



BC Centre for Disease Control
AN AGENCY OF THE PROVINCIAL HEALTH SERVICES AUTHORITY

HIV

Annual Report
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Summary of Trends

HIV

In 2016, the rate of new HIV diagnoses in BC was 5.1 (241 cases) per 100,000 population which is identical to the rate in 2015 (240 cases).

- The highest rates of new HIV diagnoses were in Vancouver Coastal and Northern Health Authorities.
- Males continued to have higher rates of new HIV diagnoses than females.
- Trends by ethnicity have shifted over the past ten years with the percentage of new diagnoses among Caucasian people gradually decreasing while the percentage of new diagnoses among Asian people increasing and most other ethnicities remaining stable. In 2016, 46% of cases were Caucasian, 10% were Asian, and 9% were Indigenous peoples.
- The majority of new HIV diagnoses among Indigenous peoples are in those who identify as First Nations. The number and rate of new HIV diagnoses among First Nations people have decreased over time and rates in males are comparable to rates in females.
- Gay, bisexual, and other men who have sex with men (MSM) continued to comprise the greatest number of new HIV diagnoses in BC (60% of all new HIV diagnoses in 2016). Trends were elevated but stable with the greatest increase in new HIV diagnoses among MSM born after 1980. Over time, the proportion of new HIV diagnoses among Caucasian MSM is gradually decreasing.
- The number of new HIV diagnoses in people who inject drugs (PWID) continued to decrease (7% of all new HIV diagnoses in 2016) for both males and females. The decrease in new diagnoses among PWID since 2008 is the main driver of the overall provincial decrease in new HIV diagnoses.
- Overall, there was a decrease in new HIV diagnoses among people who acquire HIV through heterosexual contact (24% of all new HIV diagnoses in 2016). Within this category, 55% had an identified risk factor for HIV (e.g., partner known to be living with HIV or at higher risk, or born/residing in an HIV endemic country).
- Three females were newly diagnosed with HIV through prenatal screening in 2016. In 2016, 26 women living with HIV who had live births accessed care at the Oak Tree Clinic, of which all were diagnosed before delivery and received antenatal ART. In 2016, no infants acquired HIV from prenatal exposure in BC.
- Late stage HIV infection decreased to 20% of new HIV diagnoses in 2016 from 24% in 2015.
- New HIV diagnoses in the Vancouver Coastal Health Authority had the lowest median inter-test interval (i.e., the time between the first positive HIV test and the most recent negative HIV test) for all health authorities at 0.8 years in 2016.
- A total of 44 immigrants living with HIV arrived in BC in 2016; 27% were from countries where HIV is considered to be endemic.

AIDS

In 2016, the rate of AIDS case reports continued to decrease to 1.4 (65 cases) per 100,000 population.

- The rate of AIDS cases among males has generally been higher than the rate among females; however in 2016, the rate in First Nations women was higher than the rate in men.
- The majority of AIDS case reports among Indigenous peoples are in those who identify as First Nations. The rate of AIDS case reports among First Nations people has decreased since 2007.

HIV by Region, Gender, and Age

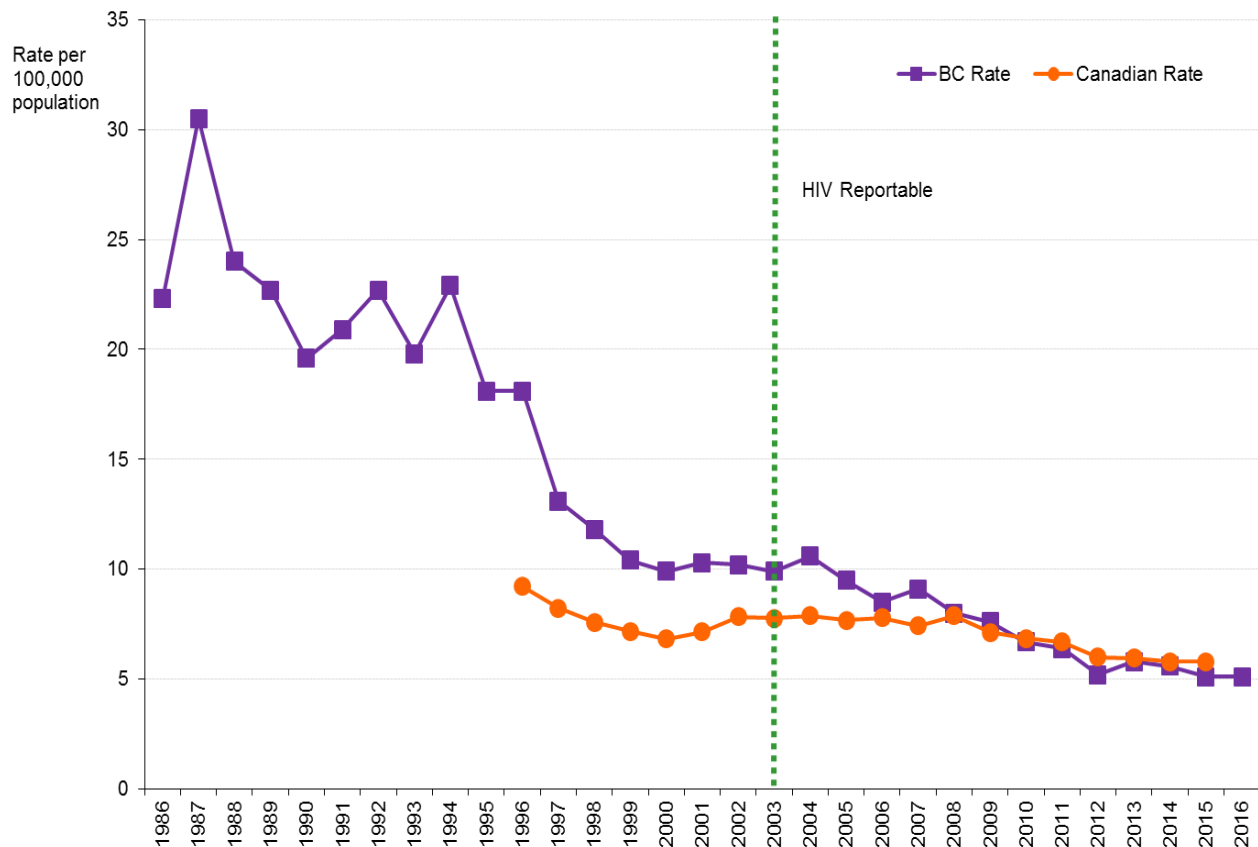
In 2016, the rate of new HIV diagnoses¹ in BC was 5.1 (241 cases) per 100,000 population which is identical to the rate in 2015 (240 cases) (Figure 1).

The highest rates of new HIV diagnoses were in the Vancouver Coastal and Northern Health Authorities (Figure 3). More specifically, Vancouver, Northern Interior, and Northwest Health Service Delivery Areas (HSDAs) had the highest rates of new HIV diagnoses in 2016 (Figure 2).

Rates of new HIV diagnoses among both males and females show a general decreasing trend over the past ten years (Figure 4). In 2016, the rate among males was 8.6 (203 cases) per 100,000 population which is similar to the rate in 2015 (203 cases). Likewise, the rate among females was 1.6 per 100,000 population in both 2016 (38 cases) and 2015 (37 cases).

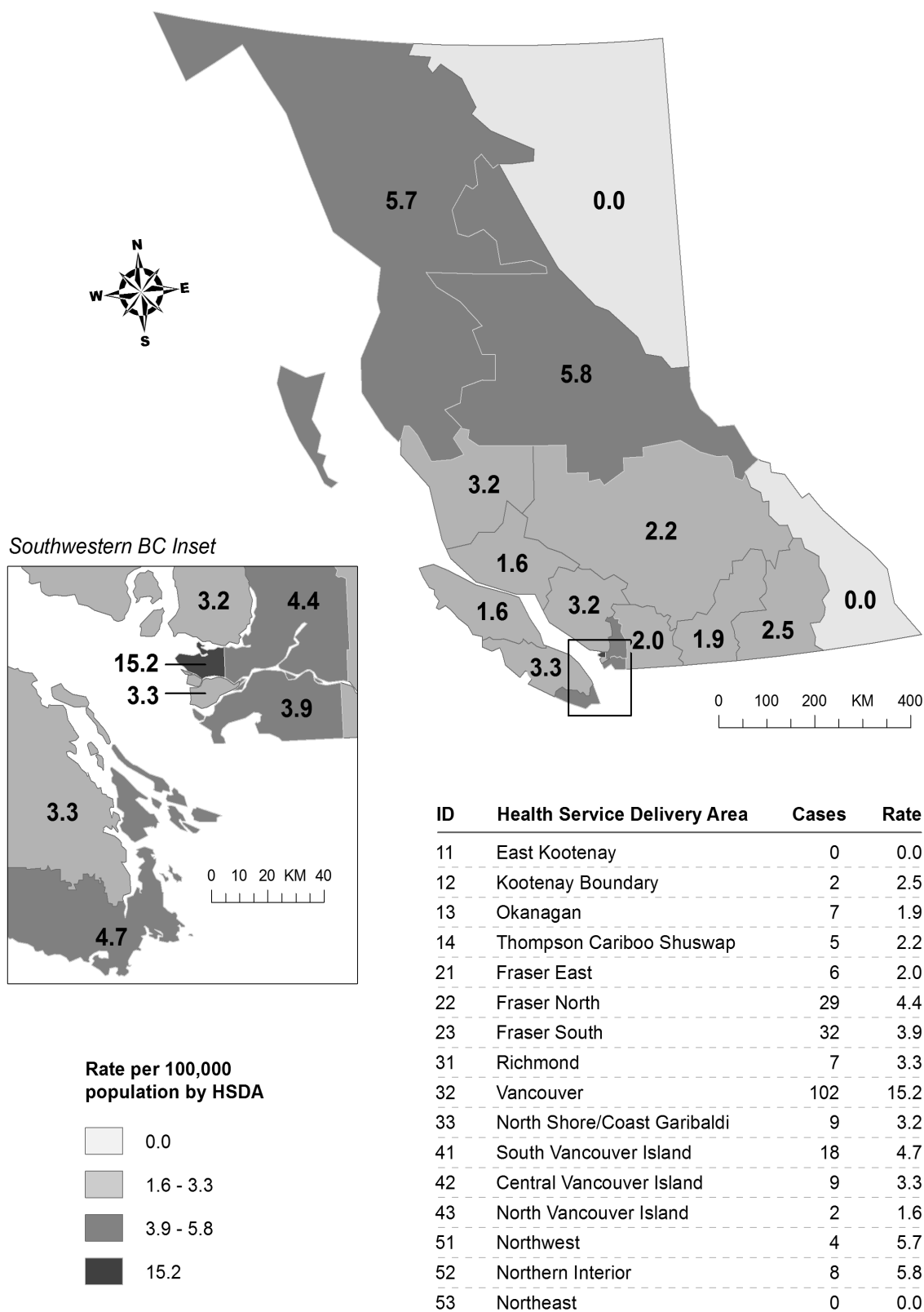
The rate of new HIV diagnoses continues to be higher among males than females. In 2016, the highest rates among males were in those 25-39 years old and among females in those 25-29 years old (Figure 5).

