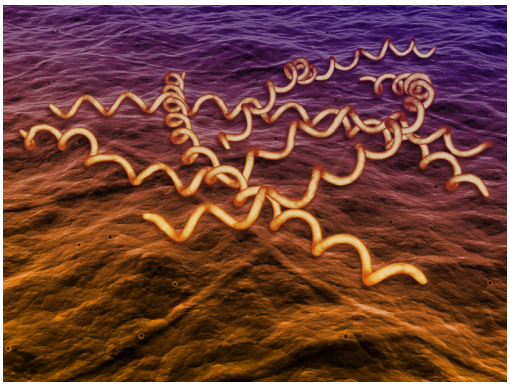
REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2012

CENTRE FOR COMMUNICABLE DISEASES AND INFECTION CONTROL
PUBLIC HEALTH AGENCY OF CANADA





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REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2012

NOTE TO THE READERS OF THE *REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2012*

The Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada (the Agency), is pleased to present the 2012 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 three chapters, each of which highlight the three main nationally notifiable STIs: chlamydia, gonorrhea, and infectious syphilis, with special focus sections within each. 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 2012 and thus the population of Nunavut was removed from the denominator when calculating annual rates for these years. At the request of Prince Edward Island (PE), its data are suppressed in any table presenting P/T specific data where PE 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 for their review and input on this report, and the National Microbiology Laboratory for their contribution of data on lymphogranuloma venereum and antimicrobial resistance and reduced susceptibility in gonorrhea.

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 (2003 to 2012). Longer-term secular trends and international comparisons are presented for context.

Chlamydia. Chlamydia continues to be the most commonly reported STI in Canada. Between 2003 and 2012, rates of reported cases of chlamydia increased by 57.6%, from 189.6 to 298.7 per 100,000. Rates increased in both sexes and across all age groups, with the highest relative rate increase occurring among males. In 2012, accordant with previous reports' findings, the rate of reported cases of chlamydia among females (383.5 per 100,000) was almost twice as high as that among males (212.0 per 100,000). In both males and females, rates of chlamydia were highest in those aged 20 to 24 years. There was significant variability in the rates of reported cases of chlamydia across Canada; rates above the national average were observed in the Northwest Territories, Manitoba, Saskatchewan, Yukon, and Alberta.

Gonorrhea. Between 2003 and 2012, the rate of reported cases of gonorrhea increased by 38.9%, from 26.0 to 36.2 per 100,000. Over this time frame, a greater relative rate increase was observed in females, though rates of gonorrhea increased in both sexes and across all age groups. In 2012, as in previous years, the rate of reported cases of gonorrhea was higher in males than females (41.4 vs. 31.0 per 100,000). Females between the ages of 15 and 24 years and males between the ages of 20 and 29 years accounted for the highest rates of gonorrhea in 2012. The highest rate of reported cases of gonorrhea was observed in the Northwest Territories.

Infectious syphilis. Rates of reported cases of infectious syphilis increased by 101.0% between 2003 and 2012, from 2.9 to 5.8 per 100,000. Over this time frame, rates increased among males by 128.3% and decreased among females by 40.9%. In 2012, as in previous years, the rate of reported cases of infectious syphilis in males was markedly higher than that in females (11.0 vs. 0.5 per 100,000). In males, rates of infectious syphilis were highest among those aged 25 to 29; in females, rates were highest among those aged 20 to 24. In 2012, infectious syphilis rates varied geographically, and the highest rates occurred in Quebec.

Reported cases and rates (per 100,000 population) of chlamydia, gonorrhea, and infectious syphilis, 2003 and 2012, Canada

	CHLAMYDIA		GONORRHEA		INFECTIOUS SYPHILIS	
YEAR	CASES	RATES	CASES	RATES	CASES	RATES
2003	59,983	189.6	8,241	26.0	908	2.9
2012	103,716	298.7	12,561	36.2	2,003	5.8

Increases in reportable STI rates in recent years have been similarly observed in Australia, England and the United States. As in Canada, chlamydia was the most commonly reported STI in 2012 and rates were considerably higher among females as compared to males in all three

countries. Gonorrhea patterns across the four countries were more varied; in Australia and England, the gonorrhea rates in males were more than double those in females, while the difference between sexes in Canada and the United States was less pronounced. Consistent with 2012 findings in Canada, rates of reported cases of infectious syphilis were substantially higher among males than females in all three countries. 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 reportable STIs have increased 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 identified. 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 http://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

Between 1991 and 1997, the rate of reported cases of chlamydia decreased steadily among both males and females, after which rates began to rise and continued to do so (Figure 1). In 2012, 103,716 cases of chlamydia were reported, corresponding to a rate of 298.7 per 100,000. The 2012 rate was a 57.6% increase from the rate of 189.6 per 100,000 in 2003. Among males, rates increased by 74.8%, from 121.3 to 212.0 per 100,000; among females, they increased by 49.5%, from 256.5 to 383.5 per 100,000.

Trends by Age Group and Sex

Historically, rates of reported cases of chlamydia in females have been substantially higher than corresponding rates in males (Figure 1). In 2012, rates were almost twice as high among females as compared to males and the majority (80.2%) of reported chlamydia infections occurred in persons under 30 years. In 2012, the highest rates were reported among females aged 20 to 24, followed by females aged 15 to 19. Among males, the highest rates were also observed in the 20 to 24 age group, though rates in females were more than double the rates in males of this age (2151.7 per 100,000 vs. 1073.9 per 100,000, respectively). Among older age groups, the gap between sexes was less pronounced and even reversed; in 2012, the rates of reported cases were higher among men than women in those aged 40 to 59 and 60 and older (Figure 2).

Between 2003 and 2012, rates of reported cases of chlamydia increased steadily among both males and females aged 10 and above. Between 2003 and 2012, in males, the highest relative rate increase occurred among those aged 10 to 14 (167.0%) (Figure 3), while the highest relative rate increase in females occurred among those aged 60 and over (266.8%), followed by those aged 40 to 59 (190.9%) (Figure 4).

Trends by Province/Territory

In 2012, as in the previous year, the highest rate of reported cases of chlamydia was observed in the Northwest Territories (2193.9 per 100,000). Chlamydia rates above the national average of 298.7 per 100,000 were also observed in Manitoba, Saskatchewan, Yukon, and Alberta (527.1, 526.0, 485.6, and 398.8 per 100,000). Between 2003 and 2012, all provinces and territories experienced a relative increase in the rate of reported cases of chlamydia, with the exception of Yukon which experienced a relative rate decrease of 16.5%. The greatest relative rate increase was observed in Ontario (74.7%), followed by the Northwest Territories (71.0%) (Table 1).

1.2 LYMPHOGRANULOMA VENEREUM

Lymphogranuloma venereum (LGV) is an STI caused by *Chlamydia trachomatis* serovars L1, L2, L2b 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 serovar L2b 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 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 2012, 170 cases were reported to the Agency by provincial health authorities via case report forms (including 104 confirmed and 66 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. The NML has records for 128 confirmed cases, from 2004 to 2005 and from 2010 to 2012 (NML records from 2006 to 2009 were unavailable) (Table 2). All confirmed cases were male, and predominantly MSM.

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, some theories suggest that the increased rates may be only partially explained by a true increase in incidence and that the observed increases may also be reflective of 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 rates of reported cases of chlamydia. NAAT allows urine specimens to be used rather than swabs, which are easier to collect and more acceptable to patients. As a result, in addition to increased sensitivity, the number of people, particularly males, who go for testing has likely increased as well. More effective screening and contact tracing may have a similar effect (11,12). A recent estimation of chlamydia disease burden in Canada found that observed increases in chlamydia prevalence could be explained by effective case finding and expansion of screening programs (13).

Over time, the rate of reported cases of chlamydia has consistently been approximately twice as high in females as in males; however, this disparity is much more pronounced in younger age groups and among those aged 40 years and older, rates are higher among men. Younger women are biologically more susceptible to chlamydial infection due to a higher prevalence of cervical ectopy (14,15). In addition, women are more likely to be screened for STIs (16,17), while research has found that men have a tendency to delay seeking health care for any cause when needed (18).

Differences in STI screening behaviours across provinces and territories may also 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 Canadian jurisdictions, which may contribute to the high rate of reported cases of chlamydia infection observed in the territory (17).

The arrested immunity hypothesis, which posits that early diagnosis and treatment of chlamydial infections may actually impede the development of an effective immune response, may also partly explain rising rates of chlamydia. According to this hypothesis, in the absence of any change in behaviour, treated individuals that have not developed an immune response are susceptible to re-infection upon returning to their sexual networks (19). 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 (20), and in Finland, where reported rates of chlamydia have increased despite a decrease in seroprevalence (21).

