HIV in Canada

Surveillance Report to December 31, 2022

Public Health Agency of Canada
Agence de la santé publique du Canada

Canada

TO PROMOTE AND PROTECT THE HEALTH OF CANADIANS THROUGH LEADERSHIP, PARTNERSHIP, INNOVATION AND ACTION IN PUBLIC HEALTH.

—Public Health Agency of Canada

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Any comments and suggestions that would improve the usefulness of future publications are welcome and can be sent to the attention of the HIV Surveillance System (HASS) within the Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, at hass@phac-aspc.gc.ca.

Land Acknowledgement

We respectfully recognize and acknowledge that the lands on which we developed this surveillance report are the homelands of First Nations, Inuit, and Métis Peoples. We acknowledge our privilege to live and work on these lands and strive to foster equitable partnerships with First Nations, Inuit, and Métis Peoples and work collaboratively to advance reconciliation in Canada.

Data presented in this surveillance report was collected by local public health agencies and submitted to the Public Health Agency of Canada (PHAC) by provinces, territories, or other HIV surveillance programs. These public health agencies operate on lands which are the homelands of the First Nations, Inuit, and Métis Peoples.

We invite readers to reflect on the generations of First Nations, Inuit and Métis who have thrived and sustained themselves in the territories which you call home, and urge readers to recognize local

Indigenous knowledge, and contribute to cultural revitalization and self-determination for Indigenous communities.

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List of acronyms

AIDS Acquired Immunodeficiency Syndrome
ART Antiretroviral Therapy
COVID-19 SARS-CoV2/ Coronavirus Disease 2019
CPHSP Canadian Perinatal HIV Surveillance Program
CVSD Canadian Vital Statistics Death Database
gbMSM Gay, Bisexual and other Men who have Sex with Men
GCMS Global Case Management System
HASS HIV Surveillance System
HIV Human Immunodeficiency Virus
ICD International Classification of Diseases
IDU Injection Drug Use
IME Immigration Medical Exam
IRCC Immigration, Refugees and Citizenship Canada
OOC Out of Country
OOP Out of Province
PHAC Public Health Agency of Canada
PLHIV People living with HIV
PrEP Pre-exposure Prophylaxis
PWID People who inject drugs
PWUD People who use drugs
PT Province or Territory
SC Statistics Canada
STBBI Sexually Transmitted and Blood-Borne Infections
STI Sexually Transmitted Infection

Executive summary

The *HIV in Canada, Surveillance Report to December 31, 2022,* published by the Public Health Agency of Canada (PHAC) presents and describes national epidemiological trends on Human Immunodeficiency Virus (HIV) diagnoses in Canada by geographic region, age at diagnosis, sex, race and/or ethnicity, and exposure category between 2013 and 2022. This surveillance report presents information on first-time diagnoses from all thirteen provinces and territories (PT), and provides robust evidence for the planning, evaluation, and implementation of HIV prevention and care programs and education.

The COVID-19 (SARS-CoV2 / Coronavirus Disease 2019) pandemic had impacts, both known and unknown, on access to HIV testing, prevention, and care services as well as on surveillance activities in Canada. For this reason, data for 2020, 2021 and 2022 should be interpreted with some caution. The true impact and lasting effects of the COVID-19 pandemic on HIV transmission in Canada may become clearer with continued collection and analysis of data in the years to come. Due to surveillance data being refined by the PT over time, as data are periodically reviewed and updated, surveillance data for previous years may also be reported by provinces and territories along with the current year's dataset. As such, historical data presented in this report does not exactly match historical data presented in previous national reports.

Key findings include:

- In 2022, 1,833 newly diagnosed cases (i.e., no previous evidence of a positive test) of HIV were reported in Canada. This is an increase of 24.9% compared with 2021 (1,468 reported cases). This increase may be due, in part, to renewed access to HIV testing services in the later stages of the COVID-19 pandemic and increasing immigration volumes from across the globe (after pandemic restrictions were lifted) as noted by Immigration, Refugees and Citizenship Canada. Social determinants of health and epidemiological patterns place some immigrants at greater risk of HIV infection before and after they arrive in Canada. While the volume of immigration has increased post-pandemic, the proportion of positive HIV tests during an Immigration Medical Exam (IME) has remained low and fairly stable (0.3% or lower). The increase in cases identified by IMEs is proportional to the increased number of IMEs due to increased immigration volumes.

- The national rate of reported newly diagnosed HIV cases was 4.7 per 100,000 population in 2022, an increase from 3.8 per 100,000 population in 2021. While the 2022 rate is within pre-COVID-19 levels, this must be interpreted with caution as the diagnosis rate for 2022 includes only first-time diagnoses while data for previous years prior to 2020 may include previously diagnosed cases due to evolution in surveillance reporting methods.

- The overall trends of the past ten years show the number of first-time HIV diagnoses in Canada was relatively stable until 2020, with a previous peak of 1,850 cases in 2016 (rate of

5.2 per 100,000 population) decreasing to 1,325 cases in 2020 (rate of 3.5 per 100,000 population), followed by increases in 2021 and 2022.

- Data received by PHAC has the sex of cases classified by the mutually exclusive categories of male, female, transgender, or not provided. In some instances, sex and gender may be erroneously conflated in this data. Therefore, data for cases reported as male or female may or may not exclude transgender people, and reporting may not necessarily align with the gender identity of individuals, depending on data collection and reporting procedures by provinces and territories. HASS is actively working on improving our data collection and reporting to better represent gender-diverse communities.

- The HIV diagnosis rate was 6.3 per 100,000 population in males (male sex) and 3.1 per 100,000 population in females (female sex) in 2022; an increase from rates reported in 2021 (which were 5.5 and 2.1 HIV diagnoses per 100,000 population, respectively).

- Recent trends in the HIV diagnosis rate among males show a continued decline in rates from 8.4 per 100,000 in 2013 to 6.3 per 100,000 in 2022. Among females, the trend shows a subtle increase, peaking at 2.7 per 100,000 females in 2019 and increasing to 3.1 per 100,000 in 2022. While the 2022 rate in males remained below pre-COVID-19 pandemic levels, the rate in females was higher than pre-COVID-19 pandemic levels.

- When broken down into ten-year age groups, the HIV diagnosis rate in the 30 to 39 years age group was the highest among all age groups with 13.1 per 100,000 population in 2022.

- HIV diagnosis rates were observed to be at least two times greater in males than in females in all age groups, with the exceptions of the children <15 years (in which females had a higher HIV diagnosis rate), 15-to-19-year age group and the 40 to 59 years age group.

- While the overall national rate increased from 2021 to 2022, this was not uniform across all provinces and territories (PTs) - the rate increase was not observed in British Columbia, Saskatchewan, and the Territories.

- The highest HIV diagnosis rate across provinces and territories was in Saskatchewan, with 19.0 per 100,000 population. The lowest diagnosis rate was in the Territories region with 1.5 per 100,000 population.

- In contrast to previous years, in 2022 the largest proportion of adult HIV diagnoses was attributed to heterosexual contact (39.2%). According to reported exposure category, male-to-

male sexual contact continues to account for the largest proportion of diagnoses in males (male sex), at 51.1% of diagnoses. Heterosexual contact continues to account for the largest proportion of diagnoses in females (female sex), at 60.1% of diagnoses. Injection drug use also remains a significant factor among cases in both males and females, accounting for 20.5% of all first-time diagnoses in 2022.

- Proportion of diagnoses attributable to different exposure categories also varied by age group. In the 20 to 24 year age group, male-to-male sexual contact accounted for the largest proportion of diagnoses (52.0%). By contrast, among 40 to 59 year olds, heterosexual contact accounted for the largest proportion of diagnoses (50.1%).

- Race-based data provides a key element in recognizing and understanding disparities in access to HIV care stemming from historic and ongoing colonialism, racism, and systemic and structural inequities in Canada. However, the reporting of race and/or ethnicity data varies significantly across jurisdictions. Overall, race and/or ethnicity data was reported for only 42.3% of first-time diagnoses in 2022. No race and/or ethnicity data were reported from Manitoba, Nova Scotia and Quebec.

- Among the 776 cases of new HIV diagnoses for whom race and/or ethnicity was reported, 30.5% of cases were reported as White people, 22.6% were reported as Indigenous people (First Nations, Inuit, Métis, or Indigenous-not otherwise specified), and 18.0% as Black people. Given race and/or ethnicity data is not missing randomly, these proportions are unlikely to be representative of all first-time diagnoses and should be interpreted with caution. In collaboration with community members, the National HIV Surveillance System (HASS) has established a Black Expert Working Group to provide advice and co-develop strategies to improve the completeness, interpretation, and contextualization of race and/or ethnicity data. HASS is seeking to establish similar engagements with First Nations, Inuit, and Métis representatives and/or organizations.

- An increased number of migrants (immigrants, refugees and temporary residents) tested positive for HIV during an immigration medical exam (IME) in Canada or abroad in 2022 compared to 2021. Data provided by Immigration, Refugees and Citizenship Canada (IRCC) demonstrated that in 2022 the total number of migrants who tested positive for HIV was 2,119, representing 0.26% of all IMEs, a proportion similar to pre-pandemic levels. In 2021, this proportion was lower (0.12%) where 865 migrants tested positive for HIV, corresponding with lower immigration volumes during that time, suggesting the large increase in HIV cases detected among migrants in 2022 was the result of increasing immigration volumes.

- Of the 239 infants reported to be potentially perinatally exposed to HIV in 2022, 96.2% were born to people who had received antiretroviral therapy (ART). There were six infants confirmed to have acquired HIV perinatally, two of whom were born to people who did not receive any ART, three of whom were born to people who received some or partial ART and one of whom was born to a person whose ART status was not known.

- In 2022, there were 84 cases of Acquired Immunodeficiency Syndrome (AIDS) reported, a continued decrease since 2013. However, findings should be interpreted with caution, as AIDS data were only submitted by four provinces in 2022 (New Brunswick, Nova Scotia, Ontario, and Saskatchewan) and, where this information was available, cases are likely underreported.

- In 2022, there were 129 deaths attributed to HIV. This represents a decrease compared with the 133 deaths attributed to HIV in 2021, however these deaths are still likely underreported.

Introduction

Human Immunodeficiency Virus (HIV) continues to be a public health issue affecting many people worldwide. Globally, there were an estimated 1.3 million new infections and 39 million people living with HIV (PLHIV) in 2022 [1] . As a result of advances in testing globally, an estimated 86% of all people living with HIV knew their HIV status in 2022 [1]. Despite significant advances in the HIV testing, prevention and treatment, people in Canada continue to face barriers to accessing these services including stigma, a perceived low risk of contracting HIV, and limited knowledge about HIV, testing availability and prevention services [2]. Specific barriers such as social stigma towards HIV, racism, colonialism, criminalization, incarceration, homophobia and transphobia continue to affect populations disproportionately impacted including Two-spirit people; gay and bisexual men; trans, queer, questioning, and non-binary people; people who inject drugs (PWID); as well as African, Caribbean, and Black communities; and Indigenous communities [2]. Participants living with HIV in one Canadian study on HIV stigma spoke about “having negative experiences within health, social, and [legal] systems and how these experiences could increase the trauma of HIV stigma and discrimination at the time of diagnoses. These experiences included not being allowed to have a friend with them when given the results of their HIV test or not being provided with important information, questions from health and social care providers that the participant felt were stigmatizing, and health promotion materials in the waiting room that they felt depicted people with HIV as being from particular racial and ethnic groups. In several cases participants felt that health and social care workers were ill-informed about current evidence related to HIV and that more needed to be done to ensure they were well-educated” [3].

Although HIV antiretroviral therapy (ART) and HIV pre-exposure prophylaxis (PrEP) have significantly altered the HIV epidemic over time; disparities in access to these interventions still exist [4]. HIV has continued to indirectly impact the health system as aging individuals with HIV have been found to have increased risk of non-AIDS defining cancers and death, and they typically require multiple medications earlier than people without HIV [4]. Changes in the epidemiology of HIV over time have necessitated reliable data regarding PrEP, testing, and treatment to allocate resources and implement programs and policies [4]. Improvements in data reporting are needed to facilitate the translation of epidemiological data to public health action [4]. As such, the Public Health Agency of Canada (PHAC) publishes annual surveillance reports to report on the epidemiology of HIV in Canada, including trends over time. While HIV diagnoses attributed to male-to-male sexual contact (39.7% of HIV diagnoses in 2021) have continued to make up the largest category of HIV diagnoses, the proportion of HIV diagnoses attributed to heterosexual contact (33.8% of HIV diagnoses in 2021) and injection drug use (21.9% of HIV diagnoses in 2021) have increased since 2018 [5]. National estimates on the cascade of HIV care in Canada have indicated that females, people who inject drugs and Indigenous peoples continue to be disproportionately impacted by HIV as they, as groups, are less likely to know they have HIV and have lower treatment and viral suppression rates [6]; likely as a result of barriers to care, such as less access to testing and treatment services and to stigmatising experiences within the healthcare system [2]. Further, the SARS-CoV-2 (COVID-19) pandemic has been shown to have various effects on the HIV epidemic such as reduced HIV testing and an increase in the percentage of positive tests in certain jurisdictions, making it necessary that health care systems are adequately prepared for the impact of COVID-19 on HIV testing [7]. As public health efforts focused on the COVID-19 pandemic, this impacted local public health surveillance practices, which have created additional challenges in the collection of surveillance information.

Routine public health surveillance activities include the ongoing, systematic collection, collation, analysis, interpretation and dissemination of public health data to identify trends in disease or injury. It also informs the design, planning, and monitoring of actions, programs and policies for prevention; and provides information for research [8]. The importance of surveillance data in the creation of policy and programs founded in evidence has been noted by the Canadian federal government through the development of the "Reducing The Health Impact of Sexually-Transmitted and Blood-Borne Infections in Canada by 2030: A Pan-Canadian Framework for Action" in 2018 [9]. The subsequent "Accelerating our response: Government of Canada five-year action plan on sexually transmitted and blood-borne infections" published in 2019 further reiterated

The term "surveillance" is often used to describe public health activities to understand trends in infectious diseases. We recognize that "surveillance" is also used by law enforcement, private security, and other parties for a different purpose. As a result, the term can raise discomfort or have negative meanings for some individuals and communities, especially racialized, 2SLGBTQI+, people who use drugs, people experiencing homelessness, and other marginalized populations. For public health STBBI surveillance, the minimum amount of data necessary is collected. Only provincial or territorial public health authorities have access to personal identifiable information (e.g., name or personal health card number) which are used for the purposes of providing health services and they remove this information before sending data to national systems. All data is stored securely and access to it is highly restricted. The reports created using national data are about trends, not people.

the importance of surveillance data in measuring impact, monitoring and reporting on trends for leveraging existing knowledge and targeting of future research [10]. Additionally, in early 2024, the new Government of Canada sexually transmitted and blood-borne infections (STBBI) action plan 2024-2030 was also released [11]. In light of the COVID-19 pandemic, the federal government has also developed a *"Pan-Canadian Health Data Strategy"* [12] with a focus on modernizing the collection of health data with short-term data collection priorities during the pandemic including enhancing data collection on the impact of COVID-19 on racialized populations and improving data collection on the impact of COVID-19 on First Nations, Inuit and Métis populations [13].

Additionally, the Canadian government has also committed to working towards international targets for the elimination of HIV transmission, specifically the UNAIDS' 95-95-95 targets which can be described as follows: 95% of those living with HIV diagnosed, 95% of those diagnosed on treatment and 95% of those on treatment virally suppressed [14]. These targets are for within each sub-population and all age groups. In addition to these targets, UNAIDS developed additional targets related to punitive laws and policies, stigma and discrimination, gender inequality and violence, access to people-centered care and context specific services, combination prevention and other areas to further reduce the burden of HIV [14].

Three different teams at PHAC produce reports describing different aspects of the HIV epidemic in Canada and Canada's progress in meeting national and international HIV transmission reduction goals:

1. The National HIV Surveillance System (HASS)
2. The Estimates and Field Surveillance Section
3. The HIV and Hepatitis C Enhanced Surveillance Section (ESS), known colloquially as "Tracks"

The National HIV Surveillance System (HASS)

The responsibilities of HASS include routine HIV case surveillance and the production of annual information products, including this surveillance report. Data on first-time diagnoses of HIV in Canada's provinces and territories are collected and reported by HASS. Case data include limited sociodemographic information (i.e. age, sex, race and/or ethnicity) and exposure categories (the most likely route of HIV acquisition). While the HASS produces information products describing trends in new HIV diagnoses overall, it is limited in its ability to highlight trends in new diagnoses among key populations disproportionately impacted by HIV.

The Estimates and Field Surveillance Section

Routine HIV surveillance (i.e., HASS) is used to summarize the information related to people who presented for HIV testing and who also then received an HIV diagnosis. It does not capture the number of people who are living with HIV and have not yet tested (i.e., are not even aware themselves that they have HIV). It also does not capture the total number of people living with HIV and receiving HIV treatment and care in Canada. Instead, this information is estimated using statistical models and methods with data from a variety of sources. PHAC develops estimates of HIV incidence (new infections), and prevalence (people living with HIV), as well as the HIV care continuum every two years, in partnership with provincial and territorial public health authorities and other government departments.

In addition, as part of the goal to increase access to combination HIV prevention, the Public Health Agency of Canada also monitors and reports on trends in HIV PrEP use in Canada. National HIV estimates provide an understanding of temporal changes in HIV transmission patterns, can be used to guide the planning and funding for prevention, treatment, care, and ongoing support for people living with and affected by HIV, and allow public health agencies to identify gaps in care and determine the types of interventions that might help increase the number of people who become virally suppressed and maintain viral suppression. The latest information about people living with HIV in Canada can be found on the STBBI surveillance page under "Reporting on Canada's progress towards STBBI elimination".

The HIV and Hepatitis C Enhanced Surveillance Section

The Enhanced HIV and Hepatitis C Surveillance Section oversees the Tracks surveillance system which is designed to gather information to describe prevalence of HIV, hepatitis C and other sexually transmitted and blood-borne infections (STBBI), HIV-related risk behaviours, and use of STBBI-related services among populations disproportionately impacted by HIV. They routinely conduct cross-sectional, bio-behavioural surveys among PWID [15]; First Nations [16], Inuit and Métis people; gay, bisexual, and other men who have sex with men (gbMSM); and African, Caribbean and Black people [17]. Bio-behavioural surveys are an instrumental tool for measuring and addressing the HIV epidemic, especially among key populations who are often underserved, equity-deserving, and have a greater likelihood of acquiring HIV [18]. These bio-behavioural surveys are composed of a questionnaire completed by the respondent along with a dried blood spot (DBS) collected from a finger-prick blood sample that is tested for HIV, hepatitis C and other STBBI. The questionnaire collects information on socio-demographic characteristics, social determinants of health, use of health and prevention services (including testing), substance use and injecting behaviours, sexual behaviours, and care and treatment of HIV and hepatitis C. Tracks consults with the provinces and territories to select sentinel sites (participant recruitment locations) and collaborates with local public health and/or community-based organizations to conduct the bio-behavioural surveys. The survey findings provide the evidence needed to assess the progress towards reaching national and international STBBI targets [10] and are a rich source of information that has been used at the local, provincial, territorial, and federal levels to inform public health policies, programs, plans and interventions, for key populations (e.g. the federal action plan on STBBI).

Review and Renewal of the National HIV Surveillance System

The National HIV Surveillance System (HASS) is currently undergoing a review and renewal process with the ultimate goal of better meeting evidence needs. The review phase has involved an internal technical assessment, an evidence review, engagement with data providers in the provinces and territories (PT), and community engagement. The principles articulated in the Pan-Canadian STBBI Framework for Action – health equity, human rights, meaningful engagement of people living with HIV and key populations, and evidence-based policy and programs – underpin the HASS Review and Renewal process [9]. By contributing to higher quality information to inform policies and programs and meaningfully engaging with partners and expert groups, the Review and Renewal process can contribute to the strategic goals outlined in the Government of Canada's Five-Year Action Plan on STBBI [10]: reducing the incidence of STBBI in Canada; improving access to testing, treatment, and ongoing care and support; and reducing stigma and discrimination that create vulnerabilities to STBBI.

As a result of community advocacy and through a collaborative effort with community members, HASS has co-developed a Black Expert Working Group (BEWG), composed of individuals with expertise in HIV care, research, and advocacy. This working group was established to support the crucial role of Black community members' collaboration in the improvement of systems for HIV (including diagnosis, data collection, and management) that would be more favourable to the wellbeing of Black communities. The BEWG provides advice and guidance to HASS and our surveillance partners, contributing to our collective efforts to improve the quality and completeness of race and/or ethnicity data and helping to ensure that this information is interpreted and presented in reports in a useful and appropriate manner. HASS is collaborating with an established Working Group for people with lived and living experience of substance use (PWLLE), and with the Community Based Research Centre (CBRC) regarding the improvement of data regarding sex, gender, and sexual diversity. HASS is currently exploring similar engagements with other disproportionately impacted populations, including with First Nations, Inuit, and Métis representatives and organizations.

National HIV surveillance reports

Starting with the 'HIV in Canada, Surveillance Report to December 31, 2020', national HIV surveillance reports now present data specifically about first-time HIV diagnoses rather than all positive test results in that year [19]. While the inclusion of previously diagnosed HIV cases is important for planning treatment and care needs, the inclusion of these cases has been shown to inflate the number of HIV diagnoses reported per year and overestimate prevalence [20]. Although the ability to report first-time diagnoses separately from previously diagnosed HIV cases, for all reported years, varies by province and territory, the focus on first time diagnoses improves our knowledge of where there may be more transmission occurring of HIV, better informing prevention activities.

It is the nature of surveillance data to be continuously updated over time across all jurisdictions (federal, provincial, and local), and as such this present report replaces all previous national HIV surveillance reports and presents the most recent surveillance data compiled for HIV, with first-time diagnosis case data included up to December 31, 2022.

The objectives of this report are to describe the epidemiology of first-time HIV diagnoses in Canada in 2022, by geographic region, age at diagnosis, sex, race and/or ethnicity, and exposure category, and to describe trends between 2013 and 2022. Updated information on immigration medical screening results for HIV, data on childbearing individuals with infants perinatally exposed to HIV, AIDS diagnoses and HIV mortality are also provided. While the term HIV refers to the viral infection itself, the terms AIDS refers to the most advanced stage of disease caused by HIV.

