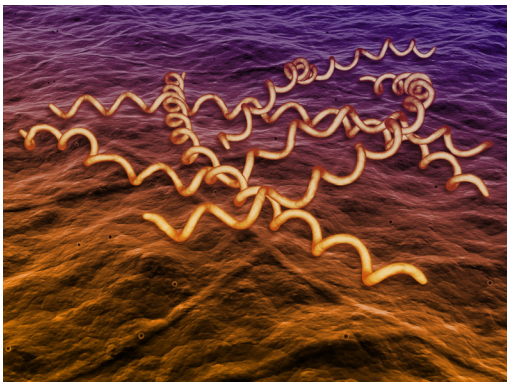
REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2011



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REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2011

NOTE TO THE READERS OF THE *REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2011*

The Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada (the Agency), is pleased to present the 2011 edition of the *Report on Sexually Transmitted Infections in Canada*. This annual report is intended to provide information on trends in reported cases of sexually transmitted infections (STIs) to those who are concerned with their public health implications (programs, policy makers, researchers, etc.). The data in this report supersede those presented in earlier editions.

The *Report on Sexually Transmitted Infections in Canada* is based on surveillance reports submitted to the Agency by provincial and territorial epidemiological units; data are summarized by age, sex, and province/territory (P/T). The report consists of four chapters. The first three highlight the three main nationally notifiable STIs: chlamydia, gonorrhea, and infectious syphilis, with special focus sections within each. The fourth chapter features an international comparison of the reported STI rates among Canada, Australia, England, and the United States. Technical notes and explanatory details specific to provincial or territorial surveillance data are presented at the end of the report.

Where relative (percentage) changes in STI rates are presented, calculations were made on unrounded figures. Data were not available for the territory of Nunavut from 2007 to 2011. At the request of Prince Edward Island (PEI), its data are suppressed in any table presenting P/T specific data where PEI counts are less than 5, as per provincial Chief Public Health Office reporting guidelines.

Any comments and suggestions that would improve the usefulness of future publications are appreciated and should be sent to the attention of the staff of the Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, at ccdic-clmti@phac-aspc.gc.ca.

ACKNOWLEDGEMENTS

The publication of this report would not have been possible without the collaboration of all provinces and territories, whose continuous contribution to national STI surveillance is greatly appreciated. The authors also gratefully acknowledge the contributions and expertise of the Sexually Transmitted and Blood-Borne Infections Surveillance Network.

This report was prepared by the Centre for Communicable Diseases and Infection Control, Infectious Disease Prevention and Control Branch, Public Health Agency of Canada.

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EXECUTIVE SUMMARY

Sexually transmitted infections (STIs) continue to be a significant public health concern in Canada. Rates of reported cases of chlamydia, gonorrhea, and infectious syphilis have been rising since the late 1990s. This report describes the trends and patterns in these three nationally reportable STIs in Canada, focusing on the past decade (2002 to 2011). Longer-term secular trends and international comparisons are presented for context.

Chlamydia. Chlamydia continues to be the most commonly reported STI in Canada. Since 2002, reported rates of chlamydia infection have increased by 61.8%. A steady increase in rates has continued in both sexes and across all age groups, the highest relative increase occurring among males. As in previous reports' findings, in 2011 the reported rate among females (378.7 per 100,000) was almost twice as high as that among males (200.1 per 100,000). The highest rates of chlamydia were reported in those between the ages of 20 and 24 in both males and females. The distribution of reported cases of chlamydia varied geographically across Canada; the highest rates were observed in the Northwest Territories, Yukon, Manitoba, and Saskatchewan.

Gonorrhea. Between 2002 and 2011, the overall rate of reported cases of gonorrhea increased by 40.8%. The reported rate, as in previous years, was higher among males than females (38.4 vs. 27.8 per 100,000 respectively) in 2011. Females between the ages of 15 and 24 and males between the ages of 20 and 24 accounted for the highest reported rates of gonorrhea. The highest gonorrhea rate was observed in the Northwest Territories.

Infectious syphilis. The overall rate of reported cases of infectious syphilis has increased by 231.8% since 2002. As before, the rate was higher among males than females (9.6 vs. 0.7 per 100,000) in 2011. Reported rates of infection among men were the highest in those aged 25 to 29 and among women in those aged 20 to 24. In 2011, infectious syphilis rates varied geographically, and the highest rates were observed in Quebec and New Brunswick.

Reported Cases and Rates (per 100,000 population) of Chlamydia, Gonorrhea, and Infectious Syphilis, 2002, 2010, and 2011, Canada

	CHLAMYDIA		GONORRHEA		INFECTIOUS SYPHILIS	
YEAR	CASES	RATES	CASES	RATES	CASES	RATES
2002	56,266	179.5	7,365	23.5	482	1.5
2010	93,329	273.7	10,743	31.5	1,698	5.0
2011	100,044	290.4	11,397	33.1	1,757	5.1

Increases in reportable STI rates in recent years have been similarly observed in Australia, England, and the United States. In 2011, patterns in reportable STIs in these three comparison countries were similar to those in Canada. In all four countries, chlamydia was the most commonly reported STI, and reported rates of chlamydia were higher among females than males. Consistent with findings in Canada, reported rates of infectious syphilis in 2011 were higher among males than females in all three comparison countries. Reported rates of gonorrhea in 2011 were more than twice as high among males as females in Australia and England; in Canada and the United States, rates were more similar between the sexes.

Overall, rates of chlamydia and gonorrhea were lower in Canada as compared to the other three countries but more similar for infectious syphilis.

Rates of reported cases of STIs have continued to increase despite numerous public health interventions designed to prevent, diagnose, and treat infection. There are various potential factors that may explain these observations. For instance, more sensitive laboratory tests used to detect chlamydia and gonorrhea have increased the number of these infections that are diagnosed. More effective screening and contact tracing methods may also improve case finding. Antimicrobial resistance, a particular concern in gonorrhea, may result in treatment failure and continued transmission of infection. Finally, changes in sexual practices may increase the number of people contracting STIs, as evidenced by the syphilis outbreaks seen across Canada.

National statistics and trends in STIs are used to inform public health programs, guidelines, and recommendations. In response to this growing public health issue, the Agency produces guidelines for health professionals and educators on the prevention, diagnosis, and treatment of these infections. They can be accessed at www.phac-aspc.gc.ca/std-mts/index-eng.php or http://orders.catie.ca.

1. CHLAMYDIA *(Chlamydia trachomatis)*

Chlamydia, an infection caused by the bacterium *Chlamydia trachomatis*, has been nationally notifiable since 1991. It is the most commonly reported sexually transmitted infection (STI) in Canada. Infections are often asymptomatic in both males and females. In the absence of screening, these infections remain undiagnosed and contribute to the spread of chlamydia in sexually active individuals (1).

A common complication associated with untreated and recurring chlamydia in females is pelvic inflammatory disease, which can lead to chronic pelvic pain, ectopic pregnancy, and infertility. In males, complications are rarer but include epididymo-orchitis and infertility. Untreated chlamydia in pregnant women can be transmitted to their newborns, causing neonatal conjunctivitis or pneumonia. As with other STIs, chlamydia increases infection with and transmission of the human immunodeficiency virus (HIV). It recruits target cells for HIV to the genital tract and increases the shedding of HIV-infected cells (2,3).

1.1 NATIONAL TRENDS

Trends over Time

Until 1997, the rate of reported cases of chlamydia decreased steadily among both males and females, after which rates began to climb and continued to do so (Figure 1). In 2011, 100,044 cases of chlamydia were reported, corresponding to a rate of 290.4 per 100,000. The 2011 rate was a 61.8% increase from the rate of 179.5 per 100,000 in 2002. Among males, rates increased by 78.1%, from 112.3 to 200.1 per 100,000; among females, they increased by 54.5%, from 245.1 to 378.7 per 100,000 (Figure 1).

Between 2010 and 2011, the chlamydia rate increased by 6.1%, from 273.7 per 100,000 to 290.4 per 100,000; among males it increased by 7.0% and among females by 5.5% (Figure 1).

Trends by Age Group and Sex

Historically, the rate of reported cases of chlamydia among females has been twice as high as compared to males; this trend continued in 2011 (Figure 1). As in the past, in 2011, the majority of reported chlamydia infections (81.3%) occurred in those under 30. The highest rates were reported among those aged 20 to 24, and the rate among females was more than twice as high as among males in this age group (2113.0 vs. 1031.0 per 100,000 respectively). The gap between female and male chlamydia rates was smaller in older age groups. In those aged 40 to 59 and 60 and older, the rates of reported cases were higher among men than women (Figure 2).

Rates of reported cases of chlamydia increased among both males and females between 2002 and 2011 in all age groups aged 10 and up. Between 2002 and 2011, among males, the highest relative rate increase occurred in those aged 40 to 59 (111.2%) (Figure 3). During the same period, the highest relative rate increase among females was in those aged 60 plus years (269.7%), followed by those aged 40 to 59 (171.1%) (Figure 4).

Trends by Province/Territory

In 2011, reported rates of chlamydia were highest in the Northwest Territories (1882.1 per 100,000) (Table 1). Reported rates in Yukon, Manitoba, Saskatchewan, and Alberta also exceeded the national average (602.9, 537.5, 525.0 and 374.5 per 100,000, respectively). Between 2002 and 2011, the highest relative increase in reported chlamydia rates occurred in Manitoba (84.4%) and Ontario (81.5%) (Table 1).

1.2 LYMPHOGRANULOMA VENEREUM

Lymphogranuloma venereum (LGV) is an STI caused by *Chlamydia trachomatis* serovars L1, L2, and L3. Infections caused by these serovars preferentially invade lymph tissue and tend to be more invasive than those caused by non-LGV chlamydia. Untreated LGV infection can result in severe complications including destruction of rectal and genital tissue; in some cases, though uncommon, meningoencephalitis, hepatitis, and death can also occur.

Though LGV is endemic in parts of Africa, Asia, South America, and the Caribbean region, it was relatively uncommon in Canada until 2003 (4). At that time, outbreaks of LGV began occurring among men who have sex with men (MSM) in urban centres in Canada (5). Outbreaks among MSM have also been reported in European countries and the United States (6–9). Recent data suggest that the infection has become endemic in the MSM population in some countries (10).

In response to the emergence of LGV in Europe, Canada initiated enhanced surveillance of this STI in 2005. Confirmatory testing for suspected LGV cases is performed by the Agency's National Microbiology Laboratory (NML). Where possible, provincial/territorial health authorities use a standardized national case report form to collect enhanced epidemiological data on each case and submit the data to the Agency.

As of December 2011, 158 cases were reported to the Agency by provincial health authorities via case report forms (including 96 confirmed and 62 probable cases). Confirmed cases were reported from Quebec, Ontario, British Columbia and Alberta; probable cases were reported from these provinces as well as one from Nova Scotia. Over the same time period, the NML has records for 90 confirmed cases, from 2004 to 2005 and from 2010 to 2011 (NML records from 2006 to 2009 being unavailable) (Table 2).

1.3 SUMMARY

Increases in the rates of reported cases of chlamydia have been observed in Canada despite numerous public health interventions designed to prevent, diagnose, and treat infection. However, these increased rates do not necessarily reflect a true increase in incidence since reported cases are affected not only by the incidence of new infections but also by improved case finding.

The introduction of more sensitive nucleic acid amplification testing (NAAT) in the mid-1990s undoubtedly led to an increase in the number of chlamydia cases detected. In fact, this change in diagnostic practice coincided with the beginning of the rise in reported rates of chlamydia. NAAT allows urine specimens to be used, which are easier to collect and more acceptable to patients than swabs. As a result, in addition to increased sensitivity, the number of people who go for testing has likely increased as well, especially the number of males. More effective screening and contact tracing may have a similar effect (12,13).

Additionally, differences in STI screening across provinces and territories may help explain some of the variation in rates by geographical location. For example, there is some evidence that chlamydia screening rates may be higher in Yukon than in some other jurisdictions in Canada, which may contribute to the high rate of reported cases of chlamydia infection observed in the territory (14).

Biological features of chlamydia that may help explain rising rates are explained in the arrested immunity hypothesis, which posits that early diagnosis and treatment of chlamydial infections may actually impede the development of an effective immune response. Treated cases that have not developed an immune response are then susceptible to re-infection upon returning to their sexual networks (in the absence of any change in behaviour) (15). Evidence supporting this theory has been observed in British Columbia, where the relative risk of re-infection with chlamydia was shown to increase between 1989 and 2003 (16), and in Finland, where reported rates of chlamydia have increased despite a decrease in seroprevalence (17).

In Canada, cycle 2 of the Canadian Health Measures Survey (CHMS) (18) estimated the prevalence of chlamydia in the general population using urine specimens collected from a sample of respondents aged 14 to 59 at mobile examination centres. The resulting prevalence was 0.7% (95% confidence interval 0.4% to 1.3%), a weighted estimate of 158,000 individuals (19). Repeated measures of chlamydia prevalence in future cycles of the CHMS will facilitate interpretation of data received through routine surveillance and may help explain the drivers behind the continuing increase in reported cases.

Trends in LGV infection in Canada are difficult to interpret. Early surveillance efforts were intensive, followed by a period of time (2007–2009) when few cases were reported by provincial health authorities; this decrease may have been influenced by underreporting or underdiagnosis rather than a true decrease in incidence. The more recent increase in cases beginning in 2010 and continuing into 2011 was driven largely by improved case finding and reporting in British Columbia (11).

In all, it is difficult to identify what factors are most responsible for the observed increase in chlamydia rates. A combination of factors is likely involved, and the possibility of a true increase in incidence cannot be ruled out. Continued monitoring of chlamydia rates and research into the reasons for observed changes will help in evaluating the public health response to STIs. National guidelines for the prevention and management of chlamydial infections are updated as new information becomes available, to provide users with the most up-to-date information for the management of STIs in Canada (2,20).

