

New HIV diagnoses in Ontario: Preliminary update, 2016



About OHESI

The Ontario HIV Epidemiology and Surveillance Initiative (OHESI) is a collaboration involving the AIDS Bureau of the Ontario Ministry of Health and Long-Term Care (MOHLTC), Public Health Ontario (PHO), the Public Health Agency of Canada (PHAC), and the Ontario HIV Treatment Network (OHTN) Applied Epidemiology Unit (AEU). The objectives of OHESI are to analyze, monitor and disseminate knowledge products on the epidemiology of HIV in Ontario. OHESI is a vital partnership that supports Ontario's ongoing ability to assess the impact of policy directions and program initiatives in the provincial "HIV/AIDS Strategy to 2026: Focusing Our Efforts - Changing the Course of the HIV Prevention, Engagement and Care Cascade in Ontario."

The success of the partnership would not be possible without the strategic, technical and resource contributions of all the partners. OHESI also receives ongoing advice from a community advisory committee: people working in the community-based HIV service sector and HIV clinics whose input helps ensure that OHESI reports and other products support collective efforts and impact in neighborhoods, communities and organizations across the province.

Background

In 2013 and 2014, the OHTN set up the OHTN Applied Epidemiology Unit (AEU), under a funding agreement with the MOHLTC, to support ongoing production of epidemiological information to support Ontario's response to HIV.

In 2014 and 2015, the OHTN AEU initiated the Ontario HIV Epidemiology and Surveillance Initiative (OHESI) and continues to provide administrative and technical support for the partnership.

Contact information

Applied Epidemiology Unit, Ontario HIV Treatment Network
1300 Yonge Street, Suite 600
Toronto, Ontario M4T 1X3
Phone: 416-642-6486
Email: OHESI@ohsn.on.ca
Website: www.OHESI.ca

Acknowledgements

We acknowledge the members of the OHESI Steering Committee and OHESI Technical Working Group for their contributions to this report.

Authors

James Wilton, Ontario HIV Treatment Network
Juan Liu, Public Health Ontario
Ashleigh Sullivan, Public Health Agency of Canada
Doug Sider, Public Health Ontario
Abigail Kroch, Ontario HIV Treatment Network

Date of publication

October 2017

Suggested citation

Wilton J., Liu J., Sullivan A., Sider D., Kroch A. New HIV diagnoses in Ontario: Preliminary Update, 2016. Ontario HIV Epidemiology and Surveillance Initiative, Toronto, Ontario, October 2017.

Table of contents

Table of contents.....	3
Take-home messages	4
Background	5
Key trends	7
Data and figures	9
1. Overall.....	9
2. By sex	10
3. By age	12
4. By priority population	13
5. By race/ethnicity	15
6. By health region	17
Data tables	18
1. Overall.....	18
2. By sex	19
3. By age	20
4. By priority population	21
5. By race/ethnicity	22
6. By health region	23

Take-home messages

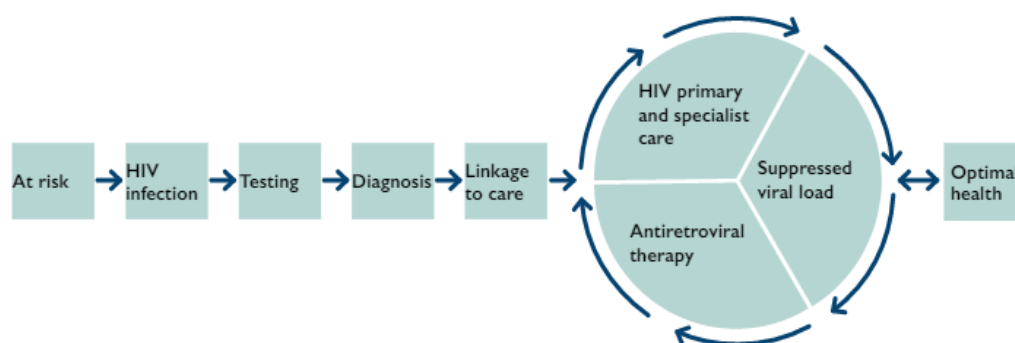
- Overall, the number and rate of new HIV diagnoses in Ontario have decreased over the past decade. Between 2007 and 2016, the number of new diagnoses each year fell from 1,013 to 881 and the annual rate of new diagnoses per 100,000 people dropped from 7.9 to 6.3.
- Despite an overall decrease in new diagnoses, there has been an increase in recent years. Between 2013 and 2016, there was a 10.5% increase in the number of new diagnoses and a 7.2% increase in the rate of new diagnoses per 100,000 people. This increase could be due to combination of factors, such as an increase in new infections, testing and/or migration.
- Even though there has been an increase in diagnoses in recent years, the diagnosis rate in 2016 (6.3 per 100,000 people) was still lower than in all years prior to 2013.
- The recent increase in new diagnoses was more pronounced among females – with the diagnosis rate increasing by 2.5% for males and 29.3% for females between 2013 and 2016. The increase among females appears to be driven by diagnoses in individuals who were White, Indigenous and/or who use injection drugs.
- While there has been a greater relative increase in diagnoses for females compared to males in recent years, the diagnosis rate has consistently been three to four times higher for males. In 2016, the diagnosis rate per 100,000 people was 10.1 for males and 2.5 for females.
- Over the past decade, the majority of new male HIV diagnoses were gay, bisexual and other men who have sex with men and/or White, while the majority of new female diagnoses were African, Caribbean and Black. Compared to males, a higher percent of new female diagnoses were Indigenous and/or people who use injection drugs.
- HIV diagnoses were not distributed equally across the province. In 2016, the rate of new diagnoses per 100,000 people was highest in Toronto (15.0) and Ottawa (8.8) and lowest in the Central East health region (2.3).
- Differences in diagnoses between 2015 and 2016 varied by health region. Ottawa, Eastern, Central West and Southwest regions all experienced an increase in the number and rate of diagnoses from 2015 to 2016. Diagnoses decreased in the Toronto, Northern and Central East regions.

Background

Why look at patterns in new HIV diagnoses?

- HIV diagnosis is an early step in the HIV prevention, engagement and care cascade (Figure i) and is critical in order for people living with HIV to be linked to care.
- Information on new diagnoses is useful for understanding how many people and who will require HIV care.
- Trends in new HIV diagnoses can provide insight into trends in HIV infections, as well as populations who may be at greater risk of HIV infection. However, new HIV diagnoses and HIV infections are not equivalent. For example, 881 new HIV diagnoses in 2016 does not mean there were 881 new HIV infections in that year. This is because many people can be infected for years before being diagnosed. Also, new HIV diagnoses include people who were diagnosed with HIV outside of Ontario, moved to the province, and were tested again.
- Trends in new HIV diagnoses should be interpreted with caution as they are influenced by the number of new HIV infections as well as HIV testing and migration patterns and it is difficult to disentangle these different effects.

Figure i. The HIV prevention, engagement, and care cascade



Where do these data come from?

- Data on new HIV diagnoses come from the Public Health Ontario Laboratory (PHOL), which conducts virtually all HIV diagnostic testing for the province.
- When someone gets an HIV test in Ontario, the health care provider conducting the test (e.g. a physician or HIV counselor) fills out a form which is sent to PHOL. This form, known as an HIV test requisition, collects information on the individual getting tested for HIV, including their sex, age and HIV risk factors.
- If the test result is HIV-positive, a second form (known as the Laboratory Enhancement Program form, or LEP form) is sent to the provider who conducted the test in order to collect information that may have been missed on the first form. Since 2009, the LEP form has collected information on race/ethnicity and country of birth, data which is not collected on the HIV test requisition. Data from both forms are combined to describe trends in new HIV diagnoses in Ontario.