High and continually increasing chlamydia rates have been observed worldwide. As in Canada, chlamydia was the most commonly reported bacterial STI in 2012 in the United States (22,23), Australia (24) and in England (25), countries that have similar socio-economic status and ethno-cultural makeup to Canada. Additionally, patterns in chlamydial infection (such as significantly higher rates in females than males) were similar across the four countries. However, there were some notable differences between countries, particularly in the magnitude of rates of reported cases. Compared to Canada's overall rate of 298.7 per 100,000, rates in Australia, England and the United States were significantly higher (355.1, 389.6, and 456.7 per 100,000, respectively). Differences in reported rates should be interpreted with caution due to inter-country differences in case definitions, reporting sources, screening programs and screening rates, age groupings, and other factors.

In Canada, cycle 2 of the Canadian Health Measures Survey (CHMS) (26) 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 (27). 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 by health care providers rather than a true decrease in incidence. The more recent increase in cases beginning in 2010 and continuing into 2012 was driven largely by improved case finding and reporting in British Columbia (28).

In all, it is difficult to identify what factors are most responsible for the observed increase in chlamydia rates in Canada. 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 (2,29).

FIGURE 1: Overall and sex-specific rates of reported chlamydia cases, 1991 to 2012, Canada

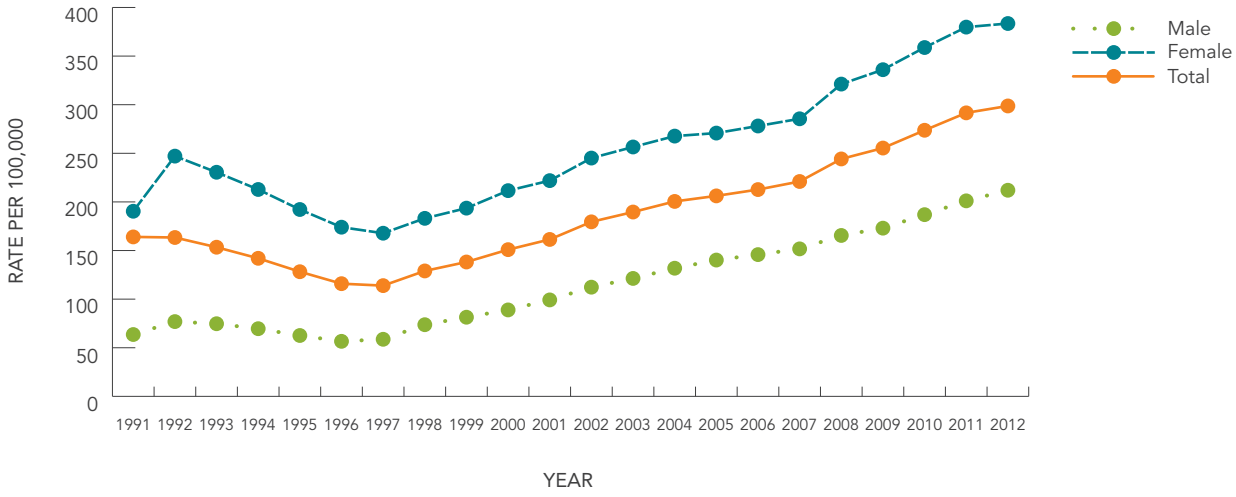


FIGURE 2: Rates of reported chlamydia cases by sex and age group, 2012, Canada

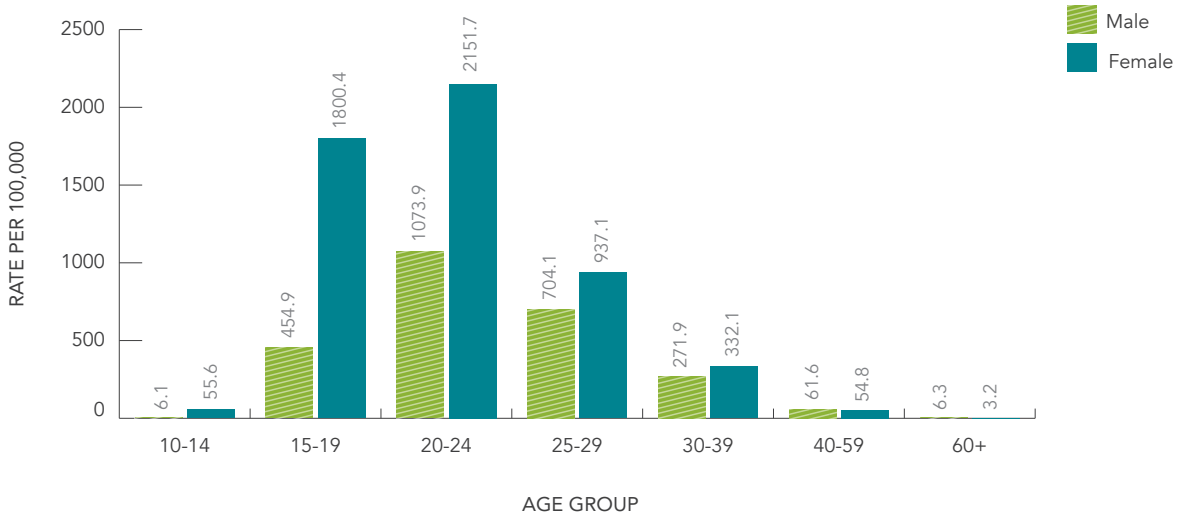


FIGURE 3: Rates of reported chlamydia in males by age group, 2003 to 2012, Canada

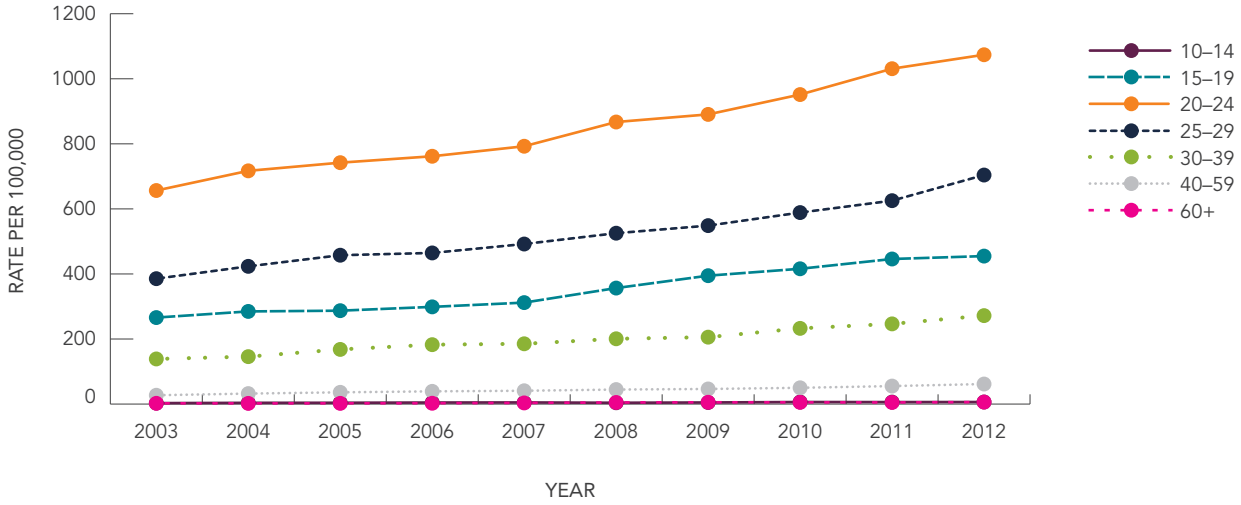


FIGURE 4: Rates of reported chlamydia in females by age group, 2003 to 2012, Canada

