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

BRIEF REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2007

Community Acquired Infections Division
Centre for Communicable Diseases and Infection Control
Public Health Agency of Canada

Canada

To promote and protect the health of Canadians through leadership, partnership, innovation and action in public health.
— Public Health Agency of Canada

Brief Report on Sexually Transmitted Infections in Canada: 2007
is available on Internet at the following address: http://www.phac-aspc.gc.ca

Également disponible en français sous le titre :
Bref rapport sur les infections transmissibles sexuellement au Canada : 2007

This report was prepared by the following STI and HCV Surveillance and Epidemiology Section members:

Gayatri Jayaraman, PhD, MPH
Manager

Stephanie Totten, MSc
Senior Epidemiologist (Acting)

Maureen Perrin, MSc (C), ITPM
Senior Epidemiologist

Lily Fang, MHSc
Epidemiologist

Carmen Yue, MHSc (C)
Student Epidemiologist

Olivia Remes
Student

For more information, please contact:

STI and HCV Surveillance and Epidemiology Section
Community Acquired Infections Division
Centre for Communicable Diseases and Infection Control
Public Health Agency of Canada
100 Eglantine Driveway, Health Canada Building #6
A.L. 0603B, Tunney's Pasture
Ottawa, Ontario K1A 0K9

E-Mail: PHAC_Web_Mail@phac-aspc.gc.ca

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

Cat.: HP37-10/2007E-PDF
ISBN: 978-1-100-13365-2

BRIEF REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA

2007

Information to the readers of a Brief Report of Sexually Transmitted Infections in Canada: 2007

This brief report provides an overview of case reports and trends in the three nationally reportable bacterial sexually transmitted infections (STIs): chlamydia, gonorrhea, and infectious syphilis between January 1, 1998 and December 31, 2007. Although only the past ten years of data are presented to reflect recent STI trends, it should be noted that 1997 marked the beginning of the surge in STI rates in Canada. The surveillance data presented in this report are drawn from case reports to the Public Health Agency of Canada (PHAC) from provinces and territories.

This brief report consists of four sections. Sections one to three correspond to the three nationally reportable bacterial STIs. Each section summarizes major findings and trends in the respective infection, and the embedded tables and figures are updated from those in earlier publications of these data. The fourth section features an international comparison of the current state of STIs between Canada and other western countries (United States, Australia, and the United Kingdom). Technical notes and explanatory details specific to provincial or territorial surveillance data are presented at the end of this report.

The publication of this brief report would not have been possible without the submission of data from all provinces and territories. Their ongoing contribution to national STI surveillance is gratefully acknowledged.

Any comments and suggestions that would improve the usefulness of future publications are appreciated and should be sent to the attention of the Community Acquired Infections Division at PHAC_Web_Mail@phac-aspc.gc.ca.

Table of Contents

Table of Figures

Table of Tables

Acknowledgements

The preparation of this brief report would not have been possible without the contributions of the provincial and territorial ministries of health. We gratefully acknowledge them for the surveillance data provided to the Public Health Agency of Canada and their expert contributions to the surveillance of nationally notifiable sexually transmitted infections.

Production of this brief report and previous surveillance reports would not have been possible without the valuable inputs of Dr. Tom Wong, Director, Community Acquired Infections Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada.

Many others contributed to the development and publication of this report:

- Local, provincial, and territorial public health units across the country with their continued commitment to collecting the data that form the basis of national surveillance;
- The Notifiable Disease Section, Surveillance and Risk Assessment Division, Public Health Agency of Canada, which is responsible for maintaining the Canadian Notifiable Disease Surveillance System from which counts of bacterial STIs are derived;
- The Federal Field Surveillance Officers who assist with data quality improvements and provide ongoing support to the Community Acquired Infections Division;
- The Communications Directorate, Marketing, Creative Services and E-Comms Division, Public Health Agency of Canada.

Executive Summary

Sexually transmitted infections (STIs) continue to be a significant and increasing public health concern in Canada. Reported rates of chlamydia, gonorrhea and syphilis have been rising since 1997. This report outlines the trends in these three nationally notifiable STIs from 1998 to 2007, providing an overview of the descriptive epidemiology of these infections in Canada.

Chlamydia continues to be the most commonly reported STI in Canada. Reported rates of chlamydia infections have increased by 73.6% from 1998 to 2007. A steady increase in reported rates has been observed in both genders and across all age groups, with the highest relative increase among males. However, younger age groups and females remain disproportionately affected by chlamydia infection. In 2007, the reported rate among women was almost twice as high as that of their male counterparts, and 82.8% of reports were for those under the age of 30. The reported rate among males over the age of 60 was three times as high as their female counterparts corresponding to a reduction in the female to male ratio of reported rates among the older population. Geographic variation was observed with the highest chlamydia rates reported in Nunavut, the Northwest Territories and Yukon.

The overall reported rate of gonorrhea increased by 124.2% between 1998 and 2007. The majority of reported cases were in those under 30 years of age. Females between the ages of 15 to 24 and males between the ages of 20 to 24 accounted for the highest reported rates of gonorrhea. The older male population, particularly those over the age of 60, experienced a dramatic rise in the rate of reported cases since 1998, although reported rates remain low in this group compared to other age groups. Like chlamydia, the distribution of reported cases of gonorrhea varies geographically across Canada. The highest reported rates occurred in the Northwest Territories and Nunavut, followed by Manitoba and Saskatchewan.

The overall reported rate of infectious syphilis increased by 516.7% between 1998 and 2007. Reported rates of infection were highest among males aged 30 to 39; among females, highest rates were reported among those 25 to 29 years old. During this time period, outbreaks were reported in Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Ottawa, Montreal, and the Yukon among men who have sex with men and among heterosexual populations.

Reported Cases and Rates of Chlamydia, Gonorrhea, and Syphilis, 1998 and 2007

	Chlamydia		Gonorrhea		Syphilis	
	Cases	Rates	Cases	Rates	Cases	Rates
1998	39,034	129.0	4,868	16.1	177	0.6
2007	73,770	224.0	11,873	36.1	1,206	3.7

Comparisons of reported STI rates to those of other western regions such as the United States, Australia, and the United Kingdom demonstrate that the observed increase in bacterial STIs is not unique to Canada, along with other similarities in trends. In all four countries, chlamydia is the most commonly reported STI and affects predominantly younger age groups, especially females. Gonorrhea rates in each country are highest in males aged 20 to 24. Across countries, males have the highest rates of infectious syphilis, reflecting the recent occurrence of outbreaks among men who have sex with men (MSM).

Brief Report on Sexually Transmitted Infections in Canada: 2007

Chlamydia, gonorrhea, and syphilis are sexually transmitted infections of public health significance included on the list of nationally notifiable diseases in Canada. Resultant surveillance data are analyzed and summarized periodically. Several observations for 2007 are noteworthy.