Data provided in this report can be divided into two sections:

- The first section focuses on HIV diagnoses in Canada in 2022 by geographic region, age at diagnosis, sex, race and/or ethnicity and exposure category in addition to presenting selected analyses from 2013-2022.

- The second section focuses on data from the Canadian Perinatal HIV Surveillance Program (2015-2022), immigration medical screening for HIV (2013-2022), AIDS case surveillance (2013-2022), and HIV mortality (2014-2022).

Methods

Data sources

Data from the following sources are presented in this surveillance report, and described in more detail subsequently:

- The National HIV Surveillance System (HASS), maintained by the Public Health Agency of Canada (PHAC);
- The Canadian Perinatal HIV Surveillance Program (CPHSP), maintained by the Canadian Pediatric and Perinatal HIV and AIDS Research Group (CPARG);
- Immigration medical screening, maintained by Immigration, Refugees and Citizenship Canada (IRCC);
- The Canadian Vital Statistics Death Database (CVSD), maintained by Statistics Canada.

National HIV Surveillance System

The National HIV Surveillance System (HASS), a passive case-based surveillance system, compiles non-identifiable information on recent HIV diagnoses as defined by the national case definition (PHAC national HIV case definition / National AIDS case definition) [21]. While data collection on HIV diagnoses through public health and laboratory reporting is the responsibility of individual provinces or territories, data submission to PHAC is voluntary. Data on each individual new diagnosis is submitted to PHAC through the submission of secure electronic datasets or using the national case report form [22].

Practices for the storage of raw data, including electronic datasets and case report forms, have been outlined in the **Directive for the collection, use and dissemination of information relating to public health (PHAC, 2013, unpublished document)**.

Since 2020, PHAC has requested the submission of data on first-time diagnoses either through a dataset with first-time diagnoses only or a dataset with both first-time diagnoses and previously diagnosed cases (either out of country/out of province or territory) with a variable to distinguish between first-time diagnoses and previously diagnosed cases. Identification and removal of 'duplicate' cases, including cases previously diagnosed within the reporting province or territory, prior to submission to PHAC are the responsibility of provinces or territories. Furthermore, details on 2022 data submitted by PT public health authorities are provided in **Appendix 2**.

Information on HIV cases diagnosed before December 31, 2022 such as age, sex, race and/or ethnicity, and behaviours and exposures that may be associated with the transmission of HIV (presented as "exposure categories") is presented in this surveillance report. Provincial or territorial HIV surveillance data was submitted to PHAC by all provinces and territories by September 7, 2023 and validated by September 18, 2023. Differences between data published in this report and data published in provincial and territorial surveillance reports are possible as PT surveillance data may be updated after submission to PHAC. In the event of any differences, the provincial and territorial reports are recommended as the primary source of information. In addition to 2022 data, Ontario (since 1985), Quebec (since 2012), British Columbia (since 1995) and Northwest Territories (since 2013) resubmitted updated historical data. As a result of surveillance data refinements by PT over time due to periodic reviews and updates, surveillance data for previous years may also be submitted along with the current year's data by PT. Therefore, historical data presented in this report may not exactly match historical data presented in previous national reports.

Canadian Perinatal HIV Surveillance Program

National data on the HIV status of infants born to women or other pregnant people living with HIV is collected by the Canadian Pediatric AIDS Research Group (CPARG) through the Canadian Perinatal HIV Surveillance Program (CPHSP), which is supported by the Canadian Institutes of Health Research-Canadian HIV Trials Network. CPHSP is a sentinel-based active surveillance system that focuses on two groups of children: infants born to people who are pregnant and living with HIV, and children living with HIV receiving care at any participating site, which are 22 pediatric and adult HIV centres or public health units from all Canadian provinces and territories, whether they were born in Canada or abroad [23]. Information about the infants and the person who gave birth to them is collected through a national, non-nominal, confidential survey of participating pediatricians in the 22 sites. CPARG estimates that the CPHSP sites cover 95% of all infants born in Canada who were exposed to HIV.

Information regarding infants and the person who gave birth to them is captured and entered by participating sites upon obstetric or pediatric referral for care. Data collected include: country of birth of the person who is pregnant, self-reported race and/or ethnicity of the person who is pregnant,

exposure category for acquiring HIV of the person who is pregnant, antiretroviral regimen and duration of therapy administered, gestational age, mode of delivery of the infant, and infant birth weight. Polymerase chain reaction tests for HIV (confirmed on at least two separate samples) and/or by HIV serology beyond 18 months of age were used to report the HIV status of the infant. HIV status is updated annually and include: “confirmed living with HIV”, “confirmed not living with HIV”, or “HIV status not confirmed.”

CPHSP Surveillance data for 2022, including data updates for previous years, were submitted to PHAC in March 2023.

Immigration medical screening

Information from the Immigration Medical Exam (IME) for migrants who have tested positive for HIV in Canada or internationally was included in the Global Case Management System (GCMS), maintained by Immigration, Refugees and Citizenship Canada (IRCC). The GCMS, used for the processing of applications for permanent and temporary residence in Canada by foreign nationals, includes information regarding an individual’s IME. IMEs are administrated by third-party panel physicians on behalf of IRCC either in Canada or internationally and must be completed by the following individuals: all foreign nationals applying for permanent residence and some applying for temporary residence in Canada. As of 2002, routine HIV screening was added as a mandatory component to the IME for applicants 15 years of age and older, and for those under 15 years of age with certain risk factors [24]. Data collected by IRCC includes data on individuals who tested positive in Canada in 2022 and those who tested positive outside of Canada and arrived in Canada in 2022.

Aggregate, non-identifying data on individuals who tested positive for HIV during an IME were provided to PHAC by IRCC in July 2023 and included the following: country of birth, sex, age group, and the province or territory where the IME was conducted (if in Canada), and the year tested (for those tested in Canada) or the year the applicant landed in Canada (for those tested outside of Canada). The following individuals are broadly classified as ‘migrants’: immigrants (permanent residents in the economic and family classes); refugees (resettled refugees, protected persons, and asylum claimants); and temporary residents (visitors, international students, temporary foreign workers, and temporary resident permit holders).

Nominal data from in-Canada and international test results where HIV was detected and a valid Canadian residential address including the PT of residence are routinely shared by the IRCC with the applicable PT for the purpose of supporting and promoting continuity of care. Historically, provinces and territories have either counted data received from IRCC as new diagnoses or excluded these from the counts of new diagnoses, with the specific procedure varying by PT. Efforts by the PTs to improve the differentiation of these cases continued with the 2022 data submission.

Canadian Vital Statistics Death Database

Regardless of cause, deaths in Canada must be registered with the provincial and territorial vital statistics registrars [25]. Data on all deaths that occurred are annually submitted to Statistics Canada, responsible for the Canadian Vital Statistics Death Database (CVSD), by provincial and territorial vital statistics registries. The CVSD, a cumulative record of death statistics derived from the annual submission of death registry forms collected by the central registry in each PT, classified cause of death based on International Classification of Diseases (ICD) codes. Between 1979 and 1999, the 9th revision of the International Classification of Diseases (ICD-9) was used to classify deaths with codes 042 to 044 indicating deaths attributed to HIV infection. From 2000 onwards, codes B20 to B24 were used to classify deaths attributed to HIV infection in the 10th revision (ICD-10).

Mortality data specific to year of death, cause of death, sex, and age at death were extracted from the publicly available data "Deaths and age-specific mortality rates, by selected grouped causes" [26] in the CVSD on December 1, 2023. For the national HIV surveillance report, the focus is on deaths attributed specifically to HIV.

Data analysis

Standardized data verification and recording procedures were applied to all datasets submitted by the individual provinces and territories and used to develop the national dataset. Individual PT data in report format table is submitted to the PT that had originally submitted the dataset for review and validation. After resolution of discrepancies (if any) and final agreement from the provinces and territories, national datasets were prepared.

Overall and geographic region, age group and sex stratified case counts and rates (cases per 100,000 population) are presented in this report. Rates were calculated using population data extracted from the Annual Demographic Statistics dataset from Statistics Canada, Demography Division [27] published to indicate the estimated size of the Canadian population on July 1, 2022.

Additional statistical procedures for comparative analyses or methods for handling missing data were not used in this report. Where deemed necessary by provincial and territorial surveillance data providers, data with small cell sizes (n ≤ 5 cases) were suppressed or data categories were merged to create larger categories.

The national dataset was compiled using first-time diagnoses reported in Canada between 2013 and 2022 using the following definitions:

- **First-time diagnosis:** HIV diagnosed and reported for the first time ever for the individual in the given reporting year and with no evidence of previous diagnosis, neither in another country nor in another Canadian province or territory.

- **Previous diagnosis**: individuals who had evidence of a known previous HIV diagnosis in another country or in another Canadian province or territory, as reported by an indicator in individual case records (see next section for more details).

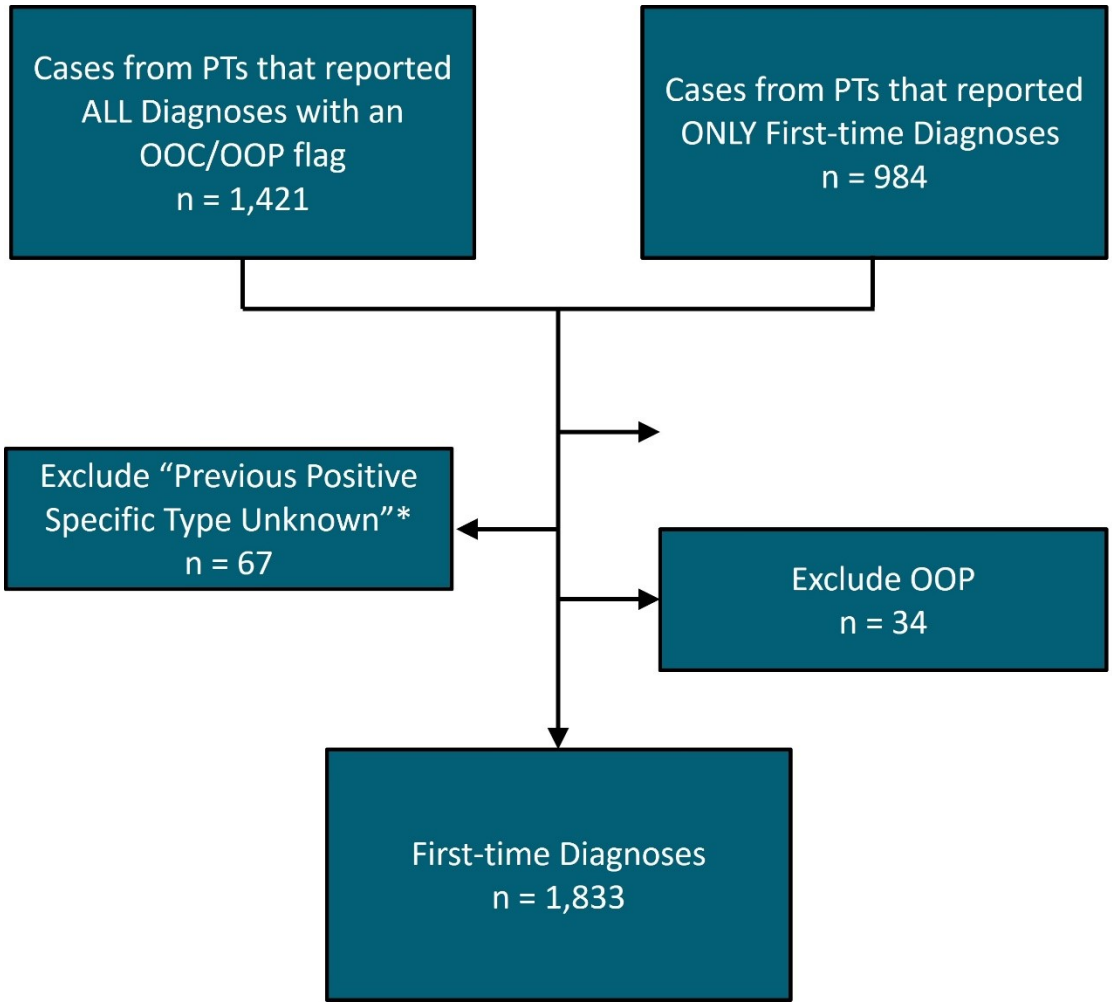
Finalizing the first-time HIV diagnoses dataset

The 2022 report is the second national HIV surveillance report where all 13 provinces and territories submitted either data for first-time diagnoses only or data for all cases with an indicator for the identification of cases diagnosed outside of Canada (i.e. Out of Country, OOC) or diagnosed in another PT outside of the reporting PT (i.e. Out of Province, OOP). Cases reported from provinces and territories who report only first-time diagnoses and cases identified as first-time diagnoses from provinces and territories who submit all cases were combined, and previously diagnosed cases as identified in the submitted PT datasets were excluded **(Figure 1),** to produce the final count of first-time HIV diagnoses for the surveillance period, January 1 to December 31, 2022.

In 2022, there were 2,405 total reported HIV cases, of which 572 were previous diagnoses (471 were classified as out-of-country, 34 were classified as out-of-province, and 67 were classified generally as a previous diagnosis). With the previously diagnosed cases removed, there were a total of **n = 1,833** cases classified as first-time HIV diagnoses and used for further analyses in this report (**Figure 1**).

Some provinces and territories provided out-of-country and out-of-province indicators for previous years part of submissions for the 2020, 2021 and 2022 reports. PT data submissions for the reporting years between 2013 and 2022 are outlined in **Figure A1** (**Appendix 2**). The 2013-2022 national first-time diagnosis dataset includes 17,268 records for use in trend analysis and excludes all known out-of-country and out-of-province cases. This total likely includes some previously diagnosed cases since the ability to provide OOC/OOP flags for historical years by PT varied. As a result, trend analyses must be considered with caution. It is anticipated that the accuracy of first-time diagnosis dataset may improve over time with updates to historical data by PT public health authorities as part of future data submissions.

Figure 1: Schematic showing the data flow for first-time and previously diagnosed HIV cases from all provinces and territories for 2022.



Abbreviations: PT, Province or Territory; OOC, Out of Country; OOP, Out of Province; n, number

* The 'Previous Positives Specific Type Unknown' are previously diagnosed cases that have been identified as previous positives, but insufficient information is available to attribute them to either OOC or OOP.

Surveillance data at a glance

First-time diagnoses

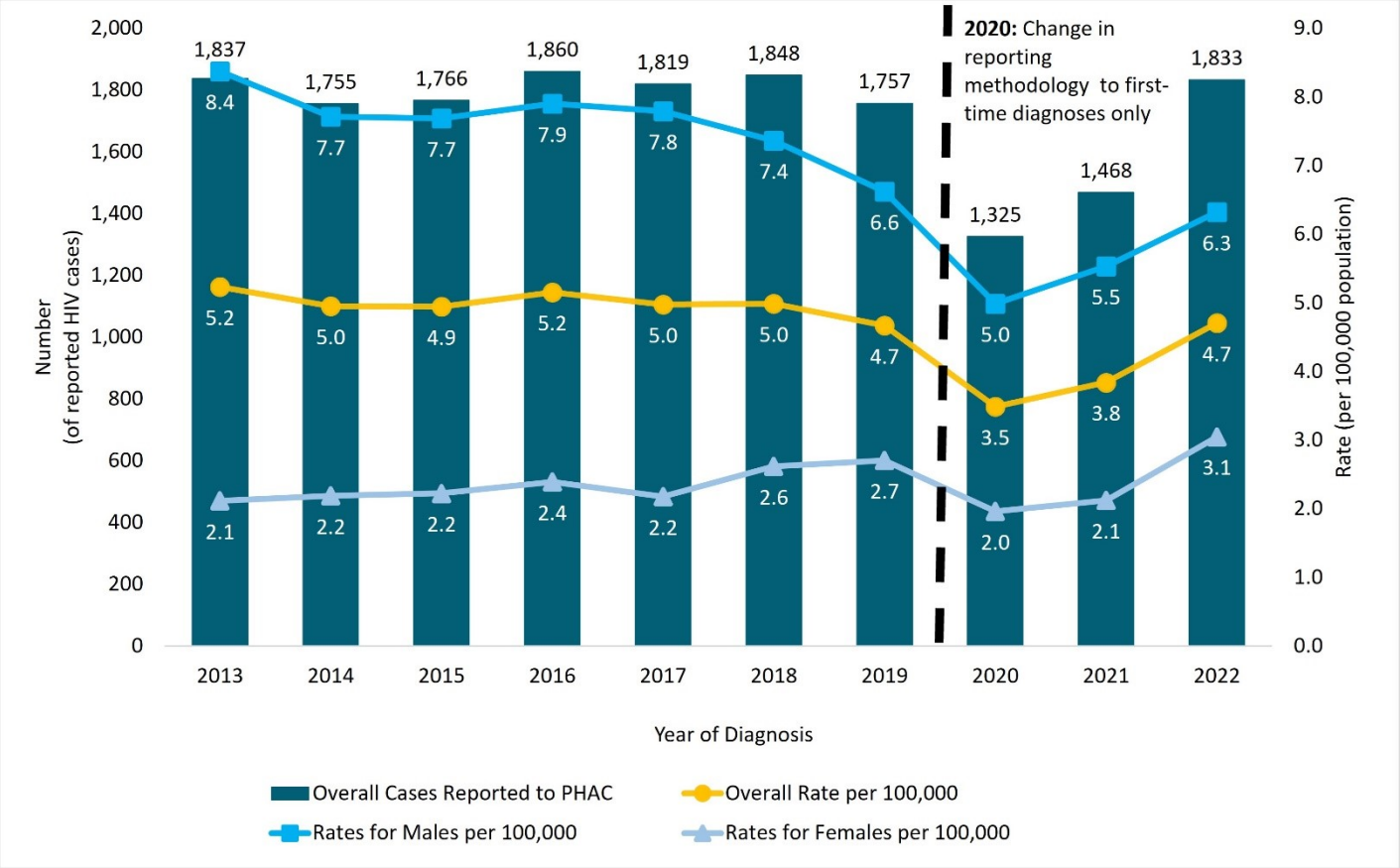
Overall trends in HIV diagnoses

In 2022, there were 1,833 cases of first-time HIV diagnoses reported in Canada. This is an increase of 24.9% compared with the number of cases reported in 2021 (1,468 cases). The national HIV diagnosis rate was 4.7 per 100,000 population (6.3 per 100,000 population in males and 3.1 per 100,000 population in females) in 2022. Between 2013 and 2019, the national diagnosis rate fluctuated within a narrow range (between 4.7 and 5.2 per 100,000) before decreasing sharply overall in 2020 with the onset of COVID-19. This trend was also seen among males and females. There was a slight increase in 2021 and, with the further increase in 2022, the rate returned to pre-COVID-19 pandemic levels. In the five-year period before the pandemic (2015-2019), the HIV diagnosis rate in males decreased overall from 7.7 per 100,000 population in 2015 to 6.6 per 100,000 population in 2019. In comparison, the HIV diagnosis rate in females increased from 2.2 per 100,000 population in 2015 to 2.7 per 100,000 population in 2019 (**Figure 2**, **Data Table 1**).

Diagnosis rate – the number of people diagnosed with HIV for the first time in a given year for every 100,000 people in the population of Canada that year. This diagnosis data is what is presented in this report.
Incidence – the estimated number of new infections occurring during a specific period of time, including people who have not been tested.
Prevalence – the estimated number of people living with HIV - both diagnosed and undiagnosed.
Incidence and prevalence are estimated by the Estimates and Field Surveillance Section and are not presented in this report , but can be found in the "Estimates of HIV incidence, prevalence and Canada's progress on meeting the 90-90-90 HIV targets, 2020" report [6]

Note that the data tables used to generate figures are found at the end of this report (**Data Tables**, **1-10**).

Figure 2: Number of first-time diagnoses of HIV and diagnosis rates overall, by sex and year, Canada, 2013 to 2022 [a,b]



[a] Rates and counts for Males and Females exclude cases where sex was reported as transgender, or cases where sex was not reported. For the Overall rates, cases where sex was reported as transgender, or not reported are included (n=12).

[b] For the years 2020-2022, first-time diagnoses are reported for all provinces/territories. Refer to the Technical Notes (**Appendix 2**) for the submission of first-time diagnosis for historical data for each province/territory.

