acquire leftover diagnostic blood specimens to test for recent infection. Since 2008, HIV incidence surveillance areas have included 25 jurisdictions. By applying additional tests, CDC is able to identify the number of new HIV infections in a given year. The data from the participating jurisdictions are extrapolated to yield a national estimate.

In 2012, CDC published estimates indicating that HIV incidence remained stable overall during the period 2008–2010. Within the overall estimates, however, some groups are affected more than others. Gay and bisexual men and other MSM continue to bear the greatest burden of HIV infection, and among races/ethnicities, African Americans continue to be disproportionately affected.

Drug Resistant Surveillance: Variant, Atypical, and Resistant HIV Surveillance (VARHS)[13]

The Variant, Atypical, and Resistant HIV Surveillance System (VARHS) was initially funded and incorporated into routine national HIV surveillance in 2004. VARHS was established to produce a population-based method of determining the prevalence of transmitted drug-resistant HIV and the distribution of subtypes among individuals newly diagnosed with HIV (who have never taken antiretroviral medications) and reported to the national HIV case surveillance system in the US. Health department surveillance staff partner with commercial/private, public, and hospital-based laboratories to obtain electronic genetic sequence data from genotype testing that has been done as a part of HIV care. Case reports from these jurisdictions are sent to CDC after removal of personally identifying information. These data provide information on the variance of the transmitted strains of HIV and the emergence of resistant strains. Currently, 11 jurisdictions are funded to collect genetic sequence data to determine HIV-1 drug resistance and subtypes.

The study analysed the largest collection of sequence data obtained from individuals newly diagnosed with HIV. One of every 6 newly diagnosed HIV-1 transmissions in antiretroviral drug resistance surveillance in 2007 contained one or more mutations associated with drug resistance. Most transmitted drug resistance-associated mutations was for a single drug class[14] and the prevalence of transmitted drug resistance-associated mutations in persons newly diagnosed with HIV is higher than in previous US studies.[15]

National HIV Behavioral Surveillance System (NHBS) [16-18]

In 2003, the CDC in collaboration with 25 state and local health departments began the National HIV Behavioral Surveillance System (NHBS) to monitor behavioral risks for HIV, HIV testing behaviors, access to and use of prevention services, and HIV testing results among groups at highest risk for HIV infection. NHBS is conducted in rotating 12-month cycles in three different populations: MSM, IDU, and heterosexuals at increased risk for HIV infection (HET). These cycles will be repeated over time such that data are collected from any given risk group every three years. Methods for recruiting participants vary for each at-risk population, but NHBS uses a standardized protocol and core questionnaire for each cycle. MSM are sampled using venue-based, time-space sampling methods. IDUs and heterosexuals are recruited using respondent-driven sampling. The first full round of NHBS, which comprised all three cycles (MSM, IDU, and

HET) was conducted during 2003–2007. The second round was conducted during 2008–2010, and the third round began in January 2011. NHBS data are used to provide a behavioral context for trends seen in HIV surveillance data and also describe populations at increased risk.

Findings from NHBS rounds have been published in several issues of CDC's Morbidity and Mortality Weekly Report. In 2008, the overall HIV prevalence among MSM was 27%, and 48% of HIV-positive MSM participants were unaware of their infection.[19] MSM in the United States continue to engage in sexual and drug-use behaviors that increase the risk for HIV infection. Although many MSM had been tested for HIV infection, many had not received hepatitis vaccinations or syphilis testing, and only a small proportion had recently participated in a behavioral intervention.[20]

Medical Monitoring Project (MMP)[13]

This surveillance project was implemented in 2005. The Medical Monitoring Project (MMP) is designed to assess a representative sample of HIV-infected persons in care in the US and Puerto Rico, to understand their care utilization, clinical characteristics, and risk behaviors. The MMP jurisdictions include over 80% of the total cases of HIV infection and AIDS in the US. It uses a 3-stage sampling design to select an appropriate sample of persons from which locally and nationally representative data can be derived. The first stage is selecting geographic areas to participate; the second stage is selecting outpatient facilities providing HIV medical care; and the third stage is selecting patients at least 18 years of age who are receiving care at those selected facilities. The annual sample of facilities participating in MMP ranges from 600–800 health-care facilities. Approximately 9,000 patients from these facilities are sampled annually. Trained MMP interviewers and abstractors collect data through face-to-face interviews and medical record abstraction. The 45-minute interview includes questions about demographics (i.e., gender, age, and health insurance or medical coverage), access to care, HIV treatment and adherence to medications, drug and alcohol use, sexual behavior, met and unmet needs for social services, and receipt of prevention counselling in a clinical setting. MMP abstractors then collect additional information on clinical outcomes, prescription of antiretroviral therapy (ART), and other health-care services provided from patients' medical charts. The current 5-year MMP cycle extends through May 31, 2013.

In 2007, most persons with HIV infection who were receiving medical care were taking ART (85%) and had some form of health insurance or coverage (84%). However, some persons were not receiving needed critical services, such as HIV case management (45%) or help finding dental services (32%). In addition, some persons living with HIV infection engaged in behaviors, such as unprotected sex (54% of MSM), that increase the risk for transmitting the virus to sexual partners, and some used non-injection (31%) or injection drugs (3%) for nonmedical purposes, which might decrease adherence to ART and increase health-risk behaviors.[21]

Enhanced Perinatal Surveillance (EPS)[22]

In 1999, CDC created the Enhanced Perinatal Surveillance (EPS) project as an extension of core HIV surveillance activities to further reduce perinatal HIV transmission in areas with high HIV prevalence. Mother-infant pairs are identified through several means: pediatric HIV surveillance, reports of HIV infected pregnant women to surveillance, birth registry matching to birth certificate records, and hospital discharge summaries. Currently, 15 jurisdictions are funded to collect supplemental perinatal surveillance information.

In addition to data collected through the National HIV Surveillance System, additional maternal data information on the use of ART, type of delivery, access to and use of prenatal care, testing during pregnancy for other conditions, and substance use during pregnancy is collected. Infant data include information on birth weight, use of antiretroviral prophylaxis after birth, date of first HIV test, all laboratory information, and presence of illnesses or birth defects. These data are used to identify and determine the HIV status of all HIV-exposed infants. Follow-up on mothers and their children is conducted every 6 months until the child is 18 months of age, unless the child receives a definitive HIV diagnosis (infected or not infected) before 18 months of age.

As of December 31, 2009, a total of 8,054 singleton births had been reported to EPS. Of all infants born to HIV-infected women, 2% were perinatally infected with HIV, 71% were not infected, and 27% remain in the indeterminate category. Most (90%) of the HIV-infected women received some prenatal care. HIV-infected women received ART during the prenatal period (84%) or labour and delivery (85%). Of the infants born to HIV-infected women, 96% received ART during the neonatal period. A large proportion (46%) of the HIV-infected women was exposed to HIV through heterosexual contact, whereas in 37% of the cases was unknown.

Table 1. Surveillance case definition for HIV infection stages among adults and adolescents (aged ≥13 years), CDC-2008, United States.

Stage	Laboratory evidence*	Clinical evidence
Stage 1	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of ≥500 cells/μL *or* CD4+ T-lymphocyte percentage of ≥29	None required (but no AIDS-defining condition)
Stage 2	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of 200–499 cells/μL *or* CD4+ T-lymphocyte percentage of 14–28	None required (but no AIDS-defining condition)
Stage 3 (AIDS)	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of <200 cells/μL *or* CD4+ T-lymphocyte percentage of <14†	*or* documentation of an AIDS-defining condition (with laboratory confirmation of HIV infection)†
Stage unknown§	Laboratory confirmation of HIV infection *and* no information on CD4+ T-lymphocyte count or percentage	*and* no information on presence of AIDS-defining conditions

* The CD4+ T-lymphocyte percentage is the percentage of total lymphocytes. If the CD4+ T-lymphocyte count and percentage do not correspond to the same HIV infection stage, select the more severe stage.