CHLAMYDIA

(Chlamydia trachomatis)

Chlamydia *(Chlamydia trachomatis)*

Chlamydia, an infection caused by *Chlamydia trachomatis*, has been notifiable nationally since 1990 and remains the most commonly reported sexually transmitted infection (STI) in Canada. Since asymptomatic infections are common in men and women, affected individuals unaware of their status in the absence of screening would serve as carriers and contribute to the spread of infection. Complications associated with untreated infections are also of concern because chlamydia disproportionately affects a younger population, particularly women. One of the most serious, common complications affecting women is pelvic inflammatory disease, which can lead to chronic pelvic pain, ectopic pregnancy, and infertility. Untreated chlamydia in pregnant women can be transmitted to their infants during childbirth, resulting in outcomes such as neonatal conjunctivitis or pneumonia. Less frequently, complications also develop in men, which include epididymoorchitis and other less common conditions1. As with other non-ulcerative STIs, chlamydia can increase the risk of HIV acquisition and transmission possibly by recruiting HIV susceptible inflammatory cells to the genital tract and by increasing the shedding of HIV-infected cells[2].

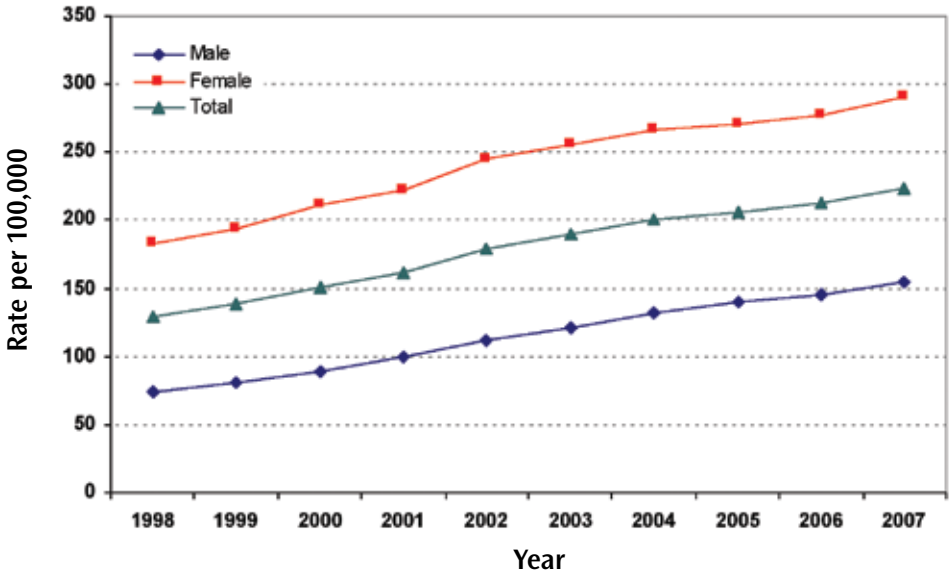
Reported rates of chlamydia infections in Canada increased consistently over time between 1998 and 2007.

- In 2007, 73,770 cases of chlamydia infections were reported, corresponding to a rate of 224.0 per 100,000 (Figure 1). The overall rate in 2007 increased by 73.6% since 1998 (129.0 per 100,000).

- Reported rates of chlamydia infections increased consistently over time in both sexes. Between 1998 and 2007, rates in males increased by 109.2% from 73.7 to 154.2 per 100,000, and rate in females increased by 59.5% from 183.1 to 292.1 per 100,000 (Figure 1).

- Consistent with historical trends, the reported rate in women was almost twice as high as that in men in 2007 (Figure 1).

Figure 1: Reported Rates of Chlamydia by Sex and Overall, 1998 to 2007, Canada



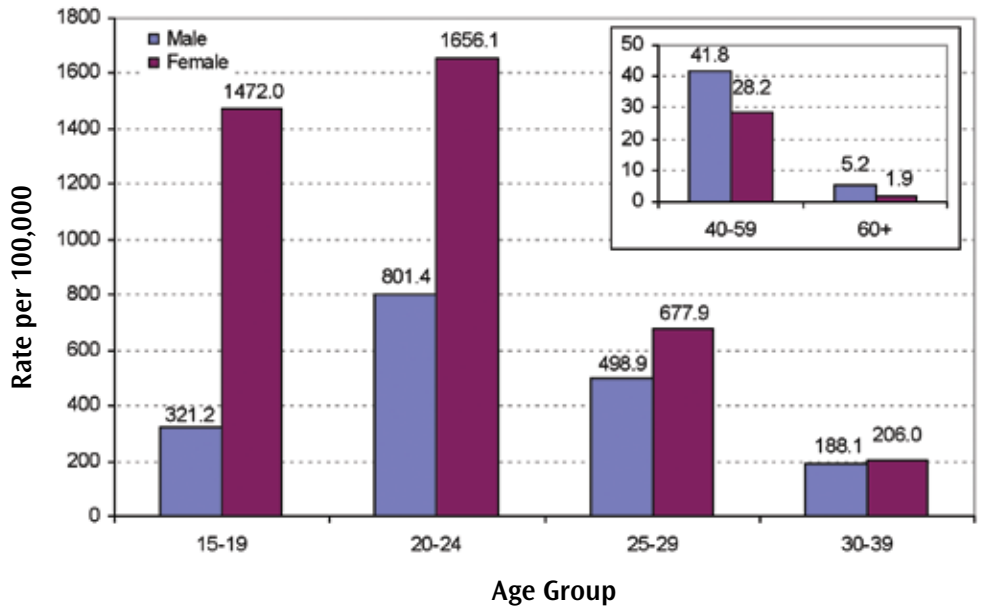
Reported rates of chlamydia infections were highest in the younger population, particularly females.

- The majority of chlamydia infections (82.8%) were reported for the young population under 30 years of age. This is in contrast to infectious syphilis in which the same age group accounted for only 22.1% of reported cases.

- In both women and men, the highest reported rates of chlamydia infections were in 20 to 24 year olds, although the rate in women (1656.1 per 100,000) was more than twice as high as that in men (801.4 per 100,000) (Figure 2).

- The ratio of female to male rates decreased with age. In the 40 and older age groups, rates were higher in men than in women. For the age group 60 and older, reported rate of infections in men (5.2 per 100,000) was nearly three times as high as that in women (1.9 per 100,000) (Figure 2).

Figure 2: Reported Rates of Chlamydia by Sex and Age Group, 2007, Canada



Reported rates of chlamydia infections increased across age groups in both males and females aged 15 and older.

- In males, the greatest absolute increase in reported rates of chlamydia infections was seen in 20 to 24 year olds. The rate increased from 394.1 per 100,000 in 1998 to 801.4 per 100,000 in 2007 (Figure 3).

- Although reported rates in older males remained consistently low over time, substantial increases were seen since 1998, especially in men aged 60 and older. Reported rates in senior men increased by 246.7% from 1.5 per 100,000 in 1998 to 5.2 per 100,000 in 2007 (Figure 3).

- In females, between 1998 and 2007, the greatest absolute increase in reported rates of chlamydia infections was seen in 20 to 24 year olds (Figure 4). The rate increased from 1011.8 to 1656.1 per 100,000.

