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BRIEF REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA: 2006

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

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— Public Health Agency of Canada

Brief Report on Sexually Transmitted Infections in Canada: 2006

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BRIEF REPORT ON SEXUALLY TRANSMITTED INFECTIONS IN CANADA

2006

Information to the readers of a Brief Report of Sexually Transmitted Infections in Canada: 2006

This brief report is intended to provide an overview of case reports and trends in the three nationally reportable bacterial STIs (chlamydia, gonorrhea, and infectious syphilis) between January 1, 1997 and December 31, 2006. The surveillance information in this report is based on two main data sources: 1) case reports to the Public Health Agency of Canada from provinces and territories on chlamydia, gonorrhea, and infectious syphilis; and 2) Canadian gonococcal resistance surveillance, a collaborative effort between the Public Health Agency of Canada (PHAC) and provincial and territorial laboratories.

This brief report consists of three parts corresponding to the three nationally reportable bacterial STIs. The accompanying text identifies major findings and trends in each of these three bacterial STIs. The tables and figures are embedded in the text and supersede those in earlier publications of these data. Technical notes and explanatory details specific to provincial or territorial surveillance data are located at the end of this report.

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

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

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

- Local public health units across the country with their continued commitment to collecting the data that form the basis of national surveillance;
- The Notifiable Disease Section, Surveillance and Risk Assessment Division, Public Health Agency of Canada, which is responsible for maintaining the National Notifiable Disease Surveillance System from which counts of bacterial STIs are derived;
- The National Microbiology Laboratory, Public Health Agency of Canada, which provided the data on antibiotic-resistant gonorrhea;
- The Federal Field Surveillance Officers who assist with data quality improvements and provide ongoing support to the Community Acquired Infections Division;
- The Scientific Publications and Multimedia Services Division, Public Health Agency of Canada.

Production of this brief report and previous surveillance reports would not have been possible without the valuable input of Dr. Tom Wong.



CHLAMYDIA

(Chlamydia trachomatis)

Brief Report on Sexually Transmitted Infections in Canada: 2006

This overview summarises data collected through routine surveillance for three nationally notifiable sexually transmitted infections: chlamydia, gonorrhea, and syphilis. Several observations for 2006 are noteworthy.

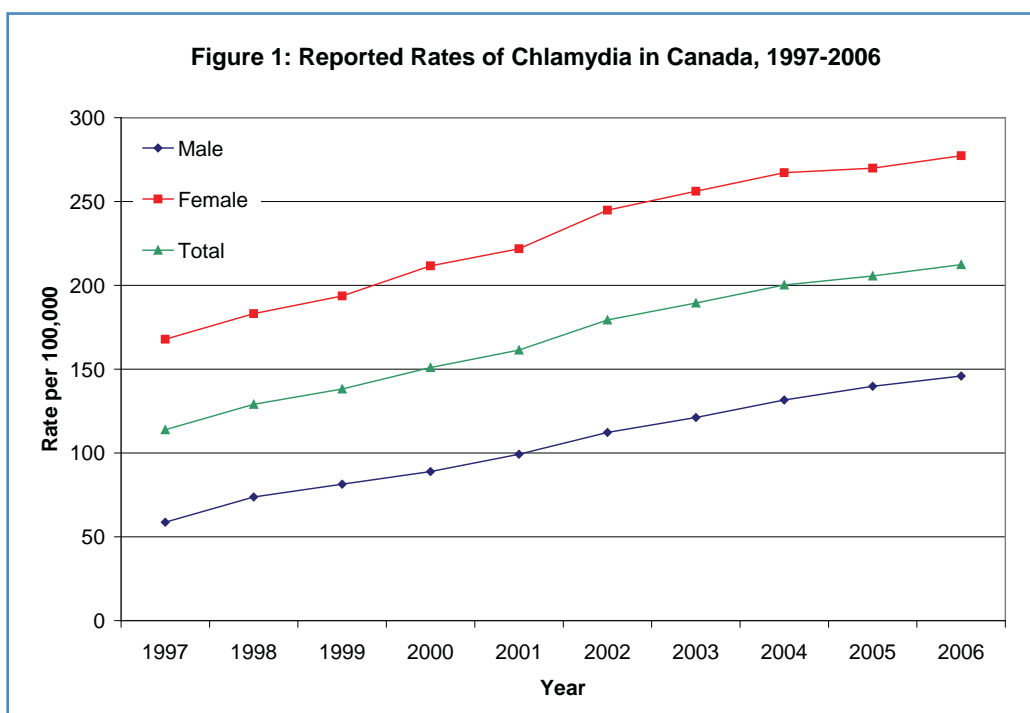
Chlamydia (*Chlamydia trachomatis*)

Chlamydia trachomatis infections, nationally notifiable since 1990, are the most commonly reported sexually transmitted infection (STI) in Canada. *C. trachomatis* serovars D to K cause infection in the genital and anal regions. Serovars L1, L2 and L3 cause the infection lymphogranuloma venereum (LGV), which is not routinely reportable but is under enhanced surveillance. Refer to <http://www.phac-aspc.gc.ca/publicat/lgv/index-eng.php> for more information on LGV.

Because genital chlamydia disproportionately affects a younger population, particularly females, the consequences of untreated infection are of concern. Sequelae for women include pelvic inflammatory disease (PID), which can lead to chronic pelvic pain, ectopic pregnancy, and infertility. Pregnant women may transmit the infection to their infant, causing conjunctivitis or pneumonia. Less frequently, males develop epididymo-orchitis or other less common conditions¹. Chlamydia can increase the concentration of cells in genital secretions that can serve as targets for HIV thereby increasing the risk of acquisition and/or transmission of HIV².