1. New HIV diagnoses in BC and Canada, 1986 to 2016*



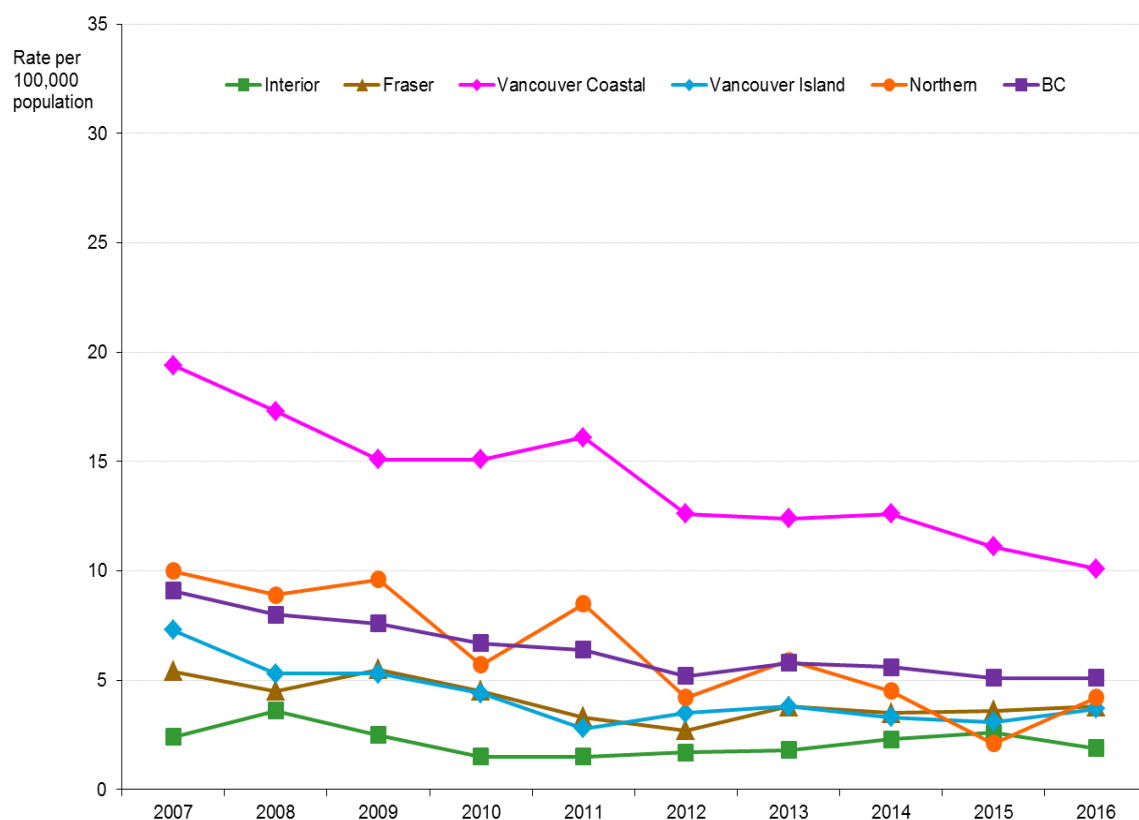
* 2016 Canadian rate is not available

2. New HIV diagnoses in BC by health service delivery area, 2016

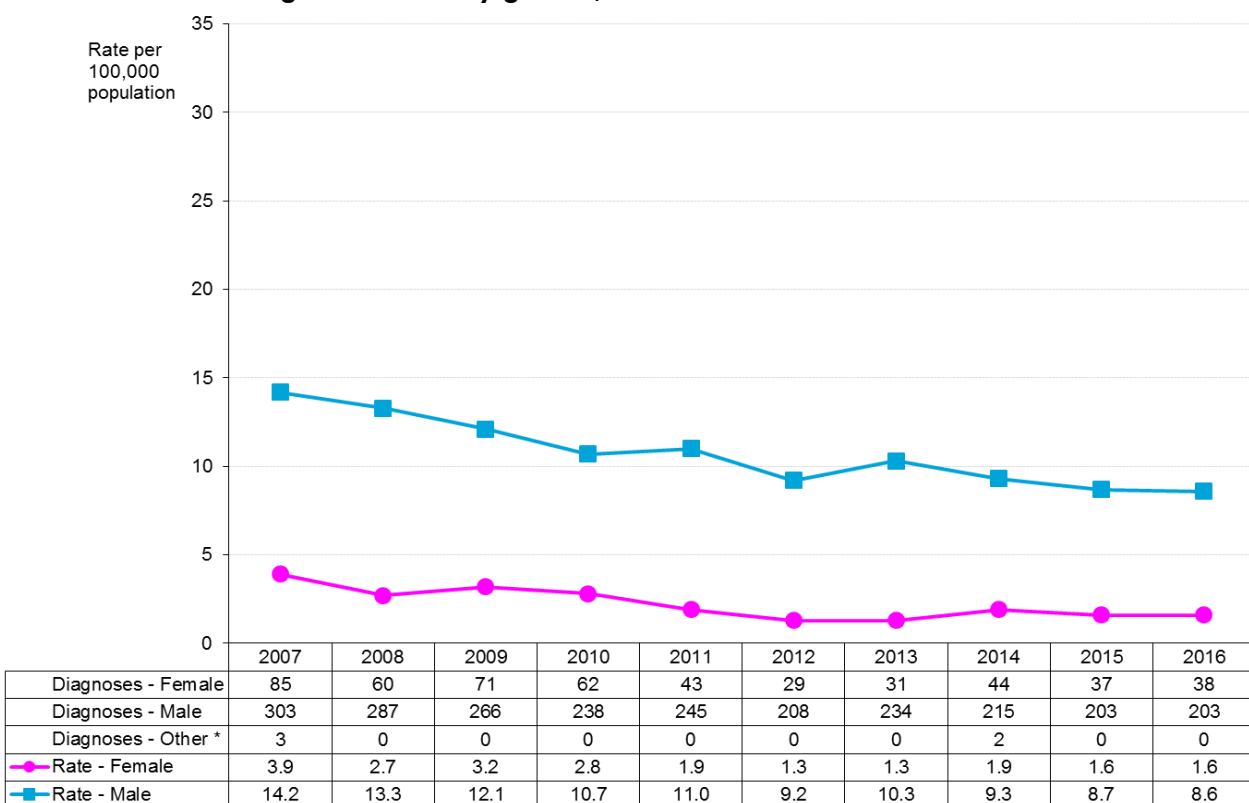


Rates calculated with population estimates released by BC Stats

3. New HIV diagnoses in BC by health authority, 2007 to 2016

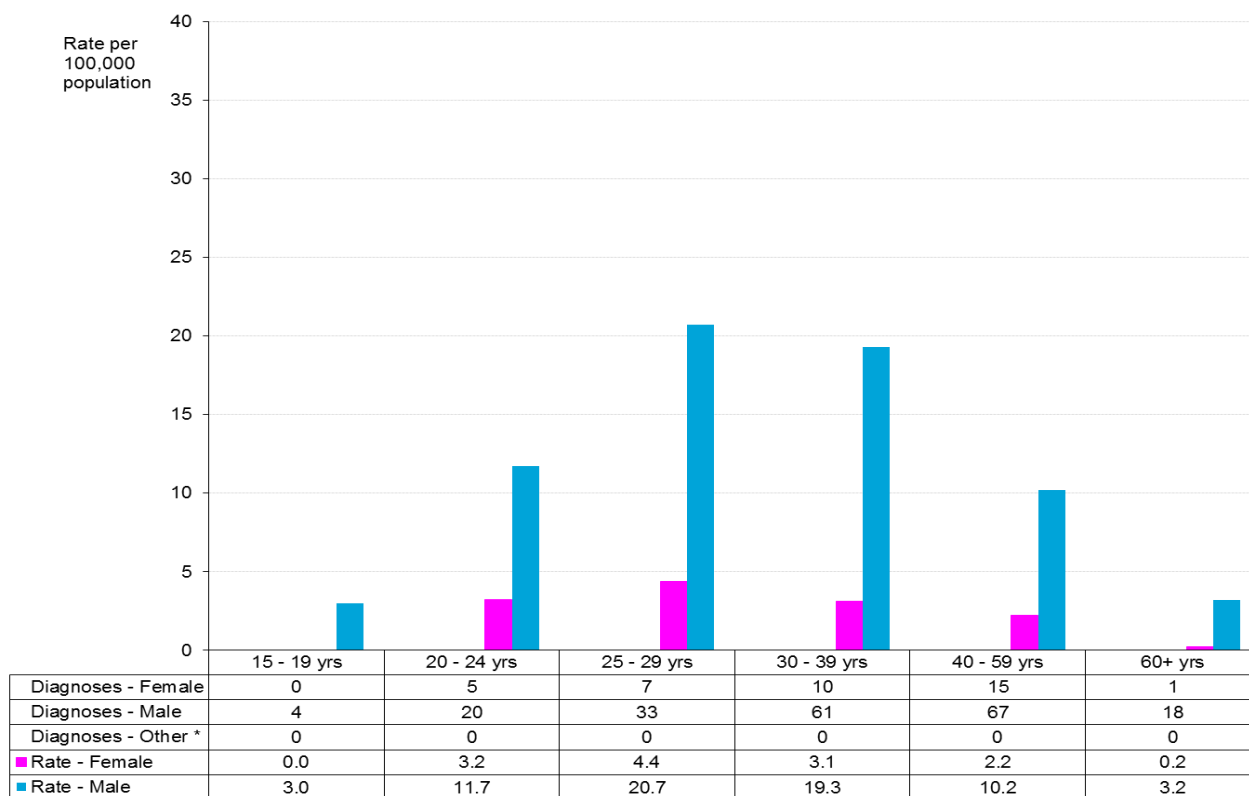


4. New HIV diagnoses in BC by gender, 2007 to 2016



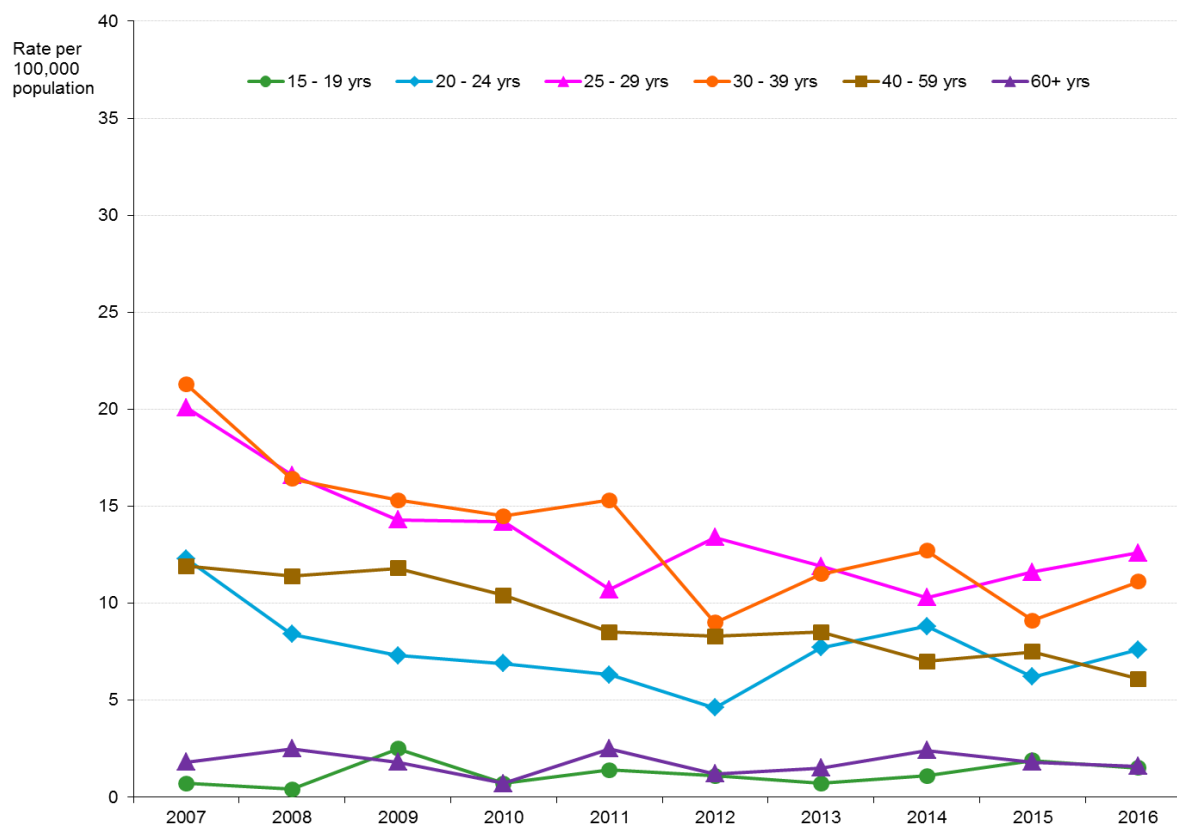
* Other - transgender and gender unknown

5. New HIV diagnoses in BC by age group and gender, 2016

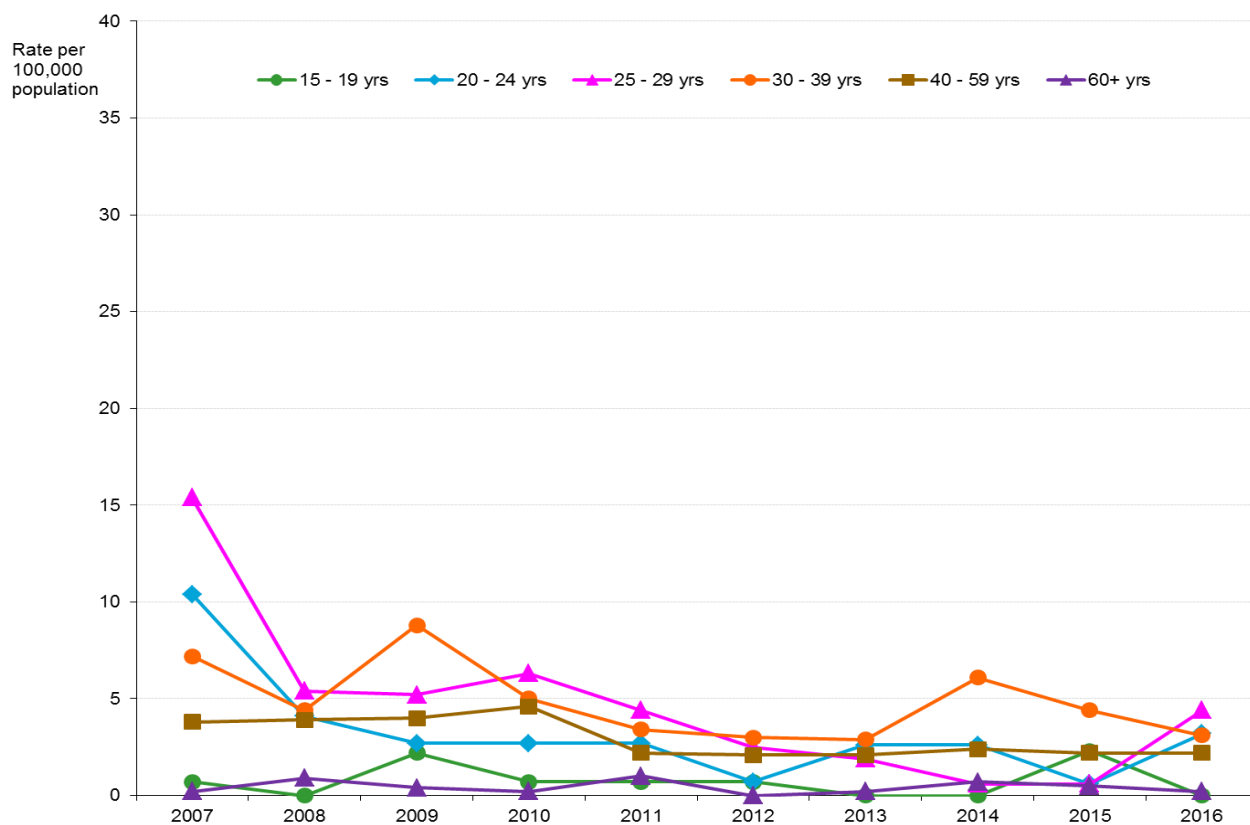


* Other - transgender and gender unknown

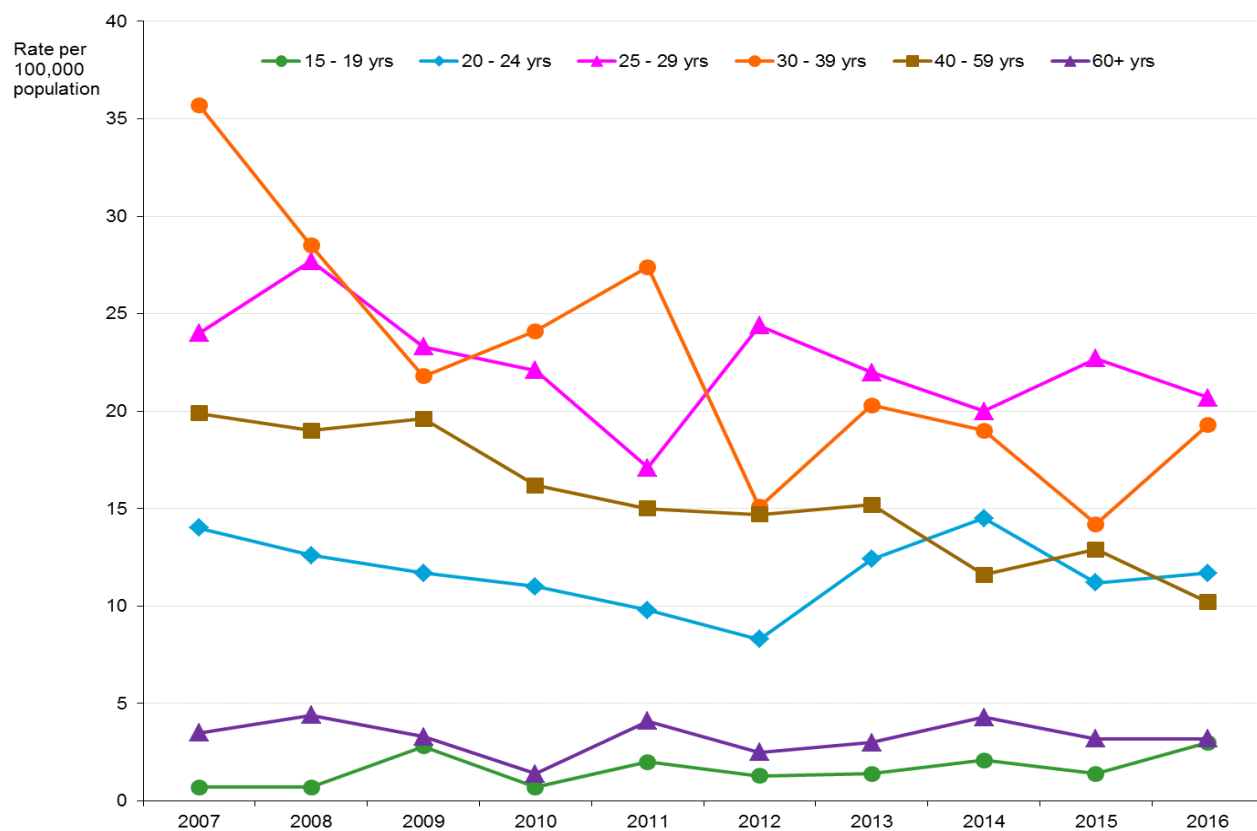
6. New HIV diagnoses in BC by age group - total, 2007 to 2016



7. New HIV diagnoses in BC by age group - female, 2007 to 2016



8. New HIV diagnoses in BC by age group - male, 2007 to 2016



HIV by Ethnicity

Over the past ten years, the proportion of reported ethnicities among people newly diagnosed with HIV in BC has shifted. The percentage of new diagnoses among Caucasian people has gradually decreased while the percentage of diagnoses among Asian people has increased with the proportion of most other ethnicities remaining relatively stable.

Similar to previous years, in 2016 most new HIV diagnoses are among people of Caucasian ethnicity (110 cases, 45.6%) followed by Asian (23 cases, 9.5%) and peoples of Indigenous (22 cases, 9.1%) ethnicity (Table 9). Over the past ten years, Indigenous peoples have been disproportionately represented in BC's HIV epidemic, consistently comprising approximately 8-17% of new HIV diagnoses while representing only about 6% of the total provincial population.² This disparity is particularly pronounced for Indigenous women who comprise 28.9% (11 cases) of new HIV diagnoses among females in 2016 (Table 10). Notably, the proportion of new HIV diagnoses among Indigenous peoples who have tested, has decreased from 16.1% (63/391 cases) in 2007 to 9.1% (22/241 cases) in 2016.

At the time of this report, the ethnicity of 52 (21.6%) individuals newly diagnosed with HIV in 2016 is unknown.

9. Percentage of new HIV diagnoses in BC by ethnicity - total, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. Diagnoses</i>	391	347	337	300	288	237	265	261	240	241
Caucasian	62.1	55.3	53.1	59.7	53.1	57.4	58.1	45.6	45.8	45.6
Indigenous	16.1	13.5	16.9	13.0	15.3	12.7	11.3	13.8	8.3	9.1
Asian	4.3	8.9	7.7	9.7	11.5	12.7	10.2	10.3	10.0	9.5
South Asian	3.1	2.3	2.1	2.7	5.2	3.4	3.4	8.4	2.5	3.3
Hispanic	4.9	6.6	6.5	3.3	4.2	4.2	4.2	5.0	2.1	4.1
Black	2.6	4.9	6.8	5.3	4.5	3.0	2.6	3.8	5.4	3.3
Other *	1.5	2.6	2.1	2.3	1.4	2.5	0.8	1.1	2.5	3.3
Unknown	5.4	5.8	4.7	4.0	4.9	4.2	9.4	11.9	23.3	21.6

* Other - Arab/West Asian and other/mixed ethnicity

10. Percentage of new HIV diagnoses in BC by ethnicity - female, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. Diagnoses</i>	85	60	71	62	43	29	31	44	37	38
Caucasian	42.4	41.7	43.7	37.1	32.6	34.5	38.7	27.3	27.0	28.9
Indigenous	38.8	35.0	23.9	33.9	37.2	37.9	38.7	36.4	27.0	28.9
Asian	2.4	3.3	2.8	6.5	4.7	6.9	9.7	4.5	10.8	7.9
South Asian	4.7	1.7	1.4	3.2	4.7	0.0	6.5	13.6	2.7	5.3
Hispanic	1.2	0.0	0.0	1.6	2.3	3.4	0.0	0.0	0.0	0.0
Black	4.7	13.3	15.5	9.7	11.6	13.8	3.2	6.8	10.8	7.9
Other *	2.4	1.7	1.4	3.2	2.3	3.4	0.0	0.0	0.0	5.3
Unknown	3.5	3.3	11.3	4.8	4.7	0.0	3.2	11.4	21.6	15.8

* Other - Arab/West Asian and other/mixed ethnicity

11. Percentage of new HIV diagnoses in BC by ethnicity - male, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. Diagnoses	303	287	266	238	245	208	234	215	203	203
Caucasian	68.0	58.2	55.6	65.5	56.7	60.6	60.7	48.8	49.3	48.8
Indigenous	9.9	9.1	15.0	7.6	11.4	9.1	7.7	9.3	4.9	5.4
Asian	5.0	10.1	9.0	10.5	12.7	13.5	10.3	11.6	9.9	9.9
South Asian	2.6	2.4	2.3	2.5	5.3	3.8	3.0	7.4	2.5	3.0
Hispanic	5.6	8.0	8.3	3.8	4.5	4.3	4.7	6.0	2.5	4.9
Black	2.0	3.1	4.5	4.2	3.3	1.4	2.6	3.3	4.4	2.5
Other *	1.3	2.8	2.3	2.1	1.2	2.4	0.9	1.4	3.0	3.0
Unknown	5.6	6.3	3.0	3.8	4.9	4.8	10.3	12.1	23.6	22.7

* Other - Arab/West Asian and other/mixed ethnicity

New HIV Diagnoses among Indigenous Peoples

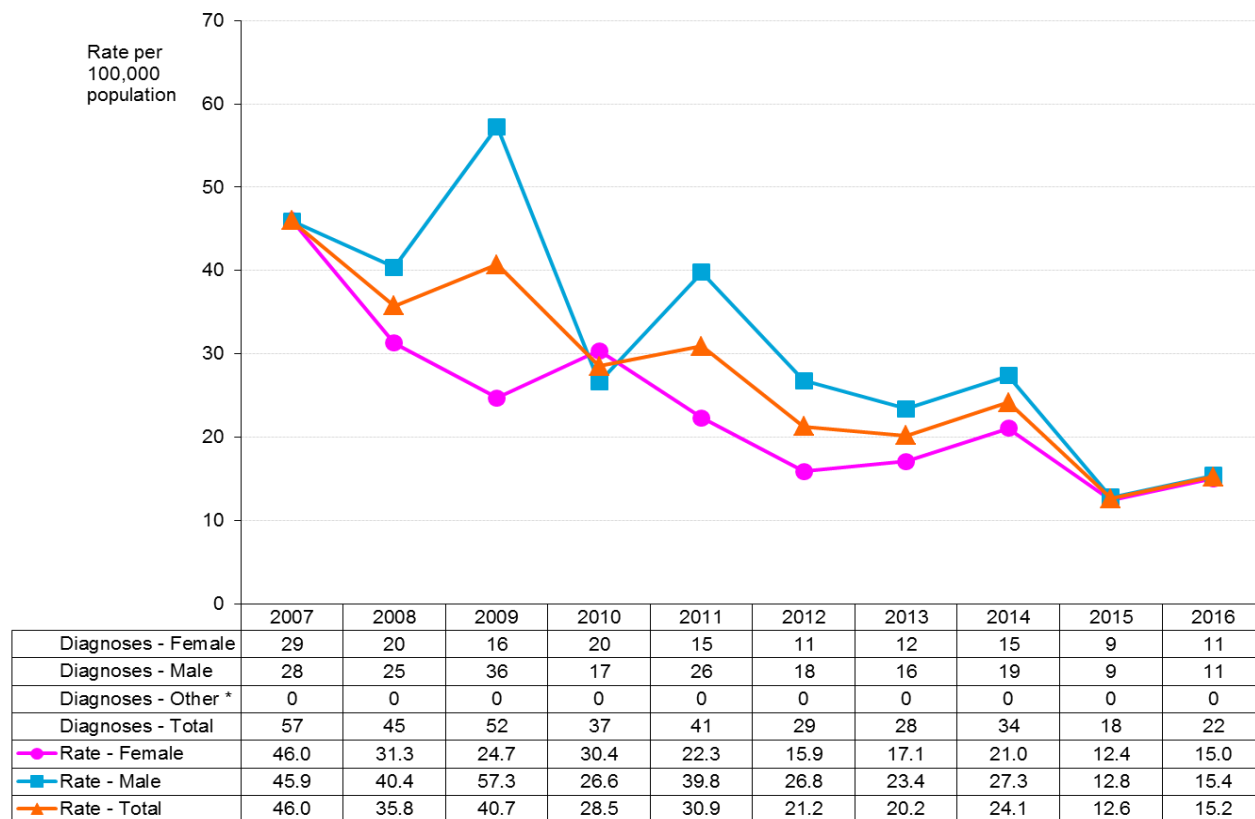
Among the 270,000 Indigenous persons living in BC, representing about 6% of the general BC population, approximately 65% are First Nations, 33% are Métis, and fewer than 1% are Inuit or of other Indigenous identity.³ Statistics can help us understand the impact of HIV among Indigenous peoples in BC but they tell only part of the story. Behind each individual with HIV counted in this report is a family, a community, and a broader social and economic context. The new HIV diagnoses among Indigenous peoples in this report include only those who have been tested and only those who self-identify as Indigenous. Indigenous peoples, particularly those living in rural and remote communities, face additional barriers to HIV testing such as concerns about confidentiality, access to testing, and the fear of being judged by health care providers.^{4, 5}

There are multiple social, economic, and contextual factors that contribute to the increased risk of HIV among Indigenous peoples and contribute to inequities in health: colonization, intergenerational trauma, Indian Residential Schools, loss of language and culture, and ongoing discrimination.⁶ Although this surveillance report will focus on simple statistics, we acknowledge the complex factors that determine health and recognize that Indigenous peoples and communities hold many strengths to draw on to address HIV prevention, care, treatment, and support.⁷

Between 2007 and 2016, there were 18-57 new HIV diagnoses reported each year among First Nations people (22 cases in 2016). During the same time period, six or fewer new HIV diagnoses were reported each year among Métis and Inuit people in BC. Because of the small number of diagnoses among Métis and Inuit people and the availability of population estimates for status First Nations people (needed for rate calculations), the remainder of this section focuses on new HIV diagnoses among people who identify as First Nations.

The number and rate of new HIV diagnoses among First Nations people have decreased over the past 10 years (Figure 12). In 2016, the rate of new HIV diagnoses among First Nations people was 15.2 (22 cases) per 100,000 population.

12. New HIV diagnoses among First Nations people in BC by gender, 2007 to 2016



* Other - transgender and gender unknown

Rates based on First Nations population estimates from the former Aboriginal Affairs and Northern Development Canada now known as Indigenous Services Canada

In 2016, as in previous years, the majority of new HIV diagnoses among First Nations people were in Northern, Vancouver Coastal, and Fraser Health Authorities.

The rate of new HIV diagnoses in First Nations women is comparable to the rate in men (Figure 12). This contrasts with gender-stratified rates among the general BC population in which rates are five-to-ten fold higher among men (Figure 4). Most new HIV diagnoses among First Nations people are among people who inject drugs (PWID) and heterosexual (HET) exposure categories. Most new HIV diagnoses among the total population are attributed to the men who have sex with men (MSM) exposure category. Rates in both First Nations women and men exceed the provincial rates among women and men (15.0 versus 1.6 per 100,000 population for women and 15.4 versus 8.6 per 100,000 population for men in 2016).

In 2016, the highest rates of new HIV diagnoses for First Nations men were in those 20-24 years old and for First Nations women were in those 20-29 years old.