Figure 3: Reported Rates of Chlamydia in Males by Age Group, 1998 to 2007, Canada

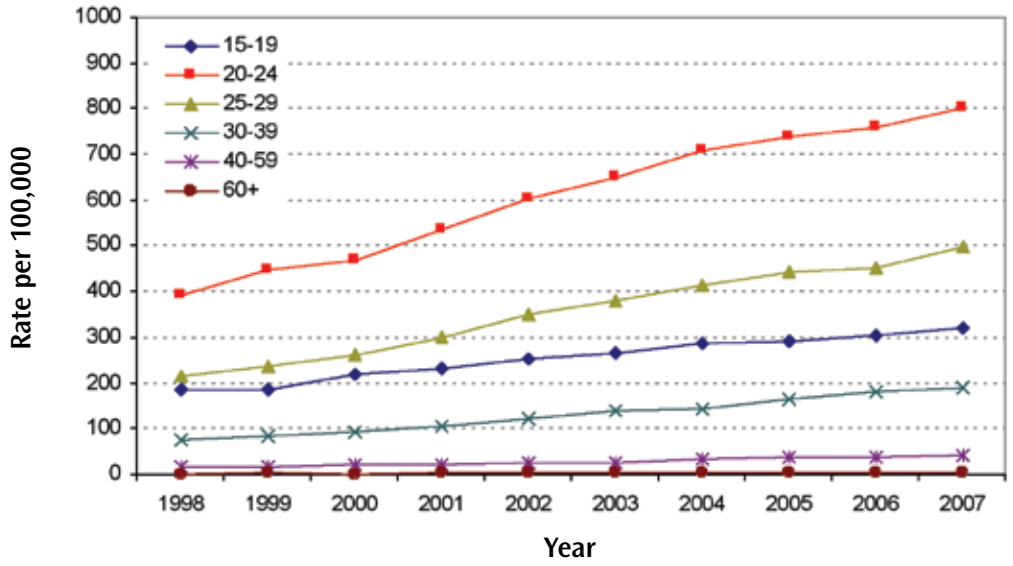
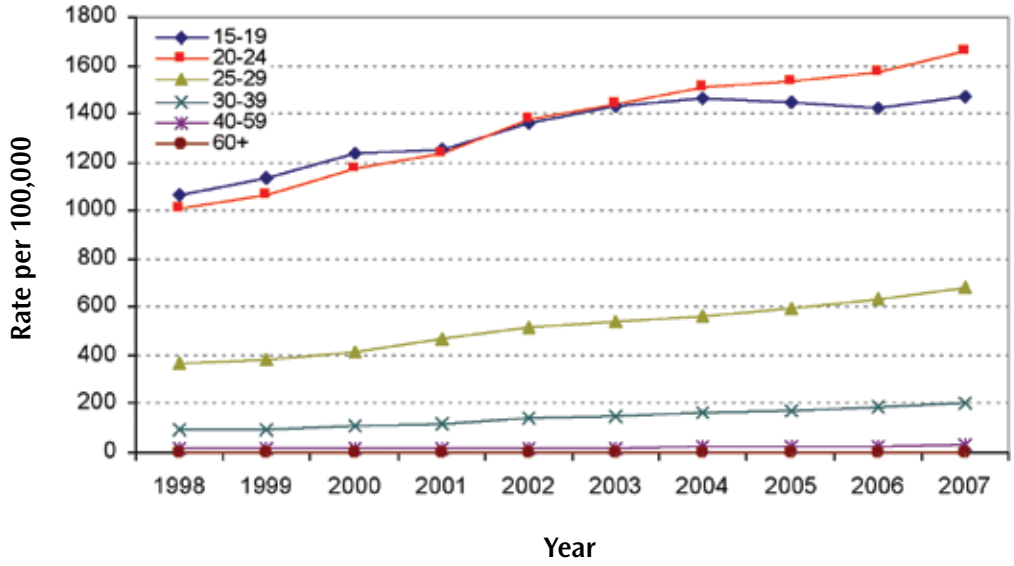


Figure 4: Reported Rate of Chlamydia in Females by Age Group, 1998 to 2007, Canada



- Although reported rates in older women remained low compared to other age groups, substantial increases were seen since 1998, especially in 30 to 59 year old women. Between 1998 and 2007, reported rates in 30 to 39 year olds increased by 127.1% (from 90.7 to 206.0 per 100,000) and by 122.9% in 40 to 59 year olds (from 12.7 to 28.2 per 100,000) (Figure 4).

While the majority of cases in 2007 occurred in the most populated provinces in Canada, reported rates of chlamydia infections were highest in the Northern territories.

- Reported chlamydia rates continue to be highest in Nunavut, the Northwest Territories and Yukon (Table 1).
- Between 1998 and 2007, the greatest increase in reported chlamydia rates occurred in British Columbia, with an increase of 95.6% (Table 1).
- In 2007, the national female-to-male rate ratio was 1.9:1.0, reflecting that more women than men were reported with chlamydia. This ratio was highest in Newfoundland and Labrador (3.7:1.0), and lowest in the Northwest Territories (1.5:1.0).

Table 1: Reported Cases and Rates[1] of Chlamydia by Province/Territory, 1998 and 2007, Canada

Jurisdiction	Number of Cases		Rate per 100,000[3]		Rate change 1998-2007 (%)
	1998	2007	1998	2007	
Canada	*39,034*	*73,770*	*129.0*	*224.0*	*73.6*
BC	4,769	10,057	119.3	**233.3**	95.6
AB	5,195	11,194	**178.7**	**318.8**	78.4
SK	2,399	4,400	**234.1**	**440.1**	88.0
MB	2,954	5,621	**259.6**	**471.0**	81.4
ON	12,458	23,324	109.4	182.3	66.6
QC	7,264	13,352	99.2	173.7	75.1
NB	959	1,187	127.3	159.2	25.1
NS	1,216	1,788	**129.9**	191.0	47.0
PE	144	172	105.2	124.5	18.3
NL	375	503	68.8	99.3	44.3
YT	177	218	**561.5**	**669.1**	19.2
NT	1,124	752	**1,665.7**	**1,727.3**	N/A
NU[2]	N/A	1202	N/A	**3,486.3**	N/A

[1] Rate change calculated using unrounded values.
[2] Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1998 rates are not comparable with 2007 rates due to the creation of Nunavut.
[3] Bolded values indicate rates above the national average.