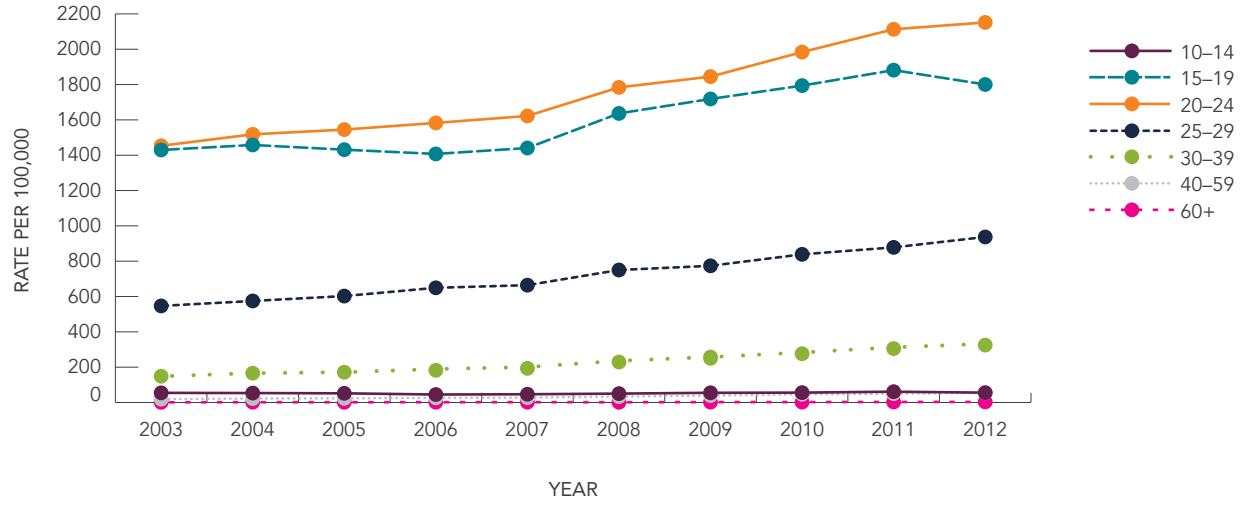


TABLE 1: Reported cases and corresponding rates of chlamydia by province/territory, 2003, and 2012, Canada

	NUMBER OF CASES		RATES PER 100,000		RATE CHANGE (%)[1]
JURISDICTION	2003	2012	2003	2012	2003–2012
Canada	**59,983**	**103,716**	**189.6**	**298.7**	**57.6**
BC	8,133	12,416	197.3	273.3	38.5
AB	7,902	15,509	248.2	398.8	60.7
SK	3,749	5,721	376.2	526.0	39.8
MB	3,688	6,589	316.9	527.1	66.3
ON	19,076	36,513	155.8	272.2	74.7
QC	12,212	20,169	163.1	249.5	52.9
NB	1,382	1,932	184.4	255.2	38.4
NS	1,552	2,613	165.5	276.5	67.0
PE	186	257	135.5	177.0	30.6
NL	642	864	123.8	164.0	32.5
YT	180	176	581.3	485.6	-16.5
NT	546	957	1282.9	2193.9	71.0
NU	735	§	2506.8	§	*

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

* The rate change cannot be quantified.

§ Data for Nunavut were not available for 2012.

TABLE 2: Reported confirmed and probable cases of lymphogranuloma venereum, 2004–2012, Canada

YEAR	CONFIRMED (NML)[1]	CONFIRMED (CASE REPORT FORM)[2]	PROBABLE (CASE REPORT FORM)[2]
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
2012	38	8	4
Total	**128**	**104**	**66**

[1] Data provided by the Viral Exanthemata and Sexually Transmitted Diseases Unit, National Microbiology Laboratory.

[2] Data provided by provincial health departments.

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 (30). 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

Between 1991 and 1997, Canada experienced a sharp decline in the rates of reported cases of gonorrhea, followed by a steady incline through to 2004, after which rates began to fluctuate between marginal increases and decreases, possibly indicative of a stabilization of gonorrhea incidence in Canada (Figure 5). In 2012, there were a total of 12,561 cases of gonorrhea reported, corresponding to a rate of 36.2 per 100,000. The 2012 rate was a 38.9% increase from the rate of 26.0 per 100,000 in 2003. Over this ten year time frame, rates increased among both males and females; males experienced a 29.1% relative rate increase while females experienced a 53.9% relative rate increase.

Trends by Age Group and Sex

Rates of reported cases of gonorrhea in 2012 were higher among females than males at younger ages (<25 years); in contrast, among older age groups (25 years plus), males exhibited higher rates of gonorrhea (Figure 6). As seen with chlamydia, the majority of gonorrhea cases were observed among individuals under the age of 30 (67.4%). In 2012, the highest rates of gonorrhea were observed among females aged 20 to 24, followed by females aged 15 to 19. In males, the highest rates of reported cases of gonorrhea were observed among those aged 20 to 24 years, followed by those aged 25 to 29 years (148.5 and 133.1 per 100,000, respectively).

Between 2003 and 2012, rates of reported cases of gonorrhea increased among both males and females aged 10 and above. The greatest relative rate increase observed among males was in those aged 10 to 14 years (262.0%), from 0.5 to 1.7 per 100,000 (Figure 7). Over this ten year time frame, the highest relative increase observed among females was in those aged 60 and over (188.0%, from 0.2 to 0.7 per 100,000), though females in this age group exhibited the lowest rate of gonorrhea as compared to females in other age groups (Figure 8).

Trends by Province/Territory

In 2012, as in the previous year, the rate of reported cases of gonorrhea was significantly higher in the Northwest Territories (440.2 per 100,000) as compared to other jurisdictions. Gonorrhea rates exceeding the national average of 36.2 per 100,000 were also observed in Manitoba, Saskatchewan and Alberta (107.9, 93.6 and 53.1 per 100,000, respectively) (Table 3). Between 2003 and 2012, all provinces and territories experienced a relative increase in the rate of the reported cases of gonorrhea, with the exception of Northwest Territories, Ontario and Nova Scotia. The greatest relative rate increase was observed in the Yukon (156.3%), from 9.7 to 24.8 per 100,000 (Table 3).

2.2 ANTIMICROBIAL RESISTANCE IN GONORRHEA

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 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 (31). 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 (32-35).

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. The most current data available (2012) showed that 30.3% of cultured strains were resistant to tetracycline, 28.52% to ciprofloxacin, 23.12% to erythromycin, 20.26% to penicillin, and 0.86% to azithromycin (Figure 9). There were no strains resistant to spectinomycin, cefixime, or ceftriaxone, though 2.2% of isolates were identified as having decreased susceptibility to cefixime and 5.5% were identified as having decreased susceptibility to ceftriaxone (36).

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 (36). Efforts are under way to conduct enhanced surveillance of AMR in gonorrhea, to provide an informative and representative picture of this issue in Canada.

2.3 SUMMARY

Although the rate of reported cases of gonorrhea in Canada 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 (12).

In contrast with chlamydia, observed rates of gonorrhea were higher in males overall, albeit with a smaller discrepancy between the sexes. Analysis of age and sex simultaneously demonstrates that like chlamydia, rates of reported cases of gonorrhea are much higher in females than males in younger age groups; however, rates become approximately equal at a younger age (20 to 24 years), and in those aged 25 years and older, male rates exceed those among females. Such differences may be partially explained by evidence that males are more likely to show signs of gonorrhea infection (37). Presence of symptoms likely influences care seeking behaviours and could contribute to the greater number of cases detected among males (37). In addition, increases in certain sex practices among MSM have been associated with increases in gonorrhea in this population (38,39).

The overall rates of reported cases of gonorrhea were substantially lower in Canada at 36.2 per 100,000 compared to the United States (107.5 per 100,000) (22,23), Australia (58.9 per 100,000) (24), and England (48.1 per 100,000) (25). There was considerable variability in the differences observed across sexes; in Australia and England, gonorrhea rates were more than twice as high among males as compared to females, while the differences between sexes in Canada and the United States were less pronounced.

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 (36,40,41). Emerging antimicrobial resistance in gonorrhea has led to changes in treatment recommendations across Canada and elsewhere (31,42-45). The potential for a link between antimicrobial resistance and rising rates of reported cases of gonorrhea is of utmost concern.