HIV by Exposure Category

Gay, bisexual, and other men who have sex with men (MSM) continue to comprise the greatest number of new HIV diagnoses in BC. The overall trend in new HIV diagnoses among MSM is elevated compared with other exposure categories but has been decreasing slightly over the past 10 years. The number of new HIV diagnoses among MSM increased to 145 cases (60.2%) in 2016 from 137 cases (57.1%) in 2015. The number of new HIV diagnoses in BC among people who inject drugs (PWID) remained similar in both 2016 (16 cases, 6.6%) and 2015 (17 cases, 7.1%). The number of new HIV diagnoses due to heterosexual contact observed a decrease to 58 (24.1%) in 2016 from 69 cases (28.8%) in 2015 (Figure 14). Trends in these three main exposure categories in BC are explored in more detail in the following sections.

At the time of this report, the exposure category of 14 (5.8%) individuals newly diagnosed with HIV in 2016 are not identified or are unknown. The final number of individuals in each exposure category for 2016 may change slightly if further information on these individuals is received.

13. New HIV diagnoses in BC by exposure category and health authority, 2007 to 2016

Health Authority	Exposure Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Interior	MSM	4	10	4	4	3	4	3	9	10	11
	PWID	9	6	1	2	1	4	0	4	1	0
	HET	4	9	11	5	5	4	8	4	7	3
	Other	0	1	2	0	1	0	1	0	0	0
	NIR/UNK	0	0	0	0	1	0	1	0	1	0
Fraser	MSM	30	30	27	22	24	22	34	27	30	36
	PWID	16	8	18	11	5	5	9	7	1	5
	HET	33	27	35	30	22	15	16	24	30	20
	Other	1	3	4	4	3	1	3	1	1	3
	NIR/UNK	1	2	3	5	0	2	2	0	1	3
Vancouver Coastal	MSM	128	121	104	112	132	105	99	103	86	83
	PWID	41	27	20	21	13	11	11	10	11	6
	HET	39	28	29	33	31	23	24	21	23	19
	Other	1	2	5	1	2	0	1	4	3	4
	NIR/UNK	0	8	6	0	0	2	5	7	5	6
Vancouver Island	MSM	9	18	16	13	8	16	14	10	11	15
	PWID	30	11	10	9	3	3	1	3	2	2
	HET	10	9	8	10	9	6	10	10	7	9
	Other	4	0	1	1	1	1	1	0	1	0
	NIR/UNK	0	1	4	0	0	0	3	2	3	3
Northern	MSM	0	2	1	1	3	1	3	2	0	0
	PWID	22	13	15	9	12	6	4	2	2	3
	HET	4	8	9	5	8	4	9	6	2	7
	Other	1	1	0	0	0	0	1	2	0	1
	NIR/UNK	1	1	2	1	1	1	0	1	2	1
BC	MSM	173	181	153	153	170	149	154	153	137	145
	PWID	118	66	64	52	34	29	25	26	17	16
	HET	90	81	92	83	75	52	68	65	69	58
	Other	7	7	12	6	7	2	7	7	5	8
	NIR/UNK	3	12	16	6	2	5	11	10	12	14

MSM - men who have sex with men

PWID - people who inject drugs

HET - heterosexual contact

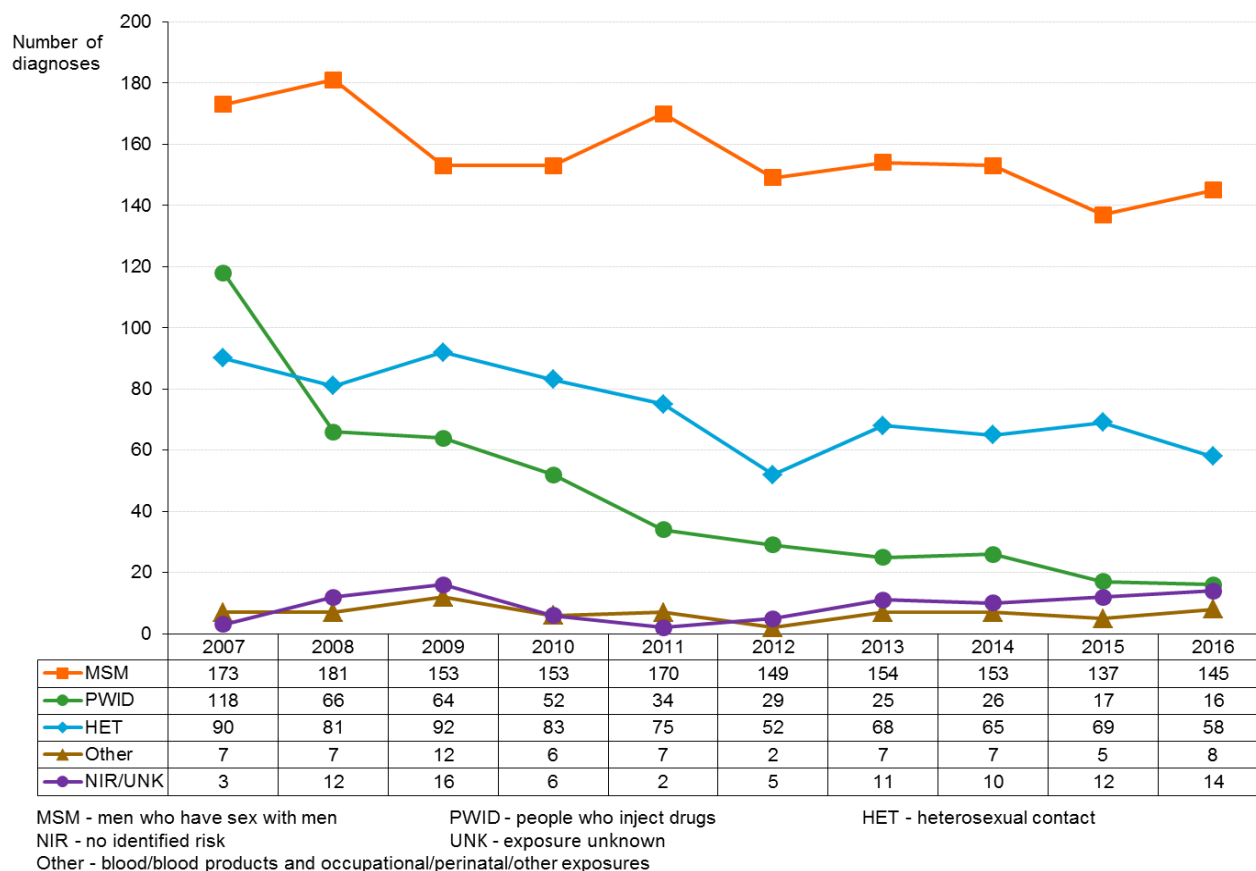
Other - blood/blood products and occupational/perinatal/other exposures

NIR - no identified risk

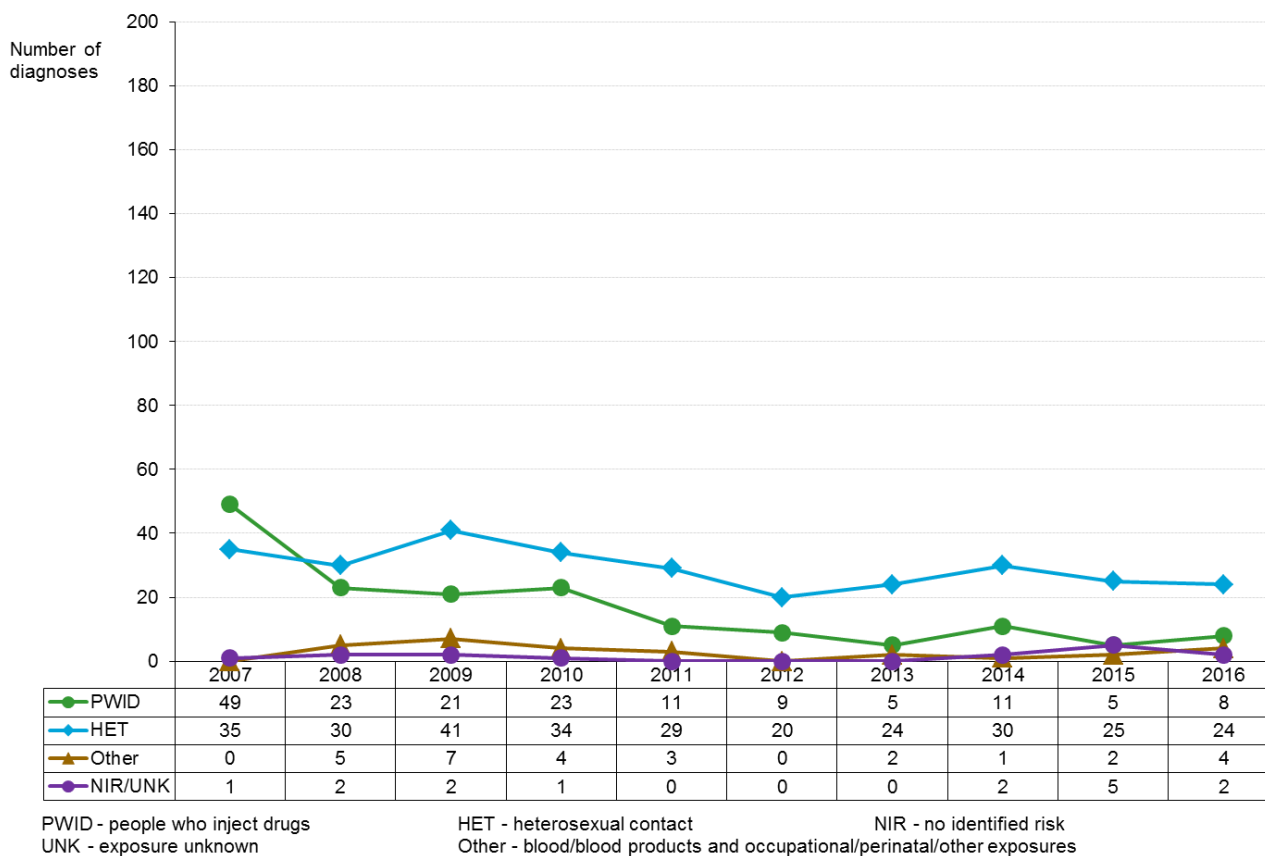
UNK - exposure unknown

BC is the sum of new HIV diagnoses from all health authorities, unknown health authority, and non-BC

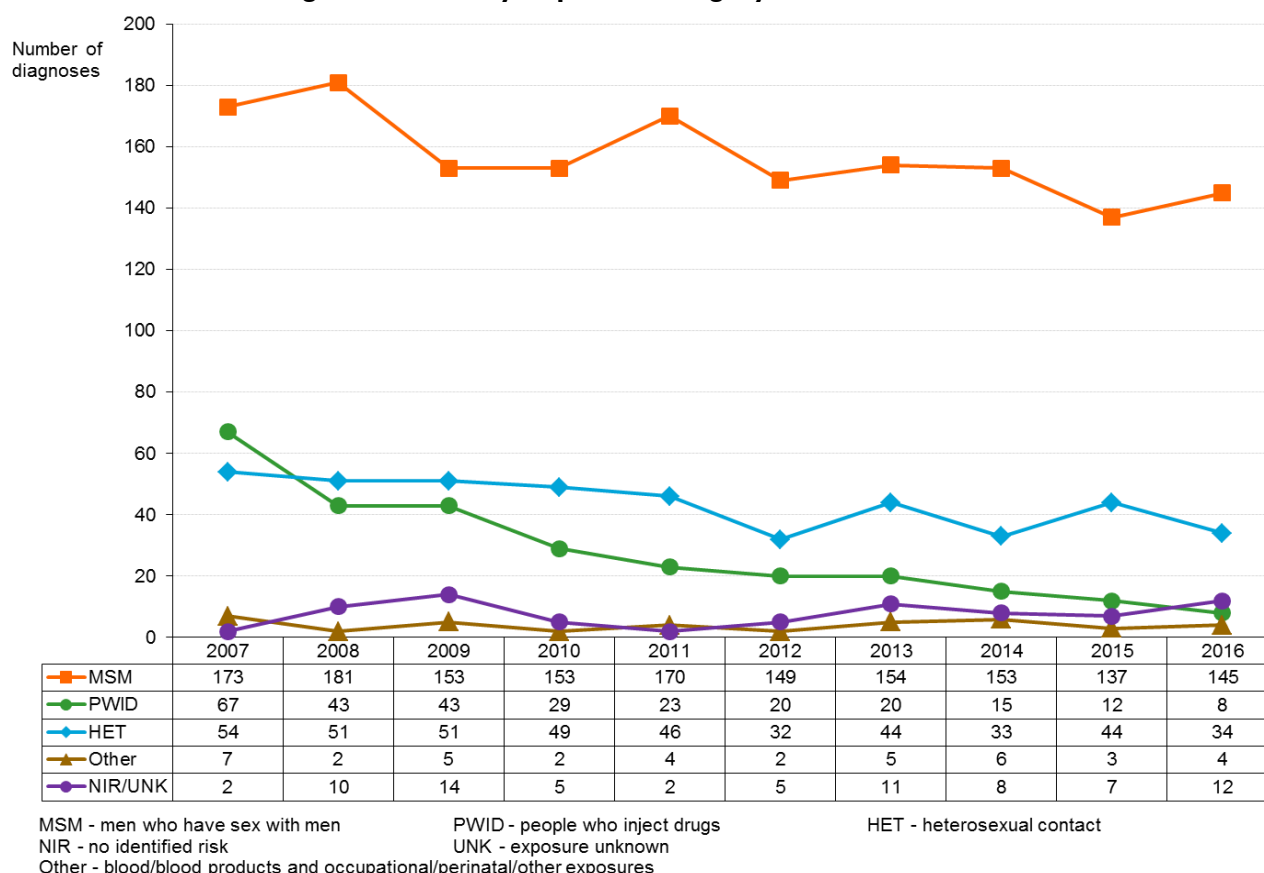
14. New HIV diagnoses in BC by exposure category - total, 2007 to 2016



15. New HIV diagnoses in BC by exposure category - female, 2007 to 2016



16. New HIV diagnoses in BC by exposure category - male, 2007 to 2016



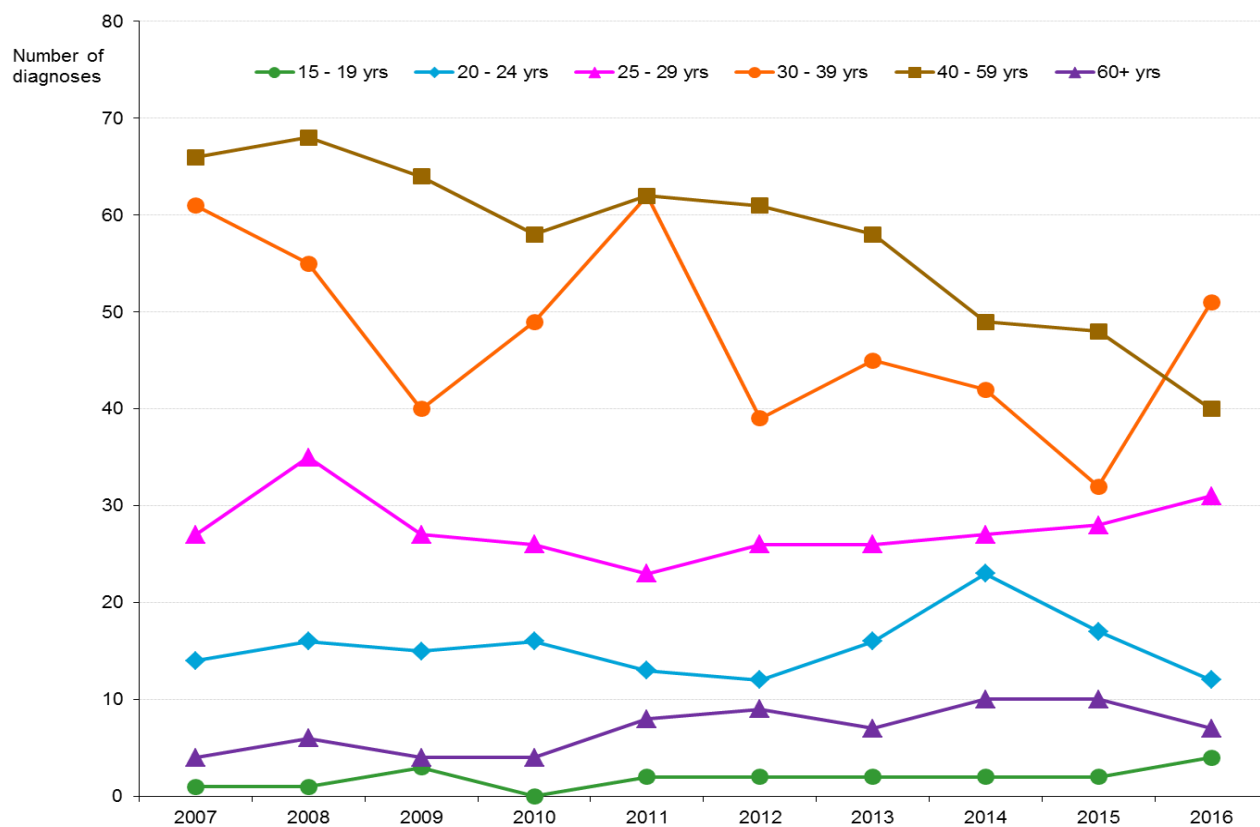
New HIV Diagnoses among Men who have Sex with Men

Gay, bisexual, and other men who have sex with men (MSM) were the population first affected by HIV in BC and remain the population most affected by HIV in BC, as in many other regions of North America. The Public Health Agency of Canada estimated that in 2014, 49% of the 12,100 people with prevalent HIV infections in BC (i.e., living with HIV) were MSM (Table 35) as were 62% of the estimated 305 people with incident (new) HIV infections (Table 34). Community surveys of MSM in venues have found an HIV prevalence of 14% in Victoria (2007)⁸ and 18% in Vancouver (2008)⁹. It is clear that MSM are disproportionately represented among new HIV diagnoses in BC compared to other males. Estimates to the size of the MSM population in BC provide context to the HIV trends observed among MSM. Recent work estimates the MSM population in BC to be 50,900.^{10, 11}

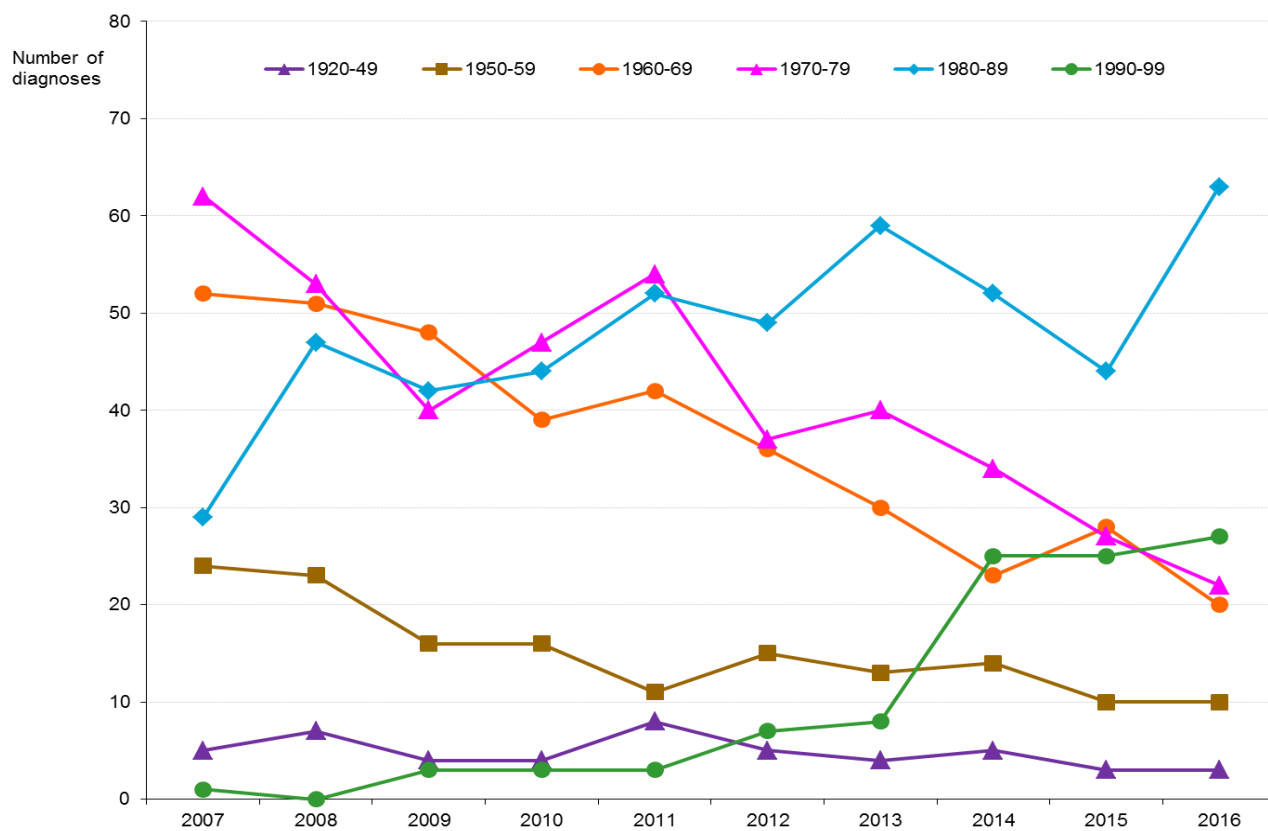
There are many factors that have led to the current epidemic of HIV among MSM in BC, ranging from social factors (such as stigma and discrimination related to sexual orientation), to community factors (such as secure access to food, access to stable housing and to appropriate, safe health services), to individual factors (such as changes in uptake of HIV medications, sexual behaviours, and use of prevention measures including condoms).¹² The recognition of the complexity of the epidemic among MSM has led internationally to an increased emphasis on renewing the public health response to HIV among MSM by adopting broader approaches to HIV prevention, including sexual health and determinants-based approaches.^{13, 14}

Overall, the trend in new HIV diagnoses among MSM appears to be declining slightly but not to the same extent as in other exposure categories (Figure 16). Accordingly, MSM comprise a greater proportion of all new HIV diagnoses in BC. In 2016, 60.2% (145 cases) of all new HIV diagnoses were among MSM and 2.8% (4 cases) of these MSM were identified as having injected drugs as well (MSM/PWID) (Table 19).