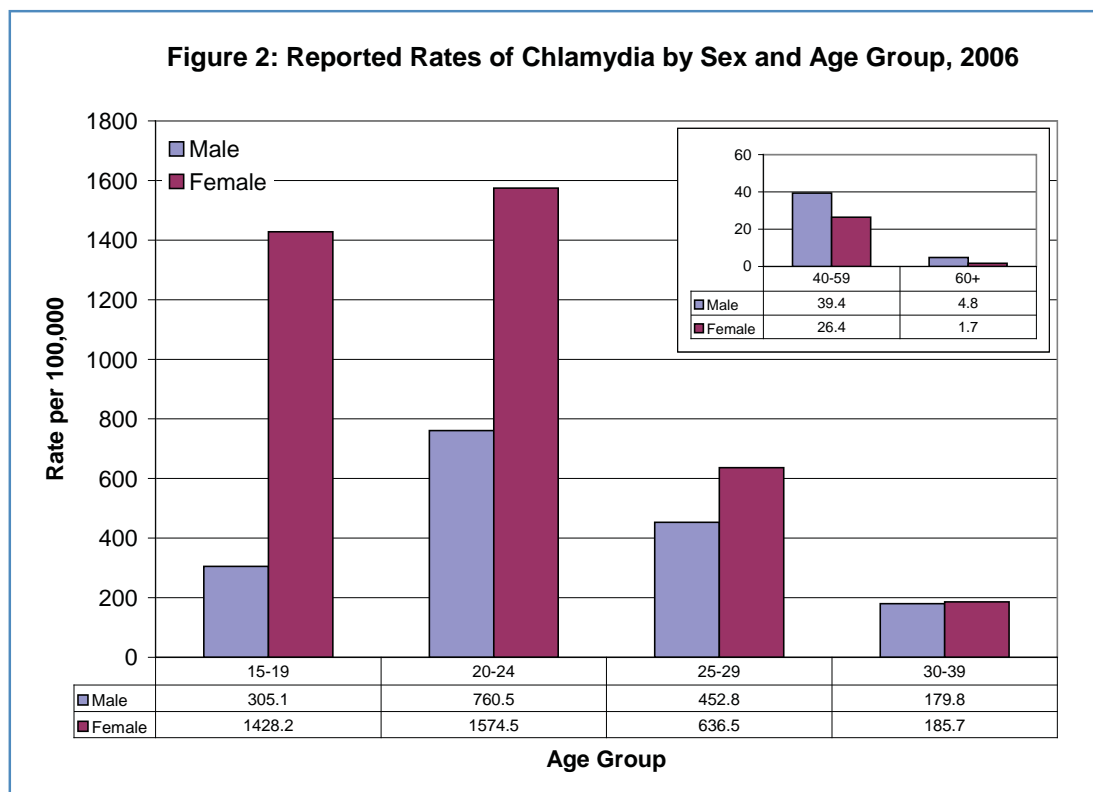
The reported rate of chlamydia infection is increasing in Canada, particularly among males.

- In 2006, 69,938 cases of chlamydia infection were reported, corresponding to a rate of 212.4 per 100,000 (Figure 1). The overall rate in 2006 increased by 3.3% from 2005 and by 86.4% since 1997.
- Between 1997 and 2006, reported rates of chlamydia infection in males increased by 148.6% (from 58.7 to 145.9 per 100,000) compared with a 65.3% increase in women during the same time period (167.8 to 277.3 per 100,000) (Figure 1).



Reported rates of chlamydia infection are highest among the younger population, particularly females.

- In 2006, the overall rate of reported chlamydia infections among women was 277.4 per 100,000, almost twice as high as the reported rate among men (145.9 per 100,000) (Figure 2).
- In 2006, the majority of reported chlamydia cases (82.8%) were in the under-30 age group (Figure 2). This is in contrast to gonorrhea and syphilis in which the same age group accounts for 65% and 20% of reported cases.
- Among women, the highest age-specific rate of reported chlamydia infections was among 20 to 24-year olds (1158.6 per 100,000) (Figure 2). While lower than the reported rate among females, the age-specific rate among males was also highest among the 20- to 24-year olds at 760.5 per 100,000 (Figure 2).
- The reported rate of chlamydia infection among males aged 60 and older was nearly threefold that of their female counterparts (4.8 vs. 1.7 per 100,000, respectively) (Figure 2).



Reported rates of chlamydia are increasing among older males.

- Between 1997 and 2006, the reported rate of chlamydia infection among males in the 60+ age group increased by 380.0% (from 1.0 to 4.8 per 100,000) (Figure 3).
- The largest increase in reported rates among females in that time period was in the 30 to 39-year age group at 126.7% (from 81.9 to 185.7 per 100,000) (Figure 4).

