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Sexually Transmitted Disease Surveillance in Canada

1995 Annual Report

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Sexually Transmitted Disease Surveillance in Canada

1995 Annual Report

Prepared by the Division of STD Prevention and Control
Bureau of HIV/AIDS and STD
Laboratory Centre for Disease Control
Health Protection Branch
Health Canada

Acknowledgements

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Highlights : Sexually Transmitted Diseases (STDs) in Canada

- During 1995, there were a total of 44,176 reported cases of STDs, including AIDS, in Canada. STDs represented 36% of all notifiable diseases (Figure 1).

- Genital chlamydia became a notifiable disease in 1990. In 1995, it accounted for 30.3% of all reported cases of notifiable diseases and was the most commonly reported (84%) sexually transmitted disease.

- Between 1991 and 1995 the number of cases of chlamydia reported nationally decreased by 26.8%.

- Women were most affected by chlamydia infections. They represented 75.8% of all genital chlamydia cases reported for 1995. Among them, females aged 15 to 19 years had the highest rate, at 1,109.1 cases per 100,000, which was 9 times the national rate (Figure 4).

- Among men, those aged 20 to 24 years old had the highest rate of chlamydia (335.6 per 100,000), which was 2.6 times the national rate (127 per 100,000).

- The Northwest Territories reported a rate of chlamydia of 1,388.5 cases per 100,000 population and a rate of gonorrhea of 189.9 cases per 100,000 population (Figures 5 and 8). These rates were respectively 11 and 10 times higher than the national rate.

- Since 1990, the number of reported cases of gonorrhea has dropped by 60%. In 1995, the rate was 17.9 cases per 100,000 population (Figure 6). Gonorrhea, including gonococcal ophthalmia neonatorum, represented 4.3% of the total reports of nationally notifiable diseases (Figure 1).

- There were 11 cases of gonorrhea in children <10 years of age, excluding 18 cases reported as gonococcal ophthalmia neonatorum. A total of 56 cases of chlamydia were reported in 1995 for children from birth to 1 year of age, and 24 cases were counted for children aged 1 to 9 years. Seventy percent of the reported cases were aged between 0 and 1 year.

- In 1995, 1,402 cases of antibiotic resistant *Neisseria gonorrhoeae* were reported. The proportion of gonococcal isolates that are resistant has increased over time (Figure 9).

- Some isolates of *N. gonorrhoeae* (<1%) are now showing a reduced susceptibility to ciprofloxacin, which belongs to the group of fluoroquinolones (Table 1).

- Aggregated cases of syphilis for 1995 represented 0.5% of the total reports of notifiable diseases (Figure 1), with a rate of 0.5 cases per 100,000 population.

- The highest reported syphilis rates were for men and women aged 20 to 24 years with respectively 1.4 cases per 100,000 male population and 1.2 cases per 100,000 female population (Figure 13).

- Saskatchewan had a reported rate of infectious syphilis of 1.9 per 100,000 population. The Northwest Territories, Yukon and Prince Edward Island did not report any cases in 1995 (Figure 14).

- The number of cases of non-infectious syphilis (syphilis, other) has dropped by 36.7% since 1993. A total of 434 cases were reported, and the overall Canadian rate is 1.5 cases per 100,000 population (Annex 1).

- Only 2 cases of congenital syphilis were reported in 1995. The disease has been declining since 1992, to reach 0.5 cases per 100,000 live births (Figure 18).

- Human papillomavirus (HPV) is sexually transmitted and is linked with uterine cervical cancer. Between 1990 and 1995, the overall age-standardized reported incidence rate for cervical

cancer fell by 21%, from 10.5 cases to 8.3 cases per 100,000 women (Figure 19). HPV is not a nationally notifiable disease, hence it is difficult to estimate its true incidence in Canada.

- There was a slight increase of 3.8% in serum specimens found to be positive for herpes in 1995. Between 1990 and 1995, there was an increase of 31.5% in the proportion of positive specimens for herpes simplex 1 and 2 (Figure 20).

- The rate of hospital discharges for pelvic inflammatory disease (PID) decreased by 55% from 1984 to 1993, from 281.2 to 125.5 per 100,000 population. In 1993/1994, women aged 25 to 34 had the highest PID rate (147.9/100,000), as compared with previous years when women aged 20 to 25 had the highest rate. Hospital discharge data may underestimate the incidence of PID because they do not include cases diagnosed and treated outside hospitals, and some PID cases are atypical and even asymptomatic (Annex 4).

Introduction

This report contains information on the distributions and trends of notifiable sexually transmitted diseases in Canada and of some others, such as herpes simplex, pelvic inflammatory diseases and human papillomavirus infection, which are not among the notifiable diseases.

Four sexually transmitted diseases (STDs) are nationally notifiable: chlamydia, gonorrhea, syphilis and chancroid (chancroid is not discussed in this report since only one case was reported for 1995). AIDS and hepatitis B can be transmitted sexually and are nationally notifiable; responsibility for these diseases within Health Canada lies respectively with the Division of HIV/AIDS Surveillance and the Division of Bloodborne Pathogens.

The aggregate data used in this annual report are reported to LCDC by the provinces and territories. Because of reporting delay, information on cases of STD diagnosed in 1995 was collected until February 1997. Every effort is made to ensure the accuracy of the surveillance of STDs. Because in many cases sexually transmitted diseases are asymptomatic, many people may not seek treatment. As a result, the number of cases reported and the case rate are underestimates of the true incidence of STDs in Canada.

Although complete reporting is optimal, reporting need not be complete in order to be useful. Estimates of the true incidence of disease can be calculated us-

Figure 1
STDs: Proportion of Total Reports of Nationally Notifiable Diseases, Canada, 1995

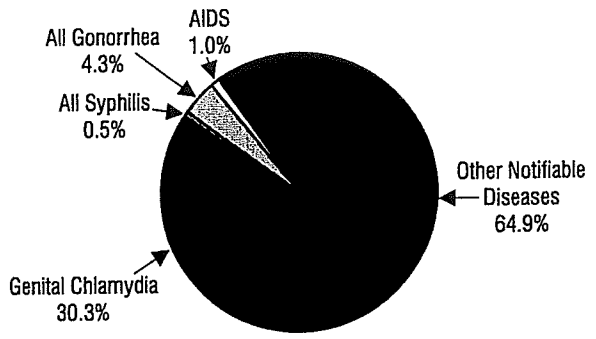

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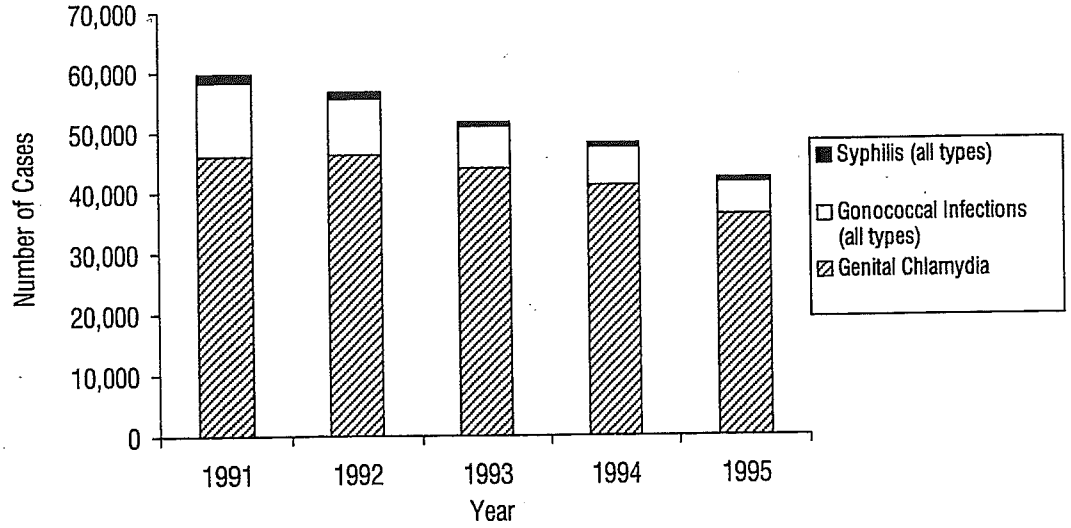
Figure 2
Reported Cases of Sexually Transmitted Diseases, Canada, 1991-1995



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ing parameters from population-based studies. High-risk groups can be identified. Trends in disease patterns can be assessed and may be useful in planning prevention strategies and in program evaluations. Since the early 1980s, the numbers of reported cases and rates of bacterial STDs, most notably gonococcal infections and syphilis, have been decreasing. A decade ago, the rate for syphilis and gonorrhea was respectively 5.2 and 9 times higher than the 1995 rate. As well, since the mid-1980s hospitalizations for pelvic inflammatory disease have been decreasing. The absolute number of hospitalizations for ectopic pregnancy began to decrease in the early 1990s.

Sexually transmitted diseases remain an important public health problem in Canada. The STD figures for 1995, including those for AIDS, represent more than a third (36%) of all notifiable diseases, as compared with 23.8% in 1987 (Figure 1). Chlamydia is mainly responsible for the increased proportion of STDs and is currently the most commonly reported STD in Canada (84% of all STD cases) (Figure 2). Young women bear the burden of chlamydia and are often unaware of their infection. The sequelae that may develop include pelvic inflammatory disease, ectopic pregnancy and infertility, which cause unnecessary pain and suffering.

Genital Chlamydia

Chlamydia infections are caused by the bacterium *Chlamydia trachomatis*. Clinically, genital chlamydia may present in males as a urethritis and in females as a mucopurulent cervicitis[1]. In women (and perhaps men), 50% to 70% of chlamydia infections are often clinically silent. Unrecognized and untreated infections can remain with the host for months and can be transmitted to sex partners[2]. For females, complications resulting from untreated or under-treated chlamydia can be severe: ectopic pregnancy (30%)[3], pelvic inflammatory disease (25%-65%)[4] and infertility. Vertical transmission of chlamydia is the primary pathogen responsible for infant infectious conjunctivitis (40%) and infant pneumonia (73%)[5]. The morbidity of chlamydia and its associated costs make chlamydia infections an important public health issue. Genital chlamydia has been the most commonly reported sexually transmitted disease in Canada since becoming a notifiable disease in 1990.