FIGURE 1: Reported Overall and Sex-Specific Rates of Chlamydia, 1991 to 2011, Canada

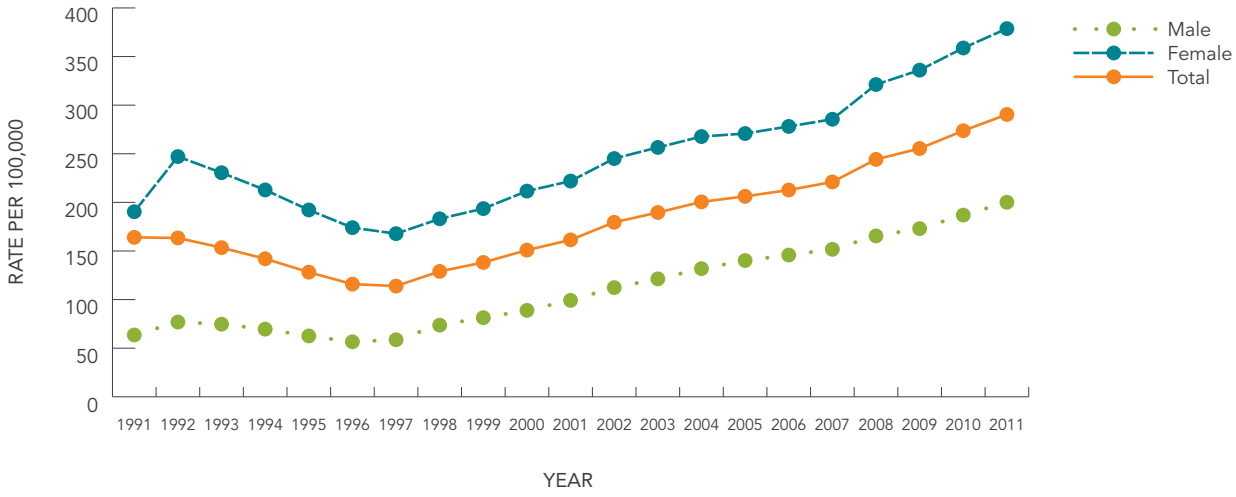


FIGURE 2: Reported Rates of Chlamydia by Sex and Age Group, 2011, Canada

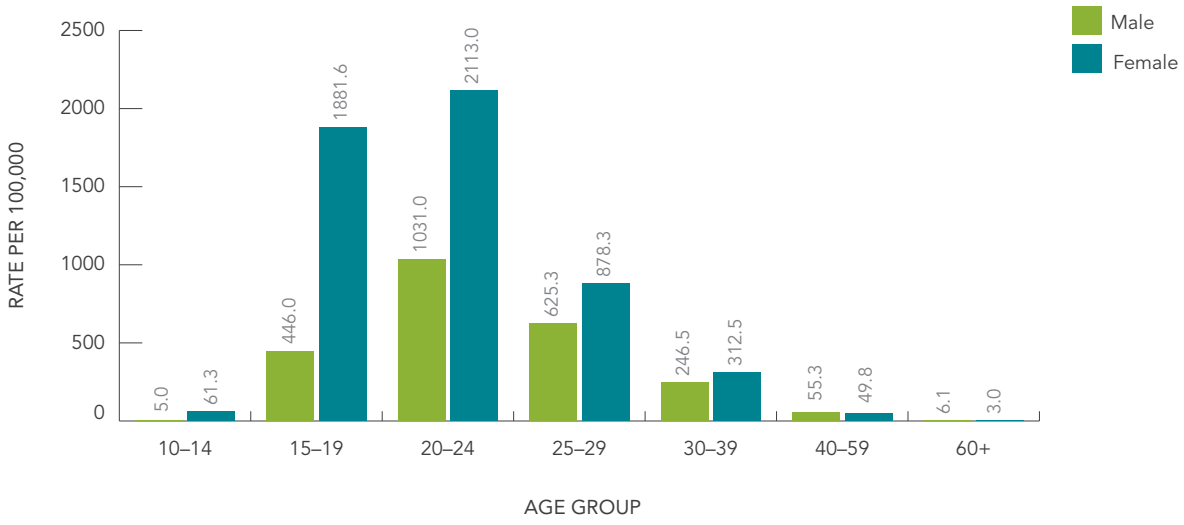


FIGURE 3: Reported Rates of Chlamydia in Males by Age Group, 2002 to 2011, Canada

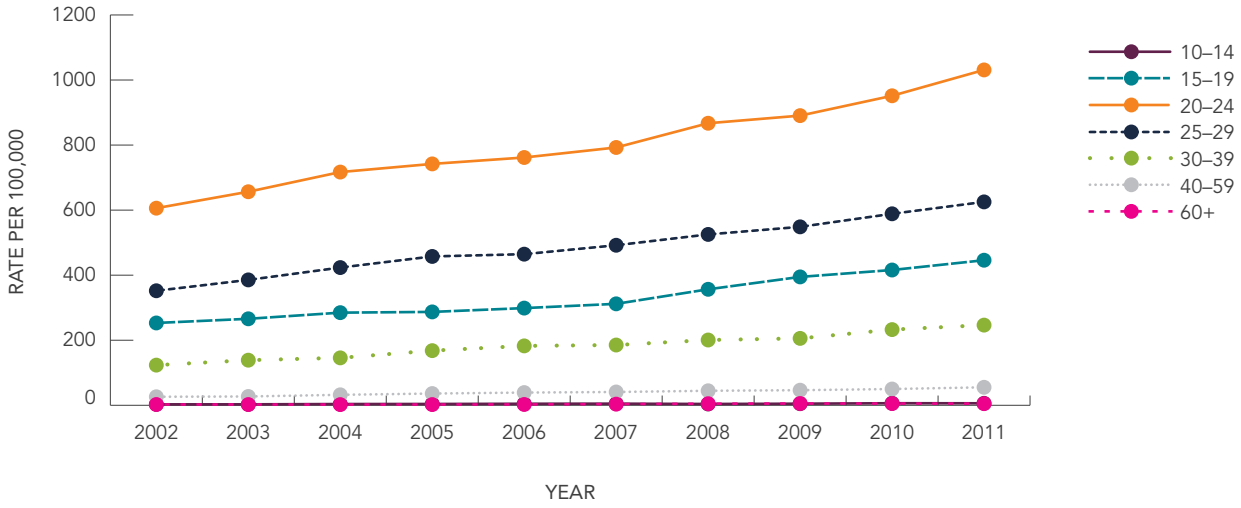


FIGURE 4: Reported Rates of Chlamydia in Females by Age Group, 2002 to 2011, Canada

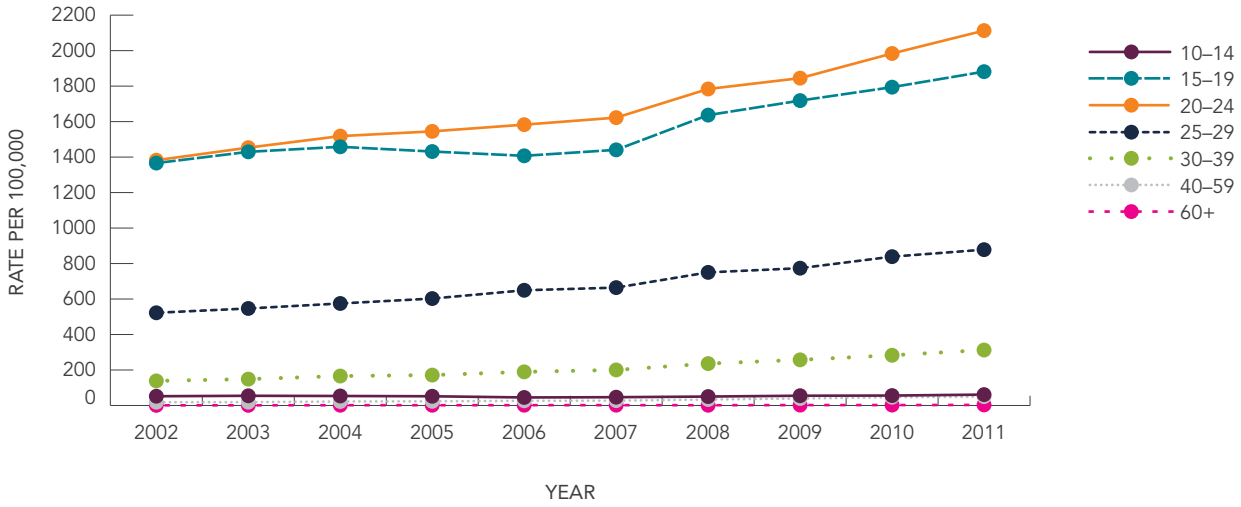


TABLE 1: Reported Cases and Rates of Chlamydia by Province/Territory, 2002, 2010, and 2011, Canada

	NUMBER OF CASES			RATES PER 100,000			RATE CHANGE (%)[1]	
JURISDICTION	2002	2010	2011	2002	2010	2011	2002–2011	2010–2011
Canada	**56,266**	**93,329**	**100,044**	**179.5**	**273.7**	**290.4**	**61.8**	**6.1**
BC	7,650	11,875	11,765	186.7	262.2	257.3	37.8	-1.9
AB	7,361	13,112	14,152	235.3	352.4	374.5	59.1	6.3
SK	3,613	5,059	5,554	362.5	484.6	525.0	44.8	8.3
MB	3,371	6,370	6,722	291.5	516.0	537.5	84.4	4.2
ON	18,101	33,478	36,343	149.7	253.1	271.8	81.5	7.4
QC	11,055	17,329	19,173	148.6	219.2	240.3	61.7	9.6
NB	1,313	1,875	1,931	175.2	249.1	255.6	45.9	2.6
NS	1,574	2,236	2,464	168.3	236.7	260.6	54.8	10.1
PE	145	213	220	105.9	148.5	150.8	42.4	1.5
NL	522	644	689	100.5	126.0	134.9	34.3	7.1
YT	141	229	209	464.5	662.6	602.9	29.8	-9.0
NT	600	909	822	1440.1	2073.9	1882.1	30.7	-9.3
NU	820	N/A	N/A	2845.3	N/A	N/A	*	*

[1] Rate change (%) calculated using unrounded numbers.

* The rate change cannot be quantified.

TABLE 2: Reported Confirmed and Probable Cases of Lymphogranuloma Venereum, 2004–2011, Canada

YEAR	CONFIRMED (NML)	CONFIRMED (CASE REPORT FORM)	PROBABLE (CASE REPORT FORM)
2004	1	3	7
2005	37	36	21
2006	N/A	26	16
2007	N/A	1	7
2008	N/A	1	4
2009	N/A	9	0
2010	18	9	2
2011	34	11	5
Total	**90**	**96**	**62**

2. GONORRHEA *(Neisseria gonorrhoeae)*

Gonorrhea, a bacterial infection caused by *Neisseria gonorrhoeae*, has been nationally notifiable since 1924. It is the second most commonly reported STI in Canada. Untreated infections can lead to complications for both sexes. There are severe consequences for females, including pelvic inflammatory disease, which often leads to chronic abdominal pain, infertility, and ectopic pregnancy. In males, 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 (21). Like other STIs, gonorrhea increases the risk of HIV acquisition and transmission, possibly by increasing the concentration of HIV target cells in genital secretions and viral shedding (3).

2.1 NATIONAL TRENDS

Trends over Time

From 1991 to 1997, reported rates of gonorrhea infection among males and females decreased dramatically. After 1997, sex-specific rates increased steadily. In 2011, there were 11,397 cases of gonorrhea infection reported nationally, corresponding to a rate of 33.1 per 100,000 (Figure 5).

Between 2002 and 2011, the reported gonorrhea rate increased by 40.8% (from 23.5 to 33.1 per 100,000). The increase was observed in both sexes, among females by 58.8% (from 17.5 to 27.8 per 100,000) and among males by 29.9% (from 29.5 to 38.4 per 100,000) (Figure 5).

Recent trends in rates of reported cases suggest a potential stabilization of gonorrhea incidence in Canada. Between 2008 and 2010, the rate decreased by 14.5% and then increased by 5.0% between 2010 and 2011.

Trends by Age Group and Sex

As with chlamydia, the majority of gonorrhea cases reported in 2011 were in people under 30 years of age (66.9%). Though rates were higher among females than males at younger ages (<20 years), in older age groups males had higher rates. In 2011, the highest rates of gonorrhea infection among females were reported in those 20 to 24 years old (136.0 per 100,000) and 15 to 19 years old (132.1 per 100,000) (Figure 6). The highest reported rate among males was in 20- to 24-year-olds (136.6 per 100,000), followed by 25- to 29-year-olds (108.5 per 100,000) (Figure 6).

After several years of steady increase, reported gonorrhea rates among both males and females appear to be levelling off in most age groups. From 2002 to 2011, the highest relative increase observed among males was in those aged 10 to 14 years (178.1%), rising from 0.7 to 2.1 per 100,000 (Figure 7). While females aged 60 and over had the lowest gonorrhea rate in 2011, this age group also had the highest relative rate increase (269.7%). The rate increased from 0.1 to 0.5 per 100,000 (Figure 8).

Trends by Province/Territory

In 2011, the rate of reported cases of gonorrhea was highest in the Northwest Territories (325.1 per 100,000) (Table 3). Between 2002 and 2011, the greatest relative increase in rates was observed in Newfoundland and Labrador (194.0%), although the overall rate of reported cases is relatively low, changing from 1.7 to 5.1 per 100,000 (Table 3).

2.2 GONORRHEA ANTIMICROBIAL RESISTANCE

Uncomplicated gonorrhea can be treated with oral or injected antibiotics. However, strains of gonorrhea have a tendency to evolve and become less susceptible or even resistant to treatment with certain antibiotics. Challenges to successful treatment arise when gonococcal infections are treated with antibiotics to which the bacteria are resistant or have decreased susceptibility. Treatment failure, further transmission of the infection, and the development of adverse consequences are likely unless the resistant organism is identified and treated appropriately.

Gonococcal resistance to penicillin, erythromycin, and tetracycline is long established, while ciprofloxacin resistance developed more recently. None of these antibiotics are currently recommended as preferred treatments by the *Canadian Guidelines on Sexually Transmitted Infections* (22). More recently, treatment failures after use of the internationally recommended first-line cephalosporins (cefixime and ceftriaxone) in the absence of any suitable alternatives have led to fears that extensively drug-resistant gonorrhea is emerging (23–26).