Figure 3: Reported Rates of Chlamydia Among Males by Age Group, 1997-2006

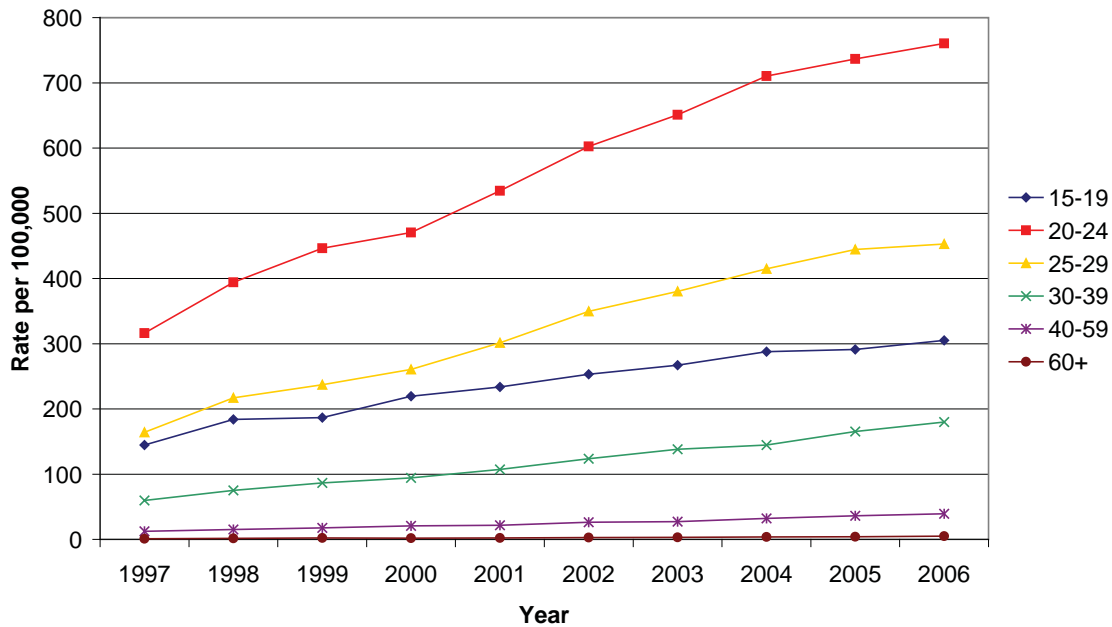
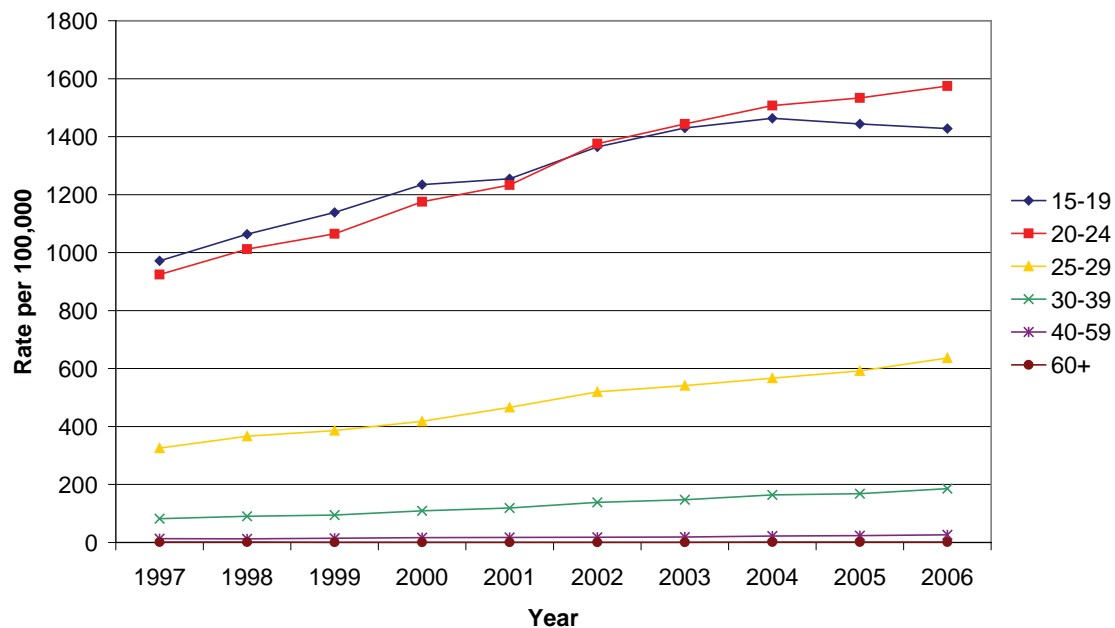


Figure 4: Reported Rates of Chlamydia Among Females by Age Group, 1997-2006



Reported rates of chlamydia infection are highest in the Northern Territories.

- Reported chlamydia rates continue to be highest in Nunavut, the Northwest Territories and Yukon (Table 1).

- Between 1997 and 2006, the greatest increase in reported chlamydia rates occurred in British Columbia, with an increase of 105.7% (Table 1).
- In 2006, the national male-to-female rate ratio was 1:1.9. This ratio was highest in Newfoundland and Labrador (1:4.0), and lowest in Manitoba (1:1.6).

Table 1. Reported Cases and Rates of Chlamydia by Province/Territory, 1997 and 2006

Jurisdiction	Number of Cases		Rate per 100,000		Rate change ¹ 1997-2006 (%)
	1997	2006	1997	2006	
NL	335	547	60.5	107.3	77.4
PE	139	169	101.6	122.4	20.5
NS	1,127	1,760	120.6	188.2	56.1
NB	819	1,326	108.6	177.0	63.0
QC	6,380	12,820	87.4	167.6	91.8
ON	10,559	22,552	93.9	177.5	89.1
MB	2,587	4,231	227.6	359.0	57.7
SK	2,317	4,260	226.7	431.4	90.3
AB	4,547	10,452	160.3	310.1	93.5
BC	4,116	9,236	103.9	213.8	105.7
YT	173	169	536.6	541.5	0.9
NT ²	1,045	696	1,542.8	1,641.5	N/A
NU ²	N/A	1,129	N/A	3,713.8	N/A
Canada	34,144	69,347	113.9	212.4	86.5

¹ Rate change calculated using unrounded values.

² Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1997 rates are not comparable with 2006 rates due to the creation of Nunavut.



GONORRHEA

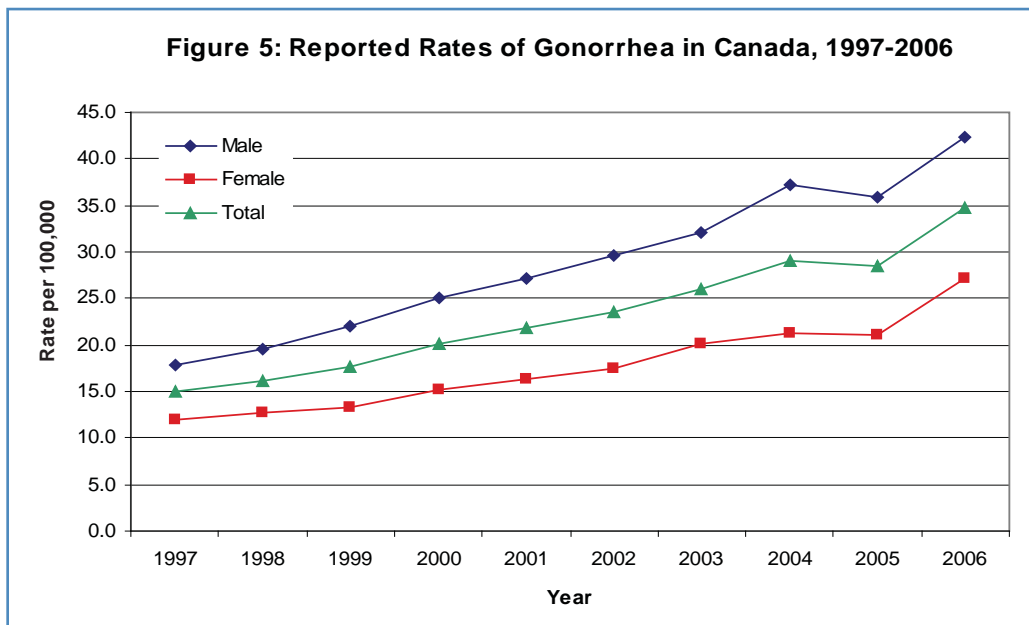
(Neisseria gonorrhoeae)

