



COMMUNICABLE DISEASE 1995–2004

A Peel Health Status Report



 Region of Peel
Working for you
Public Health

INTRODUCTION

The *Communicable Disease 1995-2004* report is the latest in a series of annual reports on communicable diseases published by Peel Public Health. This report is part of Peel Public Health's ongoing series of health status reports describing the health of the region's population.

Communicable diseases are illnesses caused by organisms or the toxins they produce. They are spread directly from an infected person, animal or environmental source. Transmission can also occur indirectly by contaminated animals and objects.

The *Communicable Disease 1995-2004* report highlights data on selected communicable diseases that are a public health concern because of their potential for spread to a large number of people and their ability to cause serious illness. Diseases meeting these criteria but which are rare in Peel are included in the Appendix. Data for this report are obtained through the Reportable Disease Information System (RDIS). For more details please refer to the Data Sources and Methods section.

The information contained in this report includes:

- An overview of the following groups of communicable diseases:
 - sexually transmitted and bloodborne infections
 - vaccine-preventable diseases
 - diseases spread by food and water
 - diseases spread by close personal contact
 - diseases spread by insects
- An Appendix containing tables with case counts and incidence rates for all communicable diseases reported in Peel and Ontario for which data were available, listed in alphabetical order.

The *Communicable Disease 1995-2004* report is intended to be a resource for Peel Public Health, health and social service agencies, physicians and other health care providers, elected officials and those that provide programs and services to groups at risk for communicable diseases.



CHAPTER 1: SEXUALLY TRANSMITTED AND BLOODBORNE INFECTIONS

Highlights

- In Peel, the incidence of Acquired Immunodeficiency Syndrome (AIDS) has remained low (0.4 to 1.4 cases per 100,000) since the introduction of the anti-retroviral therapies in 1996.¹ Any variability from year to year may be due to the small number of cases.
- Chlamydia is the most commonly reported sexually transmitted infection in Peel.
- In Peel, the incidence of chlamydia increased by approximately 73% over an eight-year period (from 101 per 100,000 in 1996 to 173 per 100,000 in 2004). This increase is due in part to improved detection methods and case finding by physicians.²
- The incidence of gonorrhoea in Peel has remained stable over the past five-year period (approximately 30 to 33 cases per 100,000).
- Persons aged 15 to 24 years have the highest incidence of chlamydia and gonorrhoea, the two most common sexually transmitted infections in Peel.
- In Peel, the incidence of syphilis has increased considerably since 2002. Twenty new cases were reported in Peel in 2004, as compared to one to two cases per year reported from 1999 to 2002. A similar increase in syphilis cases has been observed in the Greater Toronto Area.^{3,4}
- In Peel, the incidence of hepatitis B has been low since 1997 (approximately one case per 100,000 or less). The incidence of hepatitis B was highest among people aged 20 to 29 years followed by those aged 30 to 39 years, especially in men.
- The incidence of hepatitis C in Peel has decreased since 1997. The incidence of hepatitis C is highest in males aged 40 to 49 years and in females aged 30 to 39 years.

INTRODUCTION

Sexually transmitted infections (STIs) and bloodborne infections are caused by a variety of bacteria and viruses found in blood and body fluids (semen, vaginal fluids and sometimes breast milk and saliva). In addition to being spread by sexual contact, STIs can also be spread by another route such as injection or a cut in the skin.⁵ STIs are rarely spread through such activities as touching, hugging, shaking hands or non-sexual kissing. Gonorrhoea and chlamydia are almost exclusively sexually transmitted. Other diseases can also be spread through contaminated blood. For hepatitis C, blood is the main route of infection; for syphilis, sexual transmission is most frequent; while for Human Immunodeficiency Virus infection (HIV) and hepatitis B, both blood and sexual transmission are the primary routes of transmission. All these diseases may be

passed from mother to child during pregnancy or birth, often with severe consequences to the fetus or newborn.

HIV/AIDS

Human Immunodeficiency Virus (HIV) is the virus that causes Acquired Immunodeficiency Syndrome (AIDS).^{2,5,6} The progression from HIV infection to the development of AIDS varies greatly from person to person and depends largely on the extent to which the immune system has been damaged. About half of the people with HIV will develop AIDS within ten years after becoming infected, but the introduction of powerful anti-retroviral therapies in 1996 has dramatically increased the time between HIV infection and the development of AIDS.^{1,7,8}

Figure 1.1: Incidence of AIDS, Region of Peel and Ontario, 1995-2004

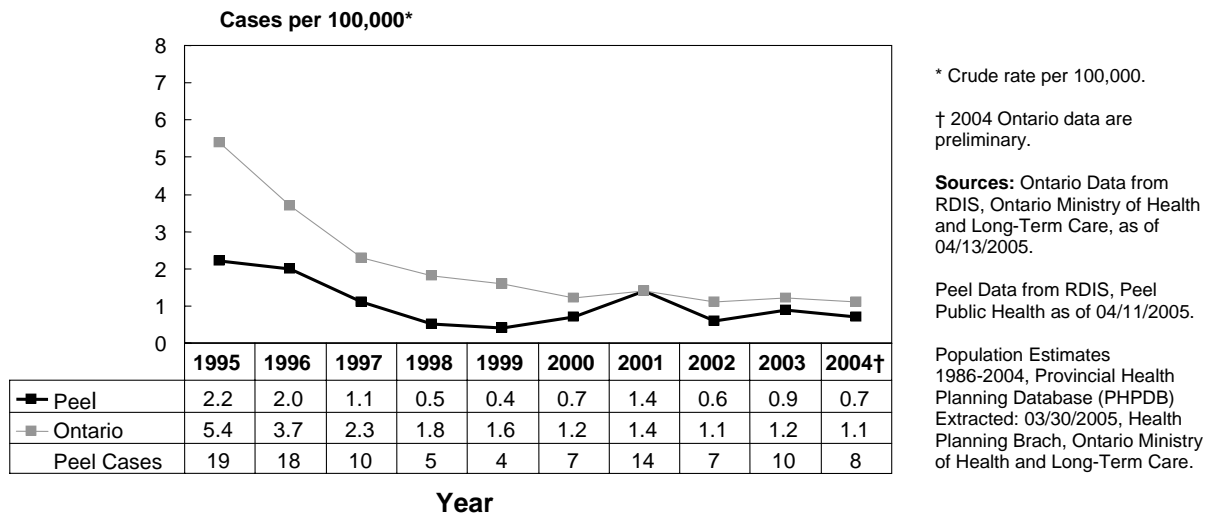


Figure 1.2: Incidence of AIDS by Age Group, Region of Peel, 1995-2004 Combined

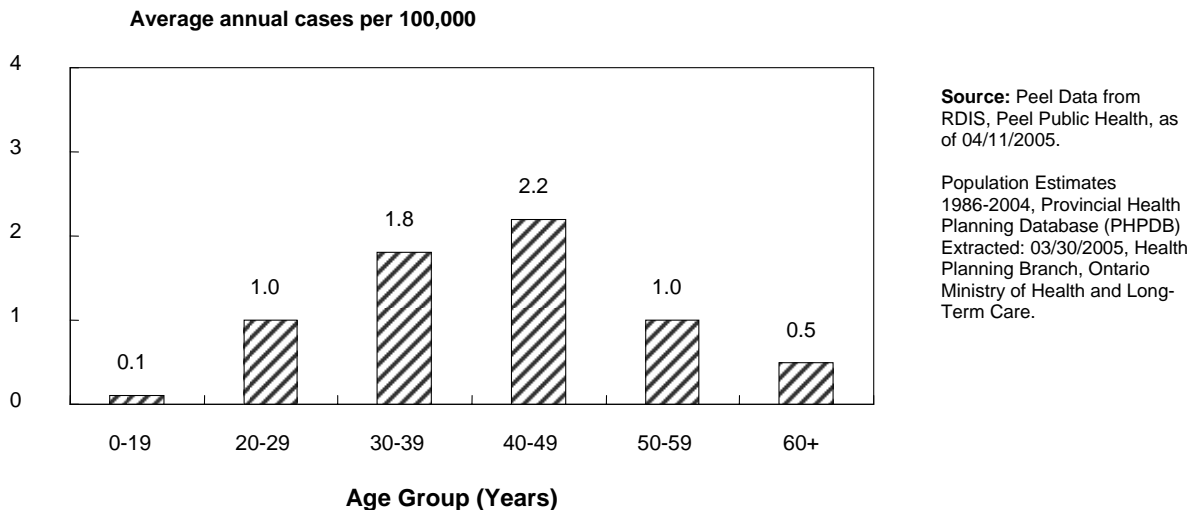
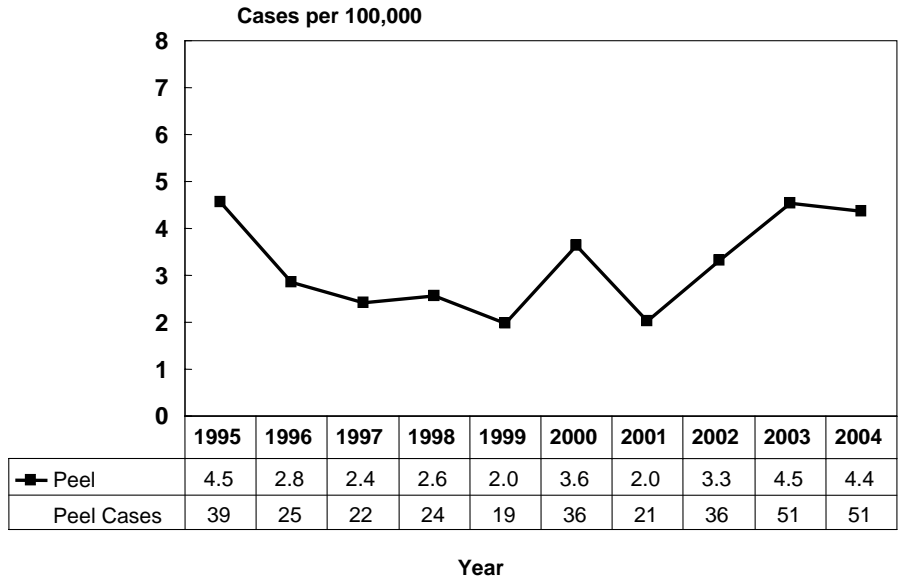


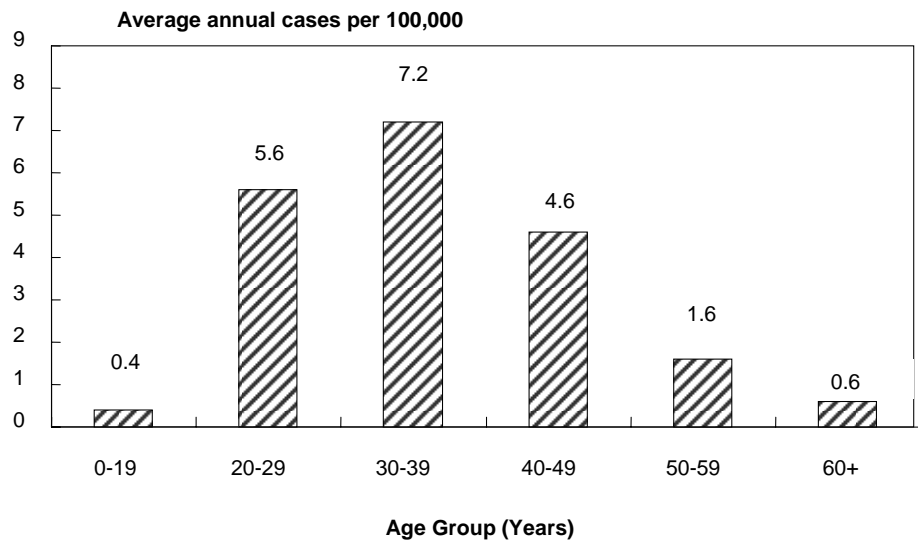
Figure 1.3: Incidence of HIV Infection, Region of Peel, 1995-2004



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

Figure 1.4: Incidence of HIV Infection by Age Group, Region of Peel, 1995-2004 Combined



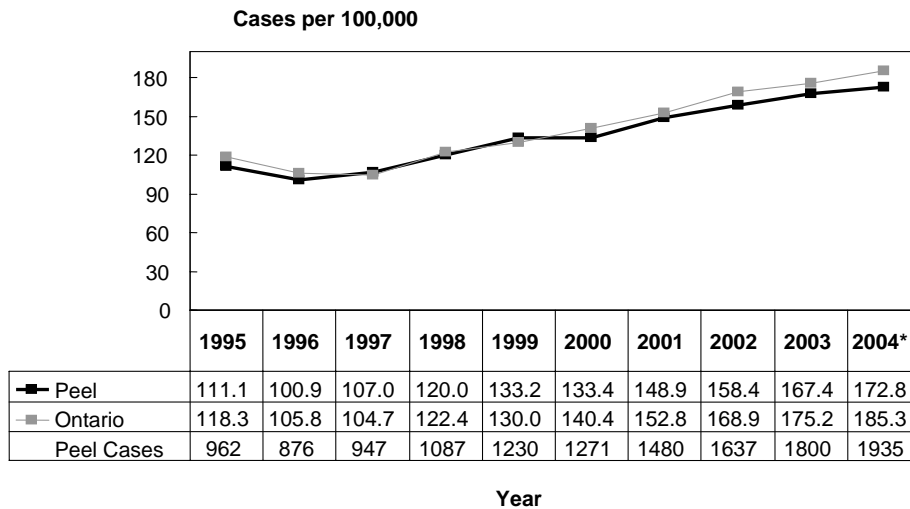
Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

CHLAMYDIA

Chlamydia, the most common sexually transmitted infection in Canada, is a bacterial infection caused by *Chlamydia trachomatis*. The most common symptoms are urinary pain and genital discharge. If left untreated, chlamydia can cause a chronic infection (pelvic inflammatory disease), infertility and tubal pregnancy. However, more than 50% of infected males and 70% of infected females have no symptoms and are unaware of their condition, making diagnosis and treatment of chlamydia difficult.^{6,9}

Figure 1.5: Incidence of Chlamydia, Region of Peel and Ontario, 1995-2004



*2004 Ontario data are preliminary.