What are some of the strengths of these data and our approach to presenting it?

- New HIV diagnoses are broken down by the overlapping priority populations outlined in Ontario's HIV/AIDS strategy. Unlike the categories traditionally used to describe new diagnoses (known as exposure categories), these priority populations are not mutually exclusive. This means that an HIV diagnosis can be assigned to more than one priority population (if applicable) – an approach which better represents Ontario's HIV epidemic.
- Trends in new diagnoses are presented as numbers as well as rates per 100,000 people. While the number of diagnoses are influenced by the size of the underlying population, rates take this into account and remove population size as a possible explanatory factor for any observed differences.
- Diagnoses are aggregated over two-year periods to describe trends by priority population and race/ethnicity. This is done to reduce the effects of year-to-year variation (which can be particularly influential for populations with a small number of diagnoses) and more clearly present trends over time.

What are some of the limitations of these data?

- The annual number of new HIV diagnoses may be higher than the actual number of individuals who were diagnosed in that year, as individuals diagnosed through non-nominal testing (anonymous, coded) may also receive a nominal test when entering care and be counted twice.
- Information on race/ethnicity and priority population is missing for about a third of new HIV diagnoses. Also, there is no option for transgender identity on the HIV test requisition form. Changes to the requisition form to be implemented in 2018 will hopefully decrease missing information and improve documentation of trans men and women.
- If a specific priority population is more likely to be missing information on HIV risk factors or race/ethnicity, that population may be underrepresented in the data. Also, due to the extent of missing data, the number of diagnoses attributed to a specific race/ethnicity or priority population is likely an underestimate of the actual number.
- Documentation of information on the requisition/LEP forms may vary from provider to provider. For example, some providers may ask the person getting tested about their HIV risk factors and race/ethnicity, while other providers may make assumptions.

When will the full report be available?

- OHESI is currently preparing a full report on HIV testing and diagnosis in Ontario with information up to and including data from 2016, which will be available soon after the publication of this preliminary update.
- The full report will contain more in-depth information on testing and diagnosis trends as well as on data sources, definitions and limitations.

Key trends

Overall

- There were a total of 881 new HIV diagnoses in Ontario in 2016 – translating to a rate of 6.3 per 100,000 people.
- Despite an overall decrease in the number and rate of new HIV diagnoses in the province over the past decade, the rate increased by 7.2% between 2013 and 2016. However, the rate of diagnoses in 2016 was still lower than for all years prior to 2013.
- The increasing trend since 2013 may reflect a combination of factors, such as increase in the number of new HIV infections or HIV tests, a shift towards more targeted testing and/or an increase in migration of HIV-positive people to Ontario. That the number of HIV tests increased by 18.9% during this time suggests the increase in diagnoses may be partly due to HIV testing.

By sex

- In 2016, there were 697 new male diagnoses and 176 new female diagnoses – translating to a rate of 10.1 and 2.5 per 100,000 people, respectively.
- Despite an overall decrease in the number and rate of diagnoses over the past decade for both sexes, the diagnosis rate increased by 2.5% among males and 29.3% among females between 2013 and 2016.
- The diagnosis rate between 2007 and 2016 has consistently been three to four times higher among males compared to females.
- The percent of new HIV diagnoses who were female has remained relatively steady over the past decade at approximately 20%.

By age

- In 2016, there were differences in age at diagnosis by sex. The most common age category at diagnosis was older for females (30 to 34 years of age) compared to males (25 to 29 years of age). However, a greater percent of female diagnoses were diagnosed at younger ages (less than 25 years of age) compared to males.
- Diagnoses among males had a second peak in the 50 to 54 age category (men born in the 1960s).

By priority population

- Overall, the majority of new HIV diagnoses over the past decade were consistently gay, bisexual other men who have sex with men - accounting for just over half of new diagnoses each year. About a quarter of diagnoses each year were African, Caribbean and Black.
- Compared to males, a higher percent of female diagnoses were African, Caribbean and Black, Indigenous and/or people who use injection drugs.
- Between 2011 and 2016, there was a doubling in the percent of female diagnoses who were Indigenous and/or people who use injection drugs.

By race/ethnicity

- Overall, the majority of new HIV diagnoses over the past decade were consistently White – accounting for just over half of new diagnoses each year. About a quarter of new diagnoses each year were Black.
- Compared to males, a higher percent of new female diagnoses were Black or Indigenous people.

- Between 2011 and 2016, there was an increase in the percent of new female diagnoses who were White or Indigenous.

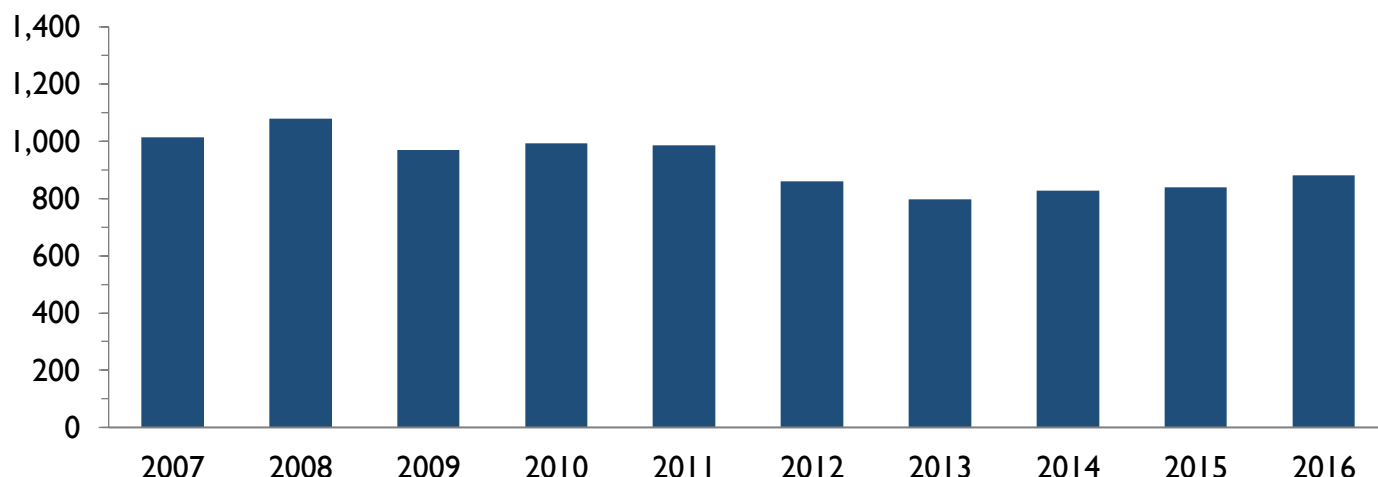
By health region

- In 2016, the number and rate of new HIV diagnoses were much higher in Toronto compared to other health regions.
- Between 2015 and 2016, the rate of HIV diagnoses increased in Ottawa, Eastern, Central West, and Southwest and decreased in Northern, Toronto, and Central East.