17. New HIV diagnoses among MSM in BC by age group, 2007 to 2016



18. New HIV diagnoses among MSM in BC by birth cohort, 2007 to 2016



19. Percentage of new HIV diagnoses among MSM who inject drugs in BC, 2007 to 2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of MSM Diagnoses	173	181	153	153	170	149	154	153	137	145
MSM/PWID	5.8	3.3	8.5	4.6	7.1	2.7	4.5	1.3	2.9	2.8

Of the 145 new HIV diagnoses among MSM in 2016, 32.4% (47 cases) were under the age of 30 years, 35.2% (51 cases) were aged 30-39 years, 27.6% (40 cases) were aged 40-59 years, and 4.8% (7 cases) were aged 60 years or older. It is important to consider that different generations of MSM in Vancouver have different experiences of the HIV epidemic due in part to the achievement of milestones such as the development of HIV treatment (i.e., antiretroviral therapy or ART), shifting community norms among gay/bisexual men, and broader socio-cultural and political factors which have reduced the stigma attached to being gay and to living with HIV.

When looking at new HIV diagnoses by different birth cohorts, new HIV diagnoses have increased substantially in recent years among MSM born between 1990-99 (Figure 18). Notably, this birth cohort, as well as the 1980-89 birth cohort, entered adolescence/adulthood in the post-ART era and hence the first to not witness first-hand the effects of AIDS – and its related mortality – experienced by the gay community in the 1980s and early 1990s. These changes in new HIV diagnoses among generations of MSM probably reflect population dynamics and sexual activity, as younger men “age in” to the epidemic.

The proportion of new HIV diagnoses among MSM aged 20-29 years decreased slightly to 29.7% (43 cases) in 2016 from 32.8% (45 cases) in 2015 (Figure 17). Increases in new HIV infections among young MSM have been reported in the US^{15, 16}, and Europe^{17, 18}. One reason for this may be the greater use of technology and the Internet to facilitate sexual encounters; studies have found elevated levels of sexual risk behaviours (i.e., unprotected anal intercourse, multiple anal intercourse partners, older sexual partners, and engaging in sexual activity at sex clubs or bathhouses) among young MSM who seek and meet sexual partners through the Internet.^{19, 20}

There is some indication that the profile of MSM by ethnicity is also shifting with the percentage of new diagnoses among Caucasian MSM gradually decreasing. In 2016, 53.1% (77 cases) of MSM newly diagnosed with HIV were Caucasian, 10.3% (15 cases) were Asian, 4.8% (7 cases) were Hispanic, and 4.1% (6 cases) were males of other ethnicity (Table 20).

At the time of this report, the ethnicity of 31 (21.4%) MSM newly diagnosed with HIV in 2016 is unknown.

20. Percentage of new HIV diagnoses among MSM in BC by ethnicity, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of Diagnoses	173	181	153	153	170	149	154	153	137	145
Caucasian	76.9	62.4	58.2	74.5	61.2	64.4	63.6	55.6	54.7	53.1
Indigenous	2.3	5.5	8.5	2.0	5.9	3.4	3.2	4.6	1.5	2.8
Asian	6.4	11.6	12.4	13.1	15.3	18.1	11.7	11.1	9.5	10.3
South Asian	2.3	2.2	0.7	1.3	2.4	2.7	1.9	7.8	0.7	2.1
Hispanic	7.5	11.0	11.8	5.2	5.9	4.7	5.8	8.5	3.6	4.8
Black	1.2	1.1	2.6	0.0	2.9	1.3	2.6	2.0	2.2	1.4
Other *	1.7	3.3	2.6	2.6	1.2	2.7	1.3	2.0	4.4	4.1
Unknown	1.7	2.8	3.3	1.3	5.3	2.7	9.7	8.5	23.4	21.4

* Other - Arab/West Asian and other/mixed ethnicity

New HIV Diagnoses among People who Inject Drugs

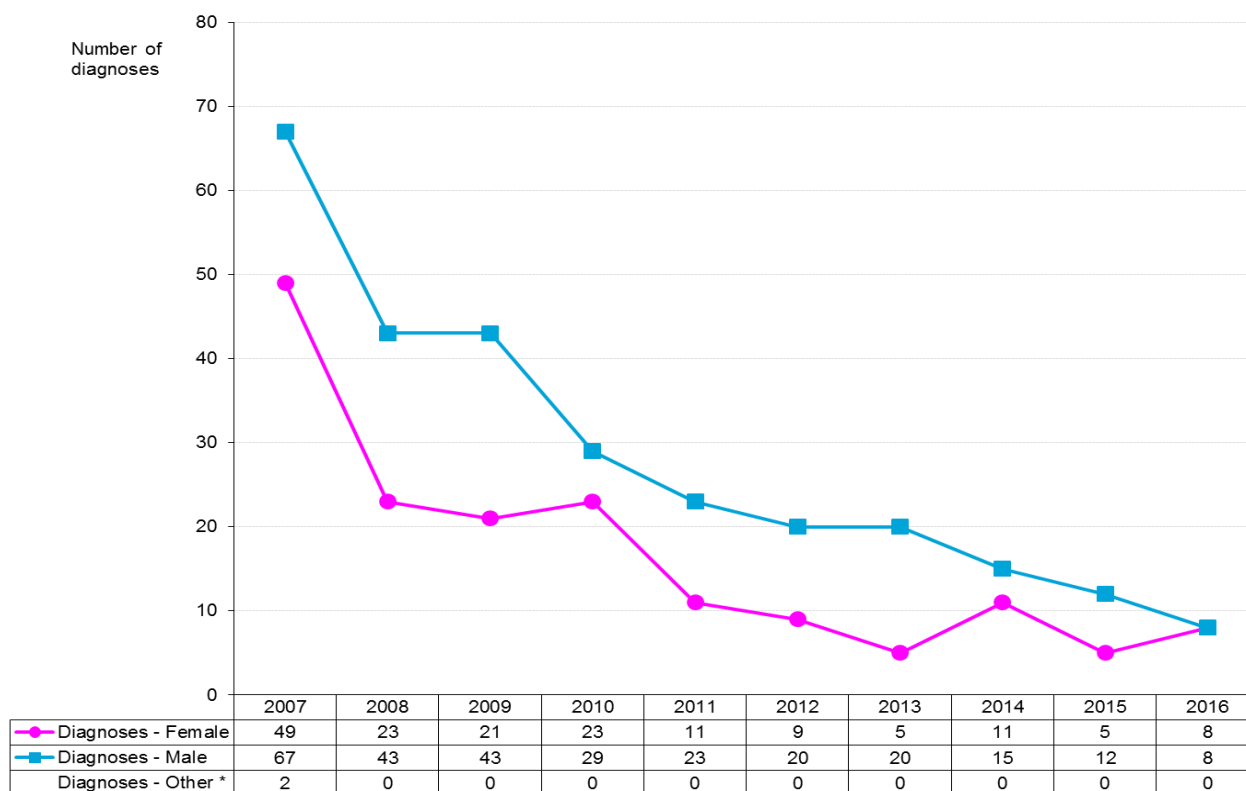
The overall decrease in HIV diagnoses in BC is largely due to the dramatic decrease in the number of new HIV diagnoses among people who inject drugs (PWID) in BC starting in 2008 (Figure 14). In the years prior to the decrease, PWID comprised approximately 30% of all new HIV diagnoses in the province. In 2016, 6.6% (16 cases) of all new HIV diagnoses were among PWID.

Estimates to the size of the PWID population in BC provide context to the HIV trends observed among PWID. Recent work estimates the PWID population in BC to be 42,200.^{21, 22}

There are several possible explanations for this decrease which are likely acting in concert to result in a net overall decrease in new diagnoses among PWID. The increasing uptake and duration of antiretroviral therapy (ART) as well as provincial harm reduction programs (such as needle distribution programs, supervised injection sites, and other prevention programs) have helped lead to declines in HIV transmission among PWID. Survey data among drug users in Vancouver and Victoria also demonstrated shifts in drug using behaviour during this period, from injecting to smoking drugs which has likely been a significant factor. The continued decline in new HIV diagnoses among PWID is encouraging, and efforts to maintain and enhance current prevention programs for PWID are needed.²³

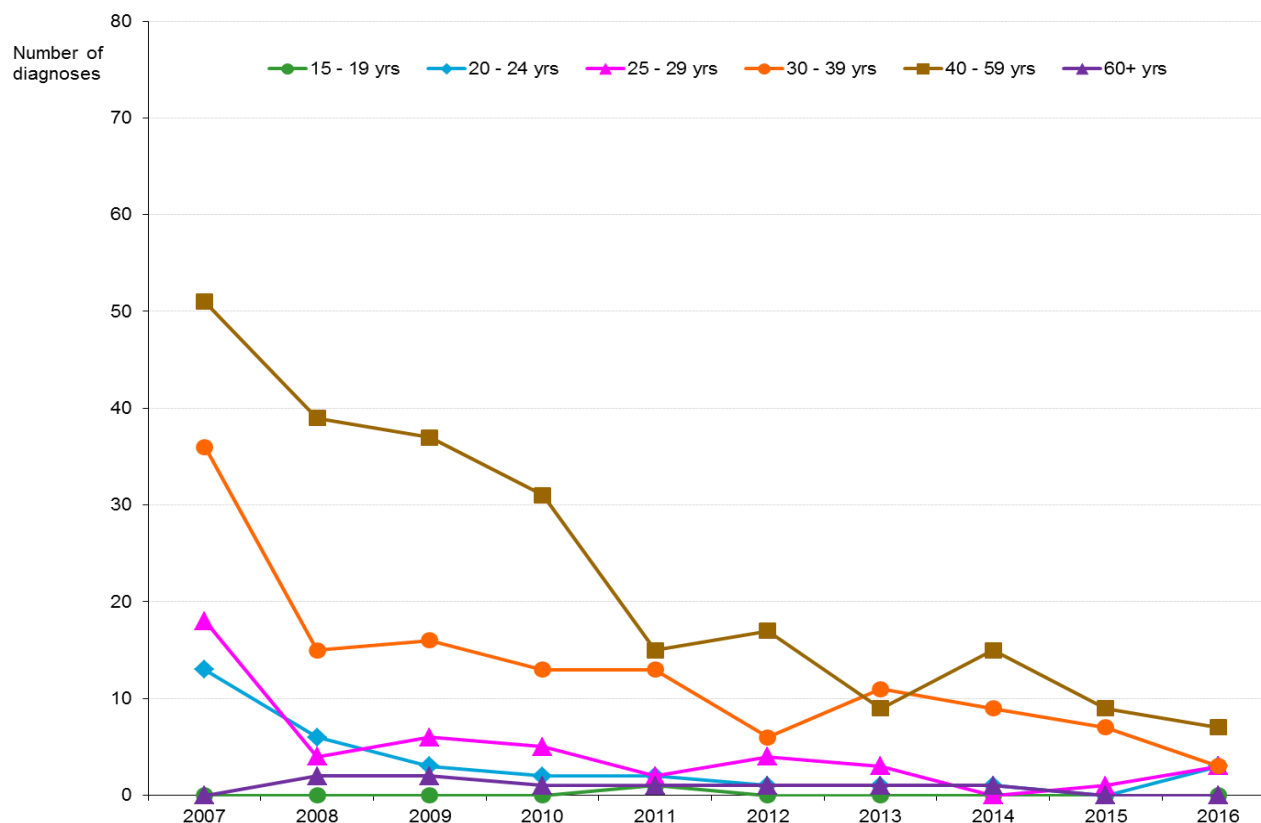
New HIV diagnoses among PWID continued to decrease in both males and females. In 2016, the number of new HIV diagnoses was similar in both genders (8 females, 8 males) (Figure 21) while the greatest number of new HIV diagnoses are in those between 40-59 years of age (7 cases, 43.8%) (Figure 22).

21. New HIV diagnoses among PWID in BC by gender, 2007 to 2016



* Other - transgender and gender unknown

22. New HIV diagnoses among PWID in BC by age group, 2007 to 2016



In 2016, the majority of new HIV diagnoses among PWID are among people of Caucasian ethnicity (7 cases, 43.8%) and Indigenous peoples (5 cases, 31.3%) (Table 23).

23. Percentage of new HIV diagnoses among PWID in BC by ethnicity, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of Diagnoses	118	66	64	52	34	29	25	26	17	16
Caucasian	50.0	57.6	53.1	65.4	44.1	55.2	56.0	30.8	41.2	43.8
Indigenous	36.4	31.8	34.4	28.8	47.1	41.4	20.0	50.0	29.4	31.3
Asian	0.0	1.5	1.6	1.9	2.9	0.0	4.0	0.0	0.0	0.0
South Asian	1.7	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hispanic	1.7	0.0	0.0	0.0	2.9	0.0	4.0	0.0	0.0	0.0
Black	0.0	1.5	1.6	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Other *	1.7	3.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	8.5	4.5	7.8	0.0	2.9	3.4	16.0	19.2	29.4	25.0

* Other - Arab/West Asian and other/mixed ethnicity

New HIV Diagnoses among People who acquire HIV through Heterosexual Contact

People who have acquired HIV through heterosexual contact (HET) represent the exposure category with the second greatest number of new HIV diagnoses in BC in 2016 (58 cases, 24.1%) (Figure 14). This population is heterogeneous. It is also possible that this population includes individuals where risk factors for acquisition of HIV through other routes of exposure exists but was not identified during follow-up.

The number of new HIV diagnoses among people who have acquired HIV through heterosexual contact decreased in 2016 to 58 cases from 69 cases in 2015. In 2016, the number of new HIV diagnoses among heterosexual males decreased to 34 cases (58.6%) from 44 cases (63.8%) in 2015. The number of new diagnoses among heterosexual females was similar in both 2016 (24 cases, 41.4%) and 2015 (25 cases, 36.2%) (Figure 24). Since 2007, the majority of new HIV diagnoses are observed among individuals between 40-59 years of age (Figure 25). In 2016, new HIV diagnoses among individuals aged 40-59 years decreased to 26 cases (44.8%) from 35 cases (50.7%) in 2015. New HIV diagnoses among individuals aged 30-39 years of age also decreased to 12 cases (20.7%) in 2016 from 18 cases (26.1%) in 2015.

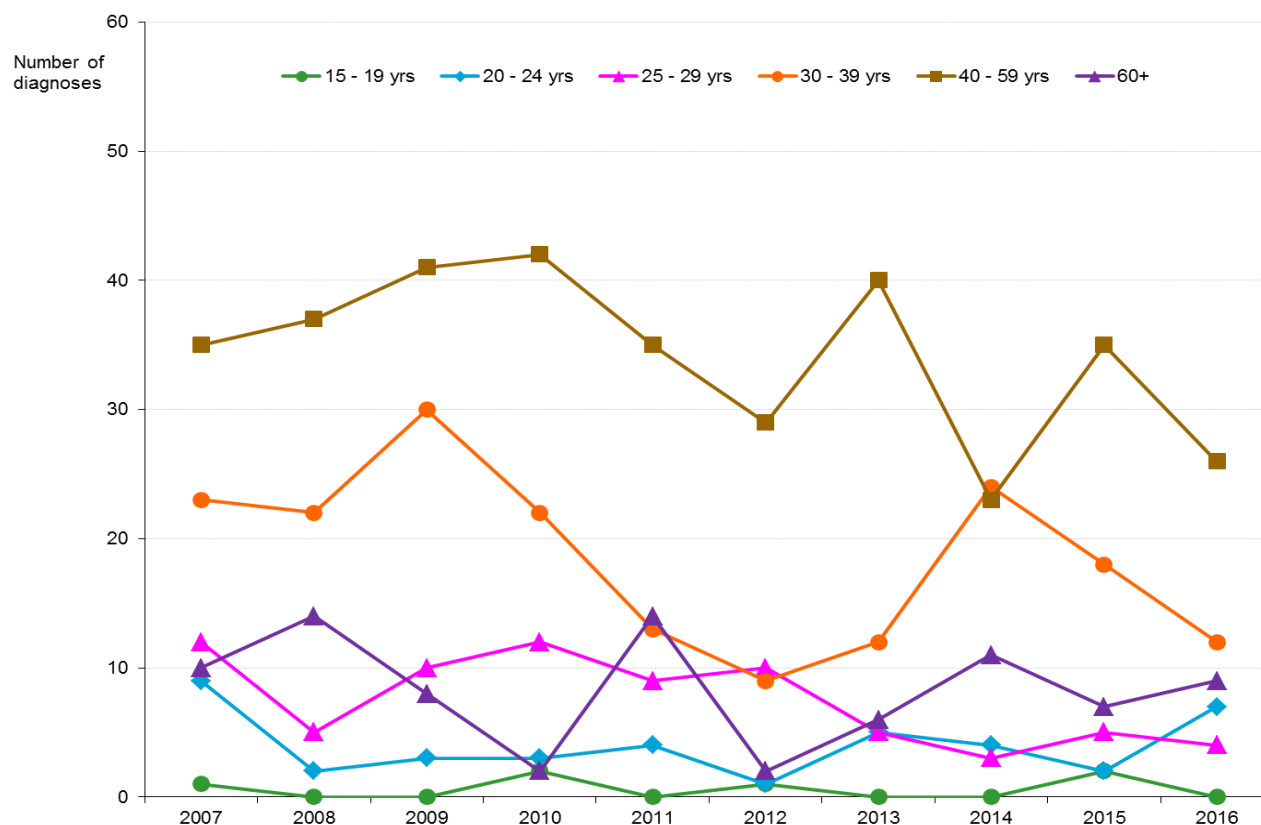
Among people who have acquired HIV through heterosexual contact, compared to other exposure categories, people from non Caucasian ethnicity comprise a greater proportion of new HIV diagnoses. Similar to previous years, in 2016, most of the new HIV diagnoses in heterosexuals are among Caucasians (26 cases, 44.8%) followed by Indigenous peoples (10 cases, 17.2%) then Asians (7 cases, 12.1%) (Table 26).