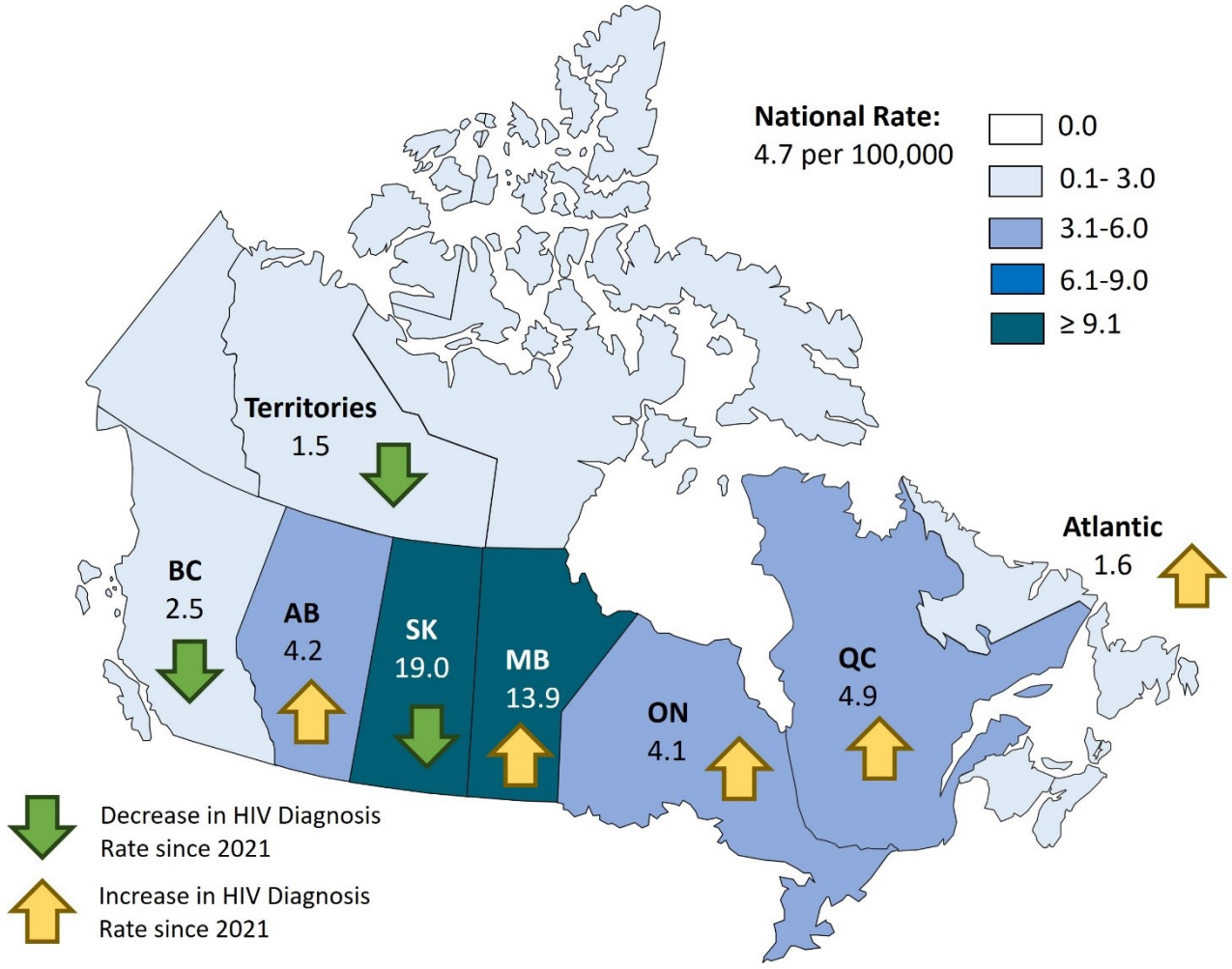
Geographic distribution

The first-time HIV diagnosis rates across Canada are shown in **Figure 3**. Rates for the Territories (Northwest Territories, Nunavut, and Yukon) and the Atlantic region (New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island) are presented as regional averages (average of each provincial or territorial rate). Saskatchewan continued to have the highest rate; the Territories and the Atlantic region had the lowest rates. While the overall national rate increased from 2021 to 2022, this was not uniform across all provinces and territories (PT). An increase in HIV diagnosis rate was observed in all provinces and territories from 2021 to 2022 except for British Columbia (which decreased from 2.8 to 2.5 per 100,000), Saskatchewan (decreased from 20.1 to 19.0 per 100,000)

and the Territories (decreased from 1.6 to 1.5 per 100,000). These rates are below pre-pandemic levels in all provinces and territories. (**Figure 3**, **Data Table 2**).

Canada is a heterogenous country that encourages diverse ways of knowing, living and healing. Consequently, each PT strives to meet the needs of its population and unique geographic region. The transmission of HIV can be influenced by various factors, that differ between regions and may be more pronounced in some regions than others, such as access to healthcare, perceived risk of infection, patient provider relationship, housing, work and food security, culture, gender, age and socioeconomic status. Due to the complex factors that can impact how HIV can be transmitted or acquired, the approaches taken by PT to address the issue can vary significantly. As a result, provincial reports should be consulted for further information regarding the status and trends in HIV in those regions, as they will have greater detail regarding their key considerations.

Figure 3: Changes in first-time HIV diagnosis rate per 100,000 population, by province or territory, Canada, 2022 [a,b,c]



Abbreviations: BC, British Columbia; AB, Alberta; SK, Saskatchewan; MB, Manitoba; ON, Ontario; QC, Quebec; ≥, greater than or equal

[a] Note that for Alberta, national reporting excludes HIV cases where the location of first-ever positive has been identified as out-of-country or outside the reporting province; consequently, HIV case totals and rates in this report may differ from those reported by Alberta.

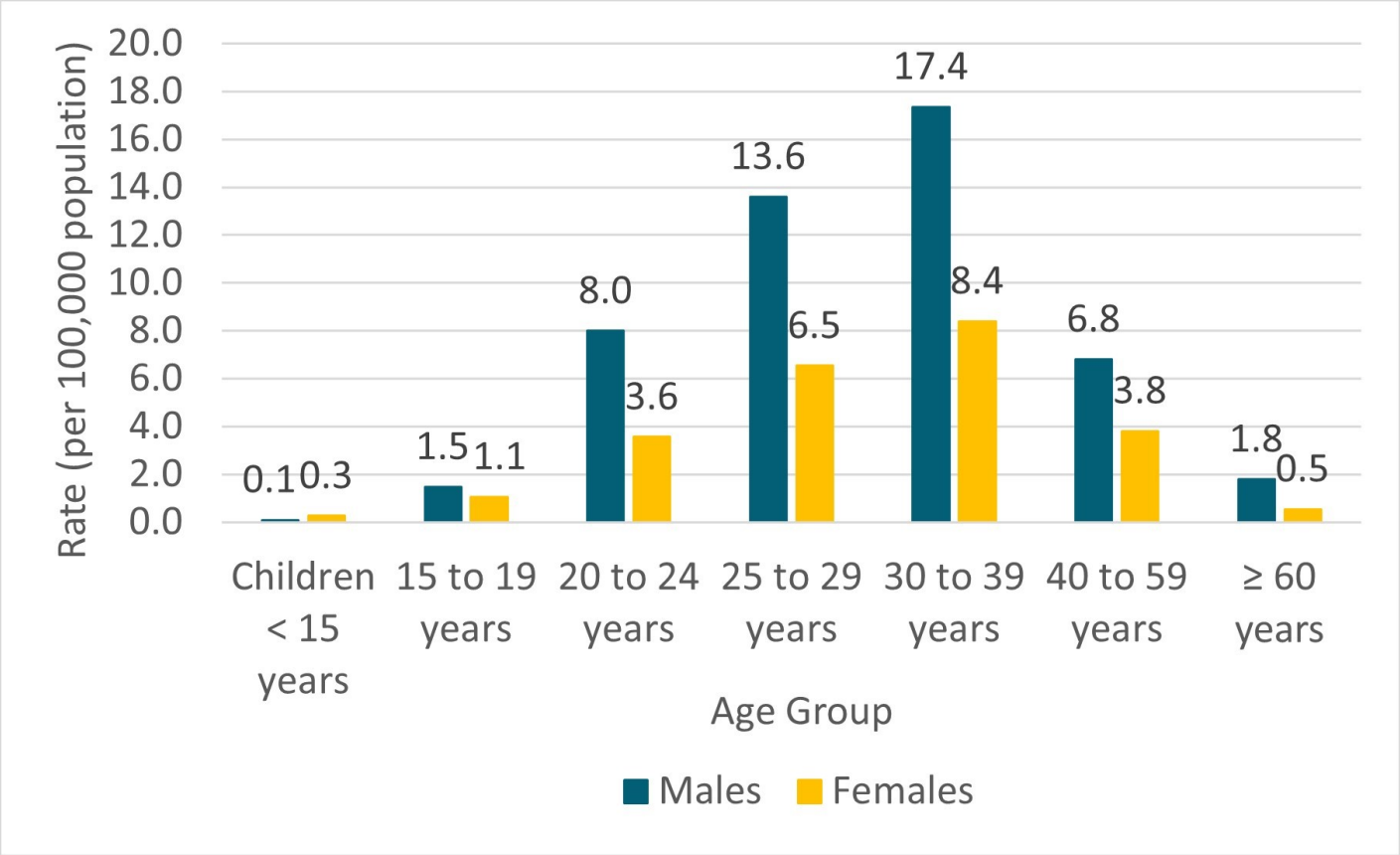
[b] Due to small case counts in certain provinces and territories, some regions are aggregated to ensure that individuals cannot be identified. For this reason, interprovincial or interterritorial comparisons cannot always be made.

[c] Due to the complex factors that can impact how HIV can be transmitted or acquired, the approaches taken by PT to address the issue can vary significantly. As a result, provincial reports should be consulted for further information regarding the status and trends in HIV in those regions, as they will have greater detail regarding their key considerations.

Age group and sex distribution

In 2022, among the cases where sex was reported as male or female (n=1,821), males accounted for 67.2% of diagnoses (n=1,224), while females accounted for 32.8% (n=597). The proportion of cases where sex was reported as female has increased from 20.4% in 2013 to 32.8% in 2022. There were 12 cases where sex was either not reported or reported as transgender. First-time HIV diagnosis rates were also stratified based on age group and sex. The age-specific HIV diagnosis rate increased for all age groups in females from 2021 to 2022 except for the 15 to 19 years (1.3 per 100,000 in 2021 vs. 1.1 per 100,000 in 2022) and ≥60 years (0.5 per 100,000 in both 2021 and 2022) age groups. In males, the age-specific HIV diagnosis rate increased in all age groups except for the following: 25 to 29 years (14.1 per 100,000 in 2021 vs. 13.6 per 100,000 in 2022), 40 to 59 years (7.0 per 100,000 in 2021 vs. 6.8 per 100,000 in 2022) and ≥60 years (1.8 per 100,000 in both 2021 and 2022). The highest observed HIV diagnosis rate in any sex-age group was in the male 30 to 39 year age group, with a rate of 17.4 per 100,000 population. Similarly, the 30 to 39 year age group had the highest diagnosis rate among female cases at 8.4 per 100,000 population. HIV diagnosis rates were observed to be at least two times greater in males than in females for most age groups. However, for children aged <15 years, females had a higher HIV diagnosis rate and a similar HIV diagnosis rate was observed among females and males in the 15 to 19 years age group (**Figure 4**, **Data Table 3**).

Figure 4: First-time HIV diagnosis rate per 100,000 population, by sex and age group, Canada, 2022 [a]

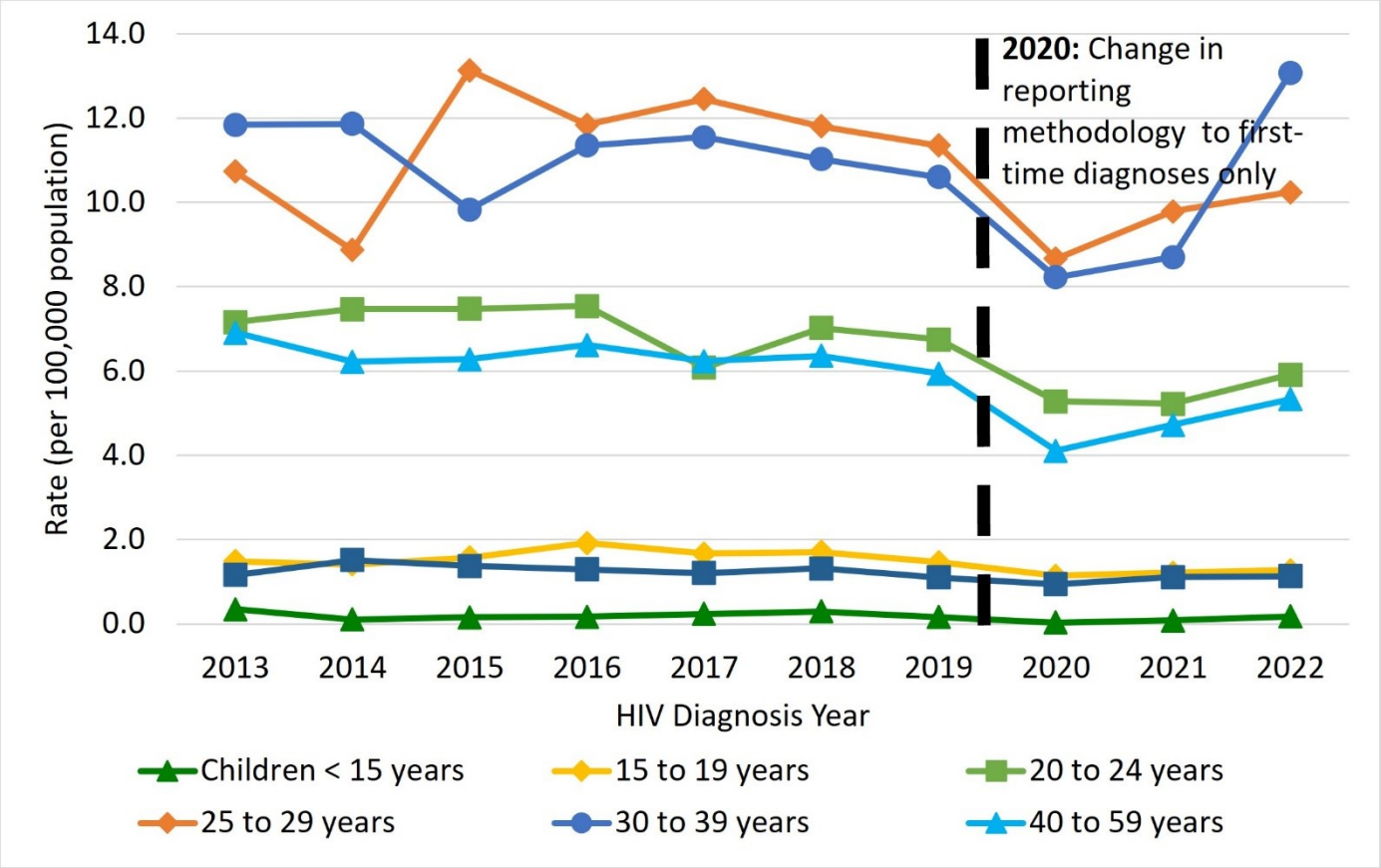


Abbreviations: <, less than; ≥, greater than or equal

[a] Excludes cases where sex was reported as transgender or cases where sex was not reported. These data are excluded because there are not currently any estimates of transgender and gender-diverse population sizes by age and jurisdiction over time available from Statistics Canada. HASS is currently undergoing a renewal process and we are aiming to improve the inclusion of data representing transgender and gender-diverse populations in future years.

HIV diagnosis rates have increased from the previous year for all age groups, but prior, there was some fluctuation in all age groups, but with a general decreasing trend from 2013-2021. The majority of HIV cases diagnosed in 2022 were between the ages of 20 and 49 years, which reflects trends observed in the previous ten years. While the 25 to 29 year age group had the highest diagnosis rate in previous years, in 2022 the highest diagnosis rate was observed in the 30 to 39 years old age group, with a rate of 13.1 per 100,000 population. The HIV diagnosis rate in 2022 was 5.9 and 10.2 per 100,000 population in age groups 20 to 24 and 25 to 29, respectively. The lowest HIV diagnosis rate in adults was observed among those aged 60 years of age and over, with a diagnosis rate of 1.1 per 100,000 population. The diagnosis rates in most age groups are now at or near pre-COVID-19 pandemic levels, with the exception of the 30 to 39 old age group which is above pre-pandemic levels (**Figure 5**, **Data Table 4**).

Figure 5: First-time HIV diagnosis rate per 100,000 population, by age group and year, Canada, 2013 to 2022 [a]



Abbreviations: <, less than; ≥, greater than or equal

[a] For the years 2020-2022, first-time diagnoses are reported for all provinces/territories. Refer to the Technical Notes (**Appendix 2**) for the submission of first-time diagnosis for historical data for each province/territory.

Exposure category distribution

In contrast to previous years, the largest proportion of adult HIV diagnoses was attributed to heterosexual contact (39.2%, n = 568); followed by male-to-male sexual contact at 34.8% (n = 504) (**Table 1**). In 2022, the proportion of HIV diagnoses attributed to injection drug use (IDU) decreased to 20.5% (n = 297) from 21.8% (n = 260) in 2021. It should be noted that in past years, the 'Other' category included cases with exposures outside of Canada, which as noted previously, were removed from the dataset.

Among females (≥ 15 years of age), exposure through heterosexual contact accounted for the highest proportion at 60.1% (n = 280), followed by IDU (36.1%, n = 168) (**Table 1**). In males (≥ 15 years of age), in 2022, the majority of cases were attributed to male-to-male sexual contact (51.1%, n = 501), followed by heterosexual contact (29.4%, n = 288) and then IDU (13.1%, n = 129).

Table 1: Number and proportion of first-time HIV cases (≥15 years of age), by sex and exposure category, Canada, 2022 [a,b,c,d]

Exposure category	Male		Female		Total [a]	
	n	% [b]	n	% [b]	n	% [b]
Male-to-male sexual contact	501	51.1	n/a	n/a	504	34.8
Male-to-male sexual contact and IDU	48	4.9	n/a	n/a	48	3.3
IDU	129	13.1	168	36.1	297	20.5
Heterosexual contact	288	29.4	280	60.1	568	39.2
Other [c]	15	1.5	18	3.9	33	2.3
Subtotal	**981**	**80.5%**	**466**	**79.1%**	**1,450**	**79.7%**
No identified risk [d]	53	4.3	22	3.7	77	4.2
Exposure category unknown or not reported ("missing")	185	15.2	101	17.1	293	16.1
Total	**1,219**	**n/a**	**589**	**n/a**	**1,820**	**n/a**

Abbreviations: n, number; n/a, not applicable; IDU, injection drug use

Refer to **Appendix 3** for details regarding exposure categories.

[a] Total columns includes cases reported as transgender and cases where sex was not reported, whereas "male" and "female" columns exclude these cases.

[b] Proportions are based on the subtotal count for cases with a known exposure category.

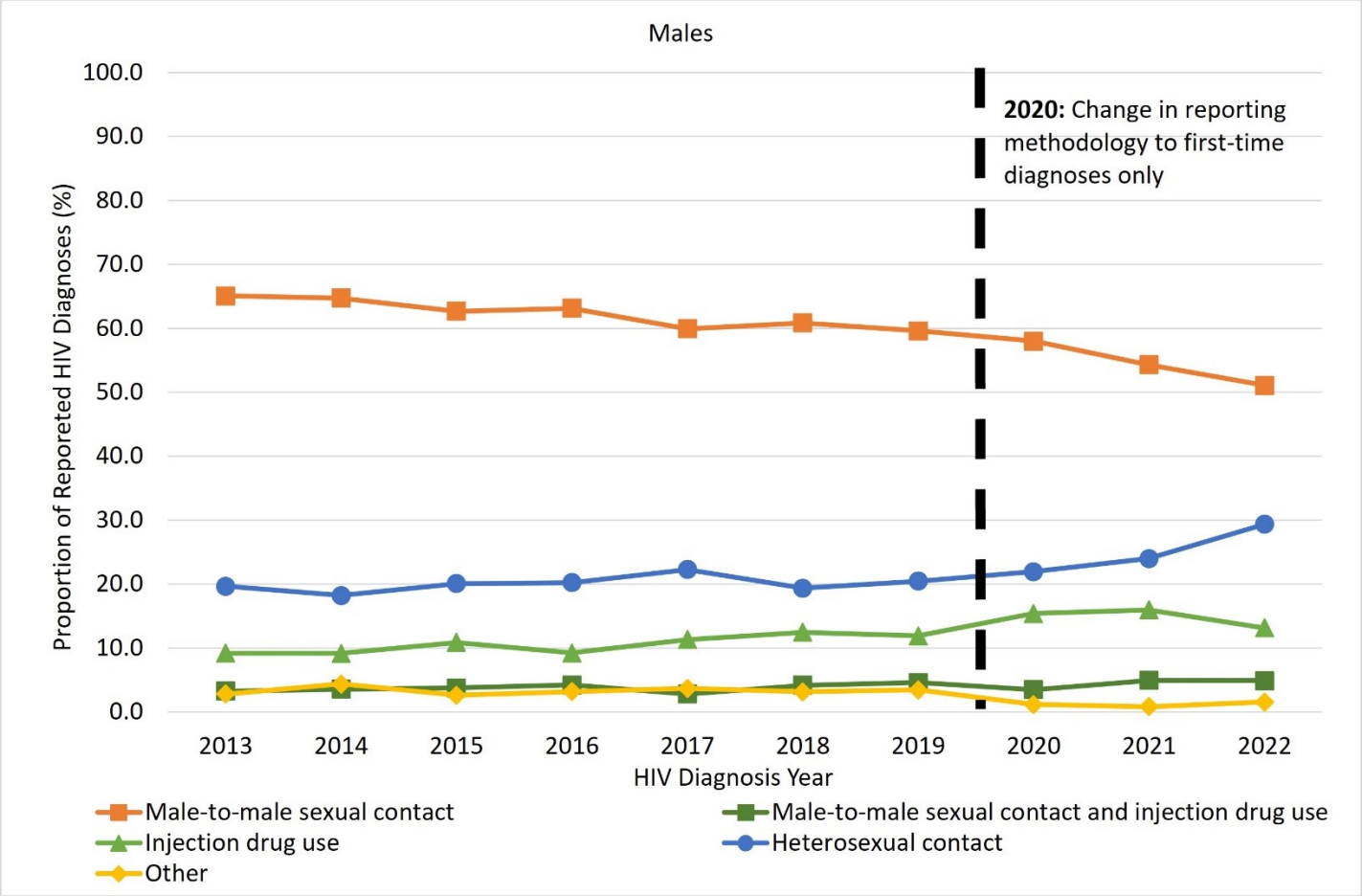
[c] Other includes blood/blood products, perinatal, occupational exposure, IRCC/Out of Country exposure (Alberta) and other exposure categories.

[d] Includes cases where the history of exposure to HIV through any of the other modes listed is unknown, or there is no reported exposure history (e.g., because of death, or loss to follow-up).

The distributions for exposure categories in males and females for the last ten years are shown in **Figure 6a** and **6b, respectively**. Among males, the distribution of diagnoses within the different exposure categories fluctuated slightly since 2013, with the proportion of cases attributed to male-to-male sexual contact decreasing and the proportion attributed to heterosexual contact increases in recent years (**Figure 6a, Data Table 5b**). For females, in the last ten years, the proportion of cases attributed to the IDU exposure category increased from 22.0% in 2013 and to 40.4% in 2020, followed by decreases to 37.7% in 2021 and 36.1% in 2022 (**Figure 6b, Data Table 5c**).

Caution is advised when comparing the 2022 data with that of previous years. Beginning in 2020, cases considered OOC have been removed from the 'Other' exposure category (with the exception of some cases from Alberta), as part of the methodological change to reporting only first-time diagnoses. This results in an overall reduction in the number of cases - from all reported cases to first-time diagnoses only and may have influenced the proportions of the exposure categories.