Data and figures

I. Overall

Figure I.1 Number of new HIV diagnoses, both sexes, Ontario, 2007 to 2016



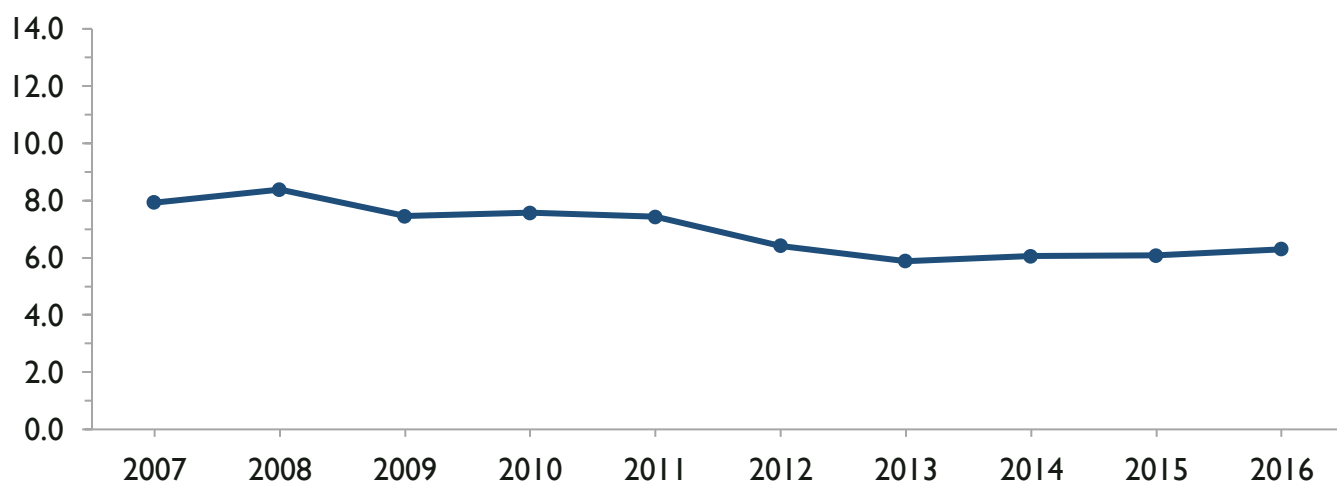
New HIV diagnoses 2016

Number	881
--------	-----

Snapshot

The number of new diagnoses has generally decreased over the past decade and was highest in 2008 (1,080 diagnoses). There has been an increase since 2013 when there were 797 diagnoses.

Figure I.2 Rate of new HIV diagnoses per 100,000 people, both sexes, Ontario, 2007 to 2016



New HIV diagnoses 2016

Rate per 100,000 people	6.3
-------------------------	-----

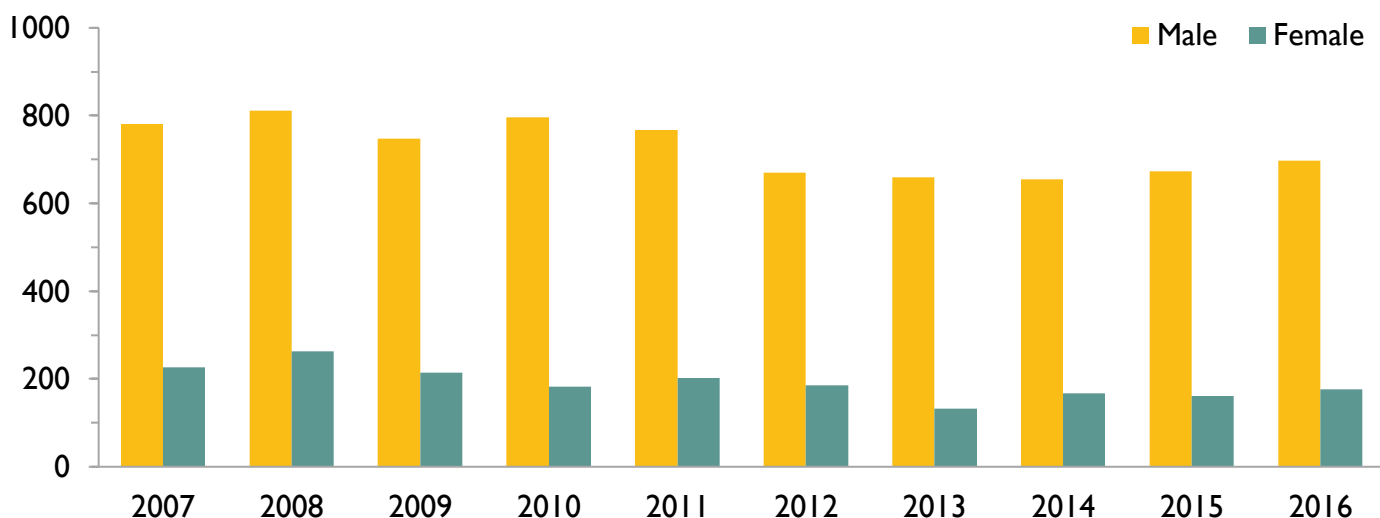
Snapshot

The rate of new diagnoses has generally decreased over the past decade and was highest in 2008 (8.4 diagnoses per 100,000 people). There has been an increase since 2013 when there were 5.9 diagnoses per 100,000 people.

Notes: Data provided by Public Health Ontario Laboratory. Rates calculated using Statistics Canada population estimates for all ages. See Table I.1 for underlying data.

2. By sex

Figure 2.1 Number of new HIV diagnoses by sex, Ontario, 2007 to 2016

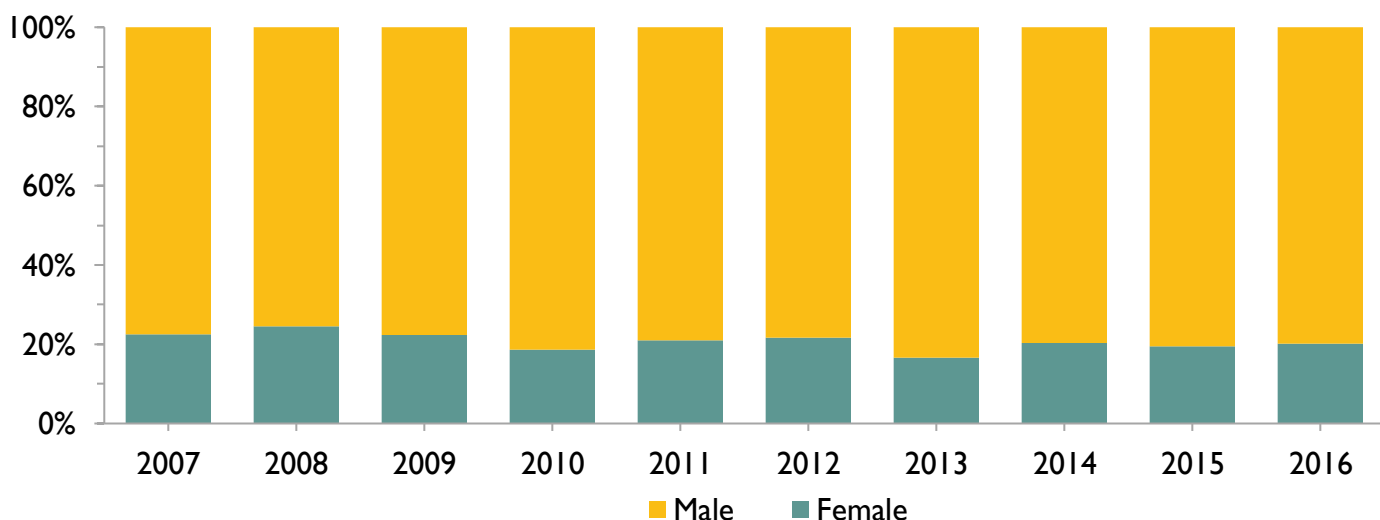


Number of diagnoses 2016	
Male	697
Female	176

Snapshot

The number of new diagnoses has generally decreased over the past decade for both sexes. There has been an increase since 2014 for males and 2013 for females when there were 655 and 132 diagnoses, respectively.