FIGURE 5: Overall and sex-specific rates of gonorrhea, 1991 to 2012, Canada

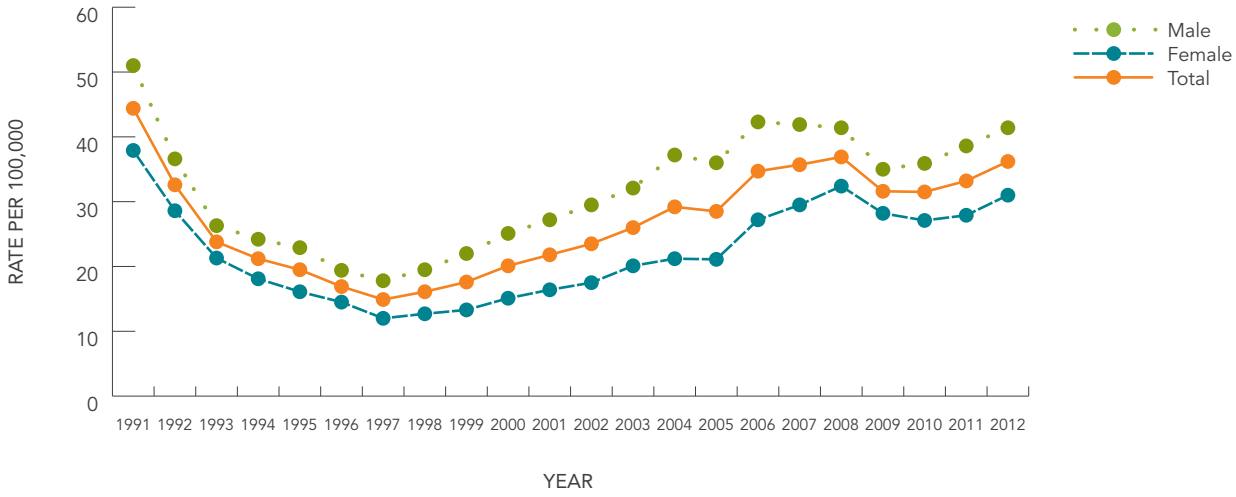


FIGURE 6: Rates of reported gonorrhea by sex and age group, 2012, Canada

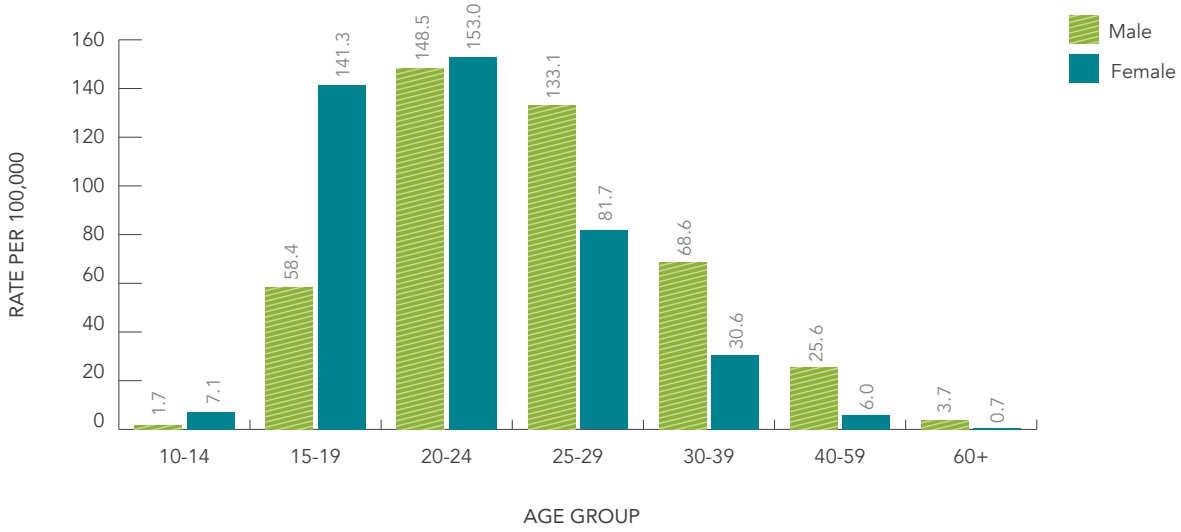


FIGURE 7: Rates of reported gonorrhea in males by age group, 2003 to 2012, Canada

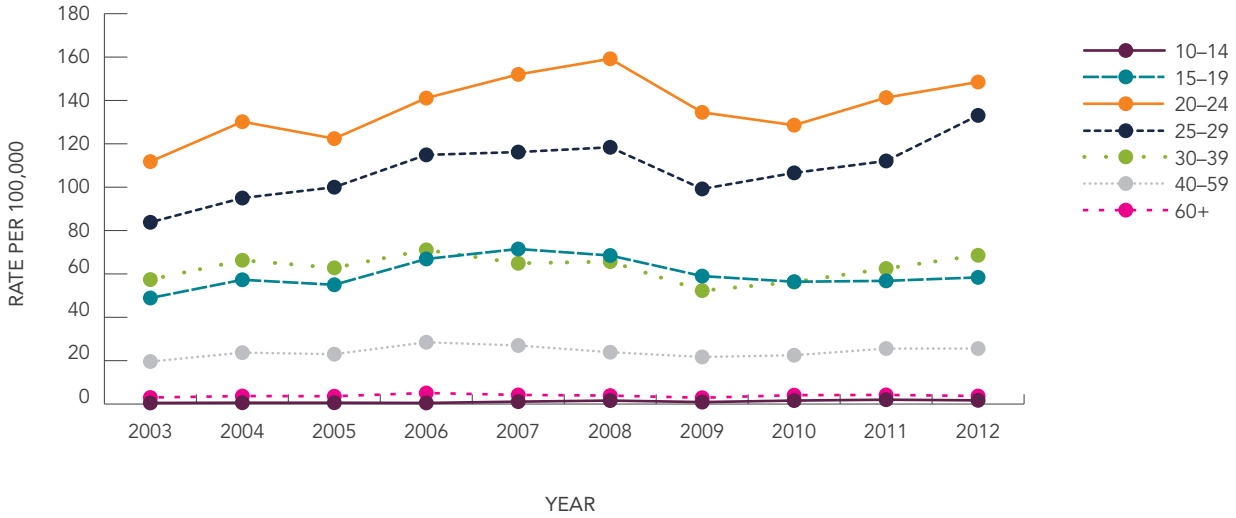


FIGURE 8: Rates of reported gonorrhea in females by age group, 2003 to 2012, Canada

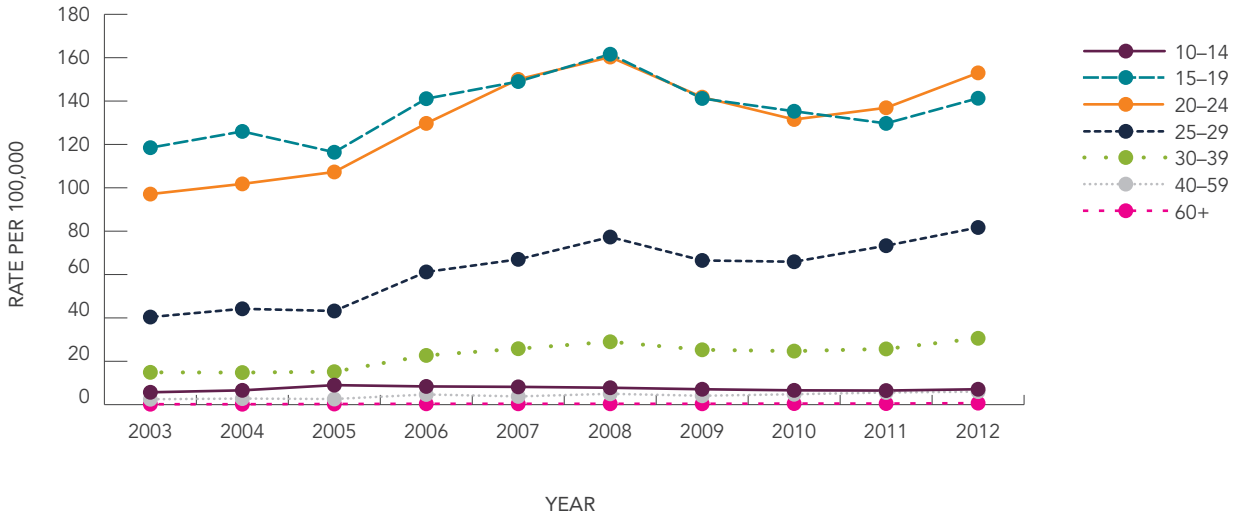


TABLE 3: Reported cases and corresponding rates of gonorrhea by province/territory, 2003, and 2012, Canada

	NUMBER OF CASES		RATES PER 100,000		RATE CHANGE (%)[1]
JURISDICTION	2003	2012	2003	2012	2003–2012
Canada	**8,241**	**12,561**	**26.0**	**36.2**	**38.9**
BC	688	1,419	16.7	31.2	87.1
AB	1,035	2,066	32.5	53.1	63.4
SK	544	1,018	54.6	93.6	71.5
MB	883	1,349	75.9	107.9	42.2
ON	3,791	4,097	31.0	30.5	-1.4
QC	872	2,230	11.6	27.6	136.8
NB	34	38	4.5	5.0	10.6
NS	118	119	12.6	12.6	-0.1
PE	–	8	–	5.5	*
NL	7	16	1.3	3.0	125.0
YT	3	9	9.7	24.8	156.3
NT	201	192	472.3	440.2	-6.8
NU	65	§	221.7	§	*

