

# HIV/AIDS

## Epi Updates

---

Chapter 13: HIV/AIDS in Canada among people  
from countries where HIV is endemic

April 2012



## **Mission**

*To promote and protect the health of Canadians through leadership, partnership, innovation and action in public health.*

—Public Health Agency of Canada

*HIV/AIDS Epi Update – Chapter 13: HIV/AIDS in Canada among people from countries where HIV is endemic* is available on Internet at the following address: <http://www.phac-aspc.gc.ca>

Également disponible en français sous le titre :

*Actualités en épidémiologie du VIH/sida – Chapitre 13 : Le VIH/sida au Canada chez les personnes originaires de pays où le VIH est endémique*

### **To obtain a copy of the report, send your request to:**

Centre for Communicable Diseases and Infection Control  
Public Health Agency of Canada  
100 Eglantine Driveway, Health Canada Building  
A.L. 0602C, Tunney's Pasture  
Ottawa, ON K1A 0K9  
E-mail: [ccdic-clmti@phac-aspc.gc.ca](mailto:ccdic-clmti@phac-aspc.gc.ca)

### **Or from**

Canadian AIDS Treatment Information Exchange (CATIE)  
555 Richmond Street West, Suite 505  
Toronto, Ontario M5V 3B1  
Toll free: 1-800-263-1638  
E-mail: [orderingcentre@catie.ca](mailto:orderingcentre@catie.ca)

This publication can be made available in alternative formats upon request.

© Her Majesty the Queen in Right of Canada, 2012

**Print** Cat.: HP40-56/13-2012E  
ISBN: 978-1-100-20523-6

**PDF** Cat.: HP40-56/13-2012E-PDF  
ISBN: 978-1-100-20524-3

## Acknowledgements

National level HIV and AIDS surveillance is possible as a result of all provinces and territories participating in, and setting directions for, HIV and AIDS surveillance. Accordingly, the Centre for Communicable Diseases and Infection Control acknowledges the provincial/territorial HIV/AIDS coordinators, public health units, laboratories, healthcare providers and reporting physicians for providing the non-nominal confidential data that enable this report to be published. Without their close collaboration and participation in HIV and AIDS surveillance, the publication of this report would not have been possible.

We also thank Web Site and Intranet Operations, PHAC, for its contribution in helping us host the report on the Internet.

**N.B.** This document must be cited as the source for any extracted information.

**Suggested citation:** Public Health Agency of Canada. *HIV/AIDS Epi Updates: HIV/AIDS in Canada among people from countries where HIV is endemic, April 2012*, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2012.

## Centre for Communicable Diseases and Infection Control

### Surveillance and Epidemiology Division

**Tel.:** (613) 954-5169    **Fax:** (613) 957-2842

#### Division personnel who contributed to the production of this chapter are noted below:

Division Director	Dr. Chris Archibald
Executive Assistant	Louise Chevrier

#### HIV/AIDS and Tuberculosis Core Surveillance Section

Manager	Jessica Halverson
Senior Surveillance Analyst	Kristina Lalonde Tomas
Senior Epidemiologist	Qiuying Yang
Research Analyst	Chris Houston

#### HIV/AIDS Enhanced Surveillance Section

Manager	Susanna Ogunnaike-Cooke
Senior Epidemiologist (contractor)	Munira Nurhbai
Senior Epidemiologist	Marissa McGuire
Senior Epidemiologist	Jill Tarasuk
Senior Epidemiologist	Mubeen Aslam
Surveillance Officer	Chantal Nelson

## Overview of the HIV/AIDS Epi Update Development and Methodology

### Objective

The primary objective of the HIV/AIDS *Epi Update* publication is to provide up-to-date information on trends and developments in the epidemiology of HIV infection, AIDS and associated risk factors in Canada. Prior to 2007, the *Epi Update* was published annually. A new staggered approach has since been developed - each chapter will now be published as a stand-alone document that will be updated as new epidemiologic data become available. Chapters 1 to 12 were first published in this new booklet format in July 2010 and can be accessed at <http://www.phac-aspc.gc.ca/aids-sida/publication/epi/2010/index-eng.php>.

### Search Methodology

A Health Canada librarian developed a detailed search strategy to generate a list of relevant HIV literature citations within the context of a Canadian population. A broad search was done using the SCOPUS database, a bibliographic database containing abstracts and citations for scholarly journal articles. Search terms included “HIV” and “Canada”. This yielded a large number of results, as it was designed to be a comprehensive search strategy.

Articles were screened by title and/or abstract using pre-defined inclusion/exclusion criteria.

To identify other relevant documents, such as reports, news articles and exposés, a Web search was done using search engines such as Google™; this search also used the search terms “HIV” and “Canada”. RSS (Really Simple Syndication) feeds were set up through the Health Canada Library to locate any newly published media reports within the parameters of the literature search objectives.

### Inclusion Criteria

Articles meeting the following criteria were included in the *HIV/AIDS Epi Update* reference materials:

- Articles that referred to the vulnerable population addressed in the current chapter, as specified in The *Federal Initiative to Address HIV/AIDS in Canada*, which include Aboriginal peoples, at-risk youth, women, people who inject drugs (IDU), men who have sex with men (MSM), prison inmates, people from countries where HIV is endemic, people living with HIV/AIDS as identified by the Federal Initiative.
- Independent variable: HIV-associated risk behaviours, social determinants of health.
- Dependant variable: HIV and associated outcomes.
- Study design: surveillance, epidemiologic studies, socio-behavioural, relevant randomized controlled trial (RCT), qualitative research and community-based research.
- Country/populations: Canada/populations of people who reside in Canada.
- Peer-reviewed literature.
- Grey literature, such as agency reports, conference abstracts.
- Articles written in English or French.

### Exclusion Criteria

Articles meeting the following criteria were excluded from the Epi Updates reference list:

- Studies relating to animals.
- Drug trials.
- Program evaluation reports, discussions on surveillance methodology, articles that include HIV and populations of interest but focus on condition/topic other than HIV (e.g. cardiovascular disease in HIV populations), similar articles published with different titles/order of authors.
- Articles written in languages other than French or English.





## HIV/AIDS in Canada among people from countries where HIV is endemic

### At a Glance

- People from countries where HIV is endemic are disproportionately affected by HIV/AIDS in Canada. They represent 14% of people living with HIV in Canada while representing only 2.2% of the population.
- The estimated new infection rate among individuals born in HIV-endemic countries is about 8.5 times higher than among other Canadians.
- People with HIV who are born in HIV-endemic countries and whose infection is attributed to heterosexual contact (Het-Endemic) are diagnosed at a younger age relative to other heterosexual contact exposure subcategories: Over 75% of positive HIV test reports assigned to the Het-Endemic exposure subcategory are among individuals under the age of 40 years, compared to 60% among other heterosexual exposure subcategories.
- The majority of reported HIV positive test reports assigned to the Het-Endemic exposure sub-category are people who self-identified as Black.
- In Canada, HIV/AIDS has a significant impact on women from countries where HIV is endemic. Females 15 years of age or older represented 55.3% of positive HIV test reports attributed to the Het-Endemic exposure subcategory between 1998 and 2009 and 40.7% of AIDS cases during this same time period.

### Introduction

This chapter draws together findings from multiple sources to provide an update on the status of HIV and AIDS in Canada among people from countries where HIV is endemic. Specifically, it starts with a summary of the estimated prevalence and incidence of HIV among this population in Canada. In addition, this chapter also presents data from the most recently available routine HIV and AIDS national surveillance data and selected findings from recent research. This chapter concludes with a discussion of the strengths and limitations of existing research and provides a summary of the findings presented.

### Background

#### Global HIV/AIDS epidemic update

The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that at the end of 2009 the total number of people living with HIV/AIDS was 33.3 million [range: 31.4 million - 35.3 million] worldwide.<sup>1</sup> There is substantial geographic variability in HIV prevalence, patterns of infection incidence and modes of transmission. Sub-Saharan Africa continues to be the most heavily affected region, accounting for an estimated 69% (1.8 million [1.6 million - 2.0 million]) of all new HIV infections in 2009, and 72% of the world's 1.8 million [1.6 million to 2.1 million] AIDS-related deaths. In UNAIDS's 2010 global report, the highest regional HIV prevalence rates were in Sub-Saharan Africa (5.0% [4.7%-5.2%]) and in the Caribbean (1.0% [0.9% - 1.1%]).<sup>1</sup>

**Table 13-1: Estimated number of people living with HIV globally and by region, 2009**

Region	Adults and children [low - high estimate]	Adult (15-49) prevalence percentage [low - high estimate]
Sub-Saharan Africa	22.5 million [20.9 million - 24.2million]	5.0 [4.7 - 5.2]
Middle East and North Africa	460 000 [400 000 - 530 000]	0.2 [0.2 - 0.3]
South and South-East Asia	4.1 million [3.7 million - 4.6 million]	0.3 [0.3 - 0.3]
East Asia	770 000 [560 000 - 1.0 million]	0.1 [0.1 - 0.1]
Oceania	57 000 [50 000 - 64 000]	0.3 [0.2 - 0.3]
Central and South America	1.4 million [1.2 million - 1.6 million]	0.5 [0.4 - 0.6]
Caribbean	240 000 [220 000 - 270 000]	1.0 [0.9 - 1.1]
Eastern Europe and Central Asia	1.4 million [1.3 million - 1.6 million]	0.8 [0.7 - 0.9]
Western and Central Europe	820 000 [720 000 - 910 000]	0.2 [0.2 - 0.2]
North America	1.5 million [1.2 million - 2.0 million]	0.5 [0.4 - 0.7]
Total	33.3 million [31.4 million - 35.3 million]	0.8 [0.7 - 0.8]

Source: UNAIDS Report on the global AIDS epidemic, 2010, p. 20

### Understanding the term “HIV-endemic countries”

The Public Health Agency of Canada’s (PHAC) Centre for Communicable Diseases and Infection Control (CCDIC) maintains a list of countries with generalized epidemics<sup>a</sup> and refers to these countries as “HIV-endemic countries” (HEC) or “countries where HIV is endemic” for the purpose of surveillance. Countries where HIV is endemic are defined as those where the prevalence of HIV among adults (age 15-49 years) is 1.0% or greater and one of the following:

- 50% or more of HIV cases are attributed to heterosexual transmission;

- a male to female ratio of 2:1 or less among prevalent infections; or
- HIV prevalence greater than or equal to 2% among women receiving prenatal care.

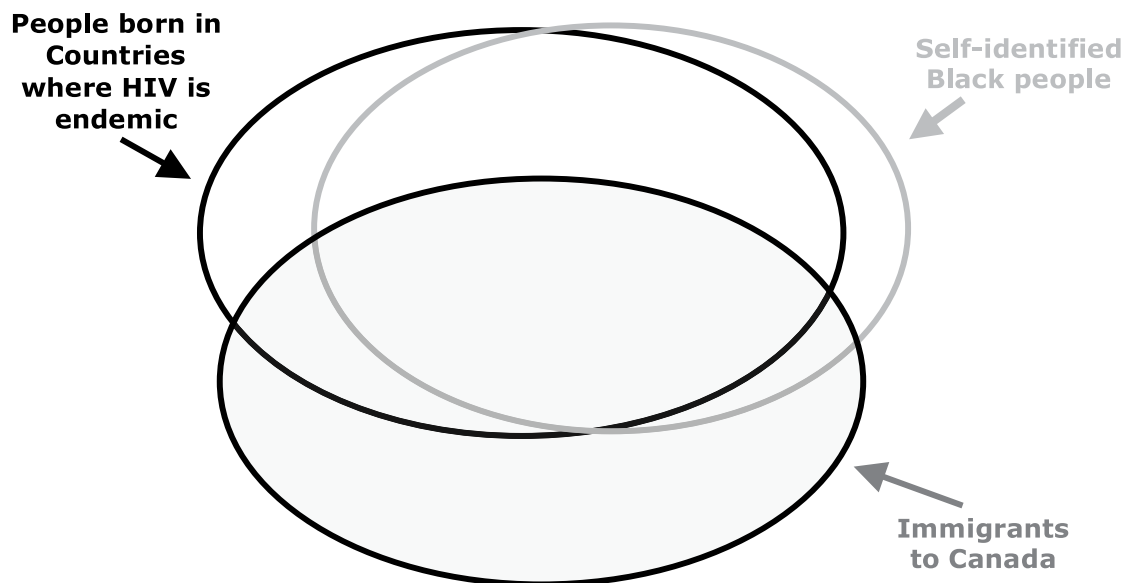
A list of countries where HIV is endemic, as per the above definition, appears in Appendix 1. This list contains a total of 71 countries, of which 42 are in Africa (mostly Sub-Saharan Africa), 26 are in the Caribbean and Central/South Central America, and three are in Asia.