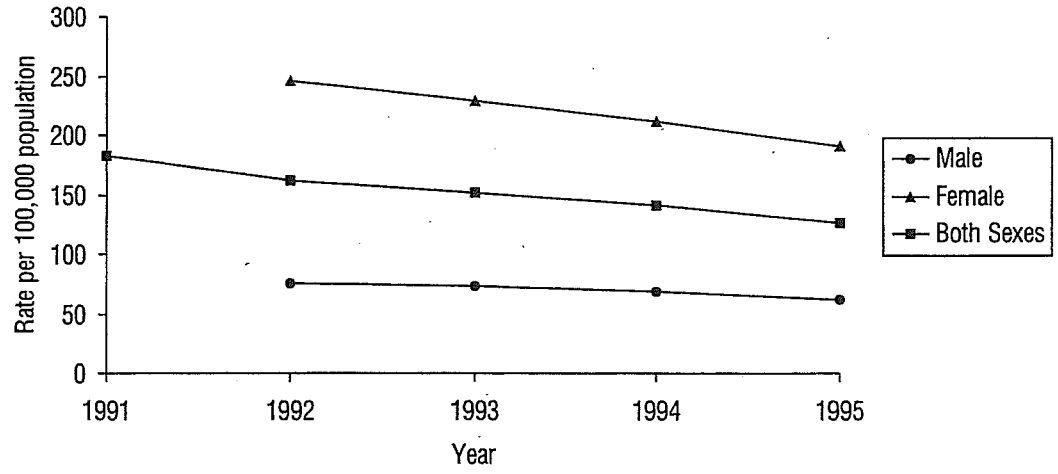
In 1991, data were collected from nine provinces/territories only, with a total reported number of 39,003 cases. If the same rate were assumed for the missing provinces/territories, the number of cases would have been 51,264 for 1991. There were 37,551 reported cases in 1995, which indicates a 26.8% drop in the number of cases reported nationally over the last 5 years, using the estimated figures of 1991. The incidence rate based on actual reported cases dropped by 30.3%, from 182.2 cases per 100,000 population in 1991 to 127 cases per 100,000 in 1995 (Figure 3).

Females represented 75.8% of genital chlamydia cases reported in 1995. The under-representation of males is most likely due to the high proportion of asymptomatic cases (for which medical intervention was not sought) and the lack of screening opportunities compared with those for women.

In 1995, 70.3% of all reported cases were between the ages of 15 and 24 years (Annex 2). Females in the 15-19-year age group had the highest reported rate, of 1,109.1 cases per 100,000, which was almost 9 times the national rate. The highest reported rate for males was 335.6 cases per 100,000 in the 20-24-year age group, 2.6 times the national rate (Figure 4).

Regionally, the Northwest Territories (NWT) reported a rate of infection of 1,388.5 cases per 100,000 population, an incidence 11 times higher than the national rate (127/100,000). The NWT was followed by the Yukon (518.0/100,000) and Manitoba (264.4/100,000).

Figure 3
Reported Genital Chlamydia: Incidence per 100,000, Canada, 1991-1995



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Newfoundland had a low rate of 47.5 cases per 100,000 population (Figure 5).

Over the past several years, there have been substantial advances in the diagnostic technology of sexually transmitted diseases — for example, DNA amplification methods, such as polymerase chain reaction (PCR) and ligase chain reaction (LCR). These tests have the advantage over the current culture methods that non-invasive samples (e.g., urine) can be used. As well, the tests have proven to be more sensitive at detecting low-level infections than the current methods[6,7] without compromising specificity[8]. Furthermore, the PCR tests may define a group of patients whose infection with *C. trachomatis* could have been missed by conventional assay methods — as for groups of men aged 24 years and over[9].

Figure 4
Reported Genital Chlamydia: Incidence per 100,000 by Age and Sex, Canada, 1995

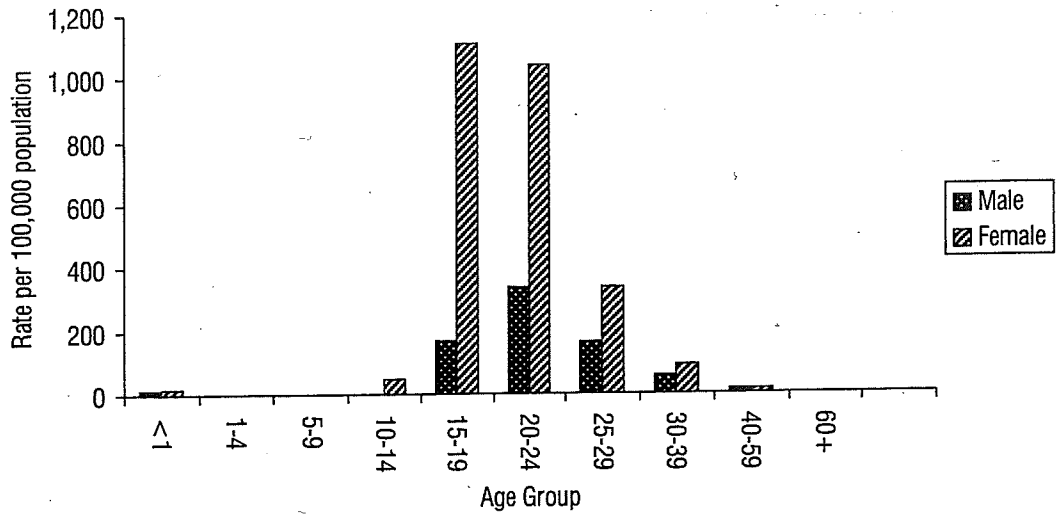

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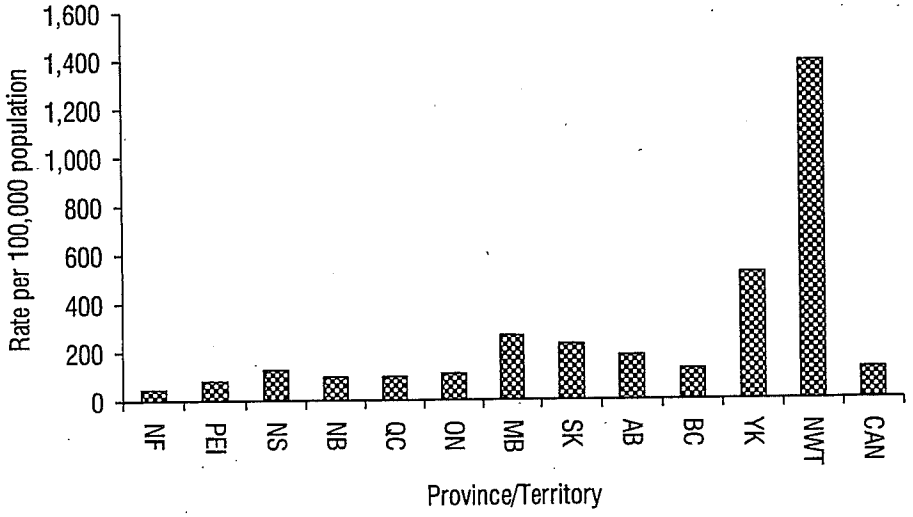
Figure 5
Reported Genital Chlamydia: Incidence per 100,000 by Province/Territory, 1995



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Gonorrhea

Gonorrhea is caused by the bacterium *Neisseria gonorrhoeae*. In males, gonorrhea often presents as a urethritis with an associated dysuria. Most infected women have no initial symptoms, although urethritis or cervicitis could develop a few days after exposure. Approximately 20% of affected women will have uterine invasion resulting in endometritis, salpingitis or pelvic peritonitis. If not treated or under-treated, pelvic inflammatory disease and infertility can result[1].

Reported rates of gonorrhea have been steadily declining since 1981. Since 1990 the number of reported cases of gonococcal infection has dropped by 60% (Figure 6). Between 1990 and 1995, the rate of reported cases fell from 52.0 cases to 17.9 cases per 100,000 population, a drop of 65.6%.

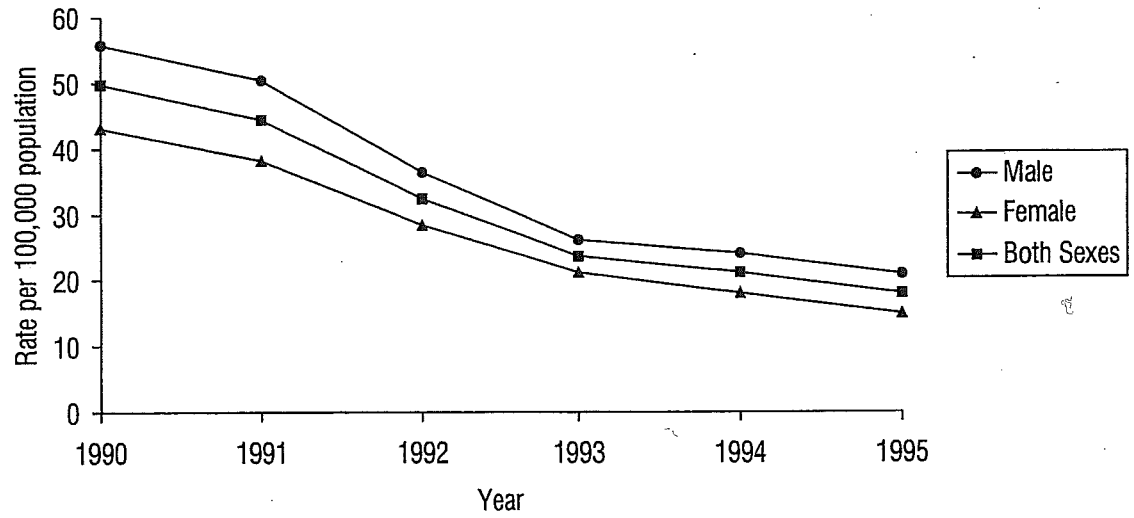
In 1995, more cases of gonococcal infection were reported in males than females: 57.8% and 42.1% respectively (in 0.1% of cases, no gender was specified).

Fifty one percent of reported cases were between the ages of 15 and 24 years, and 39% were between the ages of 25 and 39. The highest reported rate, 87.7 cases per 100,000, was for females aged 15-19 years (Figure 7). The highest rate for males was 70 cases per 100,000 in the 20-24-year age group.

According to the data reported, the Northwest Territories had an incidence rate of 189.9 cases per 100,000, and Prince Edward Island did not report any cases. As in the case of chlamydia, the provinces most affected by gonorrhea were, in decreasing order, the Northwest Territories, Yukon and Manitoba (Figure 8).

The existence of STD "core" groups is an important factor in the persistence of endemic gonococcal infections. Such groups have been previously identified as the reservoir of transmission and often the source of STDs[5]. Core groups are a subset of the population who change sexual partners frequently enough to regularly acquire and transmit STDs[10]. Sex workers,

Figure 6
Reported Gonorrhea: Incidence per 100,000, Canada, 1990-1995



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persons in detention facilities, the homeless, migrant workers and other disenfranchized persons represent core transmitters of STD in the population[11]. In the United States, core groups have been identified as representing approximately 1% of the population, and they account for over 50% of reported gonococcal infections[12]. Other factors contributing to the STD epidemic are previous STD infection, low socio-economic status, age and ethnic group, geographic clustering in urban centres[13,14], limited access to health services, substance use and sexual abuse[11]. Further research is needed to assess and describe core groups in Canada to facilitate the implementation of appropriate interventions aimed at reducing and ideally eliminating indigenous gonococcal infections.