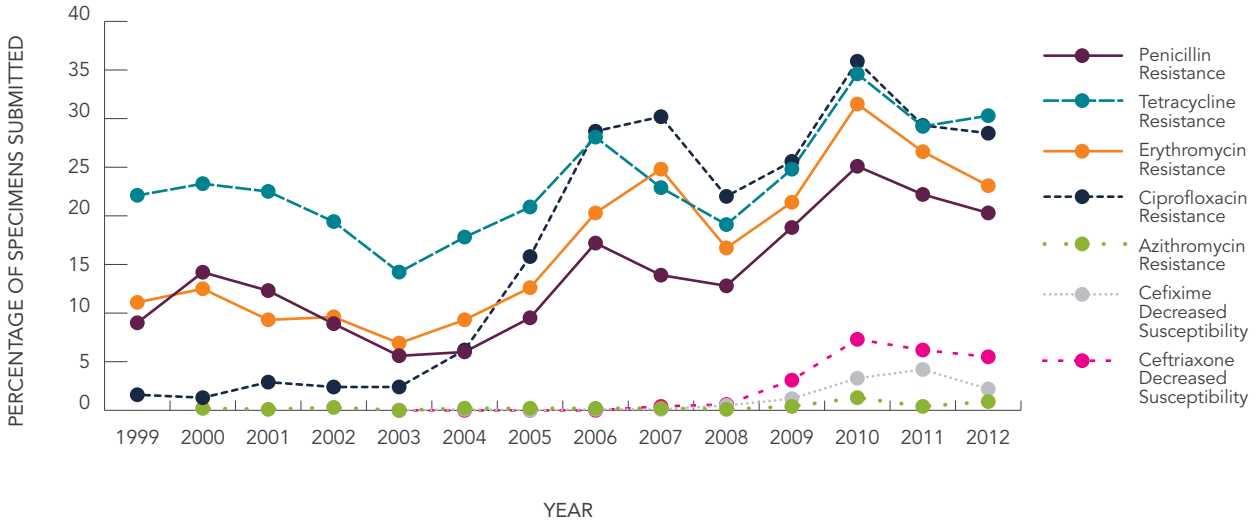
[1] Rate change calculated using unrounded numbers.

– Where counts for PE are less than 5, data have been suppressed at the request of PE.

* The rate change cannot be quantified.

§ Data for Nunavut were not available for 2012.

FIGURE 9: Antimicrobial resistance[1,2] of *Neisseria gonorrhoeae* strains tested in Canada, 1999 to 2012



[1] Percentages are calculated using the number of all cultures tested in each province/territory, including susceptible and resistant cultures, as the denominator.

[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 (46). 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 (47-49).

3.1 NATIONAL TRENDS

Trends over Time

From 1993 to 2001, rates of reported cases of infectious syphilis were very similar between males and females, with both sexes experiencing low rates over this time frame. In 2001, rates began to climb sharply, particularly among males; this trend continued through to 2012 (Figure 10). In 2012, 2003 cases of infectious syphilis were reported, corresponding to a rate of 5.8 per 100,000 and a 101.0% increase from the 2003 rate of 2.9 per 100,000. The majority of cases (94.9%) reported in 2012 were among men. Between 2003 and 2012, rates among males increased by 128.3% from 4.8 to 11.0 per 100,000; conversely, rates among females decreased by 40.9% from 0.9 to 0.5 per 100,000.

Trends by Age Group and Sex

As in previous years, in 2012, the majority (65.6%) of all reported cases of infectious syphilis were among men aged 30 years and older. The highest rates were among men aged 25 to 29 years, followed by men aged 20 to 24 years (21.5 and 21.2 per 100,000, respectively) (Figure 11). Among women, rates of reported cases of infectious syphilis were substantially lower; the highest rates among women were observed among those aged 20 to 24 years, followed by those aged 15 to 19 years (2.2 and 1.3 per 100,000, respectively).

Between 2003 and 2012, relative rate increases were observed in males of all age groups, with the exception of those the 10 to 14 age group where zero cases were reported in 2003 and 2012. The greatest relative rate increase occurred in males aged 15 to 19 years (731.2%, from 0.7 to 6.1 per 100,000), followed by males in the 20 to 24 age group (634.6%, from 2.9 to 21.2 per 100,000) (Figure 12). From 2003 to 2012, rates decreased among females of all ages, with the exception of those aged 0 to 14 where zero cases were reported and those in the 15 to 19 age group where rates increased by 12.1% from 1.2 to 1.3 per 100,000 (Figure 13). The greatest rate decrease among females was observed in those aged 25 to 29 years, whom experienced a relative decrease of 71.9%, from 3.3 to 0.9 per 100,000. Of note is that due to low number of infectious syphilis cases reported among females, rates are quite variable and thus relative rate changes should be interpreted with caution.

Trends by Province/Territory

In 2012, the rate of reported cases of infectious syphilis was highest in Quebec (8.4 per 100,000), followed by Nova Scotia (6.7 per 100,000) (Table 4).

The number of cases of infectious syphilis in Canada is low relative to other STIs and, as a result, population rates tend to be variable and unstable, thereby rendering it difficult to interpret changes over time. Between 2003 and 2012, rates of reported cases of infectious syphilis increased in all jurisdictions, with the exception of Yukon, British Columbia, Manitoba and Saskatchewan. Over this ten year period, outbreaks of infectious syphilis were reported across most jurisdictions in Canada.

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 in untreated women 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 in pregnancy (46). 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 (50,51).

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 (52). 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 less than 1 per 100,000 live births before 2005, after which a significant increase in rates was observed; an apex of 2.6 per 100,000 live births was observed in 2009. Data suggest that the increase in reported congenital syphilis cases observed over this time frame was linked to outbreaks of infectious syphilis among heterosexuals in corresponding regions across Canada (53). Since 2009, occurrences of congenital syphilis have declined, reaching a rate of 0.8 per 100,000 live births in 2011; in 2012, three cases of congenital syphilis were reported nationally, however, due to the unavailability of live birth data at the time of publication, a rate could not be calculated (Table 5).

3.3 SUMMARY

After years of near-zero incidence of infectious syphilis, in 2001, rates of reported cases of infectious syphilis began to increase dramatically and continue to do so. 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 (39,54-56). 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 (54).

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 (57-59). 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 (60,61).

Heterosexual outbreaks of syphilis have been observed mainly among sex workers and their clients, and street-involved people (56,62,63). 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 (46). Currently, congenital syphilis rates appear to be reaching pre-2005 levels, an encouraging trend that will continue to be monitored over time.

Making comparisons in infectious syphilis rates internationally is complicated by differences in surveillance practices. In the United States, only cases of primary and secondary infection are included in annual rates. 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. In England and Australia, early latent syphilis is defined as an asymptomatic individual with syphilis who has acquired the infection in the past 2 years; in Canada and the United States, the individual must have acquired the infection in the last 1 year to be considered early latent.

Overall rates of infectious syphilis were lowest in the United States (5.0 per 100,000) (22,23), although this estimate does not include early latent cases. For countries that included early latent syphilis cases, Australia had the highest rate (6.7 per 100,000) (24), while in England the rate was 5.6 per 100,000 (25) compared to Canada's rate of 5.8 per 100,000. Due to differences in reporting practices, differences in annual rates of infectious syphilis across countries should be interpreted with caution.