Gonorrhea (*Neisseria gonorrhoeae*)

Gonorrhea, an infection caused by *Neisseria gonorrhoeae*, has been reportable nationally since 1924 and remains the second most commonly reported STI in Canada. Consequences of untreated gonorrhea infection are of concern for both sexes but can be especially severe for women. Young women can develop pelvic inflammatory disease (PID), which can lead to chronic abdominal pain, infertility and ectopic pregnancy. Males with an untreated infection are at risk of epididymitis and, rarely, infertility. Though uncommon, gonorrhea can spread to the blood stream and joints³. Like other non-ulcerative STIs, gonorrhea can increase the concentration of cells in genital secretions that can serve as targets for HIV thereby increasing the risk of acquisition and/or transmission of HIV².

Since 1997, the reported rate of gonorrhea infections has increased, more in men than women.

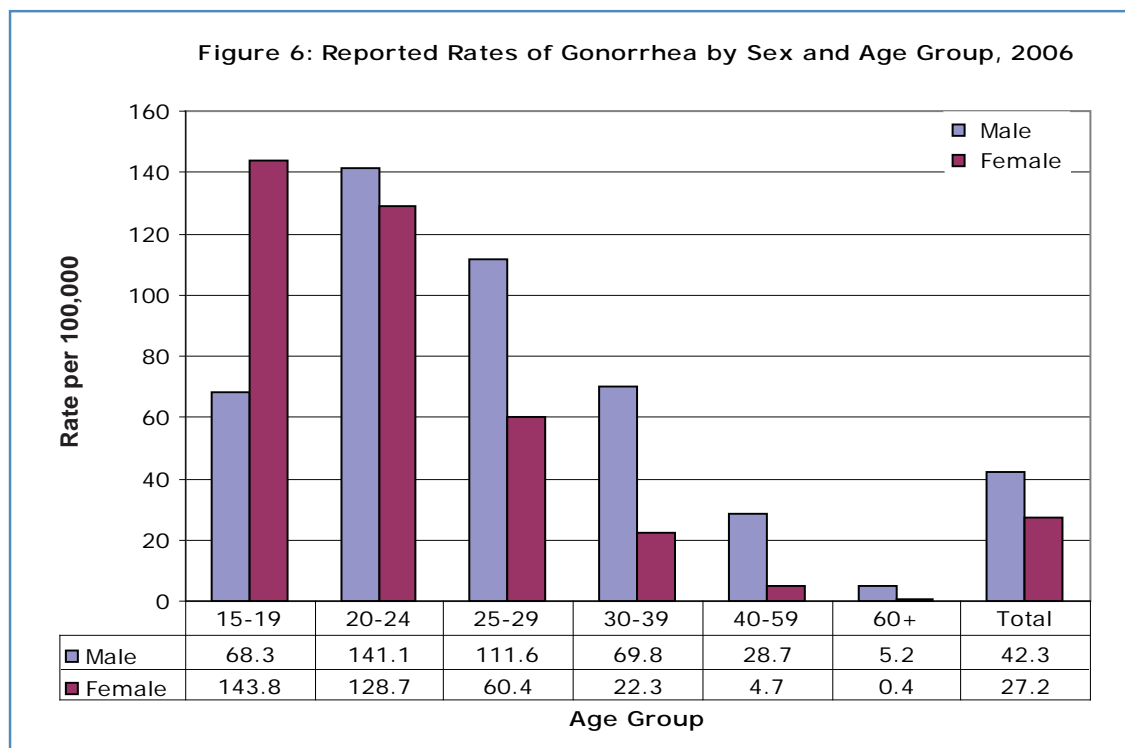
- In 2006, 11,334 cases of gonorrhea infections were reported nationally, corresponding to a rate of 34.7 per 100,000 (Figure 5). The overall reported rate of gonorrhea infection in 2006 increased by 21.5% from 2005 (28.5 per 100,000) and by 132.8% when compared to 1997 reported rates (14.9 per 100,000).
- Between 1997 and 2006, reported gonorrhea rates among males increased by 140.4% (from 17.8 to 42.3 per 100,000) compared to a 126.7% increase (from 12.0 to 27.2 per 100,000) in reported rates among females during the same time period (Figure 5).



The age-specific rates of gonococcal infections are highest among the younger population.