Figure 7
Reported Gonorrhea: Incidence per 100,000 by Age and Sex, Canada, 1995

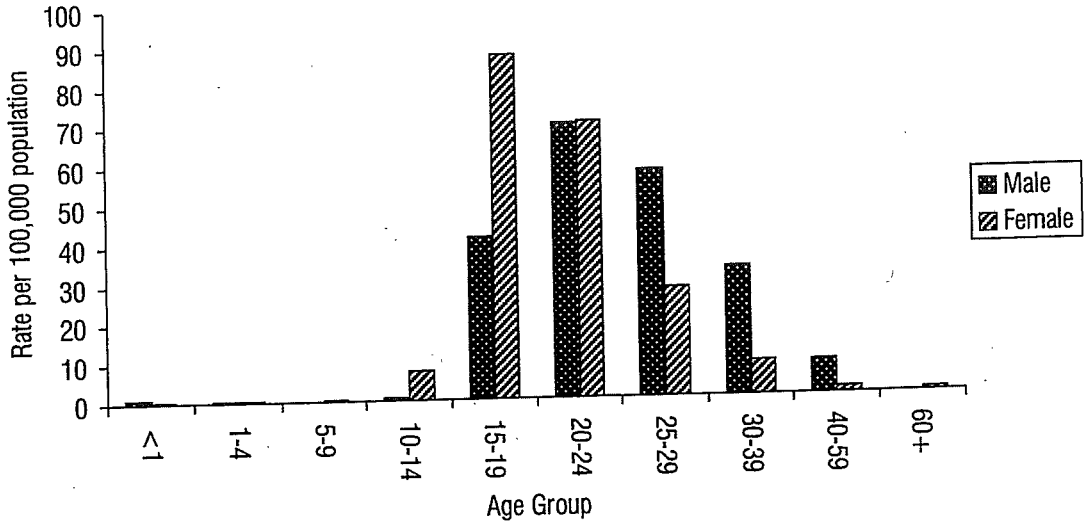

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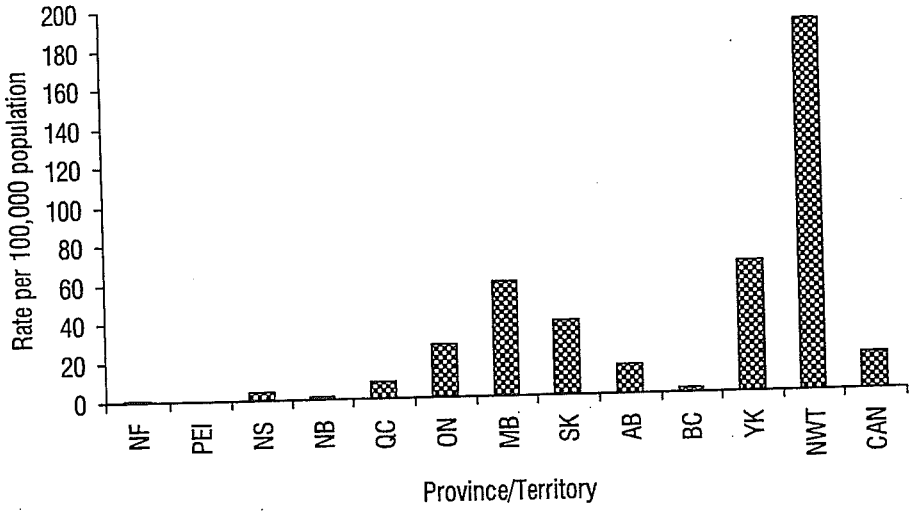
Figure 8
Reported Gonorrhea: Incidence per 100,000 by Province/Territory, 1995



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Resistant Strains of *Neisseria gonorrhoeae*

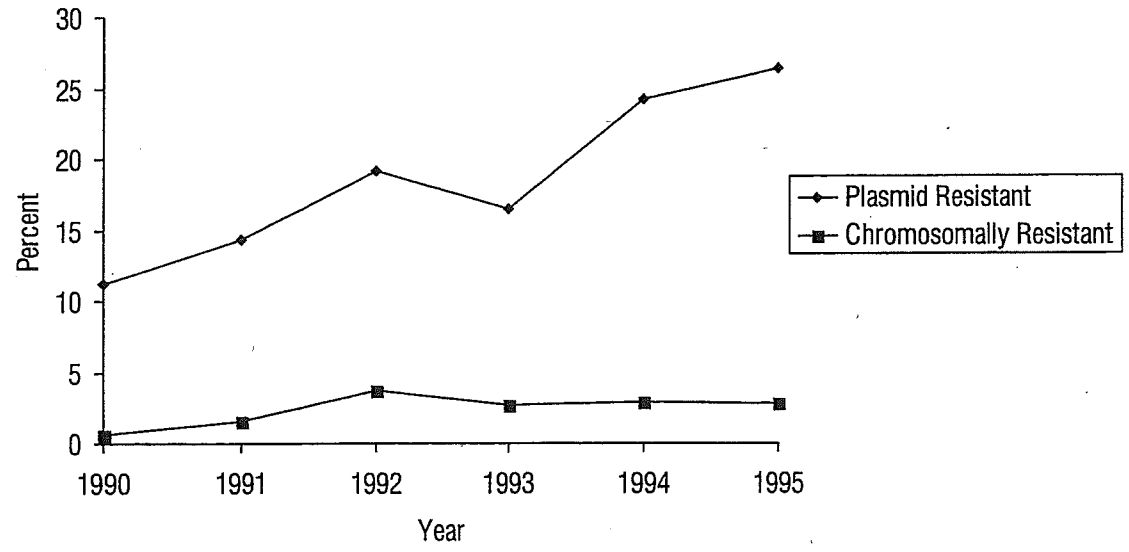
Since 1976, the National Laboratory for STD has collected and collated data on cases of antibiotic resistant *Neisseria gonorrhoeae* in Canada. In 1976, one case of penicillinase-producing *N. gonorrhoeae* (PPNG) was detected. By 1995, this number had grown to 128 cases of PPNG, 223 cases of both penicillin and tetracycline resistant *N. gonorrhoeae* (PP/TRNG), 904 cases of tetracycline resistant strains and 147 isolates with chromosomally medicated resistance.

Current data show a changing pattern regarding resistant strains of *N. gonorrhoeae* (Figure 9). There was a steady increase in the number of isolates of plasmid mediated resistant *N. gonorrhoeae* (PPNG) from 1985 to 1990. Around 1988 a combined penicillin and tetracycline resistance (PP/TRNG) was reported, and this pattern of resistance was on the rise until 1991.

Because of the high proportion of gonorrhea cases co-infected with chlamydia, the 1988 edition of the Canadian STD guidelines introduced dual therapy (penicillin and tetracycline) for gonorrhea and chlamydia when gonorrhea infection is being treated (the dual therapy is recommended only in the treatment of gonorrhea; when chlamydia alone is suspected treatment should be of chlamydia only). The reported data, as illustrated in Figure 10, show that resistance to tetracycline (TRNG) continued to increase from 1988 to 1994 and then showed a slight decline in 1995.

The 1992 edition of the Canadian STD treatment guidelines[15] maintained the dual therapy recommendation and proposed to treat uncomplicated gonorrhea with two classes of antibiotics: cephalosporins and fluoroquinolones. These antibiotics were effective against both penicillin and tetracycline resistant strains. The number of cases of gonorrhea

Figure 9
Proportion of Gonococcal Isolates with Plasmid and Chromosomally Mediated Resistance, Canada, 1990-1995



Chromosomally Resistant includes isolates that are chromosomally resistant to penicillin, tetracycline, erthromycin, spectinomycin or ciprofloxacin singly or in combination.
Data Source: Bureau of Microbiology, LCDC, Health Canada, 1997
Prepared by: Division of STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997

resistant to penicillin has continued to decrease in a significant manner since 1992 (Figure 10).

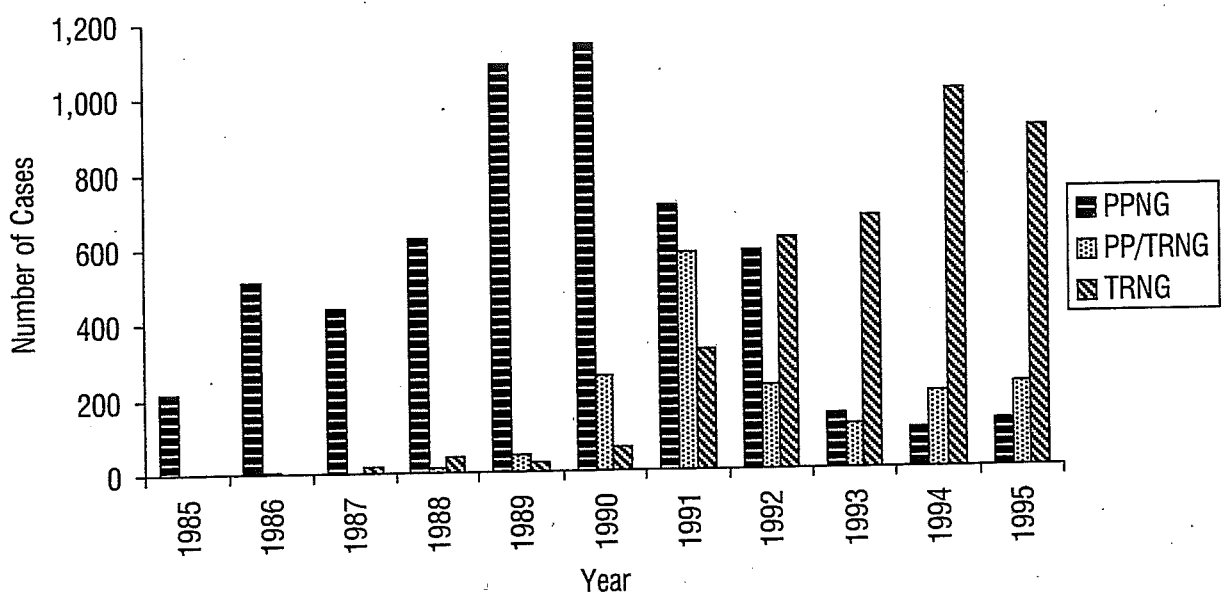
The Bureau of Microbiology, LCDC, has reported isolates of *N. gonorrhoeae* showing a reduced susceptibility to ciprofloxacin (minimum inhibitory concentration range 0.125-0.5 mg/L to ≥1.0 mg/L). Between 1993 and 1995 there was an increase of almost 60% in the number of isolates with a decreased susceptibility to ciprofloxacin, although the absolute number of isolates remains low (Table 1).

Table 1
***Neisseria gonorrhoeae* with reduced susceptibility to ciprofloxacin**

Year	MIC Range (mg/L)		Total No.
	0.125 to 0.5	≥1.00	
1993	30	2	32
1994	59	5	64
1995	36	15	51

Note: Isolates with reduced susceptibility to ciprofloxacin may include isolates that are PPNG, TRNG, CMRNG or otherwise susceptible to all antimicrobials tested by the National Laboratory for STD.