Figure 2.2 Percent of new HIV diagnoses by sex, Ontario, 2007 to 2016



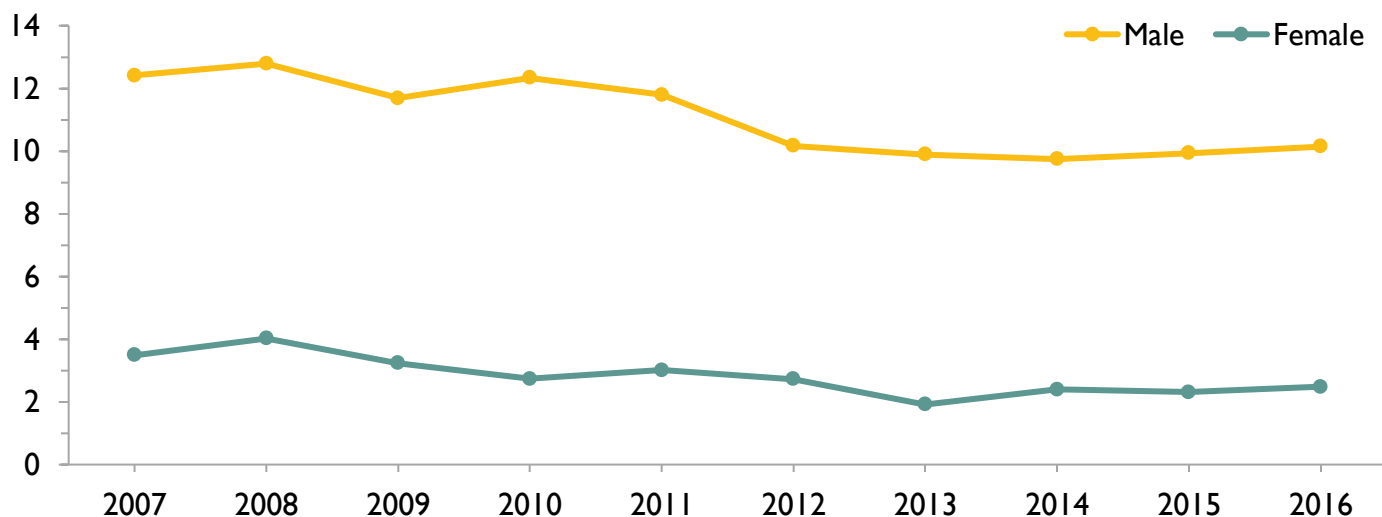
Percent of diagnoses 2016	
Male	79.8%
Female	20.2%

Snapshot

The percent of new diagnoses who were female was highest in 2008 (24.5%) and lowest in 2013 (16.7%).

Notes: Data provided by Public Health Ontario Laboratory. Diagnoses with unknown sex excluded (approximately 1% of diagnoses). See Table 2.1 for underlying data.

Figure 2.3 Rate of new HIV diagnoses per 100,000 people by sex, Ontario, 2007 to 2016



Rate of diagnoses 2016	
Male	10.1
Female	2.5

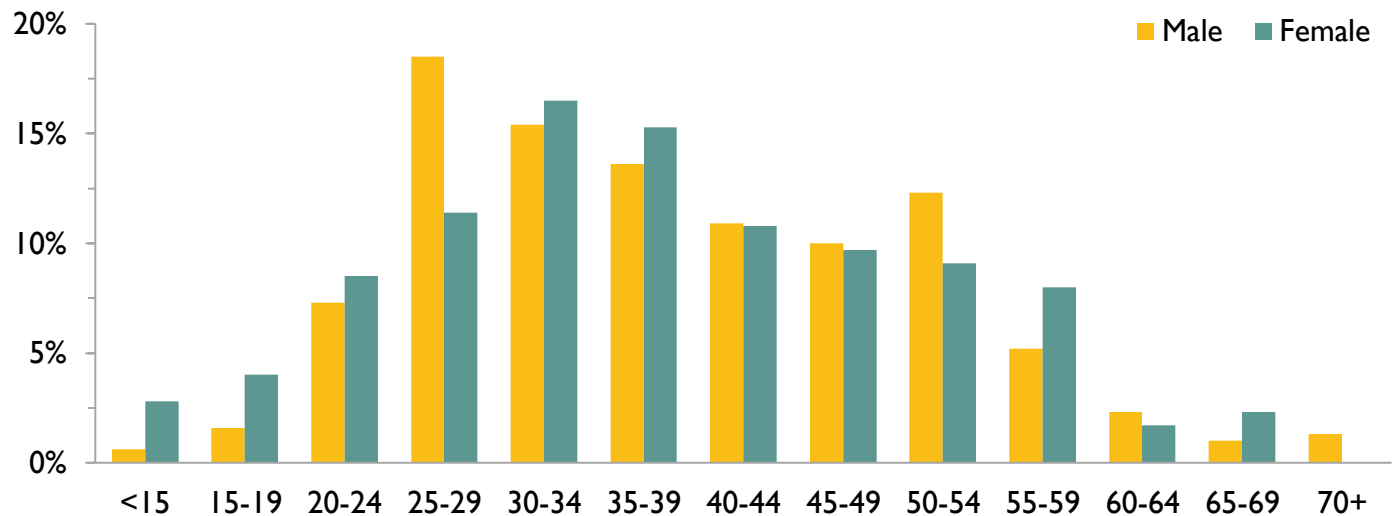
Snapshot

The rate of new diagnoses has generally decreased over time for both sexes and has consistently been three to four times higher among males. There has been an increase since 2014 for males and 2013 for females when the rates per 100,000 people were 9.7 and 1.9, respectively.

Notes: Data provided by Public Health Ontario Laboratory. Rates calculated using Statistics Canada population estimates for all ages. Diagnoses with unknown sex excluded (approximately 1% of diagnoses). See Table 2.1 for underlying data.