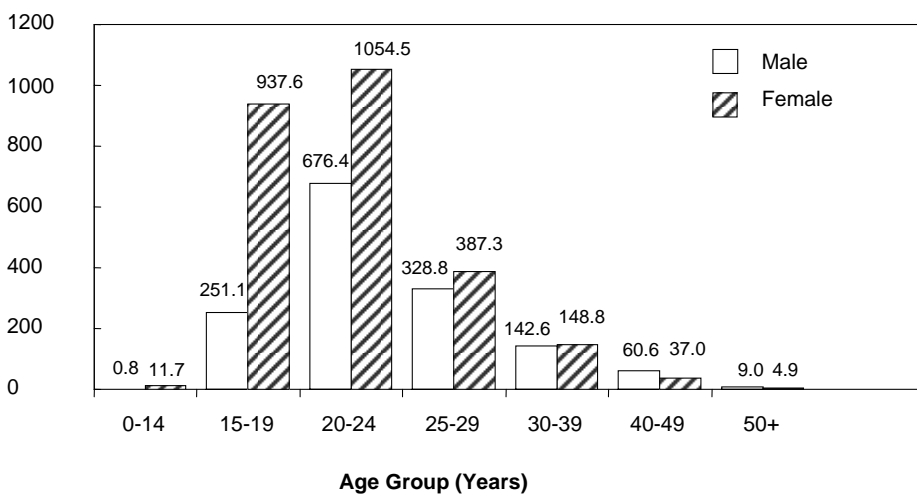
Note: Rates age-standardized using 1991 (adjusted) Canadian population.

Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 04/13/2005.

Peel Data from RDIS, Peel Public Health as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

Figure 1.6: Incidence of Chlamydia by Age Group and Sex, Region of Peel, 2004



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

GONORRHEA

Gonorrhea is a bacterial infection caused by *Neisseria gonorrhoea*. Gonorrhea is very similar to chlamydia in that it presents with symptoms of urinary pain, genital discharge and can cause long-term complications such as chronic infection, infertility and tubal pregnancy. Like chlamydia, gonorrhea can be asymptomatic and go undiagnosed.^{6,10,11}

Figure 1.7: Incidence of Gonorrhea, Region of Peel and Ontario, 1995 - 2004

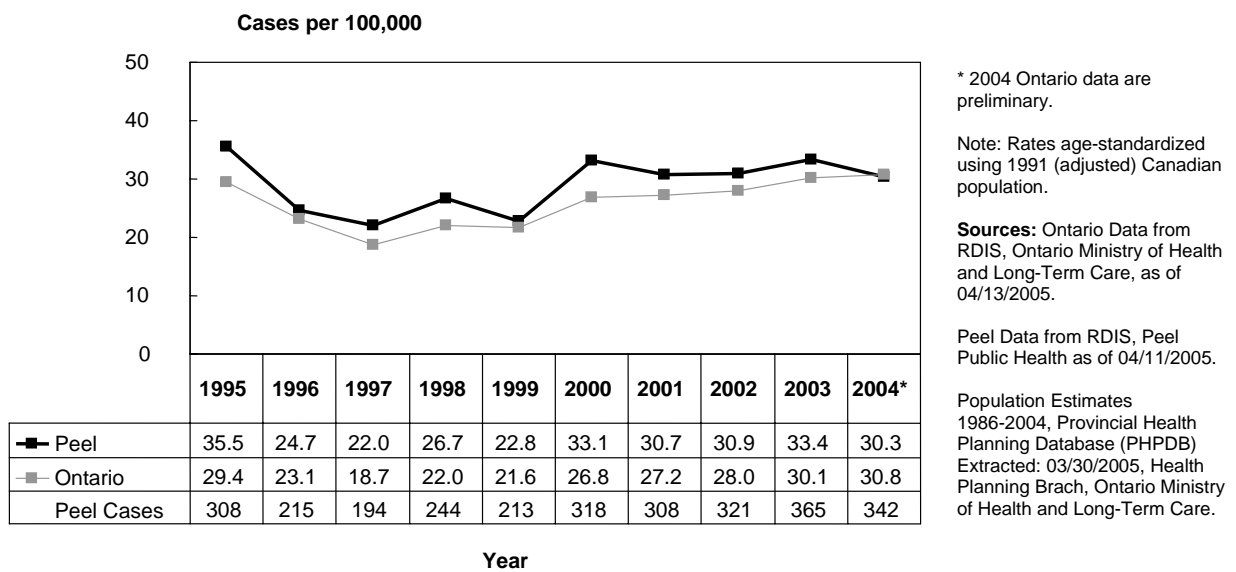
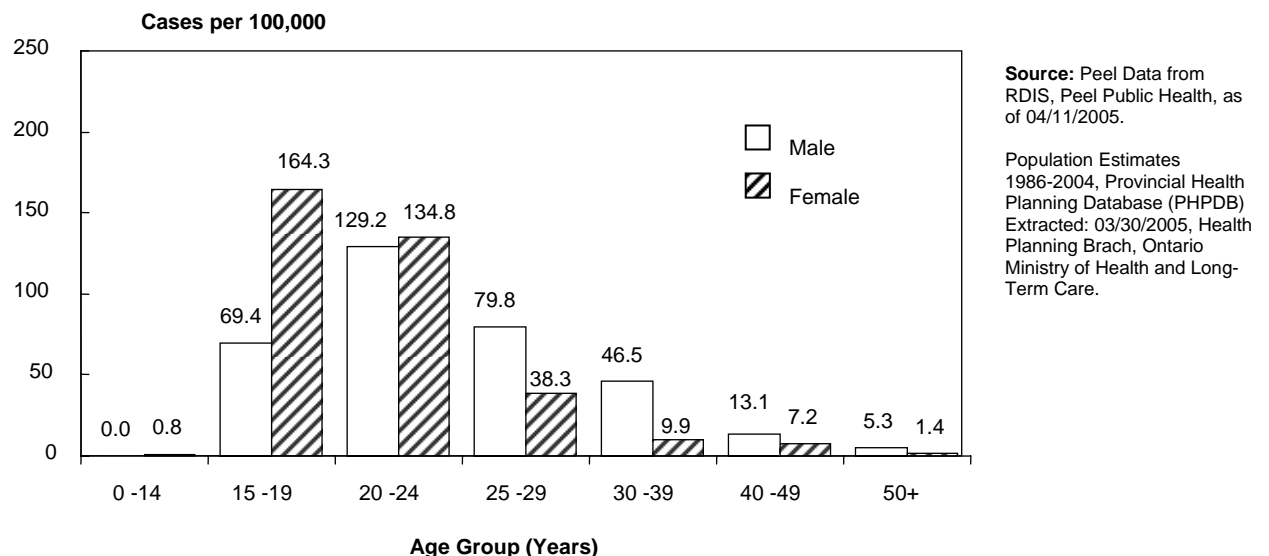


Figure 1.8: Incidence of Gonorrhea by Age Group and Sex, Region of Peel, 2004



SYPHILIS

Syphilis is a complex sexually transmitted infection caused by the bacteria *Treponema pallidum*. Syphilis moves through five stages if left untreated and is infectious mostly during the early stages (less than one year after becoming infected). However, it is during the later stages of the disease that syphilis can do the most damage to the body, affecting the brain, blood vessels, the heart and bones. It can eventually lead to death. Like chlamydia and gonorrhoea, syphilis can be asymptomatic and go undiagnosed.^{6,12}

Figure 1.9: Incidence of Syphilis (Infectious), Region of Peel and Ontario, 1995-2004

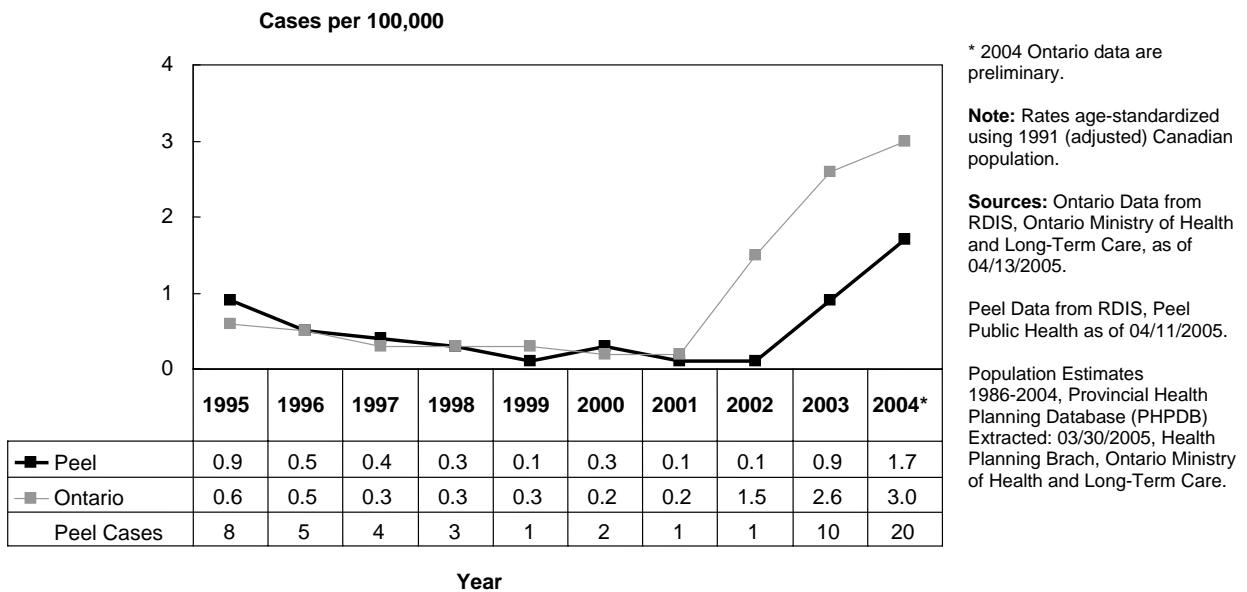
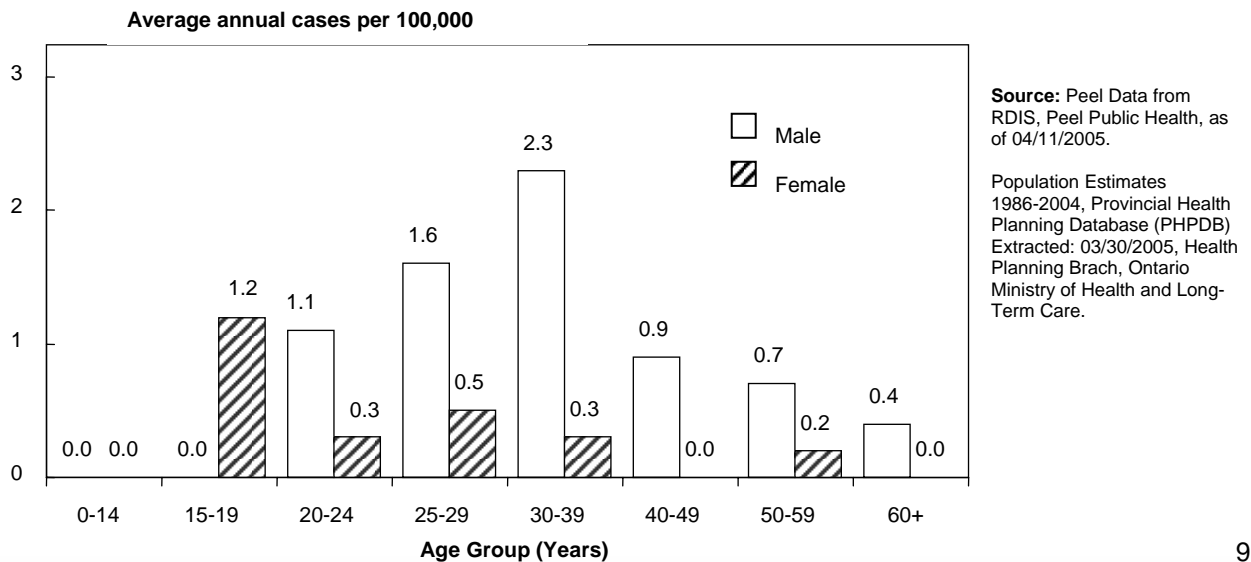