It is important to differentiate between this epidemiological population definition and other intersecting definitions, such as populations/communities defined by race, ethnicity or immigration status. Figure 13- 1 illustrates some of the relevant intersecting dimensions, some of which are used in the research studies summarized later in this chapter. For the purposes of Canadian national HIV/AIDS surveillance, the dimension of focus is people in Canada who were born in countries where HIV is endemic.

<sup>a</sup> UNAIDS defines a generalized epidemic as one where HIV is firmly established in the general population; Although sub-populations at high risk may continue to contribute disproportionately to the spread of HIV, sexual networking in the general population is sufficient to sustain an epidemic independent of sub-populations at higher risk of infection; Numerical proxy: HIV prevalence consistently over one percent in pregnant women (see [http://www.unaids.org/en/media/unaids/contentassets/dataimport/publications/irc-pub01/jc370-2ndgeneration\\_en.pdf](http://www.unaids.org/en/media/unaids/contentassets/dataimport/publications/irc-pub01/jc370-2ndgeneration_en.pdf))



**Figure 13-1: Overlapping populations – people who were born in countries where HIV is endemic, persons who self-identify as Black, and persons who immigrate to Canada.**



Note: This figure is not drawn to scale.

Adapted from: Houde A. PHAC presentation made at the ICAD/ACCHO workshop – Meeting the Challenge. Ottawa, September 28, 2009.

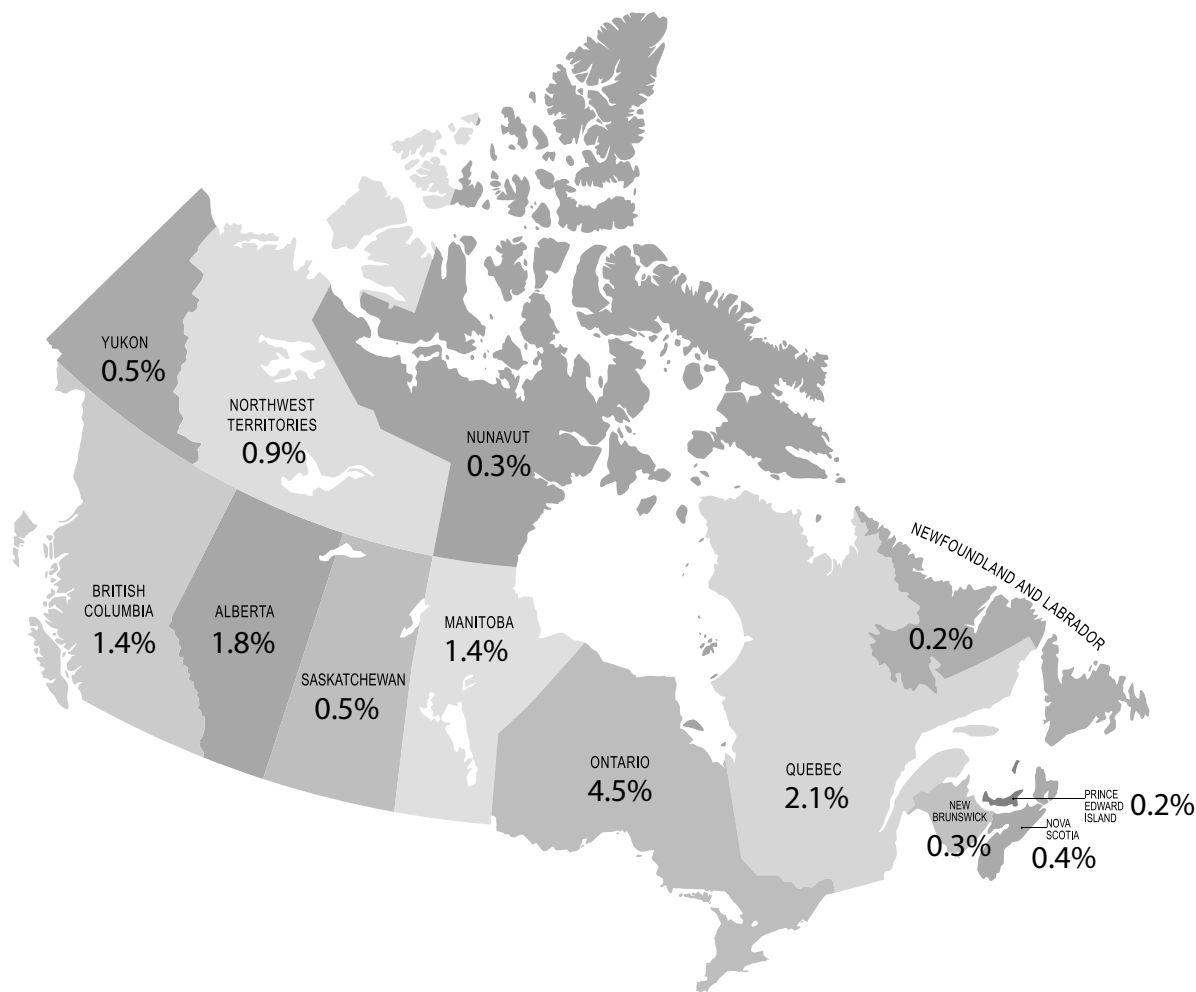
### Canadian demographic profile

Immigrants to Canada comprise an important proportion of the Canadian population – according to Statistics Canada (2006 Census) data, approximately one in five Canadians (6.2 million or 19.8% of the Canadian population) is foreign-born.<sup>2</sup> According to the same 2006 census data, people in Canada who were born in countries where HIV is endemic comprised 2.2% of the total Canadian population.<sup>3</sup> When second generation Canadians who have at least one parent who was born in a country on the HEC list are considered in addition to people born in HECs, the proportion was 2.7%.<sup>3</sup>

Ontario and Quebec have the largest proportion of individuals<sup>b</sup> who originate from countries where HIV is endemic, representing 4.5% and 2.1% of the provincial populations respectively. Other provinces with a population proportion of 1.0% or greater from countries where HIV is endemic include Alberta, British Columbia and Manitoba (Figure 13- 2). The five cities with the largest numbers of people who originate from countries where HIV is endemic are Toronto, Montréal, Vancouver, Ottawa and Calgary. Individuals who originate from the Caribbean (including Bermuda and Central/South America) make up approximately 73% of all people from countries where HIV is endemic living in Toronto. In Montréal, the top three countries of origin were Haiti (with 48.2% of the HEC population), Cambodia (6.8%), and the Democratic Republic of Congo (4.7%).

<sup>b</sup> For the purpose of this demographic description, these data include both people born in HECs and second generation Canadians who have at least one parent who was born in a country on the HEC list.

**Figure 13- 2: Proportion of provincial/territorial population born in a country where HIV is endemic or has at least one parent born in an HEC.**



### Issues facing Canadian residents who originate from countries where HIV is endemic

People who originate from countries where HIV is endemic are diverse, reflecting variations in historical backgrounds, races, ethnicities, language and cultural traditions. Unfortunately, some of these communities in Canada are disproportionately affected by social and economic factors that not only increase their vulnerability to HIV infection, but also act as barriers to prevention, screening, and treatment programs. Factors identified in the literature have included racism, homelessness, transience, poverty, underemployment, and settlement and status concerns. Further barriers

to program access include fear and stigma, denial (as a coping mechanism), social isolation, lack of social support, fear of deportation, and cultural attitudes and sensitivities about HIV transmission. The PHAC *Population-specific HIV/AIDS status report on People from Countries where HIV is Endemic - Black people of African and Caribbean descent living in Canada*<sup>4</sup> provides a comprehensive review of these issues. In addition, a Health Canada 2010 publication on migration health includes a review of migration patterns, changes in migration health legislation and policies, patterns in chronic disease, mental health, infectious diseases and health services utilization.<sup>5</sup>

## National Estimates of HIV/AIDS Prevalence and Incidence

### Description and summary of estimation methodology

PHAC uses several methods to provide an overall picture of HIV occurrence among all Canadians living with HIV (including AIDS), including those with both diagnosed and undiagnosed infections. These methods combine statistics from many data sources, including routine surveillance, population-specific/enhanced surveillance, HIV-testing behaviour information, treatment programme data and educated assumptions. Using this composite methodology, PHAC produces two types of estimates:

1. HIV prevalence, which is the number of people living with HIV (including AIDS); and
2. HIV incidence, which is the number of new infections in a one-year period.

PHAC produces estimates of national HIV prevalence and incidence approximately every three years. The estimates are summarized below. For a full description of the methodology and the national HIV estimates for 2008, please refer to Yang et al., "Estimates of the Number of Prevalent and Incident Human Immunodeficiency Virus Infections in Canada, 2008".<sup>6</sup>

## National estimates for 2008: HIV/AIDS Prevalence Data

National estimates for 2008 indicate that the number of people living with HIV (including AIDS) continues to rise, from an estimated 57,000 in 2005 to an estimated 65,000 in 2008 (a 14% increase). The increase in the number of people living with HIV is due to two factors: (1) new treatments have improved survival of HIV-infected people, and (2) new infections continue to occur.

Of prevalent HIV cases in Canada at the end of 2008, an estimated 9,250 cases (14%) were among people infected through heterosexual contact and who were born in an HIV-endemic country (Table 13- 2).

Despite the widespread availability of anti-retroviral treatment and extensive promotion of HIV testing, an estimated 26% of HIV infections (approximately 16,900; range of 12,800 to 21,000 people) remained undiagnosed in Canada in 2008. In the same year, the estimated percentage of people living with HIV who were unaware of their HIV positive status varied by exposure category. There were an estimated 35% of people living with HIV in the heterosexual exposure category in Canada who were unaware of their serostatus; this category includes people who were born in countries where HIV is endemic. By comparison, approximately 19% of infected people in the MSM exposure category and 25% of infected people in the IDU exposure category were unaware of their serostatus (Figure 13- 3).

**Table 13-2: Estimated total number of prevalent HIV infections in Canada and estimated cases attributed to heterosexual sex, with associated ranges of uncertainty at the end of 2008 and 2005 (point estimates, ranges and percentages are rounded)**

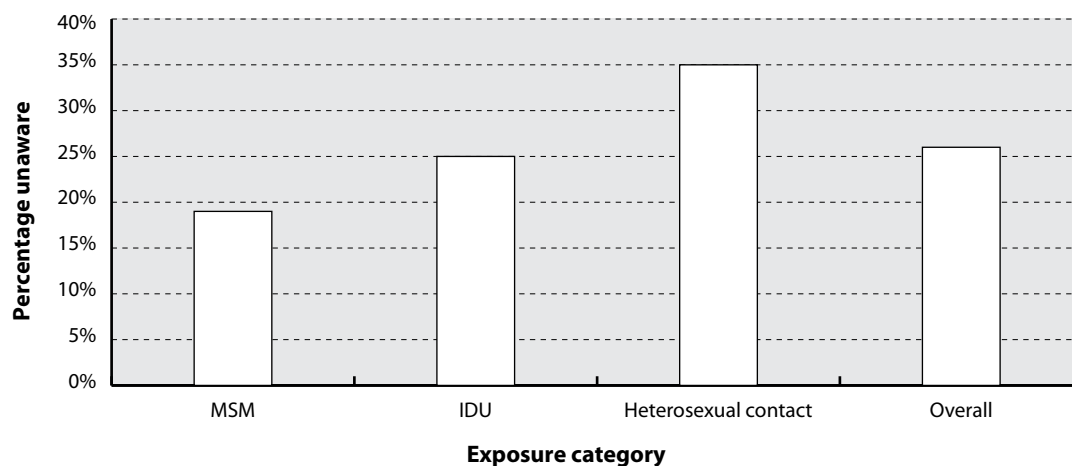
Year	Estimated Total number of PHA <sup>i</sup> in Canada	Estimated number of prevalent infections attributed to:	
		Heterosexual/Non-endemic <sup>ii</sup>	Heterosexual/ Endemic <sup>iii</sup>
<b>2008</b>	65,000 (54,000-76,000)	10,710 (8,300-13,100)	9,250 (6,800-11,700)
<b>%</b>		17%	14%
<b>2005</b>	57,000 (47,000-67,000)	9,050 (7,000-11,100)	7,860 (5,800-9,900)
<b>%</b>		16%	14%

<sup>i</sup>PHA: people living with HIV/AIDS

<sup>ii</sup>Heterosexual/non-endemic: heterosexual contact with a person who is either HIV-infected or at risk for HIV or heterosexual contact as the only identified risk.