† Documentation of an AIDS-defining condition (Appendix A) supersedes a CD4+ T-lymphocyte count of ≥200 cells/μL and a CD4+ T-lymphocyte percentage of total lymphocytes of ≥14. Definitive diagnostic methods for these conditions are available in Appendix C of the 1993 revised HIV classification system and the expanded AIDS case definition (CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41[No. RR-17]) and from the National Notifiable Diseases Surveillance System (available at http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm).

§ Although cases with no information on CD4+ T-lymphocyte count or percentage or on the presence of AIDS-defining conditions can be classified as stage unknown, every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis. Additional CD4+ T-lymphocyte counts or percentages and any identified AIDS-defining conditions can be reported as recommended. (Council of State and Territorial Epidemiologists. Laboratory reporting of clinical test results indicative of HIV infection: new standards for a new era of surveillance and prevention [Position Statement 04-ID-07]; 2004. Available at http://www.cste.org/ps/2004pdf/04-ID-07-final.pdf.)

Box 1. Criteria for HIV infection among adults and adolescents (≥13 years), CDC-2008, United States.

Laboratory Criteria

- Positive result from an HIV antibody screening test (e.g., reactive enzyme immunoassay [EIA]*) confirmed by a positive result from a supplemental HIV antibody test (e.g., Western blot or indirect immunofluorescence assay test).

  or

- Positive result or report of a detectable quantity (i.e., within the established limits of the laboratory test) from any of the following HIV virologic (i.e., non-antibody) tests†:
  - HIV nucleic acid (DNA or RNA) detection test (e.g., polymerase chain reaction [PCR])
  - HIV p24 antigen test, including neutralization assay
  - HIV isolation (viral culture)

Other Criterion (for Cases that Do Not Meet Laboratory Criteria)

HIV infection diagnosed by a physician or qualified medical-care provider§ based on the laboratory criteria and documented in a medical record.¶ Oral reports of prior laboratory test results are not acceptable.

* Rapid tests are EIAs that do not have to be repeated but require a confirmatory test if reactive. Most conventional EIAs require a repeatedly reactive EIA that is confirmed by a positive result with a supplemental test for HIV antibody. Standard laboratory testing procedures should always be followed.

† For HIV screening, HIV virologic (non-antibody) tests should not be used in lieu of approved HIV antibody screening tests. A negative result (i.e., undetectable or nonreactive) from an HIV virologic test (e.g., viral RNA nucleic acid test) does not rule out the diagnosis of HIV infection.

§ Qualified medical-care providers might differ by jurisdiction and might include physicians, nurse practitioners, physician assistants, or nurse midwives.

¶ An original or copy of the laboratory report is preferred; however, in the rare instance the laboratory report is not available, a description of the laboratory report results by a physician or qualified medical-care provider documented in the medical record is acceptable for surveillance purposes. Every effort should be made to obtain a copy of the laboratory report for documentation in the medical record.

Box 2. Case definition for HIV infection among children aged < 18 months, CDC-2008, United States.

1. Criteria for Definitive or Presumptive HIV Infection

A child aged <18 months is categorized for surveillance purposes as definitively or presumptively HIV infected if born to an HIV-infected mother and if the laboratory criterion or at least one of the other criteria is met.

Laboratory Criterion for Definitive HIV Infection

A child aged <18 months is categorized for surveillance purposes as definitively HIV infected if born to an HIV-infected mother and the following laboratory criterion is met.

- Positive results on two separate specimens (not including cord blood) from one or more of the following HIV virologic (non-antibody) tests:
  - HIV nucleic acid (DNA or RNA) detection**
  - HIV p24 antigen test, including neutralization assay, for a child aged >1 month
  - HIV isolation (viral culture)

Laboratory Criterion for Presumptive HIV Infection

A child aged <18 months is categorized for surveillance purposes as presumptively HIV infected if 1) born to an HIV-infected mother, 2) the criterion for definitively HIV infected is not met, and 3) the following laboratory criterion is met.

- Positive results on one specimen (not including cord blood) from the listed HIV virologic tests (HIV nucleic acid detection test; HIV p24 antigen test, including neutralization assay, for a child aged >1 month; or HIV isolation [viral culture] for definitively HIV infected) and no subsequent negative results from HIV virologic or HIV antibody tests.

Other Criteria (for Cases that Do Not Meet Laboratory Criteria for Definitive or Presumptive HIV Infection)

- HIV infection diagnosed by a physician or qualified medical-care provider based on the laboratory criteria and documented in a medical record. Oral reports of prior laboratory test results are not acceptable.

  or

- When test results regarding HIV infection status are not available, documentation of a condition that meets the criteria in the 1987 pediatric surveillance case definition for AIDS. (Box 5)

Box 2. (Continued)

2. Criteria for Uninfected with HIV, Definitive or Presumptive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as either definitively or presumptively uninfected with HIV if 1) the criteria for definitive or presumptive HIV infection are not met and 2) at least one of the laboratory criteria or other criteria are met.

Laboratory Criteria for Uninfected with HIV, Definitive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as definitively uninfected with HIV if 1) the criteria for definitive or presumptive HIV infection are not met and 2) at least one of the laboratory criteria or other criteria are met.††

- At least two negative HIV DNA or RNA virologic tests from separate specimens, both of which were obtained at age >1 month and one of which was obtained at age >4 months.
  or
- At least two negative HIV antibody tests from separate specimens obtained at age >6 months.
  and
- No other laboratory or clinical evidence of HIV infection (i.e., no positive results from virologic tests [if tests were performed] and no current or previous AIDS-defining condition). (Box 5)

Laboratory Criteria for Uninfected with HIV, Presumptive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as presumptively uninfected with HIV if 1) the criteria for definitively uninfected with HIV are not met and 2) at least one of the laboratory criteria are met.

- Two negative RNA or DNA virologic tests, from separate specimens, both of which were obtained at age >2 weeks and one of which was obtained at age >4 weeks.§§
  or
- One negative RNA or a DNA virologic test from a specimen obtained at age >8 weeks.
  or
- One negative HIV antibody test from a specimen obtained at age >6 months.
  or
- One positive HIV virologic test followed by at least two negative tests from separate specimens, one of which is a virologic test from a specimen obtained at age >8 weeks or an HIV antibody test from a specimen obtained at age >6 months.
  and
- No other laboratory or clinical evidence of HIV infection (i.e., no subsequent positive results from virologic tests if tests were performed, and no AIDS-defining condition for which no other underlying condition indicative of immunosuppression exists). (Box 5)

Other Criteria (for Cases that Do Not Meet Laboratory Criteria for Uninfected with HIV, Definitive or Presumptive)

- Determination of uninfected with HIV by a physician or qualified medical-care provider based on the laboratory criteria and who has noted the HIV diagnostic test results in the medical record. Oral reports of prior laboratory test results are not acceptable.
  and
- No other laboratory or clinical evidence of HIV infection (i.e., no positive results from virologic tests [if tests were performed] and no AIDS-defining condition for which no other underlying condition indicative of immunosuppression exists). (Box 5)

3. Criteria for Indeterminate HIV Infection

A child aged <18 months born to an HIV-infected mother is categorized as having perinatal exposure with an indeterminate HIV infection status if the criteria for infected with HIV and uninfected with HIV are not met.