There is an increasing trend to diagnose gonorrhea using urine specimens analyzed with NAAT. These specimens are easier to obtain and more acceptable to patients than traditional genital specimens (swabs). The laboratory test is also more sensitive, yielding fewer false negatives than culture. However, this shift towards non-culture-based diagnostic techniques has created challenges in monitoring antimicrobial resistance (AMR) as the number of culture specimens available for sensitivity testing is more limited; at present, there is no method for testing AMR from non-culture specimens.

The NML tests gonococcal isolates for resistance to penicillin, tetracycline, spectinomycin, erythromycin, azithromycin, ciprofloxacin, cefixime, and ceftriaxone. Data from 2011 showed that 29.3% of cultured strains were resistant to ciprofloxacin, and 0.39% showed resistance to azithromycin. Although there were no strains resistant to spectinomycin, cefixime, or ceftriaxone, 4.2% and 6.2% of strains exhibited a decreased susceptibility to cefixime and ceftriaxone, respectively (Figure 9).

Canadian gonococcal resistance surveillance is a collaborative effort between the NML and provincial and territorial laboratories. Submission to the NML of gonococcal isolates that have decreased susceptibility to at least one antibiotic is voluntary and not standardized across the country. Data received through laboratory-based surveillance are restricted to key demographic variables; risk factor information is not available. Furthermore, culture diagnosis for gonorrhea is typically performed in STI clinics and among higher-risk patients, limiting the representativeness of available surveillance data. The NML publishes the results of this laboratory-based surveillance annually (27). Efforts are under way to conduct enhanced surveillance of AMR in gonorrhea. It is hoped that, in the future, there will be a more informative and representative picture of the AMR issue in Canada.

2.3 SUMMARY

Although the rate of reported cases of gonorrhea is considerably lower than that of chlamydia, there are similar overall trends in the two infections. The increases in rates since the late 1990s may be at least partly explained by the factors thought to affect chlamydia rates, such as the move to more sensitive testing methods and improved case finding (13).

Antimicrobial resistance may also play a significant role in the increase in reported rates of gonorrhea, as the proportion of isolates resistant to a number of antibiotics has increased over time, which may lead to treatment failure and a longer duration of infectiousness in affected patients. The susceptibility of *N. gonorrhoeae* to first-line treatments has decreased (28,29). Emerging antimicrobial resistance in gonorrhea has led to changes in treatment recommendations across Canada and elsewhere (22,30–33). Although rates of reported cases of gonorrhea show signs of stabilizing, the potential for a link between antimicrobial resistance and rising reported rates of gonorrhea remains a concern.

FIGURE 5: Reported Overall and Sex-Specific Rates of Gonorrhea, 1991 to 2011, Canada

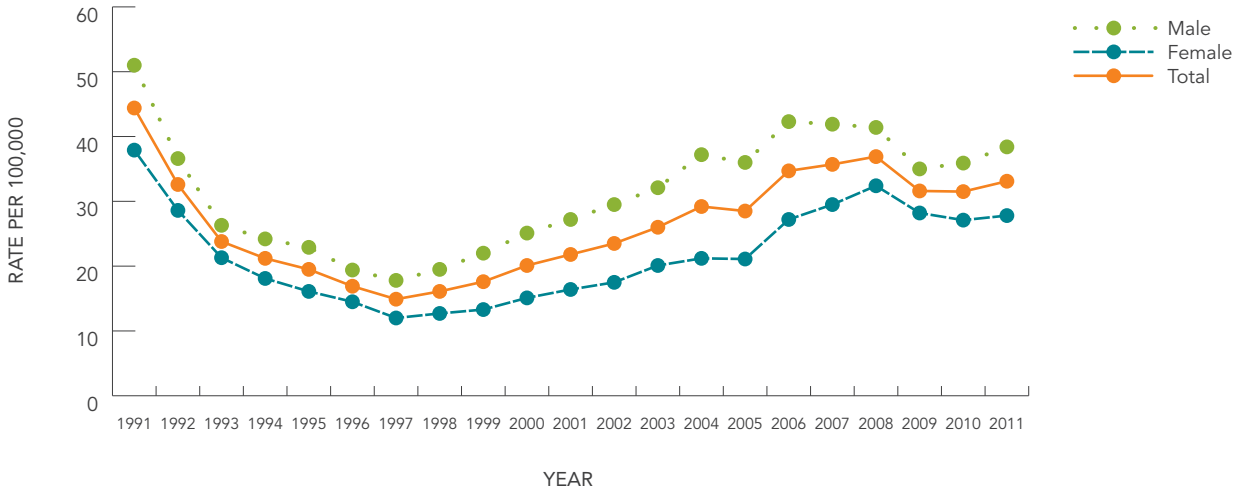


FIGURE 6: Reported Rates of Gonorrhea by Sex and Age Group, 2011, Canada

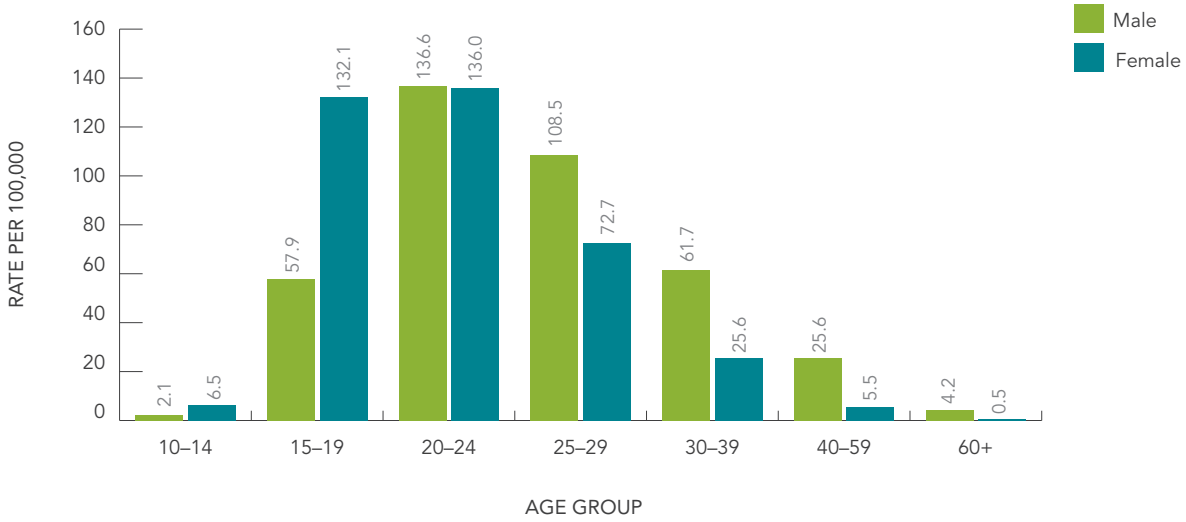


FIGURE 7: Reported Rates of Gonorrhea in Males by Age Group, 2002 to 2011, Canada

FIGURE 8: Reported Rates of Gonorrhea in Females by Age Group, 2002 to 2011, Canada

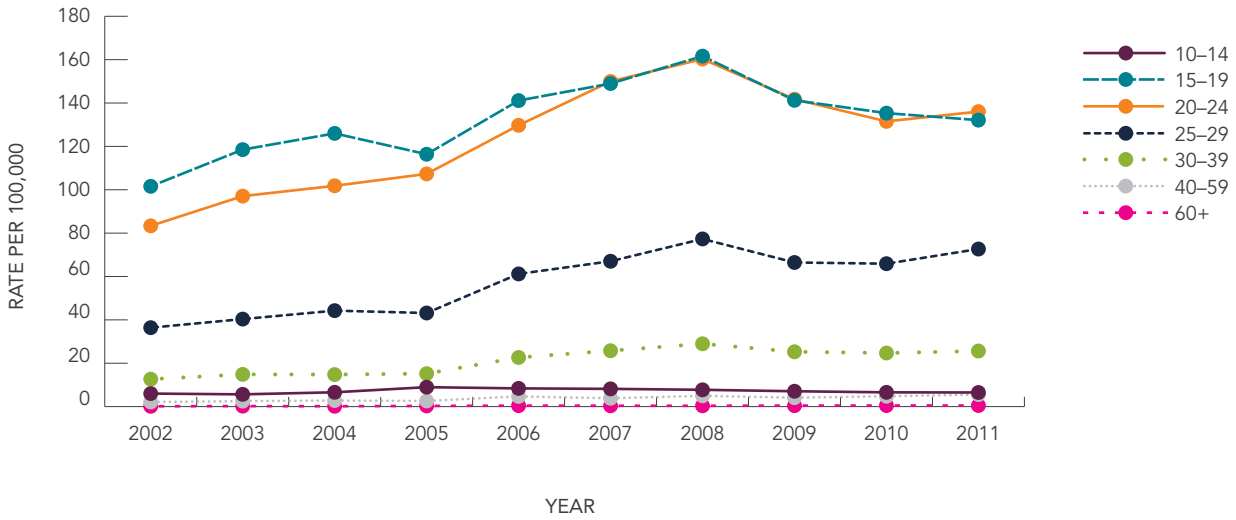


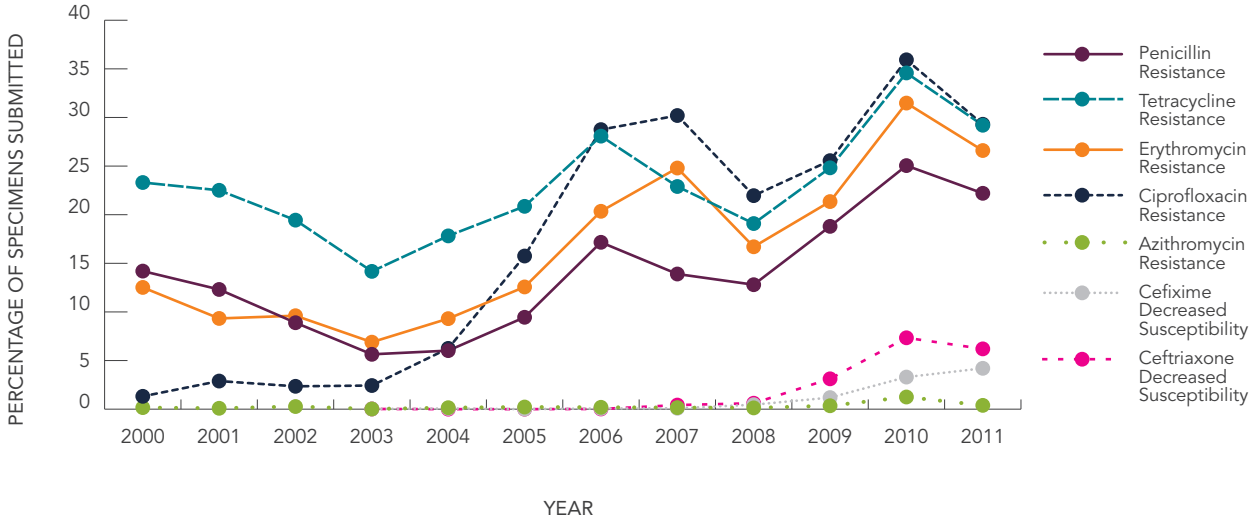
TABLE 3: Reported Cases and Rates of Gonorrhea by Province/Territory, 2002, 2010 and 2011, Canada

	NUMBER OF CASES			RATES PER 100,000			RATE CHANGE (%)[1]	
JURISDICTION	2002	2010	2011	2002	2010	2011	2002–2011	2010–2011
Canada	**7,365**	**10,743**	**11,397**	**23.5**	**31.5**	**33.1**	**40.8**	**5.0**
BC	713	1,366	1,649	17.4	30.2	36.1	107.2	19.6
AB	978	1,182	1,509	31.3	31.8	39.9	27.7	25.7
SK	559	763	758	56.1	73.1	71.7	27.8	-2.0
MB	637	982	1,055	55.1	79.5	84.4	53.2	6.1
ON	3,150	3,966	4,196	26.1	30.0	31.4	20.4	4.7
QC	878	2,058	1,879	11.8	26.0	23.5	99.6	-9.5
NB	30	64	64	4.0	8.5	8.5	111.6	-0.3
NS	199	100	102	21.3	10.6	10.8	-49.3	1.9
PE	0	0	11	0.0	0.0	7.5	*	*
NL	9	12	26	1.7	2.3	5.1	194.0	117.0
YT	11	31	6	36.2	89.7	17.3	-52.2	-80.7
NT	124	219	142	297.6	499.7	325.1	9.2	-34.9
NU	77	N/A	N/A	267.2	N/A	N/A	*	*

[1] Rate Change (%) calculated using unrounded numbers.

* The rate change cannot be quantified.

FIGURE 9: Antimicrobial Resistance[1,2] of *Neisseria gonorrhoeae* Strains Tested in Canada, 2000 to 2011



[1] Percentage based on total number of isolates tested nationally: 2003=4,235; 2004=4,018; 2005=3,619; 2006=4,201; 2007=4,275; 2008=3,907; 2009=3,106; 2010=2,970; 2011=3,360

[2] Data generously provided by the Streptococcus and STI Unit, National Microbiology Laboratory

3. INFECTIOUS SYPHILIS *(Treponema pallidum)*

Syphilis, an infection caused by the bacterium *Treponema pallidum*, has been nationally notifiable since 1924. If left untreated, it progresses through primary, secondary, latent, and tertiary stages. While all stages of syphilis are nationally notifiable, only primary, secondary, and early latent syphilis (less than 1 year after the point of infection) are considered infectious and therefore are of major public health significance. As a result, only these stages are included in national reports.

After several years (or even decades), untreated syphilis can progress to tertiary syphilis, in which serious complications occur, causing damage to the central nervous system, cardiovascular system, eyes, skin, and other internal organs. It may even be fatal (34). Individuals infected with syphilis are also at an increased risk of contracting HIV, and those co-infected with both pathogens are more likely to transmit HIV to their sexual partners (3). In co-infected individuals, there is a greater chance of rapid progression to serious consequential conditions, such as neurosyphilis, often while those individuals are still infectious (35–37).

3.1 NATIONAL TRENDS

Trends over Time

In 2011, 1,757 cases of infectious syphilis were reported to the Agency with an overall population rate of 5.1 per 100,000. Cases were reported predominantly in men: in 2011, men accounted for 93.5% of all reported cases.