Figure 10
Number of Cases of Plasmid Mediated Resistant *N. gonorrhoeae*, Canada, 1985-1995



Data Source: Bureau of Microbiology, LCDC, Health Canada, 1997
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Syphilis

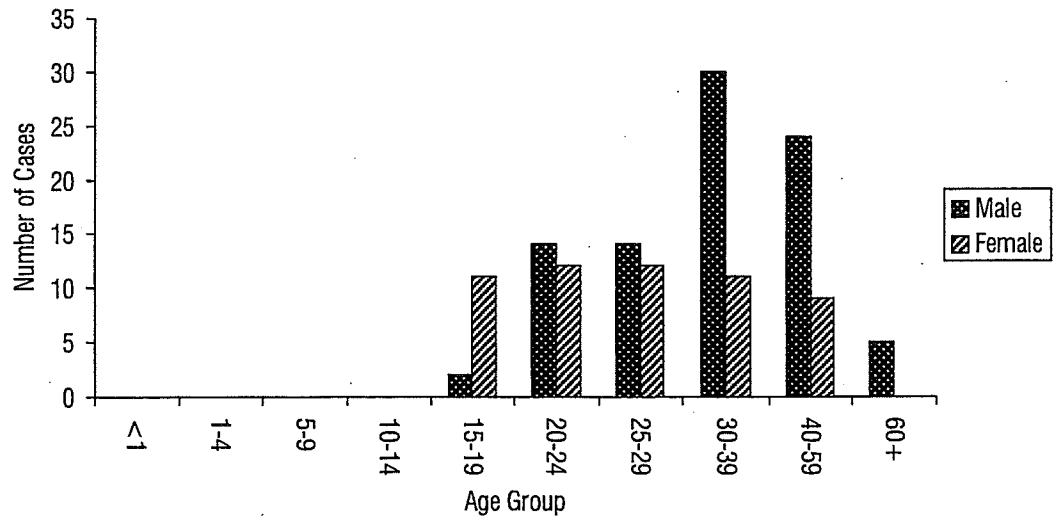
Syphilis is caused by the spirochete *Treponema pallidum*. Disease progression is divided into the following stages: primary, secondary, early latent, late latent and tertiary (cardiosyphilis, gummatous syphilis, neurosyphilis)[16,17]. Syphilis has traditionally been classified in two ways: by clinical manifestation and by infectivity. The clinical manifestation method categorizes the disease into early symptomatic (primary and secondary syphilis) and other syphilis (early latent, late latent and tertiary). The infectivity method classifies the disease into infectious syphilis (primary, secondary and early latent), non-infectious syphilis (late latent and tertiary) and congenital syphilis. The more useful method for disease surveillance is the infectivity method of classification, which allows the estimation of risk of disease transmission[16,17]. Before 1993, LCDC received aggregate data by clinical manifestation. The classification of syphilis in this report is made according to infectivity.

Infectious Syphilis

Infectious syphilis is defined in the Canada Communicable Disease Report[16] as arising when contact with an infectious individual may lead to the transmission of disease. Early latent syphilis is included under infectious diseases as potentially infectious to contacts during relapses. The number of reported cases of infectious syphilis by age and sex in Canada in 1995 is shown in Figure 11.

In 1995, the infectious syphilis rate for Canada was 0.5 cases per 100,000 population. This rate has remained virtually unchanged since 1993. The male rate increased between 1993 and 1994 and then decreased by the same amount from 1994 to 1995, representing an overall change of 0%. The female rate dropped from 0.5 to 0.4 cases per 100,000 from 1993 to 1995, a 20% decrease (Figure 12).

Figure 11
Reported Infectious Syphilis: Cases by Age and Sex, Canada, 1995



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Sixty-two percent of reported cases were male and 38% were female (Annex 1); 64% of reported cases were between the ages of 20 and 39 years. Males between the ages of 20 and 24 years had the highest reported case rate, at 1.4 cases per 100,000 male population. The highest rate for females was in the 20-24-year range, at 1.2 cases per 100,000. There was no significant difference between the rates of the 15-19-year and the 25-29-year female groups. Both had a rate of 1.1 per 100,000 population (Figure 13).

Regionally, Saskatchewan reported a rate of infectious syphilis of 1.9 cases per 100,000 population. Prince Edward Island, the Yukon and the Northwest Territories reported no cases of infectious syphilis in 1995 (Figure 14).

Figure 12
Reported Infectious Syphilis: Incidence per 100,000 by Sex, Canada, 1993-1995

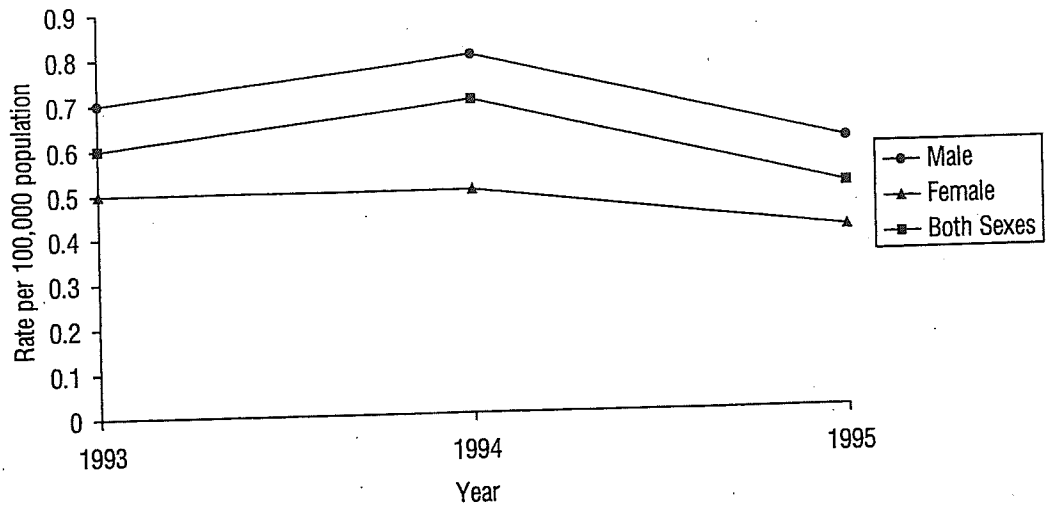

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Figure 13
Reported Infectious Syphilis: Incidence per 100,000 by Age and Sex, Canada, 1995

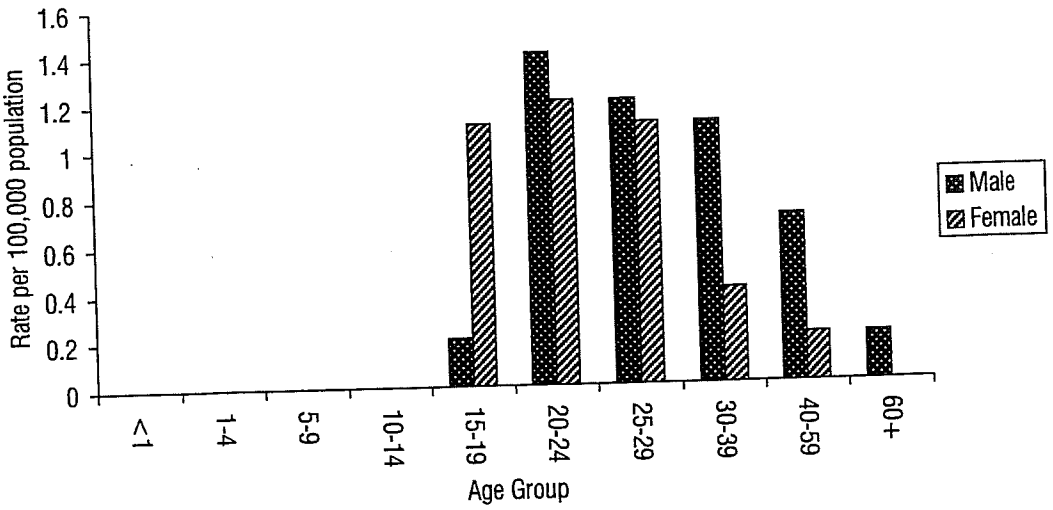

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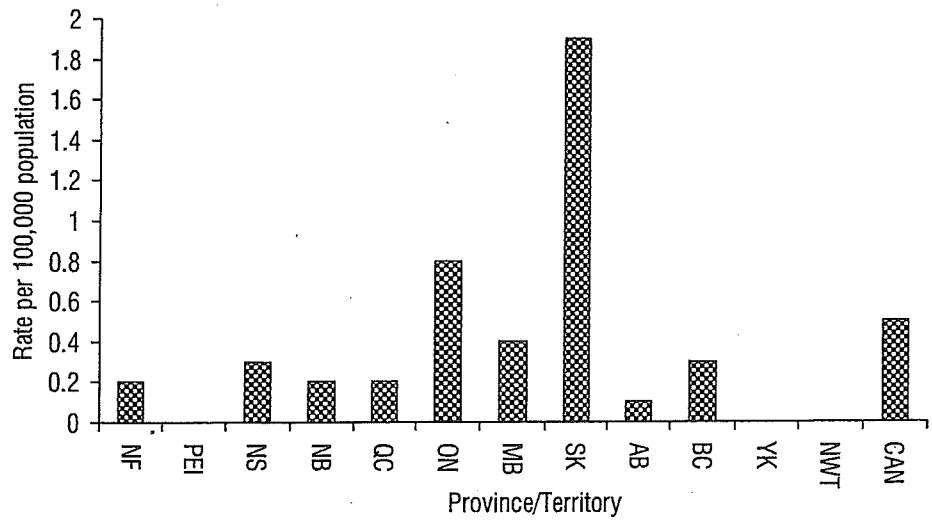
Figure 14
Reported Infectious Syphilis: Incidence per 100,000 by Province/Territory, 1995



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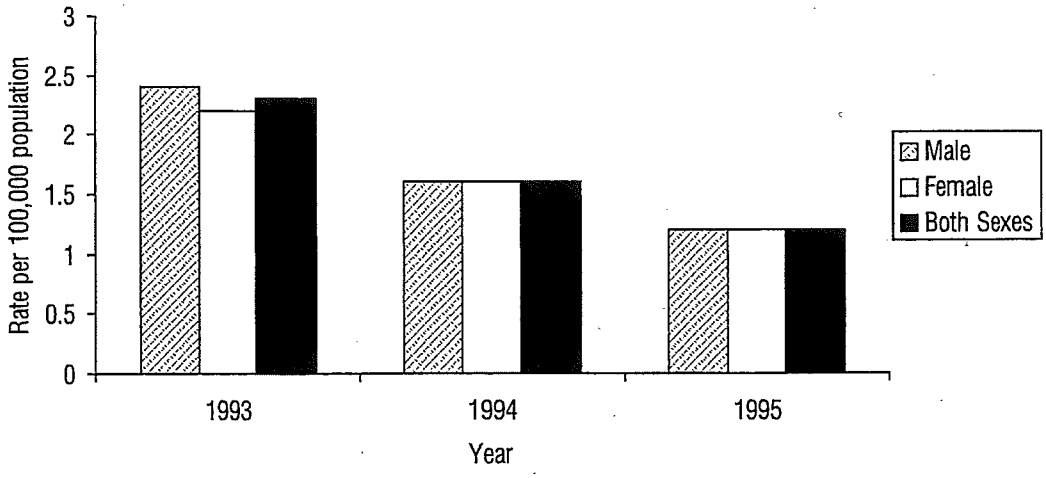
Non-Infectious Syphilis (Syphilis, Other)

This disease category was changed in 1993 to include late latent, tertiary and non-specified syphilis cases.