3. By age

Figure 3.1 Percent of new HIV diagnoses by age and sex, Ontario, 2016



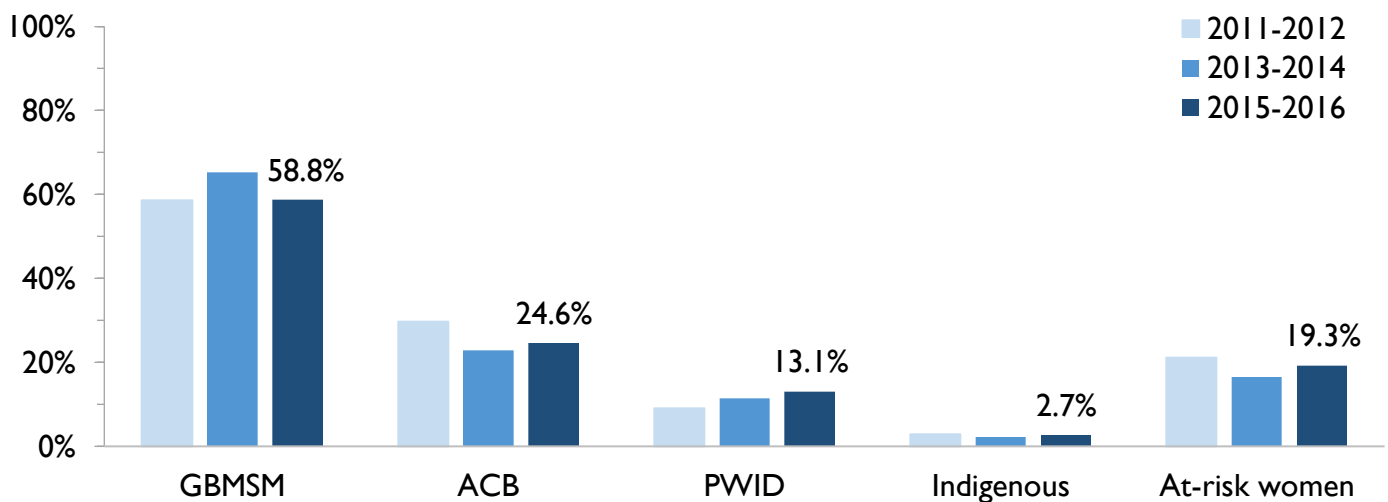
Snapshot

The most common age category at diagnosis was 25 to 29 for males (18.5%) and 30 to 34 for females (16.5%). A greater percent of females were diagnosed at younger ages (less than 25) compared to males (15.3% vs. 9.5%). Diagnoses among males had a second peak in the 50 to 54 age category (12.3%).

Notes: Data provided by Public Health Ontario Laboratory. Diagnoses with unknown sex and age excluded (approximately 1% of diagnoses). See Table 3.1 for underlying data.

4. By priority population

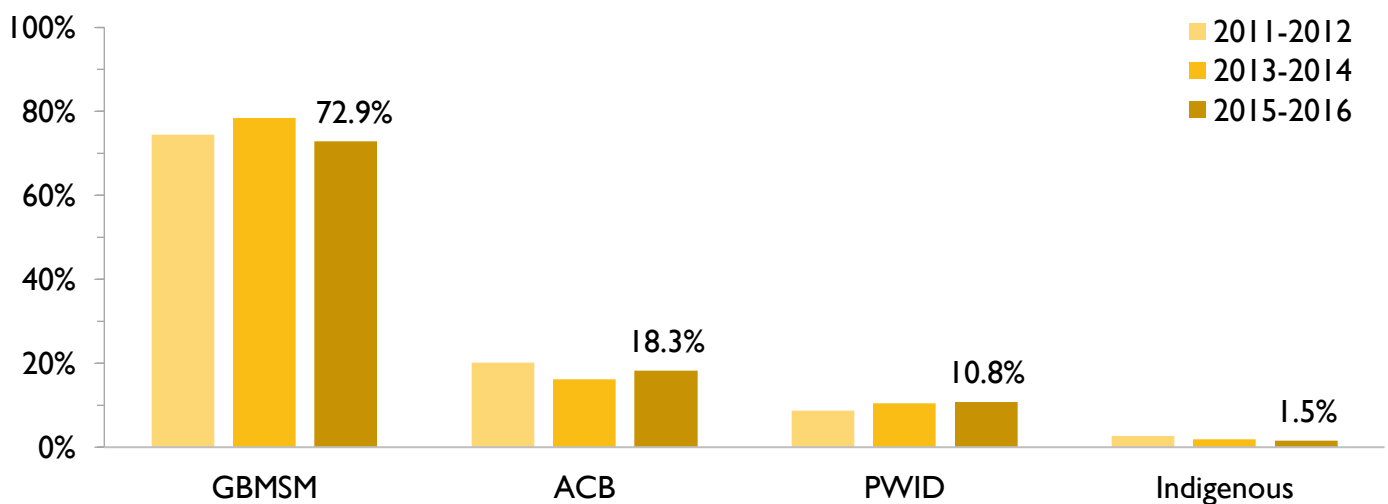
Figure 4.1 Percent of new HIV diagnoses by priority population (where known), both sexes, Ontario, 2011 to 2016



Snapshot

The percent of new diagnoses has consistently been highest among GBMSM, followed by ACB, at-risk women, PWID and Indigenous. Between 2011-2012 and 2015-2016, the percent PWID increased from 9.0% to 13.1%.

Figure 4.2 Percent of new HIV diagnoses by priority population (where known), males, Ontario, 2011 to 2016

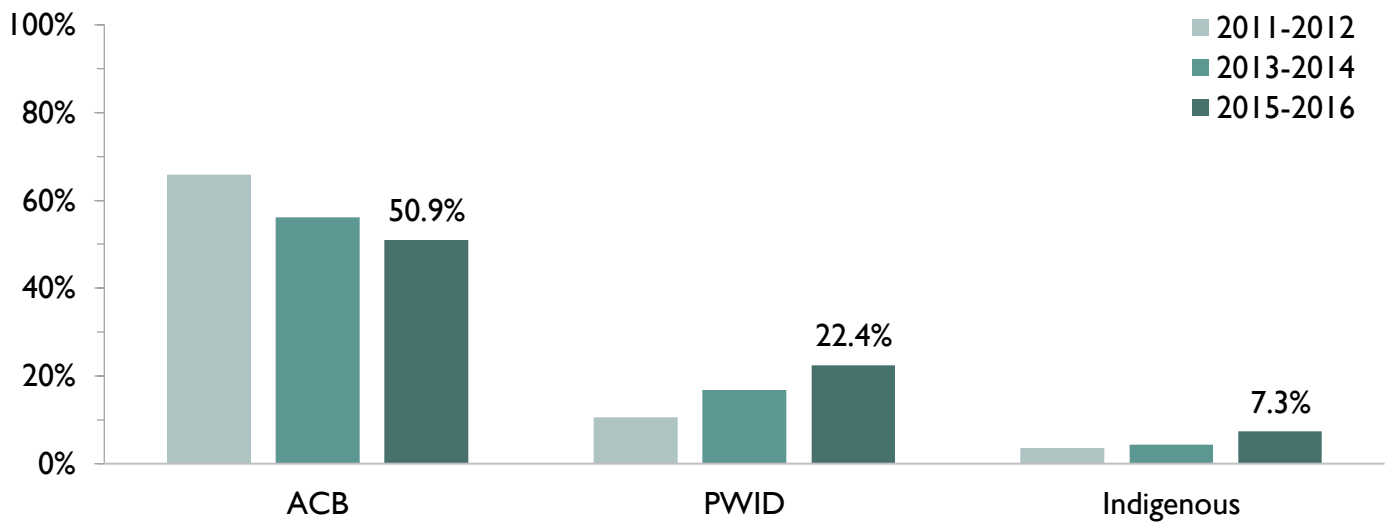


Snapshot

The percent of new male diagnoses has consistently been highest among GBMSM, followed by ACB, PWID and Indigenous. Between 2011-2012 and 2015-2016, the percent PWID increased from 8.7% to 10.8%.