Figure 6a: Percentage distribution of first-time HIV cases among adult males (≥ 15 years old), by exposure category and year of diagnosis, Canada, 2013 to 2022 [a,b,c]

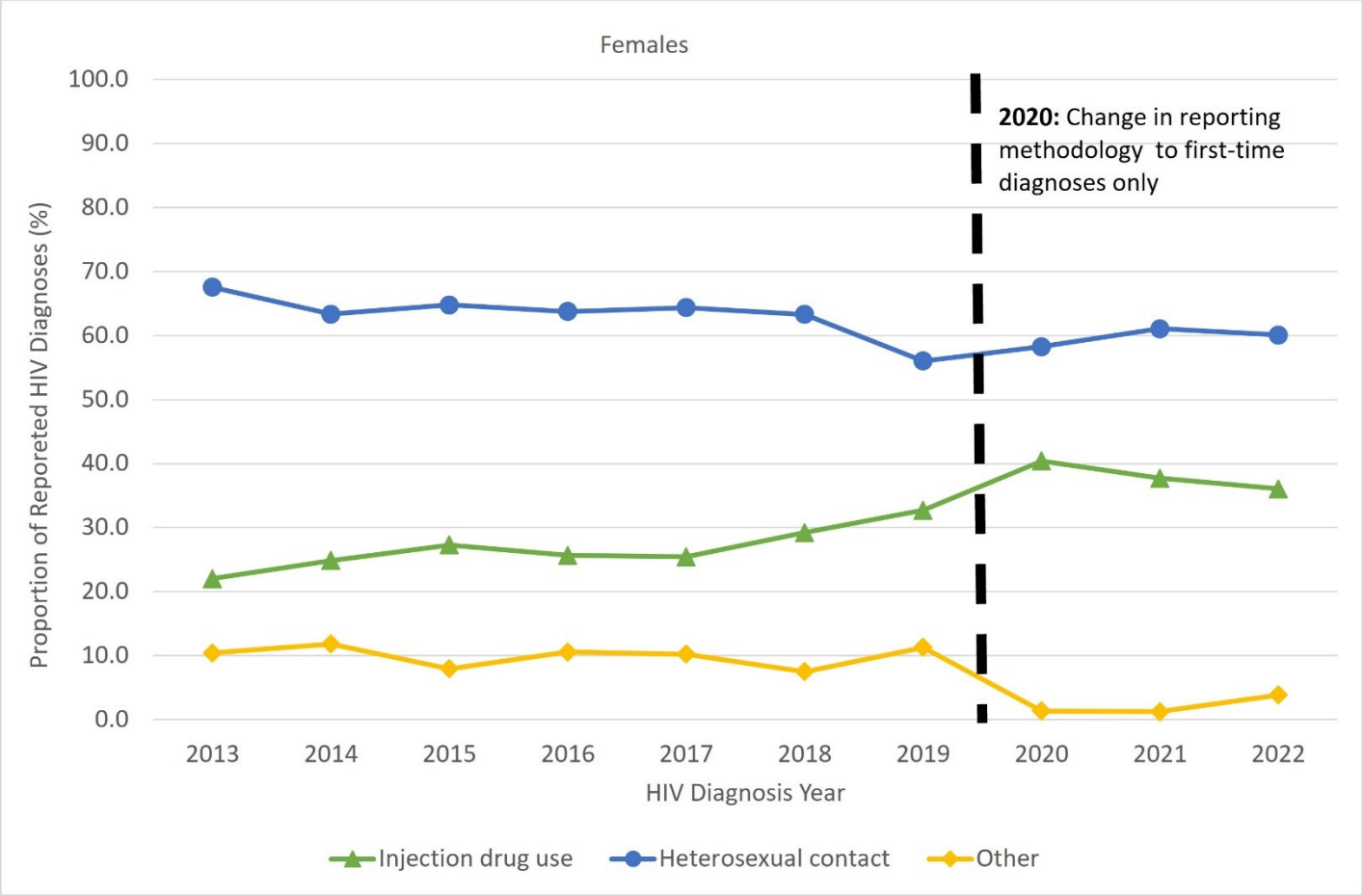


[a] Excludes cases with no identified risk, an unknown exposure category, or where the exposure category was not reported.

[b] For the years 2020-2022, first-time diagnoses are reported for all provinces/territories. Refer to Technical Notes (**Appendix 2**) for the submission of first-time diagnosis for historical data for each province/territory and for exposure category.

[c] Other includes blood/blood products, occupational exposure, cases from Alberta identified through Immigration Refugees and Citizenship Canada, and other exposure categories.

Figure 6b: Percentage distribution of first-time HIV cases among adult females (≥ 15 years old), by exposure category and year of diagnosis, Canada, 2013 to 2022 [a,b,c]



[a] Excludes cases with no identified risk, an unknown exposure category, or where the exposure category was not reported.

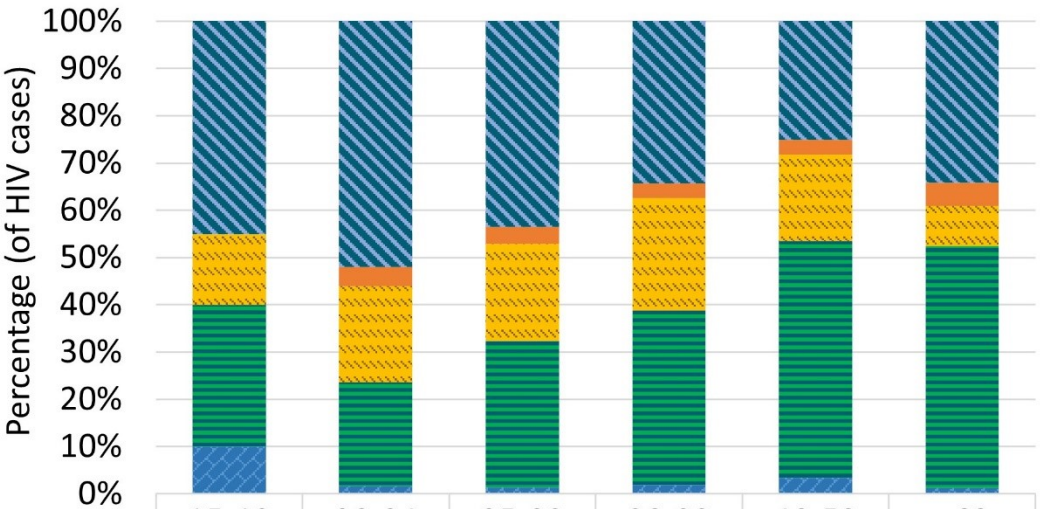
[b] For the years 2020 - 2022, first-time diagnoses are reported for all provinces/territories. Refer to Technical Notes (**Appendix 2**) for the submission of first-time diagnosis for historical data for each province/territory and for exposure category.

[c] Other includes blood/blood products, occupational exposure, cases from Alberta identified through Immigration Refugees and Citizenship Canada, and other exposure categories.

Exposure category and age group

Among the 15 to 19, 20 to 24 and 25 to 29 year age groups, male-to-male sexual contact was the largest exposure category reported, 45.0%, 52.0%, and 43.5% of cases respectively. In contrast, heterosexual contact accounted for 36.9%, 50.1%, and 51.2% of reported exposures in the 30 to 39 year, the 40 to 59 year, and the ≥60 year age groups, respectively. (**Figure 7, Data Table 6**).

Figure 7: Proportion of reported first-time HIV cases (≥15 years of age), by exposure category and age group, Canada, 2022 [a,b]



Exposure Category	15-19 years (n=20)	20-24 years (n=123)	25-29 years (n=223)	30-39 years (n=591)	40-59 years (n=411)	≥60 years (n=82)
Male-to-male sexual contact	45.0%	52.0%	43.5%	34.3%	25.1%	34.1%
Male-to-male sexual contact and injection drug use	0.0%	4.1%	3.6%	3.0%	3.2%	4.9%
Injection drug use	15.0%	20.3%	20.6%	23.9%	18.2%	8.5%
Heterosexual contact	30.0%	22.0%	30.9%	36.9%	50.1%	51.2%
Other	10.0%	1.6%	1.3%	1.9%	3.4%	1.2%

Abbreviations: n, number; ≥, older than or equal

[a] Excludes cases with no identified risk, an unknown exposure category, or where the exposure category was not reported.

[b] "Other" includes blood/blood products, occupational exposure, cases from Alberta identified through Immigration Refugees and Citizenship Canada, and other exposure categories.

Race and/or ethnicity

Black, Indigenous and other racialized persons face unique challenges in accessing and receiving quality care, stemming from the reality of colonialism, systemic and structural racism, and social inequities between White vs. non-White individuals, and Indigenous vs. non-Indigenous individuals in Canada. Stigma and discrimination, a lack of trust in health care professionals, and culturally inadequate or inappropriately tailored services are known barriers to accessing appropriate HIV care

among these groups [2, 28-31]. The collection of race and/or ethnicity-based information is a crucial element in recognizing, understanding, and addressing these disparities [32]. However, the completeness of these data in HIV surveillance has historically been low. Currently race and/or ethnicity information is missing for more than half of cases in the past few years. The current review of the national HIV surveillance program, including the collection of race and/or ethnicity information, has been undertaken in an effort to modernize and strengthen surveillance to better meet the needs of data users. As part of these efforts, we are collaborating with data contributors, data users, and community-based partners to identify priorities and ensure data collection and dissemination are done safely and in ways that reduce harm and provide supports to those populations most likely to be impacted.

Race is a social construct used to categorize people based on perceived physical differences (e.g., skin colour, facial features). While there is no scientifically accepted evidence of a biological basis for the identification and classification of discrete racial groups, ignoring race disregards the reality of injustices and social stratification within society. Disaggregating health indicators by race can therefore help us identify, monitor, and address inequalities that potentially stem from bias and racism — systemic, interpersonal, and internalized [32]. Race can be considered an important determinant of health that influences equity in health including the disproportionate burden of HIV in some communities, particularly Indigenous and Black communities.

Ethnicity is a multi-dimensional concept referring to cultural group membership; it may be connected to language, religious affiliation, or nationality, among other characteristics. Ethnicity data can be useful for tailoring culturally appropriate health services and understanding diversity [32]

Racialization is the process by which societies construct races as real, different, and unequal in ways that affect economic, political, and social life, and impose these constructions onto people [33].

Identifying the intersection of race with other social determinants of health, such as age, gender, and socioeconomic status, race-disaggregated data can help to provide a more fulsome picture of Canada's HIV landscape and barriers to care.

> "Disaggregated data is a critical tool that helps make visible the ways in which structural racism, systemic white supremacy and social exclusion both harm Indigenous and racialized peoples and sustain unearned privilege for white settlers. By collecting race and Indigenous identifiers, and ensuring they are used in a good way in partnership with [Black, Indigenous, and other racialized persons], we can take collaborative actions towards our fully realized health and wellness through evidence-based and self-determined policies, programs, and services."

— Dr. Danièle Behn Smith, Deputy Provincial Health Officer, Indigenous Health, Ministry of Health, Government of British Columbia [32]

In surveys developed by PHAC to assess the impact of the COVID-19 pandemic on provision of and access to STBBI health services the disproportionate, increased burden of HIV on racialized communities has been highlighted. Concerning access to support and treatment for people living with HIV (PLHIV): 20.6% of responding providers reported a strong decrease in their ability to provide services. More than half of these providers provided Indigenous health or healing practice services [34]. Among individuals who self-identified as being African, Caribbean, or Black (ACB) living with HIV in Canada, 38% of respondents reported experiencing challenges accessing an HIV care provider or clinic [30] Among ACB respondents, there was a noted increased experience of financial or food insecurity, domestic violence, substance use, and discrimination over the course of the COVID-19 pandemic, all of which have been linked to vulnerability to HIV infection [30]. This indicates that Black communities continue to be disproportionately impacted by HIV.

Before 2021, some race and/or ethnicity information was submitted by all PT except Quebec and British Columbia. As of 2021, race and/or ethnicity information, excluding Indigenous identity information, from British Columbia is included. In 2022, Manitoba and Nova Scotia also excluded race and/or ethnicity information from their data submission. Completeness of the data submitted varies significantly across provinces and territories. In 2022, Quebec provided first-time diagnosis case information from 2013-2022, and as such, their case counts for 2013-2022 includes only first-time diagnoses instead of all cases as in previous years. Due to this update in historical data, the proportion of completeness reported in previous years has changed. In 2021, race and/or ethnicity information was available for only 45.2% of all cases submitted to PHAC, and in 2022 the proportion of complete data for race and/or ethnicity information decreased to 42.3% (**Table 2**).

Table 2: Proportion of HIV diagnoses with race and/or ethnicity information in the HASS National Dataset, Canada, 2013-2022 [a,b]

HIV diagnosis year	Percent completeness (%)
2013	53.8
2014	53.6
2015	56.0
2016	56.1
2017	57.0
2018	54.2
2019	49.6
2020	44.6
2021	45.2
2022	42.3

Refer to **Appendix 2** for details on race/ethnicity categories reported by provinces and territories.

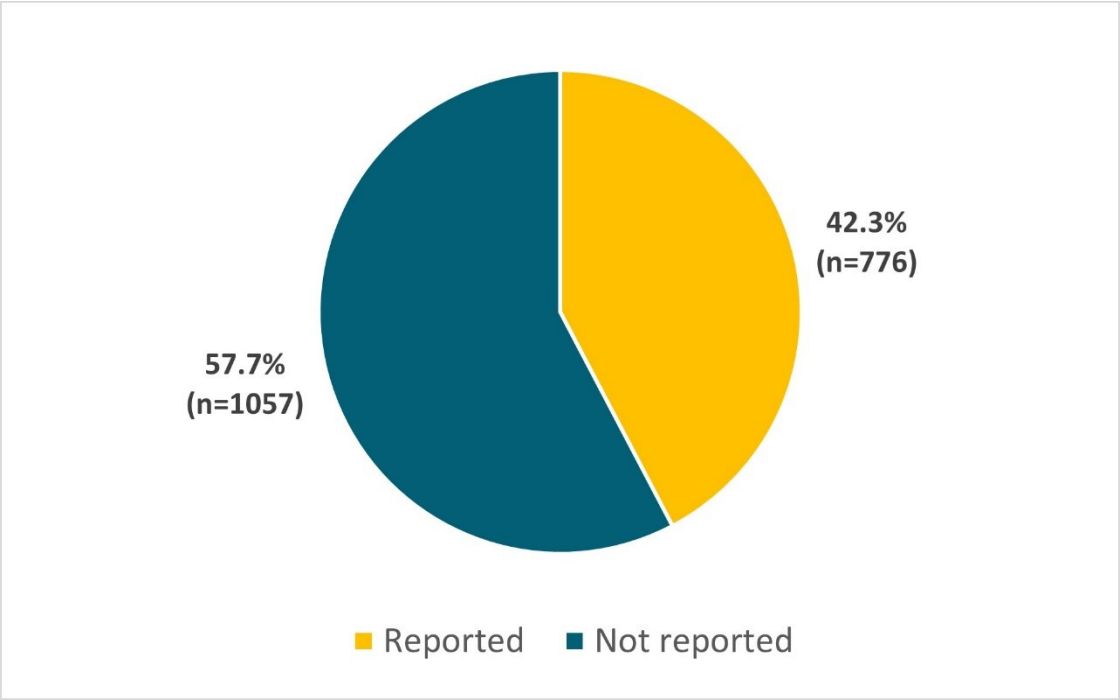
[a] Race and/or ethnicity information was not routinely submitted by British Columbia prior to 2021 and it is not submitted by Quebec; Manitoba did not submit race and/or ethnicity information in 2021 or 2022. Nova Scotia did not submit race and/or ethnicity from 2013-2022. The type of data that other provinces/territories submit varies considerably, with several provinces/territories only submitting a subset of the categories that are included in the tables and figures and with a varying degree of completeness. **Interpret data with caution**.

[b] Prior to 2021, Quebec submitted only data for all HIV diagnoses, with no capacity to separate out previous diagnoses from first-time diagnoses. In 2021, Quebec submitted aggregate historical data about first-time diagnoses and previous diagnoses for 2012-2021. Due to the update in historical data, data completeness proportions for previous years have changed and will not match those published in earlier reports (e.g., completeness for 2020 was reported as 36.1% in the HIV in Canada: Surveillance Report to December 31, 2020).

Current reporting practices for race and/or ethnicity information, such as reporting categories, vary and are limited in some provinces and territories. As such, findings should be interpreted with **caution** since a substantial portion of race and/or ethnicity information is missing or not reported. This missingness is not random, so the available data is likely not representative of the national patterns by race and/or ethnicity among HIV cases in Canada. Refer to **Appendix 2** for additional details on the race and/or ethnicity categories reported by provinces and territories.

In 2022, of all cases (n = 1,833), there were only 776 cases where race and/or ethnicity was reported – representing only 42.3% of cases with this information available (**Figure 8a**).

Figure 8a: Reporting of race and/or ethnicity data among **all cases**, 2022 (n=1,833) [a]



Refer to **Appendix 2** for details on race/ethnicity categories reported by provinces and territories.
[a] Race and/or ethnicity information is not submitted by Québec, Manitoba, or Nova Scotia. For British Columbia, Indigenous identity data was not included in the data submitted for race and/or ethnicity; for other jurisdictions, the race and/or ethnicity categories submitted and completion rate varied, interpret data with caution.

Among cases where race and/or ethnicity was reported (n = 776), the proportions need to be interpreted carefully as they represent only the cases where race and/or ethnicity was reported, for 2022. Of these, 30.5% of cases were reported as White, 22.6% as Indigenous (First Nations, Inuit, Métis, or Indigenous-not otherwise specified), and 18.0% were reported as Black. Among males with race and/or ethnicity data, the largest proportion of cases was reported among White males (34.6%), followed by Black males (14.1%). Comparatively, in females, the largest proportion of cases was reported among Indigenous females (41.7%), followed by Black females (26.4%) (**Table 3** – **Figure 8b**).

Research and local public health surveillance data have consistently documented that Indigenous and racialized communities are disproportionately affected by HIV, yet low availability of race and/or ethnicity information collected through the HASS limits the ability to produce this evidence at the national level. Having this information available nationally could inform future research, policy and practice, and allow for comparison with other countries. From November 2022 to March 2023, a collaborative effort with community members led to the establishment of a Black Expert Working Group, which will provide ongoing advice to HASS and contribute to the co-development and

implementation of strategies to improve the completeness of race and/or ethnicity data. The goals are to: 1) help inform and support how provinces and territories collect these data (depending on the needs of particular provinces and territories); 2) rebuild trust by demonstrating PHAC's commitment to pursuing the development of anti-racist and decolonial approaches, in partnership with provinces and territories and community groups, leading to greater confidence among provinces and territories that data they share with PHAC will be used appropriately; 3) result in the availability of more complete, quality data, which will in turn inform the development of evidence and more appropriately tailored prevention programs. HASS is also currently working to develop similar engagements with Indigenous organizations. In addition to race and/or ethnicity data, HASS is collaborating with an established Working Group for people with lived and living experience of injection drug use (PWLLE), and with the Community Based Research Centre (CBRC) regarding the improvement of data regarding sex, gender, and sexual diversity.

Table 3: Number and percentage distribution of first-time HIV cases, **where race and/or ethnicity was reported**, by sex and race and/or ethnicity, Canada, 2022 [a,b,c,d,e,f,g]

	Cases where race and/or ethnicity was reported [a]					
	Male		Female		Total [b]	
Race and/or ethnicity [c,d,e,f]	n	%	n	%	n	%
Indigenous [g]	73	13.7	101	41.7	175	22.6
a) First Nations	34	6.4	50	20.7	84	10.8
b) Métis	1	0.2	0	0.0	1	0.1
c) Inuit	0	0.0	0	0.0	1	0.1
d) Indigenous, not otherwise specified	38	7.1	51	21.1	89	11.5
South Asian/West Asian/Arab	60	11.3	12	5.0	72	9.3
Asian	50	9.4	4	1.7	54	7.0
Black	75	14.1	64	26.4	140	18.0
Latin American	74	13.9	4	1.7	78	10.1
White	184	34.6	53	21.9	237	30.5
Another race and/or ethnicity	16	3.0	4	1.7	20	2.6
Total cases where race and/or ethnicity was reported	**532**	**n/a**	**242**	**n/a**	**776**	**n/a**

Abbreviations: n, number; n/a, not applicable

Refer to **Appendix 2** for details on race/ethnicity categories reported by provinces and territories.

[a] This proportions of the total number of cases **that had race and/or ethnicity reported** (n=776). Cases where race and/or ethnicity was not reported were excluded from the calculations and table.

[b] Total cases include those reported as transgender, and cases where sex was not reported, whereas “male” and “female” columns exclude these cases.

[c] Race and/or ethnicity information is not submitted by Québec, Manitoba, and Nova Scotia. For British Columbia, Indigenous identity data were not included in the data submitted for race and/or ethnicity The type of data that other provinces/territories submit varies considerably, with several provinces/territories only submitting a subset of the categories that are included in the tables and figures and with a varying degrees of completeness. **Interpret this data with caution**.