Figure 1.10: Incidence of Syphilis (Infectious) by Age Group and Sex, Region of Peel, 1995-2004 Combined



HEPATITIS B

Hepatitis B is a viral infection which attacks the liver. There is a wide spectrum of illness caused by hepatitis B, ranging from no symptoms, a mild non-specific illness (loss of appetite, nausea and tiredness), to severe liver involvement (jaundice – yellow skin and eyes and liver failure). People can be chronically infected with hepatitis B, especially if the disease is acquired early in life. Long-term complications of hepatitis B infection include cirrhosis (liver scarring), liver cancer and liver failure.^{6,13}

Figure 1.11: Incidence of Acute Hepatitis B, Region of Peel and Ontario, 1995-2004

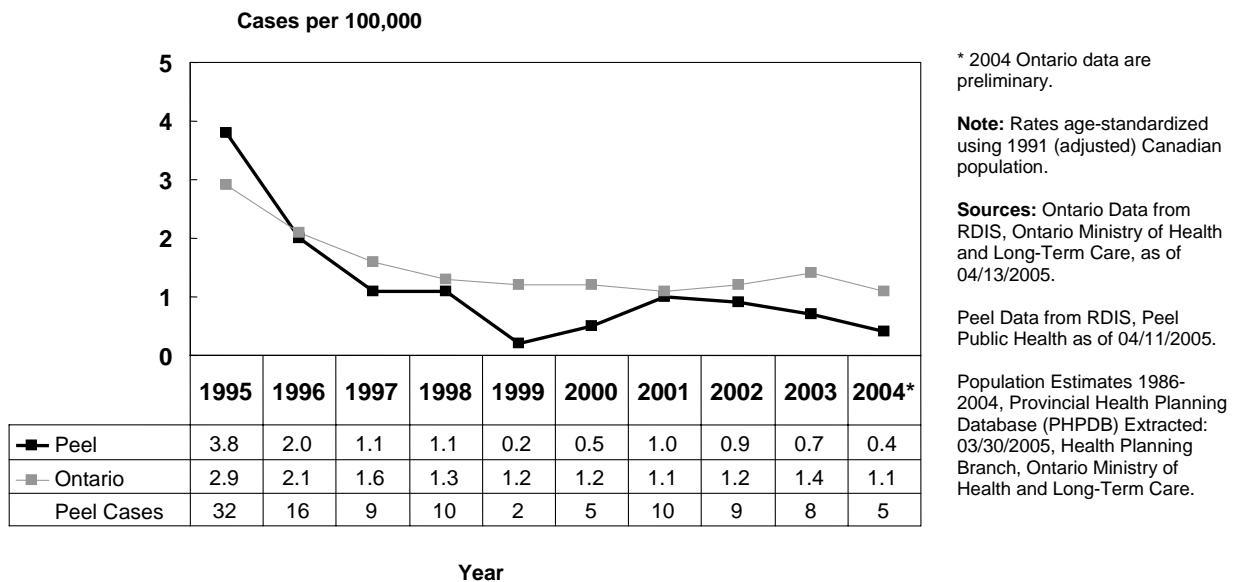
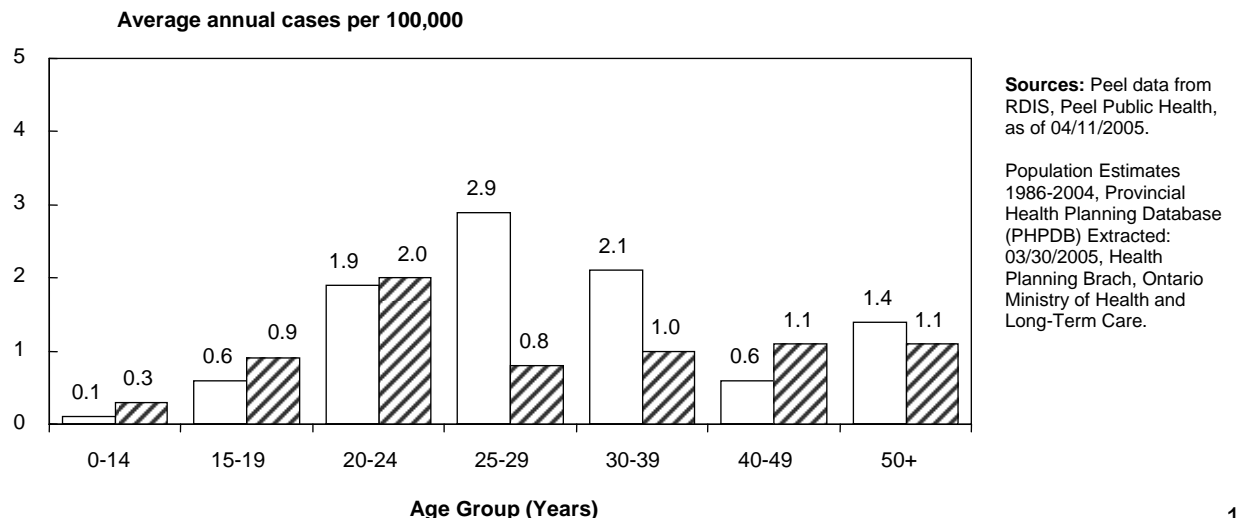


Figure 1.12: Incidence of Acute Hepatitis B by Age Group and Sex, Region of Peel, 1995-2004 Combined



HEPATITIS C

Hepatitis C is a viral infection of the liver. The symptoms of hepatitis C are similar to hepatitis B (loss of appetite, nausea, tiredness and jaundice) but tend to be milder and more subtle. Most people diagnosed with hepatitis C are chronically infected. Complications of hepatitis C include cirrhosis (liver scarring), liver cancer and liver failure.^{6,14} Reporting of hepatitis C became mandatory in 1995. In Canada, injection drug use is the primary risk factor and has been documented in 60% of the newly infected cases reported between 1999 and 2001.¹⁵

Figure 1.13: Incidence of Hepatitis C, Region of Peel and Ontario, 1995-2004

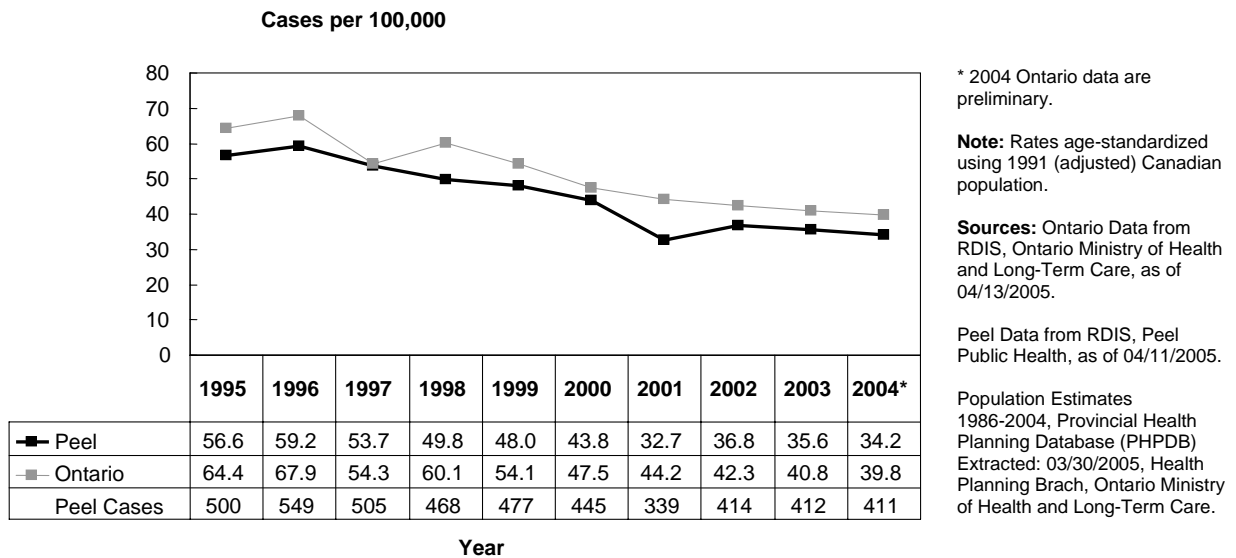
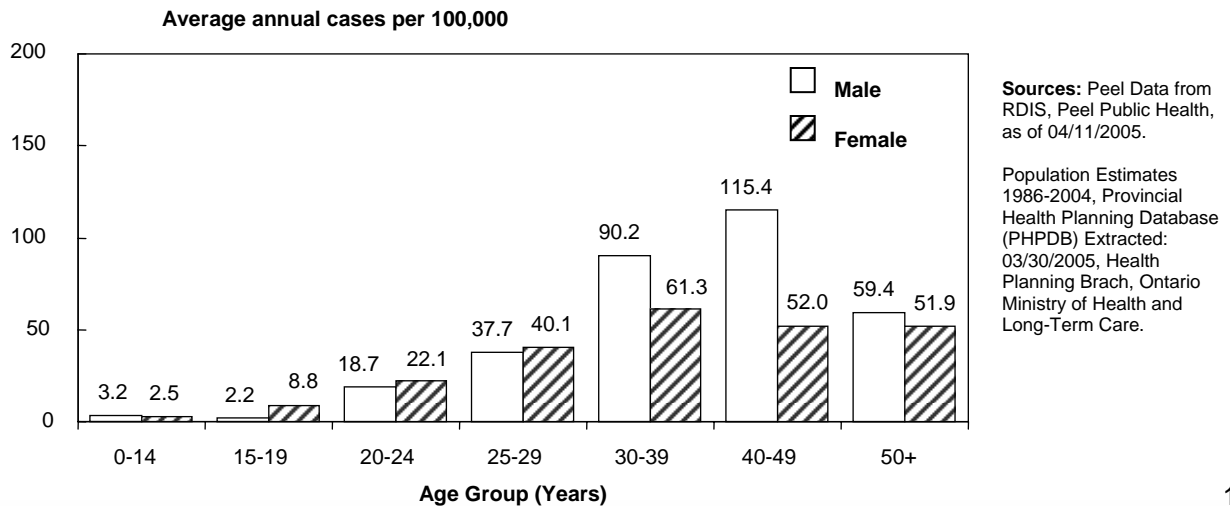


Figure 1.14: Incidence of Hepatitis C by Age Group and Sex, Region of Peel, 1995-2004 Combined





CHAPTER 2: VACCINE PREVENTABLE DISEASES

Highlights

- The incidence of measles declined dramatically since the introduction of the two-dose schedule of measles vaccine in 1996.
- In Peel, there had been no cases of measles since 1998 until 2004 where four cases occurred, all of which were imported.
- The incidence of mumps and rubella has also decreased since 1996, when a second dose of Measles/Mumps/Rubella conjugate vaccine (MMR) was added to the routine childhood immunization schedule.
- The incidence of pertussis has been low and stable since 1996 (approximately less than five cases per 100,000). Children under one year of age have the highest rate of pertussis.
- The incidence of influenza in the 2003/2004 season was the highest among the past ten seasons, due mainly to the involvement of a new variant of the A(H3N2) strain (A/Fujian/411/2002) that was not included in the flu vaccine for the season. However, the severity of the season was still within the range compared to the past H3N2 predominant seasons.¹⁶
- The reported incidence of influenza is the highest in those aged less than one year, followed by those aged 1 to 4 years and those greater than 60 years old. This may reflect the fact that these groups are more likely to have a serious illness from influenza and seek medical attention.