From 1993 to 2000, rates of reported cases of infectious syphilis were relatively stable and similar between males and females (Figure 10). Rates began to climb sharply in 2001, more so among men than women. Between 2002 and 2011, the overall increase in reported syphilis rates was 231.8%, from 1.5 to 5.1 per 100,000 (Figure 10). Over this time frame, rates increased among females by 9.3% (from 0.6 to 0.7 per 100,000) and among males by 286.9% (from 2.5 to 9.6 per 100,000) (Figure 10).

Trends by Age Group and Sex

As in previous STI surveillance reports, the majority (66.2%) of all cases of infectious syphilis in 2011 were reported in men aged 30 years and older. The highest reported rates were among men aged 25 to 29 and 30 to 39 years (19.2 and 17.2 per 100,000 respectively) (Figure 11). Among women, the highest reported rates were in those aged 20 to 24 and 25 to 29 years (2.1 and 1.8 per 100,000 respectively) (Figure 11).

Among males, the greatest relative increase between 2002 and 2011 was observed in those aged 15 to 19 (728.4%), followed by those aged 20 to 24 (710.9%) (Figure 12). Because the reported number of infectious syphilis cases is low in females, rates are quite variable. Between 2002 and 2011, the greatest relative increase in reported rates of infectious syphilis among females occurred in those aged 15 to 19 years old (189.2%) (Figure 13).

Trends by Province/Territory

In 2011, the highest rate of infectious syphilis was reported in Quebec (8.0 per 100,000), followed by New Brunswick (6.6 per 100,000) (Table 4).

Because the number of cases of infectious syphilis in Canada is low relative to other STIs, population rates tend to be variable and unstable, rendering it difficult to interpret changes over time. Between 2002 and 2011, reported rates of infectious syphilis increased in all of the provinces with the exception of Yukon and British Columbia where rates decreased (Table 4). During the same period, outbreaks of infectious syphilis were reported across Canada, in Vancouver, Toronto, Edmonton, Calgary, Winnipeg, Ottawa, Montreal, Yukon, Halifax, and the Northwest Territories (38–43).

3.2 CONGENITAL SYPHILIS

Congenital syphilis is caused by the transmission of *T. pallidum* from an infected pregnant woman to her fetus. The majority of infants with congenital syphilis are infected in utero, but they can also be infected by contact with an active genital lesion at the time of delivery. The risk of transmission from an untreated pregnant woman to her fetus varies with the stage of disease; the risk is 70–100% with primary or secondary syphilis, 40% with early latent syphilis and 10% in late latent stages (34). Routine prenatal screening for syphilis and prompt treatment of infection is an important way to prevent congenital syphilis and associated sequelae. Lack of appropriate prenatal care is the primary factor in the failure to prevent congenital syphilis infection (44,45).

Syphilis can result in serious complications in pregnancy, such as spontaneous abortion, stillbirth, or perinatal death. Live-born infected children can suffer serious consequences, usually within the first 3 months of life. Consequences include cerebral palsy, hydrocephalus, sensorineural hearing loss, and musculoskeletal deformity, all of which may be prevented with timely treatment during pregnancy (46). However, some manifestations develop much later. Only early congenital syphilis cases (diagnosed in infants less than 2 years of age) are currently reported nationally.

Rates of reported cases of congenital syphilis were low (less than 1 per 100,000 live births) before 2005; since then, rates have been significantly higher. Data suggest that the increase in reported congenital syphilis cases observed over the last several years is linked to the areas that have reported outbreaks of syphilis among heterosexuals (47). In 2011, the reported rate of congenital syphilis nationally was 0.8 per 100,000 live births, a decrease from previous years. Alberta, Ontario, and Quebec were the provinces that reported congenital syphilis cases in 2011 (Table 5).

3.3 SUMMARY

After years of near-zero incidence of infectious syphilis, reported rates of this STI have increased dramatically. This resurgence may be due largely to transmission among some MSM who engage in high-risk sexual practices. These include the use of "club drugs" and other substances that decrease inhibitions and impair decision making during sexual activity, as well as the practice of seeking sex partners on the Internet and in venues such as bathhouses, which are associated with higher-risk sexual activity (48–51). Increasing STI rates among MSM have also been observed in the United States and Europe; the causes for these increases are complex and include demographic shifts, as well as changing sexual attitudes and social contexts related to increased risky sexual behaviour (48).

In HIV-positive MSM, co-infection with syphilis is common and of considerable concern. In some studies, increased rates of syphilis and other STIs among MSM have been associated with the practice of serosorting, i.e. the choosing of sexual partners whose HIV status is the same as one's own (52–54). Serosorting in HIV-positive MSM may contribute to the rapid increases in infectious syphilis rates observed among males in Canada. HIV accelerates the progression of syphilis infection and increases the likelihood of neurological manifestations, particularly in the early stages of infection. Increases in early neurosyphilis have been noted in HIV-positive MSM (55,56).

Heterosexual outbreaks of syphilis have been observed mainly among sex workers and their clients, and street-involved people (38,39,51). Syphilis in women of childbearing age is of particular concern because of the potential for vertical transmission leading to congenital syphilis in infants exposed *in utero* to *T. pallidum*. Prenatal screening for syphilis in all pregnant women is a standard of care across Canada (34).

FIGURE 10: Reported Overall and Sex-Specific Rates of Infectious Syphilis, 1993 to 2011, Canada

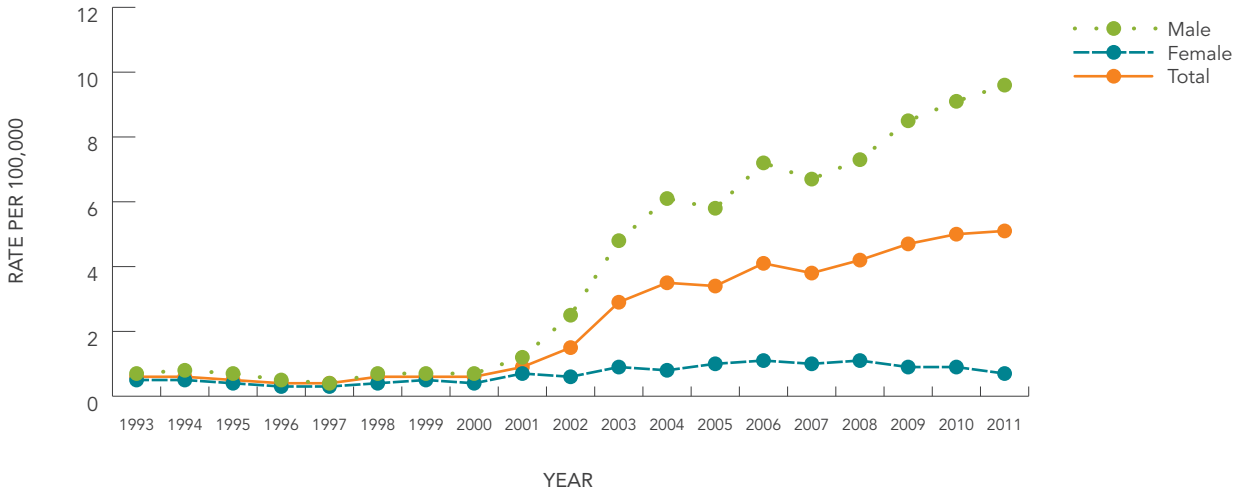


FIGURE 11: Reported Rates of Infectious Syphilis by Sex and Age Group, 2011, Canada

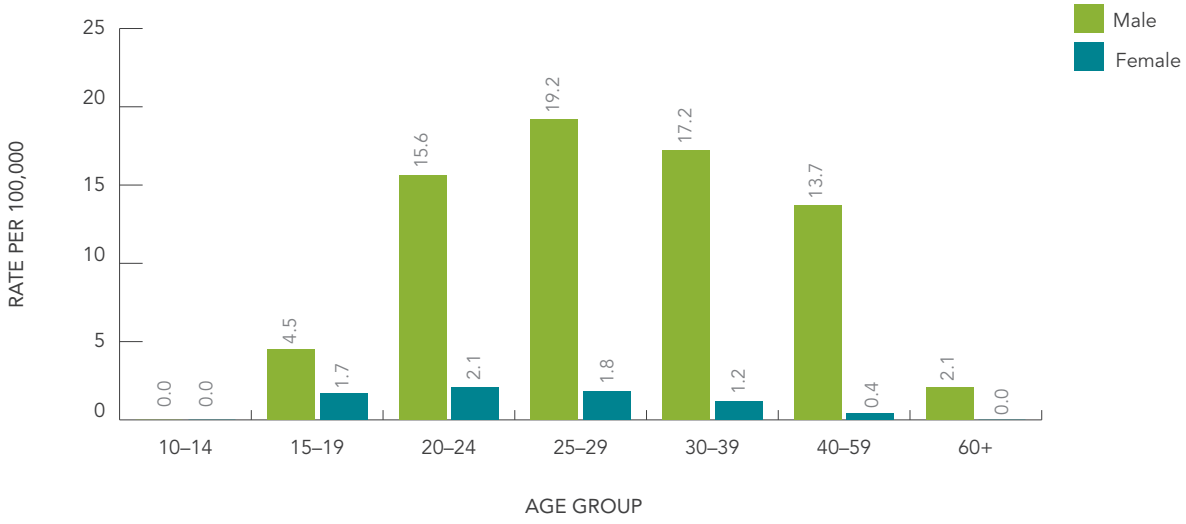


FIGURE 12: Reported Rates of Infectious Syphilis in Males by Age Group, 2002 to 2011, Canada

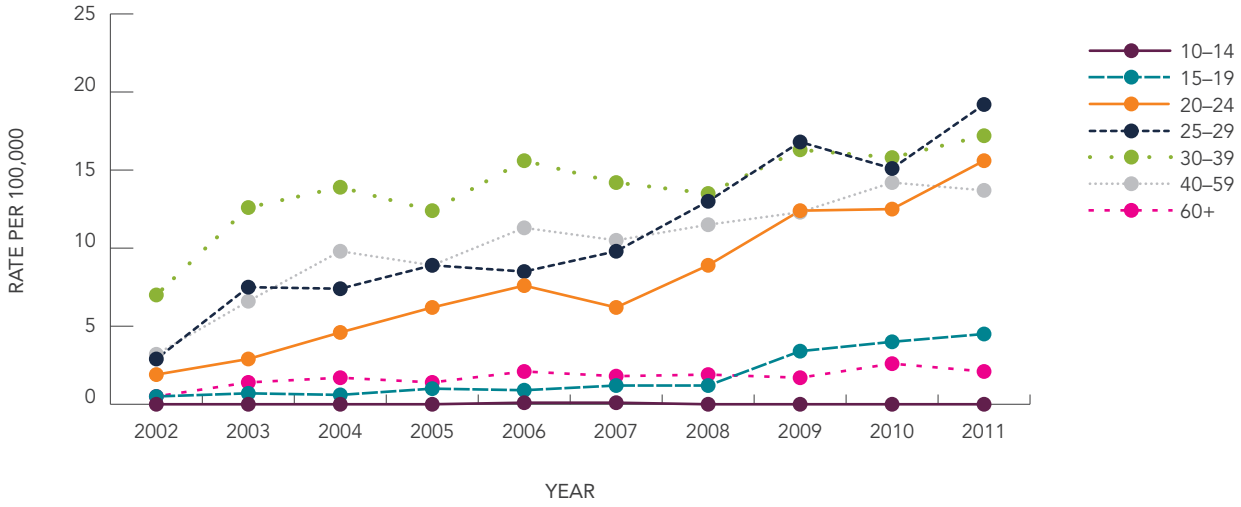


FIGURE 13: Reported Rates of Infectious Syphilis in Females by Age Group, 2002 to 2011, Canada

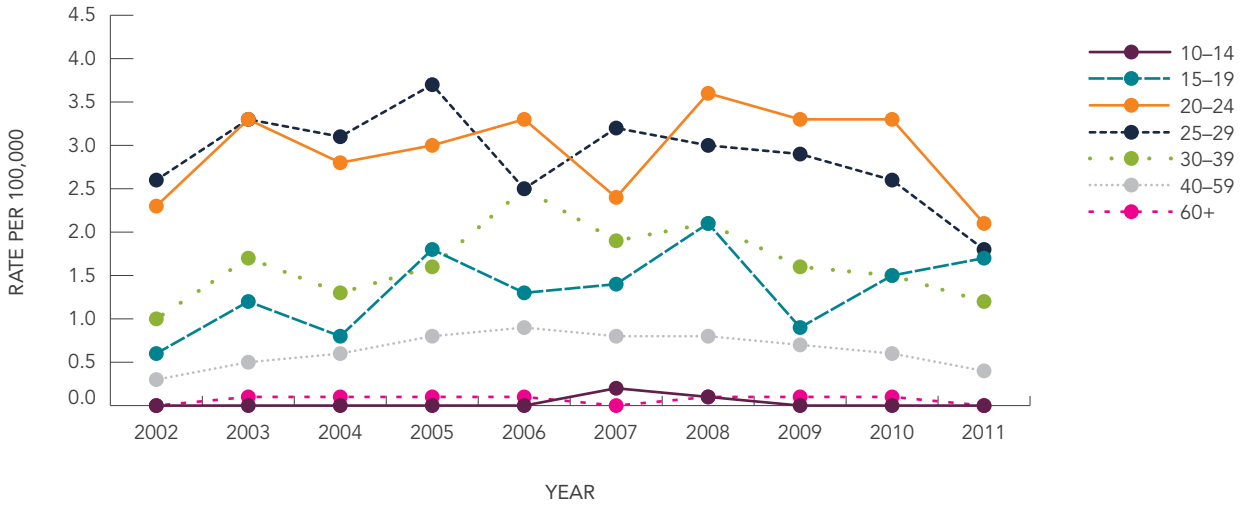


TABLE 4: Reported Cases and Rates of Infectious Syphilis by Province/Territory, 2002, 2010 and 2011, Canada

	NUMBER OF CASES			RATES PER 100,000			RATE CHANGE (%)[1]	
JURISDICTION	2002	2010	2011	2002	2010	2011	2002–2011	2010–2011
Canada	**482**	**1,698**	**1,757**	**1.5**	**5.0**	**5.1**	**231.8**	**2.4**
BC	186	92	128	4.5	2.0	2.8	-38.3	37.8
AB	14	173	94	0.4	4.6	2.5	455.8	-46.5
SK	1	36	23	0.1	3.4	2.2	2067.2	-36.9
MB	6	17	16	0.5	1.4	1.3	146.6	-7.1
ON	219	774	767	1.8	5.9	5.7	216.7	-2.0
QC	47	547	638	0.6	6.9	8.0	1165.8	15.6
NB	2	34	50	0.3	4.5	6.6	2379.7	46.5
NS	1	18	36	0.1	1.9	3.8	3458.3	99.9
PE	0	0	0	0.0	0.0	0.0	*	*
NL	0	4	5	0.0	0.8	1.0	*	25.2
YT	6	0	0	19.8	0.0	0.0	-100.0	*
NT	0	3	0	0.0	6.8	0.0	*	-100.0
NU	0	N/A	N/A	0.0	N/A	N/A	N/A	N/A

[1] Rate change (%) calculated using unrounded numbers.

