has spread within that population throughout the epidemic. These estimates are also relevant for the issues of care, treatment and support.⁴⁷ As well, from the perspective of epidemic control, the size of the prevalent population affects the likelihood of further spread of the virus throughout the population.⁴⁸

The number of people living with HIV/AIDS in Canada continues to increase. Using the methodologies referred to earlier, Health Canada estimates that 49 800 Canadians (RU: 45 000 to 54 600) were living with HIV infection (including those living with AIDS) in 1999, compared to 40 100 (RU:37 100 to 43 300) at the end of 1996.⁴⁹ This 24 per cent increase reflects a combination of continuing new infections and a decline in AIDS-related deaths due to new treatments.

Prevalence of HIV Among Different Population Groups

As described earlier, historical data have revealed a gradual shift in the HIV/AIDS epidemic from one that initially affected MSM to one that now involves many other groups, in particular users of injection drugs, Aboriginal people, women and prison populations. Despite uncertainties in the data, it would appear that both the incidence and prevalence of HIV increasingly involves members of these latter groups. This section provides a brief description of the estimated prevalence of HIV in Canada:

- by mode of transmission;
- among men and women;
- among Aboriginal people; and
- among prison populations.

Mode of Transmission

Estimates of the prevalence of HIV by exposure category for 1996 and 1999 are provided in Table 2.

The largest increase in the number of people living with HIV in Canada between 1996 and 1999 was attributed to MSM. During this period, the estimated number of people living with HIV attributed to MSM increased from 25 300 (RU: 22 500 to 28 100) to 29 600 (RU: 26 000 to 33 400). Despite this growth, the proportion of prevalent infections attributed to MSM actually declined between 1996 (when it stood at 63 per cent) and 1999 (59 per cent).

Table 2: Estimates and Uncertainty Ranges for Number of Prevalent HIV Infections in Canada in 1999 and 1996, by Exposure Category

	MSM	MSM/IDU	IDU	Heterosexual	Others	Total
1999 Estimate	29 600	2 100	9 700	8 000	400	49 800
1999 R.U.	26 000 – 33 400	1 700 – 2 600	8 100 – 11 800	6 300 – 10 100	330 – 470	45 000 – 54 600
1996 Estimate	25 300	1 700	7 100	5 500	500	40 100
1999 R.U.	22 500 – 28 100	1 400 – 2 100	6 000 – 8 500	4 400 – 6 900	430 – 580	37 100 – 43 300

Both the number and the proportion of prevalent infections attributed to IDU and to heterosexual transmission increased between 1996 and 1999. While this is consistent with previously reported trends in the epidemic, it must be emphasized that in all cases the ranges of uncertainty are quite large.

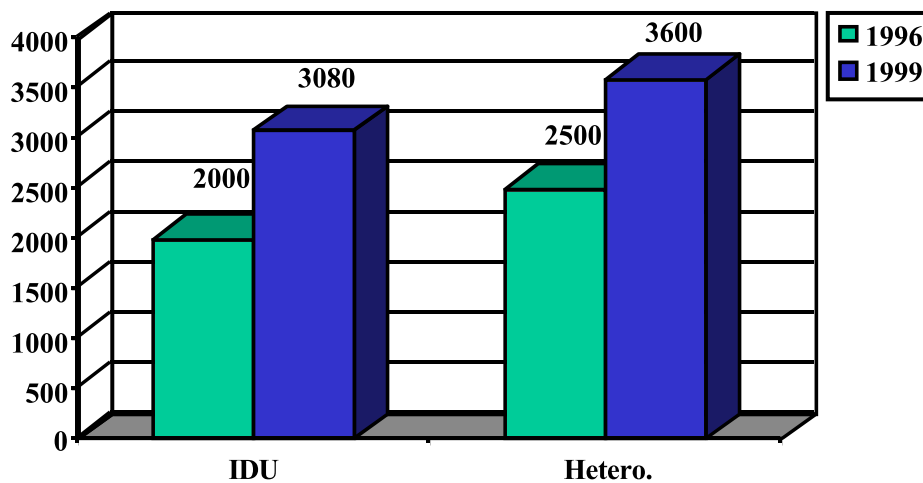
Nevertheless, these results appear to be consistent with the results of a number of community-based studies. For example, several community-based studies have documented steady increases in HIV prevalence among inner-city injection drug users. In Montreal, HIV prevalence in users of injection drugs increased from 5 per cent prior to 1988 to 19.5 per cent in 1997. In Vancouver, HIV prevalence among users of injection drugs increased from 4 per cent in 1992-93 to 23 per cent in 1996-97. In Toronto, HIV prevalence in this population group increased from 4 per cent in 1991-92 to 9.5 per cent in 1996-97. Studies carried out in needle exchange programs (NEPs) show similar results, with a 10.8 per cent increase in HIV prevalence among Ottawa NEP participants between 1992-93 and 1996-97.^{50,51} More recent studies (1998) have estimated the prevalence of HIV among users of injection drugs at 18 per cent in Montreal, 20 per cent in Ottawa, 28 per cent in Vancouver and 13 per cent in Winnipeg.^{52,53,54}