** HIV nucleic acid (DNA or RNA) detection tests are the virologic methods of choice for the diagnosis or exclusion of infection in children aged <18 months. Although HIV culture can be used, culture is less standardized and less sensitive than nucleic acid detection tests. The use of p24 antigen testing to exclude infection in children aged <18 months is not recommended because of poor sensitivity, especially in the presence of HIV antibody. Commercial tests for RNA and DNA detection have become widely available. Quantitative RNA tests have been approved by the Food and Drug Administration for monitoring HIV infection, and qualitative RNA tests have been approved to aid diagnosis. The quantitative and qualitative RNA tests meet FDA standards for high analytic and clinical sensitivity and specificity. All available tests detect the subtypes of group M and strains of group O. HIV-2 can be diagnosed with HIV-2 DNA PCR. HIV RNA tests sometimes do not detect HIV-2 because the viral loads in some HIV-2--infected persons are below detectable levels. Because of the possibility of mutation or recombination involving the sequences detected by a particular test, occasionally, virus might not be detected in a specimen from an HIV-2 infected individual. If HIV-2 infection seems likely but results are negative, testing with a different assay might be advisable.

†† Suspected cases of HIV infection among children aged <18 months who are born to a documented HIV-uninfected mother should be assessed on a case-by-case basis by the appropriate health care and public health specialists.

§§ If specimens for both negative RNA or DNA virologic tests are obtained at age >4 weeks, specimens should be obtained on separate days.

Box 3. Case definitions for HIV infection and AIDS among children aged 18 months to <13 years, CDC-2008, United States.

Criteria for HIV Infection

Children aged 18 months to <13 years are categorized as HIV infected for surveillance purposes if at least one of laboratory criteria or the other criterion is met.[¶¶]

Laboratory Criteria

- Positive result from a screening test for HIV antibody (e.g., reactive EIA), confirmed by a positive result from a supplemental test for HIV antibody (e.g., Western blot or indirect immunofluorescence assay).

  or

- Positive result or a detectable quantity by any of the following HIV virologic (non-antibody) tests***:
  - HIV nucleic acid (DNA or RNA) detection (e.g., PCR)
  - HIV p24 antigen test, including neutralization assay
  - HIV isolation (viral culture)

Other Criterion (for Cases that Do Not Meet Laboratory Criteria)

- HIV infection diagnosed by a physician or qualified medical-care provider based on the laboratory criteria and documented in a medical record. Oral reports of prior laboratory test results are not acceptable.

Criteria for AIDS

Children aged 18 months to <13 years are categorized for surveillance purposes as having AIDS if the criteria for HIV infection are met and at least one of the AIDS-defining conditions has been documented.

[¶¶] Children aged 18 months to <13 years with perinatal exposure to HIV are categorized as uninfected with HIV if the criteria for uninfected with HIV among children aged <18 months are met.

*** For HIV screening among children aged 18 months to <13 years infected through exposure other than perinatal exposure, HIV virologic (non-antibody) tests should not be used in lieu of approved HIV antibody screening tests. A negative result (i.e., undetectable or nonreactive) by an HIV virologic test (e.g., viral RNA nucleic acid test) does not rule out the diagnosis of HIV infection.

Box 4. AIDS Defining Conditions (CDC; 1987, rev.1993, rev.1994), United States.

- Bacterial infections, multiple or recurrent*
- Candidiasis of bronchi, trachea, or lungs
- Candidiasis of esophagus†
- Cervical cancer, invasive§
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (>1 month's duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
- Cytomegalovirus retinitis (with loss of vision)†
- Encephalopathy, HIV related
- Herpes simplex: chronic ulcers (>1 month's duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month's duration)
- *Kaposi sarcoma*†
- Lymphoid interstitial pneumonia or pulmonary lymphoid hyperplasia complex*†
- Lymphoma, Burkitt (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- Mycobacterium avium complex or Mycobacterium kansasii, disseminated or extrapulmonary†
- Mycobacterium tuberculosis of any site, pulmonary,†§ disseminated,† or extrapulmonary†
- Mycobacterium, other species or unidentified species, disseminated† or extrapulmonary†
- Pneumocystis jirovecii pneumonia†
- Pneumonia, recurrent†§
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia, recurrent
- Toxoplasmosis of brain, onset at age >1 month†
- Wasting syndrome attributed to HIV

* Only among children aged <13 years. (CDC. 1994)

† Condition that might be diagnosed presumptively.

§ Only among adults and adolescents aged >13 years. (CDC. 1993)

Table 2. Diagnoses of HIV infection, by year of diagnosis and selected characteristics, 2008-2011--United States

	2008			2009			2010			2011		
		Estimated[a]			Estimated[a]			Estimated[a]			Estimated[a]	
	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate
Race/ethnicity												
American Indian/Alaska Native	217	225	9.6	195	205	8.7	208	222	9.8	188	212	9.3
Asian	791	816	6.1	717	753	5.5	721	780	5.3	821	982	6.5
Black/African American	23,848	24,419	65.4	21,727	22,618	60.0	20,626	22,030	58.0	19,846	23,168	60.4
Hispanic/Latino[b]	9,405	9,691	20.0	9,061	9,495	19.6	8,548	9,225	18.2	8,555	10,159	19.5
Native Hawaiian/Other Pacific Islander	77	79	17.9	78	80	17.9	58	62	12.4	66	78	15.3
White	13,923	14,277	7.2	12,846	13,371	6.7	12,172	13,069	6.6	11,996	13,846	7.0
Multiple races	965	994	22.5	846	886	19.4	819	879	15.6	707	827	14.2
Transmission category												
Male adult or adolescent												
Male-to-male sexual contact	21,891	28,077	—	21,219	27,545	—	20,813	27,725	—	21,005	30,573	—
Injection drug use	1,916	3,039	—	1,474	2,570	—	1,252	2,305	—	1,052	2,220	—
Male-to-male sexual contact and injection drug use	1,307	1,731	—	1,125	1,547	—	1,045	1,466	—	916	1,407	—
Heterosexual contact[c]	3,458	5,200	—	3,035	4,691	—	2,710	4,391	—	2,600	4,588	—
Other[d]	8,565	55	—	8,042	38	—	7,611	31	—	7,648	36	—
Subtotal	37,137	38,104	31.0	34,895	36,392	29.4	33,431	35,918	28.7	33,221	38,825	30.8
Female adult or adolescent												
Injection drug use	1,143	2,035	—	890	1,700	—	721	1,449	—	613	1,428	—
Heterosexual contact[c]	5,567	10,078	—	4,672	9,084	—	4,285	8,659	—	3,703	8,814	—
Other[d]	5,134	33	—	4,809	20	—	4,405	17	—	4,479	15	—
Subtotal	11,844	12,146	9.5	10,371	10,804	8.4	9,411	10,125	7.7	8,795	10,257	7.7
Child (<13 yrs at diagnosis)												
Perinatal	196	201	—	164	171	—	164	174	—	110	127	—
Other[e]	49	50	—	40	42	—	45	51	—	55	65	—
Subtotal	245	252	0.5	204	213	0.4	209	226	0.4	165	192	0.4
Total[f]	**49,226**	**50,501**	**16.6**	**45,470**	**47,408**	**15.4**	**43,051**	**46,268**	**15.0**	**42,181**	**49,273**	**15.8**

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis.

[a] Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing transmission category, but not for incomplete reporting. Rates are per 100,000 population. Rates are not calculated by transmission category because of the lack of denominator data.

[b] Hispanics/Latinos can be of any race.

[c] Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

[d] Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

[e] Includes hemophilia, blood transfusion, and risk factor not reported or not identified.