FIGURE 10: Reported overall and sex-specific rates of infectious syphilis, 1993 to 2012, Canada

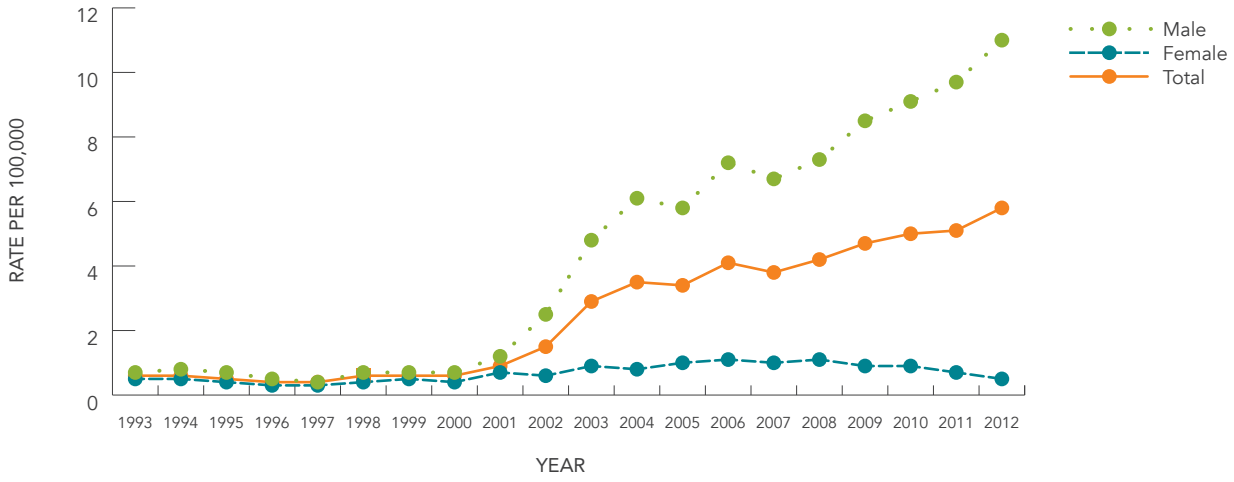


FIGURE 11: Rates of reported infectious syphilis by sex and age group, 2012, Canada

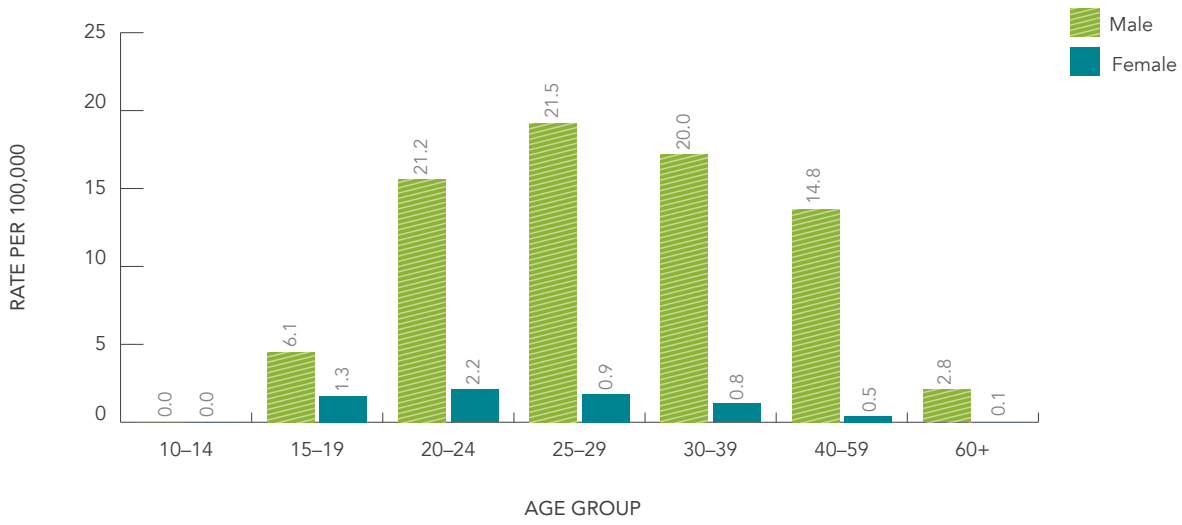


FIGURE 12: Rates of reported infectious syphilis in males by age group, 2003 to 2012, Canada

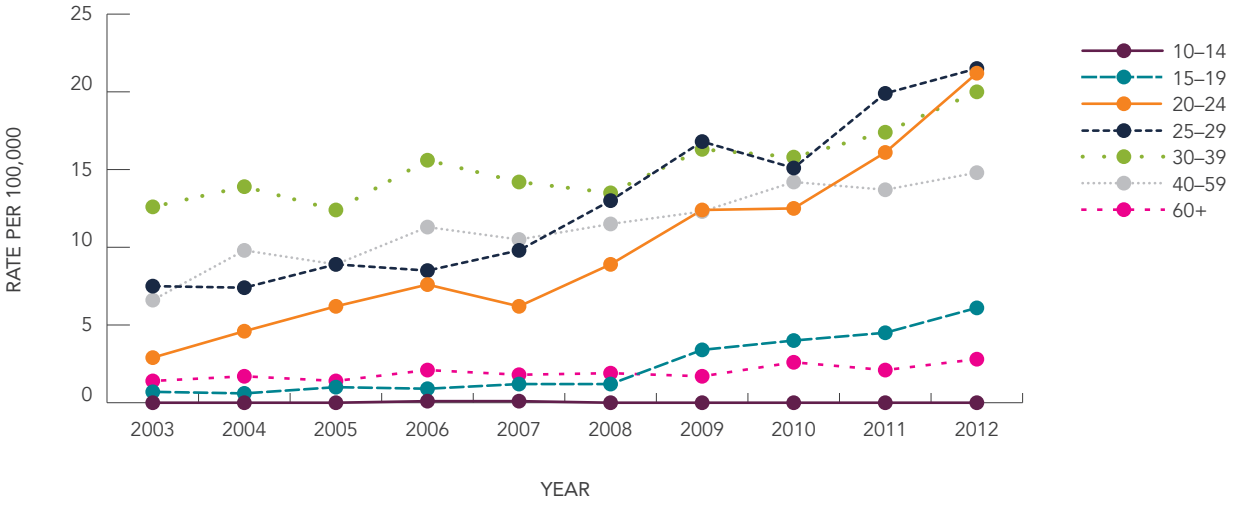


FIGURE 13: Rates of reported infectious syphilis in females by age group, 2003 to 2012, Canada

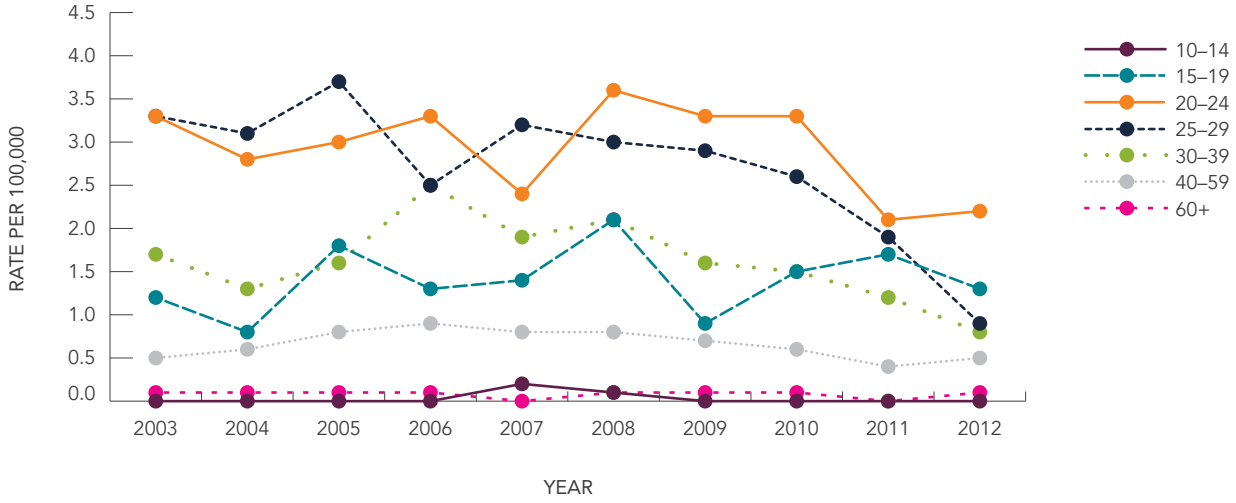


TABLE 4: Reported cases and corresponding rates of infectious syphilis by province/territory, 2003 and 2012, Canada

	NUMBER OF CASES		RATES PER 100,000		RATE CHANGE (%)[1]
JURISDICTION	2003	2012	2003	2012	2003–2012
Canada	**908**	**2,003**	**2.9**	**5.8**	**101.0**
BC	262	268	6.4	5.9	-7.2
AB	42	127	1.3	3.3	147.5
SK	6	6	0.6	0.6	-8.4
MB	37	25	3.2	2.0	-37.1
ON	386	799	3.2	6.0	88.9
QC	154	682	2.1	8.4	310.1
NB	4	21	0.5	2.8	419.7
NS	10	63	1.1	6.7	524.2
PE	–	–	–	–	*
NL	1	9	0.2	1.7	785.8
YT	5	1	16.1	2.8	-82.9
NT	1	2	2.3	4.6	95.1
NU	0	§	0.0	§	*

[1] Rate change calculated using unrounded numbers.