Men and Women

An estimated 6 800 women were infected with HIV at the end of 1999, a 48 per cent increase from the 1996 prevalence estimate of 4 600 (RU: 4 000 to 5 300). In 1999, women accounted for 14 per cent of the prevalent HIV infections, compared with 11 per cent in 1996.

As shown in Figure 16, between 1996 and 1999 the estimated number of prevalent HIV infections among women attributed to IDU increased from 2 000 (RU: 1 600 to 2 400) to 3 080, while the estimated number of prevalent infections attributed to heterosexual transmission increased from 2 500 (RU: 1 900 to 3 200) to 3 600 (RU not available).

Figure 16
Women: Estimated number of Prevalent HIV infections,
by mode of transmission, 1996 and 1999

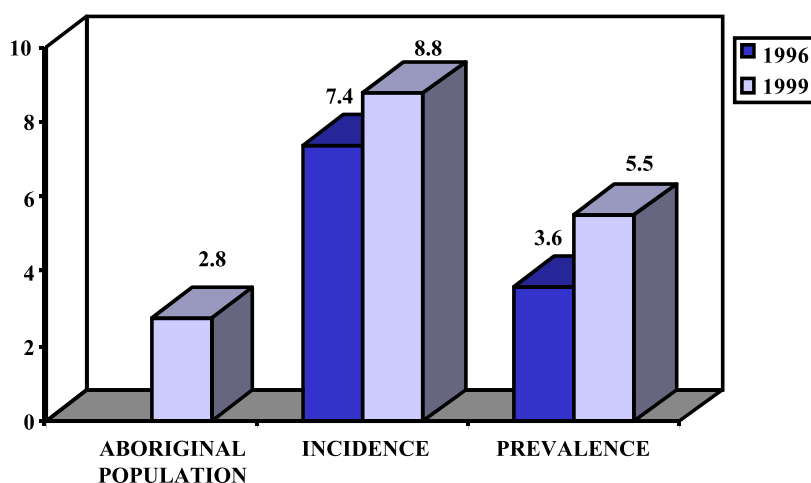


Source: Health Canada, Bureau of HIV/AIDS, STD and TB

Aboriginal People

The estimated number of prevalent HIV infections among Aboriginal populations increased by 91 per cent between 1996 and 1999, from 1 430 to 2 740. Based on these estimates, Aboriginal people accounted for 5.5 per cent of all prevalent HIV infections in Canada in 1999, an increase from 3.6 per cent of all cases in 1996 (unfortunately, there are no published ranges of uncertainty associated with these estimates). As shown in Figure 17, Aboriginal people accounted for a significantly higher proportion of HIV incidence and prevalence in Canada than might be anticipated based on their proportion of the total Canadian population (2.8 per cent).