GONORRHEA

(Neisseria gonorrhoeae)

Gonorrhea *(Neisseria gonorrhoeae)*

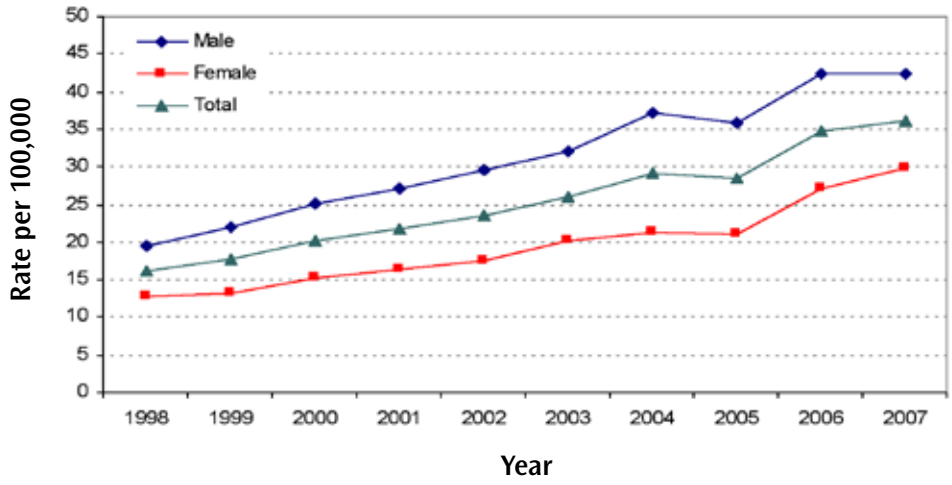
Gonorrhea, an infection caused by *Neisseria gonorrhoeae*, has been nationally notifiable since 1924 and remains the second most commonly reported sexually transmitted infection in Canada. Untreated infections can lead to complications for both sexes, with more severe consequences for women. A serious, common complication affecting women is pelvic inflammatory disease, which can lead to chronic abdominal pain, infertility, and ectopic pregnancy. In men, untreated infections can result in epididymitis and rare cases of infertility. An uncommon complication of gonorrhea is the spread of infection to the blood stream and joints[3]. Like other non-ulcerative STIs, gonorrhea can increase the risk of HIV acquisition and transmission possibly by increasing the concentration of cells in genital secretions and these cells can serve as targets for HIV thereby increasing the risk of acquiring and/or transmitting the virus[2].

Reported rates of gonorrhea infections in Canada increased consistently over time between 1998 and 2007.

- In 2007, 11,873 cases of gonorrhea infections were reported nationally, corresponding to a rate of 36.1 per 100,000 (Figure 5). The overall rate increased by 124.2% since 1998 (16.1 per 100,000).

- Between 1998 and 2007, reported rates in both sexes increased consistently over time. Rates in males increased by 116.9% (from 19.5 to 42.3 per 100,000) and in females by 134.6% (from 12.7 to 29.8 per 100,000) (Figure 5).

Figure 5: Reported Rates of Gonorrhea by Sex and Overall, 1998 to 2007, Canada

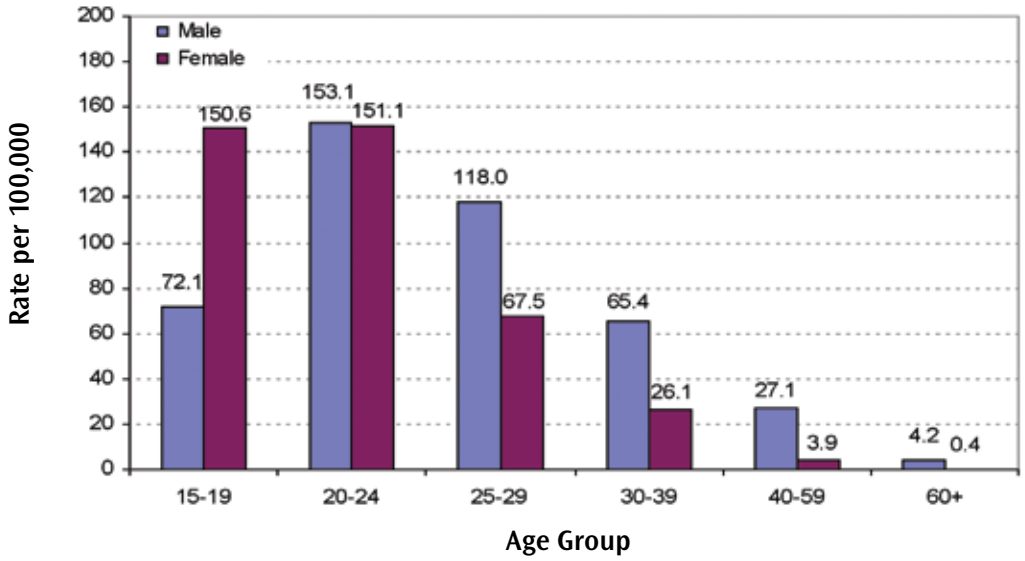


Reported rates of gonococcal infections in 2007 were highest in the younger population.

- People under 30 years of age accounted for the majority (68.3%) of reported cases in 2007. This is in contrast with infectious syphilis, in which the same age group accounted for only 22.1% of reported cases.

- The highest reported rate of gonorrhea infections in women was in 15 to 19 year olds (150.6 per 100,000) and 20 to 24 year olds (151.1 per 100,000) (Figure 6). The highest reported rate in men was in 20 to 24 year olds (153.1 per 100,000) (Figure 6).

Figure 6: Reported Rates of Gonorrhea by Sex and Age Group, 2007, Canada

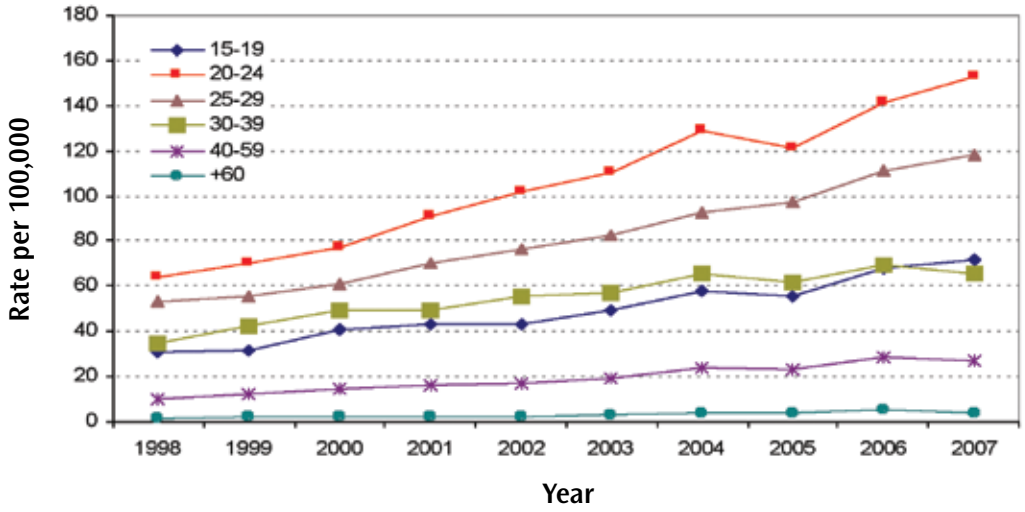


Reported rates of gonococcal infections increased consistently over time across age groups in both males and females aged 15 and older.

- In males, the greatest absolute increase in reported rates of gonococcal infections was seen in 20 to 24 year olds (Figure 7). The rate increased from 64.0 per 100,000 in 1998 to 153.1 per 100,000 in 2007.