Notes: Data provided by Public Health Ontario Laboratory. GBMSM=gay, bisexual and other men who have sex with men; ACB=African, Caribbean and Black; PWID=people who use injection drugs. Percentages based on a subset of diagnoses where race/ethnicity and/or country of birth were known (approximately 65% of diagnoses). See Table 4.1 for underlying data.

Figure 4.3 Percent of new HIV diagnoses by priority population (where known), females, Ontario, 2011 to 2016



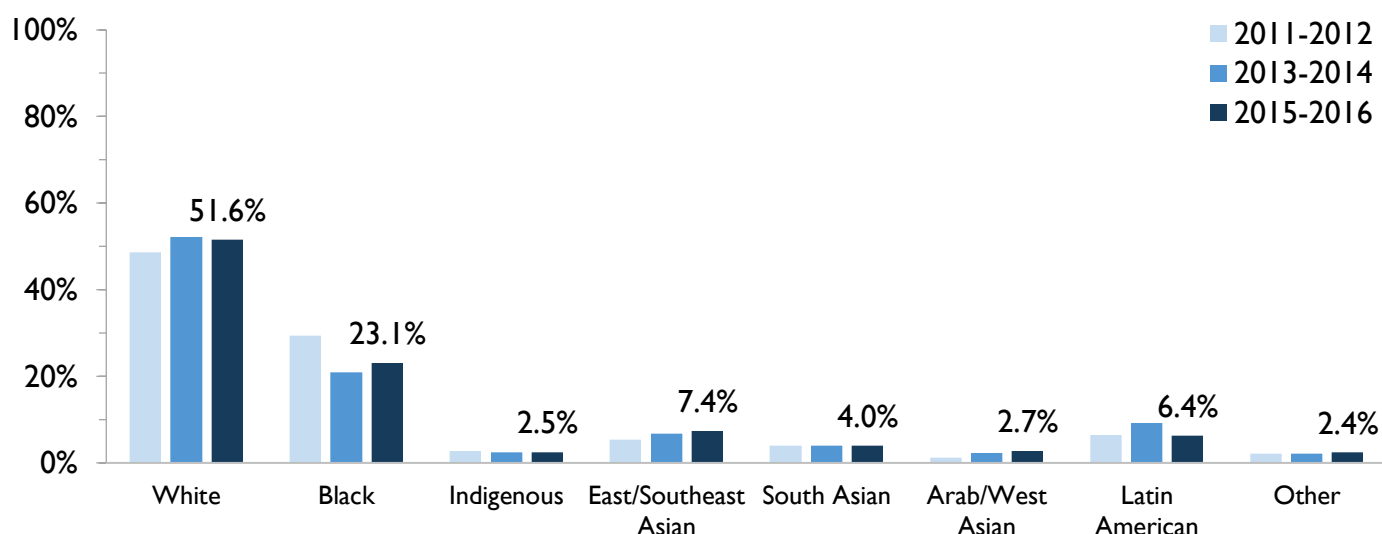
Snapshot

The percent of new female diagnoses has consistently been highest among ACB, followed by PWID and Indigenous. Between 2011-2012 and 2015-2016, the percent ACB decreased from 65.8% to 50.9%, PWID increased from 10.5% to 22.4% and Indigenous increased from 3.5% to 7.3%.

Notes: Data provided by Public Health Ontario Laboratory. ACB= African, Caribbean and Black; PWID=people who use injection drugs. Percentages based on a subset of diagnoses where race/ethnicity and/or country of birth were known (approximately 65% of diagnoses). See Table 4.1 for underlying data.

5. By race/ethnicity

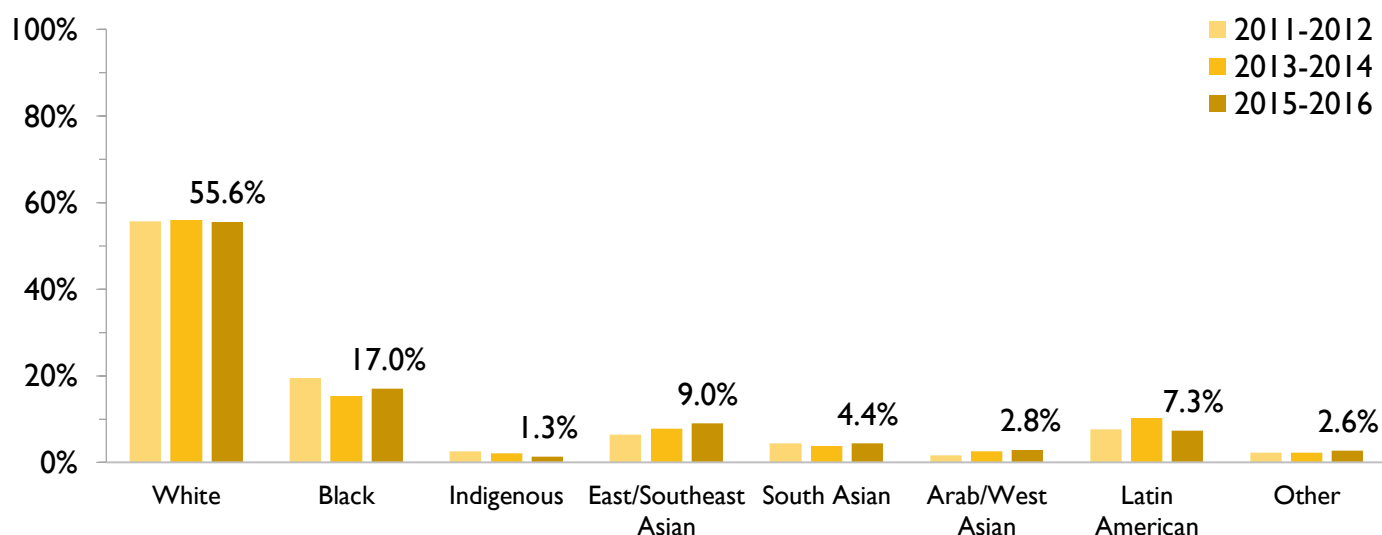
Figure 5.1 Percent of new HIV diagnoses by race/ethnicity (where known), both sexes, Ontario, 2011 to 2016



Snapshot

The percent of new diagnoses has consistently been highest among White people followed by Black people. Between 2011-2012 and 2015-2016, the percent East/Southeast Asian increased from 5.4% to 7.4% and Arab/West Asian increased from 1.2% to 2.7%.