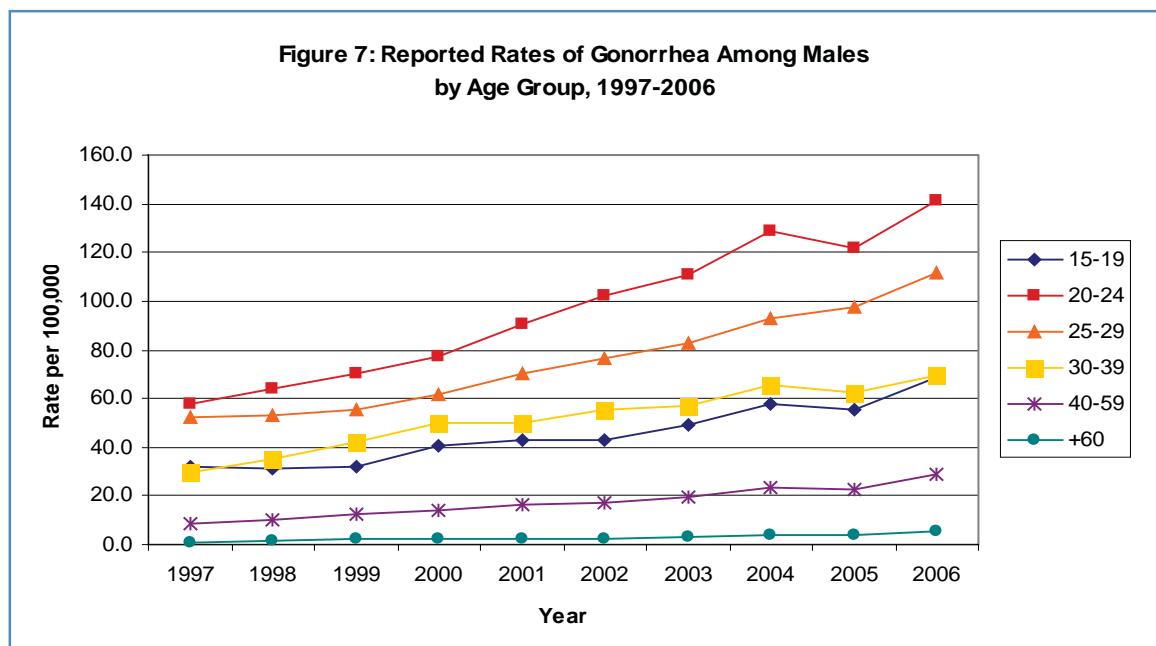
- In 2006, people under 30 years of age continue to account for the majority (65%) of reported cases. This is in contrast with chlamydia and infectious syphilis, in which the same age group accounts for 83% and 20% of reported cases, respectively.
- Among women, the 15 to 19-year age group accounted for the highest age-specific rate of reported gonorrhea infections (143.8 per 100,000) (Figure 6).

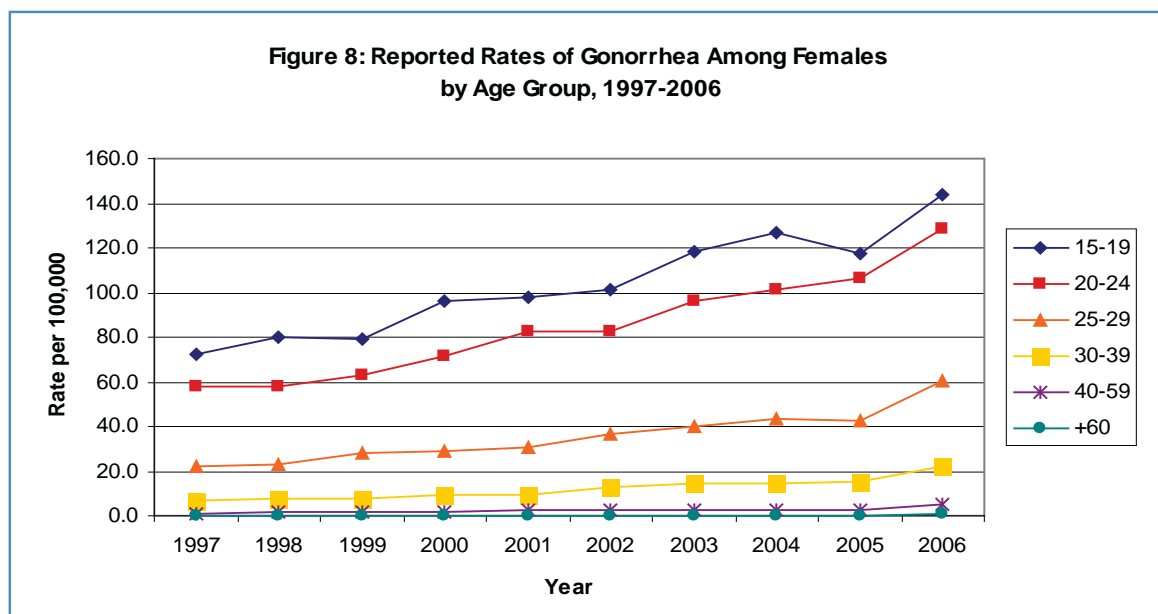
- Among men, the highest age-specific rate was among the 20 to 24-year olds (141.1 per 100,000) (Figure 6).



Since 1997, the largest increase in the reported rate of gonorrhea infection is in older age groups.

- Between 1997 and 2006, reported rates of gonorrhea were increasing across age groups. The most dramatic increase was in males over 60 years of age at 386.0% (from 1.1 to 5.2 per 100,000). This is followed closely by women aged 40-59 with an increase of 335.8% (1.1 to 4.7 per 100,000).





Though the majority of gonorrhea cases occur in the most populous provinces of the country, rates are highest in the North.

- In 2006, the highest reported rates of gonorrhea were in the Northwest Territories, Nunavut and Manitoba (Table 2).
- The highest number of gonorrhea cases was reported in Ontario, followed by Alberta and Manitoba (Table 2).
- Between 1997 and 2006, the greatest increase in reported rates was in Alberta, with an increase of 345.5% (Table 2).
- In 2006, the national male-to-female ratio was 1.5:1, reflecting that more males are reported with gonococcal infections than females. However, this average masks variation across the country. The male-to-female ratio was highest in Quebec (2.5:1), while in Yukon, more females are reported than males (1:1.8).

Table 2. Reported Cases and Rates of Gonorrhea by Province/Territory, 1997 and 2006

Jurisdiction	Number of Cases		Rate per 100,000		Rate change ¹ 1997-2006 (%)
	1997	2006	1997	2006	
NL	3	8	0.5	1.6	189.7
PE	1	0	0.7	0.0	-100.0
NS	108	101	11.6	10.8	-6.5
NB	15	32	2.0	4.3	114.8
QC	545	1271	7.5	16.6	122.6
ON	1931	3871	17.2	30.5	77.5
MB	518	1576	45.6	133.7	193.4
SK	342	954	33.5	96.6	188.7
AB	406	2149	14.3	63.8	345.5
BC	458	1078	11.6	25.0	115.7
YT	0	11	0.0	35.2	*
NT ²	150	181	221.5	426.9	N/A
NU ²	N/A	102	N/A	335.5	N/A
Canada	4477	11334	14.9	34.7	132.5

¹ Rate change calculated using unrounded values.

² Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1997 rates are not comparable with 2006 rates due to the creation of Nunavut.

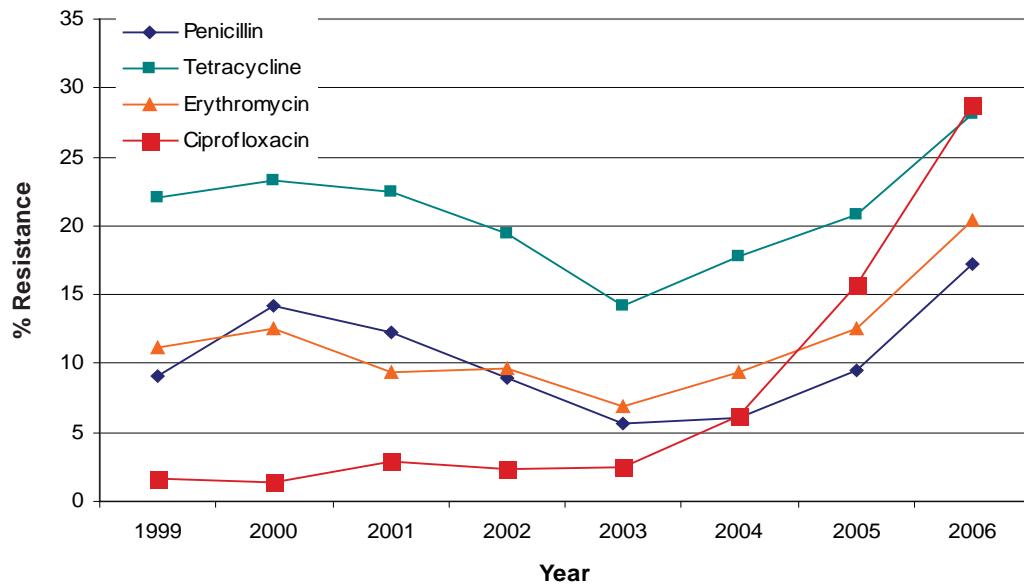
* The rate change can not be quantified.

Antimicrobial Resistance

Uncomplicated gonorrhea can be treated with single dose oral or injectable antibiotics. The challenge arises when resistant strains are treated with antibiotics to which the bacteria have decreased susceptibility. When this occurs, there is increased likelihood of transmission due to treatment failure and the development of adverse sequelae unless the resistant organism is identified and treated appropriately. Gonococcal resistance to penicillin, erythromycin and tetracycline is long established. None of these antibiotics are recommended treatments¹.

- Canadian gonococcal resistance surveillance is a collaborative effort between the National Microbiology Laboratory (NML) at PHAC 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.
- Antibiotics tested for gonococcal resistance at the NML include penicillin, tetracycline, spectinomycin, erythromycin, azithromycin, ciprofloxacin, cefixime and ceftriaxone.
- In 2006, 28.8% of cultured strains demonstrated resistance to ciprofloxacin, up from 2.4% in 2003 (Figure 9).

Figure 9: Antimicrobial Susceptibility of *N. gonorrhoeae* Strains Tested in Canada, 1999-2006



* Percentages are calculated using the number of specimens tested as the denominator.

There are no resistant strains for spectinomycin, cefixime, and ceftriaxone.



SYPHILIS

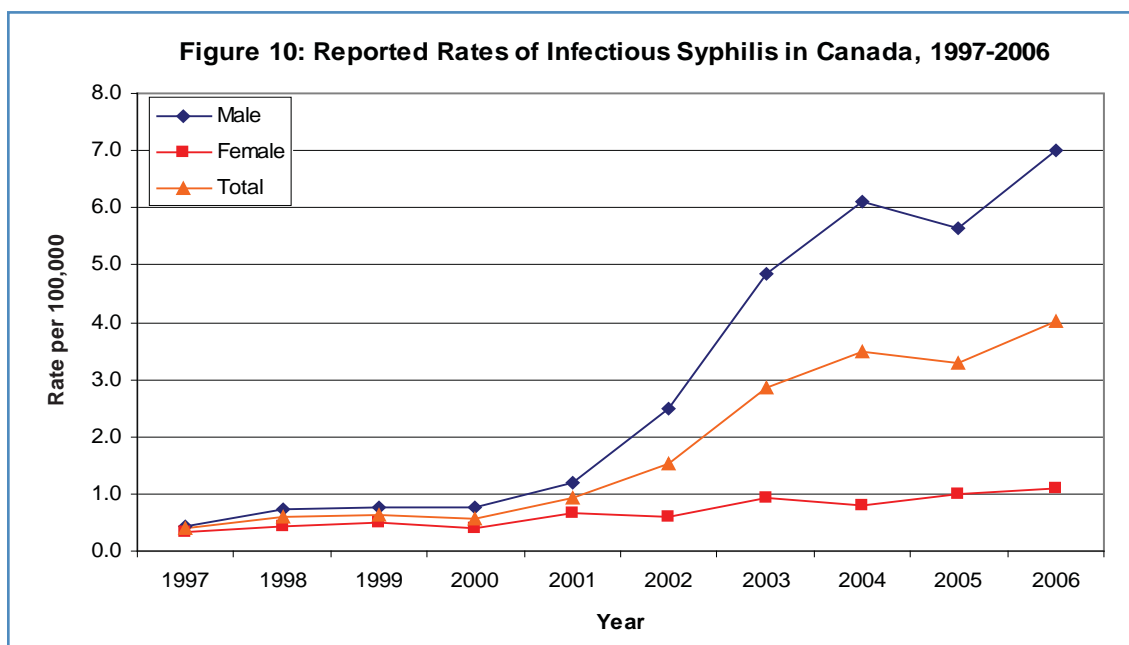
(Treponema pallidum)

Syphilis (*Treponema pallidum*)

Syphilis, nationally reportable since 1924, progresses through different stages of infection. Primary, secondary and early latent (< 1 year) syphilis, which are the most infectious stages of syphilis, are included in national reports. Untreated syphilis will enter into a late latent stage of the infection that may lead to serious complications associated with tertiary syphilis. This includes damage to the central nervous system, cardiovascular system, eyes, skin and other internal organs. Untreated syphilis can be fatal¹. Individuals infected with syphilis are at an increased risk of contracting and transmitting HIV².