24. New HIV diagnoses among HET in BC by gender, 2007 to 2016



* Other - transgender and gender unknown

25. New HIV diagnoses among HET in BC by age group, 2007 to 2016



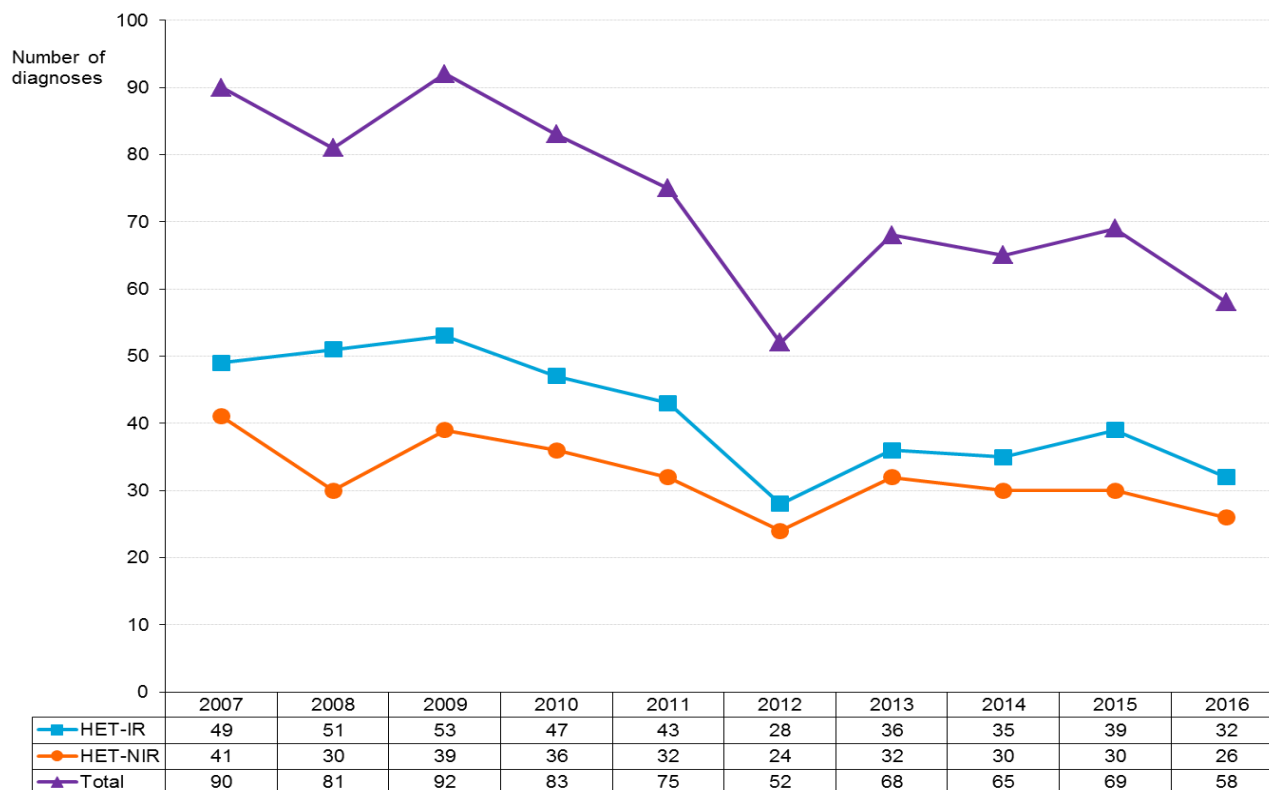
26. Percentage of new HIV diagnoses among HET in BC by ethnicity, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of Diagnoses	90	81	92	83	75	52	68	65	69	58
Caucasian	52.2	48.1	51.1	34.9	42.7	44.2	52.9	35.4	34.8	44.8
Indigenous	15.6	17.3	17.4	24.1	21.3	25.0	23.5	18.5	15.9	17.2
Asian	5.6	8.6	6.5	8.4	8.0	5.8	7.4	13.8	15.9	12.1
South Asian	6.7	3.7	5.4	7.2	13.3	5.8	7.4	15.4	5.8	3.4
Hispanic	4.4	3.7	2.2	2.4	1.3	5.8	0.0	0.0	0.0	5.2
Black	8.9	13.6	13.0	14.5	8.0	9.6	4.4	9.2	10.1	8.6
Other *	1.1	1.2	1.1	2.4	2.7	3.8	0.0	0.0	0.0	3.4
Unknown	5.6	3.7	3.3	6.0	2.7	0.0	4.4	7.7	17.4	5.2

* Other - Arab/West Asian and other/mixed ethnicity

Over the past ten years, most new diagnoses in this population each year are in people who on follow-up are found to have at least one identified risk factor (e.g., born/residing in an HIV endemic country or having a sexual partner living with HIV). In 2016, 55.2% (32 cases) of new diagnoses among people who acquired HIV through heterosexual contact had at least one identified risk factor (Figure 27).

27. New HIV diagnoses among HET in BC by identified risk factor, 2007 to 2016



HET-IR - heterosexual contact with at least one other risk factor identified
HET-NIR - heterosexual contact with no other risk factor identified

HIV in Pregnancy

In this report, we present data from two information sources to describe HIV infection among pregnant women in BC: data from prenatal HIV testing and data from the Oak Tree Clinic (OTC). The OTC provides antenatal care directly or indirectly to essentially all pregnant women with HIV infection in BC. There are rare cases that are not reported to the OTC until after delivery and these data are included in this report.

There are important differences between these two data sources that need to be understood in order to interpret the data correctly:

- Prenatal HIV tests – The number of women having at least one prenatal HIV test per year are assigned to the year in which the HIV test was performed and these data include all pregnant women (including women who do and do not have a live birth). These data come from laboratory and surveillance data which have established limitations to data quality (see Technical Appendix for details).
- Surveillance data collated by the Oak Tree Clinic – Includes pregnant women accessing care who have a live birth. The year assigned is based on the infant's year of birth. These data come from clinical data abstraction for women for whom the OTC provides direct or indirect antenatal HIV care or for those that are reported following delivery (estimated at close to complete coverage of all pregnant women with HIV infection in BC).

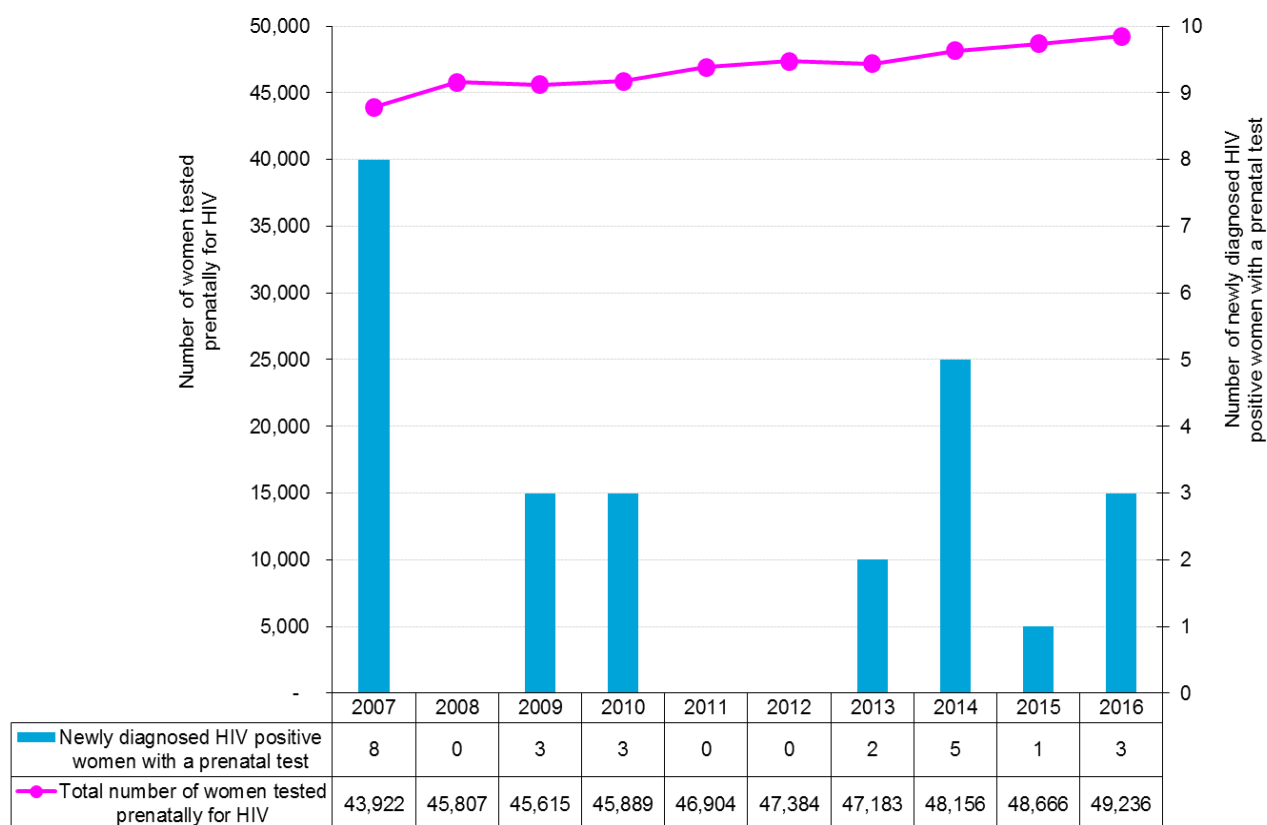
For these reasons, these two data sources are not directly comparable. However, taken together these data provide a more comprehensive overview of HIV in pregnancy in BC.

Prenatal HIV Testing

In 2016, 49,236 women were tested prenatally for HIV. Overall the number of women being tested prenatally each year in BC is increasing slightly.

Between 2007 and 2016, 25 women were newly diagnosed with HIV through prenatal screening. The number of women diagnosed with HIV through prenatal screening decreased after 2007 and remains low (Figure 28).

28. Women newly diagnosed with HIV as part of a prenatal test panel in BC, 2007 to 2016



Information source for the number of women tested prenatally for HIV is the BCCDC Public Health Laboratory

Provincial Surveillance Data Collated by the Oak Tree Clinic

Pregnant Women with HIV

The Oak Tree Clinic (OTC) at BC Children's and Women's Hospital directly or indirectly provides antenatal care for pregnant women with HIV infection and their children, including antenatal antiretroviral therapy (ART) for the prevention of mother to child transmission of HIV.

It is important that all health care providers who care for pregnant women with HIV inform the OTC to ensure surveillance of HIV among pregnant women in BC is comprehensive.

In the absence of antenatal ART, the transmission rate of HIV to infants born to women living with HIV is estimated at 25%. Between 2007 and 2016, 250 pregnant women living with HIV who had live births accessed care at OTC, ranging from 18 to 30 women per year.

The majority of women were diagnosed with HIV before conception or delivery (249/250, 99.6%). Of these 249 women, 245 (98.4%) received antenatal ART prior to delivery and HIV was not diagnosed in any infants born to these women (transmission rate 0% among women accessing antenatal ART) (Table 29). Since 2010, all pregnant women living with HIV who accessed care at the OTC received antenatal ART.

29. Pregnant women living with HIV who had live births and accessed care at Oak Tree Clinic, 2007 to 2016 (based on infant's year of birth)

Time of HIV diagnosis	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
HIV+ pregnant women with live births accessed care at OTC	30	29	21	23	30	24	18	25	24	26
Diagnosed before delivery, received antenatal ART	27	28	20	23	30	24	18	25	24	26
Diagnosed before delivery, did not receive antenatal ART	2	1	1	0	0	0	0	0	0	0
Diagnosed at or after delivery	1	0	0	0	0	0	0	0	0	0

OTC - Oak Tree Clinic

ART - antiretroviral therapy

Perinatally Acquired HIV

From 2007 to 2016, perinatally acquired HIV infection was diagnosed in one infant born in BC (2008) to a woman who did not receive antenatal ART prior to delivery.

Stage of Infection at Time of HIV Diagnosis

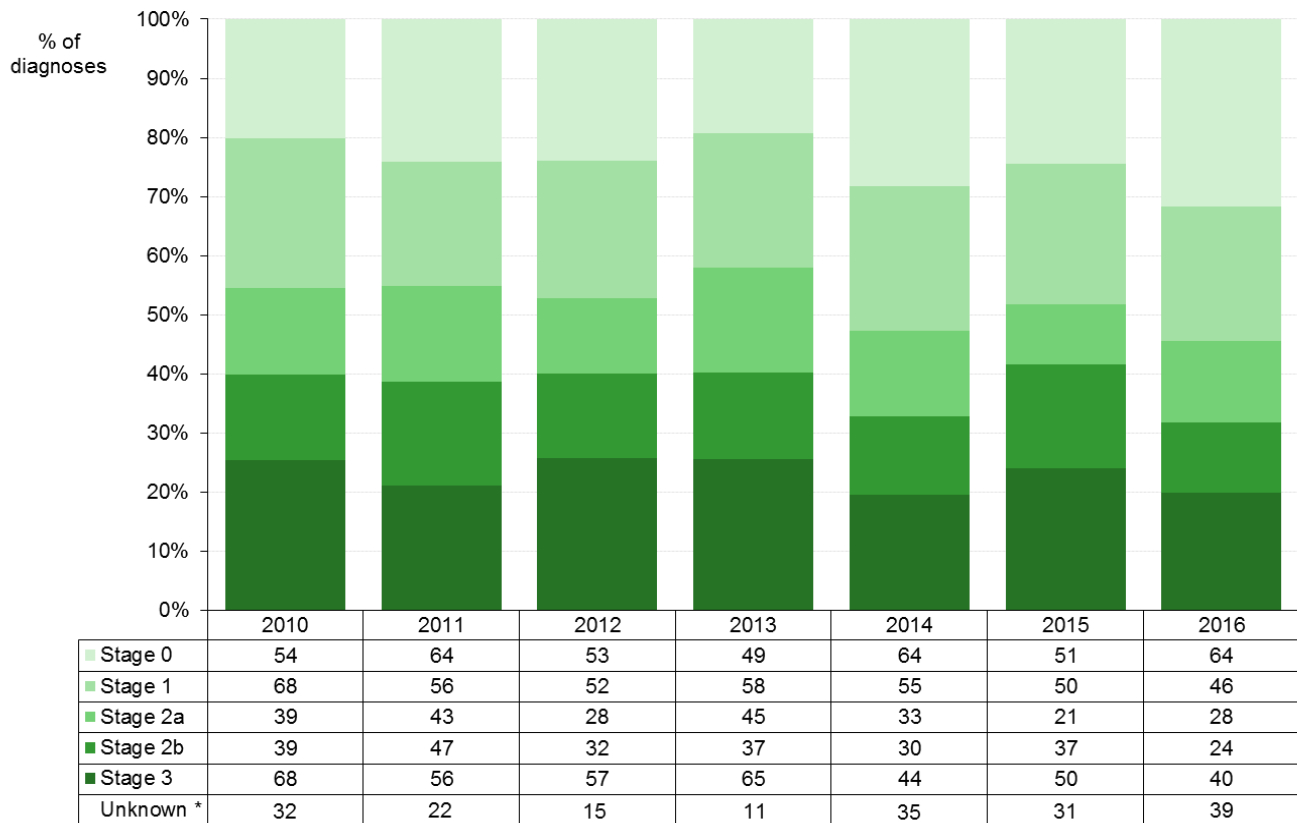
Since HIV is a progressive infection, individuals can be diagnosed weeks to years after infection and thus, can be at different stages of HIV infection at time of diagnosis. Understanding trends in the stage of infection at HIV diagnosis provides insights into the timeliness of engagement in and access to HIV testing following infection. For these reasons, the stage of infection at which individuals living with HIV are diagnosed is a key indicator for monitoring progress of the provincial HIV strategy released in 2012.²⁴ As routine testing is promoted and implemented, a decreasing proportion of individuals diagnosed with advanced stages of HIV infection is anticipated.

Individuals newly diagnosed with HIV are classified into stages of infection based on various laboratory tests for HIV, prior test history, and CD4+ cell count (see Technical Appendix for details).

Early stages of HIV infection (i.e., stages 0 and 1) increased to 45.6% (110/241 cases) of new HIV diagnoses in 2016 from 42.1% (101/240 cases) in 2015. Late stage HIV infection (i.e., stage 3) decreased to 16.6% (40 cases) of new HIV diagnoses in 2016 from 20.8% (50 cases) in 2015 (Figure 30). Note, at the time of this report, the stage of infection at the time of HIV diagnosis is not known for 39 cases (16.2%) in 2016.

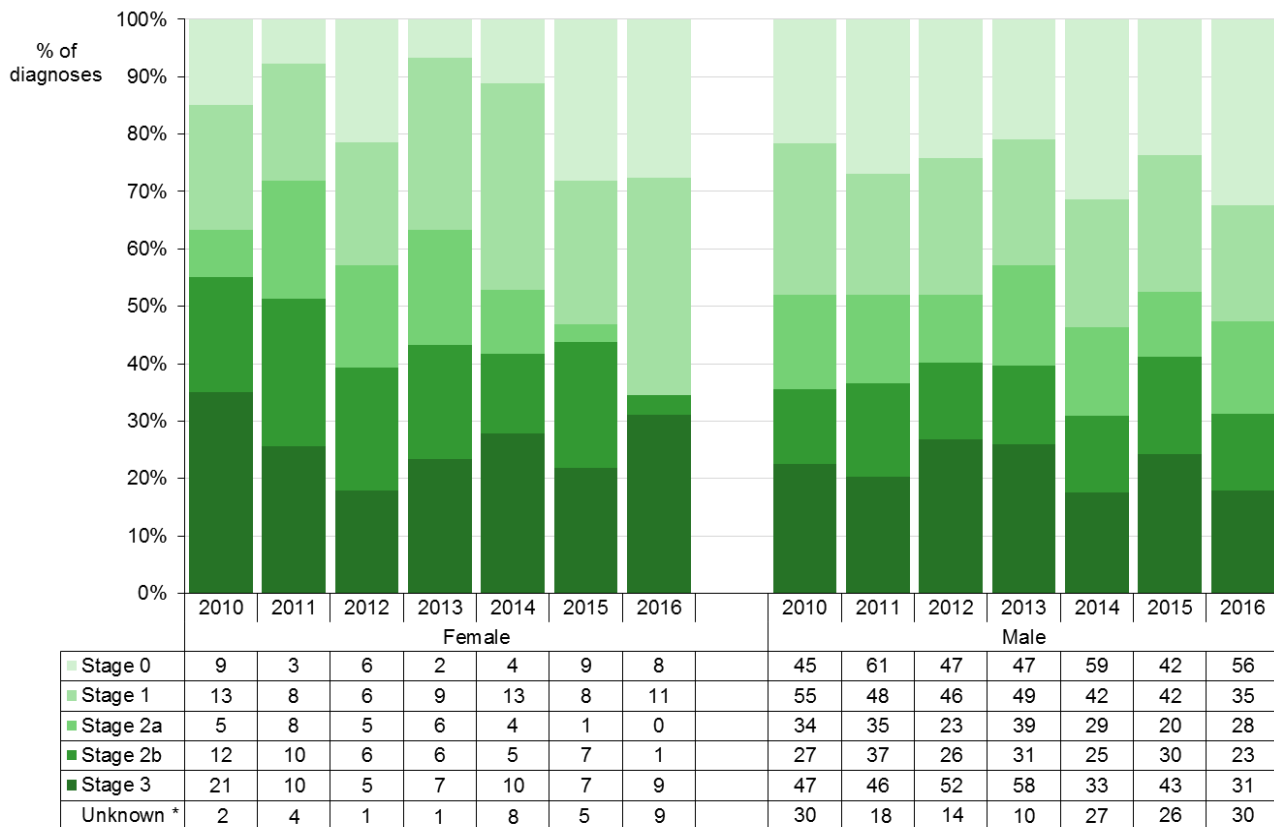
In 2016, the proportion of males newly diagnosed with HIV in early stages of infection increased to 44.8% (91/203 cases) from 41.4% (84/203 cases) in 2015 whereas the proportion of females newly diagnosed with HIV in early stages of infection increased to 50.0% (19/38 cases) in 2016 from 45.9% (17/37 cases) in 2015 (Figure 31).