Figure 17
**Estimated Proportion of Aboriginal Persons Among General Population,
 Incident and Prevalent HIV Infections, 1996 and 1999**



Source: Health Canada, Bureau of HIV/AIDS, STD and TB

Community-based studies have also been carried out on HIV prevalence among Aboriginal people. HIV prevalence rates for this population group vary widely by locale, ranging from 0.4 per cent to 29.7 per cent in various settings in Vancouver (i.e., Native Alcohol and Drug Treatment Centres, correctional institutions, NEPs), to 2.1 per cent in Alberta STD clinics, 7.9 per cent on Ontario reserves (self-reported), 13.4 per cent among Winnipeg Aboriginal users of injection drugs, and 1.4 per cent in Montreal among street youth.^{55,56,57,58}

Prison Populations

The magnitude of the HIV/AIDS problem in Canadian prison populations remains extremely poorly documented. Studies carried out in provincial prisons have shown HIV seroprevalence rates to be up to 10 times higher than in the general population, ranging from 1 per cent to 7.7 per cent.⁵⁹ Among federal prison inmates, the number of reported cases of HIV/AIDS increased from 14 in January 1989 to 159 in March 1996 and to 200 in April 1999. This means that more than 1 per cent of all inmates in federal institutions are known to be HIV-positive.^{60,61}

It must be emphasized that these are *known* cases and that the extent of under-reporting in institutions is not clear. For example, a study by Ford et al. carried out in Joyceville Prison in 1999 reported that 1.7 per cent of the prisoners who participated in the study were HIV-positive (compared with 1 per cent in 1995) and 33 per cent were hepatitis C-positive (compared with 28 per cent in 1995). Even these estimates are likely to understate the true magnitude of the problem, since nearly one out of three prisoners declined to participate in the study.⁶²

Reported AIDS Cases

The number of reported AIDS cases can also be used to illustrate the changing face of the HIV/AIDS epidemic in Canada. As of December 31, 2000, an estimated 19 153 AIDS cases had occurred in Canada (adjusted for reporting delays). As a result, Canada's cumulative rate of AIDS cases was 640 per one million persons. This places Canada somewhere in the middle of industrial nations, where cumulative rates vary from a high of 2 392 cases per one million persons in the United States to a low of 14.2 cases per one million persons in Japan.

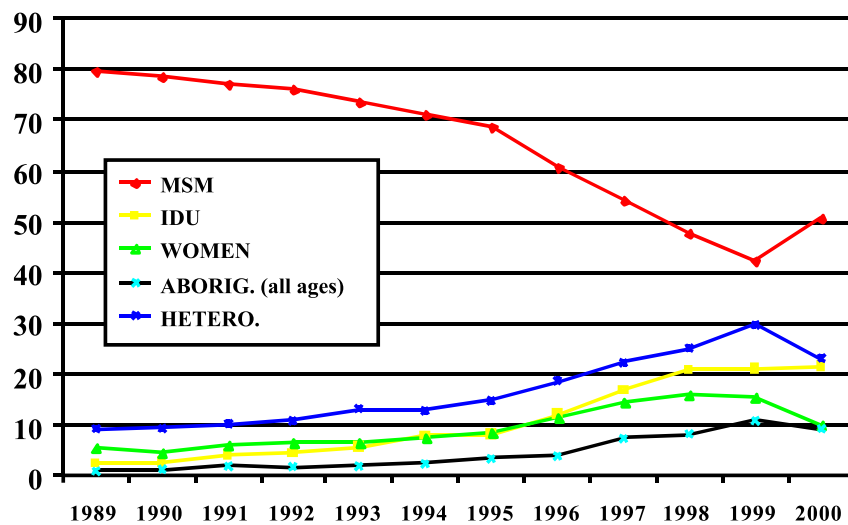
On a province-by-province basis, reported AIDS cases and reported deaths due to AIDS are roughly proportional to the province's population. The exception is Quebec, which reports 33 per cent of the national total of AIDS cases but is home to only 24 per cent of Canadians.