<sup>iii</sup>Heterosexual/endemic: heterosexual contact and origin from a country where HIV is endemic.

**Figure 13- 3: Estimated percentage of persons living with HIV who are unaware of their infection, by exposure category, Canada, 2008**



### National estimates for 2008: HIV/AIDS incidence data

Although estimates of the number of new HIV infections are quite uncertain, it appears that the number of new infections in 2008 (estimated range between 2,300 and 4,300) was about the same or slightly greater than the estimated range in 2005 (2,200 to 4,200).

People from HIV-endemic countries were over-represented among new infections - new infections attributed to the heterosexual/endemic exposure (Het-Endemic) subcategory<sup>c</sup> were in the range of 370 to 690 (16%

- Table 13- 3) in 2008; yet according to the 2006 Census, approximately 2.2% of the Canadian population was born in an HIV-endemic country. Therefore, the estimated new infection rate among individuals born in HIV-endemic countries is about 8.5 times higher than among other Canadians. Figure 13- 4 shows the trend among the estimated number of incident cases by exposure subcategory, over time, together with the estimated uncertainty. The estimated HIV incidence attributed to the Het-Endemic exposure subcategory has increased steadily over the years, with a steeper increase seen in the decade 1999 to 2008.

<sup>c</sup> A full description of the exposure categories and subcategories is provided below, in the section entitled "Routine (Case-Based) HIV/AIDS Surveillance".

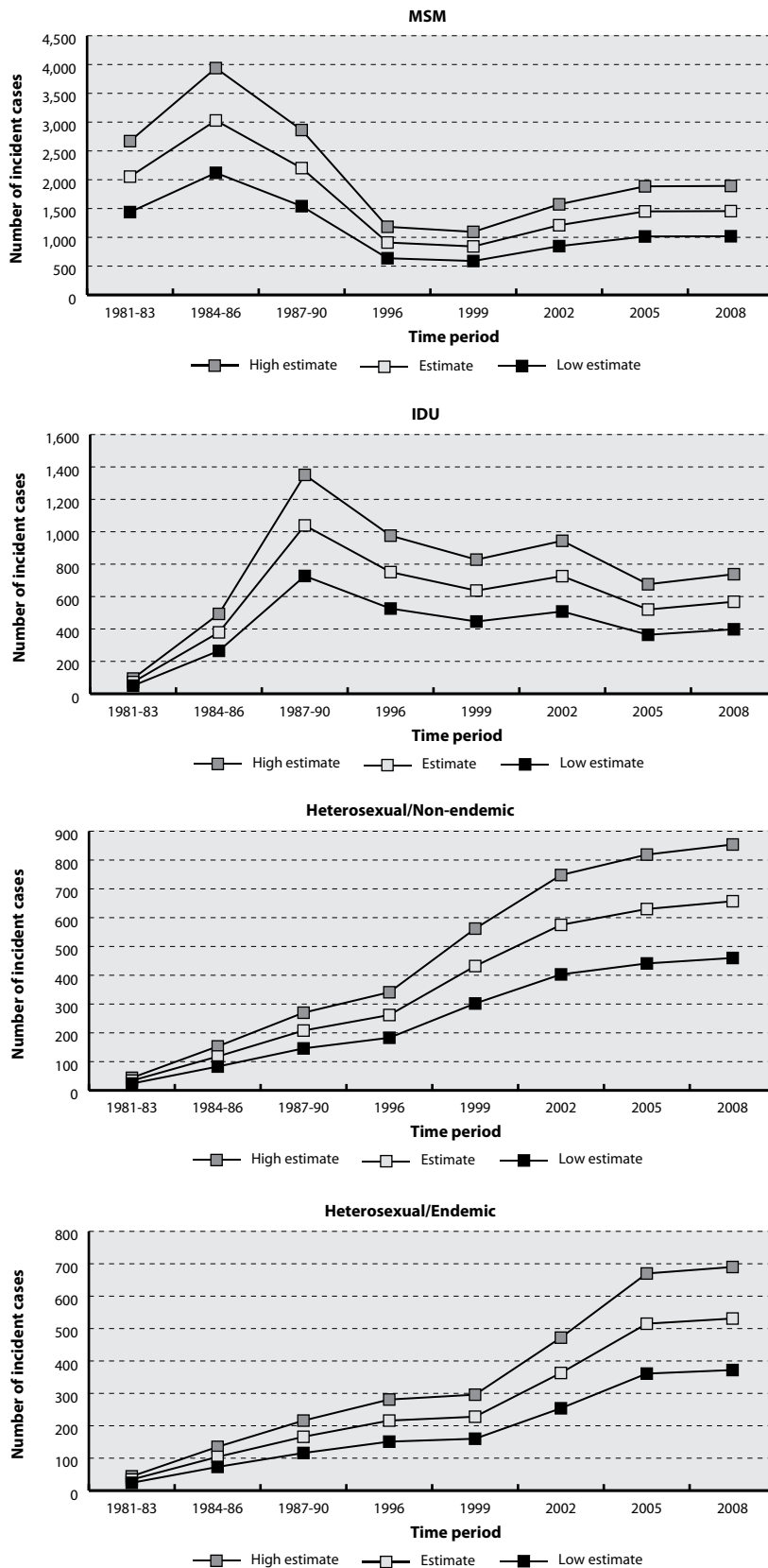
**Table 13- 3: Estimated ranges of uncertainty for number of incident HIV infections in Canada in 2008 and 2005 (ranges and percentages are rounded).**

	Total	Heterosexual/ Non-endemic <sup>i</sup>	Heterosexual/ Endemic <sup>ii</sup>
<b>2008</b>	2,300-4,300	450-860	370-690
<b>%</b>		20%	16%
<b>2005</b>	2,200-4,200	440-820	360-670
<b>%</b>		20%	16%

<sup>i</sup>Heterosexual/non-endemic: heterosexual contact with a person who is either HIV-infected or at risk for HIV or heterosexual as the only identified risk.

<sup>ii</sup>Heterosexual/endemic contact and origin from a country where HIV is endemic.

**Figure 13- 4: Trends in the estimated HIV incidence over time period in Canada, by exposure category.**



## Routine (Case-Based) HIV/AIDS Surveillance

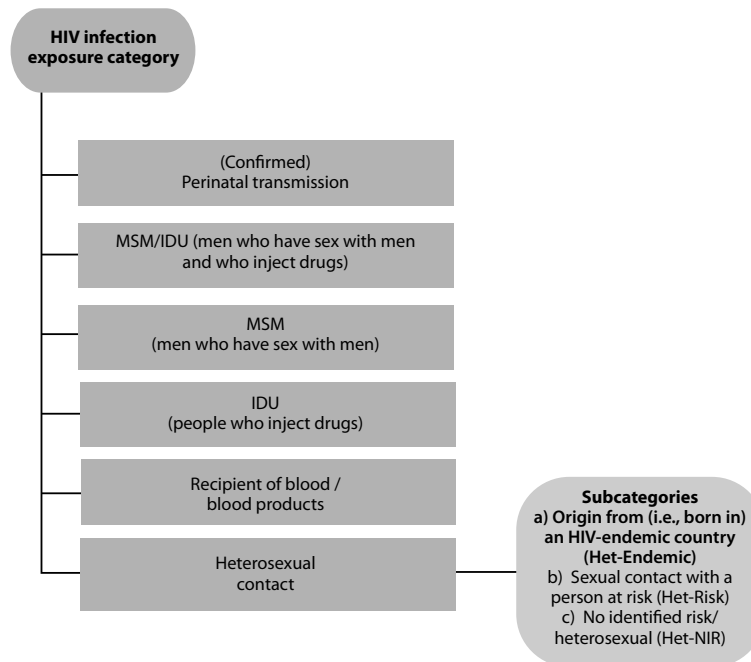
PHAC's CCDIC collects surveillance data on positive HIV test reports and reported AIDS diagnoses in Canada. Reported epidemiological information includes (but is not limited to) age, biological sex, country of birth, self-reported race/ethnicity and risk exposures associated with the transmission of HIV. For AIDS cases, death data are also collected. This information is forwarded by healthcare practitioners to provincial and territorial public health officials, who, in turn, voluntarily submit newly diagnosed cases of HIV infection and AIDS to the Centre, where the data are synthesized and analyzed at the national level. There are several limitations regarding surveillance data, including reporting delays, under-reporting, missing information and undiagnosed individuals. (Refer to Chapter 3, entitled "HIV Testing and Surveillance Systems in Canada", for a full description of HIV/AIDS surveillance in Canada.<sup>7</sup>)

### HIV exposure categories

When interpreting national HIV/AIDS surveillance data, bear in mind that the term "exposure category" refers to the most likely way a person became infected with the HIV virus and is assigned according to a hierarchy of exposure categories (Figure 13- 5). The following are the first six exposure categories: (confirmed) perinatal transmission, men who have sex with men and use injection drugs (MSM/IDU), men who have sex with men (MSM), people who inject drugs (IDU), recipients of blood/blood products (before 1985) and heterosexual contact. Cases categorized within the heterosexual contact exposure category are further sub-categorised into three exposure subcategories: 'hetero-

sexual contact with a person at risk' (Het-Risk; where a 'person at risk' includes people who inject drugs, a bisexual male, a person born in an HIV-endemic country), 'heterosexual contact and born in an HIV-endemic country' (Het-Endemic) and 'heterosexual contact with no additional identified risk' (Het-NIR; cases in which no HIV risk exposures were reported except for a history of heterosexual contact). The first five exposure categories are generally accepted to constitute a more likely route for HIV transmission compared to heterosexual sex, and so if these are reported they are designated as the HIV exposure category for the case. It is important to note that even though all risk factors associated with a positive HIV test report may be reported for a given case, only one exposure category is assigned for national HIV/AIDS surveillance reporting. A case with more than one reported HIV-related risk factor is placed in the exposure category corresponding to the exposure that is considered to have the highest risk of HIV transmission according to the risk hierarchy.

Most relevant to this HIV/AIDS Epi Update chapter is the "origin from an HIV-Endemic country" (Het-Endemic) subcategory of the broader "heterosexual contact" exposure category. The Het-Endemic exposure subcategory was first reported as an independent category in 1998. It is important to note that the Het-Endemic subcategory only includes individuals born in HIV-endemic countries who reported exposure to HIV through heterosexual contact; individuals born in HIV-endemic countries who also reported other risk factors, such as MSM or IDU, are excluded from the Het-Endemic exposure subcategory. Instead, these cases are placed within other relevant exposure categories higher on the exposure category hierarchy.

**Figure 13-5: Exposure category hierarchy for the national HIV/AIDS surveillance system**

### Limitations of key variables

The ability to adequately monitor HIV/AIDS among people born in countries where HIV is endemic requires accurate and complete access to key data elements, specifically, country of birth and risk factor/exposure category. Information on country of birth can be categorized according to the HIV-endemic country list that appears in Appendix 1. Further interpretation of the trends among this sub-population requires the use of additional variables, including age, sex and race/ethnicity. Unfortunately, the completeness of these data elements across Canada is variable.

National HIV surveillance data are limited by the number of cases with incomplete data on country of birth and exposure category: less than 5% of records are submitted with country of birth data, and exposure category data accompanied only 53.6% of positive HIV test reports at the national level from 1998 to the end of 2009. Canada's two most populous provinces, Ontario and Quebec, do not routinely collect and/or report country of birth or complete exposure category data on their positive HIV tests reports to PHAC. This is an important limitation of national surveillance, since these two provinces together account for over two-thirds of all positive HIV test reports in Canada. They also include two large urban centres (Toronto and Montréal) that are ethnically diverse.

While associated data on age group and sex variables for HIV test reports are fairly complete (94.8% and 96.0% respectively), race/ethnicity data only accompanied approximately one-third (31.1%) of positive HIV test reports from 1998 to the end of 2009. The lack of race/ethnicity data limits the accurate description of the HIV/AIDS epidemic among racial or ethnic subgroups across Canada.