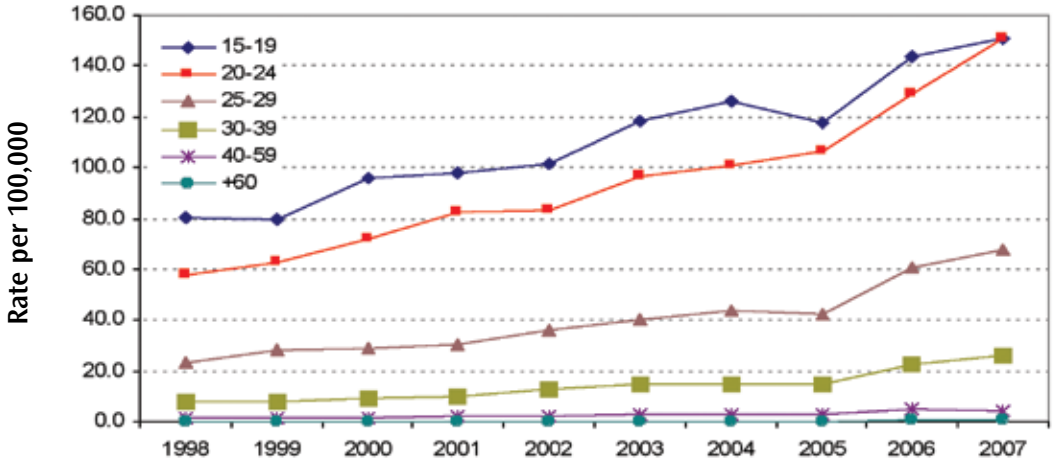
- Although reported rates in older men remained low compared to other age groups, substantial increases were seen since 1998, especially in men aged 60 and older. Reported rates in senior men increased by 180.0% from 1.5 per 100,000 in 1998 to 4.2 per 100,000 in 2007 (Figure 7).

Figure 7: Reported Rates of Gonorrhea in Males by Age Group, 1998 to 2007, Canada



- In women, the greatest increase in reported rate of gonococcal infections was seen in 20 to 24 year olds. The rate increased from 57.7 per 100,000 in 1998 to 151.1 per 100,000 in 2007 (Figure 8).

Figure 8: Reported Rates of Gonorrhea in Females by Age Group, 1998 to 2007, Canada



- Although reported rates in older women remained low compared to other age groups, substantial increases were seen since 1998, especially in women aged 30 to 39. The rate in 30 to 39 year olds increased by 239.0% (from 7.7 to 26.1 per 100,000) (Figure 8).

While the majority of gonorrhea cases occurred in the most populous provinces of the country, reported rates were highest in Northern Canada.

- In 2007, the highest number of gonorrhea cases was reported in Ontario, followed by Alberta and Manitoba (Table 2). However, reported rates were highest in the Northwest Territories and Nunavut, followed by Manitoba, and Saskatchewan (Table 2).

- Between 1998 and 2007, the greatest increase in reported rates was in Newfoundland and Labrador, with an increase of 800.0% (Table 2). However, the total number of cases reported in this jurisdiction is small; results should be interpreted with caution.

- In 2007, the national male-to-female rate ratio was 1.4:1, reflecting that more males than females were reported with gonococcal infections (Table 3). However, this average masks variations across the country. In four jurisdictions (Prince Edward Island, Manitoba, Saskatchewan and Yukon Territory), more cases were reported in females than males.

Table 2. Reported Cases and Rates[1] of Gonorrhea by Province/Territory, 1998 and 2007, Canada

Jurisdiction	Number of Cases		Rate per 100,000[3]		Rate change 1998-2007 (%)
	1998	2007	1998	2007	
Canada	*4,868*	*11,873*	*16.1*	*36.1*	*124.2*
BC	569	1,285	14.2	29.8	109.9
AB	518	2,193	**17.8**	**62.5**	251.1
SK	326	1,033	**31.8**	**103.3**	224.8
MB	424	1,485	**37.3**	**124.4**	233.5
ON	2,272	3,960	**20.0**	31.0	55.0
QC	490	1,403	6.7	18.3	173.1
NB	17	36	2.3	4.8	108.7
NS	84	72	9.0	7.7	-14.4
PE	1	3	0.7	2.2	214.3
NL	2	18	0.4	3.6	800.0
YT	11	15	**34.9**	**46.0**	31.8
NT	154	221	**228.2**	**507.6**	N/A
NU[2]	N/A	149	N/A	**476.8**	N/A

[1] Rate change calculated using unrounded values.
[2] Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1998 rates are not comparable with 2007 rates due to the creation of Nunavut.
[3] Bolded rates indicate rates above national average.

Table 3. Male-to-Female Ratio of Reported Rates of Gonorrhea by Province/Territory, 2007, Canada

Jurisdiction	Male-to-Female Rate Ratio
Canada	*1.4 : 1.0*
BC	1.9 : 1.0
AB	1.5 : 1.0
SK	0.8 : 1.0
MB	0.9 : 1.0
ON	1.5 : 1.0
QC	2.4 : 1.0
NB	2.3 : 1.0
NS	1.4 : 1.0
PE	0.5 : 1.0
NL	17.0 : 1.0
YT	0.6 : 1.0
NT	0.9 : 1.0
NU[2]	1.2 : 1.0

SYPHILIS

(Treponema pallidum)

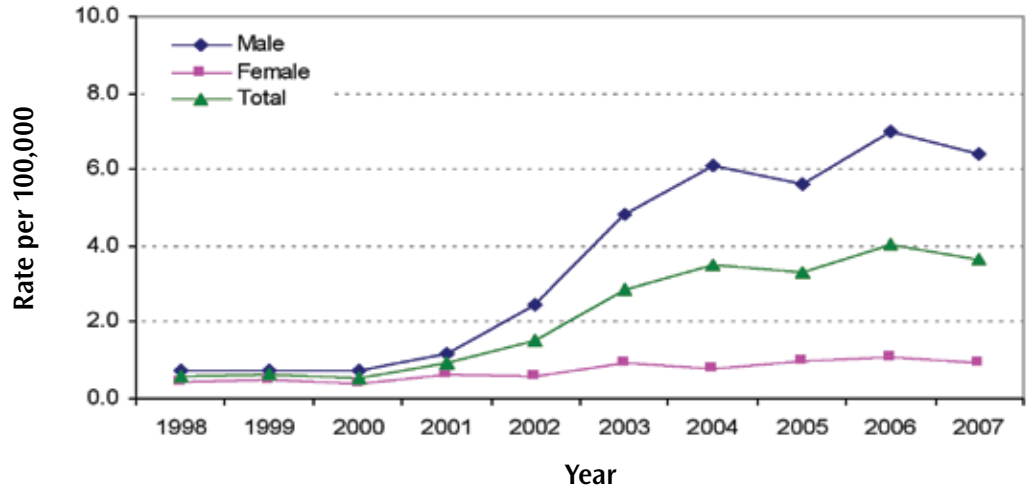
Syphilis *(Treponema pallidum)*

Syphilis, an infection caused by the bacterium *Treponema pallidum*, has been nationally notifiable since 1924. It progresses through different stages of infection, with primary, secondary and early latent (less than one year after the point of infection) stages being the most infectious, and only these stages are included in national reports. Untreated syphilis will enter into a non-infectious late latent stage of the infection that may lead to serious complications associated with tertiary syphilis. This includes damage to the central nervous system, cardiovascular system, eyes, skin and other internal organs. Untreated syphilis can be fatal[1]. Individuals infected with syphilis are at an increased risk of contracting and transmitting HIV[2].