30. Stage of infection at time of HIV diagnosis in BC, 2010 to 2016



* Percentage calculations do not include counts with stage unknown

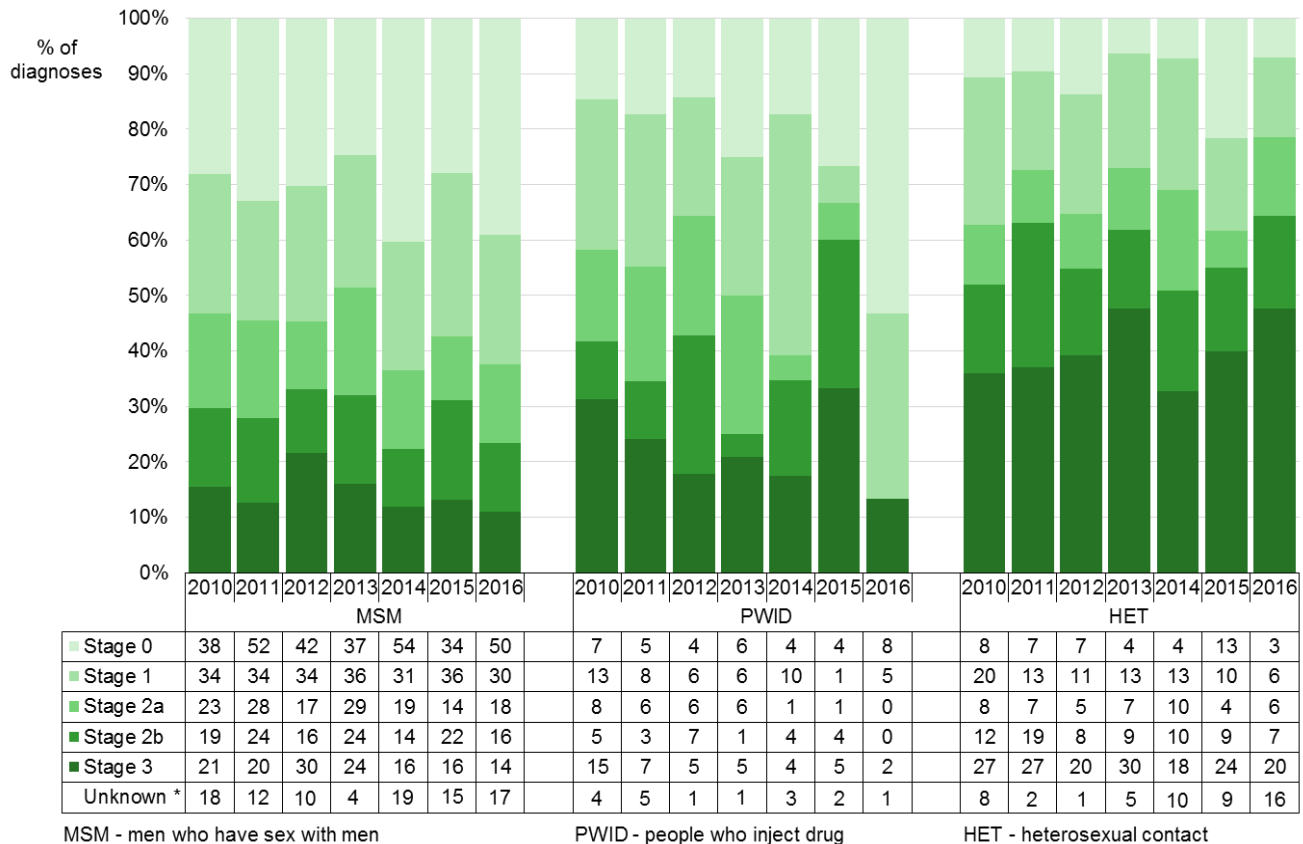
31. Stage of infection at time of HIV diagnosis in BC by gender, 2010 to 2016



* Percentage calculations do not include counts with stage unknown

The proportion of new HIV diagnoses in the early stages of infection among gay, bisexual, and other men who have sex with men (MSM) and among people who inject drugs (PWID) increased in 2016 compared to 2015 and decreased among people who acquired HIV through heterosexual contact (HET). The proportion of new HIV diagnoses in the late stage of infection among these three exposure categories either decreased or remained similar in 2016 compared to 2015 (Figure 32).

32. Stage of infection at time of HIV diagnosis in BC by exposure category, 2010 to 2016



Inter-Test Intervals and Proportion of Known Previous Negative HIV Tests at Time of HIV Diagnosis

Getting tested for HIV is the first step to being aware of one's HIV status and if positive, preventing transmission of infection to others. In BC, individuals 18-70 years old are recommended to be routinely tested for HIV every 5 years. Individuals belonging to populations with a higher burden of HIV infection are recommended to be routinely tested for HIV every year.²⁵ Analyzing a newly HIV diagnosed individual's prior testing history can help us understand potential missed opportunities for earlier diagnosis. One way to examine prior testing history is by the inter-test interval (ITI).²⁶ ITI is the time between the first positive HIV test and the most recent negative HIV test in the past ten years. In addition, the proportion of new HIV diagnoses with at least one known previous negative HIV test within the past five years is examined (see Technical Appendix for details). Shorter inter-test intervals and larger proportions of people with known HIV negative test increase the likelihood of providing an early diagnosis and lower the number of people living with HIV who are unaware of their status.

In 2016, females had a median ITI a year longer than males, 2.0 and 1.0 years respectively. Among the different age groups, the highest median ITI was among those aged 60+ years at 3.6 years and among all ethnicities, the median ITI was similar. Cases in the Vancouver Coast Health Authority (VCHA), where a high concentration of new HIV diagnoses occur, had the lowest median ITI for all health authorities at 0.8 years (Table 33).

For exposure categories, individuals who acquired HIV through heterosexual contact had the lowest proportion of known previous negative HIV tests (20.7%) which corresponded with the highest median ITI at 4.5 years. The median ITI was lowest among gay, bisexual, and other men who have sex with men (MSM) who comprise the greatest number of new HIV diagnoses in BC. The median ITI was also the lowest in VCHA, the health authority with the highest number of new HIV diagnoses. This is suggestive that individuals most at risk for acquiring HIV are testing more frequently in BC.

33. Median years for inter-test intervals* and proportion with known previous negative HIV tests** in BC, 2016

Characteristic	Category	Inter-Test Intervals *		Diagnoses	Previous Negative Test **	
		Median (yrs)	IQR	N	n	%
Total number of new HIV diagnoses in BC		1.1	0.4 - 3.2	241	118	49.0
Health Authority	Interior	1.8	0.5 - 3.6	14	10	71.4
	Fraser	1.1	0.4 - 3.3	67	24	35.8
	Vancouver Coastal	0.8	0.4 - 2.4	118	69	58.5
	Vancouver Island	3.4	0.5 - 6.7	29	10	34.5
	Northern	2.9	0.6 - 6.3	12	5	41.7
Gender	Female	2.0	0.5 - 6.3	38	16	42.1
	Male	1.0	0.4 - 3.0	203	102	50.2
Age Group	20 - 24 yrs	0.6	0.3 - 1.3	25	13	52.0
	25 - 29 yrs	0.6	0.3 - 2.8	40	28	70.0
	30 - 39 yrs	1.3	0.4 - 3.2	71	43	60.6
	40 - 59 yrs	1.7	0.5 - 3.7	82	30	36.6
	60+ yrs	3.6	1.1 - 8.1	19	4	21.1
Ethnicity	Caucasian	1.1	0.3 - 3.1	110	60	54.5
	Indigenous	1.1	0.4 - 6.3	22	11	50.0
	Visible minorities	1.0	0.6 - 3.1	57	19	33.3
Exposure Category	MSM	0.8	0.3 - 2.5	145	90	62.1
	PWID	0.9	0.4 - 2.9	16	12	75.0
	HET	4.5	1.7 - 8.0	58	12	20.7

* Most recent negative HIV test in the past 10 years

** Most recent negative HIV test in the past 5 years

IQR - interquartile range measures spread at around the 50th percentile; the two values represent the values at the 25th and 75th percentiles

Due to the small counts for ethnicities other than Caucasian and Indigenous peoples, these small counts were collapsed under the category "visible minorities" for this analysis

MSM - men who have sex with men

PWID - people who inject drugs

HET - heterosexual contact

Immigration of Individuals living with HIV

In 2002, Immigration, Refugees and Citizenship Canada (IRCC) included HIV testing as part of the immigration medical examination (IME) required for all immigration applications, Convention refugees, and refugee claimants. As of September 2004, IRCC notifies Clinical Prevention Services at BCCDC of individuals who undergo an IME outside of Canada, test positive for HIV, and indicate BC as their intended province of residence. Individuals who undertake their IME within BC and test positive for HIV are reported to BCCDC through the routine surveillance system.

The number of individuals living with HIV immigrating into BC varies annually and may reflect global migration patterns. In 2016, a total of 44 immigrants (14 females, 30 males) living with HIV arrived in BC, 12 (27.3%) coming from countries where HIV is considered to be endemic (Table 34). The median age of these immigrants was 36 years (IQR: 30-45) at the time IRCC notified BCCDC of their intent to reside in BC.

34. Percentage of immigration-related HIV diagnoses from endemic countries, 2007 to 2016

Country of Birth	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. of Immigrants</i>	43	47	41	20	36	51	49	54	59	44
Endemic	23.3	36.2	46.3	25.0	38.9	33.3	22.4	33.3	23.7	27.3
Non-Endemic	62.8	40.4	39.0	50.0	44.4	37.3	30.6	44.4	30.5	27.3
Unspecified	14.0	23.4	14.6	25.0	16.7	29.4	46.9	22.2	45.8	45.5

Estimates of HIV Incidence and Prevalence

The HIV surveillance data presented in this report are based on individuals with a new positive HIV test (or new HIV diagnosis). Individuals who have undiagnosed HIV infection and have not yet tested are not captured in the data. Furthermore, a person with a new positive test for HIV can be diagnosed months or years after the time that they became infected with HIV. For these reasons, HIV surveillance data based on new positive HIV tests do not provide accurate information on HIV incidence (i.e., the number of new infections in a one-year period, both diagnosed and undiagnosed) or prevalence (i.e., the number of people living with HIV). Knowing incidence and prevalence is important in order to monitor the HIV epidemic and to guide the development and evaluation of HIV-related prevention, treatment, care, and support programs.

Based on HIV surveillance data and using multiple estimation methods, the Public Health Agency of Canada (PHAC) generates periodic national estimates of HIV incidence and prevalence. To arrive at national estimates^{27, 28}, specific estimates for provinces, including BC, are generated and aggregated.

In BC, estimates of the total number of incident or new HIV infections in 2014 was 305 (range 210-400 cases), a decrease from 315 (220-410 cases) in 2011 (Table 35). The estimate of prevalent HIV infections or the total number of people living with HIV in the province at the end of 2014 was 12,100 (range 9,700-14,500 cases), an increase from 11,655 (9,310-14,000 cases) at the end of 2011 (Table 36).

35. Estimated number of incident HIV infections in BC by exposure category, 2011 & 2014

Exposure Category	2011			2014		
	Number	Range	% of Total	Number	Range	% of Total
MSM	175	120 - 230	56%	182	120 - 240	60%
MSM-PWID	10	<20	3%	6	<20	2%
PWID	46	20 - 70	15%	34	20 - 50	11%
HET (non-endemic)	73	50 - 100	23%	71	40 - 100	23%
HET (endemic)	11	< 20	3%	12	<20	4%
Other		<10	---		<10	---
All	315	220 - 410		305	210 - 400	

In 2014, gay, bisexual, and other men who have sex with men (MSM) continued to comprise the greatest proportion of incident and prevalent HIV infections, followed by people who inject drugs (PWID) among people living with HIV, and heterosexual persons (from countries where HIV is not endemic) among new HIV infections.²⁹

36. Estimated number of prevalent HIV infections in BC by exposure category, 2011 & 2014

Exposure Category	2011			2014		
	Number	Range	% of Total	Number	Range	% of Total
MSM	5,160	4,120 - 6,200	44%	5,500	4,400 - 6,600	46%
MSM-PWID	375	270 - 480	3%	385	270 - 500	3%
PWID	3,440	2,730 - 4,150	30%	3,400	2,700 - 4,100	28%
HET (non-endemic)	2,100	1,700 - 2,500	18%	2,220	1,740 - 2,700	18%
HET (endemic)	440	330 - 550	4%	470	340 - 600	4%
Other	140	100 - 180	1%	125	80 - 170	1%
All	11,655	9,310 - 14,000		12,100	9,700 - 14,500	

MSM - men who have sex with men

PWID - people who inject drugs

HET (non-endemic) - heterosexual contact with a person who is either HIV-infected or at risk for HIV or heterosexual as the only identified risk

HET (endemic) - heterosexual contact and origin from a country where HIV is endemic

Other - recipients of blood transfusion or clotting factor, perinatal, or occupational transmission

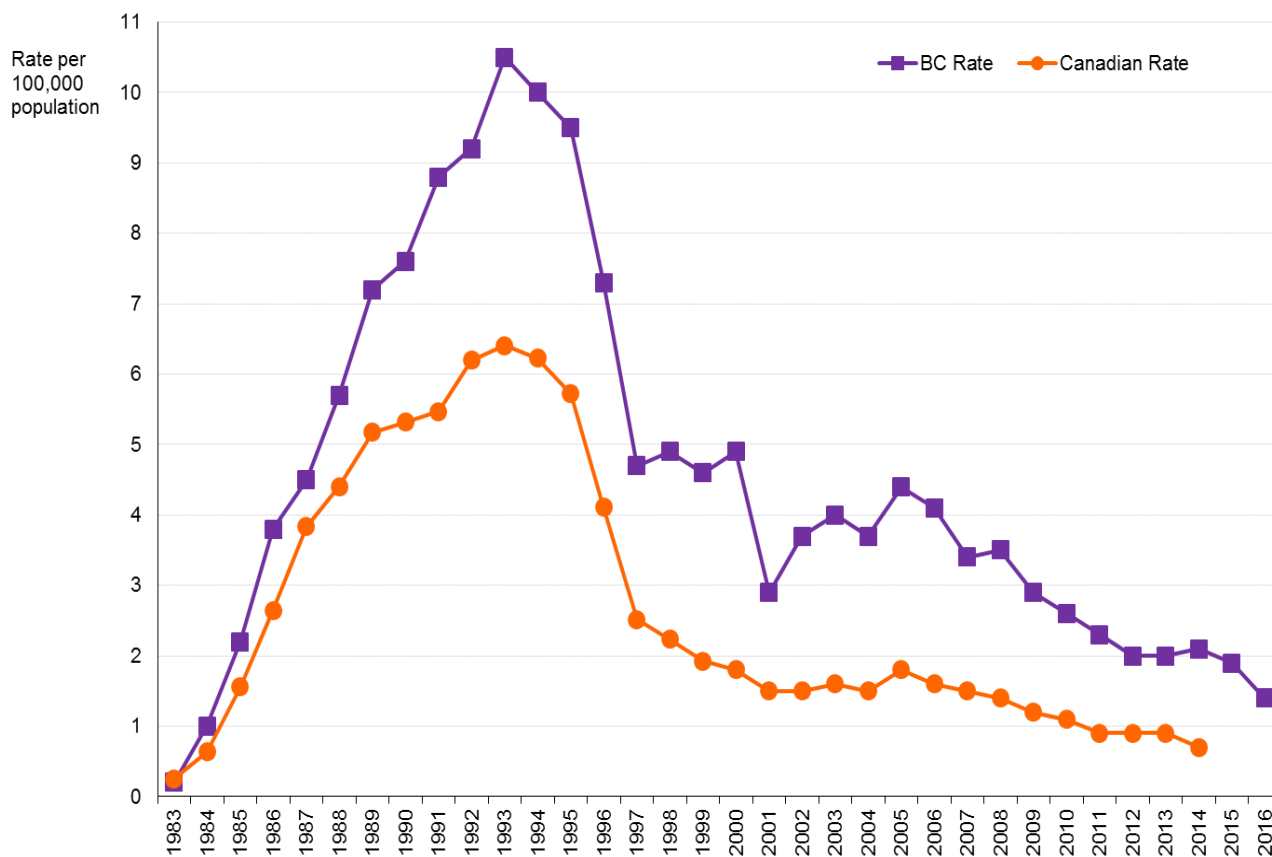
AIDS by Region, Gender, and Age

The AIDS surveillance system relies on clinicians reporting the case to Clinical Prevention Services at BCCDC. In BC, the majority of AIDS cases are reported through the Provincial HIV Treatment Program at the BC Centre for Excellence in HIV/AIDS which has comprehensive clinical data on all individuals accessing antiretroviral therapy (ART) in BC.

The rate of AIDS and the number of AIDS case reports per year have decreased from a peak in 1993 due primarily to advances in HIV treatment which includes ART. The rate of AIDS in BC continued to decrease in 2016 to 1.4 (65 cases) from 1.9 (89 cases) per 100,000 population in 2015 and remains higher than the Canadian rate (Figure 37). This difference from the national rate may represent greater ascertainment of AIDS cases in BC due to reporting by the Provincial HIV Treatment Program. Rates of AIDS vary by Health Service Delivery Area (HSDA) per year and are influenced by the small number of cases in most regions. In 2016, the highest rates were reported in North Vancouver Island, Central Vancouver Island, and Vancouver HSDAs (Figure 38).

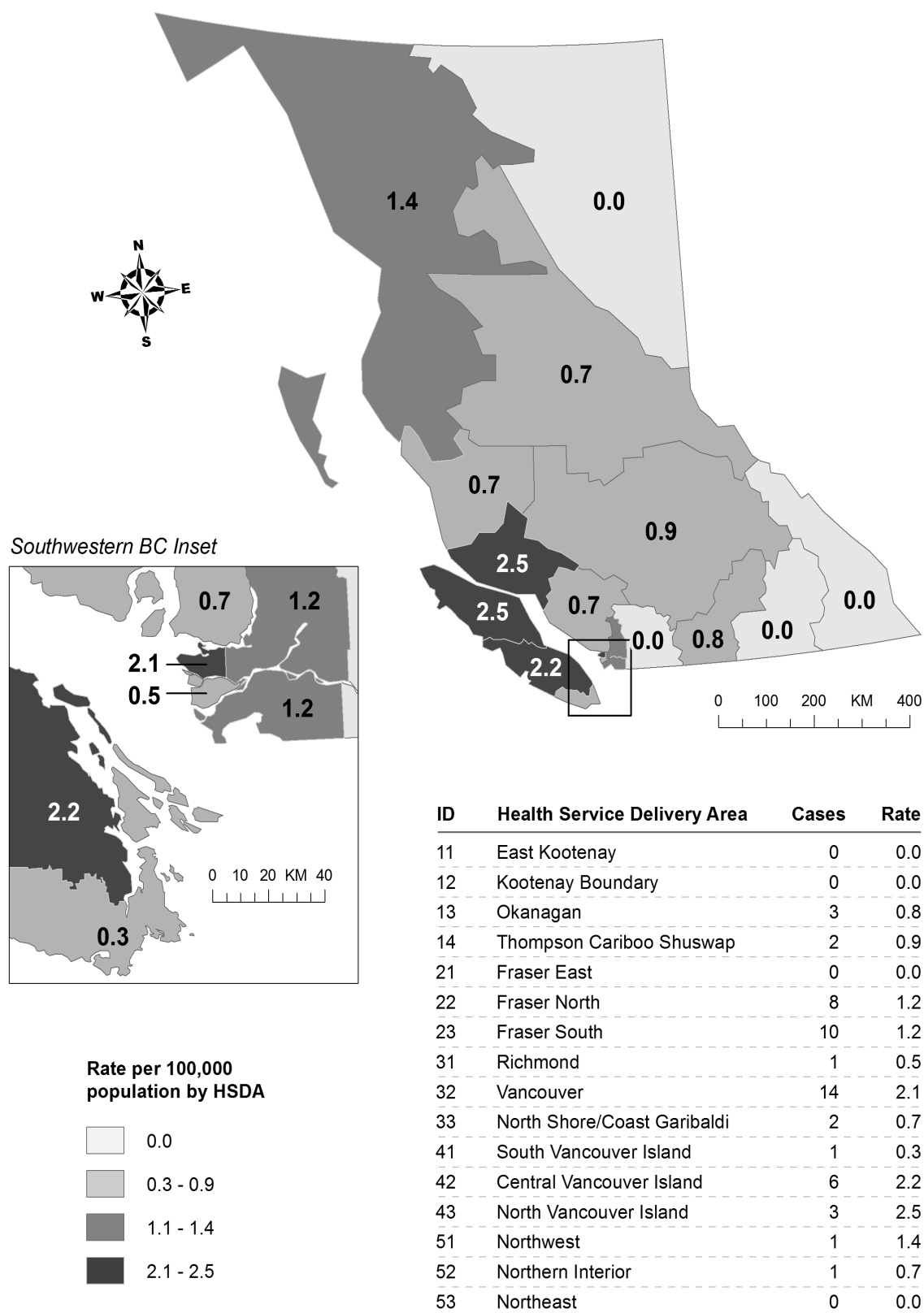
The rate of AIDS among males continues to be greater than the rate among females which likely reflects the distribution of HIV between males and females in BC (Figure 40). Rates among males have been gradually decreasing while rates in females overall appear relatively stable. The majority of new AIDS case reports are in people of Caucasian ethnicity. While Indigenous peoples only represent about 6% of the general BC population³⁰, Indigenous peoples continue to be disproportionately represented among AIDS cases in BC, comprising 21.5% (14 cases) of new cases in 2016 (Table 45); an even greater disparity than with new HIV diagnoses.