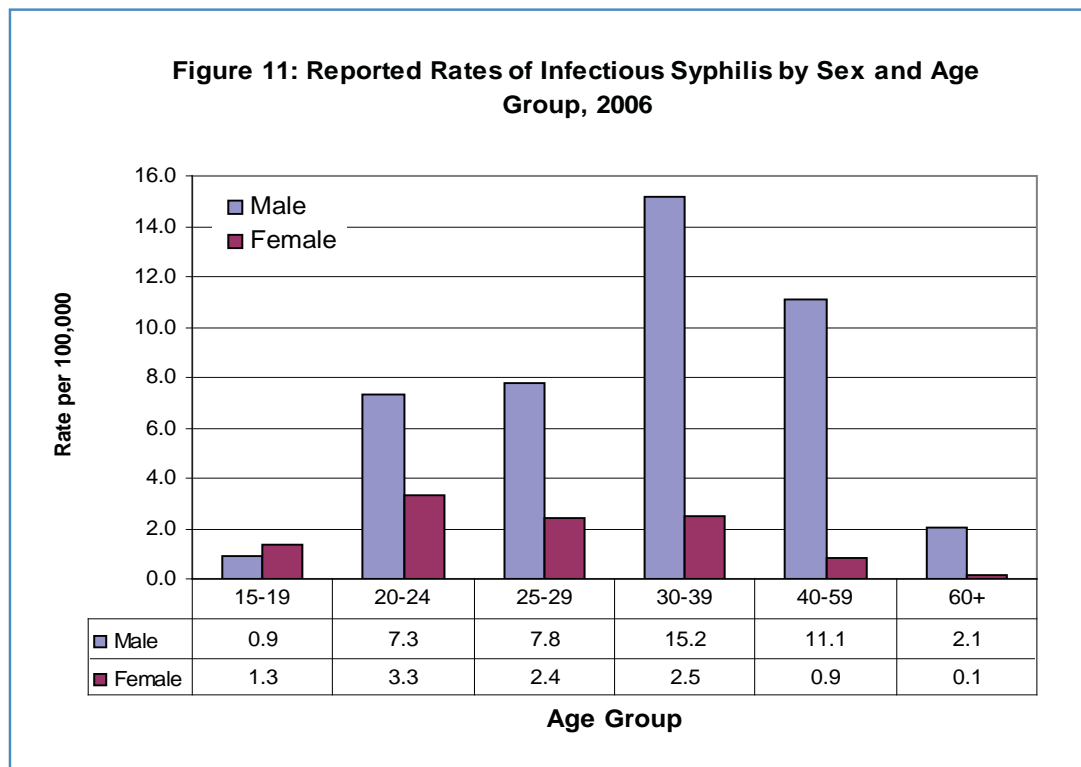
The reported rate of infectious syphilis is increasing in Canada, particularly among males.

- In 2006, 1,311 cases of infectious syphilis cases were reported to PHAC, corresponding to a rate of 4.0 per 100,000 (Figure 10). The overall rate in 2006 increased by 21.2% from 2005 (3.3 per 100,000 population) and by 900% when compared to 1997 rates (0.4 per 100,000 population).
- Historically, a greater number of cases have been reported among men than women. This trend continued in 2006, when males accounted for 86.3% of reported cases (1131 cases among males versus 180 cases among females).
- Between 1997 and 2006, outbreaks of infectious syphilis were reported across Canada, including Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Ottawa, Montreal, and Yukon⁴⁻¹².
- The reported rates of infectious syphilis have increased among both males and females with a larger increase noted among males. Between 2005 and 2006, the reported rates of infectious syphilis among males increased by 25% (from 5.6 to 7.0 per 100,000) (Figure 10). During this time, the rate among women increased by 10% (from 1.0 per 100,000 to 1.1 per 100,000) (Figure 10). Between 1997 and 2006, reported rates increased 1,650% among males (from 0.4 to 7.0 per 100,000) and by 233.3% among females (from 0.3 to 1.1 per 100,000).
- Between 1997 and 2006, there was an increase in the male-to-female ratio in the reported rates of infectious syphilis from 1.3:1 in 1997 to 6.3:1 in 2006.



Higher numbers of infectious syphilis cases are reported among the older populations, particularly males.

- Unlike chlamydia and gonorrhea, in 2006, reported cases of infectious syphilis were mainly among older males (≥ 30 years).
- In 2006, the highest reported rate of infectious syphilis was among males aged 30-39 years at 15.2 per 100,000 (Figure 11), accounting for almost one-third of all reported cases of infectious syphilis among males.



- Between 1997 and 2006, the reported rate of infectious syphilis in the 30-39 age group of males increased by 1,420% (from 1 to 15.2 per 100,000) (Figure 12).
- The corresponding increase among females in this age group was 257.1% (from 0.7 to 2.5 per 100,000) (Figure 13).
- Among females, reported rates were highest among the 20-24 year age group at 3.3 per 100,000 (Figure 13).
- Infectious syphilis can be transmitted from a mother to her child during pregnancy or delivery, leading to fetal death or congenital syphilis.
- In 2006, there were a total of seven congenital syphilis cases reported from British Columbia, Alberta, and Ontario, corresponding to a rate of 1.97 per 100,000 live birth.