Reported rate of infectious syphilis in Canada remained stable between 1998 and 2001 then increased significantly in the following three years, particularly among males. Since 2004, the rates appeared to be stabilizing in both sexes.

- In 2007, 1,206 cases of infectious syphilis were reported to PHAC, corresponding to a rate of 3.7 per 100,000. The overall rate increased by 516.7% since 1998 (0.6 per 100,000) (Figure 9).

Figure 9: Reported Rates of Infectious Syphilis by Sex and Overall, 1998 to 2007, Canada



- Historically, a greater number of cases have been reported in men than in women in 2007, men accounted for 86.8% of reported cases.

- Between 1998 and 2007, reported rates of infectious syphilis increased in both sexes with a larger increase in males. During this period, the rate in men increased by 814.3% (from 0.7 to 6.4 per 100,000) and in women increased by 150.0% (from 0.4 to 1.0 per 100,000) (Figure 9).

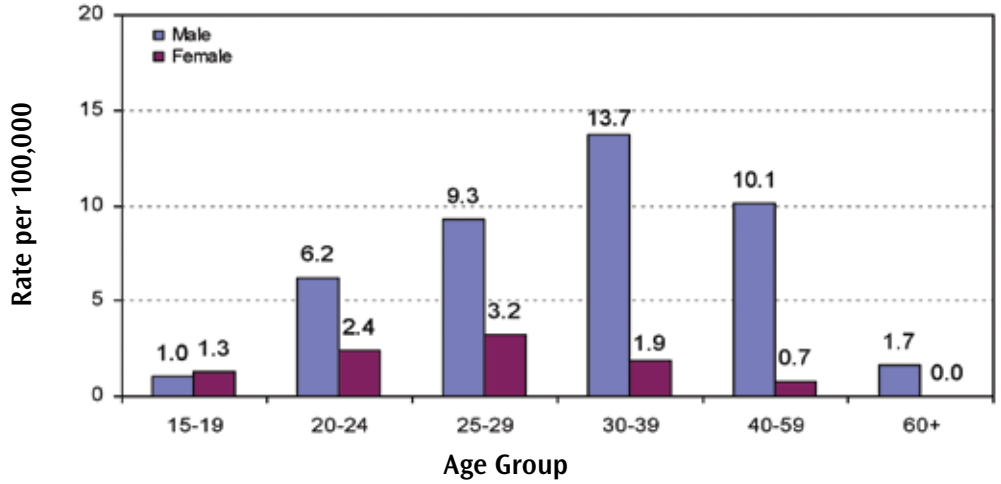
- The male-to-female rate ratio increased from 1.8:1.0 in 1998 to 6.4:1.0 in 2007, reflecting that more males than females were reported with infectious syphilis, and this disparity increased over time.

The age-specific distribution of infectious syphilis cases differed from chlamydia and gonorrhea in that reported rates were highest in the older population, particularly in males aged 30 to 39.

- In 2007, people of age 30 and older accounted for 77.8% of reported cases.

- In men, the highest reported rate of infectious syphilis was in 30 to 39 year olds (13.7 per 100,000) (Figure 10), and this age group accounted for almost one-third of reported cases in men in 2007. In women, the highest reported rate was in 25 to 29 year olds (3.2 per 100,000) (Figure 10).

Figure 10: Reported Rates of Infectious Syphilis by Sex and Age Group, 2007, Canada

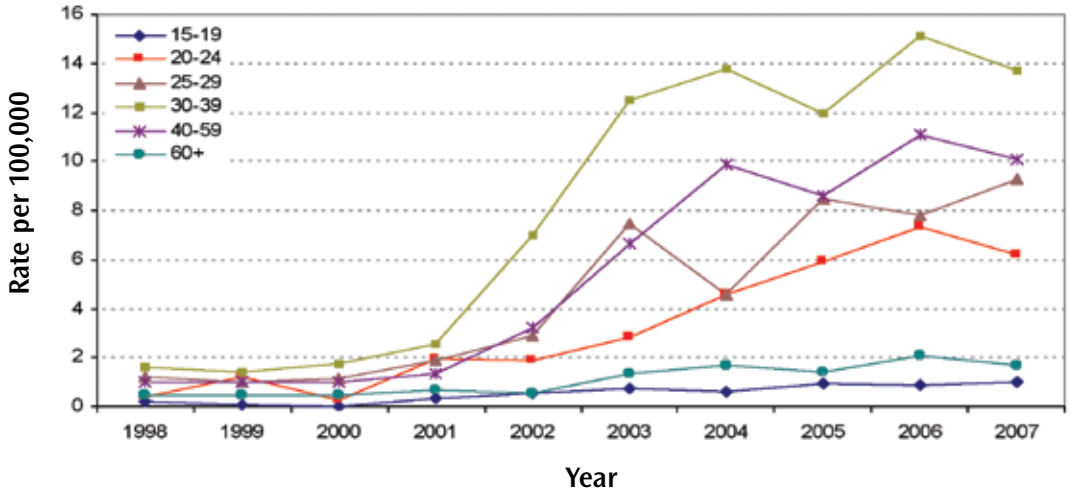


Since 2002, the age-specific reported rates of infectious syphilis fluctuated from year to year in both sexes. Overall, reported rates increased between 1998 and 2007 in most age groups.

- In males, the greatest absolute increase in reported rates of infectious syphilis was in 30 to 39 year olds. The rate increased from 1.6 per 100,000 in 1998 to 13.7 per 100,000 in 2007 (Figure 11).

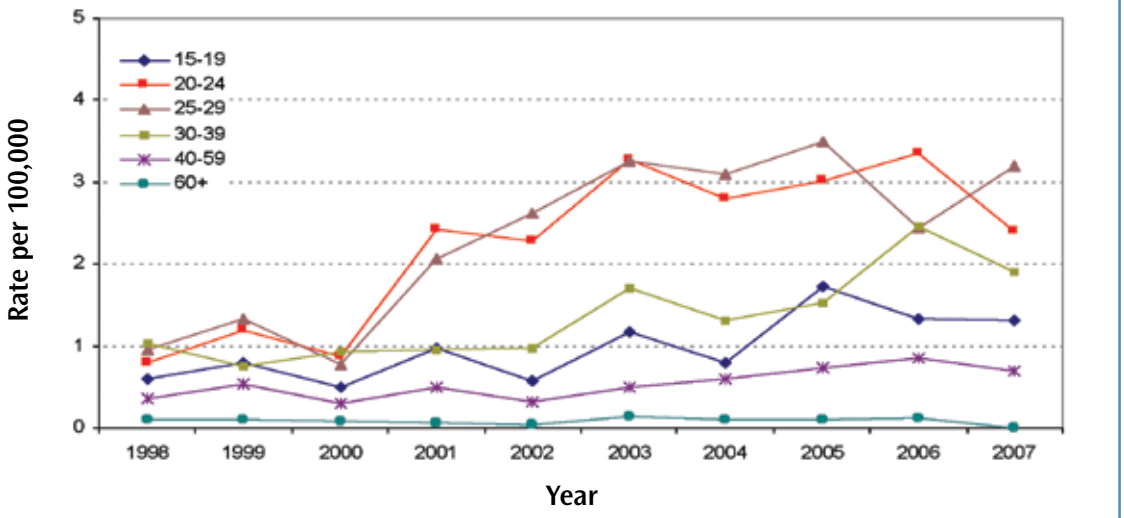
- Although reported rates in young men remained low compared to men aged 30 to 59, substantial increases were seen since 1998. The reported rate in 20 to 24 year old males increased by 1506.5% from 0.4 per 100,000 in 1998 to 6.2 per 100,000 in 2007 (Figure 11).