These key variables are more complete for AIDS case reports. Data on country of birth are available for 43% of cases, and 78% of case reports from 1998 to the end of 2009 included exposure category information. While age and sex are both 99.9% complete, race/ethnicity data were available for only 72% of reported AIDS cases from 1998 to the end of 2009. More limitations have emerged in reported AIDS cases in recent years, however. As of June 30, 2003, AIDS data (and therefore exposure category data) are not available from the province of Quebec. In addition, Ontario's AIDS case reports have not included exposure category or race/ethnicity data for the second half of 2005 onwards, due to a change in the information technology application, which affects all reportable diseases.

In sum, the surveillance data presented in this report cannot provide a representative national picture of the HIV/AIDS epidemic among people from HIV-endemic countries, because of the large amount of missing data and the fact that the HIV-endemic exposure subcategory does not include all persons born in countries where HIV is endemic. As such, caution should be used when drawing conclusions based on the percentages and frequencies in this document.

### National AIDS Surveillance data

Since AIDS reporting began in 1979, there have been 21,681 new AIDS diagnoses reported to PHAC through December 31, 2009. There were 224 AIDS cases reported to PHAC in 2009, a 28.2% decrease over the previous year. From 1998 to 2009, a total of 423 AIDS diagnoses (among those 15 years of age and older) were reported under the Het-Endemic exposure subcategory, with an annual peak of 60 cases in 2002. The

When analyzing exposure category breakdowns by race/ethnicity, the Het-Endemic exposure subcategory accounts for 78.8% of reported AIDS cases among cases who self-identify as Black, 18.6% among those self-identifying as South Asian/West Asian/Arab, and 8.2% among those self-identifying as Latin American.

When looking at reported race/ethnicity among AIDS diagnoses attributed to the Het-Endemic exposure subcategory, nearly 90% are identified as Black, with South Asian and White comprising the next most frequently reported race/ethnicity groups, at 2.5% each.

When data on reported AIDS cases within the Het-Endemic exposure subcategory are examined by age group, no distinguishable trends have been observed since 1998. From the 423 reported AIDS cases during this time period, the 30-39 years old age group comprised the largest proportion of cases at 43.5%, followed by 31.9% in the 40-49 years old age group.

**Table 13- 4: Number and proportion of reported AIDS cases 15 years of age and older within the heterosexual contact exposure subcategories, 1998 - 2009.**

Exposure category	Reported AIDS cases 15 years of age and older, 1998-2009 (n=3,708)
<b>Heterosexual contact</b>	<b>1,090</b>
Origin from an HIV-endemic country (Het-Endemic)	423 (38.8%)
Heterosexual contact with a person at risk (Het-Risk)	307 (28.2%)
Heterosexual with no identifiable risk (Het-NIR)	360 (33.0%)

Het-Endemic exposure subcategory has accounted for 11.4% of all AIDS reports among cases 15 years and older with known exposure categories since 1998. The Het-Endemic exposure subcategory reached its highest proportion in 2002, when it accounted for 16.2% of all AIDS reports that year, with a low in 2007 at 6.0%.

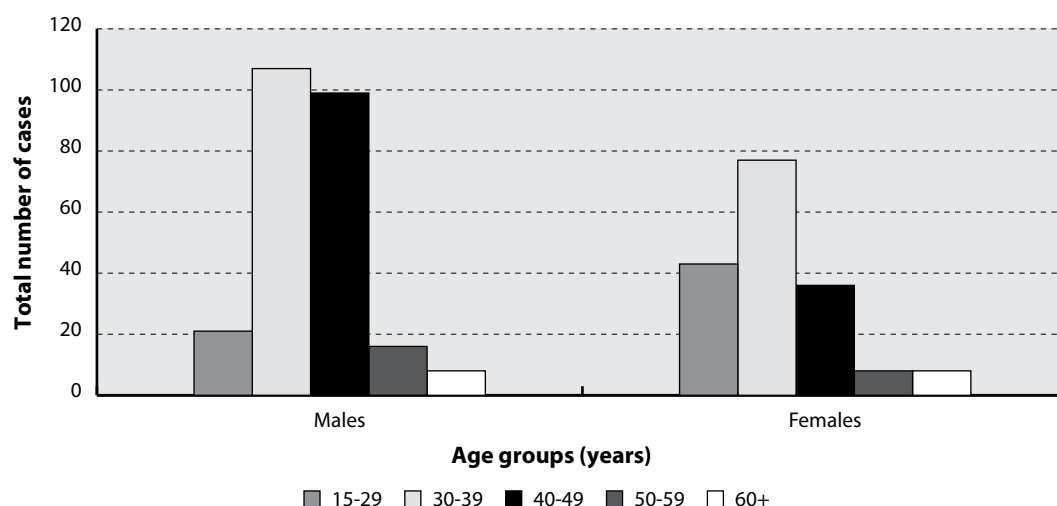
The 1,090 AIDS diagnoses attributed to heterosexual contact represent 29.4% of all confirmed cases among those 15 years of age and older with known exposure categories for the period 1998 to 2009. The Het-Endemic exposure subcategory represents the largest proportion of total AIDS reports attributed to the broader heterosexual contact exposure category since 1998, with 38.8% of cases (Table 13- 4).

When age group is further examined by sex, it is apparent that patterns of AIDS diagnoses within the Het-Endemic exposure subcategory are different between males and females. According to cumulative AIDS case reports attributed to this exposure subcategory, females tend to be diagnosed with AIDS at a younger age relative to males. For example, the 15-29 years old age group contains twice as many cases among females as males (43 vs. 21). It is the only age group in the Het-Endemic exposure subcategory in which females account for more reported AIDS cases than males (Figure 13-6).

Overall, females 15 years of age and older account for 17.4% of all AIDS cases reported nationally from 1998 to 2009. Of all exposure categories for AIDS cases, the proportion of females was highest within the Het-Endemic exposure subcategory, accounting for 40.7% of cases.



**Figure 13-6: Total reported AIDS cases 15 years of age and older, attributed to the Het-Endemic exposure sub-category, by age group and sex, 1998-2009**



### National HIV Surveillance Data

From the beginning of HIV reporting in Canada in 1985 until December 31, 2009, a total of 69,844 positive HIV test reports have been reported to the national level. Table 13-5 summarizes HIV surveillance data within the heterosexual contact exposure category for positive HIV test reports among cases 15 years of age and older

with a known exposure category between 1998 and 2009 (n=15,131). Of these reports, the Het-Endemic exposure subcategory amounted to 986 positive HIV test reports, accounting for 6.5% of national reports with exposure category information. Among the heterosexual contact cases (n=4,582), 21.5% of cases were attributed to the Het-Endemic exposure subcategory.

**Table 13-5: Number and proportion of HIV positive test reports among cases 15 years of age and older within the heterosexual exposure category, from 1998 to 2009**

Heterosexual contact exposure subcategories	Number of cases	Proportion out of total cumulative reports (n=15,131) <sup>1</sup>	Proportion out of Heterosexual contact exposure category (n=4,582)
Origin from an HIV-endemic country (Het-Endemic)	986	6.5%	21.5%
Sexual contact with a person at risk (Het-Risk)	1,935	12.8%	42.2%
Heterosexual contact with no identifiable risk (Het-NIR)	1,661	11.0%	36.3%

Source: HIV and AIDS in Canada: Surveillance Report to December 31, 2009

<sup>1</sup> n=number of cases with available information on exposure categories; Proportions are based on total number, minus reports for which exposure category was not reported or for which there was no identified risk (NIR)

### Observable trends – time-trend increase in the Het-Endemic exposure subcategory

The absolute number of annual positive HIV test reports among those 15 years of age and older attributed to the Het-Endemic exposure subcategory increased from 35 in 1998 to a high of 123 in 2006 (Figure 13-7). The proportion of annual positive HIV test reports attributed to the Het-Endemic exposure subcategory increased from 3.0% in 1998 to a peak of 9.2% in 2006, and most recently it accounted for 5.5% in 2009.

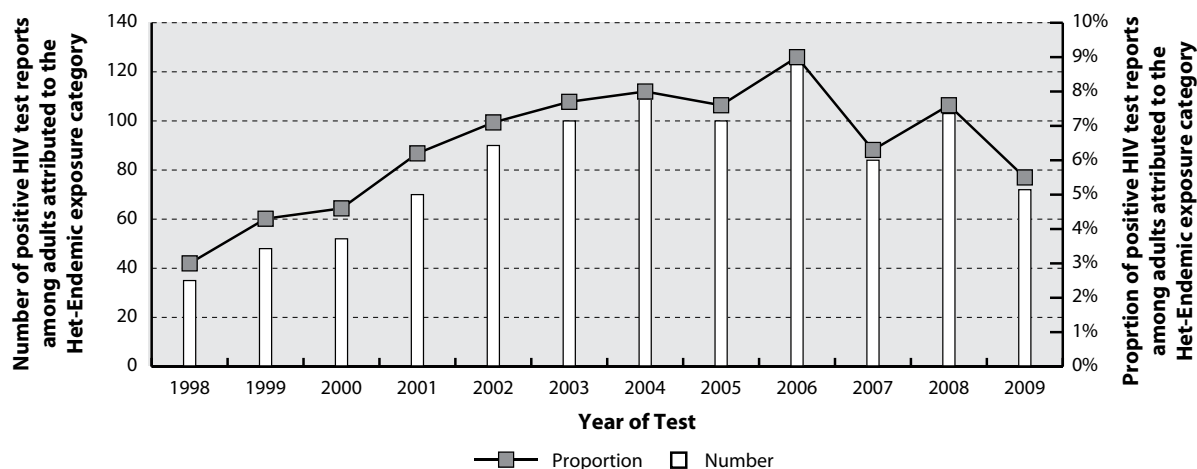
The increase observed in HIV test reports attributed to the Het-Endemic exposure subcategory could be due to several factors: a real increase in new infections among individuals born in HIV-endemic countries, better reporting in this exposure category by the provinces and territories, or increased HIV testing in this population. Another explanation is the increased migration and/

or testing of people from HIV-endemic countries who were infected overseas and subsequently immigrated to Canada. Changes to policies at Citizenship and Immigration Canada (CIC)<sup>8</sup> can potentially explain some of the increases in the numbers of positive HIV tests reported after 2001. Highlights of changes to immigration policies are provided later in the chapter in the section entitled “Immigration”.

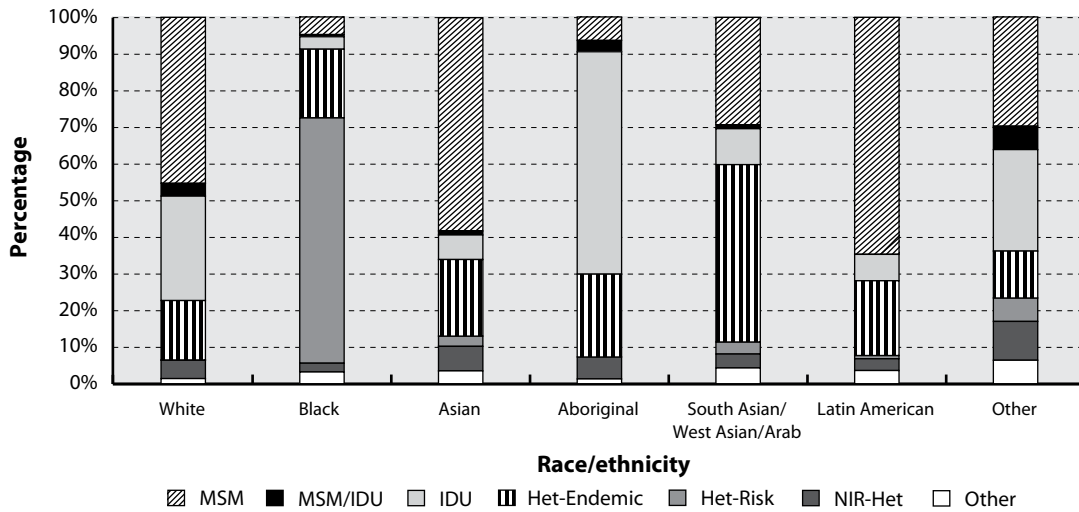
### Observable trends – positive HIV test reports by race/ethnicity

Of the 986 positive HIV test reports attributed to the Het-Endemic exposure subcategory from 1998 to 2009, 605 included information on race/ethnicity. Of these, 95.5% self-identified as Black, 1.3% as Asian and 1.2% as White. Figure 13-8 illustrates the proportion of positive HIV test reports attributed to each exposure category by race/ethnicity.