* The rate change cannot be quantified.

TABLE 5: Reported Cases and Rates of Confirmed Early Congenital Syphilis[1], 2000 to 2011, Canada

YEAR	TOTAL REPORTED CASES	RATE (PER 100,000 LIVE BIRTHS)[2]	NUMBER OF REPORTED CASES[1]												
			BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	YT	NT	NU
2000	2	0.610	1	0	0	0	0	1	0	0	0	0	0	0	0
2001	1	0.300	1	0	0	0	0	0	0	0	0	0	0	0	0
2002	3	0.912	0	1	1	0	1	0	0	0	0	0	0	0	0
2003	2	0.597	0	0	0	0	0	2	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	8	2.338	3	5	0	0	0	0	0	0	0	0	0	0	0
2006	7	1.974	2	4	0	0	1	0	0	0	0	0	0	0	0
2007	8	2.179	2	5	0	0	1	0	0	0	0	0	0	0	*
2008	6	1.591	2	2	0	0	1	0	0	0	0	0	0	1	*
2009	10	2.632	2	7	0	0	0	0	0	0	0	0	0	1	*
2010	6	1.594	0	2	2	0	2	0	0	0	0	0	0	0	*
2011	3	0.796	0	1	0	0	1	1	0	0	0	0	0	0	*

[1] Refers to laboratory-confirmed cases of early congenital syphilis (within 2 years of birth).

[2] Source: Statistics Canada, Canadian Vital Statistics, Birth Database

[*] Data for Nunavut were not available from 2007 onwards; the population of Nunavut was thus excluded from the denominator when calculating national rates for these years.

4. INTERNATIONAL COMPARISON

This section compares STI rates in Canada with those in the United States (57,58), Australia (59), and England (60). These countries were chosen for their similarity to Canada in terms of socio-economic status and ethno-cultural make-up. The statistics presented below were drawn from published health reports or were provided directly by respective national health departments. Any differences observed in reported rates should be interpreted with caution because of differences in case definitions, reporting sources, screening programs and screening rates, age groupings, and other factors.

4.1 CHLAMYDIA

As in Canada, chlamydia was the most commonly reported bacterial STI in 2011 in all three countries of comparison. Among males, the reported rates of chlamydia infection ranged from 200.1 per 100,000 in Canada to 300.5 per 100,000 in Australia. Among females, the corresponding rates varied between 378.7 per 100,000 in Canada and 648.9 in the United States. Total rates were lowest in Canada (290.4 per 100,000) and highest in the United States (457.6 per 100,000) (Table 6).

4.2 GONORRHEA

The reported overall rate of gonococcal infection was highest in the United States, at 104.2 per 100,000, and lowest in Canada, at 33.1 per 100,000 (Table 6). Both male and female rates were higher in the United States at 98.7 and 108.9 per 100,000 respectively. Male rates were lowest in Canada (38.4 per 100,000), and female rates were lowest in England (22.6 per 100,000).

4.3 INFECTIOUS SYPHILIS

The case definition for infectious syphilis varies across the countries. In the United States, only primary and secondary stages are included in the case definition. In Australia, England and Canada, early latent cases are also included in reporting. Furthermore, there are notable differences in the definition of early latent syphilis among these four countries. Early latent syphilis is defined as an asymptomatic individual with syphilis who has acquired the infection in the past 2 years in England and Australia; in Canada and the United States, the infection must be acquired within the last year to be classified as early latent syphilis.

In all four countries, men accounted for the majority of reported cases of infectious syphilis in 2011 (Table 6). Because of the differences in case definition, differences in rates should be interpreted with caution.

4.4 SUMMARY

Similar to Canada, increases in STI rates in recent years have been observed in the United States, England, and Australia (57–60). While rates of reported cases of chlamydia and gonorrhea were lower in Canada than in the other three countries in 2011, infectious syphilis rates were similar across all four countries. In addition, the four countries observed similar patterns in reportable STI rates in 2011; rates of chlamydia were higher among females than males, whereas rates of infectious syphilis were higher among males. Reported rates of gonorrhea were more than twice as high among males than females in Australia and England; in Canada and the United States, the difference in rates between sexes was smaller. STIs are an important health issue worldwide. Although the root causes of observed trends and patterns in rates may differ across countries, there are opportunities to learn from each other to limit the spread of infection.

TABLE 6: Reported Sex-Specific Rates of Chlamydia, Gonorrhea, and Infectious Syphilis in Canada, Australia, England the United States, 2011

	REPORTED RATES (PER 100,000) OF CHLAMYDIA, GONORRHEA, AND INFECTIOUS SYPHILIS IN 2011								
	CHLAMYDIA			GONORRHEA			INFECTIOUS SYPHILIS		
COUNTRY	FEMALE	MALE	TOTAL	FEMALE	MALE	TOTAL	FEMALE	MALE	TOTAL
Canada[+]	378.7	200.1	290.4	27.8	38.4	33.1	0.7	9.6	5.1
Australia[+]	421.6	300.5	345.8	35.4	73.0	52.5	1.5	10.1	5.7
England[+]	412.1	297.9	356.5	22.6	58.2	40.1	1.1	10.2	5.6
United States[^]	648.9	256.9	457.6	108.9	98.7	104.2	1.0	8.2	4.5

[+] Includes reported cases of primary, secondary, and early latent syphilis.

[^] Includes only reported cases of primary and secondary syphilis.

APPENDIX A: TECHNICAL NOTES

Case reporting: Currently, some jurisdictions report to the Agency using aggregate case counts instead of case-by-case reporting. The following selected variables are submitted by all 13 jurisdictions: age at diagnosis, year of diagnosis, province/territory of diagnosis, and sex. National reporting is therefore limited to analysis of these variables.

Reporting delay: A time delay may occur between the initial positive test for a sexually transmitted infection (STI) and the time when the report is received at the Agency. This time lag is referred to as reporting delay. In cases for which there are discrepancies between data reported by the Agency 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 2011 data presented in this 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 a variety of reasons. For example, many people who are infected with STIs do not have symptoms and therefore may not go to a health care practitioner for testing. Another reason is the influence of gender on health-seeking behaviour, resulting in fewer men who come forward for testing, a pattern reported elsewhere (61,62).

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.

Population data source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1997–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.

APPENDIX B: OVERVIEW OF STI SURVEILLANCE IN CANADA

In Canada, national surveillance of notifiable infectious diseases, including STIs, is generally conducted according to longstanding, standard operating procedures between the provinces/territories (P/Ts) and the Agency. P/Ts collect and manage surveillance data using a variety of mechanisms, including paper-based reporting, proprietary databases, and integrated web-based platforms; they submit data to the Agency on a regular basis. The content of the various data submissions depends on each jurisdiction's ability to collect the data elements, privacy legislation, and technological capacity. Data are submitted in a variety of formats (e.g., line-listed electronic, paper-based case reports, or aggregate data) and are verified and loaded into the national Canadian Notifiable Disease Surveillance System (CNDSS) by Agency personnel.

Extracts from CNDSS are used as the basis of national data tables and surveillance reports. Small discrepancies between national tables and data issued from P/T health authorities are expected as a result of the dynamic nature of surveillance data. National STI surveillance data are used by public health planners, researchers, media, and the general public, both nationally and internationally.

APPENDIX C: REPORTED CASES AND RATES OF CHLAMYDIA, GONORRHEA, AND INFECTIOUS SYPHILIS

TABLE 7: Reported Cases and Rates[1] of Chlamydia by Province/Territory and Sex, 2002 to 2011[2]

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
2002	Cases	Male	107	42	330	369	3053	6191	977	1280	2249	2333	48	198	274	17451
		Female	415	103	1241	944	7975	11905	2391	2333	5112	5316	93	402	546	38776
		Unspecified	0	0	3	0	27	5	3	0	0	1	0	0	0	39
		Total	522	145	1574	1313	11055	18101	3371	3613	7361	7650	141	600	820	56266
	Rates	Male	41.8	62.9	72.1	99.8	83.1	103.6	170.3	258.5	142.1	114.8	310.6	917.2	1828.9	112.3
		Female	157.4	147.0	259.9	248.7	211.6	194.7	410.1	465.1	330.7	257.3	623.9	2002.2	3945.9	245.1
		Total	100.5	105.9	168.3	175.2	148.6	149.7	291.5	362.5	235.3	186.7	464.5	1440.1	2845.3	179.5
2003	Cases	Male	119	52	382	408	3421	6737	1112	1345	2481	2501	53	179	220	19010
		Female	523	134	1162	974	8774	12335	2576	2404	5421	5631	127	367	515	40943
		Unspecified	0	0	8	0	17	4	0	0	0	1	0	0	0	30
		Total	642	186	1552	1382	12212	19076	3688	3749	7902	8133	180	546	735	59983
	Rates	Male	46.6	77.6	83.4	110.5	92.5	111.4	192.6	271.9	154.1	122.4	336.3	810.5	1448.2	121.3
		Female	198.9	190.8	242.4	256.2	231.6	199.2	439.3	479.1	344.6	270.8	835.4	1792.4	3645.0	256.5
		Total	123.8	135.5	165.5	184.4	163.1	155.8	316.9	376.2	248.2	197.3	581.3	1282.9	2506.8	189.6
2004	Cases	Male	168	55	395	400	3615	7386	1389	1288	2741	2787	71	206	354	20855
		Female	623	143	1194	961	9212	13029	2804	2320	5597	6026	126	373	735	43143
		Unspecified	0	0	2	0	15	19	2	1	0	1	0	0	0	40
		Total	791	198	1591	1361	12842	20434	4195	3609	8338	8814	197	579	1089	64038
	Rates	Male	65.9	81.8	86.1	108.4	97.0	120.7	238.4	260.3	167.1	135.4	442.5	917.4	2284.6	131.8
		Female	237.5	203.1	248.3	252.6	241.8	207.8	474.6	461.6	349.9	287.4	816.8	1789.3	5118.7	267.7
		Total	152.9	143.8	169.4	181.6	170.4	164.9	357.5	361.8	257.4	212.1	625.9	1337.2	3647.8	200.5

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
2005	Cases	Male	155	48	470	438	3753	8032	1453	1389	2971	2980	56	287	371	22403
		Female	495	135	1264	1059	8929	13874	2444	2505	5861	6166	136	441	734	44043
		Unspecified[4]	0	0	11	1	30	13	0	0	0	1	0	0	0	56
		Total	650	183	1745	1498	12712	21919	3897	3894	8832	9147	192	728	1105	66502
	Rates	Male	61.1	71.1	102.9	119.1	100.1	129.8	248.2	282.0	176.5	143.3	344.0	1271.9	2359.2	140.2
		Female	189.8	191.4	262.8	278.6	233.1	218.8	412.2	500.0	357.5	291.2	870.3	2116.7	5026.7	270.8
		Total	126.4	132.6	186.0	200.3	167.7	175.0	330.7	391.9	265.8	218.0	601.8	1677.5	3643.5	206.2
2006	Cases	Male	107	52	453	374	3812	8234	1601	1577	3573	3051	46	267	390	23537
		Female	440	117	1304	952	9000	14205	2643	2678	6879	6180	123	429	739	45689
		Unspecified[4]	0	0	5	0	40	12	0	0	0	5	0	0	0	62
		Total	547	169	1762	1326	12852	22451	4244	4255	10452	9236	169	696	1129	69288
	Rates	Male	42.6	77.0	99.3	102.1	100.9	131.7	272.0	320.9	205.7	145.1	278.6	1187.9	2453.0	145.8
		Female	169.9	166.3	270.7	250.9	233.5	221.6	449.0	534.8	408.4	288.6	780.3	2070.3	4959.7	278.1
		Total	107.2	122.5	187.8	177.8	168.4	177.3	358.4	428.9	305.5	217.6	523.6	1611.2	3665.7	212.7
2007	Cases	Male	0	61	474	340	4106	8559	1992	1588	3851	3374	83	317		24745
		Female	0	111	1310	846	9325	14755	3595	2811	7343	6678	153	444		47371
		Unspecified[4]	510	0	4	1	56	9	0	0	0	5	1	0		586
		Total	510	172	1788	1187	13487	23323	5587	4399	11194	10057	237	761		72702
	Rates[5]	Male	0.0	90.3	104.3	92.9	107.9	135.6	335.6	320.4	215.2	158.0	499.6	1402.3		151.7
		Female	0.0	157.2	272.2	222.9	240.3	227.7	599.1	557.1	426.1	307.2	958.9	2120.3		285.5
		Total	100.7	124.5	191.1	159.2	175.4	182.3	468.1	439.8	318.7	233.4	727.7	1747.6		221.0