In 1995, 434 cases of syphilis, other, were reported in Canada, down 36.7% from the 686 cases reported in 1993. During this time, the reported case rate dropped 37.5%, from 2.4 to 1.5 cases per 100,000 in 1993 and 1995 respectively. There was a slight difference in the overall male and female rates in 1995, at 1.5 and 1.4 cases per 100,000 respectively (Figure 15).

The groups most affected were men aged 25-29 and 30-39 years with a rate of 2.4 cases per 100,000 and women belonging to the age groups 20-24 years and 25-29 years with respective rates of 2.1 and 2.3 cases per 100,000 population (Figure 16). In 1995, 51% of

Figure 15
Reported Syphilis, Other: Incidence per 100,000 by Sex, Canada, 1995



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cases were male and 49% were female. Seventy-eight percent of reported cases were ≥ 30 years.

In 1995, Ontario reported a provincial rate of 2.6 cases per 100,000 population. Newfoundland, Prince Edward Island, British Columbia, the Yukon and the Northwest Territories reported no cases (Figure 17).

Congenital Syphilis

Congenital syphilis is caused by the vertical transmission of *Treponema pallidum* from an infected woman to her fetus. Fetal infections frequently result in spontaneous abortions or stillbirths and preterm deliveries. Neonates and infants born with congenital syphilis

Figure 16
Reported Syphilis, Other: Incidence per 100,000 by Age and Sex, Canada, 1995

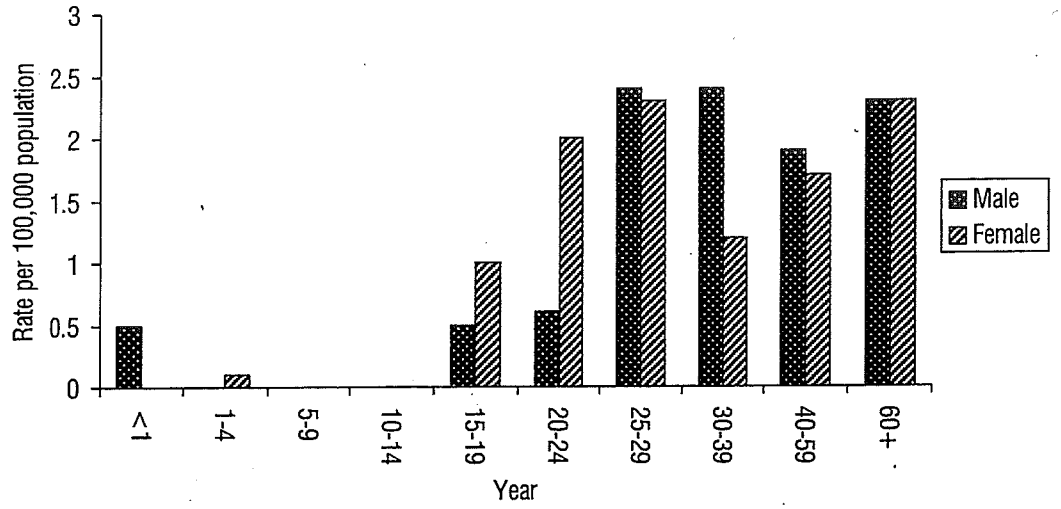

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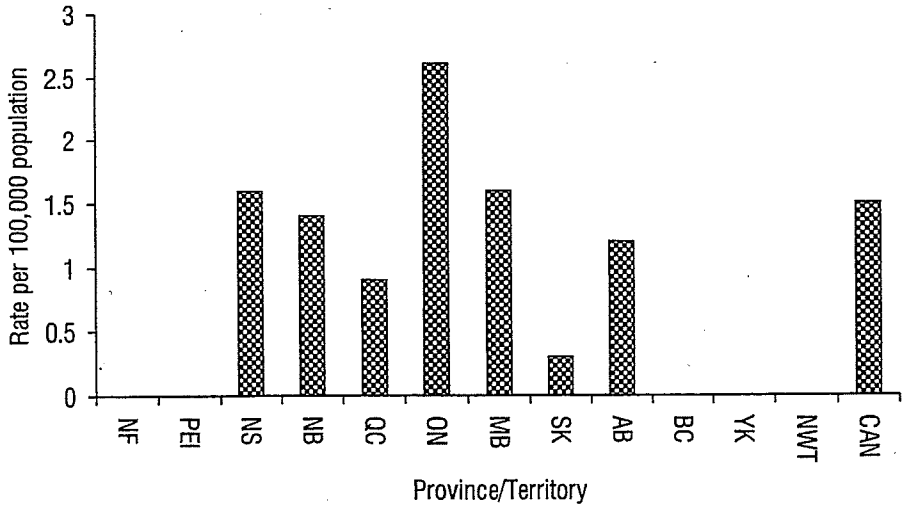
Figure 17
Reported Syphilis, Other: Incidence per 100,000 by Province/Territory, 1995



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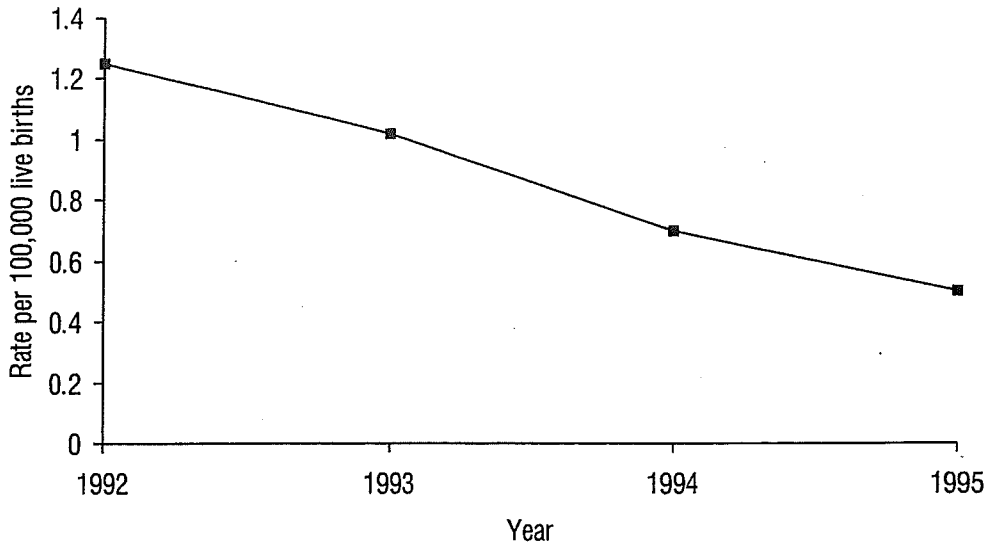
have a higher risk of infant mortality due to low birth weight and generalized systemic diseases. The disease is often asymptomatic in the first few weeks of life[1]. Although congenital syphilis may not be diagnosed until later in life, the case definition applies to neonates and infants < 1 year of age[17]. Accordingly, the appropriate denominator for calculating the rate of congenital syphilis among infants is the number of live births.

In 1995, two cases of congenital syphilis in infants < 1 year of age were reported in Ontario, one male and one female (Figure 18). From 1992 to 1995 the majority of the cases registered were from the provinces of Ontario and Quebec; Alberta was the only other province, declaring one case of congenital syphilis in 1994.

Figure 18
Reported Congenital Syphilis in Infants (< 1 year): Incidence per 100,000 Live Births, Canada, 1992-1995



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Human Papillomavirus

Human papillomavirus (HPV) is a small, non-enveloped DNA virus. More than 70 types have been identified, of which approximately 25 genital HPV types are mainly sexually transmitted. Condoms can reduce the risk of transmission but are not fully protective. Women can transmit HPV to their new-borns during delivery, who might develop respiratory laryngeal papillomatosis (RLP).

Genital warts are not nationally notifiable; they are estimated to have a prevalence of 2% among sexually active Canadian women[18]. The majority of HPV infections are benign and transient, regressing spontaneously within months to years. Recent evidence suggests, however, that a small subset of women cannot clear the HPV infection; type-specific persistent HPV in these women is the biologic precursor to cervical cancer. Flat lesions of the cervix and latent infections may harbour persistent HPV types and progress to cervical cancer. The treatment of genital warts and flat lesions of the cervix is useful for cosmetic reasons and for reducing transmission to sexual partners[19-28].

HPV is not currently under any systematic surveillance in Canada; therefore, its prevalence is unknown. Prevalence studies in the United States and Europe have shown that 10% to 40% of sexually active women are infected by HPV at any one time.

Types 6 and 11 are associated with external genital warts and laryngeal papillomatosis; types 16, 18, 31, 33 and 35 are associated with cancer of the cervix[19,20]. Accordingly, incidence rates of cervical cancer can be used as a substitute measure for specific genotypes of HPV. Although using this measure underestimates the true prevalence of HPV, it may be helpful in identifying trends. Cancer of the cervix is the second most common cancer in Canada[29] and the second most common cause of death from cancer among women worldwide[29,30].

Table 2
Cancer of the cervix: rates per 100,000 females in Canada, 1990-1995

	1990	1991	1992	1993	1994	1995
Incidence Rate	10.5	9.6	9.4	9.00*	8.7*	8.30*
Mortality Rate	3.7	3.6	3.02	3.26	3.4	3.01*

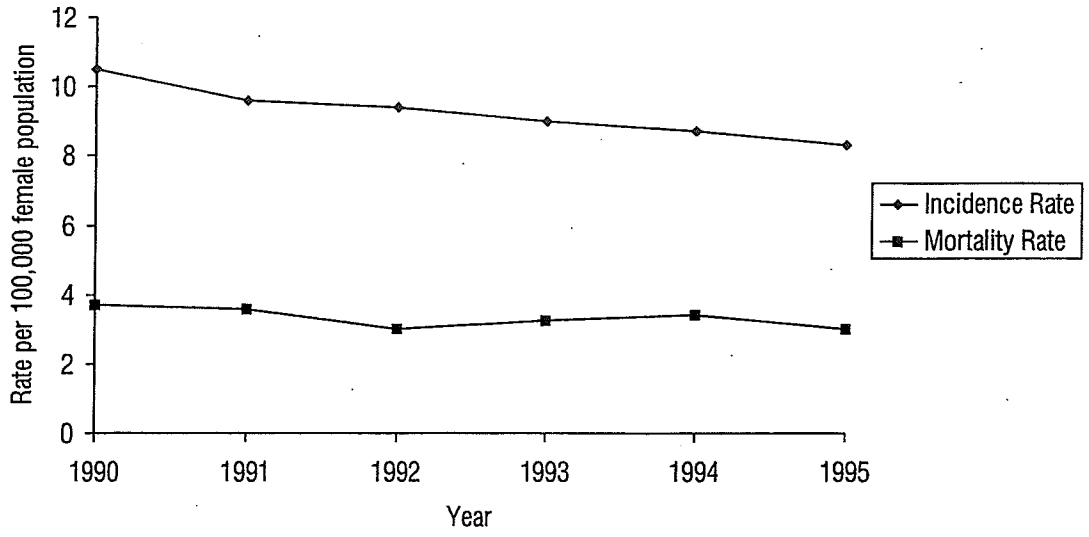
Reference code: 65 of the Canadian Diagnostic Short List or ICD-9 180. All rates are age-standardized.
*Estimated rates. Source: Health Statistics Division, Statistics Canada. Prepared by the Division of STD Prevention & Control/Bureau of HIV/AIDS & STD

Between 1990 and 1995 the age-standardized incidence rate for cervical cancer among all women decreased from 10.5 to 8.3 cases per 100,000 women, a drop of 21% (Table 2). The corresponding mortality rates over the same period dropped by 18.6% (Figure 19), most probably because of the fall in incidence rate[31].