As previously noted (see Figure 3), the number of AIDS cases reported annually in Canada has declined steadily in recent years, from 1 859 in 1993 to 584 in 1999 and increased to 644 in 2000. The decrease can be attributed in part to improved HIV treatment regimens that delay or prevent the onset of AIDS. Reasons for the increase in AIDS cases adjusted for reporting delay in 2000 remain unclear. An important issue, for which little data are currently available, is the extent to which these reductions can be sustained. While the delayed onset of AIDS is a positive development, it means that the number of people living with HIV in Canada continues to increase. The long-term implications of these trends for care, treatment and support, as well as for future changes in morbidity and mortality, are not yet known.

Reported AIDS Cases Among Different Populations

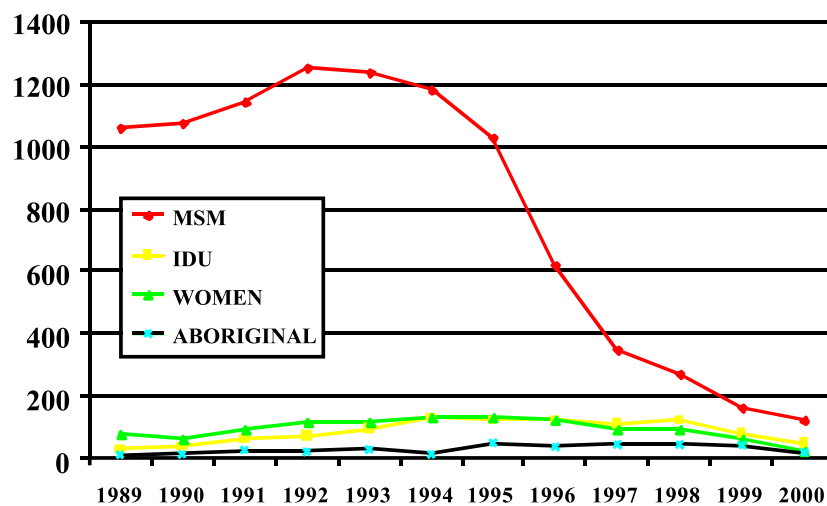
Figure 18 (not adjusted for reporting delays) shows that the annual number of reported AIDS cases has declined among most groups in recent years, but especially among MSM. However, when viewed as a percentage (see Figure 19), the reported AIDS cases attributed to MSM have declined while the percentage attributed to heterosexual contact, IDU and among women and Aboriginal people has increased.

Figure 18
Percentage Distribution of Reported Adult AIDS Cases, by
Population Group, Canada, 1989-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

Figure 19
Number of Reported Adult AIDS Cases, by Population Group,
Canada, 1989-2000



Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2000. Health Canada: April, 2001.

MSM accounted for 79.7 per cent of AIDS cases diagnosed among adults in 1989, but only 68.8 per cent of diagnosed cases in 1995 and 50.8 per cent in 2000. Over the same period, the proportion of AIDS cases attributed to IDU increased from 2.4 per cent in 1989 to 8.3 per cent in 1995 and 21.7 per cent in 2000. The proportion of reported adult AIDS cases attributed to heterosexual contact also increased steadily throughout this period, from 9.2 per cent in 1989 to 15.0 per cent in 1995 and 23.0 per cent in 2000.

The proportion of new AIDS cases among women and Aboriginal people also increased between 1989 and 1999. Women accounted for 5.7 per cent of reported AIDS diagnoses in 1989, 8.4 per cent in 1995 and 10.1 per cent in 2000. Information on the proportion of AIDS diagnoses accounted for by Aboriginal people is somewhat less reliable, due to problems related to the reporting of ethnicity.⁶³ Data related to the reporting of ethnicity suffer from a number of important limitations, including but not restricted to misclassification, non-disclosure, variations in reporting and classification biases, which may result in the systematic under-representation of specific communities.