INTRODUCTION

Vaccine preventable diseases are caused by viruses and bacteria. Nearly all of the organisms in this group are highly contagious and can be spread through a cough or sneeze of an infected person. Tetanus and polio are spread by different means. Tetanus is caused by a wound contaminated with bacteria commonly found in soil. Polio is a highly contagious virus spread by infected feces. Immunization for measles, mumps, rubella, diphtheria, polio and tetanus is mandatory for school-aged children in Ontario. Prior to universal vaccination, tetanus and polio infected a large proportion of the population and caused considerable illness and death, especially in children.¹⁷

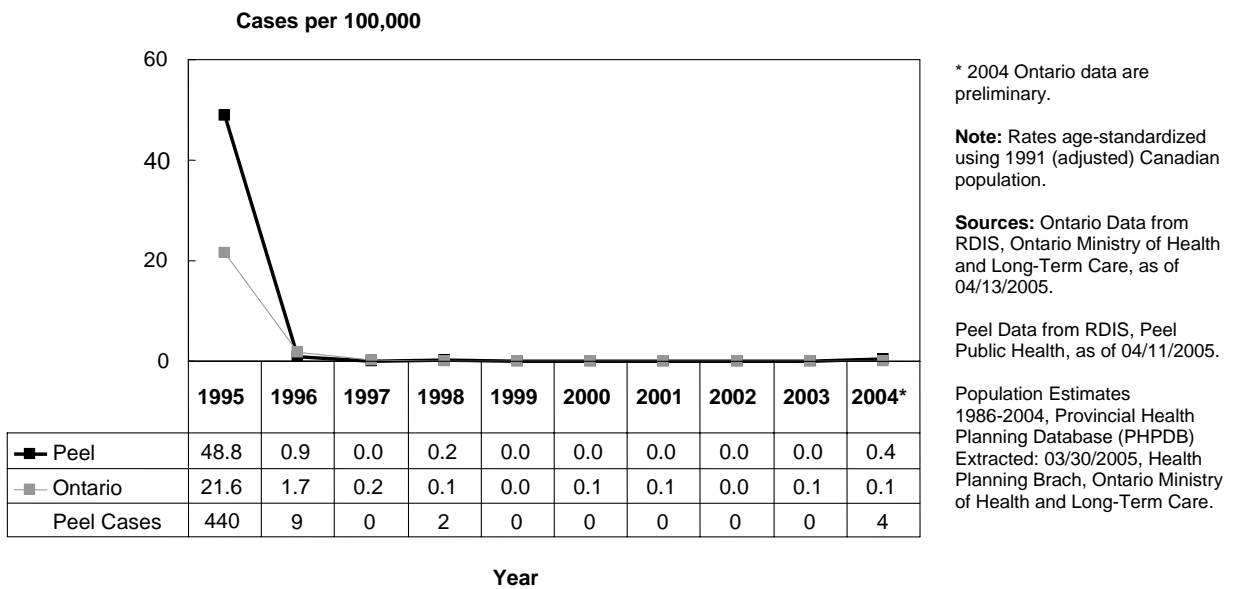
Outbreaks of vaccine preventable diseases have occurred in developed countries when immunization rates have declined (eg. Diphtheria outbreak in the Soviet Union in 1994).¹⁷ Because of high immunization rates, some diseases (diphtheria, tetanus and polio) are currently so rare in Peel that they are not included in this report. Influenza immunization is universally available in Ontario, but is voluntary. Most people are not immunized for influenza and therefore incidence remains high.

MEASLES

Measles (also called red measles), is a viral infection causing symptoms such as fever, cough, runny nose, red eyes, followed by a rash. Severe complications can include pneumonia, ear infections, nervous system damage and death. Prior to universal vaccination for measles, nearly every Canadian was infected with measles virus by the time they reached adulthood.^{6,18}

In the past, a cyclical trend could be identified, with outbreaks occurring every two or three years. In 1995, Peel and Ontario experienced an outbreak of measles. After this, two doses of measles vaccine were required instead of one. The incidence of measles has decreased dramatically as a result.

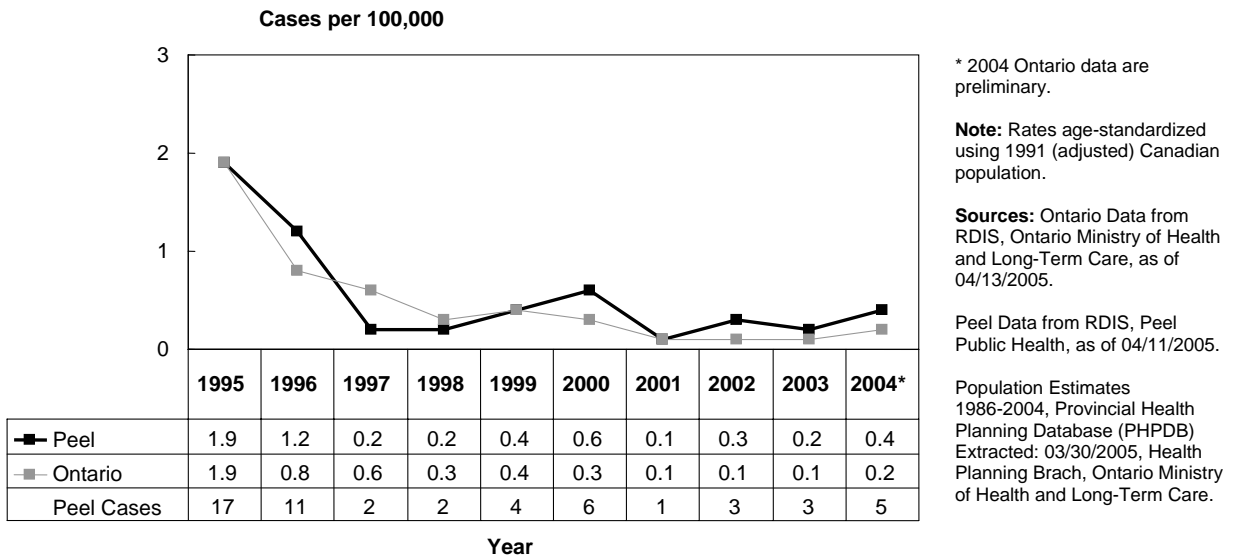
Figure 2.1: Incidence of Measles, Region of Peel and Ontario, 1995-2004



MUMPS

Mumps is an acute infectious disease caused by the mumps virus. Prior to the licensure of mumps vaccine in 1969, it was a common childhood illness. It can infect and inflame a number of different organs including the salivary glands, brain, testicles and ovaries. Serious complications of the disease include meningitis, deafness and, in rare cases, male sterility.^{6,18}

Figure 2.2: Incidence of Mumps, Region of Peel and Ontario, 1995-2004



PERTUSSIS

Pertussis or whooping cough is caused by the bacteria *Bordetella pertussis*. The main symptom is a very severe coughing spell often described as a “seal bark”. Complications are much more severe in the very young and include pneumonia, brain damage and, in rare cases, death.^{6,18}

Figure 2.3: Incidence of Pertussis, Region of Peel and Ontario, 1995-2004

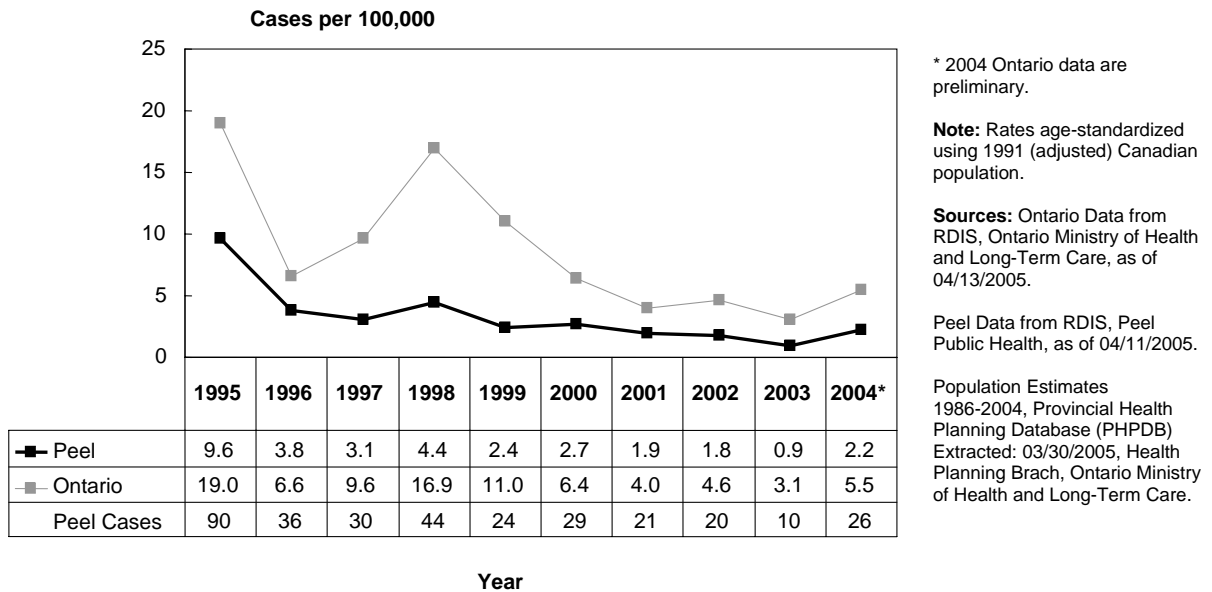
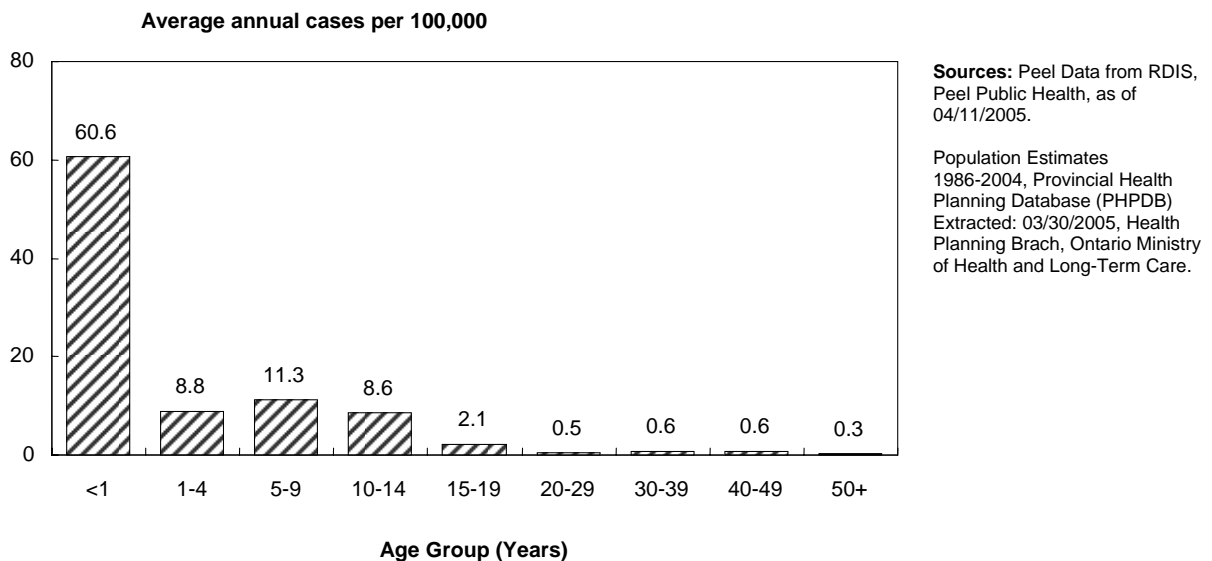