[f] Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

(Source: HIV Surveillance Report 2011)

Table 3. Diagnoses of HIV infection, by year of diagnosis and selected characteristics, 2008-2011--United States and 6 dependent areas

	2008			2009			2010			2011		
		Estimated[a]			Estimated[a]			Estimated[a]			Estimated[a]	
	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate
Race/ethnicity												
American Indian/Alaska Native	217	225	—	195	205	—	208	222	—	188	212	—
Asian	791	816	—	719	755	—	723	783	—	821	982	—
Black/African American	23,867	24,439	—	21,747	22,639	—	20,539	22,046	—	19,863	23,192	—
Hispanic/Latino[b]	10,348	10,640	—	9,879	10,337	—	9,282	10,064	—	9,196	11,057	—
Native Hawaiian/Other Pacific Islander	80	82	—	80	82	—	61	66	—	70	81	—
White	13,927	14,281	—	12,851	13,377	—	12,174	13,072	—	11,997	13,847	—
Multiple races	965	994	—	848	888	—	819	879	—	707	827	—
Transmission category												
Male adult or adolescent												
Male-to-male sexual contact	22,135	28,338	—	21,459	27,807	—	21,054	28,022	—	21,213	30,896	—
Injection drug use	2,121	3,269	—	1,623	2,746	—	1,357	2,451	—	1,132	2,365	—
Male-to-male sexual contact and injection drug use	1,329	1,756	—	1,149	1,574	—	1,062	1,488	—	925	1,423	—
Heterosexual contact[c]	3,612	5,372	—	3,172	4,847	—	2,837	4,554	—	2,712	4,775	—
Other[d]	8,621	55	—	8,095	38	—	7,670	31	—	7,716	36	—
Subtotal	37,818	38,790	31.2	35,498	37,013	29.4	33,980	36,545	28.9	33,698	39,495	30.9
Female adult or adolescent												
Injection drug use	1,185	2,081	—	919	1,733	—	736	1,471	—	641	1,471	—
Heterosexual contact[c]	5,774	10,318	—	4,862	9,303	—	4,445	8,868	—	3,835	9,026	—
Other[d]	5,170	33	—	4,835	20	—	4,433	18	—	4,502	15	—
Subtotal	12,129	12,433	9.6	10,616	11,056	8.4	9,614	10,357	7.8	8,978	10,512	7.8
Child (<13 yrs at diagnosis)												
Perinatal	199	204	—	165	172	—	165	176	—	111	128	—
Other[e]	49	50	—	40	42	—	47	54	—	55	65	—
Subtotal	248	255	0.5	205	214	0.4	212	229	0.4	166	193	0.4
Total[f]	**50,195**	**51,477**	**16.7**	**46,319**	**48,283**	**15.5**	**43,806**	**47,132**	**15.0**	**42,842**	**50,199**	**15.9**

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis.

[a] Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing transmission category, but not for incomplete reporting. Rates are per 100,000 population. Rates by race/ethnicity are not provided because U.S. census information for U.S. dependent areas is limited. Rates are not calculated by transmission category because of the lack of denominator data.

[b] Hispanics/Latinos can be of any race.

[c] Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

[d] Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

[e] Includes hemophilia, blood transfusion, and risk factor not reported or not identified.

[f] Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

(Source: HIV Surveillance Report 2011)

Table 4. Stage 3 (AIDS), by year of diagnosis and selected characteristics, 2008-2011 and cumulative--United States

	2008			2009			2010			2011			Cumulative[b]	
		Estimated[a]			Estimated[a]			Estimated[a]			Estimated[a]			
	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	Est. No.[a]
Race/ethnicity														
American Indian/Alaska Native	153	156	6.7	123	126	5.4	134	142	6.2	128	146	6.4	3,741	3,787
Asian[c]	457	478	3.6	386	408	3.0	363	404	2.7	382	492	3.3	8,789	9,054
Black/African American	15,213	15,711	42.1	14,198	14,861	39.4	13,438	14,558	38.3	12,685	15,958	41.6	477,971	486,282
Hispanic/Latino[d]	6,220	6,482	13.8	6,129	6,476	13.4	5,370	5,902	11.6	4,912	6,355	12.2	198,218	202,182
Native Hawaiian/Other Pacific Islander	38	39	9.0	45	48	10.7	34	36	7.3	40	47	9.3	863	901
White	8,676	8,929	4.5	8,094	8,452	4.2	7,135	7,712	3.9	6,698	8,304	4.2	431,084	435,613
Multiple races	817	849	19.2	794	840	18.4	648	708	12.5	590	750	12.9	17,357	17,804
Transmission category														
Male adult or adolescent														
Male-to-male sexual contact	12,279	15,427	—	12,140	15,458	—	11,207	14,934	—	10,654	16,694	—	499,157	555,032
Injection drug use	2,102	2,985	—	1,719	2,563	—	1,466	2,323	—	1,221	2,346	—	163,203	187,938
Male-to-male sexual contact and injection drug use	1,425	1,714	—	1,188	1,491	—	1,050	1,393	—	856	1,392	—	74,468	80,902
Heterosexual contact[e]	2,709	3,724	—	2,562	3,581	—	2,149	3,256	—	1,982	3,526	—	60,991	77,521
Other[f]	4,713	165	—	4,532	134	—	4,400	123	—	4,364	131	—	102,366	11,975
Subtotal	23,228	24,015	19.6	22,141	23,226	18.7	20,272	22,030	17.6	19,077	24,088	19.1	900,185	913,368
Female adult or adolescent														
Injection drug use	1,310	2,041	—	1,101	1,776	—	931	1,582	—	782	1,615	—	73,382	89,800
Heterosexual contact[e]	4,154	6,432	—	3,849	6,073	—	3,365	5,697	—	2,947	6,206	—	104,037	136,675
Other[f]	2,846	119	—	2,665	122	—	2,532	130	—	2,617	129	—	51,122	6,427
Subtotal	8,310	8,593	6.7	7,615	7,971	6.2	6,828	7,410	5.6	6,346	7,949	6.0	228,541	232,902
Child (<13 yrs at diagnosis)														
Perinatal	31	32	—	12	13	—	17	19	—	10	12	—	8,623	8,658
Other[g]	5	5	—	1	1	—	5	5	—	2	2	—	860	863
Subtotal	36	37	0.1	13	14	0.0	22	24	0.0	12	15	0.0	9,483	9,521
Total[h]	**31,574**	**32,645**	**10.7**	**29,769**	**31,211**	**10.2**	**27,122**	**29,463**	**9.5**	**25,435**	**32,052**	**10.3**	**1,138,211**[i]	**1,155,792**

Note. Reported numbers less than 12, as well as estimated numbers (and accompanying rates and trends) based on these numbers, should be interpreted with caution because the numbers have underlying relative standard errors greater than 30% and are considered unreliable.

[a] Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing transmission category, but not for incomplete reporting. Rates are per 100,000 population. Rates are not calculated by transmission category because of the lack of denominator data.

[b] From the beginning of the epidemic through 2011.

[c] Includes Asian/Pacific Islander legacy cases (see Technical Notes).

[d] Hispanics/Latinos can be of any race.

[e] Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

[f] Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

[g] Includes hemophilia, blood transfusion, and risk factor not reported or not identified.

[h] Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

[i] Includes persons of unknown race/ethnicity.