Nevertheless, among cases where ethnicity was reported, Aboriginal people accounted for 1.2 per cent of reported AIDS diagnoses in 1989, 3.6 per cent in 1995 and 11.0 per cent in 1999 and 9.2 per cent in 2000. As noted by Dalloo et al.: “Relative to other ethnic groups in Canada, reported AIDS cases appear to be diminishing least among Aboriginal people. Since 1993, the number of reported AIDS cases across all ethnic groups has declined steadily, except among Aboriginal people, where the number of cases has remained constant. The proportion of reported AIDS cases among whites has declined dramatically, whereas the proportions in other ethnic groups, especially Aboriginal, have increased ... there is no evidence to suggest that these differences could be explained by differential case reporting.”⁶⁴

AIDS Death Reports

As of December 31, 2000, 71 per cent (12 419) of the 17 594 individuals in Canada reported to have AIDS were known to be deceased. However, it must be emphasized that AIDS-related deaths tend to be under-reported for various reasons, and that reporting delays tend to result in even more substantial underestimates for recent years. Nevertheless, it is clear that the number of reported AIDS-related deaths has declined significantly in recent years. In 2000, only 127 AIDS-related deaths were reported, compared with 1 485 in 1995 — a decline of 91.4 per cent. Questions remain as to whether this trend can be sustained in future years. As well, further research is required on the extent to which members of different groups have benefited from these trends.⁶⁵ This latter issue is discussed briefly in the next section of this technical report.

Broader Determinants of Health

As is the case with other areas of public health, there is reason to believe that many of the populations most vulnerable to HIV/AIDS tend to be economically disadvantaged and may lack the “prerequisites for health” identified in the Ottawa Charter, such as adequate income, education, food, shelter, safety and security.^{66,67}

In Canada, the disproportionate health risks faced by vulnerable populations are only now beginning to be documented. In the field of HIV/AIDS, several recent studies have focussed on some of these broader determinants of health as they relate to vulnerable populations, including homeless people, street youth, Aboriginal people, users of injection drugs, sex-trade workers, inmates and other frequently marginalized groups.^{68,69,70} These studies strongly suggest that members of socio-economically disadvantaged groups are more likely to experience living and working conditions that place them at risk of HIV infection, are more likely to engage in more risk-related activities, are more likely to become HIV-positive, are less likely to follow treatment regimens and are more likely to die prematurely than are members of less disadvantaged groups.

Reports from Strathdee and others indicate convincingly that the likelihood of AIDS-related death is strongly influenced by socio-economic factors. For example, the Vancouver Lymphadenopathy AIDS Study found that HIV-positive gay men with incomes below the poverty level were twice as likely to die within a 10-year period as HIV-positive gay men with higher incomes.⁷¹ Similarly, a study by Echenberg (1997), based on a national survey of 1 136 HIV-infected Canadians (most of whom identified themselves as gay men), suggests a trend toward both lower education and lower income levels among those most recently infected.⁷² Low-Beer (1999) found that HIV-positive gay men in Vancouver were 40 per cent less likely than HIV-negative men to be employed full-time and 34 per cent more likely to have an annual income of less than \$10,000. However, the study found no relationship between education and HIV sero-positivity.⁷³

These characteristics were especially pronounced among Aboriginal MSM. In the VanGuard cohort, Aboriginal MSM were found to be significantly more likely to be unemployed, to live in unstable housing, to have annual incomes of less than \$10,000, to receive social assistance, and to report both non-consensual sex and sexual abuse during childhood.⁷⁴

There also appears to be a strong link between education levels and risk behaviours among MSM. In an analysis of three large surveys of gay and bisexual men, Myers and colleagues found that men with less education were more likely to report unprotected sex.⁷⁵