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
2008	Cases	Male	153	43	535	345	4622	9196	2352	1834	4147	3659	88	343		27317
		Female	443	115	1497	897	10387	17017	4569	3368	7906	7031	149	527		53906
		Unspecified[4]	0	0	0	0	23	48	0	0	0	7	0	0		78
		Total	596	158	2032	1242	15032	26261	6921	5202	12053	10697	237	870		81301
	Rates[5]	Male	61.6	63.1	117.6	94.1	120.4	144.2	392.3	364.7	226.2	168.3	519.7	1516.8		165.5
		Female	171.8	161.0	310.5	235.8	265.5	259.6	754.1	659.0	449.5	318.1	920.9	2501.5		321.2
		Total	117.7	113.2	216.8	166.3	193.9	203.0	574.1	513.1	335.6	244.0	715.7	1991.7		244.2
2009	Cases	Male	125	74	535	486	4915	10071	2186	1657	4521	3885	71	390		28916
		Female	410	128	1457	1090	10967	18638	4102	3184	9030	7302	142	627		57077
		Unspecified[4]	0	0	0	0	24	51	0	3	0	8	0	0		86
		Total	535	202	1992	1576	15906	28760	6288	4844	13551	11195	213	1017		86079
	Rates[5]	Male	50.1	107.3	117.2	132.0	126.7	156.3	360.3	324.0	241.0	175.6	412.1	1730.2		173.0
		Female	158.2	177.2	301.1	285.5	277.8	281.1	669.8	614.7	502.8	324.8	863.0	2972.0		336.0
		Total	105.1	143.0	211.8	210.1	203.2	220.0	515.8	470.6	369.1	251.0	632.4	2330.5		255.4
2010	Cases	Male	162	58	609	579	5398	11785	2257	1764	4553	3988	86	359		31598
		Female	482	155	1626	1295	11901	21658	4113	3294	8559	7882	142	550		61657
		Unspecified[4]	0	0	1	1	30	35	0	1	0	5	1	0		74
		Total	644	213	2236	1875	17329	33478	6370	5059	13112	11875	229	909		93329
	Rates[5]	Male	64.6	82.8	132.6	156.7	137.7	180.8	367.2	339.8	239.8	177.5	487.9	1590.9		186.9
		Female	185.1	211.4	334.8	337.9	298.6	322.9	663.5	627.6	469.7	345.2	838.6	2586.5		358.8
		Total	126.0	148.5	236.7	249.1	219.2	253.1	516.0	484.6	352.4	262.2	662.6	2073.9		273.7

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
2011	Cases	Male	189	71	705	624	6128	12809	2366	1923	4968	3991	89	320		34183
		Female	500	149	1759	1307	12998	23479	4356	3629	9178	7767	120	502		65744
		Unspecified[4]	0	0	0	0	47	55	0	2	6	7	0	0		117
		Total	689	220	2464	1931	19173	36343	6722	5554	14152	11765	209	822		100044
	Rates[5]	Male	75.4	99.6	153.4	168.2	154.8	194.3	379.8	364.9	257.9	176.0	503.7	1428.3		200.1
		Female	192.3	199.7	362.1	339.9	323.2	346.3	694.1	683.5	495.3	336.8	706.0	2360.1		378.7
		Total	134.9	150.8	260.6	255.6	240.3	271.8	537.5	525.0	374.5	257.3	602.9	1882.1		290.4

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1991–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[3] Data reported by Nunavut prior to 2007 are preliminary. 2007–2011 Nunavut data are not available.

[4] Unspecified sex includes transgender cases.

[5] 2007–2011 national rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

TABLE 8: Reported Cases and Rates[1] of Chlamydia by Age Group and Sex, 2002 to 2011[2]

YEAR		SEX	CHLAMYDIA											
			AGE GROUP (YEARS)											
			<1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2002	Cases	Male	4	1	1	26	2768	6625	3721	2998	1178	69	60	17451
		Female	8	1	6	537	14109	14461	5368	3297	833	24	132	38776
		Unspecified	0	0	0	1	2	7	4	1	0	0	24	39
		Total	12	2	7	564	16879	21093	9093	6296	2011	93	216	56266
	Rates	Male	2.4	0.1	0.1	2.4	253.1	606.0	352.1	123.5	26.2	2.9		112.3
		Female	5.0	0.1	0.6	52.1	1366.2	1382.4	522.5	138.5	18.4	0.8		245.1
		Total	3.7	0.1	0.4	26.7	793.8	986.0	436.2	131.0	22.3	1.7		179.5
2003	Cases	Male	5	1	0	25	2911	7296	4094	3292	1252	72	62	19010
		Female	14	2	2	570	14778	15451	5663	3458	876	26	103	40943
		Unspecified	0	0	0	1	3	4	3	3	4	0	12	30
		Total	19	3	2	596	17692	22751	9760	6753	2132	98	177	59983
	Rates	Male	3.0	0.1	0.0	2.3	265.9	656.5	385.5	138.7	27.1	2.9		121.3
		Female	8.7	0.3	0.2	54.6	1429.6	1453.3	546.8	148.5	18.8	0.9		256.5
		Total	5.8	0.2	0.1	27.9	831.2	1046.3	465.3	143.6	23.0	1.8		189.6
2004	Cases	Male	8	0	2	23	3142	8089	4543	3386	1526	95	41	20855
		Female	10	3	7	559	15171	16388	6042	3784	1071	47	61	43143
		Unspecified	0	0	0	0	5	11	8	2	2	0	12	40
		Total	18	3	9	582	18318	24488	10593	7172	2599	142	114	64038
	Rates	Male	4.6	0.0	0.2	2.1	284.8	717.0	423.4	145.8	32.2	3.8		131.8
		Female	6.1	0.4	0.8	53.5	1458.0	1518.3	574.9	166.0	22.5	1.5		267.7
		Total	5.3	0.2	0.5	27.2	854.5	1109.3	498.8	155.8	27.4	2.5		200.5

YEAR		SEX	CHLAMYDIA AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2005	Cases	Male	9	0	1	24	3213	8473	4961	3839	1751	103	29	22403
		Female	14	2	5	539	15127	16845	6423	3844	1143	45	56	44043
		Unspecified[3]	0	0	0	0	6	8	7	2	1	0	32	56
		Total	23	2	6	563	18346	25326	11391	7685	2895	148	117	66502
	Rates	Male	5.2	0.0	0.1	2.2	287.1	742.1	457.6	168.0	36.1	4.0		140.2
		Female	8.5	0.3	0.5	51.9	1431.3	1545.0	602.6	171.3	23.5	1.4		270.8
		Total	6.8	0.1	0.3	26.5	843.1	1134.7	529.8	169.7	29.8	2.6		206.2
2006	Cases	Male	10	0	2	27	3396	8785	5108	4136	1926	126	21	23537
		Female	19	6	10	463	15126	17387	7047	4223	1304	55	49	45689
		Unspecified[3]	0	0	0	0	9	11	10	3	2	0	27	62
		Total	29	6	12	490	18531	26183	12165	8362	3232	181	97	69288
	Rates	Male	5.5	0.0	0.2	2.5	298.8	761.8	464.6	182.6	39.1	4.7		145.8
		Female	11.2	0.9	1.1	45.2	1407.2	1582.8	649.3	189.5	26.4	1.7		278.1
		Total	8.3	0.4	0.7	23.4	837.9	1162.8	556.8	186.1	32.8	3.1		212.7
2007[4]	Cases	Male	20	0	1	37	3578	9217	5519	4193	2023	138	19	24745
		Female	10	1	7	468	15677	17938	7353	4473	1351	59	34	47371
		Unspecified[3]	0	0	0	1	8	12	7	6	3	0	549	586
		Total	30	1	8	506	19263	27167	12879	8672	3377	197	602	72702
	Rates	Male	10.8	0.0	0.1	3.5	311.9	792.6	492.0	185.3	40.9	5.0		151.7
		Female	5.7	0.1	0.8	46.7	1440.8	1622.3	664.3	200.4	27.2	1.8		285.5
		Total	8.3	0.1	0.4	24.7	861.8	1197.5	577.9	193.0	34.1	3.2		221.0

YEAR		SEX	CHLAMYDIA											
			AGE GROUP (YEARS)											
			<1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2008[4]	Cases	Male	15	0	1	50	4119	10161	6049	4561	2224	117	20	27317
		Female	10	2	5	493	17974	19844	8499	5305	1670	50	54	53906
		Unspecified[3]	0	0	0	0	15	22	13	5	5	0	18	78
		Total	25	2	6	543	22108	30027	14561	9871	3899	167	92	81301
	Rates	Male	7.9	0.0	0.1	4.9	356.6	867.1	525.3	200.7	44.6	4.0		165.5
		Female	5.5	0.3	0.6	50.3	1636.6	1783.9	750.2	236.1	33.4	1.4		321.2
		Total	6.7	0.1	0.3	27.0	981.1	1314.5	637.4	218.4	39.1	2.6		244.2
2009[4]	Cases	Male	14	2	1	56	4544	10604	6494	4703	2330	146	22	28916
		Female	5	5	11	528	18845	20796	8977	5834	1970	78	28	57077
		Unspecified[3]	0	0	0	0	9	25	24	11	8	0	9	86
		Total	19	7	12	584	23398	31425	15495	10548	4308	224	59	86079
	Rates	Male	7.2	0.3	0.1	5.5	394.7	890.5	548.6	205.7	46.4	4.9		173.0
		Female	2.7	0.7	1.3	55.0	1718.4	1845.0	773.8	257.3	39.2	2.2		336.0
		Total	5.0	0.5	0.7	29.6	1040.9	1355.7	661.1	231.6	42.9	3.4		255.4
2010[4]	Cases	Male	9	0	3	53	4737	11546	7128	5356	2530	196	40	31598
		Female	6	2	8	527	19475	22791	9903	6482	2347	83	33	61657
		Unspecified[3]	0	0	0	0	9	31	13	8	1	0	12	74
		Total	15	2	11	580	24221	34368	17044	11846	4878	279	85	93329
	Rates	Male	4.6	0.0	0.3	5.3	415.9	951.5	588.7	232.7	50.0	6.3		186.9
		Female	3.2	0.3	0.9	55.9	1794.1	1983.9	838.8	283.0	46.4	2.3		358.8
		Total	3.9	0.1	0.6	30.0	1088.9	1454.8	712.7	258.0	48.2	4.1		273.7

YEAR		SEX	CHLAMYDIA AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2011[4]	Cases	Male	12	0	1	49	5005	12708	7667	5719	2808	195	19	34183
		Female	11	0	5	565	20154	24649	10454	7230	2531	114	31	65744
		Unspecified[3]	0	0	0	0	13	29	20	7	15	0	33	117
		Total	23	0	6	614	25172	37386	18141	12956	5354	309	83	100044
	Rates	Male	6.1	0.0	0.1	5.0	446.0	1031.0	625.3	246.5	55.3	6.1		200.1
		Female	5.9	0.0	0.6	61.3	1881.6	2113.0	878.3	312.5	49.8	3.0		378.7
		Total	6.0	0.0	0.3	32.4	1147.7	1558.3	750.7	279.6	52.7	4.4		290.4

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1991–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[3] Unspecified sex includes transgender cases.

[4] 2007–2011 national cases and rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

TABLE 9: Reported Cases and Rates[1] of Gonorrhea by Province/Territory and Sex, 2002 to 2011[2]

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2002	Cases	Male	5	-	92	13	669	1954	321	268	563	597	8	66	33	4589
		Female	4	-	107	17	205	1194	316	291	415	116	3	58	44	2770
		Unspecified	0	-	0	0	4	2	0	0	0	0	0	0	0	6
		Total	9	-	199	30	878	3150	637	559	978	713	11	124	77	7365
	Rates	Male	2.0	-	20.1	3.5	18.2	32.7	56.0	54.1	35.6	29.4	51.8	305.7	220.3	29.5
		Female	1.5	-	22.4	4.5	5.4	19.5	54.2	58.0	26.8	5.6	20.1	288.9	318.0	17.5
		Total	1.7	-	21.3	4.0	11.8	26.1	55.1	56.1	31.3	17.4	36.2	297.6	267.2	23.5
2003	Cases	Male	7	-	55	15	663	2381	419	239	602	506	1	110	27	5025
		Female	0	-	63	19	205	1409	464	305	433	181	2	91	38	3210
		Unspecified	0	-	0	0	4	1	0	0	0	1	0	0	0	6
		Total	7	-	118	34	872	3791	883	544	1035	688	3	201	65	8241
	Rates	Male	2.7	-	12.0	4.1	17.9	39.4	72.6	48.3	37.4	24.8	6.3	498.1	177.7	32.1
		Female	0.0	-	13.2	5.0	5.4	22.7	79.1	60.8	27.5	8.7	13.2	444.4	269.0	20.1
		Total	1.3	-	12.6	4.5	11.6	31.0	75.9	54.6	32.5	16.7	9.7	472.3	221.7	26.0
2004	Cases	Male	1	-	53	8	672	2473	544	262	867	880	22	75	30	5887
		Female	0	-	69	7	147	1479	543	366	508	205	20	60	15	3419
		Unspecified	0	-	0	0	0	4	1	1	1	0	0	0	0	7
		Total	1	-	122	15	819	3956	1088	629	1376	1085	42	135	45	9313
	Rates	Male	0.4	-	11.5	2.2	18.0	40.4	93.4	52.9	52.9	42.8	137.1	334.0	193.6	37.2
		Female	0.0	-	14.4	1.8	3.9	23.6	91.9	72.8	31.8	9.8	129.7	287.8	104.5	21.2
		Total	0.2	-	13.0	2.0	10.9	31.9	92.7	63.1	42.5	26.1	133.4	311.8	150.7	29.2