At physicians' request, the National Laboratory for Viral Oncology, Bureau of Microbiology, Health Canada, tested and analyzed 1,056 cervical specimens for HPV in 1995. Of the total sample, 63% were negative; among the positive ones, 63% (244/387) were HPV 16 (Table 3).

Table 3 Cervical specimens: typing of HPV, 1995							
Province	**Negative**	**HPV 11**	**HPV 16**	**HPV 16 and 18**	**HPV18**	**Other**	**Not Suitable for Testing**
ON	384	1	109	6	12	36	1
SK	282	2	135	9	18	59	
NF	2						
Total	**668**	**3**	**244**	**15**	**30**	**95**	**1**

Figure 19
Cervical Cancer: Incidence and Mortality per 100,000 Females, Canada, 1990-1995



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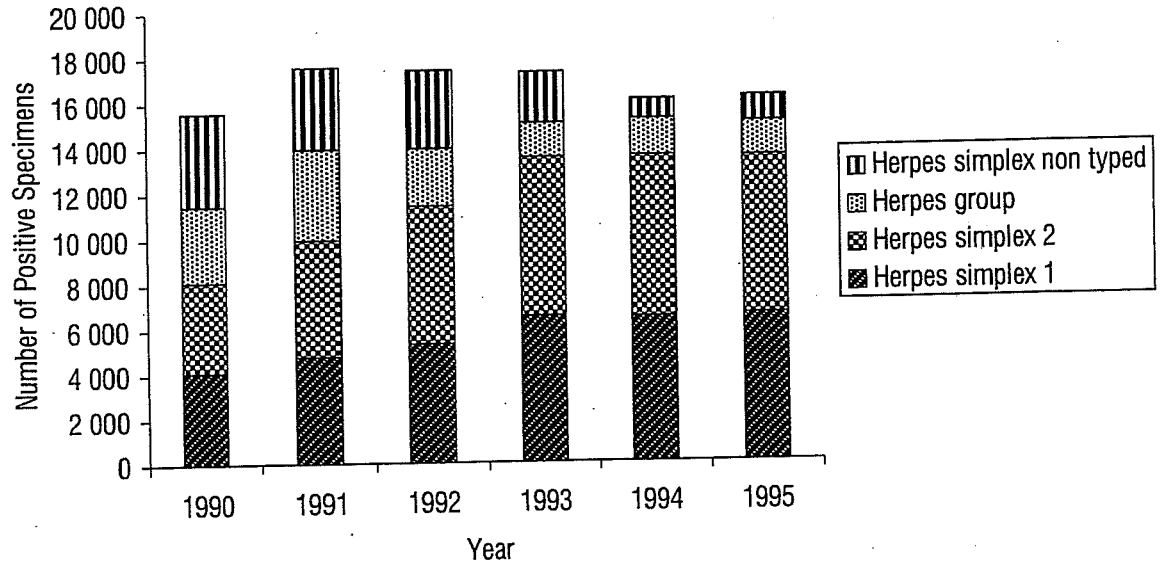
Herpes

Herpes simplex virus (HSV) is not a reportable disease in Canada, and knowledge of the seroprevalence of HSV is limited. The number of specimens found to be positive for herpes, according to the Bureau of Microbiology, LCDC, increased by 12.5% from 1990 to 1991. The number decreased from 1992 to 1994, but in 1995 there was a slight increase of 3.8% compared with the number of positive herpes specimens in 1990. As HSV is not being reported, incidence rates and trends cannot be ascertained from the number of laboratory tests.

What has changed is the distribution in the types of specimens that are positive for HSV. In 1995, 16,189 specimens were positive for herpes: 9.3% for herpes group, 7.1% for herpes simplex non typed, 40.4% for herpes simplex 1, and 43.2% for herpes simplex 2 (Annex 3). Between 1990 and 1995, there was an increase of 31.5% in the proportion of positive herpes specimens that were typed specifically for herpes simplex 1 and 2 (Figure 20) (Annex 3). Data are no longer collected for sex, age or site of lesion.

Figure 20
Number of Positive Herpes Specimens by Type, Canada, 1990-1995



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Acquired Immunodeficiency Syndrome (AIDS)

As reported up to June 30, 1996, 1,180 cases of AIDS were diagnosed in 1995; 91% of these cases were adult males, 7% were adult females, and 1.4% were pediatric cases (< 15 years of age). Forty-six percent were in the 30-39 year age group, and 38% were in the 40-59 year age group (Figure 21).

When adjusted for reporting delays and underestimates, the number of cases reported (1,180) in 1995 would be 2,314 (with 95% confidence levels).

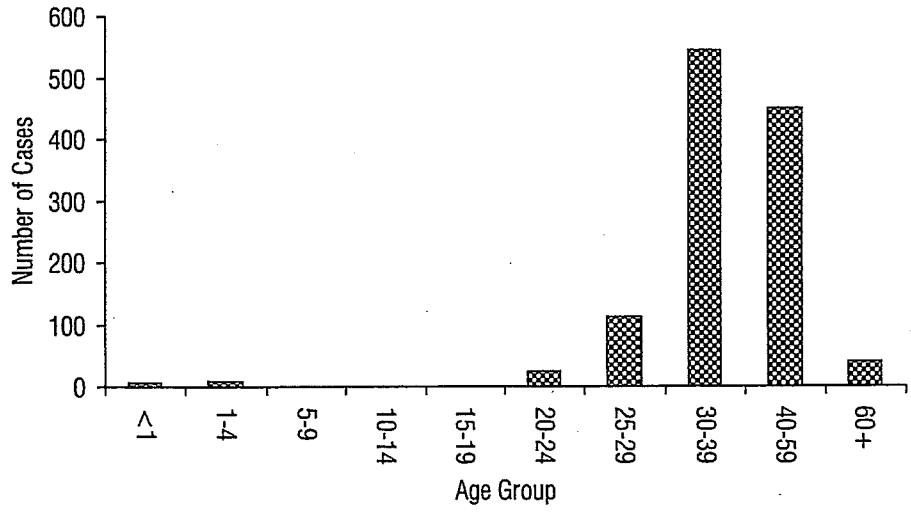
In 1995, the most common exposure categories reported for adults (Figure 22) were as follows:

- men who have sex with men (796 cases);
- heterosexual contact with a person at risk of HIV infection or who is infected with HIV (95 cases);
- injection drug use (79 cases);
- men who have sex with men and are injection drug users (59 cases); and
- heterosexual contact with a person in a pattern II country, i.e. countries in which the predominant means of transmission is heterosexual (50 cases).

In 61 cases there was no identified risk factor. Recipients of blood and clotting factor accounted for 2 out of 17 pediatric cases. Perinatal transmission accounted for 13 cases, and for 2 cases the risk factor was not specified.

Regionally, Ontario, Quebec and British Columbia reported the majority of cases in 1995, with 444, 363 and 209 cases respectively. The incidence rate per 100,000 population was 8.1 for Ontario, 12.7 for Quebec and 7.4 for British Columbia. The Prairies and Territories region, including Saskatchewan, Manitoba, Yukon and the Northwest Territories, had the lowest number (25) of reported cases in Canada with an incidence rate of 1.4 cases per 100,000 population. The Atlantic region, including Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick, had an incidence rate of 2.7 cases per 100,000 population

Figure 21
AIDS: Reported Cases by Age Group, Canada, 1995



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(47 reported cases). In Alberta the incidence rate was 3.8 cases per 100,000 population (92 reported cases) (see Figure 23).

For more details, consult the Division of HIV/AIDS Surveillance Annual Report[32] and the quarterly surveillance updates (published by the Division of HIV/AIDS Surveillance, Bureau of HIV/AIDS and STD, LCDC) or the Internet at the following address: http://www.hwc.ca/hpb/lcdc/bah/surv/index.html.

Figure 22
Reported AIDS Cases by Exposure Category, Canada, 1995

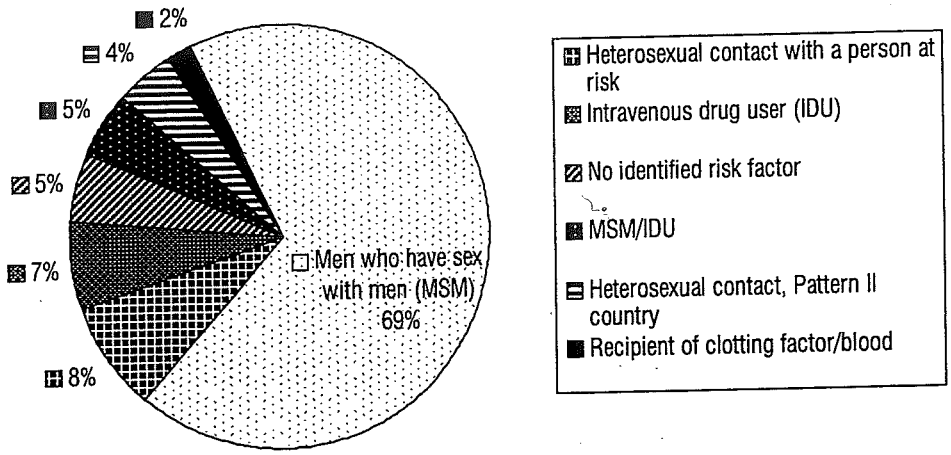

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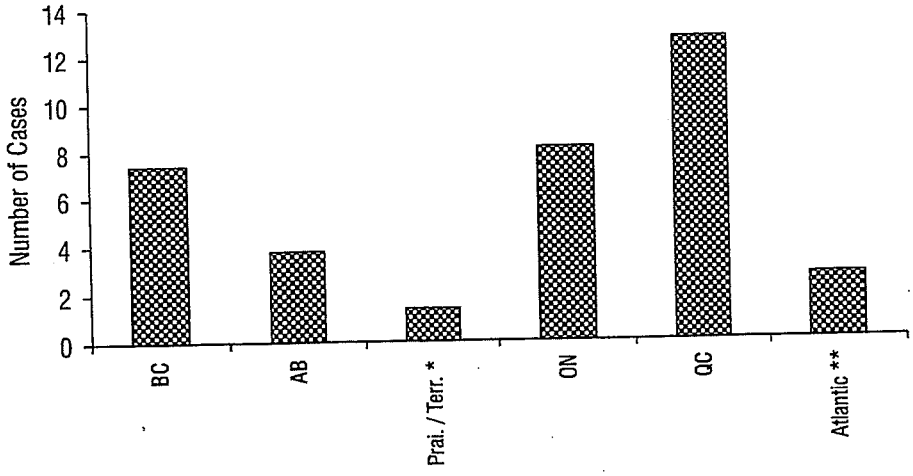
Figure 23
Reported AIDS : Incidence Rate per 100,000 by Region, Canada, 1995