Vulnerability to HIV/AIDS appears to be related not only to socio-economic status, but to living and working conditions as well, including such factors as childhood sexual abuse, unstable housing, incarceration and concerns for personal safety. A study by Braitstein (2000) reports a “stunningly” high rate of childhood sexual abuse among HIV-positive women in British Columbia: “The majority of these HIV+ women had been sexually abused or assaulted, mostly under the age of 12 years, and mostly by men intimately involved in their lives.”⁷⁶ Schilder (2000) notes that of a sample of 620 HIV-positive persons living in British Columbia, 43 per cent reported sexual abuse and 37 per cent had experienced coercive sex. Persons who were sexually abused or assaulted were significantly more likely to be women, gay men and/or users of injection drugs, and least likely to be “straight” men.⁷⁷

In many ways, the impacts of determinants of health (such as income, education, shelter and safety) become even more pronounced among users of injection drugs, Aboriginal people and street-involved people. O’Shaughnessy (1998), in commenting on the Vancouver Injection Drug Users Study (VIDUS), notes that “Inadequate housing was originally felt to be one of the factors driving the HIV epidemic among IDU, and this has not changed substantially throughout the study.” Not only is unstable housing linked to vulnerability, it also appears to constitute a barrier to optimal care. A study by Anis (2000) reports finding a “strong association” between patients’ housing status, their uptake of highly active antiretroviral treatment (HAART) and their risk of leaving “against medical advice.” Among the four groups studied, patients with no fixed address were also most likely to be current users of injection drugs and were least compliant.⁷⁸ In a separate study, unstable housing was linked to significantly poorer health status among members of the VIDUS cohort.⁷⁹ These risks were even more pronounced among female sex-trade workers enrolled in the VIDUS cohort, approximately two thirds of whom were found to collect welfare and to live in unstable housing. Weber concluded that female sex-trade workers appear to be at risk for HIV infection due to the socio-economic conditions in which they live.⁸⁰

Another Vancouver study found significantly lower use of antiretroviral therapy by injection drug users and women than by MSM⁸¹, while a study by Goldstone (1999) found that injection drug users survive for a significantly shorter time after HIV or AIDS diagnosis than do others.⁸²

The link between HIV vulnerability and socio-economic conditions is particularly pronounced in studies of incarcerated persons. Schilder (2000) found that HIV-positive people who had spent time in incarceration (defined as institutional experience, including prison, detention centre, group home or psychiatric ward) were more likely than non-institutionalized HIV-positive persons to report living in unstable housing, being non-Caucasian, having a lower level of education, receiving an income below \$10,000, using injection drugs and having difficulty obtaining addiction counselling.⁸³

Aboriginal people are over-represented in both IDU and prison populations. A review by Nguyen of studies conducted among users of injection drugs in Vancouver, Edmonton, Winnipeg and Ontario found that Aboriginal persons represented 12 per cent of the IDU participants in Ontario, 27 per cent in Vancouver and nearly two thirds in Edmonton and Winnipeg. Women made up between 27 per cent and 52 per cent of the Aboriginal participants. From the information available, there is an indication that Aboriginal participants were also found to have generally lower levels of education and less housing stability.⁸⁴

These findings have been reinforced by the results of a recent survey of Aboriginal users of injection drugs carried out in six major urban centres across Canada (Toronto, Thunder Bay, Winnipeg, Saskatoon, Edmonton and Vancouver) and in two federal prisons.⁸⁵ This study concluded that the predictors for sero-conversion among the respondents were both socio-economic and behavioural and included:

- unstable housing (44 per cent lived on the street or in boarding houses, hotels or shelters);
- poverty (74 per cent were on welfare);
- low education (30 per cent had less than Grade 10 education);
- abusive background (62 per cent);
- domestic violence (64 per cent); and
- previous imprisonment.