Figure 11: Reported Rates of Infectious Syphilis in Males by Age Group, 1998 to 2007, Canada



- In women, the greatest absolute increase in reported rates of infectious syphilis was in 25 to 29 year olds (Figure 12). The rate increased from 0.9 per 100,000 in 1998 to 3.2 per 100,000 in 2007.

Figure 12: Reported Rates of Infectious Syphilis in Females by Age Group, 1998 to 2007, Canada



The majority of reported cases were concentrated in Canada's most populous provinces.

- In 2007, the highest reported rate of infectious syphilis was in Alberta, followed by British Columbia (Table 4).

- Between 1998 and 2007, the largest increase in reported rates of infectious syphilis was in Alberta, with an in increase of 3450.0% (Table 4).

- During the same period, outbreaks of infectious syphilis were reported across Canada, including Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Ottawa, Montreal, and Yukon[4-11].

- In 2007, the national male-to-female rate ratio was 6.4:1.0, reflecting that more males than females were reported with infectious syphilis. However, this average masks variations across the country. The male-to-female rate ratio was highest in Quebec (32.1:1.0).

Table 4. Reported Cases and Rates[1] of Infectious Syphilis by Province/Territory, 1998 and 2007, Canada

Jurisdiction	Number of Cases		Rate per 100,000[3]		Rate change 1998-2008 (%)
	1998	2007	1998	2007	
Canada	*177*	*1,206*	*0.6*	*3.7*	*516.7*
BC	115	299	**2.9**	**6.9**	137.9
AB	6	250	0.2	**7.1**	3,450.0
SK	6	10	0.6	1.0	66.7
MB	3	27	0.3	2.3	666.7
ON	41	386	0.4	3.0	650.0
QC	4	226	0.1	2.9	2,800.0
NB	0	2	0.0	0.3	*
NS	2	3	0.2	0.3	50.0
PE	0	1	0.0	0.7	*
NL	0	2	0.0	0.4	*
YT	0	0	0.0	0.0	0.0
NT	0	0	0.0	0.0	N/A
NU[2]	N/A	0	N/A	0.0	N/A

[1] Rate change calculated using unrounded values.
[2] Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1998 rates are not comparable with 2007 rates due to the creation of Nunavut.
[3] Bolded rates indicate rates above national average.
* The rate change can not be quantified.

International Comparison

To put into perspective the 2007 observations highlighted in previous sections of this report, the current state of sexually transmitted infection (STIs) in Canada is compared to other western countries with comparable population health status and a well-established public health infrastructure. Selected countries for comparison are United States, Australia, and United Kingdom. Statistics presented below are either drawn from published health reports or provided directly by respective national health departments. Differences in case numbers and reported rates need to be interpreted with caution due to differences in case definitions, in reporting sources, in screening programs and screening rates, in age groupings and in other factors.

Chlamydia

- Chlamydia is the most commonly reported bacterial STI in all four countries. Reported rates of chlamydia infections ranged from 201.3 per 100,000 in United Kingdom to 370.2 per 100,000 in United States (Table 5).
- The United Kingdom only reported uncomplicated genital chlamydial infections whereas other countries reported all laboratory-confirmed clinical isolates, which included both genital and extra-genital specimens. This difference may in part explain the lower rate reported in the United Kingdom.
- In all countries except the United Kingdom, females accounted for at least 60% of all reported cases. The ratio of reported rates between males and females ranged from 1.0 : 1.0 in United Kingdom to 1.0 : 2.9 in United States (Table 5).
- In all countries, highest rates were reported in the younger population: 15 to 24 year olds in women and 20 to 24 year olds in men.

Table 5. Reported Cases and Rates of Chlamydia in Canada, Australia, the United Kingdom and the United States, 2007

Country	Number of Chlamydia Cases			Reported Rate of Chlamydia (per 100,000)			M : F Rate Ratio
	Total	Male	Female	Total	Male	Female	
Canada*	73,770	25,183	48,485	224.0	154.2	292.1	1.0 : 1.9
Australia*	52,023	20,865	31,045	247.6	199.8	293.7	1.0 : 1.5
United Kingdom	121,986	60,798	61,188	201.3	204.7	198.1	1.0 : 1.0
United States	1,108,374	280,931	827,443	370.2	190.4	544.8	1.0 : 2.9

Source: Surveillance and Epidemiology Section, Community Acquired Infections Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada for Canadian statistics. National Notifiable Disease Surveillance, Department of Health and Ageing for Australian statistics[12].
HIV and Sexually Transmitted Infections Department, Health Protection Agency for United Kingdom statistics[13].
Division of STD Prevention, Centers for Disease Control and Prevention for American statistics[14].
*Totals include cases of unknown sex.

Gonorrhea

- Reported rates of gonococcal infections were significantly higher in the United States than in other countries (Table 6).

- In the United States, reported rates of gonorrhea were similar in men and women, while in all other countries, reported rates were higher in men than in women; the male-to-female rate ratio ranged from 1.4:1.0 in Canada to 2.3:1.0 in the United Kingdom (Table 6).

- Consistent across countries, the highest rates were reported in young men aged 20 to 24. Among women, highest rates were reported in a slightly younger group in most countries: 15 to 19 year olds in Australia and the United States and 16 to 19 year olds in the United Kingdom. In Canada, however, the highest rate was reported in women aged 15 to 19 and 20 to 24.

Table 6. Reported Cases and Rates of Gonorrhea in Canada, Australia, the United Kingdom and the United States, 2007

Country	Number of Gonorrhea Cases			Reported Rate of Gonorrhea (per 100,000)			M : F Rate Ratio
	Total	Male	Female	Total	Male	Female	
Canada*	11,873	6,912	4,955	36.1	42.3	29.8	1.4 : 1.0
Australia*	7,675	5,092	2,575	36.5	48.8	24.4	2.0 : 1.0
United Kingdom	18,710	12,933	5,777	30.9	43.6	18.7	2.3 : 1.0
United States	355,991	168,011	187,980	118.9	113.9	123.8	1.0 : 1.1

Source: Surveillance and Epidemiology Section, Community Acquired Infections Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada for Canadian statistics. National Notifiable Disease Surveillance, Department of Health and Ageing for Australian statistics[12].
HIV and Sexually Transmitted Infections Department, Health Protection Agency for United Kingdom statistics[13].
Division of STD Prevention, Centers for Disease Control and Prevention for American statistics[14].
*Totals include cases of unknown sex.

Syphilis

- When compared to chlamydia and gonorrhea infection, infectious syphilis is relatively rare in all four countries. Reported rates ranged from 3.7 per 100,000 in Canada to 6.7 per 100,000 in Australia (Table 7).