Figure 12: Reported Rates of Infectious Syphilis Among Males by Age Group, 1997-2006

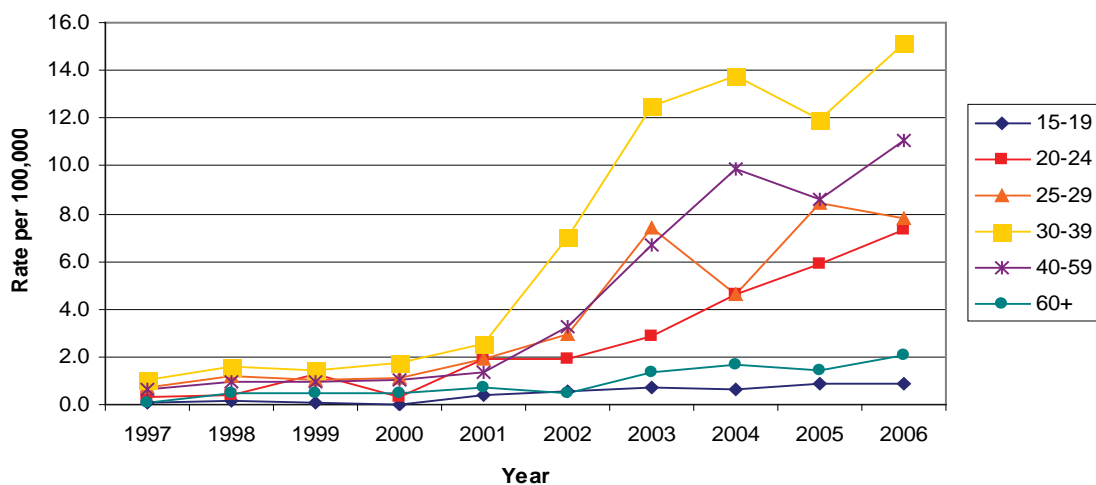
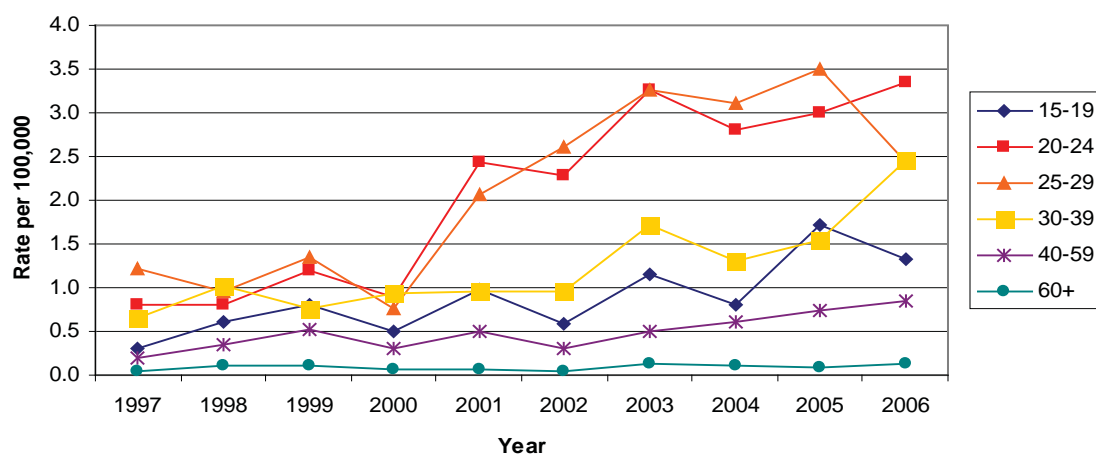


Figure 13: Reported Rates of Infectious Syphilis Among Females by Age Group, 1997-2006



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

- In 2006, the highest reported rate of infectious syphilis was in British Columbia followed by Alberta (Table 3).
- Between 1997 and 2006, the largest increases in reported rates of infectious syphilis were in Quebec and Alberta.
- In Quebec, between 1997 and 2006, the reported rate of infectious syphilis among males increased 9500% (from 0.1 to 9.6 per 100,000) compared to a 100% increase among females (from 0.1 to 0.2 per 100,000) during this same time period.

- In Alberta, between 1997 and 2006, the reported rate among males increased 4300% (from 0.2 to 8.8 per 100,000), compared to a 1200% increase among females (from 0.3 to 4.0 per 100,000) during the same time period.

Table 3. Reported Cases and Rates of Infectious Syphilis by Province/Territory, 1997 and 2006

Jurisdiction	Number of Cases		Rate per 100,000		Rate change ¹ 1997-2006 (%)
	1997	2006	1997	2006	
NL	0	0	0.0	0.0	0.0
PE	0	0	0.0	0.0	0.0
NS	1	2	0.1	0.2	100.0
NB	0	0	0.0	0.0	0.0
QC	7	367	0.1	4.8	4700.0
ON	49	361	0.4	2.8	600.0
MB	0	15	0.0	1.3	*
SK	2	17	0.2	1.7	750.0
AB	7	218	0.2	6.5	3150.0
BC	49	331	1.2	7.7	541.7
YT	0	0	0.0	0.0	0.0
NT ²	0	0	0.0	0.0	N/A
NU ²	N/A	0	N/A	0.0	N/A
Canada	115	1311	0.4	4.0	900.0

¹ Rate change calculated using unrounded values.

² Nunavut did not officially become a territory until 1999; prior to 1999, data for Nunavut was combined with Northwest Territories. Rate change for NT was not calculated since 1997 rates are not comparable with 2006 rates due to the creation of Nunavut.

* The rate change can not be quantified.

Technical Notes

Case reporting: Currently, some jurisdictions report to PHAC using aggregate case counts rather than through case by case reporting. Furthermore, only the following variables are submitted by all 13 jurisdictions: age of diagnosis, year of diagnosis, province/territory of diagnosis, and sex. National reporting is therefore limited to analyses of the variables that are submitted to PHAC.

Reporting delay: There may be a delay between the time when a person tests positive for an STI and when the report is received at PHAC. This time lag is referred to as reporting delay. In cases where there are discrepancies between data reported by PHAC and those reported by individual provinces and territories, provincial/territorial data should be considered to be more accurate as they are the most current. Also note that 2006 data are preliminary and subject to change.

Underreporting: The number of reported cases likely underestimates the true burden of infection in a given population because:

- many people who are infected with STIs do not exhibit symptoms; and
- an infected individual must interact with the medical system in order to get tested and have a positive laboratory results for a bacterial STI.

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

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

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

Population data: Statistics Canada, Demography Division, Demographic Estimates Section, July Population Estimates, 1997-2000 final intercensal estimates, 2001-2003 final postcensal estimates, 2004-2005 updated postcensal estimates, 2006 preliminary postcensal estimates.

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