37. AIDS case reports in BC and Canada, 1983 to 2016*



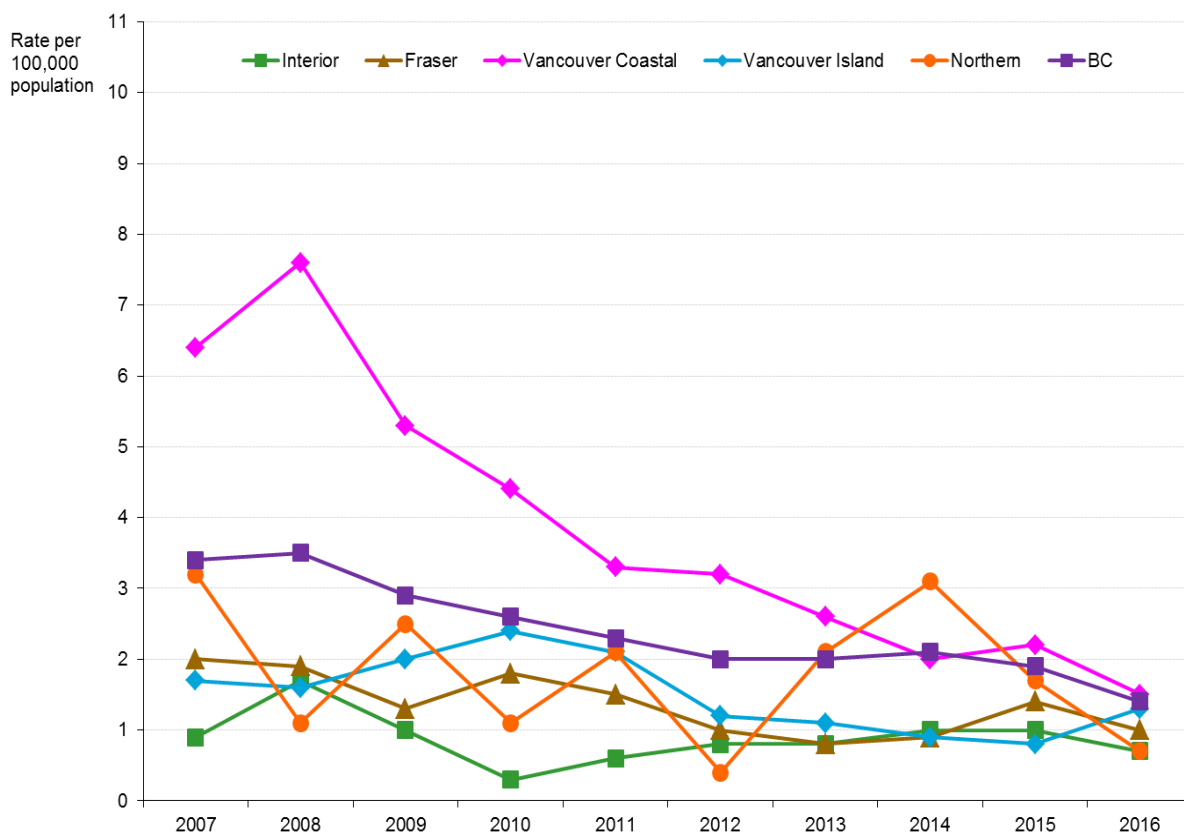
* 2015 and 2016 Canadian rates are not available

38. AIDS case reports in BC by health service delivery area, 2016

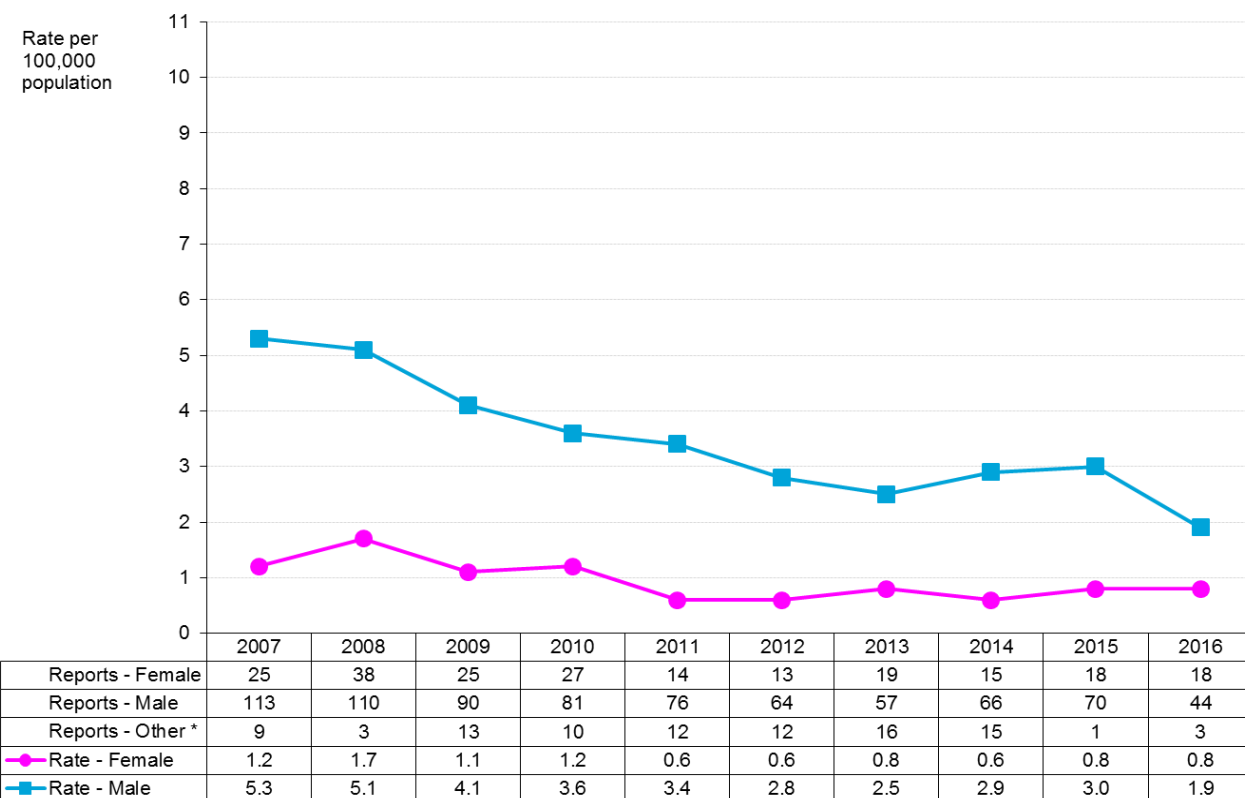


Rates calculated with population estimates released by BC Stats

39. AIDS case reports in BC by health authority, 2007 to 2016

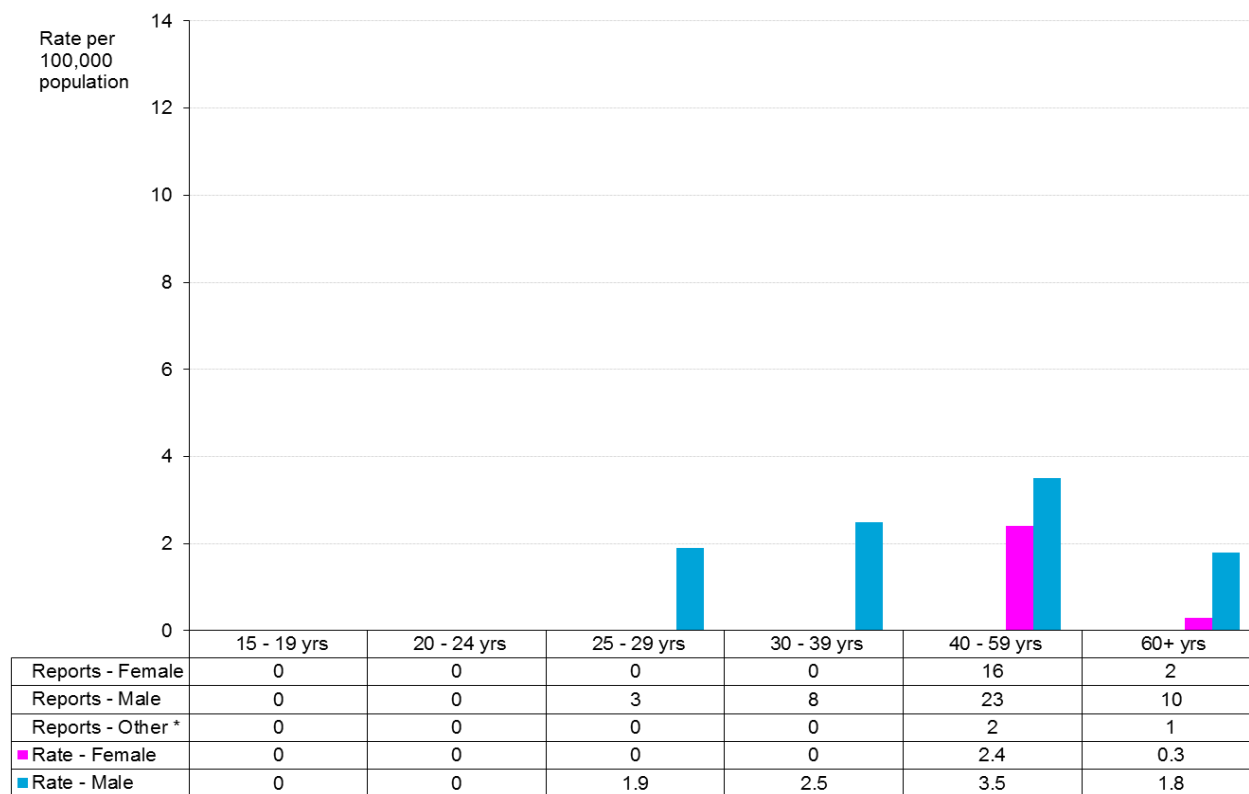


40. AIDS case reports in BC by gender, 2007 to 2016



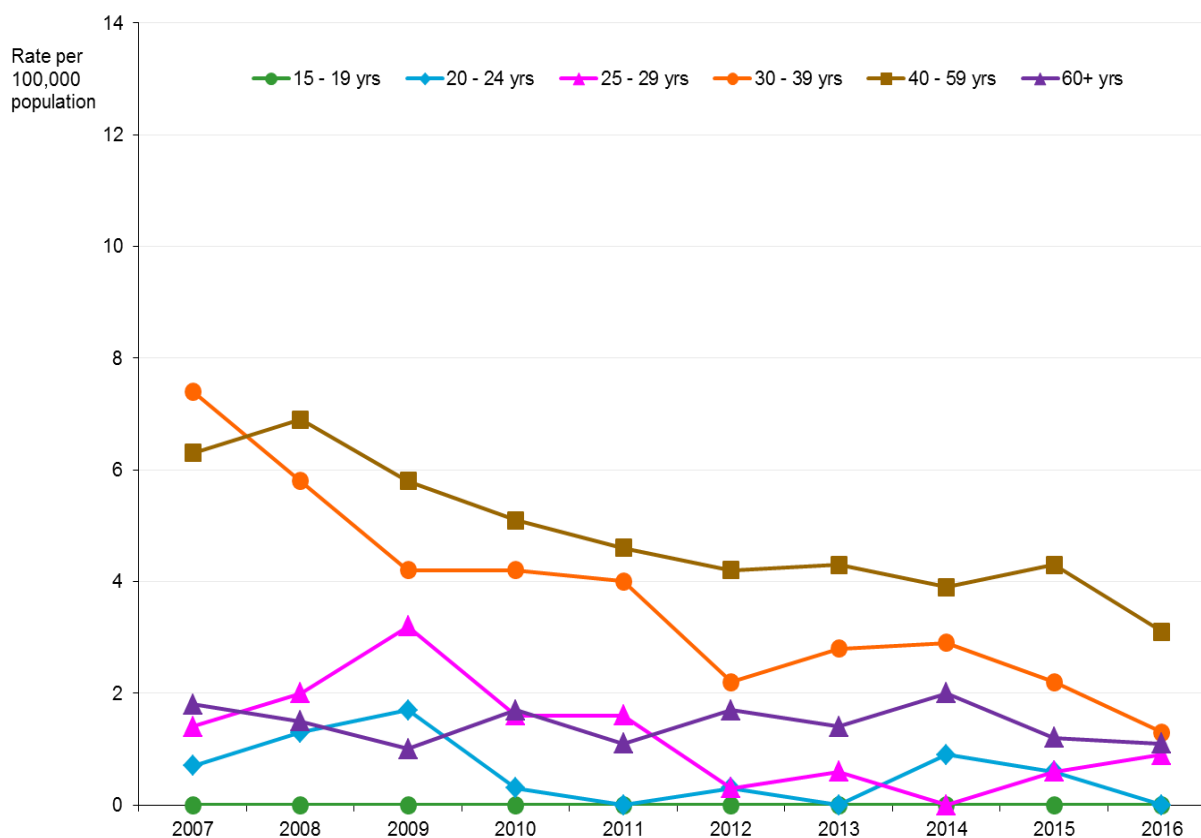
* Other - transgender and gender unknown

41. AIDS case reports in BC by age group and gender, 2016

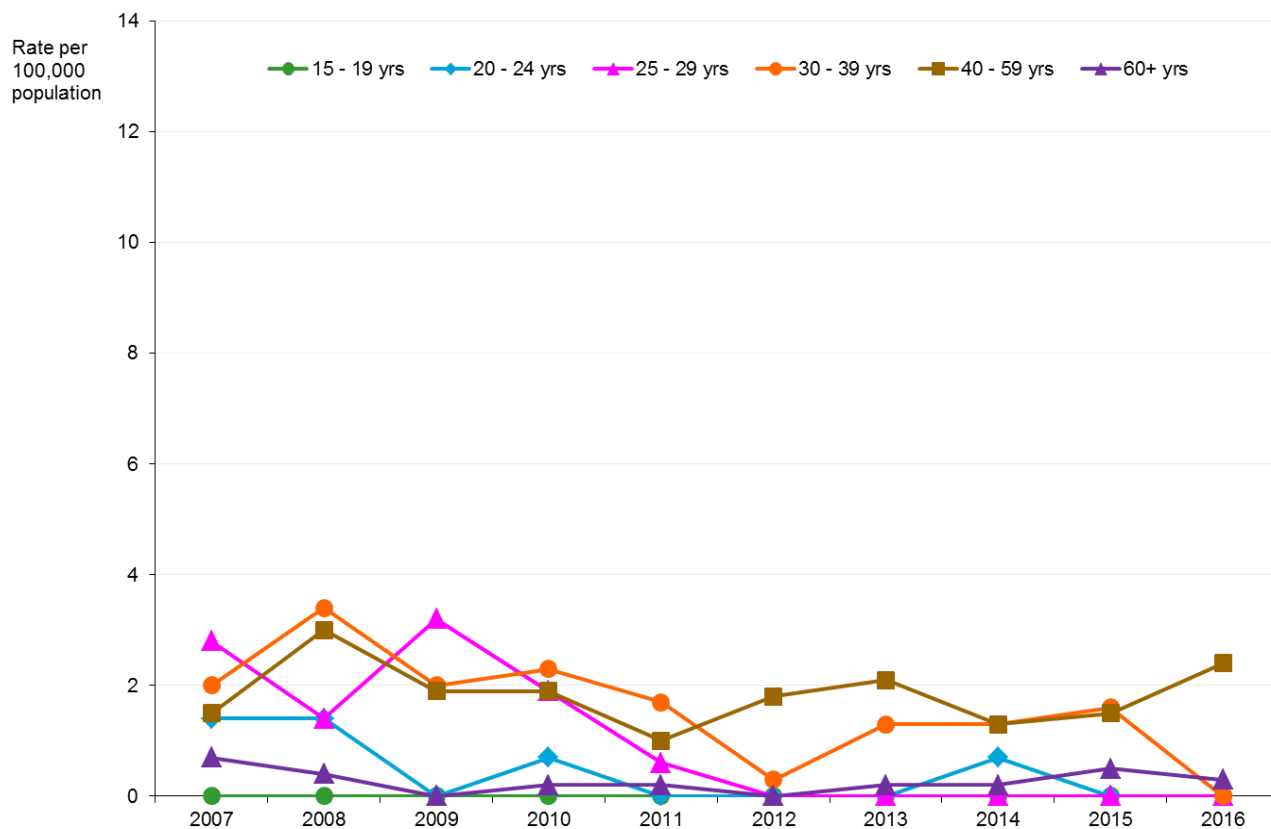


* Other - transgender and gender unknown

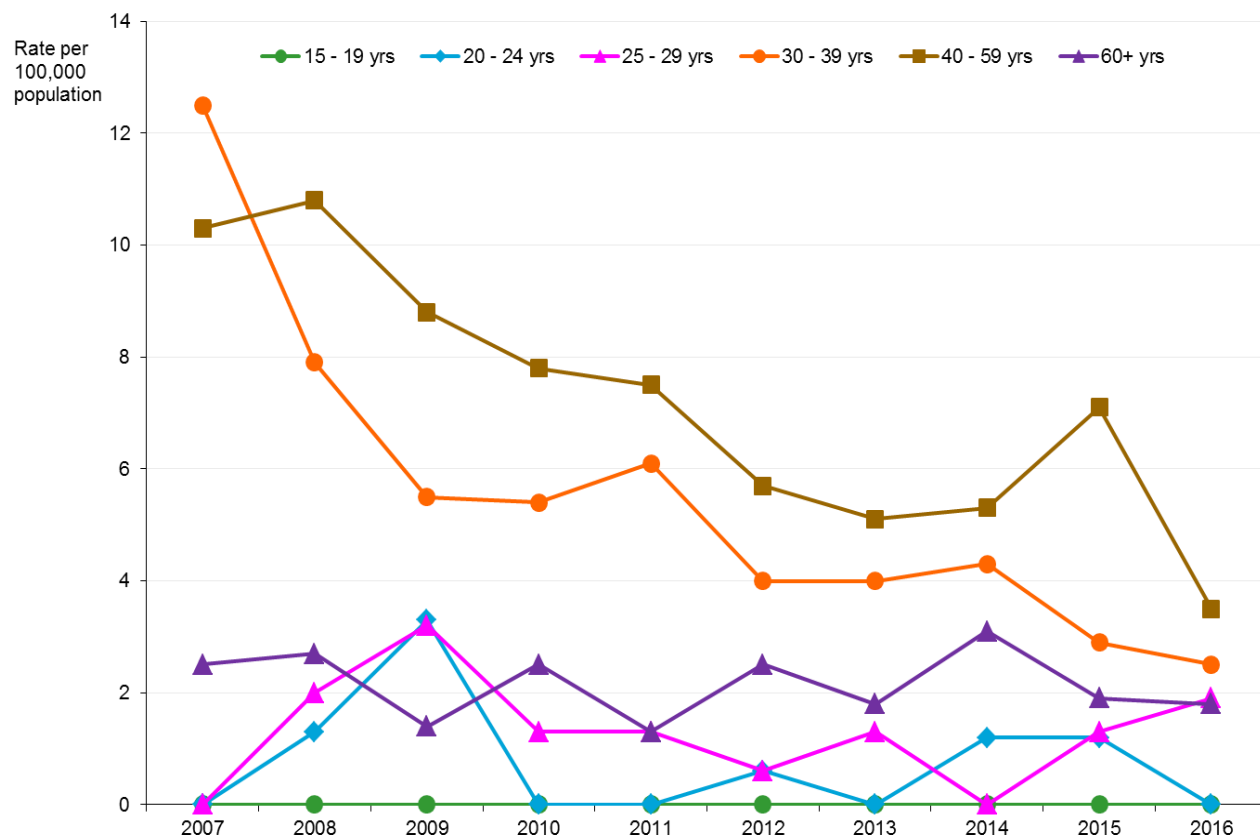
42. AIDS case reports in BC by age group - total, 2007 to 2016



43. AIDS case reports in BC by age group - female, 2007 to 2016



44. AIDS case reports in BC by age group - male, 2007 to 2016



AIDS by Ethnicity

45. Percentage of AIDS case reports in BC by ethnicity - total, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. of Diagnoses</i>	<i>147</i>	<i>151</i>	<i>128</i>	<i>118</i>	<i>102</i>	<i>89</i>	<i>92</i>	<i>96</i>	<i>89</i>	<i>65</i>
Caucasian	47.6	49.0	49.2	49.2	40.2	41.6	33.7	28.1	30.3	33.8
Indigenous	15.6	12.6	16.4	15.3	10.8	9.0	10.9	10.4	9.0	21.5
Asian	2.0	2.6	4.7	5.1	6.9	6.7	5.4	6.3	9.0	3.1
South Asian	2.7	2.0	0.8	0.8	4.9	3.4	1.1	2.1	3.4	4.6
Hispanic	2.7	2.6	0.8	0.8	1.0	2.2	2.2	1.0	2.2	3.1
Black	2.0	4.6	1.6	2.5	3.9	3.4	4.3	4.2	6.7	3.1
Other *	0.7	0.7	0.0	0.0	1.0	1.1	2.2	1.0	3.4	0.0
Unknown	26.5	25.8	26.6	26.3	31.4	32.6	40.2	46.9	36.0	30.8

* Other - Arab/West Asian and other/mixed ethnicity

46. Percentage of AIDS case reports in BC by ethnicity - female, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. of Diagnoses</i>	<i>25</i>	<i>38</i>	<i>25</i>	<i>27</i>	<i>14</i>	<i>13</i>	<i>19</i>	<i>15</i>	<i>18</i>	<i>18</i>
Caucasian	40.0	36.8	44.0	44.4	42.9	23.1	36.8	13.3	22.2	27.8
Indigenous	40.0	23.7	24.0	29.6	28.6	7.7	15.8	40.0	22.2	44.4
Asian	0.0	2.6	0.0	0.0	7.1	0.0	15.8	13.3	0.0	0.0
South Asian	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6
Hispanic	0.0	0.0	0.0	3.7	0.0	7.7	0.0	0.0	0.0	0.0
Black	8.0	5.3	0.0	3.7	7.1	15.4	0.0	13.3	11.1	5.6
Other *	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	8.0	31.6	32.0	18.5	14.3	46.2	31.6	20.0	38.9	16.7

* Other - Arab/West Asian and other/mixed ethnicity

47. Percentage of AIDS case reports in BC by ethnicity - male, 2007 to 2016

Ethnicity	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<i>No. of Diagnoses</i>	<i>113</i>	<i>110</i>	<i>90</i>	<i>81</i>	<i>76</i>	<i>64</i>	<i>57</i>	<i>66</i>	<i>70</i>	<i>44</i>
Caucasian	53.1	54.5	57.8	56.8	46.1	53.1	42.1	36.4	32.9	36.4
Indigenous	11.5	9.1	16.7	12.3	9.2	10.9	12.3	6.1	5.7	13.6
Asian	2.7	2.7	6.7	7.4	7.9	9.4	3.5	6.1	11.4	4.5
South Asian	3.5	2.7	1.1	1.2	6.6	4.7	1.8	3.0	2.9	4.5
Hispanic	3.5	3.6	1.1	0.0	1.3	1.6	3.5	1.5	2.9	4.5
Black	0.9	4.5	2.2	2.5	3.9	1.6	7.0	3.0	5.7	2.3
Other *	0.0	0.9	0.0	0.0	1.3	1.6	3.5	1.5	2.9	0.0
Unknown	24.8	21.8	14.4	19.8	23.7	17.2	26.3	42.4	35.7	34.1

* Other - Arab/West Asian and other/mixed ethnicity

AIDS Case Reports among Indigenous Peoples

As with new HIV diagnoses, the majority of new AIDS case reports among Indigenous peoples are in those who identify as First Nations (14 cases in 2016). Two or fewer new AIDS cases were reported per year among Métis and Inuit people between 2007 and 2016.