**Figure 13-7: Number and proportion of positive HIV test reports among cases 15 years of age and older attributed to the Het-Endemic exposure subcategory, by year, 1998-2009**



**Figure 13-8: Proportion of positive HIV test reports among cases 15 years of age and older attributed to each exposure category, by race/ethnicity, 1998-2009**



**Figure 13-9: Proportion of positive HIV test reports among cases 15 years of age and older whose infection was attributed to heterosexual contact exposure subcategories, by race/ethnicity, 1998-2009**

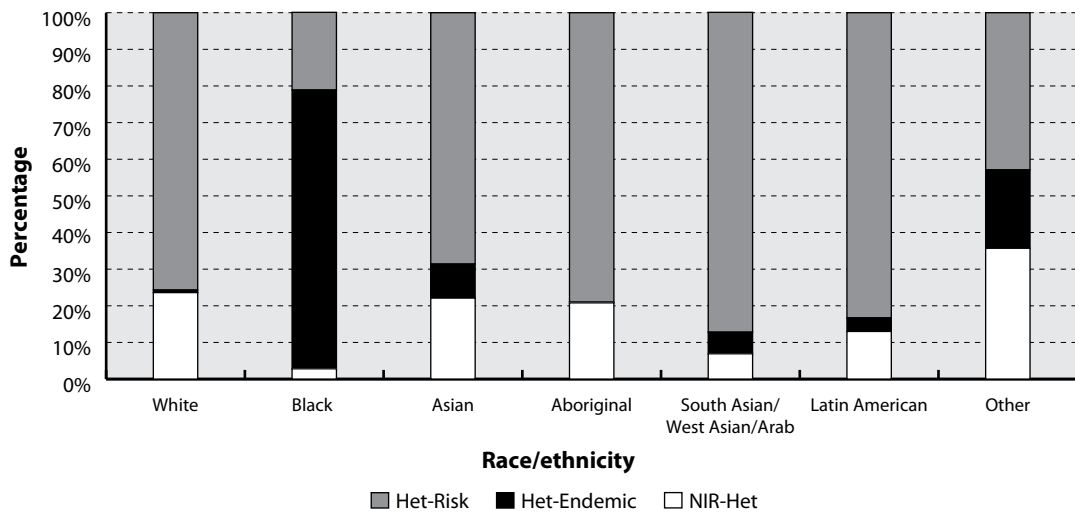


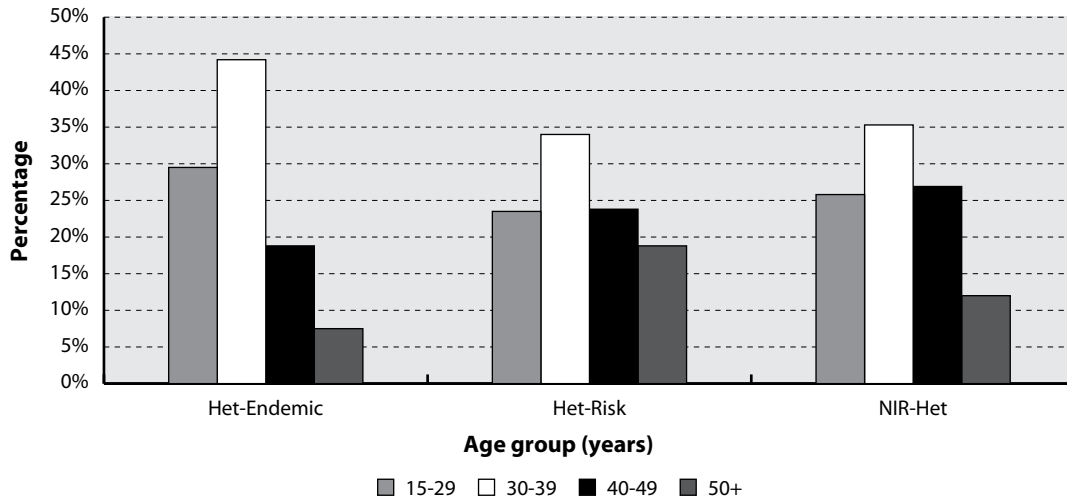
Figure 13-9 demonstrates the breakdown of the heterosexual contact subcategories among the different race/ethnicity groups. The Het-Endemic exposure subcategory accounts for the largest proportion of positive HIV test reports in the Black race/ethnicity category, representing 76.1% of cases. This is followed by 21.4% in the ‘Other’ category, 9.3% in the Asian category and 5.9% in South Asian/West Asian/Arab category.

**Observable trends –positive HIV test reports among younger age groups**

Examination of HIV test reports by age reveals a different pattern in the Het-Endemic exposure subcategory

relative to the other heterosexual contact subcategories. Of positive HIV test reports from 1998 to the end of 2009 that were attributed to the Het-Endemic exposure subcategory, 73.7% were persons between the ages of 15 and 39 years (29.5% were 15 to 29 years old and 44.2% were 30 to 39 years old). This is significantly higher than the respective 57.4% and 61.0% of cases in the Het-Risk and Het-NIR subcategories that fell within this same age grouping (Figure 13-10). These data suggest that HIV cases attributed to the Het-Endemic exposure subcategory tend to be diagnosed at younger ages.

**Figure 13-10: Age distribution (age group, in years) of positive HIV test reports among cases 15 years of age and older, within the heterosexual contact exposure subcategories, 1998-2009**



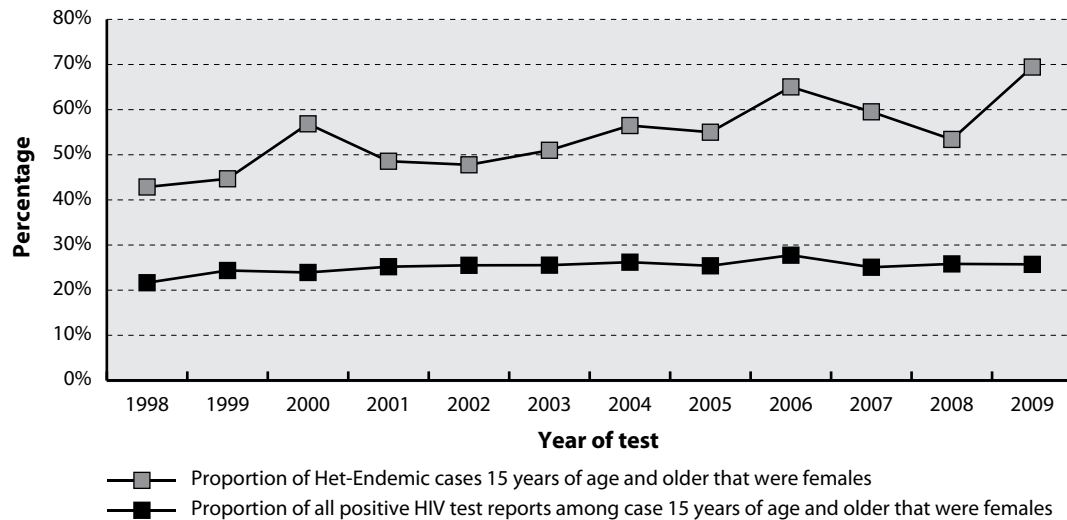
**Observable trends –positive HIV test reports among females**

Among all positive HIV test reports where “sex” was reported, females aged 15 years and older represented 25.3% of all positive HIV test reports for the period 1998 to 2009. However, during the same time period, within the Het-Endemic exposure subcategory, the proportion is quite different, with females accounting for

55.3% of positive HIV test reports (Figure 13-11). It is also the only Heterosexual contact exposure subcategory with a higher proportion of cases attributed to females than to males.

When compared to the other heterosexual contact exposure subcategories, the Het-Endemic exposure subcategory had the highest proportion of females 15 years of age and older (Table 13-6).

**Figure 13-11: Proportion of positive HIV test reports among females 15 years of age and older, by year of test, shown separately for all HIV test reports and HIV test reports attributed to the Het-Endemic exposure subcategory, 1998-2009**



**Table 13-6: Number and proportion of females 15 years of age and older among positive HIV test reports within the heterosexual contact exposure subcategories, 1998-2009**

Heterosexual contact exposure subcategories	Number of positive HIV test reports (15 years of age and older)	Number (%) of females 15 years of age and older
Origin from an HIV-endemic country (Het-Endemic)	983	544 (55.3%)
Sexual contact with a person at risk (Het-Risk)	1,933	886 (45.8%)
Heterosexual contact with no identifiable risk (Het-NIR)	1,661	680 (40.9%)

Source: HIV and AIDS in Canada Surveillance Report to December 31, 2009 and HIV Surveillance Data

### Females of childbearing age and perinatal transmission

As females account for more than half of positive HIV test reports in the Het-Endemic exposure subcategory, and since the HIV epidemic appears to be affecting younger persons in this subcategory, it is important to consider females of childbearing age (between 15 and 44 years old) and the potential for perinatal transmission of HIV to their infants. The Canadian Perinatal HIV Surveillance Program (CPHSP) collects data on the HIV status of infants perinatally exposed to HIV through a national, non-nominal confidential survey on exposed infants known to pediatricians in tertiary care centres and HIV specialists in clinics across Canada. The Canadian Pediatric AIDS Research Group (CPARG) conducts surveillance on exposure categories of the mothers, access to preventive treatment, and confirmed HIV seroconversions among infants that occur following exposure.

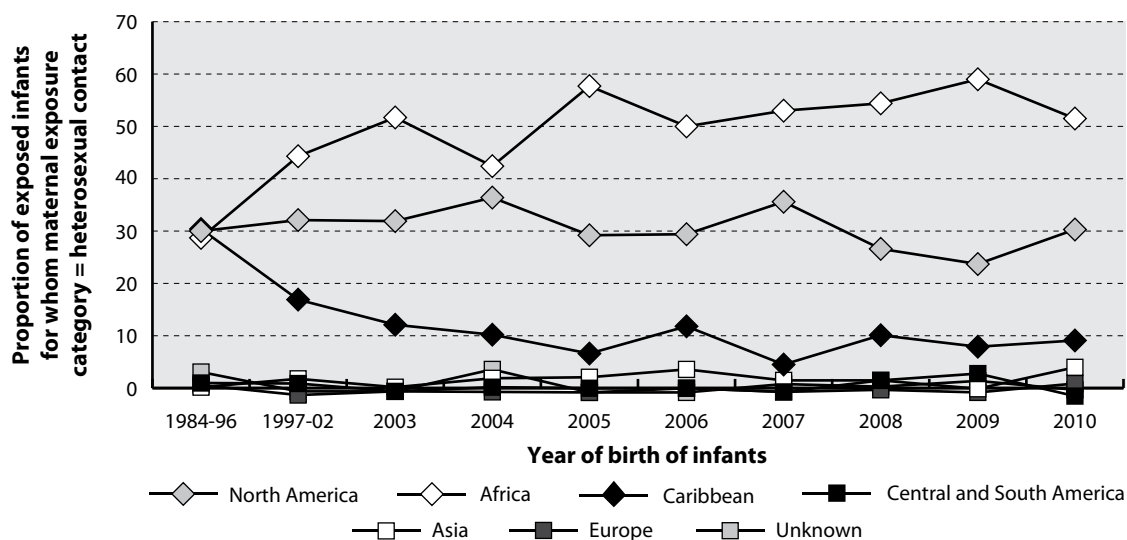
A total of 3,317 Canadian infants were perinatally exposed to HIV between 1984 and 2010. The majority of these infants (75.7%) were exposed between 1996 and 2010, and 33.9% of these infants were confirmed to be HIV positive. This is significantly lower than the proportion of infants who were perinatally exposed to HIV and who were confirmed to be HIV positive between 1984 and 1995 (66.1%). This decrease in perinatal transmission coincides with the introduction of antiretroviral therapy in HIV pregnant women. Since 2006, the number of perinatally exposed infants who were confirmed to be HIV positive in Canada has been less than 8 per year.

Between 1984 and 2010, the maternal exposure category for 72.9% of perinatally exposed infants was heterosexual contact.