Figure 5.2 Percent of new HIV diagnoses by race/ethnicity (where known), males, Ontario, 2011 to 2016

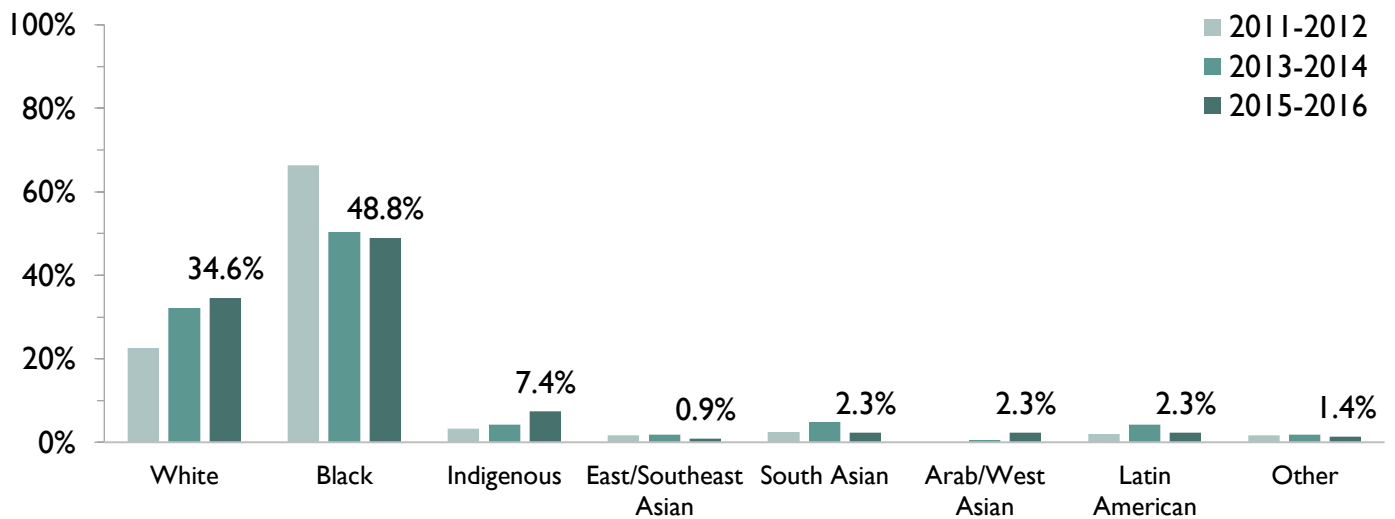


Snapshot

The percent of new male diagnoses has consistently been highest among White people followed by Black people. Between 2011-2012 and 2015-2016, the percent East/Southeast Asian increased from 6.5% to 9.0% and Arab/West Asian increased from 1.6% to 2.8%.

Notes: Data provided by Public Health Ontario Laboratory. Diagnoses where race/ethnicity was unknown were excluded (approximately 35% of diagnoses). See Table 5.1 for underlying data.

Figure 5.3 Percent of new HIV diagnoses by race/ethnicity (where known), females, Ontario, 2011 to 2016



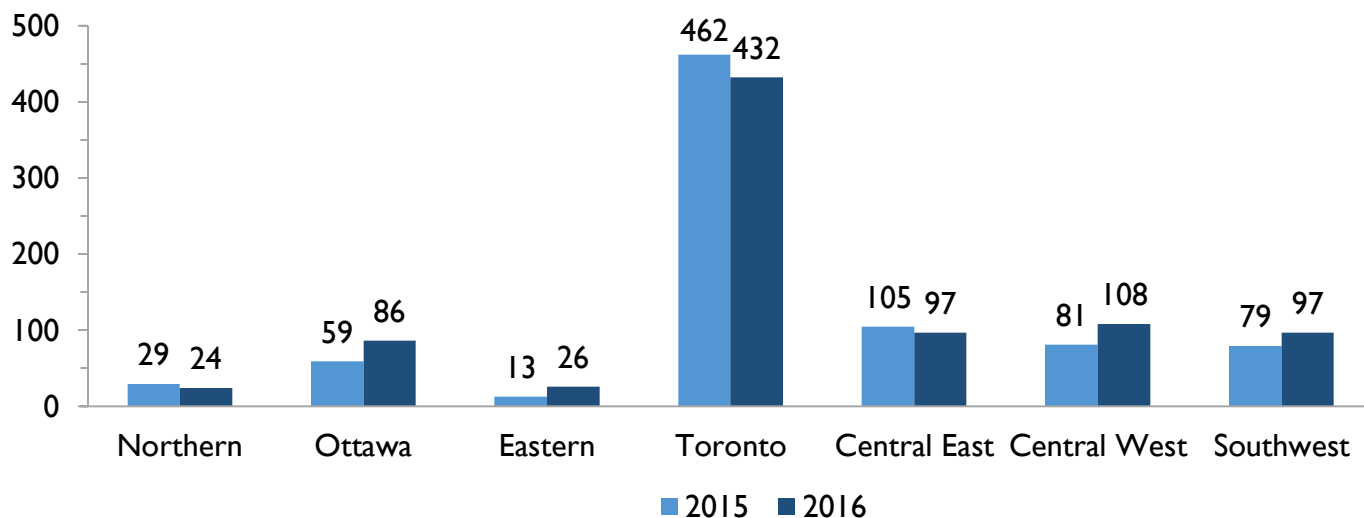
Snapshot

The percent of new female diagnoses has consistently been highest among Black people followed by White people. Between 2011-2012 and 2015-2016, the percent Black decreased from 66.4% to 48.8%, White increased from 22.5% to 34.6%, Indigenous increased from 3.3% to 7.4% and Arab/West Asian increased from 0.0% to 2.3%.

Notes: Data provided by Public Health Ontario Laboratory. Diagnoses where race/ethnicity was unknown were excluded (approximately 35% of diagnoses). See Table 5.1 for underlying data.

6. By health region

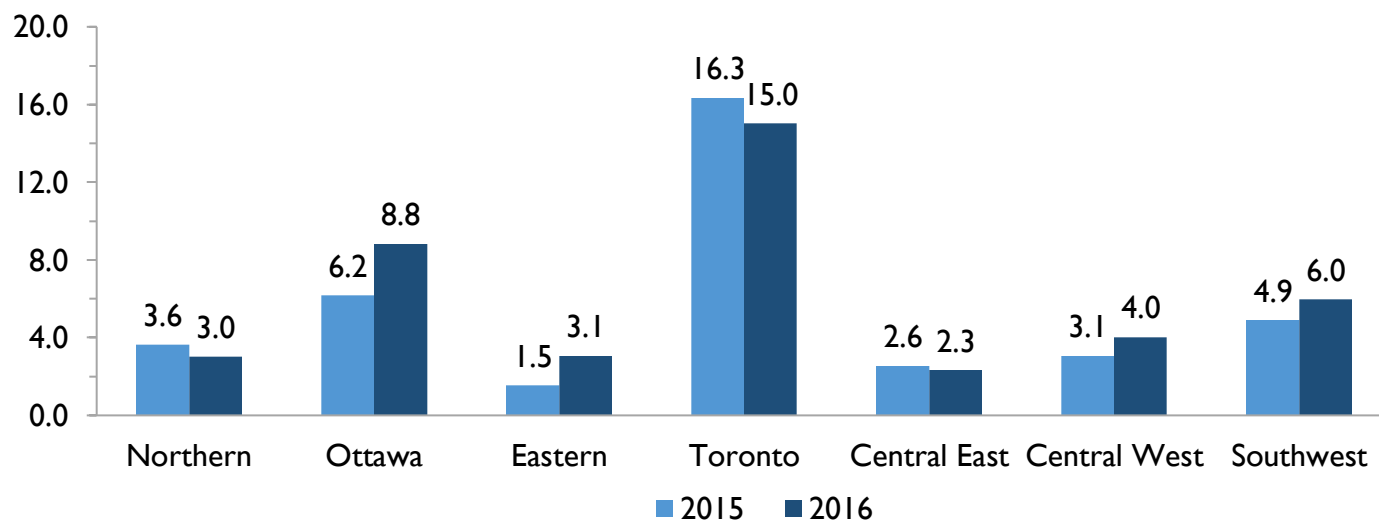
Figure 6.1 Number of new HIV diagnoses by health region, both sexes, Ontario, 2015 and 2016



Snapshot

In 2016, the number of new diagnoses was highest in Toronto and lowest in Northern and Eastern regions. Between 2015 and 2016, there were increases in Ottawa, Eastern, Central West and Southwest and decreases in Northern, Toronto and Central East regions.