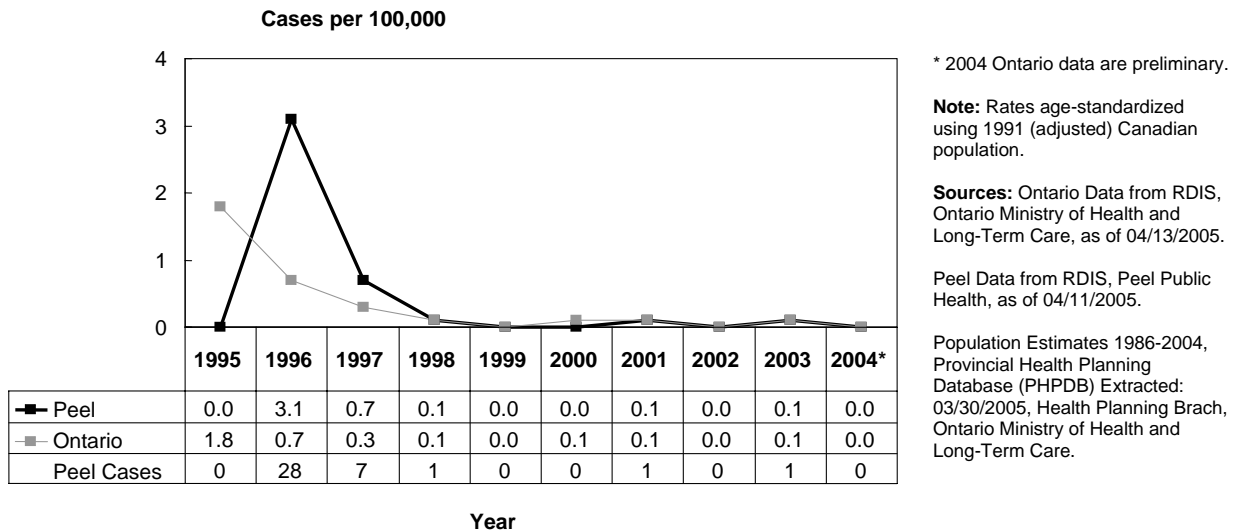
Figure 2.4: Incidence of Pertussis by Age Group, Region of Peel, 1995-2005 Combined



RUBELLA

Rubella (sometimes called German Measles) is a mild viral illness that is characterized by a rash, swollen lymph nodes and fever. It was a significant source of childhood illness and congenital birth defects until 1969, when Rubella vaccines were first licensed for use in the US. Rubella can cause intrauterine death, spontaneous abortion and severe birth defects such as blindness, deafness and mental retardation in babies whose mothers become infected with rubella during the first three months of pregnancy. The incidence of rubella has dropped since the introduction of the second-dose measles-mumps-rubella (MMR) vaccine in 1996.^{6,18}

Figure 2.5: Incidence of Rubella, Region of Peel and Ontario, 1995-2004



HAEMOPHILUS INFLUENZA TYPE B (HIB)

Haemophilus influenza type b (Hib) is a bacterium that causes serious disease including meningitis, pneumonia and death in young children. Hib was the most common cause of meningitis in young children prior to the availability of the first Hib vaccine in 1988. The incidence of Hib disease has decreased even further since the introduction of the newer conjugate vaccines in 1992 for use in infants (starting from two months of age). There were only five cases of Hib in Peel between 1995 and 2004.^{6, 18} (Please see the Appendix for more specific information).

CHICKENPOX (VARICELLA)

Chickenpox (varicella) is caused by a virus called Varicella zoster. This highly contagious illness usually starts off with a fever, fatigue, headache and runny nose which is followed within a day or two by a red blister-like rash. Complications of chickenpox include scarring of the skin, pneumonia and inflammation of the brain (encephalitis). There is an increased risk of birth defects for babies who get chickenpox from their mothers before birth. Children who are ill with chickenpox are also at increased risk of getting necrotizing fasciitis (flesh-eating disease).^{6,18}

The virus spreads easily through coughing, sneezing or being in contact with the saliva or respiratory secretions of someone who has chickenpox. It can also be spread by direct contact with the fluid from a chickenpox blister. A pregnant woman can pass the chickenpox virus on to her baby before it is born. Although rare, it is possible for the virus to remain in the body and become active again later on. When this happens, the virus causes a painful rash of blisters called shingles.^{6,18}

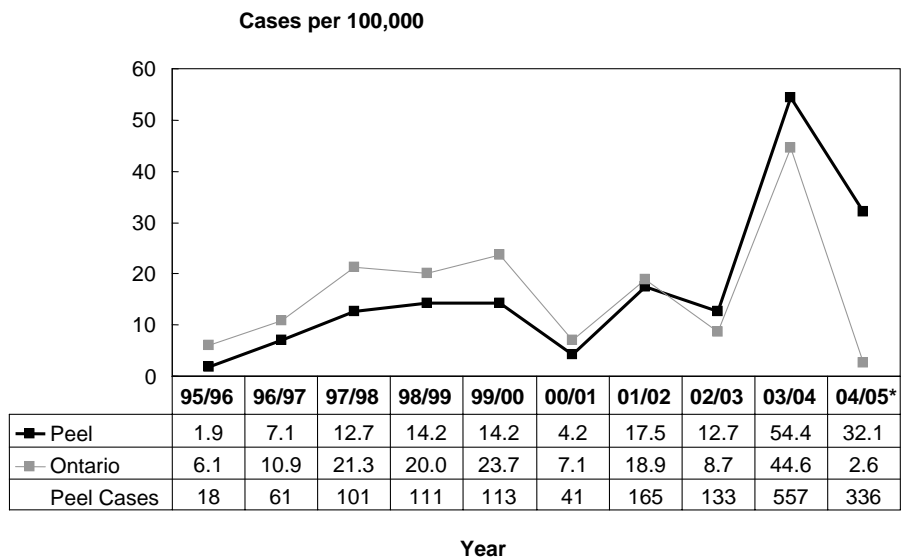
The vaccine for chickenpox was first licensed for use in Canada in 1998. As of January 2005, chickenpox vaccine was added to the publicly-funded routine infant immunization schedule for Ontario. It is estimated that the varicella vaccine offers 70 to 90 per cent protection against chicken pox of any severity and over 95 per cent protection against severe varicella for at least seven to 10 years after vaccination.¹⁹

In Peel, outbreaks of chickenpox are reported in batches by school on a monthly basis. As case information at the individual level is not available, data are not shown in this report. However, Peel Public Health will be observing trends in varicella incidence over time as more children get immunized against the disease.

INFLUENZA

Influenza is a highly infectious respiratory illness caused by the influenza virus. Although influenza symptoms such as fever, headache, cough and muscle aches are similar to the symptoms of the common cold, they are often more sudden in onset and more severe in symptoms. Unlike the common cold, influenza is much more likely to result in serious complications such as pneumonia.^{6,21} Voluntary influenza immunization was implemented in Ontario in 2000 with free influenza vaccine being made available to all Ontario residents aged six months and older.²⁰

Figure 2.6: Incidence of Influenza by Seasonal Year*, Region of Peel and Ontario, 1995/1996–2004/2005



* Seasonal year from July to June (e.g. 95/96 included all cases from July 1, 1995 to June 30, 1996), except for 2004/05 season; Peel data from July 1, 2004 to February 14, 2005; Ontario data from July 1, 2004 to December 31, 2004.

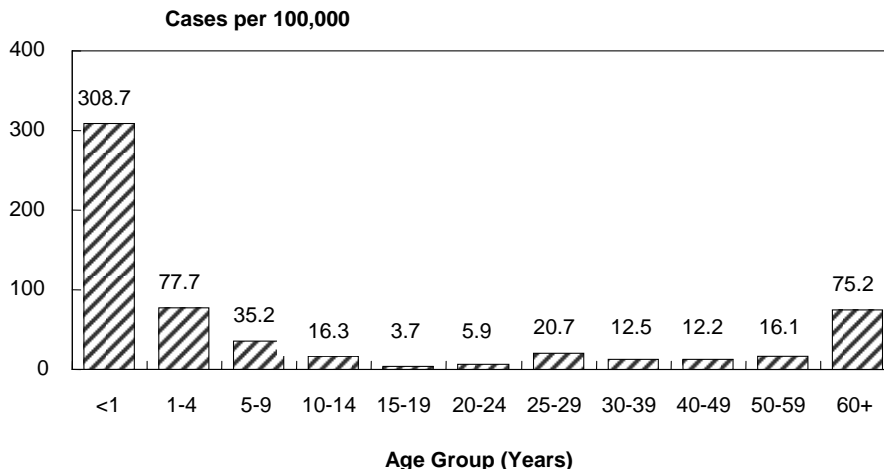
Note: Rates age-standardized using 1991 (adjusted) Canadian population.

Sources: Ontario data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 04/13/2005.

Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

Figure 2.7: Incidence of Influenza by Age Group, Region of Peel, 2004/2005



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.



CHAPTER 3: DISEASES SPREAD BY FOOD AND WATER

Highlights

- The incidence of diseases spread by food and water was generally higher in Peel than Ontario with the exception of hepatitis A and verotoxin-producing *Escherichia coli* (VTEC).
- There has been a decreasing trend in the incidence of campylobacteriosis, giardiasis, hepatitis A, salmonellosis and yersiniosis in Peel and Ontario.
- In Peel, the incidence of diseases spread by food and water was generally higher in the younger age groups except for amebiasis.
- The increase in salmonellosis cases in Ontario and Peel during 1998 was due to the second largest salmonellosis outbreak in Canadian history— an outbreak caused by a particularly virulent strain of *Salmonella enteritidis* that contaminated cheese used in the production of a pre-packaged lunch product marketed for school-age children.
- The increase in the incidence of shigellosis in 2002 was due to a large outbreak in Ontario associated with a prepared food product. The outbreak remains the largest one reported for shigellosis in Canada.

INTRODUCTION

Diseases spread by food and water are caused by bacteria, parasites and viruses that have found their way into our food or water from the feces of an infected person or animal.⁶ Many of these diseases can also be spread from one person to another if hands are not thoroughly washed with soap and water after using the washroom (this is the main method of transmission for hepatitis A).^{22,23} All these diseases may cause diarrhea that can be quite severe. In some illnesses (campylobacteriosis, hepatitis A, some types of salmonellosis, shigellosis and verotoxin-producing *Escherichia coli* (VTEC)) people will recover without antibiotics. Unfortunately, some of these infections may cause long-term complications such as kidney failure (VTEC), systemic infections (amebiasis, salmonellosis and yersiniosis) and immune system problems (campylobacteriosis, salmonellosis and yersiniosis).

The highest incidence for many of these diseases (campylobacteriosis, giardiasis, salmonellosis, shigellosis, Verotoxin-producing *Escherichia coli* and yersiniosis) occurs in those under five years of age. This may be due to:

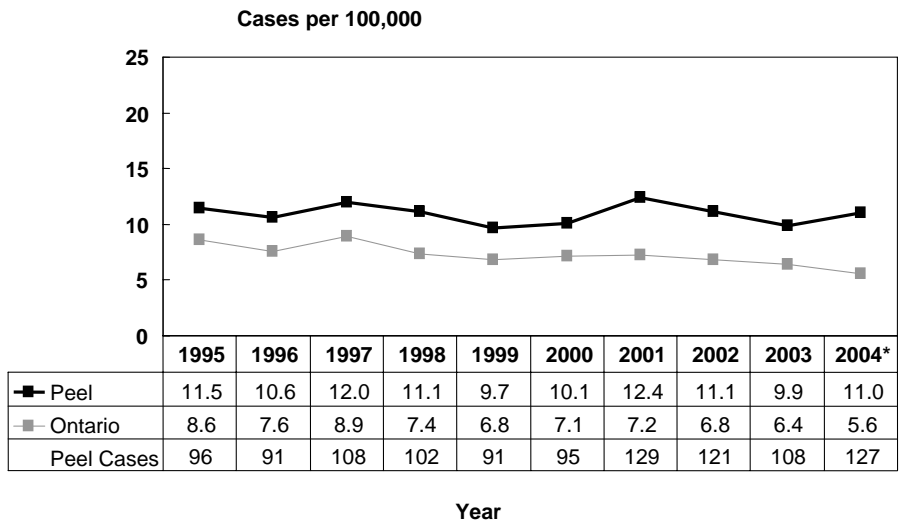
- poor personal hygiene,
- increased likelihood of severe illness due to susceptibility of dehydration in infants and young children,

- increased likelihood of severe illness due to less developed immune system, and
- increased likelihood of being seen by a physician and diagnosed if sick.

AMEBIASIS

Amebiasis is an infection caused by the parasite *Entamoeba histolytica*. Transmission occurs by eating food that has become contaminated with amebic cysts. Although anyone can become infected, amebiasis in Canada is most common in immigrants from and travellers to developing countries or those who live in institutions that have poor sanitary conditions. Symptoms can range from none or mild (loose stools, stomach discomfort or cramping) to a severe form called Amebic dysentery that is associated with stomach pain, bloody stools and fever. In rare occasions, the parasite can enter the blood stream, infecting the liver, lungs or brain.^{6,22-25}

Figure 3.1: Incidence of Amebiasis, Region of Peel and Ontario, 1995-2004



* 2004 Ontario data are preliminary.