**Figure 13-12** summarizes data on the maternal region of birth for infants in Canada who were perinatally exposed to HIV, and for whom the maternal exposure category was heterosexual contact. Maternal country of birth for perinatally exposed infants predominantly falls into North America, Africa and the Caribbean regions, and while these three regions accounted for 90% or more of maternal cases, their proportions have changed over time. Between 1984 and 1996, North American-born mothers accounted for 30.0% of maternal cases, Caribbean-born mothers for 30.4%, and African-born mothers for 28.7%. Over time, the proportion of perinatally exposed infants among North American-born mothers has remained steady, while the proportions among mothers from the other two regions have shifted. In 2010, the reported proportion of exposed infants of African-born mothers had increased to 51.5% of all perinatally exposed infants, while the proportion of exposed infants of Caribbean-born mothers had decreased to 9.1% of all exposures.

Of the 3,317 Canadian infants perinatally exposed to HIV from 1984 to 2010, 566 infants were confirmed to be HIV infected. However, the proportion of confirmed infections among infants perinatally exposed to HIV, whose maternal exposure category was heterosexual contact and whose infection status is known (n=2,163), is much higher among infants whose mothers were born in the Caribbean. Across all perinatally exposed infants in Canada from 1984-2010, the average HIV seroconversion rate for infants was 17.8%. Cumulative data reported to CPHSP indicate that 26.2% of infants of Caribbean-born mothers were confirmed to be HIV-infected, which is higher than the rates for exposed infants of African-born mothers (at 17.9%) and North American-born mothers (at 12.7%).

**Figure 13-12: Region of birth of mothers in the heterosexual contact exposure subcategory whose infants were perinatally exposed to HIV, 1984-2010**



Three important limitations should be noted when interpreting these data. Although perinatally exposed infants have been separated into the mother's region of birth (e.g., Africa, North America), this designation does not confirm that the mother has come from an HIV-endemic country. (Please refer to Appendix 1 for a list of all HIV-endemic countries). It is also important to note that the maternal cases presented below are assigned to the heterosexual contact exposure category, which includes the heterosexual endemic subcategory (Het-Endemic) as well as sexual contact with a person at risk (Het-Risk), and heterosexual contact with no identified risk (Het-NIR). Finally, the numbers presented may not reflect all infants perinatally exposed to HIV infection, since not all pregnant women are aware of their HIV status.

Although all provinces and territories in Canada promote voluntary HIV testing of pregnant women and women considering pregnancy, there is variation in how this policy is implemented across jurisdictions. For more information on perinatal transmission, refer to the *HIV/AIDS Epi Update*<sup>7</sup> Chapter 7, entitled "Perinatal Transmission of HIV in Canada."

### Surveillance data from Ontario and Quebec

As mentioned earlier, Canada's two most populous provinces, Ontario and Quebec, do not routinely collect and/or report to PHAC, country of birth, race/ethnicity,

or complete exposure category data on their positive HIV tests. Nonetheless, the subsequent sections provide a brief overview of the HIV and AIDS surveillance information available from provincial-level data sources, because a significant proportion of the population of interest resides in Ontario and Quebec. Please refer to the specific data sources for more details and interpretation. Please note that the following summary preserves the terminology used in the original research documentation regarding biological sex (male/female) and gender (man/woman).

#### Ontario

The Ontario HIV Epidemiologic Monitoring Unit (OHEMU) produces an annual HIV/AIDS surveillance report for the province. Information obtained from the OHEMU 2008 report<sup>9</sup> pertaining to people in Ontario who originate from countries where HIV is endemic is summarized below.

- From October 1985 to December 2008, a cumulative total of 29,787 HIV infections were diagnosed in Ontario. Of those with a known exposure category, 3.8% (n=554) were attributed to the HIV-endemic exposure category (origin/residence in an HIV-endemic country); within this category, 53% were male, 45% were female and 2% were of unknown sex.

- When adjusted for unknown sex and exposure category, 12.5% (n=3,723) of HIV diagnoses in Ontario were attributed to the HIV-endemic exposure category from 1985 to 2008. The proportion of annual HIV cases attributed to this exposure category has increased from less than 5% before 1990 to 22.9% in 2008.
- In Ontario's adjusted analysis, the proportion of females in the HIV-endemic exposure category was 52.4% from 1985 to 2008 and is the only exposure category with a greater proportion of females than males.
- Cumulatively from 1985 to 2008, the HIV-endemic (adjusted) exposure category accounted for 42.6% of HIV diagnoses among females and 7.0% among males in Ontario.
- From 1981 to 2008, 8,788 AIDS cases were reported in Ontario. When adjusted for the unknown exposure category, persons who originate from countries where HIV is endemic accounted for 8.0% of overall cases and 35.5% of all female cases.
- From 1984 to 2008, 860 HIV positive women delivered in Ontario and gave birth to 137 HIV-infected infants. The majority of the HIV infected infants (n=74, 54%) were born to mothers who originated from countries where HIV is endemic.
- From 2002 to June 2010, 956 cases diagnosed in Quebec were attributed to the Het-Endemic exposure subcategory, comprising 15.7% of all cases. Women accounted for 61.3% of cases from 2002-2009 among those in the Het-Endemic exposure subcategory.
- Among women, Het-Endemic cases account for approximately 40% to 55% of cases per year, and among men, they account for 5% to 10% of cases per year.
- Among all cases attributed to the Het-Endemic exposure category (n=956), 46.3% listed their ethnic origin as Caribbean, and 52.8% as Sub-Saharan African.
- Of the 505 new diagnoses among women 15 to 55 years old from 2002 to June 2010, 16.4% (n=83) were diagnosed during pregnancy. The majority (68.7%; 57/83) of these cases diagnosed during pregnancy were immigrants from countries in Sub-Saharan Africa or Haiti.
- From 2002 through June 2010, 24 newly diagnosed cases of mother-to-child transmission of HIV infection were confirmed and reported in Quebec, with 10 infants born in Canada and 14 born outside of Canada. Of those born in Canada, eight (80%) were born to mothers who originate from countries where HIV is endemic. Thirteen out of the 14 infants born outside of Canada were born to mothers who originated from an HIV-endemic country.
- Of the 458 new diagnoses attributed to the Het-Endemic subcategory, 84.9% had never previously been tested for HIV.

### Quebec

The HIV infection surveillance program in Quebec has been in place since April 2002. Quebec's surveillance report presents information in two ways: 1) new diagnoses (i.e., those who had never previously been tested or whose previous HIV tests had all been negative); and 2) all diagnoses (which includes previous diagnoses, i.e., had a previous positive HIV test, were previously tested anonymously, were previously tested in another province, etc.). Information pertaining to people from HIV-endemic countries, from the province's mid-year 2010 report<sup>10</sup> is summarized below.

- For the period April 2002 to June 2010, there was a cumulative total of 6,107 positive HIV test reports (all diagnoses) in Quebec. Of those with reported ethnic origin, 9.4% (564) were of Sub-Saharan African origin and 8.8% (529) were of Caribbean (Haitian, Jamaican, 'other,' and 'unknown' Caribbean) origin.
- The proportion of positive HIV test reports attributed to these two regional groups in Quebec was higher among women than men - 28.0% of women versus 4.5% of men of Sub-Saharan African origin, and 20.7% of women versus 5.6% of men of Caribbean origin.

## Enhanced/Population-Specific Surveillance Data

### Background

As part of the *Federal Initiative to Address HIV/AIDS in Canada*, PHAC monitors trends in HIV prevalence and associated risk behaviours among key vulnerable populations identified in Canada through enhanced (behavioural and biological) surveillance systems known as the Track surveillance systems. The primary objectives of these systems are to describe the changing patterns in the prevalence and incidence of HIV infections, risk behaviour practices, and testing patterns for HIV, hepatitis C and other sexually transmitted and blood borne infections (STBBIs) within each respective population. For a more detailed description of the Track surveillance systems, please refer to the *HIV/AIDS Epi Update*<sup>7</sup> Chapter 3, entitled "HIV Testing and Surveillance Systems in Canada."

## E-Track

### Description

The concept of the E-Track surveillance system was piloted by PHAC in collaboration with researchers in Quebec through the study of Québécois of Haitian Origin (QHO), and conducted between 2007 and 2008.<sup>d</sup> The study's objectives were:

- To determine the prevalence of the HIV, hepatitis C and syphilis infection;
- To describe the contributions of demographic factors, immigration status and sexual risk behaviours; and
- To compare the infection and risk markers to findings of a previous study of QHO conducted in 1994.

To be eligible to participate in this voluntary, anonymous, cross-sectional study, potential participants had to be Québécois, 15 to 49 years old, and born in Haiti or with at least one parent born in Haiti. Study participants were recruited at general practice medical clinics in Montréal and at selected community events important to the Haitian community.

Findings from the QHO study are presented along with other independent research findings below. (Please see “Summary of recent data on HIV prevalence, incidence and risk behaviours among Canadian residents who originate from countries where HIV is endemic.”)

Work is currently underway in Montréal and in Ontario towards the development of E-Track surveys that will focus on residents of the respective sentinel sites who originate from countries in Sub-Saharan Africa and the Caribbean where HIV is endemic.

## Summary of research on HIV prevalence, incidence and risk behaviours among people from countries where HIV is endemic

In addition to routine and enhanced HIV surveillance and national estimates, there is ongoing research exploring HIV prevalence, incidence and risk behaviours among people in Canada who originate from countries where HIV is endemic. The following section summarizes research published in peer-reviewed journals and/or presented at scientific meetings from January 1, 2006 to January 31, 2011. It is worth noting that the following

<sup>d</sup> Gabriel Joseph, Alix Adrien, Claude Tremblay, Pascale Leclerc. Les infections transmises sexuellement et par le sang chez les Québécois d'origine haïtienne : surveillance biologique et comportementale – 2e édition. Direction de santé publique, Agence de la santé et des services sociaux de Montréal, 2010

summary preserves the terminology regarding biological sex (male/female) and gender (man/woman) used in the original research documentation.

### HIV Prevalence

To date, there is a paucity of empirical data regarding the burden of HIV infection among Canadian residents from countries where HIV is endemic. However, this is a growing area of research and there are ongoing studies, some of which have recently published results. While no published studies measuring HIV incidence for Canadian residents from countries where HIV is endemic were located, one study reported on HIV prevalence and is briefly described here.

#### Ontario:

The EAST study sought to estimate HIV prevalence in immigrants from the East African countries, Ethiopia, Kenya, Somalia, Tanzania and Uganda. HIV infection was determined via HIV antibody testing of oral fluids and self-reports during interviews. HIV prevalence based on a combination of data from biological specimen and self-reports was 2.9% (95% CI: 1.3%-4.4%); 2.7% (95% CI: 0.06%-5.3%) among male participants and 1.7% (95% CI: 0.0%-3.6%) among female participants. Further analyses accounting for the non-random sampling methodology used suggested that the underlying prevalence was close to 1.2% (95% CI: 0.03%-2.4%).<sup>12,13</sup>

### HIV testing practices

- In the EAST study, 75% (340/456) of participants had been tested for HIV on at least one occasion, and over half (66%) of those were tested for immigration purposes. In multivariate modelling, individuals with the following were more likely to have been tested for HIV: 25 to 39 years old; had a medical check-up in the last two years; had a physician recommend an HIV test; new Canadian residents; held attitudes with less stigma associated with HIV/AIDS and had  $\geq 5$  lifetime sexual partners. Participants from Uganda were more likely to have been tested for HIV than those from Ethiopia, Kenya or Somalia.<sup>13</sup>
- Tharao et al. (2009) reported that since the Ontario prenatal HIV testing program mandated that all pregnant women be offered HIV testing (with informed consent) and HIV counselling, the uptake of HIV testing by pregnant women increased from 38.9% in 1999 to 96.8% in 2008. The study examined missed opportunities for HIV prevention based on the experiences of African and Caribbean women undergoing prenatal HIV testing in Ontario.<sup>14</sup> The results are summarized in the section entitled “Health Services”.