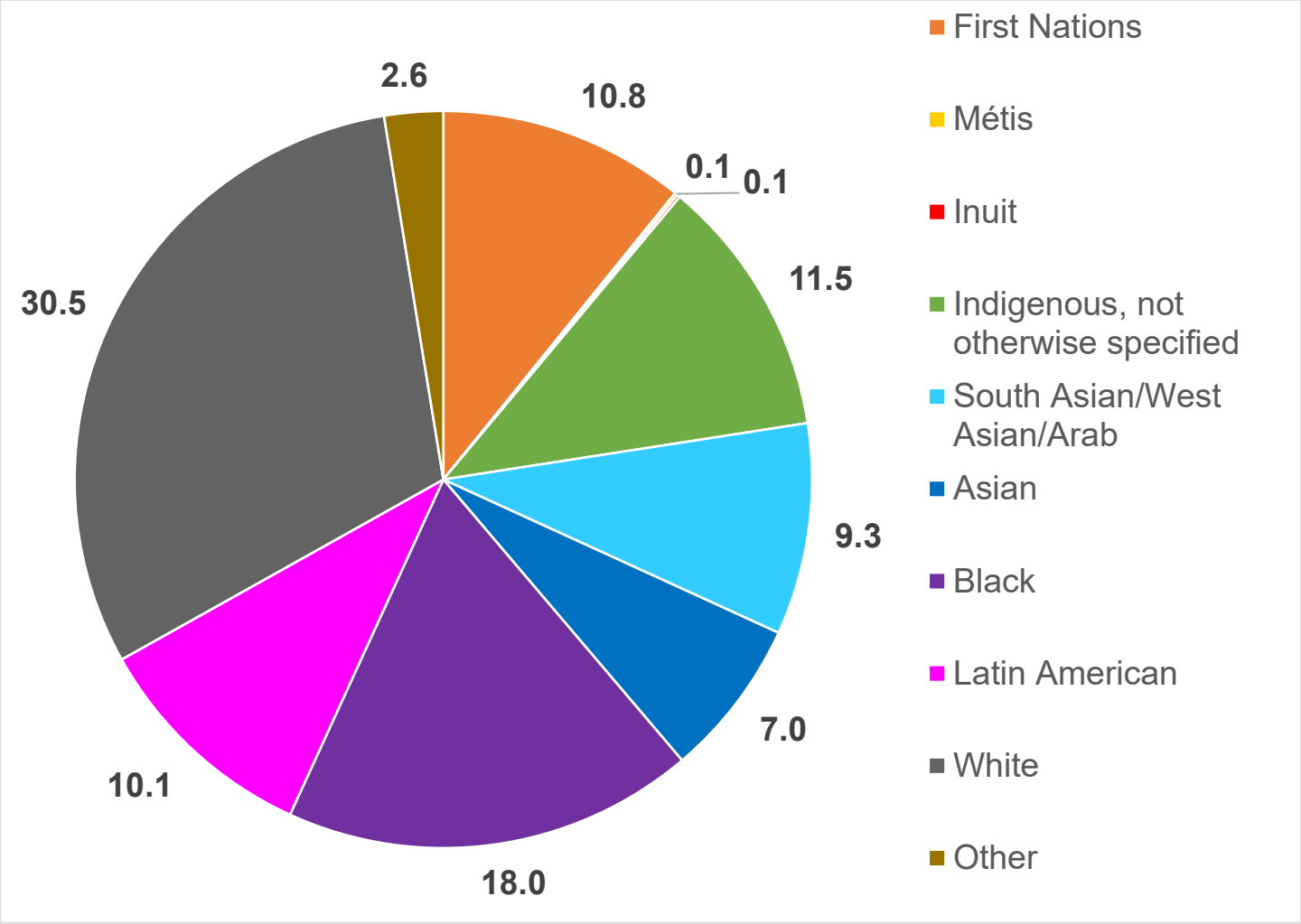
[d] Due to low completeness of race and/or ethnicity information, for each category these numbers should be considered minimum numbers and could be higher with more complete data.

[e] Reporting of multiple race and/or ethnicity is determined by each province or territory.

[f] HASS recognizes that these race and/or ethnicity categories are broad and may be homogenizing.

[g] Indigenous category is the sum of the First Nations, Inuit, Métis, and Indigenous, not otherwise specified categories.

Figure 8b: Proportions (%) of race and/or ethnicity among first-time HIV diagnoses **where race and/or ethnicity is reported** (n=776), Canada, 2022 [a]



Refer to **Appendix 2** for details on race/ethnicity categories reported by provinces and territories

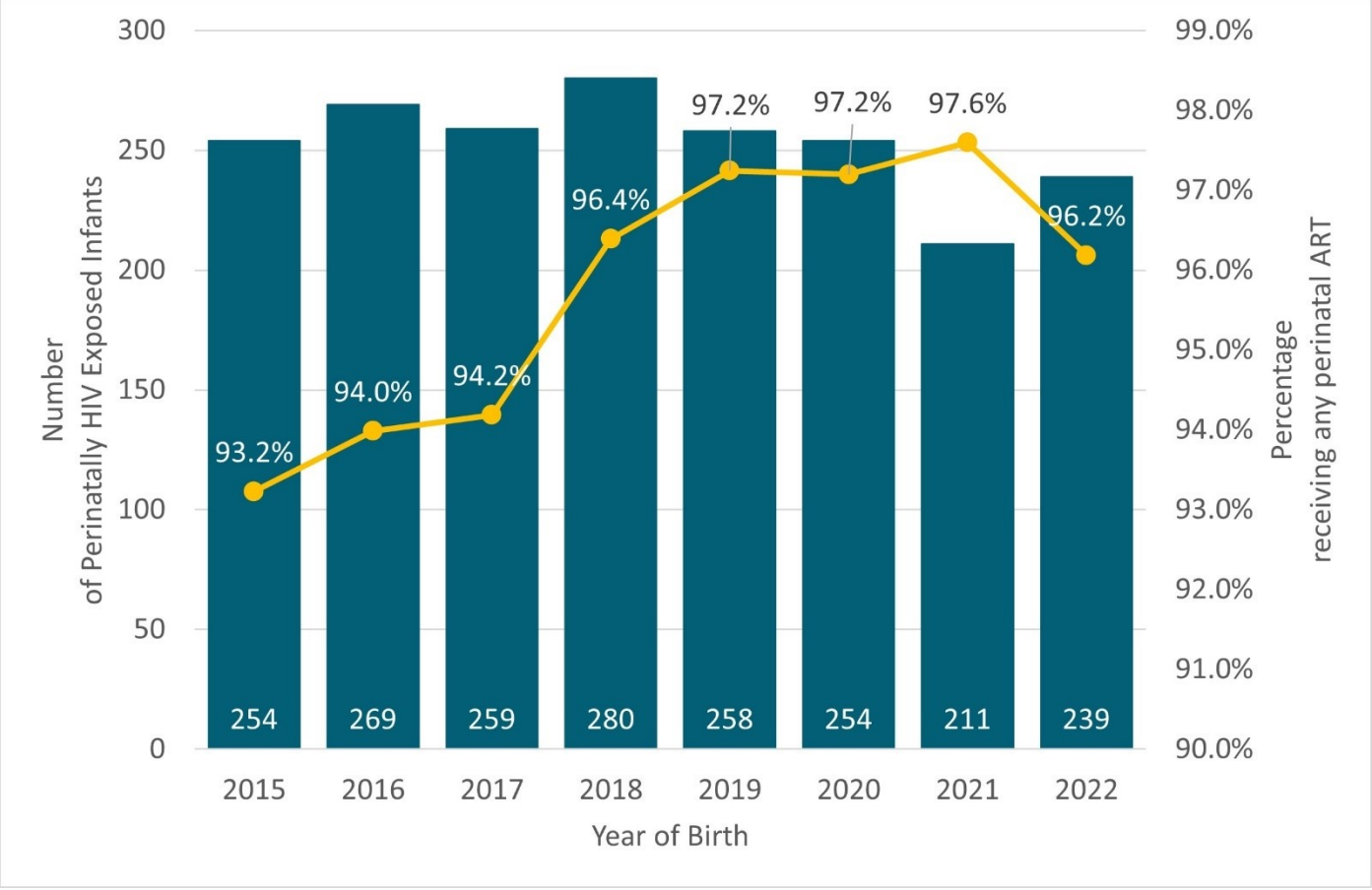
[a] Race and/or ethnicity information is not submitted by Québec, Manitoba, or Nova Scotia; for other jurisdictions, the race and/or ethnicity categories submitted and completion rate varied, interpret data with caution.

Additional surveillance data

Canadian Perinatal HIV Surveillance Program (CPHSP)

In 2022, there were 239 infants who were perinatally exposed to HIV and there were six new perinatal infections. Of those who acquired HIV, two infants were born to individuals who did not receive any antiretroviral therapy (ART), three were born to individuals who received some or partial ART and one was born to an individual whose ART status was unknown. Since 2015, the number of perinatal **exposures** has ranged between 211 and 280 with an average of 253 perinatal exposures per year. Also, since 2015, the number of perinatal **infections** has ranged between 3 and 14 with an average of 6.3 infections per year. Although the number of perinatal exposures fluctuated yearly, there was a decrease from 254 exposures in 2015 to 239 in 2022 (**Figure 9**). The proportion of women and other pregnant people living with HIV who received any ART during pregnancy in 2022 was 96.2%, which was slightly higher than the average between 2015 and 2020 (95.8%; range 93.2% to 97.2%), but lower than 2021 (97.6%) (**Figure 9**). Additional results from CPHSP can be found in **Data Table 7**.

Figure 9: Number of perinatally HIV-exposed infants and proportion of mothers and pregnant people living with HIV who received antenatal antiretroviral therapy, by year of birth, Canada, 2015 to 2022 [a]



Source: CPHSP
Abbreviations: PLHIV, People living with HIV
[a] The proportion of mothers or pregnant people receiving ART excludes pregnant people with an unknown perinatal ART status. Infants born to pregnant people with an unknown perinatal ART status are included in the total number of perinatally HIV-exposed infants.

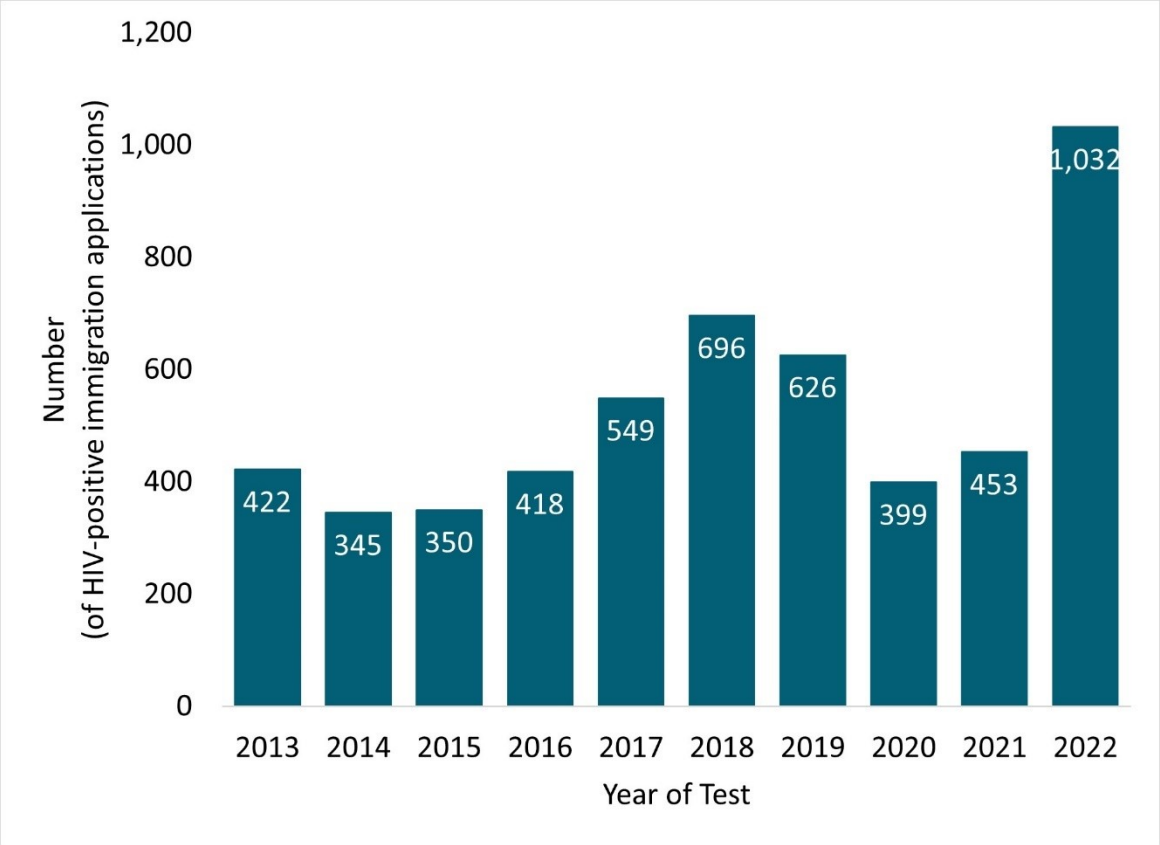
HIV cases identified through immigration medical screening

An increased number of migrants (immigrants, refugees and temporary residents) tested positive for HIV during an immigration medical exam (IME) in Canada or abroad in 2022 compared to 2021. In 2022, the total number of migrants who tested positive for HIV was 2,119, representing 0.26% of all IMEs, a proportion similar to pre-pandemic levels. In 2021, this proportion was lower (0.12%) where 865 migrants tested positive for HIV, corresponding with lower immigration volumes during that time. The increase in cases identified by IMEs in 2022 is proportional to the increased number of IMEs due to increased immigration volumes, suggesting immigration volumes are the primary driver of the observed number of HIV cases among migrants. Out of all migrants who tested positive for HIV during the IME, the proportions of migrants who tested positive (in 2022) prior to arrival in Canada (51.3%) and after arriving in Canada (48.7%) remained similar compared with the previous year, as there were 47.6% who tested positive outside of Canada and 52.4% who tested positive in Canada in 2021 (**Data Table 8**).

There was a total of 5,290 individuals who tested positive through an IME conducted in Canada in the last 10 years (2013-2022) with an average of 529 per year (range: 345 to 1,032) (**Figure 10**). Between 2013 and 2022, of the applicants who tested positive for HIV during an IME in Canada, males accounted for a higher proportion, at 59.3% (n = 3,277). Overall, for both males and females, migrants in the 30 to 39 years old age group accounted for the highest proportion of positive tests at 39.1% (n = 2,164). This is followed by the 40 to 49 years old age group at 25.3% (n = 1,402) and the 20 to 29 years old age group, 18.9% (n = 1,045) (**Data Table 9**).

Of the IMEs conducted in Canada between 2013 and 2022 where HIV was detected, 52.3% were completed in Ontario, followed by 27.1% conducted in Quebec, 8.6% in Alberta, and 8.3% in British Columbia. In 2022, IRCC public health notifications sent to the provinces or territories were mostly sent to Ontario.

Figure 10: Number of migrants who tested positive for HIV during an immigration medical exam conducted in Canada, 2013 to 2022 [a,b]



Source: IRCC

[a] Immigration, Refugees, and Citizenship Canada, IRCC GCMS and IMS/FOSS as of July 2022. Reproduced and distributed with the permission of Immigration, Refugees, and Citizenship Canada.

[b] For applicants tested in Canada, the year refers to the year of the test. For applicants tested internationally, the year refers to the year the applicant landed in Canada.

AIDS cases

AIDS refers to the most advanced stage of disease caused by HIV. A total of 84 AIDS cases were reported in 2022 (**Table 4**). Between 2013 and 2022, 1,620 AIDS cases were reported to PHAC. The number of AIDS diagnoses decreased in both males and females between 2013 and 2020 in the provinces that consistently report AIDS data to PHAC (British Columbia, New Brunswick, Nova Scotia, Ontario, and Saskatchewan). Additional AIDS data are available on the Notifiable Diseases website, Notifiable Diseases Online (canada.ca). Refer to **Figure A3** (**Appendix 2**) for information on the current reporting of AIDS cases.

Over the years, AIDS reporting practices have changed and a noted decrease in AIDS reporting since 2013 may partially be due to reduced reporting by PT public health authorities. Recently, there has been a shift away from reporting AIDS as a separate diagnosis toward categorizing it as a stage of HIV infection. The stages of HIV infection are determined by CD4 count (an indicator of immune system health) and/or the presence of AIDS defining conditions, such as recurring pneumonia. This method of HIV surveillance has already been implemented in some provinces and territories, as well as in other jurisdictions internationally. For future reporting, HASS will consult with provinces and territories on moving toward reporting HIV staging data rather than AIDS diagnoses exclusively.

Table 4: Number of AIDS cases (all ages), by sex and year of diagnosis, from reporting Canadian provinces and territories, 2013 to 2022 [a,b]

Year of diagnosis	Males	Females	Total
2013	184	63	263
2014	179	48	243
2015	162	49	212
2016	138	52	193
2017	119	38	158
2018	110	28	139
2019	83	23	106
2020	84	38	122
2021	83	16	100
2022	60	24	84
Total	**1202**	**379**	**1620**

[a] Total cases includes those reported as transgender, and cases where sex was not reported, whereas "male" and "female" columns exclude these cases.

[b] AIDS reporting practices by PT authorities have changed over time, refer to **Appendix 2**.

HIV mortality

Based on available Vital Statistics death data from Statistics Canada (SC), there were 1,598 deaths attributed to HIV in Canada between 2013 and 2022. While the number of HIV-attributed deaths has decreased from 241 in 2013 to 105 in 2019, it increased to 133 in 2021 and decreased to 129 in 2022. Among those aged 15 years and older, 76.0% (n = 98) of the HIV-attributed deaths were in males. Although the number of deaths in both males and females decreased since 2013, the proportion of deaths in females compared with males decreased from 21.6% (n=189) in 2013 to 18.4% (n=25) in 2020 and then increased to 24.0% (n=31) in 2022. (**Table 5** and **Table 6**). The proportion of deaths among those aged 60 years or older has increased from 22.8% (n=55) in 2013 to 37.5% (n=51) in 2020, decreased to 31.6% (n=42) in 2021 and increased to 38.8% (n=50) in 2022; the proportion of deaths among those aged 30 to 39 years decreased from 11.2% (n=27) in 2013 to 9.8% (n=13) in 2021 and increased to 15.5% (n=20) in 2022 (**Table 7**).

Table 5: Number of deaths attributed to HIV infection, by age at death and sex, Canada, 2013 to 2022

Age group	Males		Females		Total
	n	%	n	%	n
Under 15 years	0	0	1	100	1
15 years and older	1,229	77.0	368	23.0	1,597
Total	**1,229**	**76.9**	**369**	**23.1**	**1,598**

Source: SC

Abbreviations: n, number

Table 6: Number of deaths attributed to HIV infection (≥ 15 years), by sex, Canada, 2013 to 2022 [a]

Year of death	Males	Females	Total
2013	189	52	241
2014	149	56	205
2015	131	59	190
2016	134	41	175
2017	117	25	142
2018	112	30	142
2019	81	24	105
2020	111	25	136
2021	107	26	133
2022	98	31	129
Total	**1,229**	**369**	**1,598**

Source: SC

[a] Due to improvements in methodology and timeliness by Statistics Canada, the duration of data collection has

been shortened compared with previous years. As a result, there may have been fewer deaths captured by the time of the release of the CVSD data. The 2020, 2021 and 2022 data should be considered preliminary.

Table 7: Number of deaths attributed to HIV infection by age group, Canada, 2013 to 2022

Age Group	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Children <15 years	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15 to 19 years	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20 to 24 years	3	1.2	1	0.5	1	0.5	1	0.6	3	2.1	0	0.0	1	1.0	0	0.0	0	0.0	2	1.6
25 to 29 years	3	1.2	2	1.0	1	0.5	4	2.3	2	1.4	2	1.4	1	1.0	2	1.5	4	3.0	4	3.1
30 to 39 years	27	11.2	27	13.2	18	9.5	23	13.1	11	7.7	19	13.4	11	10.5	15	11.0	13	9.8	20	15.5
40 to 59 years	153	63.5	127	62.0	121	63.7	108	61.7	71	50.0	78	54.9	59	56.2	68	50.0	74	55.6	53	41.1
≥60 years	55	22.8	48	23.4	49	25.8	38	21.7	55	38.7	43	30.3	33	31.4	51	37.5	42	31.6	50	38.8
Total	**241**	**n/a**	**205**	**n/a**	**190**	**n/a**	**175**	**n/a**	**142**	**n/a**	**142**	**n/a**	**105**	**n/a**	**136**	**n/a**	**133**	**n/a**	**129**	**n/a**

Source: SC
Abbreviations: n, number

Discussion

In 2022, there were 1,833 first-time HIV diagnoses in Canada. While the diagnosis rate has fluctuated in previous years, the HIV diagnosis rate of 4.7 per 100,000 represented an increase from 2020 (3.5 per 100,000) and 2021 (3.8 per 100,000) but was within the historical range of pre-pandemic diagnosis rates reported for 2013-2019 (range: 4.7-5.2 per 100,000). In addition to an increase in the overall diagnosis rate, the diagnoses rates in males (6.3 per 100,000) and females (3.1 per 100,000) also increased. Since the focus on reporting shifted to first-time diagnoses only in 2020 [19], these trends should be interpreted with caution. The continued increase in 2022 could represent a continuing "rebound" in HIV diagnoses since the start of the COVID-19 pandemic, with an observed 38.3% increase in the number of first-time diagnoses from 2020. This rebound was likely partly due to an increase in testing and access to STBBI services and preventative measures, and increased immigration volumes as pandemic restrictions were lifted. While the volume of immigration to Canada has increased post-pandemic, the increase in HIV cases identified by IMEs is proportional to the increased number of IMEs due to increased immigration volumes.

To improve the accuracy of reporting and analysis of trends in HIV when there is movement of people within a country or individuals diagnosed prior to migrating, it is important to distinguish between first-time diagnoses and previously diagnosed cases of HIV [20]. While the inclusion of previously diagnosed cases of HIV provides a better understanding of prevalence, which can be used in health care system planning and treatment, reporting on first-time diagnoses provides a better understanding of HIV transmission and can be used to plan initiatives for prevention [20]. As such, the focus of HIV surveillance reporting has shifted to reporting on first-time diagnoses as of the 2020 surveillance report [19]. While surveillance data for 2020, 2021 and 2022 include first-time diagnoses only, data for previous years includes previously diagnosed cases as not all jurisdictions were able to provide data on previously diagnosed cases prior to 2020. More details on the status of first-time vs. previously diagnosed case reporting can be found in **Appendix 2**. As the national dataset contains previously diagnosed cases prior to 2020, trends presented must be interpreted with caution.