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2005	Cases	Male	1	-	53	9	729	2077	595	298	950	910	13	78	37	5750
		Female	0	-	50	14	165	1242	580	422	579	294	8	64	20	3440
		Unspecified[5]	0	-	1	0	5	3	0	0	1	0	0	0	0	10
		Total	1	-	104	23	899	3322	1175	720	1530	1204	21	142	57	9200
	Rates	Male	0.4	-	11.6	2.4	19.4	33.6	101.6	60.5	56.4	43.8	79.9	345.7	235.3	36.0
		Female	0.0	-	10.4	3.7	4.3	19.6	97.8	84.2	35.3	13.9	51.2	307.2	137.0	21.1
		Total	0.2	-	11.1	3.1	11.9	26.5	99.7	72.5	46.1	28.7	65.8	327.2	187.9	28.5
2006	Cases	Male	7	-	58	20	906	2428	844	414	1298	723	4	79	54	6835
		Female	1	-	41	12	364	1416	734	540	850	354	7	102	48	4469
		Unspecified[5]	0	-	0	0	2	2	0	0	1	1	0	0	0	6
		Total	8	-	99	32	1272	3846	1578	954	2149	1078	11	181	102	11310
	Rates	Male	2.8	-	12.7	5.5	24.0	38.8	143.4	84.2	74.7	34.4	24.2	351.5	339.6	42.3
		Female	0.4	-	8.5	3.2	9.4	22.1	123.3	107.8	50.5	16.5	44.4	492.2	322.1	27.2
		Total	1.6	-	10.6	4.3	16.7	30.4	133.3	96.2	62.8	25.4	34.1	419.0	331.2	34.7
2007	Cases	Male	17	-	41	25	987	2342	690	451	1329	831	6	113		6833
		Female	1	-	31	11	420	1620	794	582	864	452	11	109		4897
		Unspecified[5]	0	-	0	0	1	2	0	0	0	2	0	0		5
		Total	18	-	72	36	1408	3964	1484	1033	2193	1285	17	222		11735
	Rates[6]	Male	6.8	-	9.0	6.8	25.9	37.1	116.3	91.0	74.3	38.9	36.1	499.9		41.9
		Female	0.4	-	6.4	2.9	10.8	25.0	132.3	115.3	50.1	20.8	68.9	520.5		29.5
		Total	3.6	-	7.7	4.8	18.3	31.0	124.3	103.3	62.4	29.8	52.2	509.8		35.7

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2008	Cases	Male	0	-	72	14	1054	2235	616	548	1231	893	7	156		6827
		Female	0	-	71	14	595	1633	749	786	896	534	10	143		5434
		Unspecified[5]	0	-	0	0	1	4	0	0	0	2	0	0		7
		Total	0	-	143	28	1650	3872	1365	1334	2127	1429	17	299		12268
	Rates[6]	Male	0.0	-	15.8	3.8	27.5	35.0	102.7	109.0	67.2	41.1	41.3	689.8		41.4
		Female	0.0	-	14.7	3.7	15.2	24.9	123.6	153.8	50.9	24.2	61.8	678.8		32.4
		Total	0.0	-	15.3	3.7	21.3	29.9	113.2	131.6	59.2	32.6	51.3	684.5		36.9
2009	Cases	Male	7	-	56	27	1214	1974	457	368	787	840	8	111		5849
		Female	3	-	71	25	658	1561	567	507	757	508	7	130		4794
		Unspecified[5]	0	-	0	0	4	6	0	0	0	2	0	0		12
		Total	10	-	127	52	1876	3541	1024	875	1544	1350	15	241		10655
	Rates[6]	Male	2.8	-	12.3	7.3	31.3	30.6	75.3	72.0	42.0	38.0	46.4	492.4		35.0
		Female	1.2	-	14.7	6.5	16.7	23.5	92.6	97.9	42.1	22.6	42.5	616.2		28.2
		Total	2.0	-	13.5	6.9	24.0	27.1	84.0	85.0	42.1	30.3	44.5	552.3		31.6
2010	Cases	Male	9	-	38	39	1364	2196	435	316	629	922	17	109		6074
		Female	3	-	62	25	690	1767	547	447	553	441	14	110		4659
		Unspecified[5]	0	-	0	0	4	3	0	0	0	3	0	0		10
		Total	12	-	100	64	2058	3966	982	763	1182	1366	31	219		10743
	Rates[6]	Male	3.6	-	8.3	10.6	34.8	33.7	70.8	60.9	33.1	41.0	96.4	483.0		35.9
		Female	1.2	-	12.8	6.5	17.3	26.3	88.2	85.2	30.3	19.3	82.7	517.3		27.1
		Total	2.3	-	10.6	8.5	26.0	30.0	79.5	73.1	31.8	30.2	89.7	499.7		31.5

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2011	Cases	Male	10	7	54	35	1180	2396	451	327	850	1178	2	65		6555
		Female	16	4	48	29	692	1794	604	431	659	468	4	77		4826
		Unspecified[5]	0	0	0	0	7	6	0	0	0	3	0	0		16
		Total	26	11	102	64	1879	4196	1055	758	1509	1649	6	142		11397
	Rates[6]	Male	4.0	9.8	11.7	9.4	29.8	36.3	72.4	62.1	44.1	52.0	11.3	290.1		38.4
		Female	6.2	5.4	9.9	7.5	17.2	26.5	96.2	81.2	35.6	20.3	23.5	362.0		27.8
		Total	5.1	7.5	10.8	8.5	23.5	31.4	84.4	71.7	39.9	36.1	17.3	325.1		33.1

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1980–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[3] Data for Prince Edward Island are suppressed at the request of PEI for any year in which counts were less than 5.

[4] Data reported by Nunavut prior to 2007 are preliminary. 2007–2011 Nunavut data are not available.

[5] Unspecified sex includes transgender cases.

[6] 2007–2011 national rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

TABLE 10: Reported Cases and Rates[1] of Gonorrhea by Age Group and Sex, 2002 to 2011[2]

YEAR		SEX	GONORRHEA											
			AGE GROUP (YEARS)											
			<1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2002	Cases	Male	0	0	0	8	472	1122	814	1341	767	60	5	4589
		Female	2	2	3	62	1049	872	374	301	97	4	4	2770
		Unspecified	0	0	0	0	0	1	0	2	1	0	2	6
		Total	2	2	3	70	1521	1995	1188	1644	865	64	11	7365
	Rates	Male	0.0	0.0	0.0	0.7	43.2	102.6	77.0	55.3	17.0	2.5		29.5
		Female	1.3	0.3	0.3	6.0	101.6	83.4	36.4	12.6	2.1	0.1		17.5
		Total	0.6	0.1	0.2	3.3	71.5	93.3	57.0	34.2	9.6	1.2		23.5
2003	Cases	Male	0	0	0	5	535	1242	890	1362	906	73	12	5025
		Female	1	2	0	59	1225	1032	418	346	117	7	3	3210
		Unspecified	0	0	0	0	1	1	0	1	0	1	2	6
		Total	1	2	0	64	1761	2275	1308	1709	1023	81	17	8241
	Rates	Male	0.0	0.0	0.0	0.5	48.9	111.8	83.8	57.4	19.6	3.0		32.1
		Female	0.6	0.3	0.0	5.7	118.5	97.1	40.4	14.9	2.5	0.2		20.1
		Total	0.3	0.1	0.0	3.0	82.7	104.6	62.4	36.3	11.0	1.5		26.0
2004	Cases	Male	0	0	0	7	632	1469	1019	1539	1121	93	8	5888
		Female	1	0	1	69	1311	1099	465	337	134	5	0	3422
		Unspecified	0	0	0	0	0	0	3	1	1	0	2	7
		Total	1	0	1	76	1943	2568	1487	1877	1256	98	10	9317
	Rates	Male	0.0	0.0	0.0	0.6	57.3	130.2	95.0	66.3	23.7	3.7		37.2
		Female	0.6	0.0	0.1	6.6	126.0	101.8	44.2	14.8	2.8	0.2		21.2
		Total	0.3	0.0	0.1	3.5	90.6	116.3	70.0	40.8	13.2	1.7		29.2

YEAR		SEX	GONORRHEA AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2005	Cases	Male	0	0	0	6	616	1397	1084	1436	1113	93	5	5750
		Female	2	1	2	93	1230	1170	460	341	127	10	4	3440
		Unspecified[3]	0	0	0	0	1	3	2	2	1	0	1	10
		Total	2	1	2	99	1847	2570	1546	1779	1241	103	10	9200
	Rates	Male	0.0	0.0	0.0	0.6	55.0	122.4	100.0	62.8	23.0	3.6		36.0
		Female	1.2	0.2	0.2	9.0	116.4	107.3	43.2	15.2	2.6	0.3		21.1
		Total	0.6	0.1	0.1	4.7	84.9	115.1	71.9	39.3	12.8	1.8		28.5
2006	Cases	Male	2	1	0	5	761	1627	1263	1611	1402	137	26	6835
		Female	2	3	6	86	1517	1425	664	505	232	14	15	4469
		Unspecified[3]	0	0	0	0	0	3	1	1	1	0	0	6
		Total	4	4	6	91	2278	3055	1928	2117	1635	151	41	11310
	Rates	Male	1.1	0.1	0.0	0.5	66.9	141.1	114.9	71.1	28.5	5.1		42.3
		Female	1.2	0.4	0.7	8.4	141.1	129.7	61.2	22.7	4.7	0.4		27.2
		Total	1.1	0.3	0.3	4.3	103.0	135.7	88.2	47.1	16.6	2.5		34.7
2007[4]	Cases	Male	0	0	0	12	820	1768	1303	1469	1336	116	9	6833
		Female	0	5	8	82	1621	1658	742	575	191	13	2	4897
		Unspecified[3]	0	0	0	0	0	1	0	3	0	0	1	5
		Total	0	5	8	94	2441	3427	2045	2047	1527	129	12	11735
	Rates	Male	0.0	0.0	0.0	1.1	71.5	152.0	116.2	64.9	27.0	4.2		41.9
		Female	0.0	0.7	0.9	8.2	149.0	150.0	67.0	25.8	3.8	0.4		29.5
		Total	0.0	0.4	0.4	4.6	109.2	151.1	91.8	45.5	15.4	2.1		35.7

YEAR		SEX	GONORRHEA AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2008[4]	Cases	Male	0	0	4	16	789	1862	1361	1489	1192	113	1	6827
		Female	0	4	5	76	1775	1783	876	651	249	13	2	5434
		Unspecified[3]	0	0	0	0	1	2	1	1	1	0	1	7
		Total	0	4	9	92	2565	3647	2238	2141	1442	126	4	12268
	Rates	Male	0.0	0.0	0.4	1.6	68.3	158.9	118.2	65.5	23.9	3.9		41.4
		Female	0.0	0.6	0.6	7.8	161.6	160.3	77.3	29.0	5.0	0.4		32.4
		Total	0.0	0.3	0.5	4.6	113.8	159.7	98.0	47.4	14.4	2.0		36.9
2009[4]	Cases	Male	3	0	0	9	679	1602	1174	1197	1091	88	6	5849
		Female	0	5	5	68	1549	1598	771	573	207	16	3	4795
		Unspecified[3]	0	0	0	0	3	4	1	2	0	0	2	12
		Total	3	5	5	77	2231	3204	1946	1772	1298	104	11	10656
	Rates	Male	1.5	0.0	0.0	0.9	59.0	134.5	99.2	52.3	21.7	2.9		35.0
		Female	0.0	0.7	0.6	7.1	141.2	141.8	66.5	25.3	4.1	0.4		28.2
		Total	0.8	0.3	0.3	3.9	99.2	138.2	83.0	38.9	12.9	1.6		31.6
2010[4]	Cases	Male	1	0	1	16	642	1560	1291	1296	1138	128	1	6074
		Female	0	3	5	62	1469	1511	778	566	242	18	5	4659
		Unspecified[3]	0	0	0	0	0	3	1	2	1	1	2	10
		Total	1	3	6	78	2111	3074	2070	1864	1381	147	8	10743
	Rates	Male	0.5	0.0	0.1	1.6	56.4	128.6	106.6	56.3	22.5	4.1		35.9
		Female	0.0	0.4	0.6	6.6	135.3	131.5	65.9	24.7	4.8	0.5		27.1
		Total	0.3	0.2	0.3	4.0	94.9	130.1	86.6	40.6	13.7	2.2		31.5

YEAR		SEX	GONORRHEA AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2011[4]	Cases	Male	0	0	0	20	650	1684	1331	1432	1300	134	4	6555
		Female	1	1	1	60	1415	1587	865	593	281	19	3	4826
		Unspecified[3]	0	0	0	0	2	3	3	3	1	1	3	16
		Total	1	1	1	80	2067	3274	2199	2028	1582	154	10	11397
	Rates	Male	0.0	0.0	0.0	2.1	57.9	136.6	108.5	61.7	25.6	4.2		38.4
		Female	0.5	0.1	0.1	6.5	132.1	136.0	72.7	25.6	5.5	0.5		27.8
		Total	0.3	0.1	0.1	4.2	94.2	136.5	91.0	43.8	15.6	2.2		33.1

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1980–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[3] Unspecified sex includes transgender cases.