- The QHO study carried out a sub-group analysis of participants who reported heterosexual sex, comparing those who requested HIV testing to those who had never been tested for HIV (NHBTH). The results showed that 56.9% identified as NHBTH (169/297). Multivariate analysis suggested that NHBTH were more likely to be younger, not well informed on HIV testing and in a married or common law relationship.<sup>11</sup>

### Risk behaviours and correlates of risk behaviour

- The EAST study also investigated the risk behaviour of participants with two or more sexual partners (22%; 76/352). Of this group, 50% had two partners, 33% had three and 12% had four or more. Sixty-one participants (81%) reported sex with at least one person from Africa. In the previous year, 7% did not use condoms and 69% reported inconsistent or imperfect use. Just under half (43%) reported concurrent sexual partners. Compared to participants with one partner, those with two or more were significantly more likely to be male, younger, have first engaged in sex at a younger age, and have 10 or more lifetime sexual partners.<sup>15</sup>
- In the 2007-2008 QHO study, of 624 participants, 62.8% were female and 56.4% were 20 to 34 years of age. Compared to females, males were more likely to have at least one regular partner, or both regular and casual partners, and were more likely to have used a condom during their last sexual encounter with a casual partner. Overall, 42.7% reported always using a condom with a casual partner in the preceding 12 months. Factors significantly associated with having at least one heterosexual casual partner included: male sex, younger age, being single, second generation QHO, larger number of regular partners, anal heterosexual relations, well informed about HIV testing and a history of HIV testing. The authors identified that female regular partners of male QHO are the most vulnerable to HIV infection.<sup>16</sup> This trend has remained unchanged since the preceding QHO study conducted in 1994.<sup>17</sup>
- In a 2008 qualitative study of 15 young male (15-25 years) Quebec residents with at least one parent of Haitian origin, 11 participants reported having engaged in group sex. Some reported the use of drugs or alcohol to convince females to participate. Most believed group sex to be a low risk for the acquisition of a sexually transmitted infection (STI), however, nine reported consistent condom use during group sex and six chose a specific type of sexual activity (e.g. oral sex, masturbation, avoidance of group sex in the dark) as STI risk reduction strategies.<sup>18</sup>

### Determinants of health

The environments in which people live and work are strongly associated with their well-being. This section summarizes recent literature examining some of the key determinants of health among people from countries where HIV is endemic. For an in-depth overview of all the determinants of health, please refer to PHAC's *Population-Specific HIV/AIDS Status Report on People from Countries where HIV is Endemic*.<sup>4</sup>

### Social environments and culture

- The Stigma Study (2004-2006) explored the experiences of members of three African and three Caribbean communities in Toronto. In-depth interviews with 30 HIV positive individuals and 12 focus groups with 74 members of the communities at large found a range of cultural and structural issues that may increase risk for infection, discourage testing and treatment, and lead to the isolation of HIV positive people. The key factors that emerged were stigma, denial, discrimination, fear, homophobia, gossip, harassment and ostracism. There was also the perception that HIV is not a major issue within their community, particularly in Canada, and in relation to other pressing issues such as poverty, employment, and housing. Most important, these factors prevented people who are HIV positive from seeking early treatment, and health and support services.<sup>19-21</sup>
- Phase 1 of BLACCH [The Black, African and Caribbean (ACB) Health, 2010], a community-based qualitative study, found that health is viewed holistically and most participants perceived themselves as 'healthy.' Participants acknowledged that HIV is an important health issue in their community; however, they believed their personal risk of infection to be low due to marriage or abstinence.<sup>22,23</sup>
- The OHTN Cohort, a multi-site research study that collects clinical and sociobehavioural data on a cohort of participants living with HIV, studied the impact of HIV stigma and country of birth nativity on depression as a health outcome. Forty-one percent of the study sample used for these analyses (256/630) was born abroad. In multivariate modelling, those born abroad were significantly more likely to report symptoms of depression, even after controlling for HIV stigma. The study found that participants with "... high amounts of social support and/or high sense of mastery are better able to fight off feelings and thoughts of depressions when faced with stressful HIV symptoms". The authors recommended that health service providers be aware of the influence of being born abroad on the health outcomes of immigrants living with HIV.<sup>24</sup>

- A 2007 environmental scan to inform the development of a National HIV/AIDS Strategy for Canadian Black, African and Caribbean communities found: lack of linkages/cohesiveness between organizations/community efforts aimed at addressing HIV/AIDS in Black communities; difficulty in accessing HIV/AIDS funding; lack of a nationally visible Black spokesperson for HIV; immigration challenges; and lack of understanding of issues relating to Black people living with HIV. The report makes recommendations to inform the planning and delivery of programs and services to Black communities.<sup>25</sup>

### Health services

Access to health services is important for disease prevention, health promotion and care required to maintain or restore health in case of disease. Many barriers to access and the complexities of providing health services have been identified among Canadian residents originating from countries where HIV is endemic.<sup>4,19</sup> Recent research is summarized below.

- Tharao et al. carried out in-depth interviews with 44 African and Caribbean women (HIV positive and negative) who had had been tested for HIV during pregnancy. Participants reported that they received poor pre/post test counselling, resulting in: limited awareness of HIV and HIV transmission to infant; fear and panic upon diagnosis due to lack of knowledge about treatment plans; suicidal ideation; misunderstanding of the role of public health, follow-up processes and privacy; autonomy violation when tested without knowledge or consent; and experience/perception of differential treatment based on refugee status, race and/or gender.<sup>14</sup>
- In Phase 1 of BLACCH (2010), stigma, discrimination and lack of HIV related education were cited as barriers to accessing HIV-related services. A need for more ACB presence in health/social services was highlighted. In contrast, some participants reported that they would not access services from a person belonging to their ethnic community, primarily due to concerns over confidentiality.<sup>22,23</sup>
- In 2006, qualitative interviews were conducted with fifteen health professionals working with African refugees resettled in Vancouver. Factors cited by interviewees as being unique to HIV positive refugees included: difficulties finding a doctor, difficulties with transportation to HIV-related visits, lack of cultural competency, language barriers, and HIV-related stigma and discrimination within the African refugee community. Similarly, health providers could not provide optimal care as they were limited by language, cultural barriers and lack of knowledge regarding refugee health. Participants also mentioned communication issues between services providers from different levels of government and the absence of guidelines on disclosure of HIV status.<sup>26,27</sup>

Published results on HIV treatment outcomes in people from HIV-endemic countries are limited; two studies are summarised below.

- A Quebec-based observational cohort of 92 HIV positive adults (66 female; 26 male) from six Sub-Saharan African countries treated in a multidisciplinary HIV clinic were followed for 3.1 years. At baseline, 21 were on highly active antiretroviral therapy (HAART) and 71 were not treated. After starting HAART, 98% achieved undetectable viral load levels after 11 weeks and three years later, the viral load levels for 59% of participants were still undetectable. The study shows that HIV positive refugees responded favourably to treatment in Canada.<sup>28</sup>
- The Southern Alberta Cohort (SAC) also reported that patients from Sub-Saharan Africa had HIV care outcomes equivalent to Canadian born patients. In particular, refugees had more clinical encounters and social worker visits compared to other immigrants and Canadian born patients. Moreover, they found that social support was a key factor for Sub-Saharan African patients in accessing health services and maintaining treatment.<sup>29</sup>

### Immigration

Over the past decade, there have been a few important policy changes regarding HIV testing of migrants to Canada, including:

- In 2001, a revised Citizenship and Immigration Canada (CIC) policy exempted applicants who were family class, refugee, protected person or family of foreign nationals from the excessive demands on health resources rule; thus, any of the above with HIV/AIDS cannot be refused visas on medical grounds.<sup>30</sup>
- On January 15, 2002, CIC added routine HIV screening for all applicants who require an Immigration Medical Examination (IME) and are 15 years of age and older, as well as for those children who have received blood or blood products, have or had a known HIV positive mother or are potential adoptees.

- In June 2002, the Immigration and Refugee Protection Act (IRPA)<sup>8</sup> was implemented, requiring that applicants be assessed for inadmissibility on health grounds (i.e., danger to public health, danger to public safety and excessive demands on health or social services). However, the IRPA exempted certain groups of immigrants from excessive demand evaluation.
- In 2004, CIC discontinued the routine HIV testing of potential adoptees.

Recent results from CIC IME HIV testing have shown the following:

- Between January 15, 2002 and December 31, 2009, 4,280 applicants who underwent an IME tested positive for HIV.<sup>6</sup>
- In 2009, 574 applicants who underwent an IME tested HIV-positive.
  - Of these, 335 were identified by HIV testing in Canada, and 239 were identified outside of Canada.
  - Of the 574 HIV-positive diagnoses in 2009, 341 (59.4%) were born in Africa and the Middle East, 178 (31%) in the Americas, 46 (8%) in Asia and nine (1.6%) in Europe. In 2009, the 335 HIV-positive tests identified in Canada represented 13.9% (335/2,417) of the positive HIV tests reported to PHAC.

It is worth noting that in September 2004, CIC offered to provincial/territorial health authorities the option of receiving reports on HIV cases (medically examined overseas) who have entered Canada, however, not all provinces/territories chose to receive this information. Changes to policies at CIC (described above) can likely explain some of the increase in the number of positive HIV tests reported after 2001.

Some studies have examined how immigration law and policy, and people's knowledge and perception of these laws and policies, may influence their testing and treatment-seeking behaviours. These studies found the following:

- Lack of knowledge may influence risk awareness and risk behaviour among younger people. Some qualitative studies of people from HIV-endemic countries found that participants, particularly youth, believed they were less vulnerable to HIV in Canada, because visas are only granted to migrants who have passed the immigration medical exam.<sup>19,31</sup>

- There are indications from qualitative sources that people who do not have legal status in Canada and are HIV positive reported that they have not applied for legal residence due to fear of deportation. In the meantime, they are without health care, social assistance benefits or regular employment. Research shows that these factors complicate and add to the stresses of dealing with HIV.<sup>19,25</sup>

The following two studies examined demographic and clinical characteristics of HIV positive persons with a focus on immigrants and/or people from HIV-endemic countries.

### **British Columbia (B.C.):**

- Based on a report from the BC Centre for Disease Control (BCCDC), using data from Citizenship and Immigration Canada and the BC HIV surveillance system, 172 HIV positive persons immigrated to British Columbia from January 2000 to August 2007, with a "... slight increasing trend" in the annual number of HIV positive immigrants over the period. Of these 172 HIV positive immigrants, 53 (31%) were from countries where HIV is endemic, mainly from Sub-Saharan Africa.<sup>32,33</sup>
- In the same BCCDC report, an analysis of the full HIV Surveillance System was done to determine the number of all new positive HIV cases that identified having a sexual partner from an HIV-endemic country as a potential risk factor. This analysis showed that, from May 2003 through August 2007, 60 individuals who tested newly HIV positive reported having a sexual partner from a country where HIV is endemic. Of these, 25% (16) of were themselves born in an HIV-endemic country. Overall, the data showed a decreasing trend in the number of HIV positive individuals reporting partners from endemic countries.<sup>32,33</sup>

### **Alberta:**

- A study looking into the impact of policy changes to Canada's Immigration Act and changing migration patterns on regional HIV population examined data on all HIV positive individuals enrolled in care at the Southern Alberta Cohort (SAC) between January 2001 and January 2007.<sup>29</sup> In the analyses (which excluded temporary residents), patients were categorized by self-reported country of birth: Canada; Sub-Saharan Africa (SSA); and other foreign born (other than SSA).

<sup>6</sup> Health Management Branch (HMB), formerly Medical Services Branch (MSB), Citizenship and Immigration Canada- Database on HIV, as of January 2010.

- Between January 2001 and January 2007, 692 patients with HIV initiated case at SAC. Of these, 18% (126) were born in Sub-Saharan Africa (predominantly East and Central Africa). The proportion of patients from Sub-Saharan Africa increased annually from 6% in 2001 to 31% in 2006. Of those with known immigration status, 68% were immigrants and 32% refugees.
- Patients from Sub-Saharan Africa were significantly ( $p < 0.01$ ) more likely to be female (53%), younger (mean age 33.1 years), with heterosexually acquired HIV when compared to Canadian and other foreign-born patients.
- Patients from Sub-Saharan Africa were significantly ( $p < 0.01$ ) more likely to be or have been married, or living in a common law relationship compared to Canadian and other foreign-born patients.
- Patients from Sub-Saharan Africa had the lowest median CD4 counts at initial clinic visit compared to Canadian and other foreign-born patients, indicating diagnosis at a later disease stage compared to non-immigrants. In latter years of the study period, there was a "... small but increasing number..." of patients from Sub-Saharan Africa who had started a HAART regimen in Africa prior to moving to Canada.
- Most (97%) of patients from Sub-Saharan Africa were infected with non-B HIV viral subtypes; HIV viral subtypes C, A1, G, D, and AG were most common strains among these patients.
- Compared to Canadian-born patients (CAN) and other foreign-born patient (FB), a significantly larger proportion of Sub-Saharan African patients (SSA) tested positive for: Tuberculin skin tests (26% for SSA vs. 7% for CAN and 5% for FB,  $p < 0.001$ ); *Toxoplasma* serology (33% for SSA vs. 8% for CAN and 4% for FB); and hepatitis B infection (8% for SSA vs. 2% for CAN and 3% for FB). By contrast, a lower proportion of patients from Sub-Saharan Africa tested positive for hepatitis C infection (2% for SSA vs. 18% for CAN and 6% for FB).