The observed decline in 2020 and subsequent increases in 2021 and 2022 were consistent with the pattern observed in other countries. For instance, in the United Kingdom (UK), the number of HIV diagnoses had decreased to 3,026 in 2020 and increased to 3,118 in 2021 and 3,805 in 2022 [35]. In the United States, the number of HIV diagnoses decreased to 30,275 in 2020 and increased to 35,716 in 2021 and 37,449 in 2022 [36]. However, in Australia the number of HIV diagnoses decreased to 626 in 2020 and 541 in 2021 before increasing to 555 in 2022 [37]. It was noted that this decrease was likely due to disruptions in clinical care services, hesitancy in accessing these services, and shortages of HIV testing materials that resulted from the COVID-19 pandemic; the subsequent increases were likely due to increased access to HIV testing after the initial stages of the pandemic. As such, it is also important to consider the trends in HIV testing internationally to gauge whether

trends observed in Canada are comparable. While HIV testing data for 2022 was not available for the United States and Australia, the number of HIV tests performed in the UK increased from 1,048,551 in 2021 to 1,155,551 in 2022 but remained lower than the number of tests in 2019 [35].

When comparing the diagnosis rate with international counterparts with comparable HIV surveillance systems, Canada's HIV diagnosis rate of 4.7 per 100,000 was lower than the UK at 6.0 per 100,000 and France at 6.1 per 100,000 [38]. While the number of HIV diagnoses was available for Australia, the HIV diagnosis rate was not available [37]. All four countries report on first-time diagnoses and all observed decreases in 2020. In 2022, Australia, United Kingdom and France reported increases in the number of first-time diagnoses, similar to Canada. While the UK reported an increased number of tests in 2022, this was still lower than the number of tests in 2019; the number of individuals accessing care had increased in 2022 compared with 2020 and 2021 [39]. However, subsequent years of data are needed to examine trends throughout the later stages of the pandemic and beyond.

The reported barriers to accessing STBBI health services and the subsequent return to more typical access may explain variations in the number of HIV tests administered over time. For example, Manitoba [40] and Ontario [41] had observed increased testing volumes in 2021 and 2022 returning to pre-pandemic testing levels after a decrease observed in 2020 during the pandemic. However, while testing volumes returned to normal pre-pandemic levels in British Columbia in 2021 after a decrease in 2020, testing volumes for the first and second quarters of 2022 are lower than the corresponding quarters in 2021 [42]. Studies examining the effects of reduced HIV testing and preventive services during the COVID-19 pandemic found the potential for increased HIV transmission during the early stages of the pandemic and beyond [43, 44].

The collection of data on race and/or ethnicity and other social characteristics is a key component in recognizing disparities in access to healthcare, as well as understanding the disproportionate burden of HIV on particular populations [32]. Unfortunately, the proportion of cases in 2022 for which race and/or ethnicity data was available remained low at 42.3%. This low completeness is due to a variety of reasons across the provinces and territories, ranging from limited collection of this information to restrictions on the ability to submit these data to the national HIV surveillance program. In addition, there is variation in terms of how race and/or ethnicity information is collected across the provinces and territories. This critical data gap prevents users of HIV surveillance data from accurately identifying disparities in the burden of HIV in particular populations and understanding the magnitude of prevention and care needs for those populations. As an objective of the renewal work currently being conducted by the national HIV surveillance program, improvement to the collection of race-based data will be made through ongoing collaboration with provincial, territorial, and federal data providers as well as with community members, organizations, and other data users. This includes ongoing collaboration with the Black Expert Working Group and endeavouring to establish similar engagements with other communities.

The male-to-male sexual contact exposure category continued to account for over half (51.1%) of all diagnoses in males, which is slightly lower than what was observed in previous years. Although the impact of changes, due to the COVID-19 pandemic, on HIV transmission remain unclear, evidence of an effect is emerging. A study of gay, bisexual, and other men who have sex with men (gbMSM) in Vancouver found increased interruption of PrEP use between September 2020 and April 2021 when compared with a similar period prior to the pandemic [45]. Regarding other exposure categories, the proportion of cases in males attributable to heterosexual contact has increased from 2018 (19.7%) to 2022 (29.4%), and the proportion attributable to injection drug use increased from 2016 (4.2%) to 2021 (16.0%) before dropping in 2022 (13.1%). It should also be noted that the pandemic had a substantial impact on HIV prevention services, such as the 80.6% of individuals who use substances reporting difficulties in accessing harm reduction services [46].

Similar to previous years, heterosexual contact (60.1%) and injection drug use (36.1%) are the most common exposure categories in females. Increases in the proportions attributable to both exposure categories from 2019-2021 may be a statistical artifact due to the removal of those diagnosed out of country from the “Other” exposure category (part of the methodological change in 2020 to first-time diagnoses).

Heterosexual transmission has become an increasingly significant route of HIV acquisition with a greater proportion of HIV diagnoses attributed to that exposure category than previous years. A variety of factors contribute to HIV acquisition through heterosexual contact, including social determinants of health, and sexual and preventative practices. One study conducted between 2015-2019 of Black heterosexual men in Ottawa and Windsor, ON, showed lower odds of HIV diagnosis among condom users, as well as increased odds among those without a high school degree and those with difficulty accessing sexual healthcare [47]. Additional analyses of the same cohort indicated that 55.0% of Black heterosexual men in Windsor and 70.2% in Ottawa reported at least one or more casual female sexual partners in the preceding year, with only 32.1% and 34.3%, respectively reporting always using condoms with these partners [48]. While not limited to heterosexuals, a 2016 survey among Canadians aged 18-25 years who have travelled abroad found that 75.6% of females reported using condoms at home for penetrative sex, 60.5% had asked for their partners’ history of STBBI and 28.3% had asked for their partner to be screened for STBBI [49]. The same survey found that 76.2% of males reported using condoms at home for penetrative sex, 58.1% had asked for their partner’s history of STBBI and 18.1% of asked for their partner to be screened for STBBI [49]. Further findings from the 2019 United States national HIV Behavioral Surveillance program indicates that among HIV-negative males with female partners, 83.9% reported condomless vaginal sex and 19.9% reported condomless anal sex within the last 12 months; among males living with HIV with female partners, these proportions of condomless sex were 63.1% and 20.0% respectively [50]. Among HIV-negative females with male partners, 88.7% reported condomless vaginal sex and 23.6% reported condomless anal sex while among females living with HIV, 76.6% reported condomless vaginal sex

and 32.1% reported condomless anal sex [50]. PrEP use in Canada was found to differ by sex as 98% of PrEP users in 2022 were male and 2% were female [51], though it is unclear how many of these users are heterosexual. It should be noted that the studies mentioned here did not consider gender in their analyses and instead only looked at binary sex categories.

Factors that are associated with an increased likelihood of HIV acquisition were also observed among key populations disproportionately impacted by HIV. It is important that populations disproportionately impacted by HIV receive the ongoing support they need in order to tailor interventions that promote HIV prevention, testing, and treatment in their communities.

In PHAC surveys from 2018-2020 among First Nations individuals in Alberta and Saskatchewan, 81.9% of respondents reported having access to primary health care, though only 36.4% reported using services that included Indigenous health or health practices, and only 37.3% reported receiving STBBI prevention counselling in the preceding twelve months. In terms of HIV testing, 62.8% of individuals in First Nations communities in Alberta and Saskatchewan [16] have reported ever testing for HIV. During this same period, 18.3% reported avoiding healthcare services because of stigma and discrimination [16].

Similar surveys conducted from 2017-2019 among people in Canada who inject drugs found that 11.6% of participants reported injecting with used needles or syringes in the past six months, and 38.0% reported injecting with other used injection equipment, such as filters, cookers, or swabs. Survey respondents also reported using harm reduction services, with 90.1% using a needle or syringe distribution program and 13.5% using a supervised injection or consumption site in the preceding twelve months, and 90.5% of people who inject drugs have reported ever testing for HIV. [15]

The proportion of African Canadian adolescents in British Columbia reporting at least two sexual partners within the last year has largely not changed from 51.1% in 2003 to 54.2% in 2018 but the proportion of those reporting not using condoms at the last occurrence of sex had increased from 31.1% in 2003 to 48.4% in 2018. Those participants who had experienced sexual violence, racial or gender discrimination, or who reported lower levels of neighbourhood safety were more likely to engage in sexual practices with a higher likelihood of transmitting HIV [52].

The impact of the COVID-19 pandemic on behaviours associated with an increased likelihood of HIV acquisition, such as injection drug use or sex without condoms or PrEP use, was mixed, with increases in these behaviours noted in certain populations. In a survey of attendees at STI clinics in British Columbia, only 5% of attendees reported an increase in the number of partners in March to mid-May 2020 and 26% reported an increase in the number of partners in mid-May to July-August 2020 [53]. While the majority of people who inject drugs in Montreal reported no change in the overall use of injection drugs, 15.9% had reported increased use of injection drugs during the COVID-19

pandemic [54]. The prevalence of HIV PrEP use increased in all Canadian provinces after the pandemic, when comparing before and after the COVID-19 pandemic, with national prevalence increasing from 61 per 100,000 people in 2019 to 89 per 100,000 in 2022 [51]. Despite increased PrEP use, increased frequency of behaviours increasing the likelihood of HIV acquisition was observed in certain individuals.

Migration is likely a significant factor in the increased number of HIV diagnoses reported this year. In 2022, migration increased and even surpassed pre-pandemic levels, with Canada welcoming 431,645 permanent residents [55] Similar increases were also reported in the UK [56] and Australia [57]. A corresponding increase was observed in the number of HIV cases identified in IMEs conducted in Canada, which increased from 453 in 2021 to 1,032 in 2022. In Alberta alone, its annual report found that 40.1% of new HIV diagnoses among males and 46.3% among females were acquired out of country, an increase from below 40% in 2021 [58]. Further supporting the idea that increasing immigration volumes were a primary driver of the increase in HIV cases identified through IMEs, IRCC noted that for all IMEs (both those conducted in Canada and those conducted overseas), the proportion of IMEs that had an HIV diagnosis decreased from 2017 to 2021 and increased in 2022 to being within the range of proportions observed pre-pandemic. Migrants also face barriers in accessing HIV testing and care such as difficulty accessing healthcare, HIV-related stigma and other regulatory/policy, health system, community and individual level barriers [2]. These barriers may be further exacerbated for those migrants who are sexual or gender minorities, who are racialized, or who engage in sex work [59]. When assessing the burden of HIV in migrant communities, it is also important to recognise that HIV may not always have been acquired outside of Canada. Previous studies have observed that among migrants living with HIV, approximately 40% in Europe [60] and close to half in Australia [61], acquired HIV post-migration. However, the place of HIV acquisition (i.e., in Canada or outside of Canada) generally cannot be distinguished based on national HIV surveillance data received by PHAC from provinces/territories or from IRCC.

Perinatal transmission of HIV in Canada continues to be low, with six perinatal infections reported for 2022. Two infants were born to individuals who did not receive any antiretroviral therapy (ART), three were born to individuals who received some or partial ART and one was born to an individual whose ART status was unknown. The COVID-19 pandemic also had an impact on perinatal transmission. Analyses conducted by CPHSP have indicated that there was an increase in perinatal transmission, from transmissions occurring among 1.3% of exposed infants in 2015-2019 compared with 3.2% in 2020 [62]. People who were pregnant and who had acquired HIV through injection drug use (IDU) had the greatest likelihood of perinatal transmission because of sub-optimal HIV treatment [62].

Despite advancements in prevention and treatment, HIV remains a significant health burden in Canada, with 1,597 deaths attributed to HIV between 2013 and 2022. This burden is carried disproportionately by communities experiencing other systemic barriers to equity. For example, Black

populations are at a significantly increased risk of death from HIV when compared with White populations – 5 times and 21 times greater among males and females, respectively [63]. Yet, deaths attributed to HIV continue to be underreported even though this data is obtained from vital statistics registries. Reasons for this underreporting include: variability in assignment of cause of deaths between physicians, cause of death determination being sensitive to the order in which diagnoses are listed, difficulty in determining the underlying cause of certain conditions and miscoding of cause of deaths for stigmatized diseases such as HIV [64]. Regarding miscoding of cause of deaths, HIV related deaths have been shown to be misattributed to "immunodeficiency antibody" and "immunodeficiency other" [65].

However, there are differences across the cascade of care for HIV between different populations. Among all those diagnosed with HIV in British Columbia in 2022, 79.1% are on treatment and 56.5% are virally suppressed [66]. Further, data recently published by British Columbia indicates that females, those under 30 years of age and people who inject drugs had lower proportions of the population diagnosed on treatment and virally suppressed compared with their counterparts who are male, older, and who do not inject drugs, respectively [66]. Among those diagnosed with HIV in Ontario, 85.9% are on ART and 84.3% are virally suppressed [41]. Meanwhile in western Europe, 90% of all people living with HIV are diagnosed, 96% of those diagnosed are on treatment and 94% of those on treatment are virally suppressed [67].

In addition to the mentioned groups, the European Centre for Disease Prevention and Control's report identifies other key populations disproportionately impacted by HIV including migrants, sex workers and prisoners [67].Previous models from British Columbia indicate that a sustained combination of testing, retention in care and treatment initiatives could reduce cumulative HIV incidence by 12.8% and deaths by 4.7% in people living with HIV [68]. Improving the quality of surveillance data during the renewal of the HIV surveillance system will provide evidence needed for the appropriate allocation of resources for testing, retention in care and treatment as Canada moves to meet its 90-90-90 targets by 2020 and its 95-95-95 targets by 2030 [69].

Strengths

This report provides an epidemiological profile of new HIV diagnoses in Canada, including a detailed view of cases among migrants to Canada, perinatal transmission, and HIV mortality. This surveillance report presents first-time diagnoses for all thirteen provinces and territories, providing information on these diagnoses by age, sex, exposure category, and race and/or ethnicity. More provinces and territories also updated their historical data by further identifying and excluding previously diagnosed cases from 2013 through 2019. The change in recent years to focus on first-time diagnoses allows for a clearer picture of where transmission of HIV may be occurring in Canada as well as make better international comparisons with countries such as the UK and Australia.

Limitations

Limitations of the surveillance report have been previously detailed [19, 22, 70] and they include low completeness of race and/or ethnicity information; an absence of information on, or inconsistent collection of, data elements such as gender identity; and variation in reporting previously diagnosed cases in historical data (prior to 2019). Additionally, people diagnosed through HIV self-testing may not be captured in the national diagnosis data.

Any interpretation and use of the race and/or ethnicity data presented in this report should be carefully considered given the low completeness of these data. The current race and/or ethnicity data is unlikely to provide an accurate representation of the national picture of race and/or ethnicity among people living with HIV, as these data are unavailable for nearly two-thirds of newly diagnosed cases. The ongoing HASS renewal work is directly addressing these concerns and we are aiming to improve the collection of race and/or ethnicity data in the coming years.

Information on trans and non-binary identities is also very limited as the current data includes only binary sex categories (male or female) without data on gender identity. In its current state, the HIV surveillance system does not reflect our changing understanding of sex, gender identity, and sexual orientation [71]. HASS is actively working on improving our data collection and reporting to better represent gender-diverse communities.

For 2022, the COVID-19 pandemic may have continued to have impacts on surveillance data – increased workloads for public health organizations and delays in HIV testing, data collection, and reporting. More time and data are needed to fully assess the effects of the pandemic on the HIV epidemic.

Despite all provinces and territories being able to report on first-time diagnosed HIV cases separately from previously diagnosed cases, some provinces and territories were unable to provide this information consistently from 2012 through 2019. For this reason, all trends prior to 2020 must be interpreted with caution. De-duplication and identification of first-time diagnoses is conducted at the PT level and due to the challenges of de-duplication and limitations in PT systems, it is possible that there may still be some duplicates or previous positive cases remaining in the data. It is expected that there will be a gradual improvement through the removal of previously diagnosed cases from the national dataset over time. This report only presents diagnosis data, which does not represent the true number of people newly living with HIV (incidence) or total number of people living with HIV (prevalence) in Canada in 2022. Data included in this surveillance report should also be considered provisional, as national surveillance data are updated annually. If discrepancies exist between data summarized in this report and provincial or territorial reports, the most recent provincial or territorial report should be utilized.

Conclusion

The number and rate of first-time HIV diagnoses in Canada increased in 2022 compared with 2021, within figures similar to those observed prior to the COVID-19 pandemic though the overall rate remains slightly lower. The increase observed in 2022 is likely due to some changes in behaviour increasing likelihood of HIV acquisition during the pandemic, at least in part due to increases in immigration volumes (not increased rate of positive HIV tests during IMEs) and may still be partially explained by renewed access to HIV testing. It remains unknown how the COVID-19 pandemic and its lasting effects will impact the epidemiology of HIV in future years. HIV surveillance data assists in monitoring progress against the pan-Canadian STBBI Framework and the associated Government of Canada Five-Year Action Plan on STBBI, along with Canada's progress towards the international elimination targets (95-95-95 by 2030). Trends in domestic diagnoses can be used to inform the provision of tailored prevention programs. PHAC will continue to collaborate with provinces, territories, and other surveillance partners to make improvements to better meet HIV surveillance evidence needs, to make progress towards embedding community perspectives, and to produce more culturally appropriate and useful knowledge translation and mobilization products.

Data tables

Data Table 1: Number of first-time diagnoses of HIV and diagnosis rates overall, by sex and year, Canada, 2013 to 2022 [a]

Year of Diagnosis	Overall Diagnoses	Overall Rate per 100,000	Male Diagnoses[a]	Male Rate per 100,000[a]	Female Diagnoses[a]	Female Rate per 100,000[a]
2013	1,837	5.2	1,457	8.4	374	2.1
2014	1,755	5.0	1,356	7.7	391	2.2
2015	1,766	4.9	1,362	7.7	400	2.2
2016	1,860	5.2	1,416	7.9	435	2.4
2017	1,819	5.0	1,413	7.8	401	2.2
2018	1,848	5.0	1,356	7.4	489	2.6
2019	1,757	4.7	1,238	6.6	512	2.7
2020	1,325	3.5	942	5.0	375	2.0
2021	1,468	3.8	1,051	5.5	408	2.1
2022	1,833	4.7	1,224	6.3	597	3.1

[a] Excludes cases where sex was reported as transgender, or cases where sex was not reported.

Data Table 2: Number and rate of first-time HIV diagnoses (per 100,000 population) by province and territory, Canada, 2022 [a,b]

Province or Region	Number of Diagnoses	HIV Diagnosis Rate (per 100,000 population) in 2022	HIV Diagnosis (per 100,000 population) in 2021
Alberta [a]	190	4.2	4.0
Atlantic Region [b]	39	1.6	1.4
British Columbia	134	2.5	2.8
Manitoba	196	13.9	10.4
Ontario	623	4.1	3.3
Quebec	422	4.9	2.9
Saskatchewan	227	19.0	20.1
Territories [b]	2	1.5	1.6

[a] For Alberta, national reporting excludes HIV cases where the location of first-time positive has been identified as out-of-country or outside the reporting province; consequently, HIV case totals from PHAC may differ from those reported by Alberta.

[b] Rates for the territories (Yukon, Nunavut, and Northwest Territories) and Atlantic region (Prince Edward Island, New Brunswick, Nova Scotia and Newfoundland and Labrador) are presented as averages. Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

Data Table 3: Number and rate of first-time HIV diagnoses (per 100,000 population), by sex and age group, Canada, 2022 [a]

Age group	Males		Females	
	Number of diagnoses	Rate per 100,000	Number of diagnoses	Rate per 100,000
Children <15 years	3	0.1	8	0.3
15 to 19 years	16	1.5	11	1.1
20 to 24 years	105	8.0	43	3.6
25 to 29 years	191	13.6	85	6.5
30 to 39 years	484	17.4	228	8.4
40 to 59 years	339	6.8	193	3.8
≥60 years	84	1.8	29	0.5

Abbreviation: <, less than

[a] Excludes cases where sex was reported as transgender, or cases where sex was not reported.

Data Table 4: Number and rate of first-time HIV diagnoses (per 100,000 population) by age group and year, Canada, 2013 to 2022 [a,b]

Age group	Year of diagnosis																			
	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate	n	Rate
Children <15 years	20	0.4	6	0.1	9	0.2	10	0.2	14	0.2	18	0.3	10	0.2	2	0.0	5	0.1	11	0.2
15 to 19 years	32	1.5	30	1.4	33	1.6	40	1.9	35	1.7	36	1.7	31	1.5	24	1.1	25	1.2	27	1.3
20 to 24 years	173	7.2	181	7.5	179	7.5	180	7.5	146	6.1	171	7.0	167	6.7	131	5.3	128	5.2	149	5.9
25 to 29 years	257	10.7	214	8.9	319	13.1	292	11.8	313	12.5	304	11.8	298	11.3	229	8.7	258	9.8	277	10.2
30 to 39 years	560	11.8	569	11.9	475	9.8	556	11.3	574	11.5	559	11.0	550	10.6	435	8.2	466	8.7	719	13.1
40 to 59 years	706	6.9	636	6.2	640	6.3	673	6.6	632	6.2	642	6.4	599	5.9	413	4.1	473	4.7	535	5.3
≥60 years	87	1.2	117	1.5	110	1.4	107	1.3	103	1.2	116	1.3	101	1.1	89	0.9	108	1.1	113	1.1

Abbreviations: n = number; <, less than; ≥, greater than or equal

[a] Excludes cases where age is not reported or unknown.

[b] Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

Data Table 5a: Percentage distribution of first-time HIV cases among adults (≥ 15 years old) by exposure category and year of diagnosis, Canada, 2013 to 2022 [a,b,c]

Exposure category	Year of diagnosis																			
	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Male-to-male sexual contact	858	51.8	786	50.8	768	48.7	793	48.5	751	46.4	715	45.0	642	43.1	452	41.9	475	39.7	504	34.8
Male-to-male sexual contact and injection drug use	43	2.6	43	2.8	46	2.9	53	3.2	35	2.2	49	3.1	49	3.3	27	2.5	43	3.6	48	3.3
Injection drug use	196	11.8	195	12.6	229	14.5	213	13.0	235	14.5	267	16.8	263	17.6	240	22.3	260	21.8	297	20.5
Heterosexual contact	487	29.4	432	27.9	474	30.0	496	30.3	513	31.7	489	30.8	453	30.4	346	32.1	406	34.0	568	39.2
Other [c]	72	4.3	92	5.9	61	3.9	80	4.9	83	5.1	68	4.3	84	5.6	13	1.2	11	0.9	33	2.3

Abbreviations: n = number

[a] Excludes cases with unknown exposure category, cases with no identified risk, and cases where exposure category was not reported.