* Includes Saskatchewan, Manitoba, Yukon, & Northwest Territories
** Includes Newfoundland, Price Edward Island, Nova Scotia & New Brunswick

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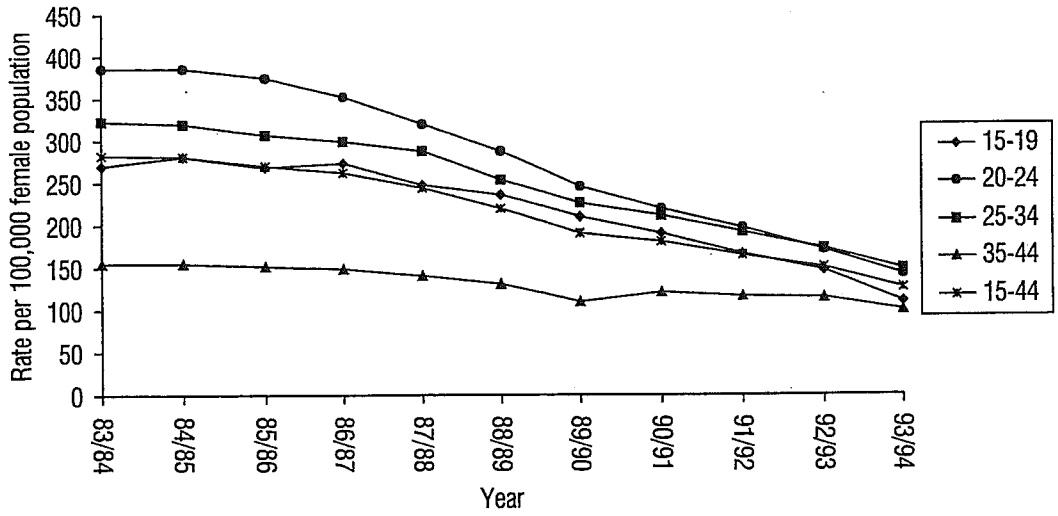
Pelvic Inflammatory Disease

Pelvic inflammatory disease (PID) is inflammation of the internal female genital organs. About 10% of women have had at least one episode of PID in their life time[5]. It is estimated that 75% to 85% of PID cases are caused by sexually transmitted diseases and, of these, gonorrhea and chlamydia infections are responsible in 20% to 40% and 25% to 65% of cases respectively[5]. The sequelae of PID can be severe: chronic pelvic pain, ectopic pregnancy and tubal infertility. Approximately 15% of women who have had PID become infertile after one episode and 30% after two infections. The costs of PID infections (ICD-9 code 614) in Canada are substantial. On the basis of 1984/85 hospital morbidity statistics, the total cost for hospital and outpatient care was estimated at more than $140 million, and this did not include the costs associated with investigating chronic pelvic pain. At that time, the average hospital stay was 6.2 days, and 40% of patients underwent surgery[33]. Goeree and Gully estimated the number of inpatient and outpatient cases of PID in Canada during 1990 to be 100,000[4]. The average length of hospital stay was calculated as 4.2 days and the cost estimated at $57,792,796. The variation in the estimates of PID costs from one study to another can be attributed, in part, to the methodologies used. Studies have investigated a wide range of variables, among which some relate to the specific time period for the estimate; the cost of illness, disease or disability; the costs associated with new cases and with the sequelae of cases from a previous period; hospitalization rate; ambulatory treatment; and productivity losses.

PID is not a reportable condition in Canada. Its true incidence and prevalence are unknown. Data are extracted from hospital discharge data (Canadian Institute of Hospital Information or CIHI). Only those cases that are severe enough to be hospitalized are counted; less severe cases treated out of hospital are not included. Also, these data reflect the number of hospital discharges, not the number of cases. Women hospitalized for PID more than once for the same infection in one fiscal year are counted for each hospital discharge. This would affect the real incidence rate. The incidence rates have been calculated

Figure 24
Hospital Separations for Pelvic Inflammatory Disease: Incidence per 100,000 Females by Age, Canada, 1983/84-1993/94



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per 100,000 females by selected age groups using population data from Statistics Canada.

Nationally, hospital-treated PID case rates for women aged 15-44 have been decreasing since the early 1980s. The rate fell from 281.2 per 100,000 in 1984/85 to 125.5 per 100,000 in 1993/94, a drop of 55.4% (Figure 24). Up until 1992/93, women aged 20-24 had the highest PID rates. Since then, women aged 25-34 have had the highest rates, at 147.9 per 100,000 in 1993/94. Women aged 20-24 had a rate of 141.7 per 100,000 in 1993/94. Women aged 15-19 and 35-44 had the lowest rates, at 125.5 and 110.1 per 100,000 respectively. Women aged 20-24 experienced the largest drop in PID rates between 1984/85 and 1993/94; the rate fell from 385.9 to 141.7 per 100,000, a drop of 63.2%.

Women aged 15-19 demonstrated the second largest drop in PID rates, which fell by 60.7% between 1984/85 and 1993/94. The age group with the smallest decline in PID rates was the 35-44 year group; this rate dropped by 35.0% in the same 10-year period. However, the age-adjusted rates for PID have been converging since the mid-1980s (Annex 4).

The rate of hospital discharges for PID decreased by 55.5% between 1984 and 1993, from 281.8 to 125.5 per 100,000 population. Several factors could explain the decline in PID rates in the past decade. A true decline in PID prevalence could have occurred. Decreasing gonococcal infection and chlamydia rates tend to support this conclusion. Another explanation is that the decline is an artefact of the data collection method. If more PID cases are now being diagnosed and treated outside the hospital setting than they were 10 years ago, then an artificial decrease in PID rates would be apparent, because the only data available are hospital data[4,5,33]. Most PID cases are atypical or show mild or no symptoms; therefore, fewer people seek medical intervention. This factor would also contribute to a decrease in the PID prevalence rates[34-36].

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Annexes

Annex 1.1

Reported cases of STD in Canada by province/territory and sex, 1995

Province/ Territory	Sex	Chlamydia	Gonococcal Infections	Infectious Syphilis*	Syphilis, Other	Congenital Syphilis†	AIDS‡	Chancroid	Gonococcal Ophth. Neo.
Newfoundland	Male	45	2	1	0	0	6	0	0
	Female	227	2	0	0	0	0	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	272	4	1	0	0	6	0	0
Prince Edward Island	Male	27	0	0	0	0	2	0	0
	Female	85	0	0	0	0	0	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	112	0	0	0	0	2	0	0
Nova Scotia	Male	282	15	1	3	0	24	0	0
	Female	884	23	0	12	0	2	0	0
	Unspecified	1	0	0	0	0	0	0	0
	Total	1,167	38	1	15	0	26	0	0
New Brunswick	Male	164	5	1	5	0	15	0	0
	Female	598	7	0	6	0	1	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	762	12	1	11	0	16	0	0
Quebec	Male	1,759	425	6	32	0	374	1	2
	Female	5,278	165	7	34	0	50	0	1
	Unspecified	11	5	0	0	0	0	0	0
	Total	7,048	595	13	66	0	424	1	3
Ontario	Male	2,931	1,719	58	148	1	502	0	6
	Female	9,157	1,264	34	139	1	42	0	7
	Unspecified	2	0	0	0	0	0	0	0
	Total	12,090	2,983	92	287	2	544	0	13
Manitoba	Male	782	376	3	9	0	15	0	0
	Female	2,226	282	1	9	0	1	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	3,008	658	4	18	0	16	0	0
Saskatchewan	Male	612	208	9	2	0	11	0	0
	Female	1,737	178	10	1	0	2	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	2,344	386	19	3	0	13	0	0

* Comprises syphilis, early latent + early symptomatic (primary & secondary)

† Congenital syphilis includes infant cases only (age group <1 year)

‡ From data based on AIDS cases reported to LCDC to March 31, 1997. See "Quarterly Surveillance Update: AIDS in Canada", Bureau of HIV/AIDS and STD, LCDC, 1997

Reported cases of STD in Canada by province/territory and sex, 1995									
Province/ Territory	Sex	Chlamydia	Gonococcal Infections	Infectious Syphilis*	Syphilis, Other	Congenital Syphilis†	AIDS‡	Chancroid	Gonococcal Ophth. Neo.
Alberta	Male	1,167	223	3	22	0	89	0	1
	Female	3,851	177	1	12	0	6	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	5,018	400	4	34	0	95	0	1
British Columbia	Male	1,057	40	8	0	0	229	0	0
	Female	3,602	42	2	0	0	17	0	0
	Unspecified	1	0	0	0	0	0	0	0
	Total	4,660	82	10	0	0	246	0	0
Yukon	Male	34	11	0	0	0	2	0	0
	Female	122	9	0	0	0	0	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	156	20	0	0	0	2	0	0
Northwest Territories	Male	225	40	0	0	0	1	0	0
	Female	689	85	0	0	0	1	0	0
	Unspecified	0	0	0	0	0	0	0	0
	Total	914	125	0	0	0	2	0	0
Canada	Male	9,085	3,064	90	221	1	1,268	1	9
	Female	28,451	2,234	55	213	1	124	0	9
	Unspecified	15	5	0	0	0	0	0	0
	Total	37,551	5,303	145	434	2	1,392	1	18

* Comprises syphilis, early latent + early symptomatic (primary & secondary)

† Congenital syphilis includes infant cases only (age group <1 year)

‡ From data based on AIDS cases reported to LCDC to March 31, 1997. See "Quarterly Surveillance Update: AIDS in Canada", Bureau of HIV/AIDS and STD, LCDC, 1997

Annex 1.2

Rates per 100,000 population of nationally notifiable STD in Canada by province/territory and sex, 1995