[4] 2007–2011 national cases and rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

TABLE 11: Reported Cases and Rates[1] of Infectious Syphilis[2] by Province/Territory and Sex, 2002 to 2011[3]

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2002	Cases	Male	0	-	1	1	47	207	4	0	9	113	4	0	0	386
		Female	0	-	0	1	0	12	2	1	5	72	2	0	0	95
		Unspecified	0	-	0	0	0	0	0	0	0	1	0	0	0	1
		Total	0	-	1	2	47	219	6	1	14	186	6	0	0	482
	Rates	Male	0.0	-	0.2	0.3	1.3	3.5	0.7	0.0	0.6	5.6	25.9	0.0	0.0	2.5
		Female	0.0	-	0.0	0.3	0.0	0.2	0.3	0.2	0.3	3.5	13.4	0.0	0.0	0.6
		Total	0.0	-	0.1	0.3	0.6	1.8	0.5	0.1	0.4	4.5	19.8	0.0	0.0	1.5
2003	Cases	Male	1	-	10	3	148	362	21	5	33	172	3	0	0	758
		Female	0	-	0	1	5	24	16	1	9	89	2	1	0	148
		Unspecified	0	-	0	0	1	0	0	0	0	1	0	0	0	2
		Total	1	-	10	4	154	386	37	6	42	262	5	1	0	908
	Rates	Male	0.4	-	2.2	0.8	4.0	6.0	3.6	1.0	2.0	8.4	19.0	0.0	0.0	4.8
		Female	0.0	-	0.0	0.3	0.1	0.4	2.7	0.2	0.6	4.3	13.2	4.9	0.0	0.9
		Total	0.2	-	1.1	0.5	2.1	3.2	3.2	0.6	1.3	6.4	16.1	2.3	0.0	2.9
2004	Cases	Male	0	-	14	3	218	428	17	2	58	227	1	1	0	969
		Female	0	-	0	1	14	16	6	0	16	78	0	1	1	133
		Unspecified	0	-	0	0	1	1	0	0	0	0	0	0	0	2
		Total	0	-	14	4	233	445	23	2	74	305	1	2	1	1104
	Rates	Male	0.0	-	3.0	0.8	5.9	7.0	2.9	0.4	3.5	11.0	6.2	4.5	0.0	6.1
		Female	0.0	-	0.0	0.3	0.4	0.3	1.0	0.0	1.0	3.7	0.0	4.8	7.0	0.8
		Total	0.0	-	1.5	0.5	3.1	3.6	2.0	0.2	2.3	7.3	3.2	4.6	3.3	3.5

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2005	Cases	Male	2	-	2	1	249	338	47	1	85	202	1	0	0	928
		Female	0	-	0	0	8	19	4	1	51	85	0	0	0	168
		Unspecified[6]	0	-	0	0	0	0	0	0	0	1	0	0	0	1
		Total	2	-	2	1	257	357	51	2	136	288	1	0	0	1097
	Rates	Male	0.8	-	0.4	0.3	6.6	5.5	8.0	0.2	5.1	9.7	6.1	0.0	0.0	5.8
		Female	0.0	-	0.0	0.0	0.2	0.3	0.7	0.2	3.1	4.0	0.0	0.0	0.0	1.0
		Total	0.4	-	0.2	0.1	3.4	2.8	4.3	0.2	4.1	6.9	3.1	0.0	0.0	3.4
2006	Cases	Male	0	-	2	0	367	343	26	14	151	254	0	0	0	1157
		Female	0	-	0	0	6	26	0	3	67	77	0	0	0	179
		Unspecified[6]	0	-	0	0	0	0	0	0	0	0	0	0	0	0
		Total	0	-	2	0	373	369	26	17	218	331	0	0	0	1336
	Rates	Male	0.0	-	0.4	0.0	9.7	5.5	4.4	2.8	8.7	12.1	0.0	0.0	0.0	7.2
		Female	0.0	-	0.0	0.0	0.2	0.4	0.0	0.6	4.0	3.6	0.0	0.0	0.0	1.1
		Total	0.0	-	0.2	0.0	4.9	2.9	2.2	1.7	6.4	7.8	0.0	0.0	0.0	4.1
2007	Cases	Male	2	-	1	2	240	387	26	9	176	243	0	0		1086
		Female	2	-	0	0	7	20	1	1	74	55	0	0		161
		Unspecified[6]	0	-	0	0	0	0	0	0	0	1	0	0		1
		Total	4	-	1	2	247	407	27	10	250	299	0	0		1248
	Rates[7]	Male	0.8	-	0.2	0.5	6.3	6.1	4.4	1.8	9.8	11.4	0.0	0.0		6.7
		Female	0.8	-	0.0	0.0	0.2	0.3	0.2	0.2	4.3	2.5	0.0	0.0		1.0
		Total	0.8	-	0.1	0.3	3.2	3.2	2.3	1.0	7.1	6.9	0.0	0.0		3.8

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2008	Cases	Male	6	-	0	5	368	415	10	8	144	218	0	26		1200
		Female	2	-	0	1	8	34	3	4	101	16	0	21		190
		Unspecified[6]	0	-	0	0	1	1	0	0	0	1	0	0		3
		Total	8	-	0	6	377	450	13	12	245	235	0	47		1393
	Rates[7]	Male	2.4	-	0.0	1.4	9.6	6.5	1.7	1.6	7.9	10.0	0.0	115.0		7.3
		Female	0.8	-	0.0	0.3	0.2	0.5	0.5	0.8	5.7	0.7	0.0	99.7		1.1
		Total	1.6	-	0.0	0.8	4.9	3.5	1.1	1.2	6.8	5.4	0.0	107.6		4.2
2009	Cases	Male	3	-	23	8	357	689	5	15	189	119	0	19		1427
		Female	0	-	1	1	16	22	0	6	90	7	0	14		157
		Unspecified[6]	0	-	0	0	1	0	0	0	0	0	0	0		1
		Total	3	-	24	9	374	711	5	21	279	126	0	33		1585
	Rates[7]	Male	1.2	-	5.0	2.2	9.2	10.7	0.8	2.9	10.1	5.4	0.0	84.3		8.5
		Female	0.0	-	0.2	0.3	0.4	0.3	0.0	1.2	5.0	0.3	0.0	66.4		0.9
		Total	0.6	-	2.6	1.2	4.8	5.4	0.4	2.0	7.6	2.8	0.0	75.6		4.7
2010	Cases	Male	4	-	17	32	519	728	9	26	118	90	0	1		1544
		Female	0	-	1	2	26	46	8	10	55	2	0	2		152
		Unspecified[6]	0	-	0	0	2	0	0	0	0	0	0	0		2
		Total	4	-	18	34	547	774	17	36	173	92	0	3		1698
	Rates[7]	Male	1.6	-	3.7	8.7	13.2	11.2	1.5	5.0	6.2	4.0	0.0	4.4		9.1
		Female	0.0	-	0.2	0.5	0.7	0.7	1.3	1.9	3.0	0.1	0.0	9.4		0.9
		Total	0.8	-	1.9	4.5	6.9	5.9	1.4	3.4	4.6	2.0	0.0	6.8		5.0

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2011	Cases	Male	4	-	36	46	613	736	13	8	65	122	0	0		1643
		Female	1	-	0	4	25	31	3	15	29	6	0	0		114
		Unspecified[6]	0	-	0	0	0	0	0	0	0	0	0	0		0
		Total	5	-	36	50	638	767	16	23	94	128	0	0		1757
	Rates[7]	Male	1.6	-	7.8	12.4	15.5	11.2	2.1	1.5	3.4	5.4	0.0	0.0		9.6
		Female	0.4	-	0.0	1.0	0.6	0.5	0.5	2.8	1.6	0.3	0.0	0.0		0.7
		Total	1.0	-	3.8	6.6	8.0	5.7	1.3	2.2	2.5	2.8	0.0	0.0		5.1

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1993–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] Infectious syphilis includes primary, secondary and early latent stages.

[3] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[4] Data for Prince Edward Island are suppressed at the request of PEI for any year in which counts were less than 5.

[5] Data reported by Nunavut prior to 2007 are preliminary. 2007–2011 Nunavut data are not available.

[6] Unspecified sex includes transgender cases.

[7] 2007–2011 national rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

TABLE 12: Reported Cases and Rates[1] of Infectious Syphilis[2] by Age Group and Sex, 2002 to 2011[3]

YEAR		SEX	INFECTIOUS SYPHILIS[2] AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2002	Cases	Male	0	0	0	0	6	21	31	170	146	12	0	386
		Female	0	0	0	0	6	24	27	23	14	1	0	95
		Unspecified	0	0	0	0	0	0	0	0	0	0	1	1
		Total	0	0	0	0	12	45	58	193	160	13	1	482
	Rates	Male	0.0	0.0	0.0	0.0	0.5	1.9	2.9	7.0	3.2	0.5		2.5
		Female	0.0	0.0	0.0	0.0	0.6	2.3	2.6	1.0	0.3	0.0		0.6
		Total	0.0	0.0	0.0	0.0	0.6	2.1	2.8	4.0	1.8	0.2		1.5
2003	Cases	Male	0	0	0	0	8	32	80	298	307	33	0	758
		Female	0	0	0	0	12	35	34	40	23	4	0	148
		Unspecified	0	0	0	0	0	1	1	0	0	0	0	2
		Total	0	0	0	0	20	68	115	338	330	37	0	908
	Rates	Male	0.0	0.0	0.0	0.0	0.7	2.9	7.5	12.6	6.6	1.4		4.8
		Female	0.0	0.0	0.0	0.0	1.2	3.3	3.3	1.7	0.5	0.1		0.9
		Total	0.0	0.0	0.0	0.0	0.9	3.1	5.5	7.2	3.6	0.7		2.9
2004	Cases	Male	0	0	0	0	7	52	79	322	466	42	1	969
		Female	0	0	0	0	8	30	33	30	28	4	0	133
		Unspecified	0	0	0	0	0	0	0	0	1	0	1	2
		Total	0	0	0	0	15	82	112	352	495	46	2	1104
	Rates	Male	0.0	0.0	0.0	0.0	0.6	4.6	7.4	13.9	9.8	1.7		6.1
		Female	0.0	0.0	0.0	0.0	0.8	2.8	3.1	1.3	0.6	0.1		0.8
		Total	0.0	0.0	0.0	0.0	0.7	3.7	5.3	7.6	5.2	0.8		3.5

YEAR		SEX	INFECTIOUS SYPHILIS[2] AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2005	Cases	Male	0	0	0	0	11	71	96	284	430	36	0	928
		Female	0	0	0	0	19	33	39	37	37	3	0	168
		Unspecified[4]	0	0	0	0	0	1	0	0	0	0	0	1
		Total	0	0	0	0	30	105	135	321	467	39	0	1097
	Rates	Male	0.0	0.0	0.0	0.0	1.0	6.2	8.9	12.4	8.9	1.4		5.8
		Female	0.0	0.0	0.0	0.0	1.8	3.0	3.7	1.6	0.8	0.1		1.0
		Total	0.0	0.0	0.0	0.0	1.4	4.7	6.3	7.1	4.8	0.7		3.4
2006	Cases	Male	0	0	0	1	10	88	93	354	555	56	0	1157
		Female	0	0	0	0	14	36	27	56	42	4	0	179
		Unspecified[4]	0	0	0	0	0	0	0	0	0	0	0	0
		Total	0	0	0	1	24	124	120	410	597	60	0	1336
	Rates	Male	0.0	0.0	0.0	0.1	0.9	7.6	8.5	15.6	11.3	2.1		7.2
		Female	0.0	0.0	0.0	0.0	1.3	3.3	2.5	2.5	0.9	0.1		1.1
		Total	0.0	0.0	0.0	0.0	1.1	5.5	5.5	9.1	6.1	1.0		4.1
2007[5]	Cases	Male	0	0	0	1	14	72	110	321	518	49	1	1086
		Female	0	0	0	2	15	26	35	42	40	1	0	161
		Unspecified[4]	0	0	0	0	0	0	0	1	0	0	0	1
		Total	0	0	0	3	29	98	145	364	558	50	1	1248
	Rates	Male	0.0	0.0	0.0	0.1	1.2	6.2	9.8	14.2	10.5	1.8		6.7
		Female	0.0	0.0	0.0	0.2	1.4	2.4	3.2	1.9	0.8	0.0		1.0
		Total	0.0	0.0	0.0	0.1	1.3	4.3	6.5	8.1	5.6	0.8		3.8

YEAR		SEX	INFECTIOUS SYPHILIS[2]											
			AGE GROUP (YEARS)											
			<1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2008[5]	Cases	Male	0	0	0	0	14	104	150	307	571	54	0	1200
		Female	0	0	0	1	23	40	34	48	42	2	0	190
		Unspecified[4]	0	0	0	0	0	0	0	1	1	0	1	3
		Total	0	0	0	1	37	144	184	356	614	56	1	1393
	Rates	Male	0.0	0.0	0.0	0.0	1.2	8.9	13.0	13.5	11.5	1.9		7.3
		Female	0.0	0.0	0.0	0.1	2.1	3.6	3.0	2.1	0.8	0.1		1.1
		Total	0.0	0.0	0.0	0.0	1.6	6.3	8.1	7.9	6.2	0.9		4.2
2009[5]	Cases	Male	0	0	0	0	39	148	199	373	617	50	1	1427
		Female	0	0	0	0	10	37	34	36	37	3	0	157
		Unspecified[4]	0	0	0	0	0	0	0	0	1	0	0	1
		Total	0	0	0	0	49	185	233	409	655	53	1	1585
	Rates	Male	0.0	0.0	0.0	0.0	3.4	12.4	16.8	16.3	12.3	1.7		8.5
		Female	0.0	0.0	0.0	0.0	0.9	3.3	2.9	1.6	0.7	0.1		0.9
		Total	0.0	0.0	0.0	0.0	2.2	8.0	9.9	9.0	6.5	0.8		4.7
2010[5]	Cases	Male	0	0	0	0	45	152	183	364	718	82	0	1544
		Female	0	0	0	0	16	38	31	35	30	2	0	152
		Unspecified[4]	0	0	0	0	0	1	0	1	0	0	0	2
		Total	0	0	0	0	61	191	214	400	748	84	0	1698
	Rates	Male	0.0	0.0	0.0	0.0	4.0	12.5	15.1	15.8	14.2	2.6		9.1
		Female	0.0	0.0	0.0	0.0	1.5	3.3	2.6	1.5	0.6	0.1		0.9
		Total	0.0	0.0	0.0	0.0	2.7	8.1	8.9	8.7	7.4	1.2		5.0

YEAR		SEX	INFECTIOUS SYPHILIS[2] AGE GROUP (YEARS) <1	1–4	5–9	10–14	15–19	20–24	25–29	30–39	40–59	60+	NS	TOTAL
2011[5]	Cases	Male	0	0	0	0	51	192	236	399	696	68	1	1643
		Female	0	0	0	0	18	24	22	27	22	1	0	114
		Unspecified[4]	0	0	0	0	0	0	0	0	0	0	0	0
		Total	0	0	0	0	69	216	258	426	718	69	1	1757
	Rates	Male	0.0	0.0	0.0	0.0	4.5	15.6	19.2	17.2	13.7	2.1		9.6
		Female	0.0	0.0	0.0	0.0	1.7	2.1	1.8	1.2	0.4	0.0		0.7
		Total	0.0	0.0	0.0	0.0	3.1	9.0	10.7	9.2	7.1	1.0		5.1

[1] Rate per 100,000 population. Population estimates provided by Statistics Canada. (Source: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1993–2005 final intercensal estimates, 2006–2008 final postcensal estimates, 2009–2010 updated postcensal estimates, 2011 preliminary postcensal estimates.)

[2] Infectious syphilis includes primary, secondary and early latent stages.

[3] 2011 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of December, 2013.

[4] Unspecified sex includes transgender cases.

[5] 2007–2011 national cases and rates (per 100,000) based on postcensal estimates for the corresponding years, excluding Nunavut.

SOURCE: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2013.

NOTE: Small variability may exist between data reported by the provinces/territories and the Public Health Agency of Canada. Provincial/territorial data are definitive should a discrepancy exist.

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