Figure 6.2 Rate of new HIV diagnoses per 100,000 people, both sexes, Ontario, 2015 and 2016



Snapshot

In 2016, the rate of new diagnoses was highest in Toronto and lowest in Central East. Between 2015 and 2016, there were increases in Ottawa, Eastern, Central West and Southwest and decreases in Northern, Toronto and Central East regions.

Notes: Data provided by Public Health Ontario Laboratory. Health regions are aggregations of Public Health Units. Diagnoses were assigned to a health region based on their address of residence or, if unknown, the address of the ordering provider. Rates calculated using Statistics Canada population estimates for all ages. See Table 6.1 for underlying data.

Data tables

I. Overall

Table I.1 Number and rate of new HIV diagnoses per 100,000 people, both sexes, Ontario, 2007 to 2016

Year	Number of new HIV diagnoses	Ontario population (all ages)	Rate of new HIV diagnoses per 100,000 population
2007	1,013	12,764,195	7.9
2008	1,080	12,882,625	8.4
2009	969	12,997,687	7.5
2010	994	13,135,063	7.6
2011	986	13,263,544	7.4
2012	861	13,413,702	6.4
2013	797	13,556,229	5.9
2014	828	13,685,171	6.1
2015	839	13,797,038	6.1
2016	881	13,982,984	6.3

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Population estimates retrieved from Statistics Canada.

2. By sex

Table 2.1 Number and rate of new HIV diagnoses per 100,000 people by sex, Ontario, 2007 to 2016

Year	Males			Females			% of new diagnoses who were female
	Number of new HIV diagnoses	Ontario population (all ages)	Rate of new HIV diagnoses per 100,000	Number of new HIV diagnoses	Ontario population (all ages)	Rate of new HIV diagnoses per 100,000	
2007	781	6,292,177	12.4	226	6,472,018	3.5	22.4%
2008	811	6,341,504	12.8	263	6,541,121	4.0	24.5%
2009	747	6,389,905	11.7	214	6,607,782	3.2	22.3%
2010	796	6,452,783	12.3	183	6,682,280	2.7	18.7%
2011	768	6,513,580	11.8	203	6,749,964	3.0	20.9%
2012	670	6,591,394	10.2	186	6,822,308	2.7	21.7%
2013	659	6,660,093	9.9	132	6,896,136	1.9	16.7%
2014	655	6,723,083	9.7	167	6,962,088	2.4	20.3%
2015	673	6,777,657	9.9	162	7,019,381	2.3	19.3%
2016	697	6,871,630	10.1	176	7,111,354	2.5	20.3%

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Population estimates retrieved from Statistics Canada. Diagnoses with unknown sex excluded (approximately 1% of diagnoses).

3. By age

Table 3.1 Percent of new HIV diagnoses by age and sex, Ontario, 2016

Age	Males	Females
	Percent of new HIV diagnoses	Percent of new HIV diagnoses
<15	0.6%	2.8%
15-19	1.6%	4.0%
20-24	7.3%	8.5%
25-29	18.5%	11.4%
30-34	15.4%	16.5%
35-39	13.6%	15.3%
40-44	10.9%	10.8%
45-49	10.0%	9.7%
50-54	12.3%	9.1%
55-59	5.2%	8.0%
60-64	2.3%	1.7%
65-69	1.0%	2.3%
70+	1.3%	0.0%

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Diagnoses with unknown sex and age excluded (approximately 1% of diagnoses).

4. By priority population

Table 4.1 Percent of new HIV diagnoses by priority population and sex, Ontario, 2011 to 2016

	Gay, bisexual and other men who have sex with men	African, Caribbean and Black	People who use injection drugs	Indigenous	At-risk women
Overall					
2011-2012	58.6%	29.7%	9.0%	2.8%	21.1%
2013-2014	65.3%	22.8%	11.5%	2.3%	16.6%
2015-2016	58.8%	24.6%	13.1%	2.7%	19.3%
Males					
2011-2012	74.5%	20.1%	8.7%	2.6%	-
2013-2014	78.4%	16.1%	10.4%	1.9%	-
2015-2016	72.9%	18.3%	10.8%	1.5%	-
Females					
2011-2012	-	65.8%	10.5%	3.5%	100%
2013-2014	-	56.2%	16.8%	4.3%	100%
2015-2016	-	50.9%	22.4%	7.3%	100%

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Percentages based on a subset of diagnoses where race/ethnicity and/or country of birth were known (approximately 65% of diagnoses).

5. By race/ethnicity

Table 5.1 Percent of new HIV diagnoses by race/ethnicity and sex, Ontario, 2011 to 2016

	White	Black	Indigenous	East / Southeast Asian	South Asian	Arab / West Asian	Latin American	Other
Overall								
2011-2012	48.6%	29.4%	2.7%	5.4%	4.0%	1.2%	6.4%	2.2%
2013-2014	52.2%	21.0%	2.4%	6.8%	3.9%	2.3%	9.3%	2.2%
2015-2016	51.6%	23.1%	2.5%	7.4%	4.0%	2.7%	6.4%	2.4%
Males								
2011-2012	55.7%	19.5%	2.6%	6.5%	4.4%	1.6%	7.6%	2.2%
2013-2014	55.9%	15.4%	2.1%	7.7%	3.8%	2.6%	10.3%	2.3%
2015-2016	55.6%	17.0%	1.3%	9.0%	4.4%	2.8%	7.3%	2.6%
Females								
2011-2012	22.5%	66.4%	3.3%	1.6%	2.5%	0.0%	2.0%	1.6%
2013-2014	32.1%	50.3%	4.2%	1.8%	4.8%	0.6%	4.2%	1.8%
2015-2016	34.6%	48.8%	7.4%	0.9%	2.3%	2.3%	2.3%	1.4%

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Diagnoses where race/ethnicity was unknown were excluded (approximately 35% of diagnoses).

6. By health region

Table 6.1 Number and rate of new HIV diagnoses per 100,000 people, Ontario, 2011 to 2016

	Number of new HIV diagnoses	Health region population (all ages)	Rate of new HIV diagnoses per 100,000
Northern			
2015	29	798,132	3.6
2016	24	796,159	3.0
Ottawa			
2015	59	956,929	6.2
2016	86	973,481	8.8
Eastern			
2015	13	845,673	1.5
2016	26	849,207	3.1
Toronto			
2015	462	2,827,234	16.3
2016	432	2,876,092	15.0
Central East			
2015	105	4,107,607	2.6
2016	97	4,181,180	2.3
Central West			
2015	81	2,648,326	3.1
2016	108	2,682,147	4.0
Southwest			
2015	79	1,613,137	4.9
2016	97	1,624,718	6.0

Notes: Data provided by the Public Health Ontario Laboratory (PHOL). Diagnoses were assigned to a health region based on their address of residence or, if unknown, the address of the ordering provider. Population estimates retrieved from Statistics Canada.