Mirroring the provincial AIDS rate (Figure 37), the rate of new AIDS case reports among First Nations people has decreased since 2007 (Figure 48). The recent reduction of people living with advanced HIV disease and AIDS highlights the success of improving access to HIV testing, treatment, and care.

Between 2007 and 2016, the rate of reported AIDS cases has been consistently higher among First Nations people in BC compared to the BC population overall. This may be due to systematic barriers for First Nations people to access HIV services including stigma, geographic and social isolation, racism, and poverty.³¹

The AIDS rate in First Nations men has generally been higher than the rate in women; however in 2016, the rate in First Nations women was higher than the rate in men (Figure 48). Rates in both First Nations women and men exceed the provincial rates among women and men (10.9 versus 0.8 per 100,000 population for women and 8.4 versus 1.9 per 100,000 population for men in 2016).

48. AIDS case reports among First Nations people in BC by gender, 2007 to 2016



* Other - transgender and gender unknown

Rates based on First Nations population estimates from the former Aboriginal Affairs and Northern Development Canada now known as Indigenous Services Canada

Endnotes

- ¹ In this report, the term “new HIV diagnoses” is used instead of the term “persons testing newly positive for HIV” which was used in previous reports. Both terms are equivalent for surveillance purposes for describing cases.
- ² Statistics Canada. Aboriginal Peoples Highlight Tables, 2016 Census. Retrieved from <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/abo-aut/Table.cfm?Lang=Eng&T=101&S=99&O=A>
- ³ See Endnote #2
- ⁴ Reference to the barriers Indigenous peoples face when seeking HIV testing: Ha S, Paquette D, Tarasuk J, Dodds J, Gale-Rowe M, Brooks JI et al. (January/February 2014). A systematic review of HIV testing among Canadian populations. *Canadian Journal of Public Health*, 105(1), e53-e62.
- ⁵ References to the barriers Indigenous peoples face when seeking HIV testing: Bucharski D, Reutter LI, Ogilvie LD. (2006). “You need to know where we’re coming from”: Canadian Aboriginal women’s perspectives on culturally appropriate HIV counseling and testing. *Health Care for Women International*, 27(8), 723-747.
- ⁶ For more information about the multiple historic factors which have contributed to inequities in health among Indigenous peoples see: BC Provincial Health Officer. (2009). Pathways to Health and Healing: 2nd Report on the Health and Well-being of Aboriginal People in British Columbia. Provincial Health Officer’s Annual Report 2007. Retrieved from <https://www2.gov.bc.ca/assets/gov/government/ministries-organizations/ministries/health/office-of-indigenous-health/abohlth11-var7.pdf>
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- ¹⁰ Recent work that estimated the size of the MSM population in BC see: The Centre for Global Public Health: University of Manitoba. (October 5, 2016). Estimation of Key Population Size of People who Use Injection Drugs (PWID), Men who Have Sex with Men (MSM) and Sex Workers (SW) who are At Risk of Acquiring HIV and Hepatitis C in the Five Health Regions of the Province of British Columbia. Retrieved from: https://pacificaidnetwork.org/files/2016/04/PSE-Project-FINAL-Report_October-5-2016.pdf
- ¹¹ Recent work that estimated the size of the MSM population in BC see: Pacific AIDS Network website <https://pacificaidnetwork.org/files/2016/04/BC-Summary-Nov-2-2016.pdf>
- ¹² For more information about factors that have led to the current epidemic of HIV among MSM in BC see: Provincial Health Officer. (2014). HIV, Stigma and Society: Tackling a Complex Epidemic and Renewing HIV Prevention for Gay and Bisexual Men in British Columbia. Provincial Health Officer’s 2010 Annual Report. Retrieved from <http://www.health.gov.bc.ca/pho/pdf/hiv-stigma-and-society.pdf>
- ¹³ Reference to broader approaches to HIV prevention in MSM: Wolitski R, Fenton K. (April 2011). Sexual health, HIV, and sexually transmitted infections among gay, bisexual, and other men who have sex with men in the United States. *AIDS and Behavior* 15(Suppl 1), 9-17.
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- 21 Recent work that estimated the size of the PWID population in BC see Endnote #10
- 22 Recent work that estimated the size of the PWID population in BC see Endnote #11
- 23 For more information on potential explanations for the decrease of new HIV diagnoses among people injecting drugs in BC see: Office of the Provincial Health Officer. (2011, March). Decreasing HIV Infections among People who use Drugs by Injection in British Columbia: Potential Explanations and Recommendations for Further Action. Retrieved from <http://www.health.gov.bc.ca/library/publications/year/2011/decreasing-HIV-in-IDU-population.pdf>
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- 26 Reference to HIV inter-test interval: Gilbert M, Hottes TS, Lester R, Gustafson R, Krajden M, Ogilvie G. (January/February 2014). Time since last negative HIV test among men who have sex with men and people who use injection drugs in British Columbia, 2006-2011. *Canadian Journal of Public Health*, 105(1), e63-e68. Retrieved from: <http://journal.cpha.ca/index.php/cjph/article/view/4262/2893>
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- 29 HIV incidence and prevalence estimates from 2011 and 2014 provided courtesy of the Surveillance and Epidemiology Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada.

³⁰ See Endnote #2

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Technical Appendix

Data Limitations

There are several key limitations to surveillance data which are important to understand in order to interpret surveillance data appropriately.

- The majority of surveillance data presented in this report are extracted from case report forms completed by either health care providers or public health nurses as part of the follow-up process (which includes partner notification, patient education, and referral to appropriate services). There is an expected reporting delay to receipt of these forms. For HIV data this affects the classification of cases by exposure category and ethnicity, resulting in a number of cases for the most recent year where this information is unknown. These numbers are not considered final until next year's report.
- Surveillance trends can be affected by factors which do not represent a true increase or decrease in infection rates. For example, trends are influenced by patient or provider testing behaviours which may result in changes to the number of tests performed each year.
- Surveillance data are only reflective of the proportion of the population who test for HIV. Individuals with infections who have not tested would not be represented in surveillance data.
- Cases are classified by exposure category and ethnicity according to information elicited during follow-up from the case or their health care provider and under-reporting of this information may lead to misclassification.
- HIV is reported as the number of new HIV diagnoses and does not reflect the number of new HIV infections (i.e., HIV incidence) as individuals may test positive years after the time of HIV infection.
- The system of enhanced follow-up for HIV was established following the addition of HIV to the reportable diseases list in 2003 and has resulted in improved data quality in subsequent years (for details see "Interpretation of HIV Data" in the Additional Notes section of this Technical Appendix).
- Rates of new HIV diagnoses or AIDS cases among First Nations people are calculated with the numerator comprised of individuals with HIV or AIDS who self-identify as First Nations and the denominator comprised of individuals who are registered First Nations in BC.

Case Definitions

HIV and AIDS are listed as reportable diseases in the *Communicable Disease Regulation* (Schedule A) of the *Public Health Act*.

Human Immunodeficiency Virus (HIV)

Adults, adolescents, and children ≥ 18 months:

Detection of HIV antibody by screening test (i.e., ELISA or point of care HIV test) followed by positive confirmatory test (i.e., Western blot or nucleic acid amplification test), or detection of HIV nucleic acid (RNA or DNA) or detection of p24 antigen with confirmation by neutralization assay, or isolation of HIV in culture.

Children < 18 months: Detection of HIV DNA by nucleic acid amplification testing (NAAT) on two separate samples collected at different times.

Stage of Infection at Time of HIV Diagnosis

Earlier diagnosis and start of antiretroviral therapy are associated with a reduction in morbidity and transmission while diagnosis in late stages are associated with poorer health outcomes and are potential missed opportunities for earlier engagement into treatment and care.^{32, 33}

In this report, stage of infection has been revised to reflect a new and more accurate method for estimating stages by utilizing case surveillance data, CD4+ counts, and acute status through laboratory results and testing history. The criteria, which are based on case definitions developed by the US Centers for Disease Control, for classifying stage of infection at HIV diagnosis are described in the table below. Currently, CD4+ information is routinely obtained by public health nurses and entered into the provincial HIV/AIDS database. Regular collection of this information, however, is a fairly recent practice thus analysis of stage of infection is only possible for cases diagnosed from 2010 forward which limits annual comparisons of trends to recent years.

Stage	Definition
Stage 0	Laboratory findings suggestive of acute HIV infection (i.e., detection of HIV DNA or RNA by NAAT or detection of p24 antigen in the absence of confirmed detection of HIV antibody) <u>or</u> previous negative or indeterminate HIV test within 180 days of the first confirmed positive HIV test.
Stage 1	Not in Stage 0 <u>and</u> CD4+ ≥ 500
Stage 2a	Not in Stage 0 <u>and</u> CD4+ between 350 and 499
Stage 2b	Not in Stage 0 <u>and</u> CD4+ between 200 and 349
Stage 3	CD4+ < 200
Stage unknown	Acute status and CD4+ information are all unknown

Acquired Immune Deficiency Syndrome (AIDS)

One or more of the specified indicator diseases, and meets the case definition for HIV infection.

Indicator diseases for adult and pediatric cases:

- 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 disease (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)
- 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 (formerly Pneumocystis carinii) pneumonia (PCP)*
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia (recurrent)
- Toxoplasmosis of brain*
- Wasting syndrome due to HIV

* These conditions may be diagnosed presumptively, otherwise definitive diagnosis is required.

Indicator diseases that apply only to pediatric cases (< 15 years old):

- Bacterial infections, multiple or recurrent (excluding recurrent bacterial pneumonia)
- Lymphoid interstitial pneumonia and/or Pulmonary lymphoid hyperplasia (may be diagnosed presumptively)

Data Sources

HIV Data - Surveillance

All confirmatory laboratory testing for HIV antibodies is done at the BCCDC Public Health Laboratory (PHL). BCCDC determines which of these individuals are testing positive for HIV for the first time then informs the appropriate designated public health nurse (PHN) about these individuals. The PHN provides follow-up for these individuals that include completing surveillance forms which are then forwarded to BCCDC where the collected information is entered into the provincial HIV/AIDS database.

Persons testing HIV positive as part of immigration requirements are obtained through two separate sources. As of September 2004, Immigration, Refugees and Citizenship Canada (IRCC) notifies Clinical Prevention Services at BCCDC of individuals who undergo an immigration medical exam (IME) outside of Canada, test positive for HIV, and indicate BC as their intended province of residence. Individuals who undertake their IME within BC (as indicated by reason for testing) and test positive for HIV are reported to BCCDC by BCCDC PHL through routine surveillance.

HIV Data - Testing

HIV testing data presented in this report are based on HIV testing conducted by the BCCDC PHL which is estimated to conduct >95% of all screening tests for HIV in the province. Island Health Laboratories perform HIV screening tests which are currently not captured in this report's HIV testing data. Provincial testing volumes for females undergoing HIV testing as part of prenatal care (i.e., reason for testing is prenatal screening) are available from 2007 onwards and include all prenatal HIV tests conducted by the BCCDC PHL. For this analysis, the number of unique women having a prenatal test per year is reported (i.e., a woman has more than one prenatal test per year is counted once).

AIDS Data

AIDS case reports are allocated according to the year a client is diagnosed with his/her first AIDS defining illness (e.g., a client is diagnosed with his/her first AIDS defining illness in 2005 and a subsequent AIDS defining illness in 2012 – this client's AIDS case report is allocated only to year 2005). Prior to 1997, AIDS case reports were compiled courtesy of the Vancouver Health Department. From 1997 to 2000, Clinical Prevention Services at BCCDC compiled AIDS case reports in collaboration with the Division of HIV/AIDS Surveillance, Bureau of HIV/AIDS and STD, Laboratory Centre for Disease Control, Health Protection Branch, Health Canada.

Since 2000, AIDS case reports have been compiled by Clinical Prevention Services at

BCCDC in collaboration with the BC Centre for Excellence in HIV/AIDS. A twice-yearly review of clinical records maintained by the BC Centre for Excellence in HIV/AIDS is conducted to identify new diagnoses of AIDS defining illness and this information is entered into the provincial HIV/AIDS database. AIDS case report forms are also received from health care providers who have made a diagnosis of an AIDS defining illness in a person living with HIV or from public health nurses if this is elicited during follow-up of a new positive HIV test (e.g., AIDS at the time of HIV diagnosis).

Please note a review of clinical reports from the BC Centre for Excellence in HIV/AIDS in 2013 included additional reports of historic AIDS cases. These cases were identified through a retrospective linkage with both historical discharge diagnoses data from the HIV/AIDS ward at St Paul's Hospital and data from the death registry at BC Vital Statistics Agency.

Population Data

Unless noted otherwise, population data and associated rates were based on the P.E.O.P.L.E. 2016 Population Estimates and Projections released by BC Stats, BC Ministry of Technology, Innovation and Citizens' Services.

First Nations Population Estimates

Population rates for First Nations people are calculated using estimates from the former Aboriginal Affairs and Northern Development Canada now known as Indigenous Services Canada.

These estimates are based on the Indian Registry System (IRS) which includes individuals who have registered for First Nations status under the Indian Act. The IRS is subject to several limitations, including:

- Under-counting due to delayed reporting of infants entitled to be registered, as well as other unregistered individuals who are entitled for status designation
- Over-counting due to individuals remaining on the IRS after they are deceased

- Geographic misclassification because individuals are included in the BC population according to membership of a BC band rather than current place of residence
- Systematic biases from imbalance in the migration into and out of the BC region (these are difficult to quantify)

For further details about the data source and its limitations, see the report entitled *Registered Indian Population by Sex and Residence, 2014*. Aboriginal Affairs and Northern Development Canada.

Additional Notes

Interpretation of HIV Data

The number of new HIV diagnoses does not reflect the number of new HIV infections per year or HIV incidence as individuals may be diagnosed with HIV years after their initial infection with HIV.

HIV became a reportable disease in BC in 2003 accompanied by more complete follow-up of new HIV diagnoses by designated public health nurses. This change improved the quality of surveillance data through:

- Improved identification and exclusion from surveillance reports of individuals having a first HIV diagnosis in BC who were found to have a previous HIV diagnosis outside BC
- Improved documentation of exposure category and ethnicity resulting in a decrease in the proportion of new HIV diagnoses where exposure or ethnicity is unknown

New or Previous Positive HIV Test

If a report of a new positive HIV test is identified in an individual having a history of a previous positive test (i.e., previous positive test result identified in the BCCDC PHL database or elicited during case follow-up), this is considered a previous positive HIV test and excluded from surveillance reporting. If no such history is elicited, the report is then considered to represent a new HIV diagnosis and included

in surveillance reporting. The exception is for persons testing as part of immigration requirements – persons who tested previously positive for non-immigration purposes are classified as persons with a previous positive HIV test thus not included in surveillance reporting but included as immigration-related HIV diagnoses in Figure 34.

Classification of Health Region

Cases are assigned to health regions (i.e., Health Authority or Health Service Delivery Area) by residence. If residence is unknown, the case is then assigned to the health region where the individual was tested.

Classification of Ethnicity

Cases are classified by ethnicity according to information elicited from the case or health care provider during follow-up.

Ethnicity	Example
Arab/West Asian	Armenian, Egyptian, Iranian, Moroccan, Lebanese, Afghani
Asian	Chinese, Japanese, Vietnamese, Cambodian, Indonesian, Filipino, Korean, Laotian
Black	African, Haitian, Jamaican, Somali
Caucasian (White)	Irish, Scottish, English, Portuguese, Italian, Russian
Hispanic	Mexican, Central/South American
Indigenous	First Nations, Inuit, Métis
South Asian	East Indian, Pakistani, Sri Lankan, Punjabi, Bangladeshi
other/mixed ethnicity	ethnicity is known but is not included in one of the above categories or case has dual ethnicity
unspecified	information about ethnicity is not elicited from case or health care provider

Exposure Group Hierarchy

Individuals having a new positive HIV test may belong to more than one exposure category (e.g., a person may have a history of injecting drugs and heterosexual

contact). These individuals are assigned to the exposure category listed first (or highest) in the following hierarchy.

- MSM*:** Male who reports having male sex partner(s), with or without female sex partners.
- PWID:** Person who reports current or prior history of injecting drugs.
- Heterosexual Contact*:** Male who reports having female sex partner(s) only or female who reports having male with/without female sex partner(s).
 - Heterosexual with at least one Identified Risk factor – Person who reports heterosexual contact and one or more of the following:
 - was born/resided in a country where HIV is endemic
 - sexual partner is living with HIV
 - sexual partner is at increased risk for acquiring HIV (e.g., injects drugs, male who has both male and female sex partners, or from an HIV endemic country)
 - sex trade worker
 - patron of sex trade worker
 - Heterosexual with No Identified Risk factor – Person who reports heterosexual contact and no information about place of birth/residence, or about sexual partner(s), or none of the above risk factors.
- Blood / Blood Product Recipient:** Person who reports receipt of whole blood or blood product (e.g., packed red cells, plasma, platelets, cryoprecipitate, or pooled concentrates of clotting factor).
- Occupational Exposure:** Person who reports exposure to HIV contaminated blood or body fluids or concentrated virus in an occupational setting.
- Perinatal Transmission:** Transmission of HIV from a mother living with HIV to her child either in utero, during childbirth, or through breastfeeding.

7. **Other Risk Factor:** Likely route of exposure to HIV is known but cannot be classified into any of the major exposure categories listed here. For example, receipt of semen from a donor living with HIV or females reporting female sex partner(s) only.
8. **No Identified Risk Factor (NIR):** Route of exposure to HIV is not identified at the time of completion of case follow-up (e.g., route of exposure not provided by case).
9. **Unknown:** Route of exposure to HIV is unknown.

Note that in this report, individuals with a new HIV diagnosis are categorized into five groups:

- MSM – men who have sex with men
- PWID – people who inject drugs
- HET – heterosexual contact
- Other – blood/blood product recipient, occupational exposure, perinatal transmission, and/or other exposures
- NIR/Unknown – no identified risk/exposure unknown

* A transgender individual may be assigned to either MSM or Heterosexual Contact exposure category depending on how this individual describes their sexual partners.

Endemic Country

Individuals are categorized as being from an endemic country according to the Endemic Countries List³⁴ maintained by the Public Health Agency of Canada.