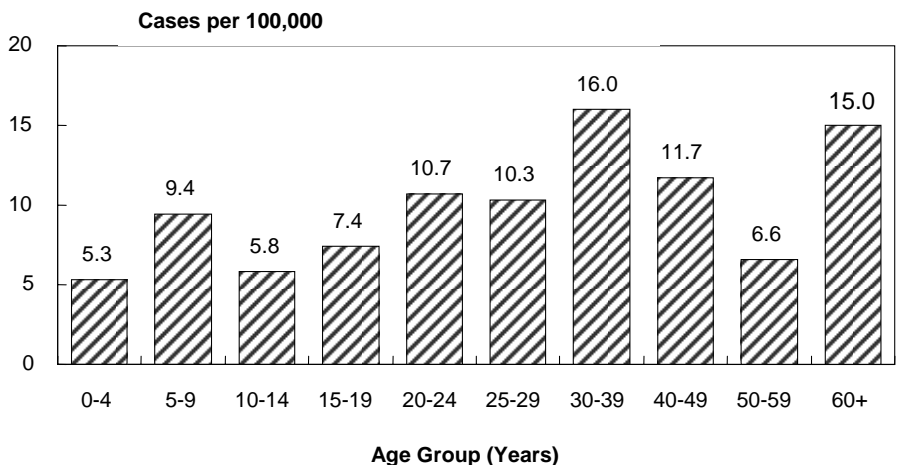
Note: Rates age-standardized using 1991 (adjusted) Canadian population.

Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 04/13/2005.

Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

Figure 3.2: Incidence of Amebiasis by Age Group, Region of Peel, 2004



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

CAMPYLOBACTERIOSIS

Campylobacteriosis is the most common bacterial cause of diarrheal illness. Most cases are associated with ingestion of undercooked chicken or pork, or drinking contaminated water or raw milk. Infection may also be contracted from close contact with infected pets, farm animals or infants. Most people who become ill have diarrhea with nausea, vomiting, abdominal pain and fever.
6,22,23,26

Figure 3.3: Incidence of Campylobacteriosis, Region of Peel and Ontario, 1995-2004

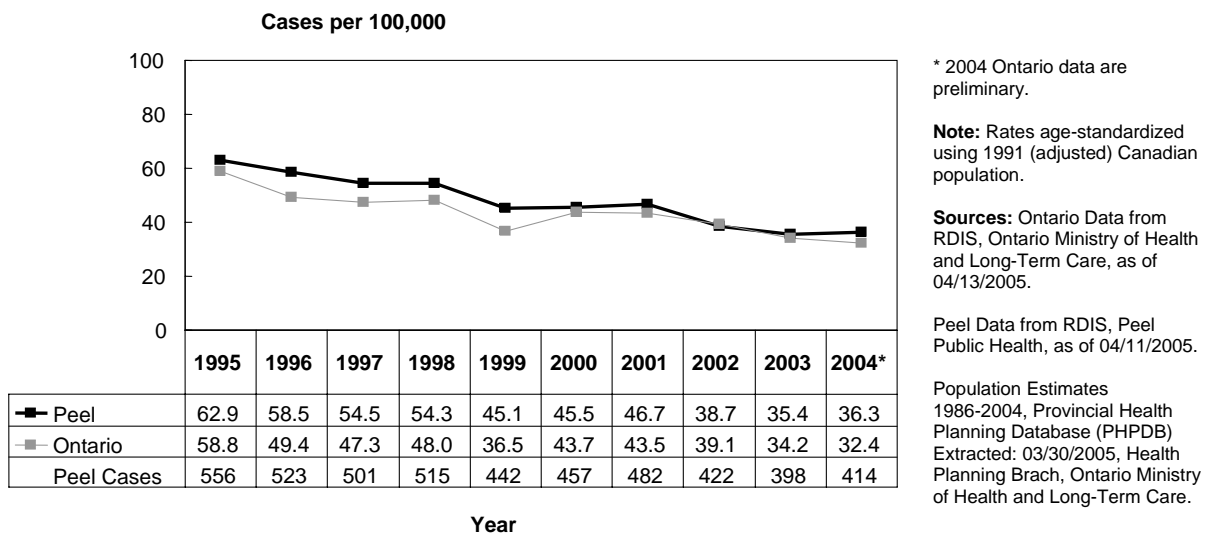
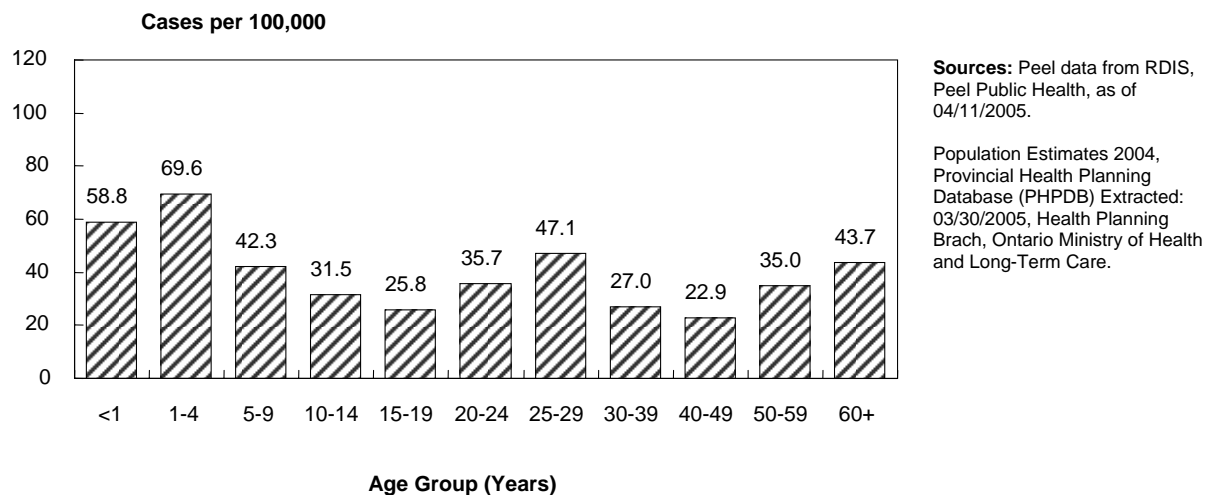


Figure 3.4: Incidence of Campylobacteriosis by Age Group, Region of Peel, 2004



GIARDIASIS

Giardiasis is an illness caused by a microscopic parasite called *Giardia lamblia*, and is usually spread from person-to-person by hand-to-mouth transfer of the organism cysts from the feces of an infected individual. It can also be acquired by drinking contaminated water or coming in contact with contaminated surfaces. Giardiasis is one of the most common causes of waterborne disease and is very common in institutions and in daycare centres.^{6,22,23,27}

Figure 3.5: Incidence of Giardiasis, Region of Peel and Ontario, 1995-2004

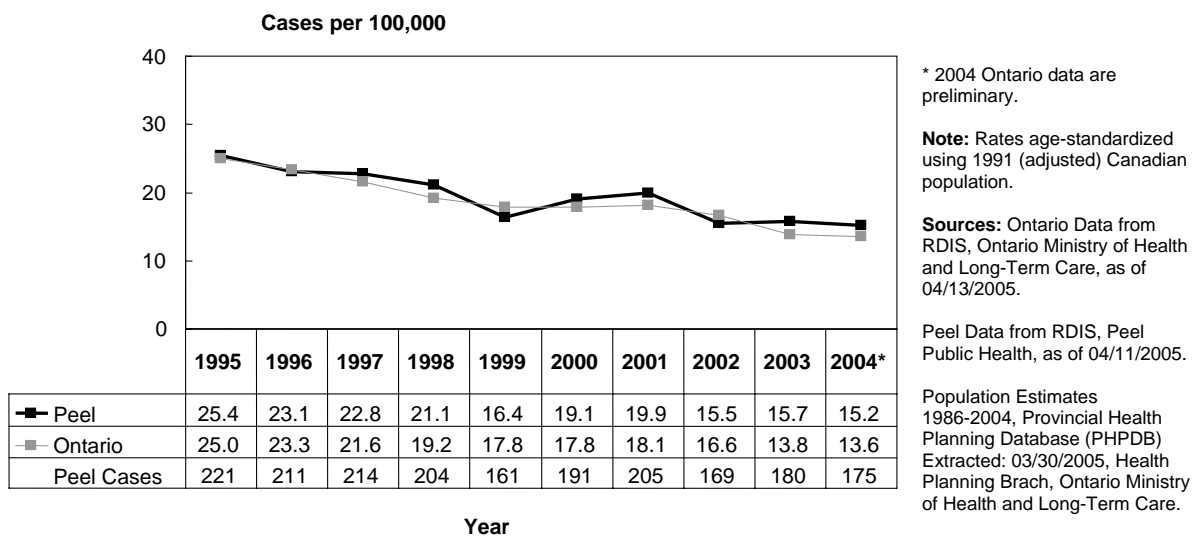
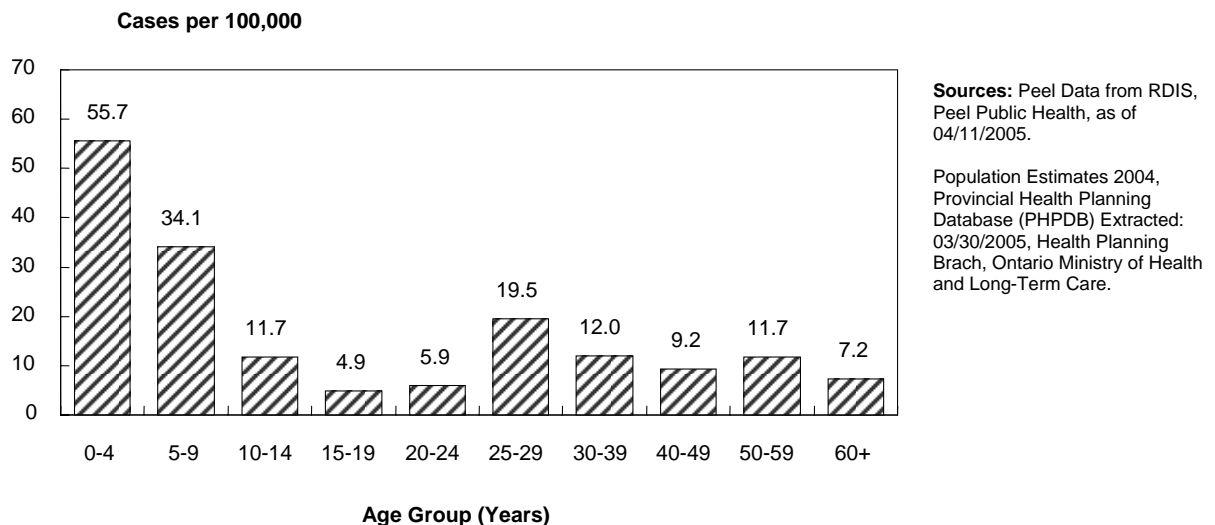


Figure 3.6: Incidence of Giardiasis by Age Group, Region of Peel, 2004



HEPATITIS A

Hepatitis A is an infection of the liver caused by hepatitis A virus (HAV). It is usually spread from person-to-person when something that has been contaminated with feces containing the virus (including food or water) is put in the mouth. The disease usually manifests with symptoms of fever, tiredness and jaundice. Asymptomatic infection is common in children. Unlike hepatitis B and C, the infection tends to have less severe consequences and chronic infection does not occur.^{6,22,23,28,29}