[b] Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

[c] Other includes blood/blood products, perinatal, occupational exposure, IRCC/Out of Country exposure (Alberta) and other exposure categories.

Data Table 5b: Percentage distribution of first-time HIV cases among adult males (≥ 15 years old) by exposure category and year of diagnosis, Canada, 2013 to 2022 [a,b,c,d]

Exposure category	Year of diagnosis																			
	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Male-to-male sexual contact	858	65.1	786	64.7	768	62.7	793	63.1	751	59.9	714	60.9	638	59.6	452	58.0	473	54.3	501	51.1
Male-to-male sexual contact and injection drug use	43	3.3	43	3.5	46	3.8	53	4.2	35	2.8	49	4.2	49	4.6	27	3.5	43	4.9	48	4.9
Injection drug use	121	9.2	111	9.1	133	10.9	116	9.2	142	11.3	146	12.4	127	11.9	120	15.4	139	16.0	129	13.1
Heterosexual contact	259	19.7	221	18.2	246	20.1	254	20.2	279	22.3	227	19.4	219	20.5	171	22.0	209	24.0	288	29.4
Other [d]	37	2.8	53	4.4	32	2.6	40	3.2	46	3.7	37	3.2	37	3.5	9	1.2	7	0.8	15	1.5

Abbreviations: n = number

[a] Excludes cases where sex was reported as transgender, or cases where sex was not reported.

[b] Excludes cases with unknown exposure category, cases with no identified risk, and cases where exposure category was not reported.

[c] Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

[d] Other includes blood/blood products, perinatal, occupational exposure, IRCC/Out of Country exposure (Alberta) and other exposure categories.

Data Table 5c: Percentage distribution of first-time HIV cases among adult females (≥ 15 years old) by exposure category and year of diagnosis, Canada, 2013 to 2022 [a,b,c,d]

Exposure category	Year of diagnosis																			
	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Injection drug use	74	22.0	82	24.8	96	27.3	97	25.7	92	25.4	121	29.2	136	32.7	120	40.4	121	37.7	168	36.1
Heterosexual contact	227	67.6	209	63.3	228	64.8	241	63.8	233	64.4	262	63.3	233	56.0	173	58.2	196	61.1	280	60.1
Other [d]	35	10.4	39	11.8	28	8.0	40	10.6	37	10.2	31	7.5	47	11.3	4	1.3	4	1.2	18	3.9

Abbreviations: n = number

[a] Excludes cases where sex was reported as transgender, or cases where sex was not reported.

[b] Excludes cases with unknown exposure category, cases with no identified risk, and cases where exposure category was not reported.

[c] Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

[d] Other includes blood/blood products, perinatal, occupational exposure, IRCC/Out of Country exposure (Alberta) and other exposure categories.

Data Table 6: Proportion of reported first-time HIV cases (≥15 years of age) by exposure category and age group, Canada, 2022 [a,b,c,d]

Age group	Male-to male sexual contact		Male-to-male sexual contact and injection drug use		Injection drug use		Heterosexual contact		Other [d]	
	n	%	n	%	n	%	n	%	n	%
15-19 years	9	45.0	0	0.0	3	15.0	6	30.0	2	10.0
20-24 years	64	52.0	5	4.1	25	20.3	27	22.0	2	1.6
25-29 years	97	43.5	8	3.6	46	20.6	69	30.9	3	1.3
30-39 years	203	34.3	18	3.0	141	23.9	218	36.9	11	1.9
40-59 years	103	25.1	13	3.2	75	18.2	206	50.1	14	3.4
≥60 years	28	34.1	4	4.9	7	8.5	42	51.2	1	1.2

Abbreviations: n = number; ≥, greater than or equal

[a] Excludes cases where age is not reported or unknown.

[b] Excludes cases with unknown exposure category, cases with no identified risk, and cases where exposure category was not reported.

[c] Population data source: Annual Demographic Statistics, Demography Division, Statistics Canada, July 1, 2022

[d] Other includes blood/blood products, perinatal, occupational exposure, IRCC/Out of Country exposure (Alberta) and other exposure categories.

Data Table 7: Number of Canadian-born, perinatally HIV-exposed infants by year of birth, current status and use of antiretroviral therapy (ART) for prophylaxis, 1984 to 2022 [a,b,c]

	Year of birth									
	1984-2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
No perinatal ART prophylaxis										
Confirmed living with HIV	**675**	**11**	**6**	**5**	**4**	**3**	**2**	**3**	**2**	**711**
Asymptomatic	46	6	3	2	2	1	1	1	2	64
Symptomatic	6	1	1	0	0	0	0	1	0	9
Died of AIDS	100	0	0	0	0	0	0	0	0	100
Died of other	10	0	0	0	0	0	0	0	0	10
Lost to follow-up [a]	229	4	2	3	2	2	1	1	0	244
Adult care [b]	284	0	0	0	0	0	0	0	0	284
Confirmed not living with HIV	**512**	**6**	**10**	**10**	**6**	**4**	**4**	**2**	**5**	**559**
HIV status not confirmed	**26**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**29**
Indeterminate	0	0	0	0	0	0	0	0	2	2
Lost to follow-up [c]	26	0	0	0	0	0	1	0	0	27
Subtotal	**1213**	**17**	**16**	**15**	**10**	**7**	**7**	**5**	**9**	**1299**
Any perinatal ART prophylaxis										
Confirmed living with HIV	**30**	**2**	**0**	**1**	**2**	**0**	**2**	**0**	**3**	**40**
Asymptomatic	4	1	0	0	0	0	0	0	2	7
Symptomatic	1	0	0	0	0	0	1	0	1	3
Died of AIDS	1	0	0	0	0	0	0	0	0	1
Died of other	1	0	0	0	0	0	0	0	0	1
Lost to follow-up [a]	16	1	0	1	2	0	1	0	0	21
Adult care [b]	7	0	0	0	0	0	0	0	0	7
Confirmed not living with HIV	**3085**	**228**	**247**	**238**	**256**	**236**	**231**	**191**	**173**	**4885**
HIV status not confirmed	**26**	**4**	**3**	**4**	**9**	**11**	**10**	**12**	**51**	**130**
Indeterminate	0	0	0	0	0	0	0	0	51	51
Lost to follow-up [c]	26	4	3	4	9	11	10	12	0	79
Subtotal	**3141**	**234**	**250**	**243**	**267**	**247**	**243**	**203**	**227**	**5055**
Perinatal ART prophylaxis exposure unknown	**52**	**3**	**3**	**1**	**3**	**4**	**4**	**3**	**3**	**76**
Total	**4406**	**254**	**269**	**259**	**280**	**258**	**254**	**211**	**239**	**6430**

Data Source: CPHSP data received March 13, 2023

Abbreviations: AIDS, Acquired Immunodeficiency Syndrome; ART, Antiretroviral Therapy

[a] A child is considered to be lost to follow-up if there are no current status data for the past 3 years or for the 3 years before the child turned 18 years old.
[b] These are subjects that were 18 years of age or over by the end of 2022 and transferred to adult care.
[c] Also included infants that died before status was finalized.

Data Table 8: Number and percentage distribution of immigration applicants to Canada diagnosed with HIV as a result of an immigration medical exam (IME) by year and location of test, 2013 to 2022 [a,b,c]

	Tested in Canada		Tested Internationally		Total diagnosed with HIV on IME
Year [a,b]	Number diagnosed with HIV	% [c]	Number diagnosed with HIV	% [c]	
2013	422	67.7	201	32.3	623
2014	345	67.9	163	32.1	508
2015	350	63.6	200	36.4	550
2016	418	55.7	333	44.3	751
2017	549	65.7	286	34.3	835
2018	696	67.8	330	32.2	1,026
2019	626	52.7	562	47.3	1,188
2020	399	53.7	344	46.3	743
2021	453	52.4	412	47.6	865
2022	1,032	48.7	1,087	51.3	2,119
Total	**5,290**	**57.5**	**3,918**	**42.5**	**9,208**

Source: Immigration, Refugees, and Citizenship Canada, IRCC GCMS and IMS/FOSS as of July 2023. Reproduced and distributed with the permission of Immigration, Refugees, and Citizenship Canada.
[a] For applicants tested in Canada, the year refers to the year of the test.
[b] For applicants tested internationally, the year refers to the year the applicant landed in Canada.
[c] Percentages refer to proportion of category among all positive HIV tests as a result of an IME reported for the particular year specified.

Data Table 9: Number and percentage distribution of immigration applicants to Canada diagnosed with HIV as a result of an immigration medical exam (IME) by location of test, sex, age group, and province, 2013 to 2022 [a,b,c,d,e,f]

	Tested in Canada		Tested Internationally	
	Number diagnosed with HIV	%	Number diagnosed with HIV	%
Sex [b]				
Male	3277	59.3%	2241	57.3%
Female	2251	40.7%	1668	42.7%
Age group [c]				
<20	78	1.4%	247	6.3%
20-29	1045	18.9%	1149	29.3%
30-39	2164	39.1%	1343	34.3%
40-49	1402	25.3%	662	16.9%
50+	844	15.3%	517	13.2%
Province [d,e]				
AB	476	8.6%	468	13.4%
BC	462	8.3%	414	11.8%
MB	87	1.6%	204	5.8%
ON	2893	52.3%	1250	35.8%
QC	1497	27.1%	842	24.1%
SK	62	1.1%	111	3.2%
Atlantic provinces [f]	55	1.0%	195	5.6%
Territories [f]	1	0.0%	10	0.3%

[a] Immigration, Refugees, and Citizenship Canada, IRCC GCMS and IMS/FOSS as of July 2023. Reproduced and distributed with the permission of Immigration, Refugees, and Citizenship Canada.

[b] Excludes cases where sex was reported as transgender, or cases where sex was not reported.

[c] Excludes cases where age is unknown or not reported.

[d] For applicants tested in Canada, the province refers to the province where test was conducted. For applicants tested internationally, the province refers the intended province of residence.

[e] Excludes cases where province is unknown or not reported.

[f] Due to small numbers, the data for the Atlantic provinces and territories are aggregate

Data Table 10: International statistics on reported HIV cases by country, 2022 [a]

Country	Cumulative number to 2022 [a]	Number reported in 2022	All ages rate per 100,000 population for 2022
North America and Australia			
Canada	90,910	1,833	4.7
United States	NR	37,821	NR
Australia	NR	555	NR
Western Europe			
Austria	10,979	189	2.1
Andorra	96	NR	NR
Belgium	36,942	1,060	9.1
Denmark	8,558	258	4.4
Finland	4,781	273	4.9
France	105,420	4,158	6.1
Germany	79,377	3,239	3.9
Greece	17,784	565	5.4
Iceland	545	40	10.6
Ireland	11,601	887	17.5
Israel	11,746	456	5.0
Italy	55,189	1,888	3.2
Luxembourg	3,510	71	11.0
Malta	772	60	11.5
Netherlands	30,732	431	2.5
Norway	7,138	245	4.5
Portugal	66,146	804	7.8
San Marino	94	1	3.0
Spain	66,942	2,937	6.2
Sweden	14,657	446	4.3
Switzerland	37,894	349	4.0
United Kingdom	175,831	4,040	6.0

Abbreviation: NR, not reported

[a] The cumulative number is the total number of cases reported by each country since reporting began.

Sources

- Centers for Disease Control and Prevention. Core indicators for monitoring the Ending the HIV Epidemic initiative (preliminary data): National HIV Surveillance System data reported through June 2023; and preexposure prophylaxis (PrEP) data reported through March 2023. HIV Surveillance Data Tables 2023;4(3).Accessed December 15, 2023. Data are considered preliminary because they are based on only a 12-month reporting delay. Note: Data includes the United States' 6 dependent territories (American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the U.S. Virgin Island).

- National HIV notifications 2013 – 2022. The Kirby Institute, UNSW Sydney, Sydney, Australia.

- European Centre for Disease Prevention and Control, WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2023 – 2022 data. Copenhagen: WHO Regional Office for Europe; 2023. Accessed December 1, 2023.

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Appendix 2: Technical notes

All provinces, with the exception of Newfoundland and Labrador, submitted line-listed data. Newfoundland and Labrador, the Northwest Territories, Nunavut and Yukon submitted data using the National HIV/AIDS case report form. The national case definitions for both HIV and AIDS can be found on-line: Case definitions: Nationally notifiable diseases (canada.ca).

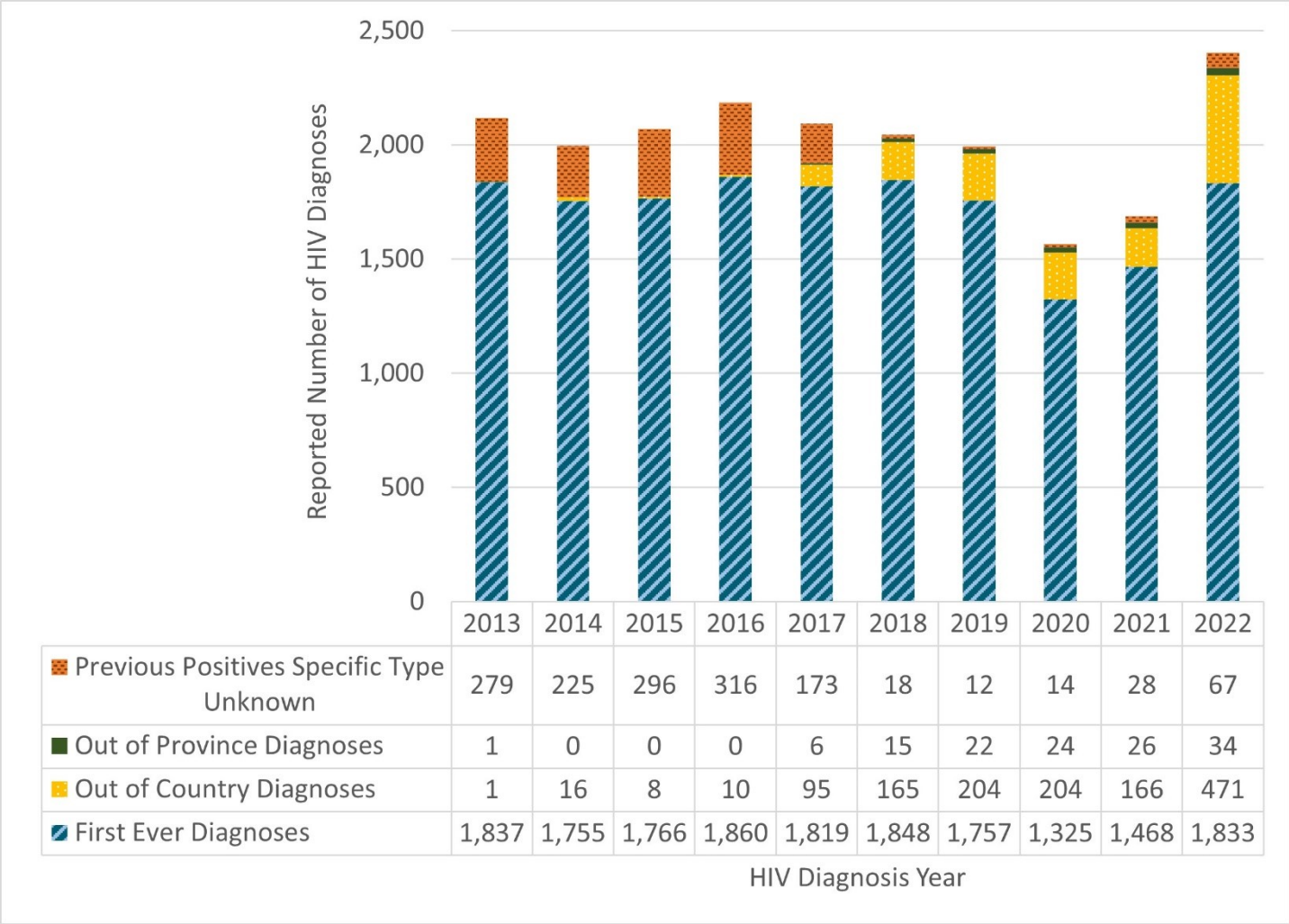
The data for HIV and AIDS are maintained in two unlinked databases. Different HIV and AIDS reporting requirements and practices exist across the country. Historically, there was also variation in reporting of first-time ever diagnoses of HIV and previous diagnoses, and all cases were referred to as 'newly reported' in previous reports. The ability to distinguish between first-time diagnoses and previously diagnosed cases varies by province and territory and by surveillance year. Please refer to '**Figure A1: Status of reporting on first-time diagnoses and previously diagnosed cases in all Canadian provinces and territories, 2013 to 2022'** for more detail about the pattern of reporting among the provinces and territories on previous positive cases over the past ten years. **Figure A2** presents the breakdown of all cases (first-time diagnoses versus previously diagnosed cases) in Canadian provinces and territories over the past 10 years.

Figure A1: Status of reporting on first-time diagnoses and previously diagnosed cases in all Canadian provinces and territories, 2013 to 2022

Province or Territory	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Alberta	N	N	N	N	N	N	N	Y	Y	Y
British Columbia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Manitoba	N	N	N	N	N	N	Y	Y	Y	Y
New Brunswick	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Newfoundland and Labrador	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Northwest Territories	N	N	N	N	N	N	N	Y	Y	Y
Nova Scotia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nunavut	N	N	N	N	N	N	N	Y	Y	Y
Ontario	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Prince Edward Island	N	N	N	N	N	N	Y	Y	Y	Y
Quebec	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Saskatchewan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Yukon	N	N	N	N	N	N	N	Y	Y	Y

Legend	
N	No - Case data includes disaggregated out of country/out of province HIV diagnoses.
Y	Yes - Case data represents first-time diagnoses only.

Figure A2: Reported HIV cases (including first-time and previously diagnosed) by year of diagnosis, Canada, 2013 to 2022 [a,b,c,d,e]



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Previous Positives Specific Type Unknown	279	225	296	316	173	18	12	14	28	67
Out of Province Diagnoses	1	0	0	0	6	15	22	24	26	34
Out of Country Diagnoses	1	16	8	10	95	165	204	204	166	471
First Ever Diagnoses	1,837	1,755	1,766	1,860	1,819	1,848	1,757	1,325	1,468	1,833

[a] Out of country and out of province cases were not included in datasets from British Columbia and Ontario.
[b] As of 2019, Saskatchewan reports only first-time diagnosed cases based on the year of testing, which is the reporting year for that HIV case. Previous positive cases referred from other jurisdictions outside Saskatchewan (including OOC) are captured in the SK HIV Public Health database (Panorama) but this data is not extracted or shared with PHAC.
[c] Includes data on HIV cases previously diagnosed within Quebec between 2013-2016 as Quebec reported first-time diagnoses between 2013-2022 but breakdown of type of previous positives was not reported between 2013-2016.
[d] The 'Previous Positives Specific Type Unknown' are previously diagnosed cases from Quebec between 2013-2016 and other provinces where the cases have been identified as previous positives, but insufficient information is available to attribute them to either OOC or OOP.
[e] Cases reported as 'Previously diagnosed in province' for Quebec (2017-2022) have been excluded to correspond to case reporting in the other Provinces and Territories.

HIV data

- Twelve of thirteen provinces and territories provided line-listed data on first-time diagnoses for 2022. Quebec provided line-listed data on all diagnoses within the province that did not separate first-time from previously diagnosed cases in 2022; however, they also provided aggregate data tables for first-time diagnoses so that the data could be incorporated into the national analyses.

- Provincial and territorial public health authorities provided information on previously diagnosed cases in their data submission. These were defined as HIV cases that had evidence of a known previous HIV diagnosis in another country (Out of Country, OOC) or in another Canadian province or territory (Out of Province, OOP). The additional aggregate summary data from Quebec included previously diagnosed cases where there was insufficient information to determine if they were OOP or OOC. In this case they were classified as 'Previous Positives Specific Type Unknown' in **Figure A2**.

- Some Provinces and Territories were able to provide historical information on previous positive cases; however, given resource constraints faced throughout the COVID-19 pandemic, not all provinces and territories were able to do this for this reporting cycle.

- Data within provincial and territorial public health authorities are continuously updated to remove duplicate cases and enhance the completeness of the data.

- For Alberta, in 2022, national reporting excludes HIV cases where the location of the first-time positive has been identified as out-of-country or outside the reporting province; consequently, HIV case totals from PHAC may differ from those reported by Alberta provincial reports. This is also noted within the report.

Race and/or ethnicity category

- Race and/or ethnicity information were submitted by all provinces and territories excluding Manitoba, Nova Scotia and Quebec. Additionally, reporting practices (such as race and/or ethnicity categories used) vary across provinces and territories and are limited in some provinces and territories.

- New Brunswick submitted information about whether a case was First Nations or not First Nations but did not submit information about any other race and/or ethnicity category.

Similarly, Saskatchewan submitted race and/or ethnicity in terms of whether a case self-declared as Indigenous or not but does not collect information about any other race and/or ethnicity category. British Columbia submitted information about race and/or ethnicity in cases who are not Indigenous.

Among the provinces and territories, the completeness of this variable ranged from 25.0% to 100% in 2022 (42.3% overall) and therefore should be interpreted with caution given the large amount of missing data and may not be fully representative of the national picture of race and/or ethnicity information for HIV cases.

- Further detail about the categories used in this report are:
    - Individuals reported in the South Asian/West Asian/Arab category include, for example, those of Pakistani, Sri Lankan, Bangladeshi, Armenian, Egyptian, Iranian, Lebanese, or Moroccan descent.
    - Individuals reported in the Asian category include, for example, those of Chinese, Japanese, Vietnamese, Indonesian, Laotian, Korean or Filipino descent.
    - Individuals reported in the Black category include, for example, those of Somali, Haitian or Jamaican descent.
    - Individuals reported in the Latin American category include, for example, those of Mexican, Central American, or South American descent.
    - Individuals reported in the 'Other' ethnicity category include those of mixed-race descent or any other racial and/or ethnic category.

Exposure category

- Exposure category data were submitted by all provinces and territories; while 12 of the 13 PT public health authorities submitted exposure category information as line-listed data, Quebec submitted exposure category data in aggregate table form.
- Among the provinces and territories, the completeness of this variable ranged from 56.6% to 100% in 2021 (81.2% overall).