(Source: HIV Surveillance Report 2011)

Table 5. Stage 3 (AIDS) by year of diagnosis and selected characteristics, 2008-2011 and cumulative--United States and 6 dependent areas

	2008			2009			2010			2011			Cumulative[b]	
		Estimated[a]			Estimated[a]			Estimated[a]			Estimated[a]			
	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	No.	Rate	No.	Est. No.[a]
Race/ethnicity														
American Indian/Alaska Native	153	156	—	123	126	—	134	142	—	128	146	—	3,742	3,788
Asian[c]	458	479	—	386	408	—	363	404	—	382	492	—	8,823	9,088
Black/African American	15,223	15,721	—	14,213	14,877	—	13,447	14,568	—	12,691	15,966	—	478,440	486,763
Hispanic/Latino[d]	6,922	7,238	—	6,742	7,152	—	5,860	6,463	—	5,295	6,849	—	231,815	236,410
Native Hawaiian/Other Pacific Islander	40	42	—	46	49	—	36	39	—	42	51	—	900	921
White	8,679	8,932	—	8,099	8,458	—	7,137	7,715	—	6,698	8,304	—	431,213	435,744
Multiple races	818	850	—	794	840	—	648	708	—	592	753	—	17,388	17,835
Transmission category														
Male adult or adolescent														
Male-to-male sexual contact	12,420	15,583	—	12,270	15,606	—	11,312	15,058	—	10,742	16,812	—	504,797	560,860
Injection drug use	2,309	3,215	—	1,874	2,740	—	1,587	2,466	—	1,294	2,447	—	176,147	201,271
Male-to-male sexual contact and injection drug use	1,451	1,743	—	1,218	1,524	—	1,071	1,418	—	872	1,411	—	76,974	83,455
Heterosexual contact[e]	2,824	3,852	—	2,667	3,705	—	2,245	3,371	—	2,065	3,638	—	64,771	81,477
Other[f]	4,733	171	—	4,549	135	—	4,412	124	—	4,379	134	—	102,889	12,157
Subtotal	23,737	24,563	19.7	22,578	23,708	18.9	20,627	22,437	17.7	19,352	24,443	19.1	925,578	939,219
Female adult or adolescent														
Injection drug use	1,350	2,087	—	1,145	1,826	—	958	1,615	—	802	1,642	—	76,312	92,833
Heterosexual contact[e]	4,311	6,612	—	3,995	6,238	—	3,479	5,834	—	3,039	6,330	—	109,274	142,153
Other[f]	2,858	120		2,672	124		2,539	130		2,622	129		51,418	6,567
Subtotal	8,519	8,818	6.8	7,812	8,188	6.2	6,976	7,579	5.7	6,463	8,102	6.0	237,004	241,553
Child (<13 yrs at diagnosis)														
Perinatal	32	33	—	12	13	—	17	19	—	11	14	—	9,021	9,059
Other[g]	5	5	—	1	1	—	5	5	—	2	2	—	884	887
Subtotal	37	38	0.1	13	14	0.0	22	24	0.0	13	16	0.0	9,905	9,945
Total[h]	**32,293**	**33,419**	**10.8**	**30,403**	**31,910**	**10.2**	**27,625**	**30,040**	**9.6**	**25,828**	**32,561**	**10.3**	**1,172,489[i]**	**1,190,719**

Note. Reported numbers less than 12, as well as estimated numbers (and accompanying rates and trends) based on these numbers, should be interpreted with caution because the numbers have underlying relative standard errors greater than 30% and are considered unreliable.

[a] Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing transmission category, but not for incomplete reporting. Rates are per 100,000 population. Rates by race/ethnicity are not provided because U.S. census information for U.S. dependent areas is limited. Rates are not calculated by transmission category because of the lack of denominator data.

[b] From the beginning of the epidemic through 2011.

[c] Includes Asian/Pacific Islander legacy cases (see Technical Notes).

[d] Hispanics/Latinos can be of any race.

[e] Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

[f] Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

[g] Includes hemophilia, blood transfusion, and risk factor not reported or not identified.

[h] Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

[i] Includes persons of unknown race/ethnicity.

(Source: HIV Surveillance Report 2011)

b) CANADA

The government of Canada is a federal system, comprised of 10 provinces and 3 territories. Each provincial and territorial government has a considerable degree of autonomy in the area of health, resulting in each having slightly different systems for HIV and AIDS surveillance. As a result, there are variations in reporting such as data formats, data submission guidelines, and laboratory diagnostics[23], thus the completeness of epidemiological information collected and submitted to Public Health Agency of Canada (PHAC) varies by jurisdiction.

The PHAC is the federal organization responsible for the surveillance of infectious diseases, such as HIV, through the Centre for Infectious Disease Prevention and Control (CIDPC). It was created in 2004, following the outbreak of the Severe Acute Respiratory Syndrome in Canada. Previously, surveillance of infectious diseases was the responsibility of Health Canada. HIV/AIDS surveillance in Canada is conducted by the collection of AIDS case reports and positive HIV test reports as well as data collected through sentinel surveillance.

At the end of 2011, an estimated 71,300 persons were living with HIV infection (including AIDS) in Canada, of whom 25% were unaware of their infection. Approximately 3,175 new infections were estimated to have occurred at the end of the same year. Gay men and other MSM continue to be the population most affected, accounting for an estimated 49% of all adults (≥15 years) positive HIV test report with known exposure category. An estimated 30% of people were infected by heterosexual sex. People who use injection drugs followed at 17%. Disproportionate rates of infection have also been noted among aboriginal people and people who were born in a country where HIV is endemic (Box 7).[24]

AIDS Case Surveillance

Reporting System: AIDS Case Reporting and Surveillance System

The first AIDS case in Canada was reported to the Laboratory Centre for Disease Control, Department of National Health and Welfare (former Health Canada, current Health Protection Agency of Canada) in February 1982. This is when the AIDS Case Reporting and Surveillance System was created. Following a retrospective evaluation of health files, it was determined that the first AIDS case in Canada was diagnosed in 1979.

An AIDS case report is made when an individual is first given a diagnosis of AIDS by the health care provider. A new AIDS diagnosis must be reported by law to the public health authority in the area in which the diagnosis was made. Information must be sent first to the local health department then to the provincial or territorial health authority. The province or territory then sends selected information to the CIDPC.[23] Reporting cases to the federal government is voluntary, but the provinces and territories all participate in the AIDS Case Reporting and Surveillance System.

The information reported to the CIDPC does not include names nor is it identifying. However, it may include demographic data (e.g. age, gender, city of residence, name of the diagnosing health canter, country of birth, or ethnicity), risks associated with the transmission of HIV, and laboratory data. In Canada, collection of AIDS surveillance data is the responsibility of each provincial or territorial health authority. Most provinces and territories use a standardized form to report AIDS diagnoses; however, they will not necessarily collect the same data. This particularly applies to information on ethnicity, age and exposure category.[25] An AIDS case report or a positive HIV test report is described as pediatric if the person received a diagnosis of AIDS or tested positive for HIV before being 15 years of age.

AIDS Case Reports[26]

In Canada, AIDS case reports are confirmed AIDS cases, which are diagnosed if a person has undergone testing for HIV and received a positive result *and* has one or more of the specified indicator diseases (Box 5 and 6). This definition is uniform across all Canadian provinces and territories.

The definition of AIDS used in Canada is based on guidelines set by the CDC in the US (CDC, 1993).[8] However, it is important to notice that in contrast to the US AIDS case definition, the list of specific disease indicators required for a Canadian AIDS diagnosis does not include CD4 cell count <200/mm^3.

Results of AIDS Case Surveillance

The annual number of reported AIDS cases in Canada has been decreasing steadily over the past eighteen years, largely due to the introduction of highly anti-retroviral therapy (HAART) in 1996. In 2011, 151 cases of AIDS were reported; representing a 32% decreased from 2010. (Table 6) AIDS cases were only diagnosed among adults (≥15years) and were predominantly males (82%). Males had a higher proportion of AIDS case reports in the oldest age groups, compared to females who had a higher proportion in the younger age groups (Figure 5). Of all reported adult (≥15 years) AIDS cases with information of exposure category, the largest proportion of cases among males was attributed to MSM (41%) and among females to heterosexual contact (57%) (Figure 6).

Figure 4. Number of reported AIDS cases, by year of diagnosis, 1979-2011, Canada.