Figure 3.7: Incidence of Hepatitis A, Region of Peel and Ontario, 1995-2004

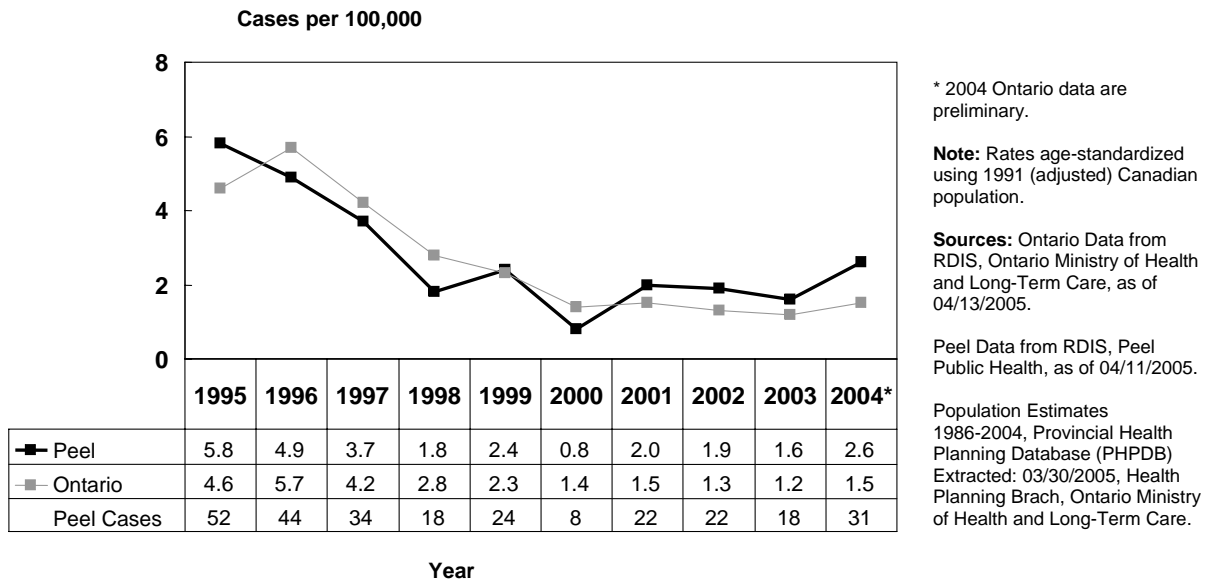
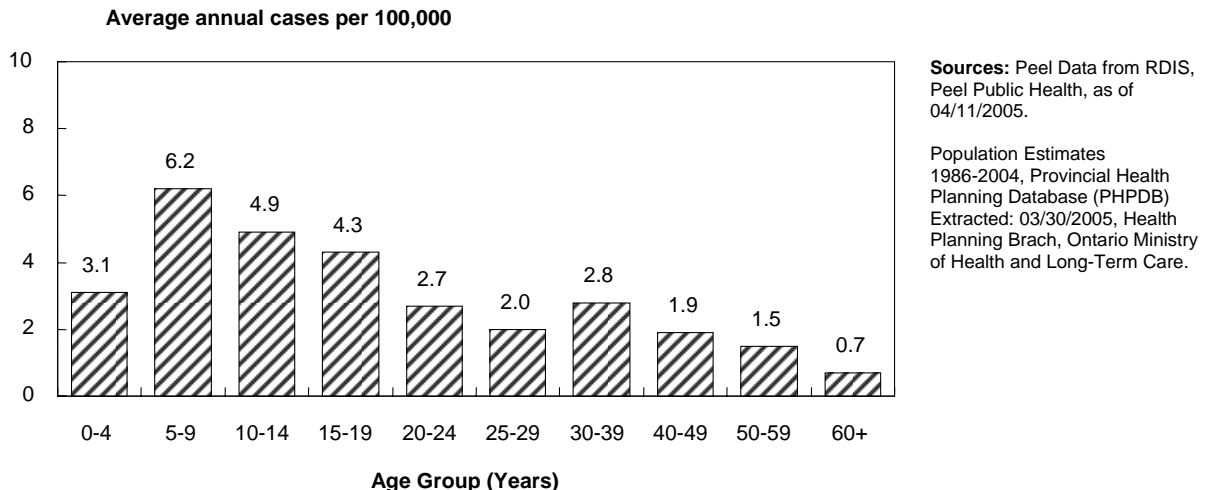


Figure 3.8: Incidence of Hepatitis A by Age Group, Region of Peel, 1995-2004 Combined



SALMONELLOSIS

Salmonellosis is an infection caused by a number of different types of *Salmonella* bacteria that live in the intestines of people and animals. Cases are usually associated with contaminated foods of animal origin such as poultry, pork, and eggs, but all foods can be contaminated. Salmonellosis can also be associated with pets including dogs, cats and turtles. The increase in salmonellosis cases in Ontario and Peel during 1998 was due to the second largest salmonellosis outbreak in Canadian history, an outbreak caused by a particularly virulent strain of *Salmonella enteritidis* that contaminated cheese used in the production of a pre-packaged lunch product marketed for school-age children.^{6,22,23,29}

Figure 3.9: Incidence of Salmonellosis, Region of Peel and Ontario, 1995-2004

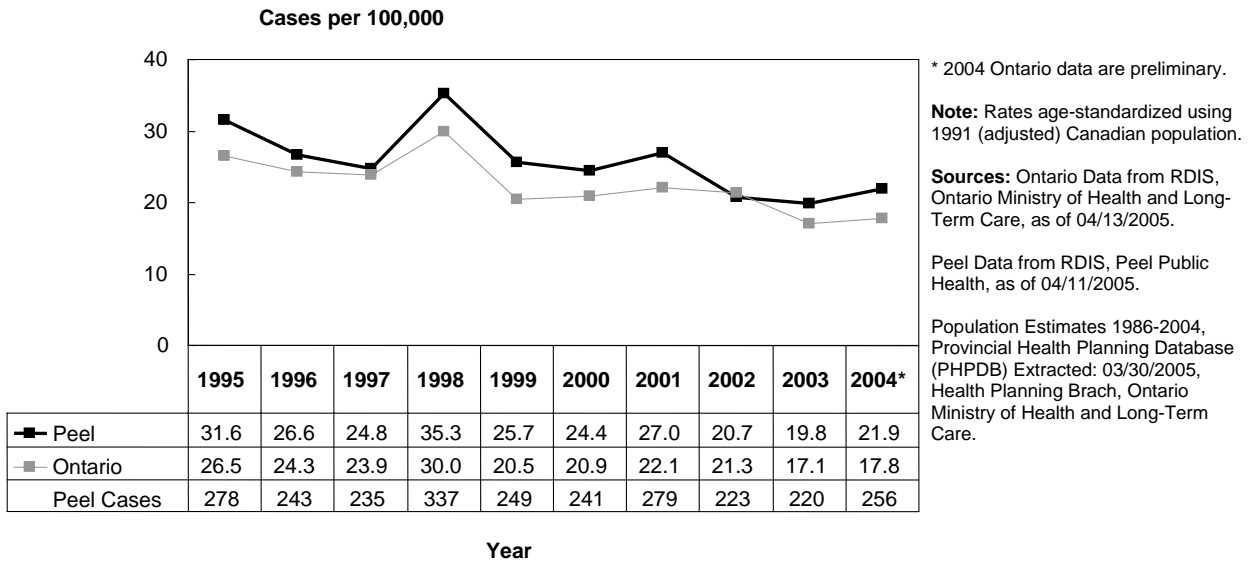
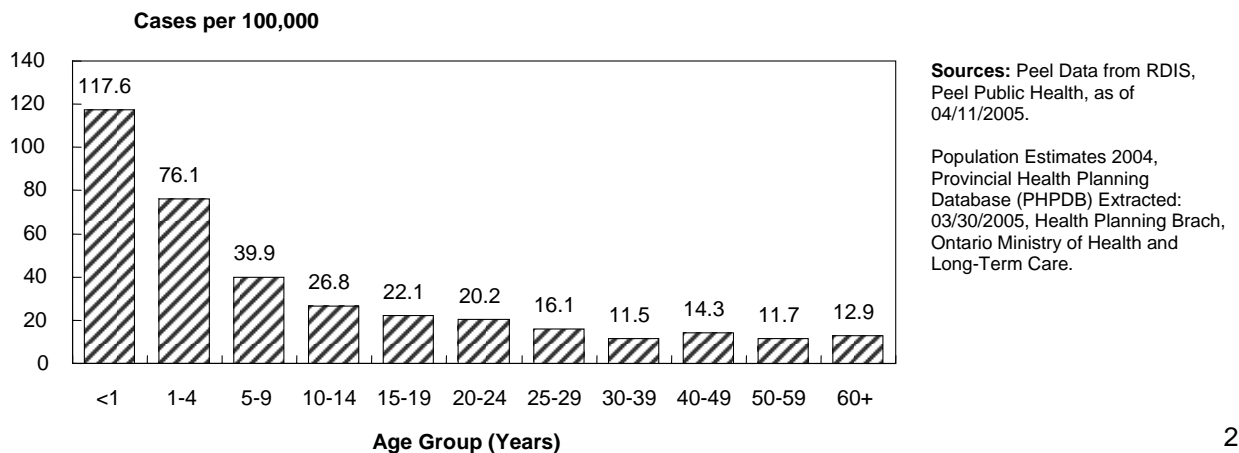


Figure 3.10: Incidence of Salmonellosis by Age Group, Region of Peel, 2004



SHIGELLOSIS

Shigellosis is caused by a family of bacteria called *Shigella* that is only found in the intestines of humans. Disease is spread directly from an infected person who has improperly washed hands. *Shigella* can also make its way into food and water from infected food handlers, infected fertilizer and contaminated flies.^{6,22,23,31} The increase in the incidence of shigellosis in 2002 was due to a large outbreak in Ontario associated with a prepared food product.²²

Figure 3.11: Incidence of Shigellosis, Region of Peel and Ontario, 1995-2004

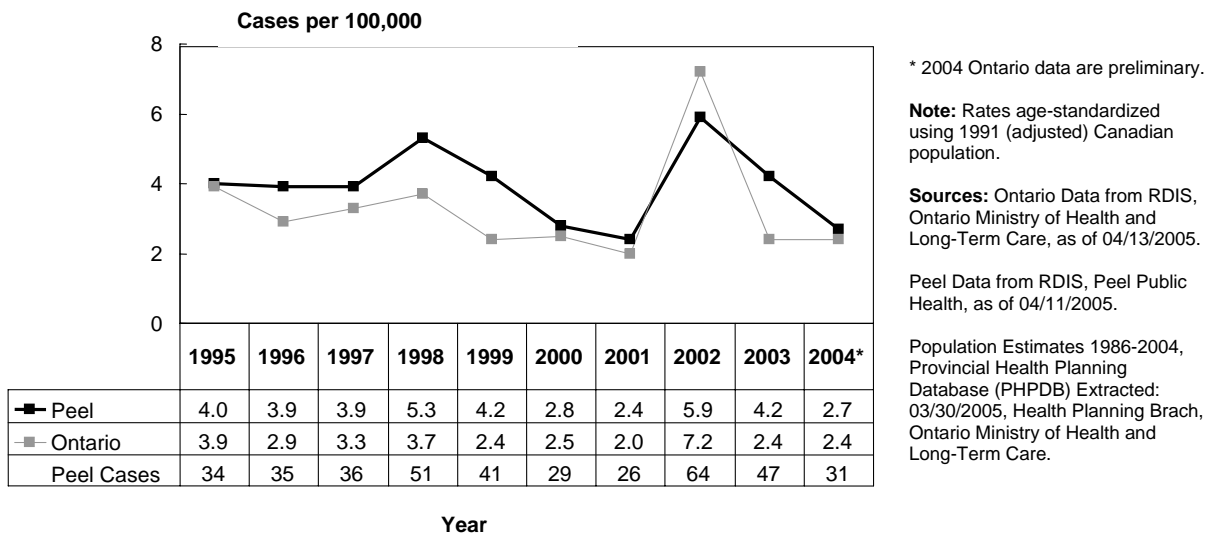
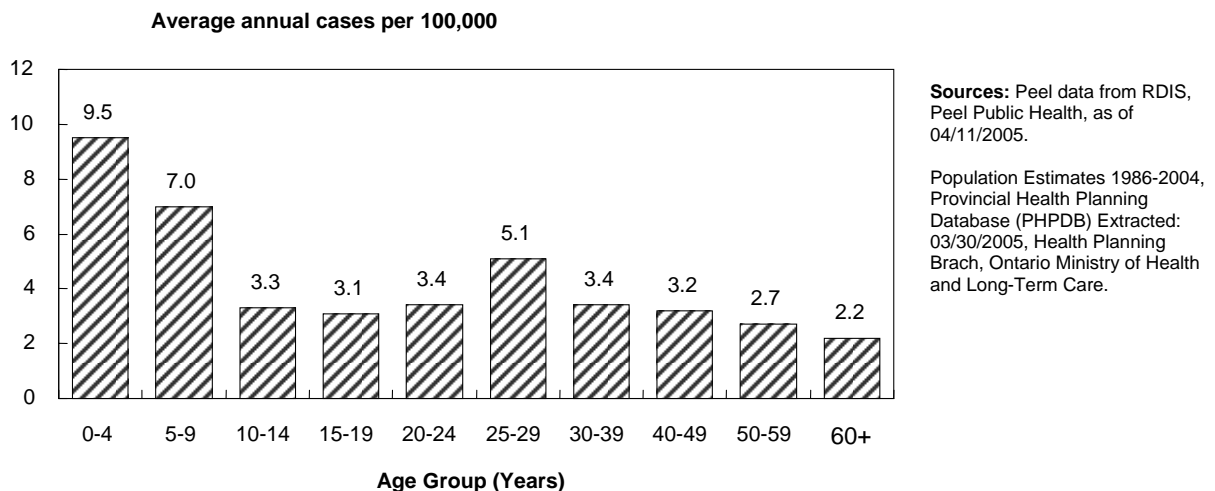