- As with chlamydia, the case definition for syphilis varied across countries. In both the United States and the United Kingdom, only primary and secondary infectious syphilis cases were reported. In Australia and Canada, early latent cases were also included in reporting. However, there are notable differences in the definition of early latent syphilis between these four countries. Early latent syphilis is defined as an asymptomatic individual with syphilis who has acquired the infection in the past two years (for UK and Australia) and one year for Canada and the US.

- In all four countries, men accounted for over 85% of reported cases of infectious syphilis. The disparity in reported rates between men and women varied by country; the male-to-female rate ratio ranged from 6.0 : 1.0 in United Kingdom to 7.4 :1.0 in Australia (Table 7).

- Among men, highest rates were reported in those over 30 (30 to 39 year olds in Canada, 35 to 39 year olds in Australia, 35 to 44 year olds in the United Kingdom) except in the United States where highest rates were reported among 25 to 29 year olds in addition to 35 to 39 year olds.

- Among women, highest rates were reported in younger populations: 15 to 19 year olds in Australia, 20 to 24 year olds in the United Kingdom and the United States, and 25 to 29 year olds in Canada.

Table 7. Reported Cases and Rates[1] of Infectious Syphilis (Primary, Secondary, Early Latent Syphilis) in Canada and Australia and Primary and Secondary Syphilis in the United Kingdom and the United States, 2007

Country	Number of Infectious Syphilis^/ Primary & Secondary* Cases			Reported Rate of Infectious Syphilis^/Primary & Secondary Syphilis* (per 100,000)			M : F Rate Ratio
	Total	Male	Female	Total	Male	Female	
Canada*+	1,206	1,047	158	3.7	6.4	1.0	6.4 : 1.0
Australia*+	1,402	1,231	169	6.7	11.8	1.6	7.4 : 1.0
United Kingdom^	2,680	2,395	285	4.4	8.1	0.9	9.0 : 1.0
United States^	11,466	9,773	1,693	3.8	6.6	1.1	6.0 : 1.0

Source: Surveillance and Epidemiology Section, Community Acquired Infections Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada for Canadian statistics. National Notifiable Disease Surveillance, Department of Health and Ageing for Australian statistics[12].
HIV and Sexually Transmitted Infections Department, Health Protection Agency for United Kingdom statistics[13].
Division of STD Prevention, Centers for Disease Control and Prevention for American statistics[14].
*Totals include cases of unknown sex.
+ Includes reported cases of primary, secondary and early latent syphilis. NB: The definition for early latent syphilis varies between the four countries. Early latent syphilis is defined as an asymptomatic individual with syphilis who has acquired the infection in the past two years (for UK and Australia) and one year for Canada and the US.
^ Includes only reported cases of primary and secondary syphilis cases.

Technical Notes

Case reporting: Currently, some jurisdictions report to the Public Health Agency of Canada (PHAC) using aggregate case counts instead of case-by-case reporting. Selected variables submitted by all 13 jurisdictions are: age at diagnosis, year of diagnosis, province/territory of diagnosis, and sex. As such, national reporting is limited to analyses of these variables.

Reporting delay: A time delay may occur between when a person is tested positive for a sexually transmitted infection (STI) and when the report is received at PHAC. This time lag is referred to as reporting delay. In cases where there are discrepancies between data reported by PHAC and those reported by individual provinces and territories, provincial/territorial data should be considered to be more accurate as they are the most current. The 2007 data presented in this brief report are also preliminary and subject to change.

Underreporting: The number of reported cases likely underestimates the true burden of infection in a given population for one or more of the following reasons:

- Many people who are infected with STIs do not exhibit symptoms
- An infected individual may not interact with the medical system to get tested for a bacterial STI.

Annual trends: Observed trends must be interpreted with caution since there are a number of factors that contribute to changes::

- Rates based on small numbers are more prone to fluctuation over time; and
- There may be changes to testing patterns due to improved diagnostic capabilities, improved duplicate removal, and reporting delay.

2005 data: Reported cases for Ontario in 2005 are underestimates due to a transition in the provincial reporting system. Decreases for 2005 are likely an artifact of reporting delay, not a true reduction in disease incidence. Canadian cases and rates for 2005 are affected.

Population data: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1997-2000 final intercensal estimates, 2001-2003 final postcensal estimates, 2004-2007 updated postcensal estimates.

References

1. Public Health Agency of Canada. *Canadian Guidelines on Sexually Transmitted Infections (STI)* 2008 Edition: PHAC, 2008. http://www.phac-aspc.gc.ca/std-mts/sti_2006/sti_intro2006-eng.php
2. Fleming DT, Wasserheit JN. *From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection*. Sex Transm Infect 1999;75:3-17.
3. Holmes KK, Mardh PA, Sparling PF et al. *Sexually transmitted diseases 3rd ed*. Mcgraw-Hill.
4. Manitoba Health. *The descriptive epidemiology of sexually transmitted infections (STI) and blood-borne pathogens in Manitoba: 2002-2003*. Manitoba Health. 2008.
5. Gratix J, Honish L, Mashinter L, et al. *Case series descriptive analysis of a primary syphilis outbreak in Edmonton, Alberta, July 2004-April 2006*. Can Commun Dis Rep 2007 Mar;33(6):61-7.
6. Jayaraman GC, Read RR, Singh A. *Characteristics of individuals with male-to-male and heterosexually acquired infectious syphilis during an outbreak in Calgary, Alberta, Canada*. Sex Transm Dis 2003 Apr;30(4):315-9.
7. Ogilvie G, Knowles L, Wong E, et al. *Incorporating a social networking approach to enhance contact tracing in a heterosexual outbreak of syphilis*. Sex Transm Infect 2005 Apr;81(2):124-7.
8. Patrick DM, Rekart ML, Jolly A, Mak S, Tyndall M, Maginley J, Wong E, Wong T, Jones H, Montgomery C, Brunham RC. *Heterosexual outbreak of infectious syphilis: epidemiological and ethnographic analysis and implications for control*. Sex Transm Infect 2002 Apr;78 Suppl 1:i164-i169.
9. Régie Régionale de la Santé et des Services Sociaux de Montréal-Centre. *Bacterial STIs make a comeback!* Prévention en practique médicale. 2002. 9-24-0080.
10. Toronto Public Health. *Infectious syphilis on the rise in Toronto - information for health care providers*. Toronto Public Health. 2005.
11. Wheeler C. *Surge in syphilis prompts warning: disease breaks out among users of gay bathhouses*. Ottawa Citizen 2001 Mar 28.
12. Department of Health and Ageing, Australian Government. *National Notifiable Diseases Surveillance System: Notifications of a selected disease by age group, sex, and year*. Retrieved February 25, 2009, from http://www9.health.gov.au/cda/Source/Rpt_5_sel.cfm
13. Health Protection Agency. *Selected STI diagnoses and diagnosis rates from GUM clinics in the UK: 2003-2007*. Retrieved February 28, 2009, from http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1215589013442
14. Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance, 2007*. Atlanta, GA: U.S. Department of Health and Human Services; December 2008.