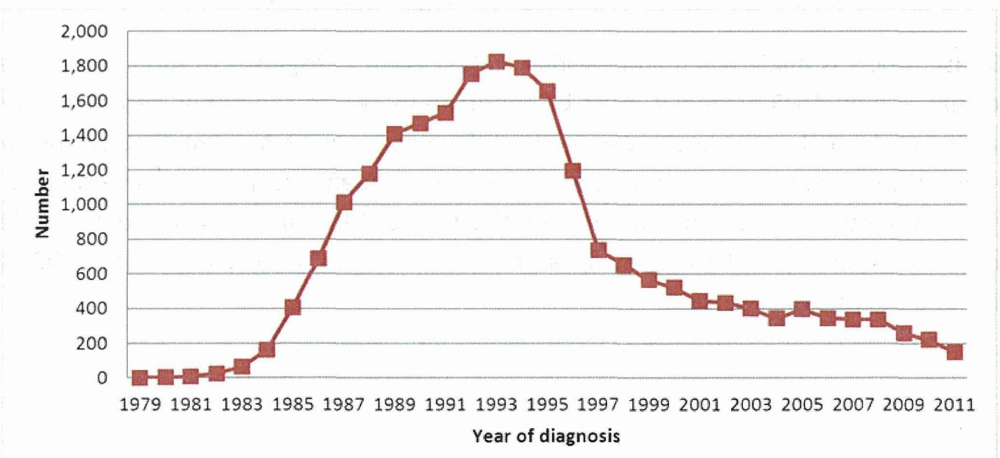


Figure 5. Proportion of reported AIDS cases, by sex and age group 2011, Canada.

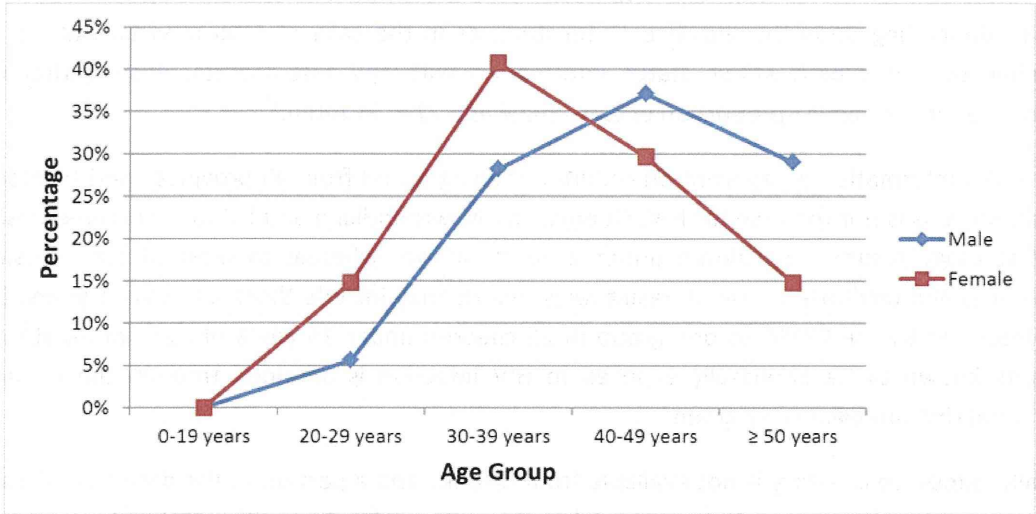
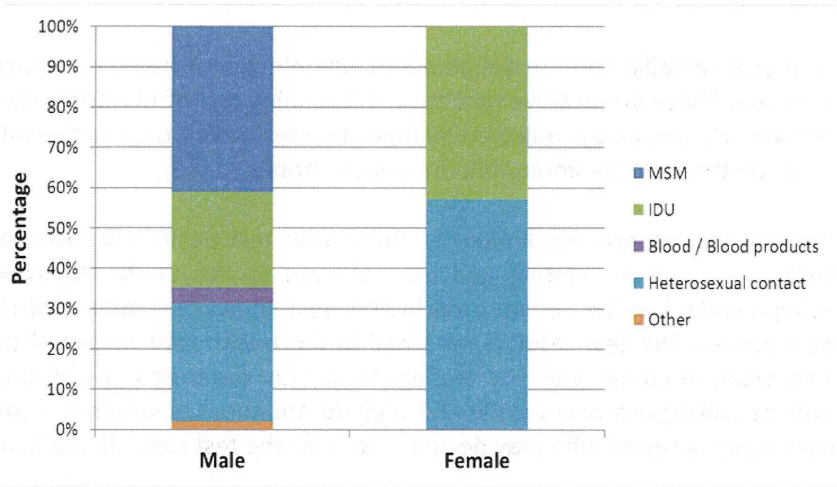


Figure 6. Proportion of reported AIDS cases among adults (≥15 years), by sex and exposure category, 2011, Canada.



HIV Case Surveillance

(Source: Public Health Agency of Canada)

Reporting System: Positive HIV Test Reports

HIV is a notifiable disease in all provinces and territories (British Columbia was the last province to include HIV as reportable disease in May 1, 2003). However, as in the case of AIDS reports it is not legally notifiable *at the national level*. Although it is not legislated by law, each province and territory voluntarily submits data to the PHAC through the Canadian Notifiable Disease Surveillance System.[27] The positive HIV test results reported to PHAC are from people who test positive for HIV through nominal (name-based), non-nominal (non identifying) or anonymous testing in the provinces and territories and whose results are reported to PHAC by their respective health authority or HIV testing laboratory. Within provinces and territories, coordinators attempt to identify and remove duplicate positive HIV test reports before data are submitted to the CIDPC. Provincial and territorial files are also reviewed for duplicates at the national level. Positive HIV test reports are provided non-nominally to PHAC.

When examining HIV data it is important to consider that due to the independence of Canada's provinces and territories with regard to health care the amount of epidemiological information varies depending upon the province or territory, as in the case of AIDS reports. Ontario and Quebec do not submit ethnic status information with HIV test reports, despite that they comprise for the highest proportion of cases (42% and 21%, in 2009).[25]

For AIDS, information is reported on children of all ages and from all provinces and territories. However, this is not the case for HIV. Quebec and Newfoundland and Labrador exclude positive HIV serology results for children under 2 years of age, whereas in most of the remaining provinces and territories, positive result tests reports may include those less than 2 years. Data are received by the CIDPC as one group of all children under 15 years of age. Information on infants known to be perinatally exposed to HIV infection is obtained through the Canadian Perinatal HIV Surveillance Program.

Finally, exposure category is not available from Quebec and a portion of the data from Ontario. Such cases are classified as *Not reported*, but this only applies to positive HIV test reports, and not to reported AIDS cases.

HIV Case definition[26, 28]

Canadian national surveillance case definition for HIV infection is based on laboratory confirmed cases of infection. These are positive results on a screening test of HIV antibody (e.g. repeatedly reactive enzyme immunoassay) followed by a positive test result on a confirmatory test for HIV antibody (e.g. Western blot or immunofluorescence antibody test).

The positive HIV test reports are limited to those who test positive for HIV through nominal, non-nominal or anonymous testing and are reported to the CIDPC. Non-nominal tests are ordered using a code, but the person ordering the test knows the identity of the person being tested and a positive HIV test result is recorded in the health care record of the person being tested. In contrast, in anonymous HIV testing the person ordering the test and the laboratory carrying out the testing use only a code and they do not know to whom the code belongs. It is only the person being tested who may decide to include the test result in the health care record.