Province/ Territory	Sex	Chlamydia	Gonococcal Infections	Infectious Syphilis	Syphilis, Other	Congenital Syphilis*	AIDS	Chancroid	Gonococcal Ophth. Neo.
Newfoundland	Male	15.6	0.7	0.3	0.0	0.0	2.1	0.0	0.0
	Female	79.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	Total	47.5	0.7	0.2	0.0	0.0	1.0	0.0	0.0
Prince Edward Island	Male	40.1	0.0	0.0	0.0	0.0	3.0	0.0	0.0
	Female	123.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	82.3	0.0	0.0	0.0	0.0	1.5	0.0	0.0
Nova Scotia	Male	61.0	3.2	0.2	0.6	0.0	5.2	0.0	0.0
	Female	186.1	4.8	0.0	2.5	0.0	0.4	0.0	0.0
	Total	124.4	4.1	0.1	1.6	0.0	2.8	0.0	0.0
New Brunswick	Male	43.5	1.3	0.3	1.3	0.0	4.0	0.0	0.0
	Female	155.9	1.8	0.0	1.6	0.0	0.3	0.0	0.0
	Total	94.7	1.6	0.1	1.4	0.0	2.1	0.0	0.0
Quebec	Male	48.7	11.8	0.2	0.9	0.0	10.3	0.0	0.05
	Female	141.9	4.4	0.2	0.9	0.0	1.3	0.0	0.02
	Total	96.1	8.1	0.2	0.9	0.0	5.8	0.0	0.04
Ontario	Male	53.5	31.4	1.1	2.7	0.0	9.2	0.01	0.1
	Female	163.0	22.5	0.6	2.5	0.0	0.7	0.0	0.1
	Total	109.0	26.9	0.8	2.6	0.0	4.9	0.009	0.1
Manitoba	Male	138.6	66.7	0.5	1.6	0.0	2.7	0.0	0.0
	Female	388.2	49.2	0.2	1.6	0.0	0.2	0.0	0.0
	Total	264.4	57.9	0.4	1.6	0.0	1.4	0.0	0.0
Saskatchewan	Male	121.2	41.2	1.8	0.4	0.0	2.2	0.0	0.0
	Female	340.0	34.8	2.0	0.2	0.0	0.4	0.0	0.0
	Total	230.8	38.0	1.9	0.3	0.0	2.2	0.0	0.0
Alberta	Male	84.4	16.1	0. 2	1.6	0.0	6.4	0.0	0.07
	Female	282.4	13.0	0.1	1.6	0.0	0.4	0.0	0.0
	Total	182.7	14.6	0.1	1.2	0.0	3.5	0.0	0.03
British Columbia	Male	56.5	2.1	0.4	0.0	0.0	12.2	0.0	0.0
	Female	190.2	2.2	0.1	0.0	0.0	0.9	0.0	0.0
	Total	123.7	2.2	0.3	0.0	0.0	6.5	0.0	0.0
Yukon	Male	222.6	72.0	0.0	0.0	0.0	13.1	0.0	0.0
	Female	821.8	60.6	0.0	0.0	0.0	0.0	0.0	0.0
	Total	518.0	66.4	0.0	0.0	0.0	3.3	0.0	0.0
Northwest Territories	Male	659.6	117.3	0.0	0.0	0.0	3.0	0.0	0.0
	Female	2,172.5	268.0	0.0	0.0	0.0	3.2	0.0	0.0
	Total	1,388.5	189.9	0.0	0.0	0.0	3.0	0.0	0.0
Canada	Male	62.0	20.9	0.6	1.5	0.0	8.6	0.0	0.06
	Female	190.4	15.0	0.4	1.4	0.0	0.8	0.0	0.06
	Total	126.8	17.9	0.5	1.5	0.5	4.7	0.0	0.06

* Congenital syphilis includes infant cases only (age group <1 year) / Congenital syphilis rate per 100,000 live births
Population figures used to calculate the rates are estimates from the 1991 Census/Statistics Canada

Annex 1.3

Rates per 100,000 population of nationally notifiable STDs in Canada by sex and age, 1995

Disease	Sex	Total	Age Group (years)										
			0<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+	NS (Age)
Chlamydia	Male	61.9	12.2	0.7	0.3	2.0	169.6	335.6	163.1	55.7	10.9	1.6	-
	Female	190.4	17.2	0.6	1.0	47.6	1,109.1	1,041.7	336.8	88.5	12.6	1.2	-
	Total	126.8	14.7	0.7	0.7	24.3	627.6	683.7	249.2	72.0	11.8	1.3	-
Gonococcal Infections	Male	20.9	1.02	0.2	0.0	0.8	41.5	70.0	58.0	32.7	8.8	1.5	-
	Female	14.9	0.5	0.5	0.2	7.5	87.8	70.6	27.7	8.7	1.3	0.0	-
	Total	17.9	0.8	0.4	0.1	4.1	64.0	70.3	43.1	20.8	5.0	0.7	-
Infectious Syphilis*	Male	0.6	0.0	0.0	0.0	0.0	0.2	1.4	1.2	1.1	0.7	0.2	-
	Female	0.4	0.0	0.0	0.0	0.0	1.1	1.2	1.1	0.4	0.2	0.0	-
	Total	0.5	0.0	0.0	0.0	0.0	0.6	1.3	1.2	0.8	0.5	0.1	-
Syphilis, Other† (Non-infectious)	Male	1.5	0.5	0.0	0.0	0.0	0.5	0.6	2.4	2.4	1.9	2.3	-
	Female	1.4	0.0	0.1	0.0	0.0	1.0	2.0	2.3	1.2	1.7	2.3	-
	Total	1.5	0.5	0.0	0.0	0.0	0.7	1.3	2.4	1.8	1.8	2.3	-
Congenital Syphilis‡	Male	-	-	-	-	-	-	-	-	-	-	-	-
	Female	-	-	-	-	-	-	-	-	-	-	-	-
	Unspecified	-	-	-	-	-	-	-	-	-	-	-	-
	Total	0.5	0.5	-	-	-	-	-	-	-	-	-	-
Chancroid	Male	0.007	0.0	0.0	0.0	0.0	0.0	0.096	0.0	0.0	0.0	0.0	-
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
	Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
	Total	0.007	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-

Population figures used to calculate the rates are estimates from the 1991 Census/Statistics Canada
NS = not specified
* Infectious syphilis includes syphilis early symptomatic + syphilis early latent
† Syphilis, Other includes syphilis late latent + tertiary
‡ Congenital syphilis rates per 100,000 live births (sex not specified)

Source: Bureau of Infectious Diseases, Division of Disease Surveillance, May 1997
Prepared by: The Division of STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997

Annex 1.4

Reported number of STD cases in Canada by sex and age, 1995

Disease	Sex	Total	Age Group (years)										
			0<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+	NS (Age)
Chlamydia	Male	9,085	24	6	3	21	1,721	3,478	1,848	1,484	398	33	69
	Female	28,451	32	5	10	466	10,704	10,496	3,745	2,312	459	31	191
	Unspecified	15	0	0	0	0	2	2	1	0	1	0	9
	Total	37,551	56	11	13	487	12,427	13,976	5,594	3,796	858	64	269
Gonococcal Infections	Male	3,064	2	2	0	8	421	725	657	871	320	32	26
	Female	2,234	1	4	2	74	847	712	308	227	47	1	11
	Unspecified	5	0	0	0	0	0	0	2	1	0	0	2
	Total	5,303	3	6	2	82	1,268	1,437	967	1,099	367	33	39
Infectious Syphilis*	Male	90	0	0	0	0	2	14	14	30	24	5	1
	Female	55	0	0	0	0	11	12	12	11	9	0	0
	Unspecified	0	0	0	0	0	0	0	0	0	0	0	0
	Total	145	0	0	0	0	13	26	26	41	33	5	1
Syphilis, Other† (Non-infectious)	Male	221	1	0	0	0	5	6	27	64	69	49	0
	Female	213	0	1	0	0	10	20	26	32	62	61	1
	Unspecified	0	0	0	0	0	0	0	0	0	0	0	0
	Total	434	1	1	0	0	15	26	53	96	131	110	1
Congenital Syphilis	Male	1	1	0	0	0	0	0	0	0	0	0	0
	Female	1	1	0	0	0	0	0	0	0	0	0	0
	Unspecified	0	0	0	0	0	0	0	0	0	0	0	0
	Total	2	2	0	0	0	0	0	0	0	0	0	0
Chancroid	Male	1	0	0	0	0	0	1	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Unspecified	0	0	0	0	0	0	0	0	0	0	0	0
	Total	1	0	0	0	0	0	1	0	0	0	0	0

NS = not specified

* Infectious syphilis includes syphilis early symptomatic + syphilis early latent

† Syphilis, Other includes syphilis late latent + tertiary

Source: Bureau of Infectious Diseases, Division of Disease Surveillance, May 1997

Prepared by: The Division of STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997

Annex 2

Genital chlamydia : reported cases and rates by age and sex, Canada, 1995										
No. of Cases	Age, yr.									
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Both sexes	56	11	13	487	12,426	13,976	5,594	3,796	858	64
Males	24	6	3	21	1,721	3,478	3,478	1,484	398	33
Females	32	5	10	466	10,704	10,496	3,745	2,312	459	31
	Rates									
Both sexes	14.7	0.7	0.7	24.3	627.6	683.7	249.2	72.0	12.0	1.6
Males	12.2	0.6	0.3	2.0	169.6	335.6	163.1	55.7	11.0	1.2
Females	17.2	0.7	1.0	47.6	1,109.1	1,041.7	3,36.8	88.5	12.6	1.3

Prepared by: STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997

Annex 3

Number of positive herpes specimens in Canada by typing, 1990-1995						
	1990	1991	1992	1993	1994	1995
Herpes group	3,337	4,021	2,517	1,552	1,611	1,501
Herpes simplex non typed	4,136	3,596	3,483	2,238	882	1,152
Herpes simplex 1	4,065	4,731	5,279	6,509	6,449	6,536
Herpes simplex 2	4,055	5,197	6,128	6,991	7,117	7,000
Total number of positve cases	15,593	17,545	17,407	17,290	16,059	16,189

Prepared by: STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997

Annex 4

Age-specific rates* for hospital separation for PID: 1983/84 to 1993/94

Age	Year										
	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
	Rate										
15-19	269.6	280.2	267.2	273.1	247.2	236.2	210.0	190.5	166.5	147.0	110.1
20-24	386.0	385.9	373.4	351.5	319.7	286.8	245.3	219.3	196.4	171.6	141.7
25-34	323.1	319.5	306.0	298.5	286.3	252.7	226.6	210.5	192.7	172.1	147.9
35-44	154.7	155.0	151.9	147.8	140.9	130.4	109.2	120.4	116.0	114.5	100.7
15-44	**281.8**	**281.2**	**269.7**	**261.1**	**243.3**	**218.7**	**190.5**	**180.0**	**164.3**	**149.2**	**125.5**
	No. of Cases										
15-19	2,891	2,868	2,634	2,650	2,368	2,249	1,993	1,803	1,567	1,387	1,046
20-24	4,802	4,797	4,607	4,243	3,723	3,197	2,660	2,309	2,046	1,778	1,459
25-34	7,269	7,320	7,143	7,101	6,951	6,246	5,721	5,359	4,881	4,343	3,700
35-44	2,552	2,664	2,711	2,735	2,710	2,604	2,275	2,609	1,591	2,616	2,359
15-44	17,514	17,649	17,095	16,729	15,752	14,296	13,682	12,090	11,085	10,124	8,564

* Rate per 100,000 female population
Note: Since 1980 Statistics Canada has reported all hospital morbidity by fiscal year
PID reference code ICD-9 or code 167 of the Canadian Diagnostic Short List used by Statistics Canada
ICD-9: International Classification of Diseases, 9th. Edition
Prepared by: STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Health Canada, 1997