## Strengths and Limitations

Findings presented in this chapter were obtained from public health surveillance data and recently published HIV-related research focussed on people from countries where HIV is endemic who are living in Canada. The limitations mentioned earlier should be reiterated:

- Surveillance data may understate the magnitude of the HIV epidemic, since such data are subject to reporting and can only describe the diagnosed portion of the epidemic. In addition, information on some variables in the surveillance data was incomplete, which affects the interpretation of the diagnosed portion of the epidemic. Reliance on the HIV-endemic exposure subcategory does not capture information on persons from countries where HIV is endemic who are assigned to an exposure category higher up in the risk hierarchy (such as MSM or IDU).
- The inherent design strengths of the cross-sectional and qualitative studies, including community samples, permitted a range of risk behaviours and associations to be explored in this population. A number of biases must be considered when interpreting these findings.
- There are relatively few quantitative studies or analyses, and those conducted represent small subsections of this diverse and complex population within Canada. For all studies, both quantitative and qualitative, the study designs limit causal inferences from the data.
- Studies are largely based on self-reported data, which may introduce a variety of social biases. For example, the sensitive nature of information related to sexual behaviours may be misreported or under-reported by some respondents. In addition, HIV diagnostic data are limited to people who present themselves for testing.
- Direct comparisons across studies should be avoided or made with caution due to the variation in design, eligibility criteria, study samples, research aims, and analysis methods used. Given this, the findings cannot be generalized beyond the study populations, making it difficult to draw conclusions regarding trends in risk behaviours. For more specific study-level limitations, please refer to the respective studies referenced within this chapter.

## Conclusion

There is considerable cultural, community and religious diversity among people from different Sub-Saharan African countries, Caribbean countries and other countries where HIV is endemic, as well as among other Black peoples. However, they are often grouped together for research and program delivery purposes, which limits the depth of exploration of factors that affect specific groups or communities. Despite the limitations associated with surveillance and research findings, a picture emerges regarding the pattern of the HIV/AIDS epidemic among people from countries where HIV is endemic.

The observed trends suggest that there is an increasing proportion of reported HIV and AIDS cases attributed to the Het-Endemic exposure subcategory, suggesting that people from HIV-endemic countries are over-represented in the Canadian HIV epidemic. Furthermore, those particularly affected include persons under the age of 40 years and females, including those of child-bearing age. Most of the cases assigned to the HIV-endemic exposure subcategory were people who self-identified as Black. This impact on youth, females and Black populations indicates the different characteristics of the HIV epidemic among people from countries where HIV is endemic and emphasizes the complexity of Canada's HIV epidemic. In addition, it is apparent that a significant proportion of this population is unaware of their HIV infection, signalling the need for continued efforts towards increasing testing coverage and capitalizing on testing events for additional HIV prevention opportunities.

## Implications for public health

There is a need for improved HIV/AIDS surveillance data at the national level to permit better monitoring and characterization of trends in HIV among persons from HIV-endemic countries, which will in turn provide better data to guide prevention and care programs for this group. To accomplish this, PHAC is actively working to strengthen its collaboration with provincial/territorial governments and community stakeholders in order to find specific ways to improve the quality of information on exposure category and ethnicity for the population born in countries where HIV is endemic. It is anticipated that the E-Track surveillance system, an enhanced (behavioural and biological) surveillance system to monitor the prevalence of HIV and associated factors amongst people from countries where HIV is endemic, will provide additional information that will be useful for HIV prevention and control efforts by local, provincial and national governments.

A growing body of evidence is being generated in this area, and studies are ongoing or in development. Further research in this area is key to better understanding the diversity within the populations aggregated under the epidemiological term, "people from countries where HIV is endemic," in order to elucidate factors associated with these observed trends and to assess the best way to address them. More complete surveillance and research information would enable policy makers, public health officials, and community members to jointly develop, implement, and sustain culturally relevant prevention, education, and support services for this population across Canada.

## References

- UNAIDS Global Report 2010: UNAIDS Report on the global AIDS epidemic 2010 [Internet]. UNAIDS; 2010 [Cited 4/20/2011, 2011]. Available from: [http://www.unaids.org/globalreport/Global\\_report.htm](http://www.unaids.org/globalreport/Global_report.htm).
- Statistics Canada. Immigration in Canada: A Portrait of the Foreign-born Population, 2006 Census: Findings. Statistics Canada, Catalogue No.: 97-557-XIE, 2006.
- Ali F, Aslam M, Ogunnaik-Cooke S, Boulos D, Archibald C. Demographic distribution of population groups originating from HIV-endemic countries in Canada. 4th Annual Public Health Agency of Canada Research Forum. Public Health Agency of Canada; 2009.
- Public Health Agency of Canada. People from Countries where HIV is Endemic - Black people of African and Caribbean descent living in Canada: Public Health Agency of Canada; 2010.
- Health Canada. Migration Health: Embracing a Determinants of Health Approach. Health Policy Research Bulletin, Issue 17, December 2010.
- Yang Q, Boulos D, Yan P, Zhang F, Remis RS, Schanzer D, et al. Estimates of the number of prevalent and incident human immunodeficiency virus (HIV) infections in Canada, 2008. *Can J Public Health* 2010;101(6):486-90.
- Public Health Agency of Canada. HIV/AIDS Epi Updates. Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada; 2010.
- Department of Justice. Immigration and Refugee Protection Act 2001, c. 27, s. 28; 2003, c. 22, s. 172(E). <http://laws-lois.justice.gc.ca/eng/acts/I-2.5/page-1.html#h-1>
- Remis RS, Swantee C, Liu J. Report on HIV/AIDS in Ontario 2008. Toronto, ON: Epidemiological Monitoring Unit, University of Toronto; 2010.
- Bitera R, Fauvel M, Alary M, Parent R, Sylvain D, Hastie M. Programme de surveillance de l'infection par le virus de l'immunodéficience humaine (VIH) au Québec: mise à jour des données au 30 juin 2010. Laboratoire de santé publique du Québec. Direction des risques biologiques et de la santé au travail. Février 2011. Avec la collaboration de l'Unité de recherche en santé des populations du Centre hospitalier affilié universitaire de Québec.
- Adrien A, Boulos D, Tremblay C, Leclerc P, Cox J, Archibald CP, et al. Self-reported HIV testing behaviours among Quebecers of Haitian origin. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):73B (Abstract P220).
- Calzavara L, Tharao W, Gray KA, Johns A, Burchell A, Myers T, et al. HIV Prevalence in Toronto's East African Communities. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):38B (Abstract O095).
- Gray KA, Calzavara L, Tharao W, Johns A, Burchell A, Myers T, et al. Factors Associated With HIV Testing In Toronto's East African Communities: Results From EAST. *Can J Infect Dis Med Microbiol* 2008; March/April;19(Suppl A):78A (Abstract P225).
- Tharao WE, Stanley R, Massaquoi N, Leonard L, Samson L, McGee F, et al. Missed HIV Prevention Opportunities: African and Caribbean Women and HIV Testing during pregnancy. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):33B (Abstract O075).
- Gray KA, Calzavara L, Tharao W, Johns A, Burchell A, Myers T, et al. Risk behaviour among EAST (East African Health Study in Toronto) participants with multiple sexual partners. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):66B (Abstract P193).
- Adrien A, Cox J, Leclerc P, Boivin J-, Archibald C, Boulos D, et al. Behavioural Risks for HIV Infection Among Quebec Residents of Haitian Origin. *J Immigr Minor Health* 2010 Dec;12(6):894-9.
- Adrien A, Leane V, Remis R, Boivin J, Rud E, Duperval R, et al. Migration and HIV: an epidemiological study of Montrealers of Haitian origin. *Int J STD AIDS* 1999;10(4):237-42.
- Beaulieu M, Adrien A, Vouma JIL, Desanges S, Jean-Gilles J. Experiences of group sex among young male Quebecers of Haitian origin: HIV Risk environment and social context. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):91B (Abstract P295).
- Lawson E, Gardezi F, Calzavara L, Husbands W, Myers T, Tharao WE. HIV/AIDS stigma, denial, fear and discrimination: experiences and responses of people from African and Caribbean communities. The HIV Social, Behavioural and Epidemiological Studies Unit, University of Toronto. Toronto: University of Toronto; 2006. Joint publication of the African and Caribbean Council on HIV/AIDS in Ontario (ACCHO)
- Gardezi F, Calzavara L, Husbands W, Tharao W, Lawson E, Myers T, et al. Experiences of and responses to HIV among African and Caribbean communities in Toronto, Canada. *AIDS Care* 2008;20(6):718-25.
- Calzavara L, Myers T, Husbands W, Tharao W, Satzinger F, HIV Stigma Study Team. Homophobia and its implications for HIV transmission and intervention programs in African and Caribbean communities in Canada. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):33B (Abstract O076).
- Baidoobonso S, Longman RM, Bauer GR, Nleya-Ncube M, Abdelkader M, Pugh D, et al. The Black, African and Caribbean Canadian Health (BLACCH) Study: Phase I Preliminary Findings. 19th Annual Canadian Conference on HIV/AIDS Research; 2010 May 13-16; Saskatoon, Canada. 2010;2010(4/20/2010).
- Baidoobonso S, Mokban H, Abdelkader M, Bauer G. Similarities and differences in health care use and HIV-related concerns based on immigration profile: findings from the BLACCH study interviews. 13th Annual Ontario HIV Treatment Network (OHTN) Research Conference: Research at the Front Lines: Targeting the Complexities of HIV. November 15, 16 2010. Abstract book. Toronto (ON); 2010. (Abstract 136).

24. Noh MS, Rueda S, Noh S, Li A, Fenta H, Rourke SB, et al. Impact of HIV Stigma on Health Outcomes Among People Born Abroad Living with HIV. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):99B. (Abstract P323).
25. DA Falconer & Associates Inc. Taking Action on HIV/AIDS in Black Communities in Canada: A Resource for Moving Ahead. Ottawa: Interagency Coalition on AIDS and Development (ICAD); 2008.
26. Brandson EK, Barrios R. African Refugee Resettlement In Vancouver And HIV Infection. *Can J Infect Dis Med Microbiol* 2008; March/April;19(Suppl A):91A. (Abstract P270).
27. Brandson EK, Duncan KC, Barrios R. African Refugee Resettlement in Vancouver and HIV Infection. *Can J Infect Dis Med Microbiol* 2009; Spring;20(Suppl B):33B. (Abstract O077).
28. Gilmore N, Klein MB, Lalonde R, Ankouad A, Cyr J, Duchesneau C, et al. Clinical and Treatment Outcomes of an Observational Cohort of HIV-Infected, Sub-Saharan Refugees Cared For In A Multidisciplinary Clinic In Canada. *Can J Infect Dis Med Microbiol* 2008; March/April;19(Suppl A):32A. (Abstract O0F64).
29. Krentz H, Gill MJ. The five-year impact of an evolving global epidemic, changing migration patterns, and policy changes in a regional Canadian HIV population. *Health Policy* 2009;90(2-3):296-302.
30. Coyte PC, Thavorn K, Dhanji H. The economic burden of immigrants with HIV/AIDS: When to say no? *J Global Bus Advance* 2010;3(1):60-78.
31. Omorodion F, Gbadebo K, Ishak P. HIV vulnerability and sexual risk among African youth in Windsor, Canada. *Culture, Health and Sexuality* 2007;9(4):429-37.
32. Haag D, Gilbert M. Trends in HIV Positive Immigrants and Reporting by Citizenship and Immigration Canada (CIC), 2000-2007. BC Centre for Disease Control; 2007.
33. Haag D, Gilbert M, Smith S, Ogilvie G, Rekart M. Arriving In BC: Trends In HIV Positive Individuals Immigrating To British Columbia, Canada. *Can J Infect Dis Med Microbiol* 2008; March/April;19(Suppl A):78A. (Abstract P223).

## Appendix 1 - HIV-ENDEMIC COUNTRY LIST

### Africa:

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

### Caribbean, Bermuda and Central/South America:

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

### Asia:

Cambodia  
 Myanmar/Burma  
 Thailand

Source: PHAC, HIV/AIDS Epi Updates 2007