– Where counts for PE are less than 5, data have been suppressed at the request of PE.

* The rate change cannot be quantified.

§ Data for Nunavut were not available for 2012.

TABLE 5: Reported cases and corresponding rates of confirmed early congenital syphilis[1], 2003 to 2012, Canada

YEAR	TOTAL REPORTED CASES	RATE (PER 100,000 LIVE BIRTHS)[2]
2003	2	0.597
2004	0	0
2005	8	2.338
2006	7	1.974
2007	8	2.179
2008	6	1.591
2009	10	2.632
2010	6	1.594
2011	3	0.796
2012	3	N/A[3]

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

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

[3] Statistics Canada Canadian Vital Statistics data 2012 not yet available; rates could not be calculated.

* 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.

APPENDIX A: TECHNICAL NOTES

Case definitions: Case definitions for communicable diseases under national surveillance can be found online at http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/index-eng.php.

Reporting formats: Currently, some jurisdictions report to the Agency using aggregate counts instead of 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.

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.

Data sources

Canadian Notifiable Disease Surveillance System (CNDSS): The CNDSS contains data on nationally notifiable infectious diseases reported by provincial and territorial health authorities. 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. 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.

LGV enhanced surveillance system: 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 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.

National *Neisseria gonorrhoeae* Surveillance Program: Provincial public health laboratories voluntarily submit *N. gonorrhoeae* isolates to the NML when the provincial laboratories identify resistance to at least one antibiotic or if the provincial laboratories do not perform any antimicrobial susceptibility testing. The total number of isolates cultured in each province is used as the denominator for proportion resistance calculations.

Population denominators: 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, and 2012 updated postcensal estimates.

Live birth data: Statistics Canada, Canadian Vital Statistics, Birth Database, 2005-2012.

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

TABLE 6: Reported cases and rates[1] of chlamydia by province/territory and sex, 2003 to 2012[2]

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
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
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

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
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
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

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
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
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	73.0	101.0	152.1	167.0	154.2	196.7	386.6	359.5	258.6	178.4	491.8	1432.6		201.1
		Female	188.0	202.1	365.7	342.3	322.2	347.8	700.6	682.8	491.0	343.3	693.4	2372.0		379.8
		Total	131.2	152.7	260.9	255.6	239.4	274.0	544.9	520.8	373.4	261.5	590.4	1889.6		291.6

YEAR		SEX	CHLAMYDIA													
			NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[3]	TOTAL
2012	Cases	Male	277	75	774	618	6657	13309	2299	1989	5584	4439	69	391		36481
		Female	587	182	1838	1314	13466	23183	4290	3731	9925	7966	107	566		67155
		Unspecified[4]	0	0	1	0	46	21	0	1	0	11	0	0		80
		Total	864	257	2613	1932	20169	36513	6589	5721	15509	12416	176	957		103716
	Rates[5]	Male	106.6	105.9	166.9	165.0	165.9	202.0	370.5	363.8	283.1	196.6	372.8	1749.0		212.0
		Female	219.9	244.8	381.9	343.5	330.8	339.7	681.5	689.9	517.9	348.6	603.3	2661.7		383.5
		Total	164.0	177.0	276.5	255.2	249.5	272.2	527.1	526.0	398.8	273.3	485.6	2193.9		298.7

[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 final postcensal estimates, 2012 updated postcensal estimates)

[2] 2011 and 2012 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of January 2014.

[3] Data reported by Nunavut prior to 2007 are preliminary. 2007-2012 Nunavut data are not available.

[4] Unspecified sex includes transgender cases.

[5] 2007-2012 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, 2014.

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 7: Reported cases and rates[1] of chlamydia by age group and sex, 2003 to 2012[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
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
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

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
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
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

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
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
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	6.2	0.0	0.1	5.0	437.2	1066.3	645.7	249.4	55.2	6.1		201.1
		Female	6.0	0.0	0.6	60.8	1847.8	2126.1	886.2	313.9	50.0	3.0		379.8
		Total	6.1	0.0	0.3	32.1	1126.0	1590.1	766.4	281.9	52.8	4.4		291.6

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
2012[4]	Cases	Male	5	0	0	59	5168	13099	8446	6334	3141	210	19	36481
		Female	2	4	5	509	19361	25417	11157	7778	2781	123	18	67155
		Unspecified[3]	0	0	0	0	6	16	8	4	7	0	39	80
		Total	7	4	5	568	24535	38532	19611	14116	5929	333	76	103716
	Rates	Male	2.6	0.0	0.0	6.1	454.9	1073.9	704.1	271.9	61.6	6.3		212.0
		Female	1.1	0.5	0.6	55.6	1800.4	2151.7	937.1	332.1	54.8	3.2		383.5
		Total	1.9	0.3	0.3	30.1	1109.4	1604.8	820.5	302.2	58.3	4.6		298.7

[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 final postcensal estimates, 2012 updated postcensal estimates).

[2] 2011 and 2012 data are preliminary and changes are anticipated. Data reported by Nunavut prior to 2007 are preliminary. Data were verified with provinces and territories as of January 2014.

[3] Unspecified sex includes transgender cases.

[4] 2007–2012 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, 2014.

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 gonorrhea by province/territory and sex, 2003 to 2012[2]

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2003	Cases	Male	7	0	55	15	663	2381	419	239	602	506	1	110	27	5025
		Female	0	0	63	19	205	1409	464	305	433	181	2	91	38	3210
		Unspecified	0	0	0	0	4	1	0	0	0	1	0	0	0	6
		Total	7	0	118	34	872	3791	883	544	1035	688	3	201	65	8241
	Rates	Male	2.7	0.0	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	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	0.0	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	5888
		Female	0	-	69	7	147	1479	543	366	508	205	20	60	15	3422
		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	9317
	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
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

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2006	Cases	Male	7	0	58	20	906	2428	844	414	1298	723	4	79	54	6835
		Female	1	0	41	12	364	1416	734	540	850	354	7	102	48	4469
		Unspecified[5]	0	0	0	0	2	2	0	0	1	1	0	0	0	6
		Total	8	0	99	32	1272	3846	1578	954	2149	1078	11	181	102	11310
	Rates	Male	2.8	0.0	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	0.0	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	0.0	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
2008	Cases	Male	13	-	72	14	1054	2235	616	548	1231	893	7	156		6840
		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	13	-	143	28	1650	3872	1365	1334	2127	1429	17	299		12281
	Rates[6]	Male	5.2	-	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	2.6	-	15.3	3.7	21.3	29.9	113.2	131.6	59.2	32.6	51.3	684.5		36.9

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
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		4795
		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		10656
	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	0	38	39	1364	2196	435	316	629	922	17	109		6074
		Female	3	0	62	25	690	1767	547	447	553	441	14	110		4659
		Unspecified[5]	0	0	0	0	4	3	0	0	0	3	0	0		10
		Total	12	0	100	64	2058	3966	982	763	1182	1366	31	219		10743
	Rates[6]	Male	3.6	0.0	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	0.0	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	0.0	10.6	8.5	26.0	30.0	79.5	73.1	31.8	30.2	89.7	499.7		31.5
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	3.9	10.0	11.7	9.4	29.7	36.8	73.7	61.1	44.2	52.7	11.1	291.0		38.6
		Female	6.0	5.4	10.0	7.6	17.2	26.6	97.1	81.1	35.3	20.7	23.1	363.8		27.9
		Total	5.0	7.6	10.8	8.5	23.5	31.6	85.5	71.1	39.8	36.7	16.9	326.4		33.2

YEAR		SEX	GONORRHEA													
			NL	PE[3]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[4]	TOTAL
2012	Cases	Male	9	3	73	26	1424	2385	611	444	1098	959	4	85		7121
		Female	7	5	46	12	797	1705	738	574	968	456	5	107		5420
		Unspecified[5]	0	0	0	0	9	7	0	0	0	4	0	0		20
		Total	16	8	119	38	2230	4097	1349	1018	2066	1419	9	192		12561
	Rates[6]	Male	3.5	4.2	15.7	6.9	35.5	36.2	98.5	81.2	55.7	42.5	21.6	380.2		41.4
		Female	2.6	6.7	9.6	3.1	19.6	25.0	117.2	106.1	50.5	20.0	28.2	503.2		31.0
		Total	3.0	5.5	12.6	5.0	27.6	30.5	107.9	93.6	53.1	31.2	24.8	440.2		36.2

[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 final postcensal estimates, 2012 updated postcensal estimates).

[2] 2011 and 2012 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of January 2014.