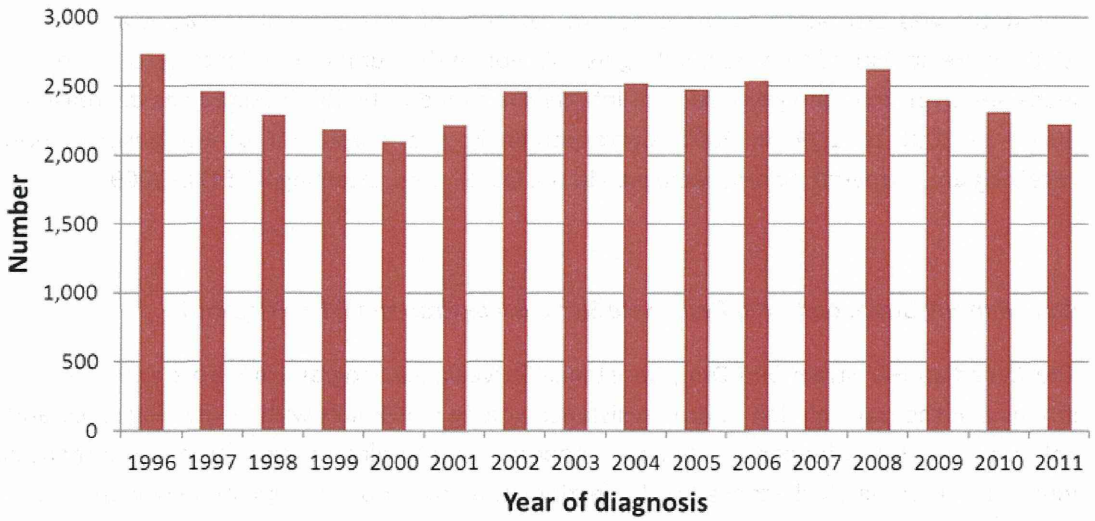
These reports include patient information, laboratory data and the activities that put the person at risk for transmission of HIV. Information reported to CIDPC does not include names nor does it identify anyone. The term does not include individuals who may be positive and have not been tested or individuals who have received a positive HIV test result, but the result has *not been forwarded* to CIDPC.

Results of Positive HIV Test Report

The number of positive HIV test reports in 2011 decreased in 3.9% since 2010 and follows an overall downward shift since 2008 (Figure 7). Of all adult cases (≥15 years) 23% were among adult females. Age distribution of positive HIV test reports varies significantly among females from that of male; females are generally being diagnosed at a younger age compared to males (Figure 8). In 2011, 49% of all adult (≥15 years) positive HIV test reports with known exposure category were attributed to MSM, followed by heterosexual contact (30%) and IDU (17%). Overall, females were more likely to get infected through IDU than men. Only 30% of positive

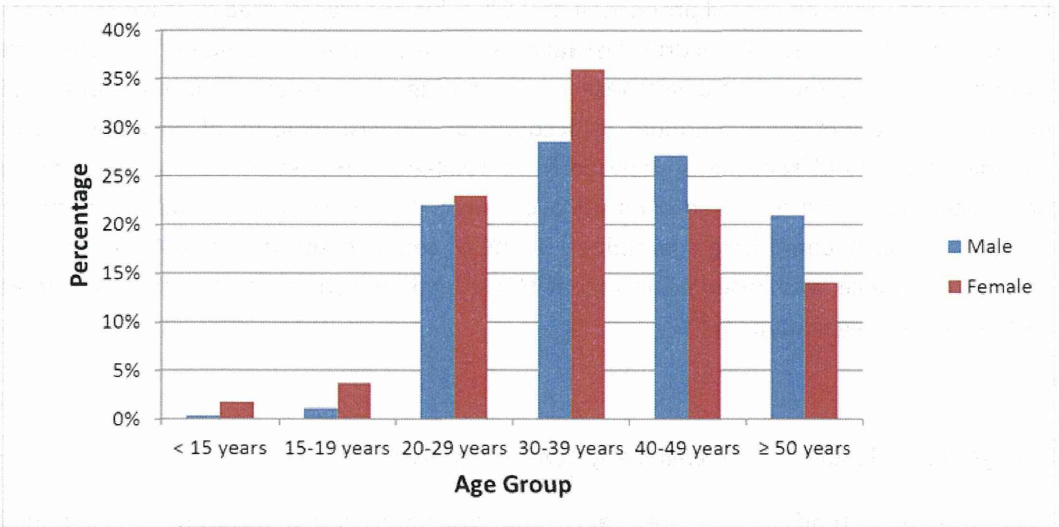
HIV test results included race/ethnicity information and among these the Aboriginal category represented 33%.[24]

Figure 7. Number of positive HIV test reports, by year of diagnosis, 1996-2011, Canada.



(Source: Public Health Agency of Canada)

Figure 8. Age distribution of positive HIV test reports, by sex, 2011, Canada.



(Source: Public Health Agency of Canada)

Sentinel Surveillance

Canadian Perinatal HIV Surveillance Program

The Canadian Perinatal HIV Surveillance Program is an initiative of the Canadian Pediatric AIDS Research Group that collects national data on the HIV status of infants exposed perinatally to HIV infection. The surveillance program collects data on all identified infants and children born to mothers who are known to be infected with HIV in Canada. It includes infants exposed to HIV

during pregnancy and older infants and children not identified in the perinatal period or born outside Canada who are receiving care for HIV infection.

There have been 3,055 infants identified as perinatally exposed to HIV born between 1984 and 2009. Between 1984 and 2009, the overall proportion of HIV-exposed infants whose mothers' HIV status was attributed to the exposure category of heterosexual contact was 72.6%, and 25.0% were attributed to injection drug use. Although the number of infants exposed to HIV has increased over time, the proportion of infants confirmed to be HIV-infected has decreased from 10.7% in 2001 to 1.7% in 2009. Correspondingly, the proportion of HIV-positive mothers receiving antiretroviral therapy increased in the last 9 years, attaining 91.5% in 2009.[25]

Canadian HIV Strain and Drug Resistance Surveillance Program (SDR Program)

The Canadian HIV Strain and Drug Resistance Surveillance Program monitors and assesses HIV strains and the transmission of drug resistance among individuals with newly diagnosed and not yet treated HIV infection in Canada. Laboratory samples (serum from treatment-naïve individuals with newly diagnosed HIV infection) and corresponding epidemiologic data are sent from the provincial health laboratories to PHAC for HIV strain and drug resistance testing. One of the central goals of this program is to conduct the systematic surveillance of HIV subtypes in Canada.[29]

From 1999 to 2008, an overall proportion of 9.8% exhibited transmitted drug resistance to either one or more therapies. Overall drug resistance increased during this time period, with resistance to non-nucleoside reverse transcriptase inhibitor drug class experiencing the most significant increase. HIV-1 subtype B continues to account for the vast majority of new HIV diagnoses in Canada, at 88.3% of specimens analyzed from 1984-2008. However, increasing proportions of non-B subtypes were observed from 2003 onwards. The most common non-B subtypes were subtypes C and A, comprising a combined 3-12% of annual cases analyzed. A higher proportion of drug resistance was observed in recent HIV infections compared to established infections, particularly among subtype B.[30]

Biological and Behavioral Surveillance System: Track systems[31]

PHAC monitors trends in HIV prevalence and associated risk behaviours in key populations identified in Canada through second-generation HIV surveillance systems known as the "Track" systems. To date, PHAC has developed and implemented second-generation HIV surveillance systems that focus on IDU (I-Track System) and on gay, bisexual, and other MSM (M-Track System). The E-Track concept, which has a focus on people who originate from countries where HIV is endemic (Box 7) or those from specific ethno-cultural populations, has been successfully piloted in Quebec and is being further developed. Currently under development are two additional "Track" systems: the A- Track (focus on Aboriginal peoples) and the P-Track (focus on persons with HIV infection).

The overall objectives of the I-, M-, E- and A-Track systems are to describe the changing patterns in the prevalence of HIV infections and possibly also incidence, as well as risk behaviour practices and the testing patterns for HIV, hepatitis C and other sexually transmitted and blood borne infections in each respective population. The P-Track is envisioned to monitor trends in access to and uptake of care and treatment services.

The Track systems are conducted through periodic, cross-sectional surveys administered at selected urban/semi-urban sites across Canada. Core generic protocols and questionnaires designed to meet the needs of local/provincial and national levels are developed in consultation with research experts in the field and with populations of interest. Protocols and questionnaires are reviewed by the Health Canada and PHAC research ethics boards as well as local research ethic boards for each site.