AIDS data

The AIDS surveillance database captures non-nominal data on people diagnosed with AIDS (as per the national case definition) and includes HIV diagnosis, the disease indicative of AIDS and the vital status for the AIDS case (e.g., death). Among the provinces and territories, the following changes to AIDS reporting have occurred over time, which affect the completeness of AIDS surveillance data (**Figure A3**).

From January 1, 1979, to December 31, 2022, there were 25,091 cases of AIDS reported to PHAC. Additional AIDS data is available on the Notifiable Diseases website, Notifiable Diseases Online (canada.ca).

Figure A3: Status of reporting of AIDS diagnoses in all Canadian provinces and territories, 2013 to 2022 [a,b,c]

Province or Territory	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Alberta[a]	Y	Y	Y	Y	Y	N	N	N	N	N
British Columbia[b]	Y	Y	Y	Y	Y	Y	Y	Y	Y	LAG
Manitoba[c]	Y	Y	Y	Y	Y	N	N	N	N	N
Newfoundland and Labrador[c]	N	N	N	N	N	N	N	N	N	N
New Brunswick	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nova Scotia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ontario	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Prince Edward Island[c]	N	N	N	N	N	N	N	N	N	N
Quebec[c]	N	N	N	N	N	N	N	N	N	N
Saskatchewan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Yukon	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nunavut	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Northwest Territories	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Legend	
Y	Yes - Province reported AIDS Data
N	No - Province does not report AIDS
LAG	Reporting by lag year

[a] Alberta did not report AIDS data due to under reporting in 2018 and 2019. AIDS is no longer reportable in Alberta as of 2020.

[b] There is a one-year lag associated with the submission of AIDS data in British Columbia (e.g. 2021 data was submitted in 2022).

[c] AIDS is no longer reportable in: Manitoba as of 2018, Newfoundland and Labrador as of 2009, Prince Edward Island as of 2012, and Quebec as of June 30, 2003.

Appendix 3: Exposure category hierarchy

Based on information submitted about behaviours, HIV or AIDS cases are assigned a single exposure category from the PHAC exposure category hierarchy corresponding to the exposure route with the highest likelihood of HIV transmission. For example, if an individual who uses injection drugs and reports heterosexual contact is diagnosed with HIV, this individual would be attributed to the 'injection drug use' exposure category as this category has a higher likelihood of HIV transmission than 'heterosexual contact'. Several limitations of using the exposure category hierarchy exists: the exposure category does not differentiate between specific behaviours and populations with an increased burden of HIV; assessment of the exposure category can vary based on both the individual's responses and the questions posed by the care provider; and the exposure category hierarchy may need to be revised considering more recent evidence regarding probabilities of HIV transmission with the assistance of surveillance partners and subject-matter experts.

The exposure hierarchy is as follows:

Male-to-male sexual contact: This category includes males who report sexual contact with other males. It is important to note that this is a broad category that does not consider that the likelihood of acquiring or transmitting HIV varies by type of sexual contact, with condomless anal sex having the greatest transmission risk [72, 73]

Male-to-male sexual contact and Injection Drug Use (IDU): This category includes males who report sexual contact with other males and who also report injecting drugs.

Injection Drug Use (IDU): This category includes people who report injecting drugs.

Blood/blood products:

Recipient of blood/clotting factor: Before 1998, it was not possible to separate this exposure category. However, where possible, it has been separated into subcategories a and b.

Recipient of blood: Received transfusion of whole blood or blood components, such as packed red cells, plasma, platelets, or cryoprecipitate.

Recipient of clotting factor: Received pooled concentrates of clotting factor VIII or IX for treatment of hemophilia/coagulation disorder.

Heterosexual contact: This exposure applies to a person who indicated heterosexual contact and where there is no indication of male-to-male sexual contact, use of injection drugs, or a recipient of blood or clotting factor before 1998.

Occupational exposure: Exposure to HIV-contaminated blood or body fluids, or concentrated virus, in an occupational setting. This applies only to reported AIDS cases and not to HIV cases where the occupational exposure category is captured under "Other".

Perinatal transmission: The transmission of HIV from a person living with HIV to their infant, either in utero, during childbirth, or through breastfeeding.

Other: Used to classify cases where the mode of HIV transmission is known but cannot be classified into any of the major exposure categories listed here; for example, a recipient of semen from an HIV-positive donor. The “Other” exposure category includes cases from Alberta identified through Immigration Refugees and Citizenship Canada (for years before 2020), and also blood/clotting, perinatal, occupational exposure and other exposure categories.

No identified risk (NIR): Used when the history of exposure to HIV through any of the other modes listed is unknown, or there is no reported history (e.g., because of death, or loss to follow-up).

Not reported: In certain provinces and territories, exposure categories are not reported to PHAC and are classified as "not reported".

References

1. Joint United Nations Programme on, HIV/AIDS (UNAIDS). (2023) Global HIV & AIDS statistics — Fact sheet 2023. https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf .

2. Laprise C and Bolster-Foucault C. (2021) Understanding barriers and facilitators to HIV testing in Canada from 2009-2019: A systematic mixed studies review. Can Commun Dis Rep. DOI: 10.14745/ccdr.v47i02a03.

3. Restall G, Ukoli P, Mehta P, et al. (2023) Resisting and disrupting HIV-related stigma: a photovoice study. BMC Public Health. DOI: 10.1186/s12889-023-16741-1.

4. Sullivan PS, Satcher Johnson A, Pembleton ES, et al. (2021) Epidemiology of HIV in the USA: epidemic burden, inequities, contexts, and responses. Lancet. DOI: 10.1016/S0140-6736(21)00395-0.

5. Public Health Agency of Canada. (2023) HIV in Canada, Surveillance Report to December 31, 2021. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/hiv-canada-surveillance-report-december-31-2021.html

6. Public Health Agency of Canada. (2022) Estimates of HIV incidence, prevalence and Canada's progress on meeting the 90-90-90 HIV targets, 2020. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/estimates-hiv-incidence-prevalence-canada-meeting-90-90-90-targets-2020.html .

7. Rick F, Odoke W, van den Hombergh J, et al. (2022) Impact of coronavirus disease (COVID-19) on HIV testing and care provision across four continents. HIV Med. DOI: 10.1111/hiv.13180.

8. Groseclose SL and Buckeridge DL. (2017) Public Health Surveillance Systems: Recent Advances in Their Use and Evaluation. Annu Rev Public Health. DOI: 10.1146/annurev-publhealth-031816-044348.

9. Centre for Communicable Diseases and Infection Control. (2018) A summary of the Pan-Canadian framework on sexually-transmitted and blood-borne infections. Can Commun Dis Rep. DOI: 10.14745/ccdr.v44i78a05.

10. Jackson C and Tremblay G. (2019) Accelerating our response: Government of Canada five-year action plan on sexually transmitted and blood-borne infections. Canada communicable disease report. DOI: 10.14745/ccdr.v45i12a04.

11. Public Health Agency of Canada. (2024) Government of Canada's sexually transmitted and blood-borne infections (STBBI) action plan 2024-2030. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/sexually-transmitted-blood-borne-infections-action-plan-2024-2030.html .

12. Public Health Agency of Canada. (2022) Pan-Canadian Health Data Strategy: Toward a world-class health data system. https://www.canada.ca/content/dam/phac-aspc/documents/corporate/mandate/about-agency/external-advisory-bodies/list/pan-canadian-health-data-strategy-reports-summaries/expert-advisory-group-report-03-toward-world-class-health-data-system/expert-advisory-group-report-03-toward-world-class-health-data-system.pdf .

13. Public Health Agency of Canada. (2022) Short-term data priorities to support the COVID-19 response. https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/canadas-reponse/short-term-data-priorities.html .

14. Joint United Nations Committee on A. (2023) 2025 AIDS Targets. https://aidstargets2025.unaids.org/#section-targets .

15. Tarasuk J, Zhang J, Lemyre A, et al. (2020) National findings from the Tracks survey of people who inject drugs in Canada, Phase 4, 2017–2019. Canada communicable disease report. DOI: 10.14745/ccdr.v46i05a07.

16. Lydon-Hassen K, Jonah L, Mayotte L, et al. (2022) Summary findings from Tracks surveys implemented by First Nations in Saskatchewan and Alberta, Canada, 2018–2020. Canada communicable disease report. DOI: 10.14745/ccdr.v48i04a05.

17. A/C Study Research Team. (2020) A/C STUDY Community Report HIV among African, Caribbean, and Black People in Ontario. https://acstudy.ca/wp-content/uploads/2021/02/E%CC%81TUDE_AC.pdf.

18. WHO, CDC, UNAIDS, et al. (2017) Global HIV Strategic Information Working Group Biobehavioural Survey Guidelines For Populations At Risk For HIV. https://www.who.int/publications/i/item/978-92-4-151301-2 .

19. Public Health Agency of Canada. (2023) HIV in Canada, Surveillance Report to December 31, 2020. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/hiv-canada-surveillance-report-december-31-2020.html .

20. Popovic N, Yang Q, Haddad N, et al. (2019) Improving national surveillance of new HIV diagnoses. Can Commun Dis Rep. DOI: 10.14745/ccdr.v45i12a02.

21. Public Health Agency of Canada. (2023) Case definitions: Nationally notifiable diseases. https://diseases.canada.ca/notifiable/diseases-list .

22. Public Health Agency of Canada. (2015) HIV and AIDS in Canada Surveillance Report to December 31, 2014. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/hiv-aids-canada-surveillance-report-december-31-2014.html .

23. Forbes JC, Alimenti AM, Singer J, et al. (2012) A national review of vertical HIV transmission. AIDS. DOI: 10.1097/QAD.0b013e328350995c.

24. Immigration Refugees and Citizenship Canada. Canadian Panel Member Guide to Immigration Medical Examinations 2020, https://www.canada.ca/en/immigration-refugees-citizenship/corporate/publications-manuals/panel-members-guide.html (2023).

25. Statistics Canada. Statistics Canada, Canadian Vital Statistics - Death database (CVSD), https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3233 (2023).

26. Statistics Canada. Deaths and age-specific mortality rates, by selected grouped causes, Table: 13-10-0392-01, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310039201 (2023).

27. Statistics Canada. (2024) Population estimates on July 1, by age and gender, Table: 17-10-0005-01. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501&request_locale=en .

28. Loutfy MR, Logie CH, Zhang Y, et al. (2012) Gender and Ethnicity Differences in HIV-related Stigma Experienced by People Living with HIV in Ontario, Canada. PLOS ONE. DOI: 10.1371/journal.pone.0048168.

29. Woodgate RL, Zurba M, Tennent P, et al. (2017) "People try and label me as someone I'm not": The social ecology of Indigenous people living with HIV, stigma, and discrimination in Manitoba, Canada. Soc Sci Med. DOI: 10.1016/j.socscimed.2017.10.002.

30. Public Health Agency of Canada. (2022) National Report Findings from the Survey on the Impact of COVID-19 on access to STBBI-related services, including harm reduction services, for African, Caribbean and Black people in Canada. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/survey-impact-covid-19-access-stbbi-harm-reduction-services-african-caribbean-black-people.html .

31. Antabe R, Konkor I, McIntosh M, et al. (2021) “I went in there, had a bit of an issue with those folks”: everyday challenges of heterosexual African, Caribbean and black (ACB) men in accessing HIV/AIDS services in London, Ontario. BMC Public Health. DOI: 10.1186/s12889-021-10321-x.

32. Canadian Institute for Health Information. (2022) Guidance on the Use of Standards for Race-Based and Indigenous Identity Data Collection and Health Reporting in Canada. https://www.cihi.ca/sites/default/files/document/guidance-and-standards-for-race-based-and-indigenous-identity-data-en.pdf .

33. British Columbia's Office of the Human Rights Commissioner. (2020) Racialization. https://bchumanrights.ca/glossary/racialization/ .

34. Public Health Agency of Canada. (2022) National Report Findings from the Survey on the Impact of COVID-19 on the delivery of STBBI prevention, testing and treatment, including harm reduction services, in Canada. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/survey-impact-covid-19-access-stbbi-services-harm-reduction-people-who-use-drugs-alcohol.html .

35. UK Health Security Agency. HIV: annual data tables. , https://www.gov.uk/government/statistics/hiv-annual-data-tables (2023).

36. Centers for Disease Control and Prevention. America's HIV Epidemic Analysis Dashboard., https://ahead.hiv.gov/?indicator=4&measure=count&display=table (2023).

37. Kirby Institute, University of New South Wales. (2023) National HIV notifications 2013 – 2022. https://www.kirby.unsw.edu.au/sites/default/files/documents/HIV-summary-2022.pdf .

38. WHO Regional Office for Europe and European Centre for Disease Prevention and Control. (2023) HIV/AIDS surveillance in Europe 2023 - 2022 data. https://www.ecdc.europa.eu/sites/default/files/documents/HIV-AIDS_surveillance_in_Europe_2023_%28_2022_data_%29_0.pdf .

39. UK Health Security Agency. (2023) HIV testing, PrEP, new HIV diagnoses and care outcomes for people accessing HIV services: 2023 report. https://www.gov.uk/government/statistics/hiv-annual-data-tables/hiv-testing-prep-new-hiv-diagnoses-and-care-outcomes-for-people-accessing-hiv-services-2023-report#hiv-care-outcomes .

40. Government of Manitoba, Department of Health, Seniors and Long-Term Care, Performance and Oversight Division, Epidemiology and Surveillance. (2023) HIV in Manitoba 2022: Annual Surveillance Update. https://www.gov.mb.ca/health/publichealth/surveillance/hivaids/docs/dec2022.pdf .

41. Ontario HIV Epidemiology and Surveillance Initiative. (2023) Trends in HIV testing, diagnoses and the care cascade in Ontario in 2022. https://www.ohesi.ca/trends-in-hiv-testing-diagnoses-and-the-care-cascade-in-ontario-in-2022/ .

42. BCCDC Clinical Prevention Services (CPS). Sexually Transmitted and Blood Borne Infection
(STBBI) and Tuberculosis (TB) Surveillance Report, https://bccdc.shinyapps.io/stbbi_tb_surveillance_report/ (2024, accessed June 10, 2024).

43. Fojo A, Wallengren E, Schnure M, et al. (2022) Potential Effects of the Coronavirus Disease 2019 (COVID-19) Pandemic on Human Immunodeficiency Virus (HIV)

Transmission: A Modeling Study in 32 US Cities. Clin Infect Dis. DOI: 10.1093/cid/ciab1029.

44. Miller RL, McLaughlin A, Montoya V, et al. (2022) Impact of SARS-CoV-2 lockdown on expansion of HIV transmission clusters among key populations: A retrospective phylogenetic analysis. Lancet Reg Health Am. DOI: 10.1016/j.lana.2022.100369.

45. Sang J, Moore D, Wang L, et al. (2022) EPC 445 Examining the impacts of the COVID-19 pandemic on syndemic conditions and PrEP use among HIV among gay, bisexual and other men who have sex with men in Vancouver, Canada. The 24th International AIDS Conference. Montreal, Canada. July 29-August 3, 2022.

46. Cox J, Zhang J, Wong M, et al. (2022) PEMOD74 Impact of COVID-19 on access to sexually transmitted and blood-borne infections (STBBI) and harm reduction services for people who use drugs or alcohol in Canada. The 24th International AIDS Conference. . Montreal, Canada. July 29-August 3, 2022.

47. Etowa J, Omorodion F, Mbagwu I, et al. (2022) Understanding the Factors Associated with Hiv and Stis Diagnosis among Black Heterosexual Men in Ottawa and Windsor, Ontario. Journal of Public Health Research. DOI: 10.4081/jphr.2022.2048.

48. Omorodion FI, Etowa EB, Kerr J, et al. (2022) Correlates of Casual Sex Amidst Vulnerability to HIV Among ACB Heterosexual Men in Ottawa and Windsor, Ontario Canada. Journal of Racial and Ethnic Health Disparities. DOI: 10.1007/s40615-021-00975-z.

49. Gareau E and Phillips KP. (2022) Sexual behaviors at home and abroad: an online survey of Canadian young adult travelers. BMC Public Health. DOI: 10.1186/s12889-022-13383-7.

50. Centers for Disease Control and Prevention. (2021) HIV Infection, Risk, Prevention, and Testing Behaviors
Among Heterosexually Active Adults at Increased Risk for HIV Infection—National HIV Behavioral
Surveillance, 23 U.S. Cities, 2019. HIV Surveillance Special Report 26.

51. Public Health Agency of Canada. (2023) Trends in HIV Pre-Exposure Prophylaxis [HIV-PrEP] use in 9 Canadian provinces, 2019 – 2022. https://www.canada.ca/en/public-

health/services/publications/diseases-conditions/trends-pre-exposure-prophylaxis-use-in-9-canadian-provinces-2019-2022-infographic.html .

52. Ojukwu EN, Okoye HU and Saewyc E. (2023) Social Correlates of HIV-Risky Behaviours among African Canadian Adolescents Living in British Columbia, Canada: A Secondary Data Analysis. Int J Environ Res Public Health. DOI: 10.3390/ijerph20116031.

53. Gilbert M, Chang H, Ablona A, et al. (2021) Partner number and use of COVID-19 risk reduction strategies during initial phases of the pandemic in British Columbia, Canada: a survey of sexual health service clients. Canadian Journal of Public Health. DOI: 10.17269/s41997-021-00566-9.

54. Minoyan N, Høj SB, Zolopa C, et al. (2022) Self-reported impacts of the COVID-19 pandemic among people who use drugs: a rapid assessment study in Montreal, Canada. Harm Reduct J. DOI: 10.1186/s12954-022-00620-w.

55. Immigration Refugees and Citizenship Canada. 2023 Annual Report to Parliament on Immigration, https://www.canada.ca/en/immigration-refugees-citizenship/corporate/publications-manuals/annual-report-parliament-immigration-2023.html#highlights (2023, accessed June 6, 2024).

56. Office for National Statistics. (2023) Long-term international migration, provisional: year ending December 2022. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/bulletins/longterminternationalmigrationprovisional/yearendingdecember2022 .

57. Department of Home Affairs AG. (2023) 2022-23 Migration Program Report Program year 1 July 2022 to 30 June 2023. https://www.homeaffairs.gov.au/research-and-stats/files/report-migration-program-2022-23.pdf .

58. Alberta Health GoA. (2023) Alberta Sexually Transmitted Infections and HIV 2022. https://open.alberta.ca/dataset/c6850032-20d3-4845-a465-568ed7e61b7c/resource/facb3e6b-3890-4606-be07-45d5c35565e9/download/hlth-alberta-sexually-transmitted-infections-and-hiv-2022.pdf .

59. Nöstlinger C, Cosaert T, Landeghem EV, et al. (2022) HIV among migrants in precarious circumstances in the EU and European Economic Area. The Lancet HIV; 9: e428.

60. Yin Z, Brown AE, Rice BD, et al. (2021) Post-migration acquisition of HIV: Estimates from four European countries, 2007 to 2016. Euro Surveill. DOI: 10.2807/1560-7917.ES.2021.26.33.2000161.

61. King JM, Petoumenos K, Dobbins T, et al. (2023) A population-level application of a method for estimating the timing of HIV acquisition among migrants to Australia. J Int AIDS Soc. DOI: 10.1002/jia2.26127.

62. Singer J, Bitnun A, Kakkar F, et al. (2022) 43 Canadian Perinatal HIV Surveillance Program: Assessment of the effect of the COVID-19 pandemic on access to HIV Treatment and vertical transmission. The 31st Annual Canadian Conference on HIV / AIDS Research. Virtual. April 27-29,2022.

63. Tjepkema M, Christidis T, Olaniyan T, et al. (2023) Mortality inequalities of Black adults in Canada. Health Rep. DOI: 10.25318/82-003-x202300200001-eng.

64. Department of Data and Analytics (DNA) Division of Data, Analytics and Delivery for Impact (DDI). (2020) WHO methods and data sources for country-level causes of death 2000-2019 . https://www.who.int/docs/default-source/gho-documents/global-health-estimates/ghe2019_cod_methods.pdf .

65. Kyu HH, Jahagirdar D, Cunningham M, et al. (2021) Accounting for misclassified and unknown cause of death data in vital registration systems for estimating trends in HIV mortality. Journal of the International AIDS Society. DOI: 10.1002/jia2.25791.

66. British Columbia Centre for Excellence in, HIV/AIDS and British Columbia Ministry of Health. (2022) HIV Monitoring Semi-Annual Report for British Columbia Fourth Quarter 2022. https://stophivaids.ca/qmr/2022-Q4/#/bc .

67. European Centre for Disease Prevention and Control. (2023) Continuum of HIV care Monitoring implementation of the Dublin Declaration on partnership to fight HIV/AIDS in Europe and Central Asia: 2022 progress report. https://www.ecdc.europa.eu/sites/default/files/documents/CoC_HIV_0.pdf .

68. Nosyk B, Min JE, Krebs E, et al. (2018) The Cost-Effectiveness of Human Immunodeficiency Virus Testing and Treatment Engagement Initiatives in British Columbia, Canada: 2011-2013. Clin Infect Dis. DOI: 10.1093/cid/cix832.

69. Joint United Nations Programme on, HIV/AIDS (UNAIDS). (2014) Fast-Track: Ending the AIDS Epidemic by 2030. https://www.unaids.org/sites/default/files/media_asset/JC2686_WAD2014report_en.pdf .

70. Haddad N, Weeks A, Robert A, et al. (2021) HIV in Canada-surveillance report, 2019. Can Commun Dis Rep. DOI: 10.14745/ccdr.v47i01a11.

71. Hurren K, Haque S, Kwag M, et al. (2023) SEEING US AS WE ARE: Gender, Sex, & Sexual Orientation Identification in Electronic Health Records. https://www.cbrc.net/seeing_us_as_we_are_gender_sex_sexual_orientation_identification_in_electronic_health_records .

72. Public Health Agency of Canada. (2012) HIV Transmission Risk: A Summary of the Evidence HIV. https://canadacommons.ca/artifacts/1196206/hiv-transmission-risk/1749330/ .

73. Loutfy M, Tyndall M, Baril J, et al. (2014) Canadian consensus statement on HIV and its transmission in the context of criminal law. Can J Infect Dis Med Microbiol. DOI: 10.1155/2014/498459.