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

[4] Data reported by Nunavut prior to 2007 are preliminary. 2007-2012 Nunavut data are not available.

[5] Unspecified sex includes transgender cases.

[6] 2007-2012 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, 2014.

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 age group and sex, 2003 to 2012[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
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
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

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
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
2008[4]	Cases	Male	0	0	4	16	791	1866	1364	1493	1192	113	1	6840
		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	2567	3651	2241	2145	1442	126	4	12281
	Rates	Male	0.0	0.0	0.4	1.6	68.5	159.2	118.4	65.7	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	113.9	159.8	98.1	47.5	14.4	2.0		36.9

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
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
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	2.0	56.8	141.3	112.1	62.5	25.6	4.2		38.6
		Female	0.5	0.1	0.1	6.5	129.7	136.9	73.3	25.7	5.6	0.5		27.9
		Total	0.3	0.1	0.1	4.2	92.5	139.3	92.9	44.1	15.6	2.2		33.2

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
2012[4]	Cases	Male	1	0	0	16	663	1811	1596	1598	1308	122	6	7121
		Female	1	2	5	65	1519	1807	973	716	303	26	3	5420
		Unspecified[3]	0	0	0	1	0	7	2	2	3	0	5	20
		Total	2	2	5	82	2182	3625	2571	2316	1614	148	14	12561
	Rates	Male	0.5	0.0	0.0	1.7	58.4	148.5	133.1	68.6	25.6	3.7		41.4
		Female	0.5	0.3	0.6	7.1	141.3	153.0	81.7	30.6	6.0	0.7		31.0
		Total	0.5	0.1	0.3	4.3	98.7	151.0	107.6	49.6	15.9	2.0		36.2

[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 final postcensal estimates, 2012 updated postcensal estimates).

[2] 2011 and 2012 data are preliminary and changes are anticipated. Data reported by Nunavut prior to 2007 are preliminary. Data were verified with provinces and territories as of January 2014.

[3] Unspecified sex includes transgender cases.

[4] 2007-2012 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, 2014.

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 infectious syphilis[2] by province/territory and sex, 2003 to 2012[3]

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2003	Cases	Male	1	0	10	3	148	362	21	5	33	172	3	0	0	758
		Female	0	0	0	1	5	24	16	1	9	89	2	1	0	148
		Unspecified	0	0	0	0	1	0	0	0	0	1	0	0	0	2
		Total	1	0	10	4	154	386	37	6	42	262	5	1	0	908
	Rates	Male	0.4	0.0	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	0.0	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	0.0	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	0	14	3	218	428	17	2	58	227	1	1	0	969
		Female	0	0	0	1	14	16	6	0	16	78	0	1	1	133
		Unspecified	0	0	0	0	1	1	0	0	0	0	0	0	0	2
		Total	0	0	14	4	233	445	23	2	74	305	1	2	1	1104
	Rates	Male	0.0	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	0.0	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	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
2005	Cases	Male	2	0	2	1	249	338	47	1	85	202	1	0	0	928
		Female	0	0	0	0	8	19	4	1	51	85	0	0	0	168
		Unspecified[6]	0	0	0	0	0	0	0	0	0	1	0	0	0	1
		Total	2	0	2	1	257	357	51	2	136	288	1	0	0	1097
	Rates	Male	0.8	0.0	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	0.0	0.2	0.3	0.7	0.2	3.1	4.0	0.0	0.0	0.0	1.0
		Total	0.4	0.0	0.2	0.1	3.4	2.8	4.3	0.2	4.1	6.9	3.1	0.0	0.0	3.4

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2006	Cases	Male	0	0	2	0	367	343	26	14	151	254	0	0	0	1157
		Female	0	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	0
		Total	0	0	2	0	373	369	26	17	218	331	0	0	0	1336
	Rates	Male	0.0	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	0.0	0.2	0.4	0.0	0.6	4.0	3.6	0.0	0.0	0.0	1.1
		Total	0.0	0.0	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
2008	Cases	Male	6	0	0	5	368	415	10	8	144	218	0	26		1200
		Female	2	0	0	1	8	34	3	4	101	16	0	21		190
		Unspecified[6]	0	0	0	0	1	1	0	0	0	1	0	0		3
		Total	8	0	0	6	377	450	13	12	245	235	0	47		1393
	Rates[7]	Male	2.4	0.0	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	0.0	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	0.0	0.8	4.9	3.5	1.1	1.2	6.8	5.4	0.0	107.6		4.2

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2009	Cases	Male	3	0	23	8	357	689	5	15	189	119	0	19		1427
		Female	0	0	1	1	16	22	0	6	90	7	0	14		157
		Unspecified[6]	0	0	0	0	1	0	0	0	0	0	0	0		1
		Total	3	0	24	9	374	711	5	21	279	126	0	33		1585
	Rates[7]	Male	1.2	0.0	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	0.0	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	0.0	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	0	17	32	519	728	9	26	118	90	0	1		1544
		Female	0	0	1	2	26	46	8	10	55	2	0	2		152
		Unspecified[6]	0	0	0	0	2	0	0	0	0	0	0	0		2
		Total	4	0	18	34	547	774	17	36	173	92	0	3		1698
	Rates[7]	Male	1.6	0.0	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	0.0	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	0.0	1.9	4.5	6.9	5.9	1.4	3.4	4.6	2.0	0.0	6.8		5.0
2011	Cases	Male	4	0	36	46	613	736	13	8	65	122	0	0		1643
		Female	1	0	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		0
		Total	5	0	36	50	638	767	16	23	94	128	0	0		1757
	Rates[7]	Male	1.5	0.0	7.8	12.3	15.4	11.3	2.1	1.5	3.4	5.5	0.0	0.0		9.7
		Female	0.4	0.0	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	0.0	3.8	6.6	8.0	5.8	1.3	2.2	2.5	2.8	0.0	0.0		5.1

YEAR		SEX	INFECTIOUS SYPHILIS[2]													
			NL	PE[4]	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU[5]	TOTAL
2012	Cases	Male	8	0	62	17	649	773	22	1	105	260	1	2		1900
		Female	1	0	1	4	28	25	3	5	22	7	0	0		96
		Unspecified[6]	0	0	0	0	5	1	0	0	0	1	0	0		7
		Total	9	0	63	21	682	799	25	6	127	268	1	2		2003
	Rates[7]	Male	3.1	0.0	13.4	4.5	16.2	11.7	3.5	0.2	5.3	11.5	5.4	8.9		11.0
		Female	0.4	0.0	0.2	1.0	0.7	0.4	0.5	0.9	1.1	0.3	0.0	0.0		0.5
		Total	1.7	0.0	6.7	2.8	8.4	6.0	2.0	0.6	3.3	5.9	2.8	4.6		5.8

[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 final postcensal estimates, 2012 updated postcensal estimates).

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

[3] 2011 and 2012 data are preliminary and changes are anticipated. Data were verified with provinces and territories as of January 2014.

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

[5] Data reported by Nunavut prior to 2007 are preliminary. 2007-2012 Nunavut data are not available.

[6] Unspecified sex includes transgender cases.

[7] 2007-2012 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, 2014.

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 age group and sex, 2003 to 2012[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
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
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

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
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
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

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
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
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	16.1	19.9	17.4	13.7	2.1		9.7
		Female	0.0	0.0	0.0	0.0	1.7	2.1	1.9	1.2	0.4	0.0		0.7
		Total	0.0	0.0	0.0	0.0	3.1	9.2	10.9	9.3	7.1	1.0		5.1

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
2012[5]	Cases	Male	0	0	0	0	69	258	258	465	754	94	2	1900
		Female	0	0	0	0	14	26	11	18	25	2	0	96
		Unspecified[4]	0	0	0	0	1	2	2	0	0	0	2	7
		Total	0	0	0	0	84	286	271	483	779	96	4	2003
	Rates	Male	0.0	0.0	0.0	0.0	6.1	21.2	21.5	20.0	14.8	2.8		11.0
		Female	0.0	0.0	0.0	0.0	1.3	2.2	0.9	0.8	0.5	0.1		0.5
		Total	0.0	0.0	0.0	0.0	3.8	11.9	11.3	10.3	7.7	1.3		5.8

[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 final postcensal estimates, 2012 updated postcensal estimates).

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

[3] 2011 and 2012 data are preliminary and changes are anticipated. Data reported by Nunavut prior to 2007 are preliminary. Data were verified with provinces and territories as of January 2014.

[4] Unspecified sex includes transgender cases.

[5] 2007-2012 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, 2014.

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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