Other studies reinforce the notion that Aboriginal users of injection drugs are more likely to be female, more likely to be HIV-positive and less likely to be enrolled in a methadone program than are non-Aboriginal injection drug users.⁸⁶

A qualitative study carried out in northern Alberta suggests that HIV risk behaviours may become survival techniques for some Aboriginal women. In-depth analyses of the life histories of eight key informants revealed histories of unstable family relationships, frequent moves and physical, emotional or sexual abuse. High-risk behaviours associated with escaping these conditions (e.g., running away, substance abuse, promiscuity and prostitution) were considered appropriate survival techniques by the respondents.⁸⁷

This theme of persistent social and economic disadvantage has been reflected in a study of Aboriginal persons who are living with HIV/AIDS. These individuals are more likely to be underemployed, poorer and less well-educated than their non-Aboriginal counterparts. The authors of the study concluded that as a result of these inequities HIV-positive Aboriginal people may have difficulty receiving the benefits of available therapies. These findings underline the need for basic social, educational and support services directed toward Aboriginal people living with HIV infection or AIDS.⁸⁸

Life Expectancy and Quality of Life

The increasing prevalence of HIV, and continued declines in the incidence and prevalence of diagnosed AIDS cases and in reported AIDS-related deaths, suggest that life expectancy for people living with HIV/AIDS continues to improve.

A number of recent community-based studies have reported improvements in life expectancy and the quality of life among people living with HIV/AIDS. (It should be noted that these studies have generally been conducted in large urban centres, and their applicability to smaller communities or non-urban populations is unclear). For example, a recent study in British Columbia assessed improvements in life expectancy among HIV-positive gay and bisexual men in West Vancouver between 1990-92 and 1995-97.⁸⁹ During this period, life expectancy increased by 3.8 years. The authors suggest that the gain in life expectancy is attributable to the rapid uptake of more potent antiretroviral regimens among HIV-positive gay and bisexual men. However, they caution that even in this new era of antiretroviral therapy, life expectancy in this population is still low and loss of life attributable to HIV is high.

Other studies have suggested that recent mortality declines have been associated with reduced medical service costs, improvements in employment and health status and enhanced quality of life, at least among the populations studied.^{90,91,92}

In one study, the proportion of persons on antiretroviral therapy who rated their health to be better than one year ago increased from 19 per cent in 1995 to 39 per cent in 1998. Over the same period, the number of persons who rated their health to be much worse than one year ago declined sharply, from 43 per cent to 18 per cent. In addition, the unemployment rate among the study group dropped from 64 per cent in 1995 to 56 per cent in 1998.⁹³

Another study reported that the use of protease inhibitors was associated with a marked overall improvement in quality of life, including improvement in health perception, mental health, social functioning, physical functioning and role functioning.⁹⁴

A 1998 survey of persons living with HIV/AIDS carried out by the Canadian AIDS Society found that 38 per cent of respondents were currently working, 36 per cent were doing volunteer work and 20 per cent of unemployed respondents were looking for work.⁹⁵ However, among those considering a return to work, a majority indicated “great concern” about:

- losing disability benefits (70 per cent);
- losing drug benefits (69 per cent);
- losing extended health care coverage (59 per cent);
- receiving time off for medical appointments without losing pay or their job (55 per cent);
- managing a treatment schedule and side effects in the workplace (51 per cent); and
- disclosing their HIV status (51 per cent).

The CAS national survey further revealed that more than 50 per cent of respondents who were working had not disclosed their HIV status to employers. Of the group that had not disclosed, 45 per cent expected discrimination from their employer or co-workers. Among respondents not working, 65 per cent indicated they would not reveal their HIV status to a future employer or co-worker because of fear of discrimination or negative attitudes.

A recent study by Nixon confirms that consideration of a return to work is a significant and complex issue facing people living with HIV/AIDS. However, “unlike other populations studied ... challenges to people returning to the workforce for people living with HIV/AIDS are largely sociopolitical rather than physical. Such challenges include the fear of abandoning a carefully constructed financial safety net and concern about disclosure of serostatus and sexual identity.”⁹⁶

As these studies reveal, the improved prognosis for many HIV-positive people, as well as the changing nature of the epidemic itself, have important implications related to quality of life — implications that to date have been the subject of very little research. This research is urgently needed since changes in quality of life — whether positive or negative — will have an impact on virtually every component of the CSHA.

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