Participants are primarily recruited using venue-based sampling methods, and participation is voluntary, anonymous and requires informed consent. Respondents are limited to participating once during each survey round across all of the sentinel surveillance sites. Information on demographic characteristics, sexual behaviours, drug use, testing for HIV, hepatitis and other sexually transmitted and blood borne infections, and attitudes towards HIV is collected through a self- or interviewer-administered national core questionnaire. Sentinel sites have the option of adding additional site-specific questions to address local needs. A biological specimen, either a finger-prick blood sample or oral fluid sample, is collected; these specimens are tested for antibodies against HIV and hepatitis C virus (HCV). Depending on sentinel site prioritization, specimen availability and test validity, specimens may also be tested for syphilis and other sexually transmitted and blood borne infections.

I-Track

People who have injected drugs in the past 6 months and who meet the age limit of consent for the given province or territories are eligible to participate. The pilot phase of I-Track was undertaken between October 2002 and August 2003 at selected urban and semiurban sites across Canada. Phase 1 was completed in seven sites between October 2003 and May 2005. Phase 2 was completed in 10 sites between 2005 and 2008. Implementation of Phase 3 started in April 2010.

The pilot phase demonstrated the feasibility of the sentinel surveillance system and laid the foundation for undertaking Phase 1. A total of 3,287 IDU participated in I-Track Phase 2. The results of the study indicated that the prevalence of HIV (3% to 21% across the 10 sites) and HCV (from 51% to 77%) remains unacceptably high in IDU populations in Canada. Although the risky behaviours have shown a decline in the two phases of the I-Track survey, the possibility for the spread of HIV and HCV in these populations of IDU still exists.[31]

M-Track System

For this surveillance system, information is collected directly from MSM through a questionnaire and a biological specimen collected for testing for antibodies against HIV, HCV and syphilis. As of December 31, 2009, a total of six sites had participated in M-Track. Phase 1 of M-Track was

undertaken between 2005 and 2007 in five Canadian sentinel sites, and more than 4,500 men participated. In 2008, Vancouver also implemented M-Track.

Results from Phase 1 confirmed that the seroprevalence of HIV, syphilis and HCV are high among MSM from participating sentinel sites. Many men are having safer sex, but a significant proportion of men still report unprotected anal intercourse. Phase 1 of M-Track also confirmed that testing for HIV was high, but that a proportion of participants were unaware of their HIV positive status. Data related to the testing behaviours of MSM for other sexually transmitted and blood borne infection, as well as knowledge about other sexually transmitted and blood borne infections among MSM, indicated that awareness about the consequences of infection could be enhanced, and that testing for all pertinent infections should be offered to MSM reporting risky sexual practices.[32]

Box 5. HIV and AIDS case classification, Canada.

Confirmed Case of Human Immunodeficiency Virus (HIV) Infection

Children < 18 months:

- Detection of HIV nucleic acid (by deoxyribonucleic acid [DNA] polymerase chain reaction [PCR]) or p24 antigen in two separate samples collected one month and four months after delivery

Adults, Adolescents and Children >18 months:

- Detection of HIV antibody with confirmation

  OR

- Detection of HIV nucleic acid or p24 antigen

Confirmed Case of Acquired Immunodeficiency Syndrome (AIDS)

- A positive test for HIV infection with confirmation

  AND

- Definitive diagnosis of one or more AIDS indicative diseases (Box 6)

Laboratory Evidence

Laboratory Confirmation

Any of the following will constitute a confirmed case of HIV:

Children < 18 months (on 2 separate samples):

- Positive for HIV nucleic acid
- Positive for HIV p24 antigen (>1 months)
- Positive HIV culture

Adults, Adolescents and Children >18 months:

- Positive for HIV-1, HIV-2 antibody with confirmation for HIV antibody (e.g. Western blot or immunofluorescent technique)
- Positive for HIV nucleic acid
- Positive for HIV p24 antigen
- Positive HIV culture

Approved/Validated Tests

- Tests for anti-HIV-1, anti-HIV-2 antibodies (enzyme immunoassay [EIA], Western blot, line immunoassay [LIA], radioimmunoprecipitation assay [RIPA], rapid tests)
- Nucleic acid amplification test (NAT) for HIV-RNA/DNA
- HIV p24 antigen test
- Standard HIV culture

Indications and Limitations

- In children <18 months of age born to HIV positive mothers, all positive results should be repeated with a second specimen for confirmation. All negative tests should be repeated at 6-12 months to verify negative status

Box 6. 1993 Canadian AIDS defining condition..

AIDS Indicative Diseases for Adults and Adolescents > 15 years of Age

- Bacterial pneumonia (recurrent)*
- Candidiasis (bronchi, trachea or lungs)
- Candidiasis (esophageal)†
- Cervical cancer (invasive)*
- Coccidioidomycosis (disseminated or extrapulmonary)*
- Cryptococcosis (extrapulmonary)
- Cryptosporidiosis chronic intestinal (> 1 month duration)
- Cytomegalovirus diseases (other than in liver, spleen or nodes)
- Cytomegalovirus retinitis (with loss of vision)*, †
- Encephalopathy, HIV-related (dementia)*
- Herpes simplex: chronic ulcer(s) (> 1 month duration) or bronchitis, pneumonitis or esophagitis
- Histoplasmosis (disseminated or extrapulmonary)*
- Isosporiasis, chronic intestinal (> 1 month duration)*
- Kaposi's sarcoma†
- Lymphoma, Burkitt's (or equivalent term)*

Box 6. (continued)

- Lymphoma, immunoblastic (or equivalent term)*
- Lymphoma (primary in brain)
- Mycobacterium avium complex or M. kansasii (disseminated or extrapulmonary)*
- Mycobacterium of other species or unidentified species*,†
- M. tuberculosis (disseminated or extrapulmonary)*
- M. tuberculosis (pulmonary)*
- Pneumocystis jirovecii pneumonia†
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia (recurrent)*
- Toxoplasmosis of brain†
- Wasting syndrome due to HIV*

For pediatric cases only (< 15 years old)

* Bacterial infections (multiple or recurrent, excluding recurrent bacterial pneumonia)*
- Lymphoid interstitial pneumonia and/or pulmonary lymphoid hyperplasia†

* Must have laboratory evidence of HIV infection

† May be diagnosed presumptively if laboratory evidence of HIV infection is present

Box 7. List of HIV endemic countries, Canada.

Caribbean and Central/South America
- Anguilla
- Antigua and Barbuda
- Bahamas
- Barbados
- Bermuda
- British Virgin Islands
- Cayman Islands
- Dominica
- Dominican Republic
- French Guiana
- Grenada
- Guadeloupe
- Guyana
- Haiti
- Honduras
- Jamaica
- Martinique
- Montserrat
- Netherlands Antilles
- St. Lucia
- St. Kitts and Nevis
- St. Vincent and the Grenadines
- Suriname
- Trinidad and Tobago
- Turks and Caicos Islands
- U.S. Virgin Islands

Asia
- Cambodia
- Myanmar/Burma
- Thailand

Africa
- Angola
- Benin
- Botswana
- Burkina Faso
- Burundi
- Cameroon
- Cape Verde
- Central African Republic
- Chad
- Democratic Republic of the Congo (formerly Zaïre)
- Djibouti
- Equatorial Guinea
- Eritrea
- Ethiopia
- Gabon
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Ivory Coast
- Kenya
- Lesotho
- Liberia
- Malawi
- Mali
- Mozambique
- Namibia
- Niger
- Nigeria
- Republic of the Congo
- Rwanda
- Senegal
- Sierra Leone
- Somalia
- South Africa
- Sudan
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

Note: This list was last updated March 2007 (Source: Public Health Agency of Canada)