Figure 3.12: Incidence of Shigellosis by Age Group, Region of Peel, 1995-2004 Combined



VEROTOXIN-PRODUCING *ESCHERICHIA COLI* (VTEC)

Although most strains of *Escherichia coli* (*E. coli*) are harmless and live in the intestines of healthy humans and animals, verotoxin-producing *E. coli* (VTEC) produces a powerful toxin which can cause severe illness or death. VTEC may be acquired by consuming animal food products, unpasteurized milk or contaminated water.^{6,22,23} In 2000, a major VTEC outbreak occurred in Walkerton, Ontario that was linked to a contaminated municipal water supply (see figure 3.13).³²

Figure 3.13: Incidence of Verotoxin-Producing *Escherichia coli* (VTEC), Region of Peel and Ontario, 1995-2004

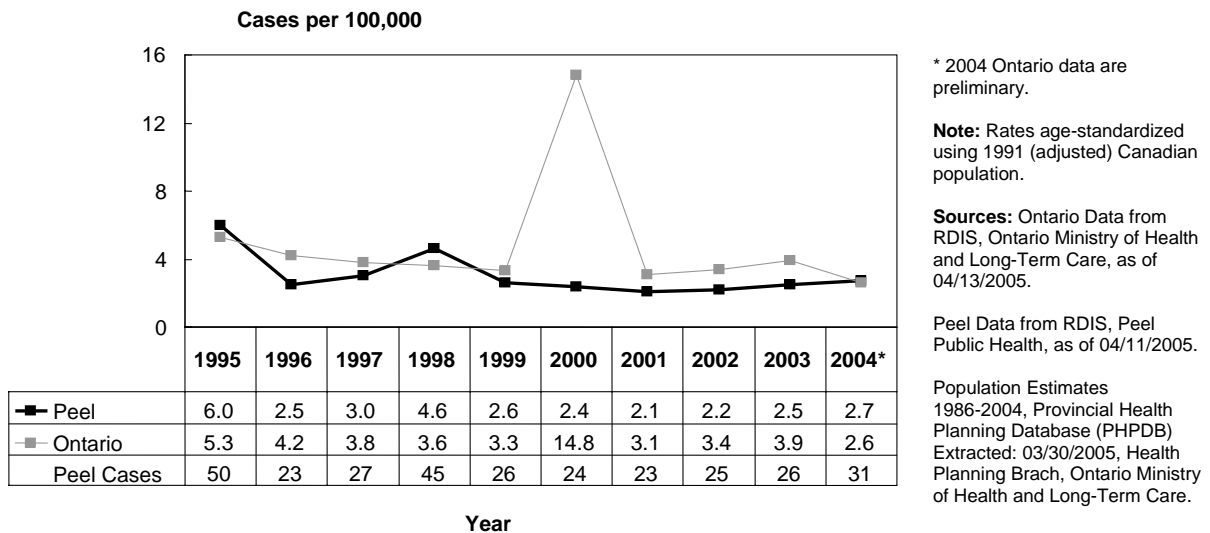
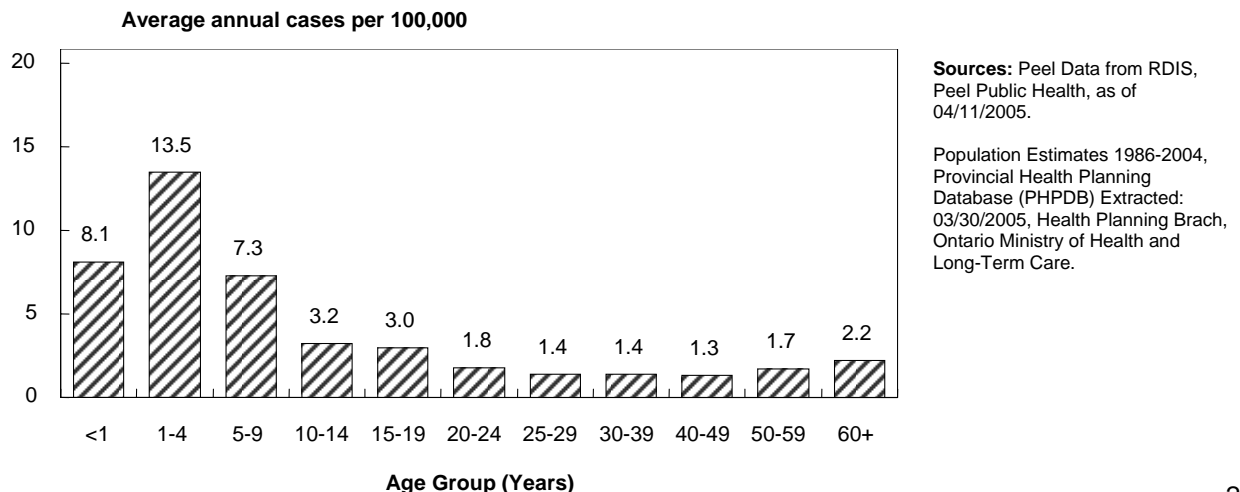


Figure 3.14: Incidence of Verotoxin-Producing *Escherichia coli* (VTEC) by Age Group, Region of Peel, 1995-2004 Combined



YERSINIOSIS

Yersiniosis is a bacterial infection caused by a number of types of *Yersinia* bacteria found in animals, especially pigs. Most cases are caused by eating raw or undercooked pork. It is a relatively less frequent cause of diarrhea and abdominal pain than other enteric infections and occurs more frequently in children. Symptoms include diarrhea which is often bloody, fever and stomach pain.^{6,22,23,33}

Figure 3.15: Incidence of Yersiniosis, Region of Peel and Ontario, 1995-2004

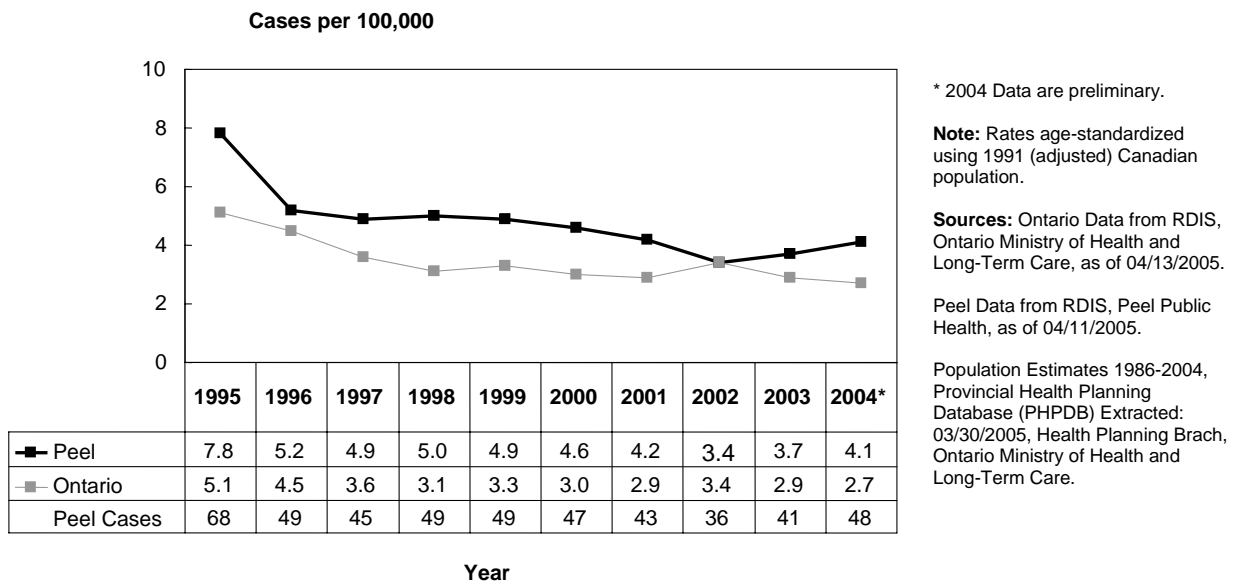
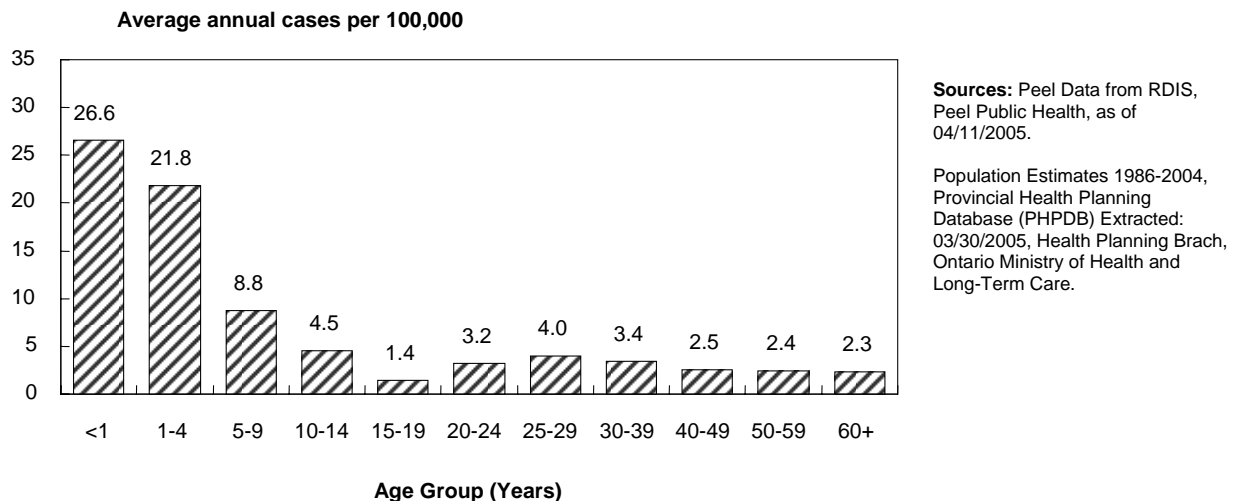


Figure 3.16: Incidence of Yersiniosis by Age Group, Region of Peel, 1995-2004 Combined



CHAPTER 4: DISEASES SPREAD BY CLOSE PERSONAL CONTACT

Highlights

- In Peel, invasive meningococcal disease is most common among children aged less than one year, followed by those aged 1 to 4 years and those 15 to 19 years of age.
- A vaccine for meningococcal type C disease was added to the recommended schedule of routine childhood immunizations as of January 1, 2005.
- In Peel, the number of reported invasive group A streptococcal infections (GAS) has been decreasing since 2002 after an upward trend from 1995 to 2001. The increase from 1995 to 2001 is partially explained by the more inclusive case definition that has been used since 1996. Two outbreaks in 2001 also raised incidence rates in that year.
- Invasive group A streptococcal infection is most common in children less than one year of age and those over 60 years of age.
- The incidence of tuberculosis was generally stable in Peel from 1995 to 2004. It was found to be more prevalent in those aged 60 years and older.

INTRODUCTION

Diseases spread by close personal contact are most often passed between family members or people who share living arrangements. Transmission also occurs among casual contacts, but is much less likely since repeated, close and prolonged exposure is usually required for infection. Streptococcal and meningococcal infections are spread from the nasal and throat secretions of a person infected by or carrying the bacteria. Infections can occur through direct contact or from large droplets produced by coughing and sneezing. Many people carry these organisms without being sick. Some types of meningococcal disease can be prevented by immunization. Tuberculosis (TB) is spread in the air when a person coughs up TB bacteria from their lungs.⁶

INVASIVE MENINGOCOCCAL DISEASE

Invasive meningococcal disease is caused by the bacterium *Neisseria meningitidis* (also known as meningococcus). Invasive disease arises as a result of infection of the lining of the brain (meninges) or the blood stream and can be life-threatening. The symptoms of meningitis include high fever, headache, stiff neck, vomiting and drowsiness. Other symptoms of meningococcal disease might include sensitivity to bright light (photophobia), confusion and a purplish skin rash.⁶ Canadian children under one year of age are most at risk for meningococcal infection, followed by children aged 1 to 5 and those 15 to 19 years of age.³⁴ As of January 1, 2005, vaccine for meningococcal type C disease was added to the recommended schedule of routine childhood immunization.^{35,36}

Figure 4.1: Incidence of Meningococcal Disease, Region of Peel and Ontario, 1995-2004

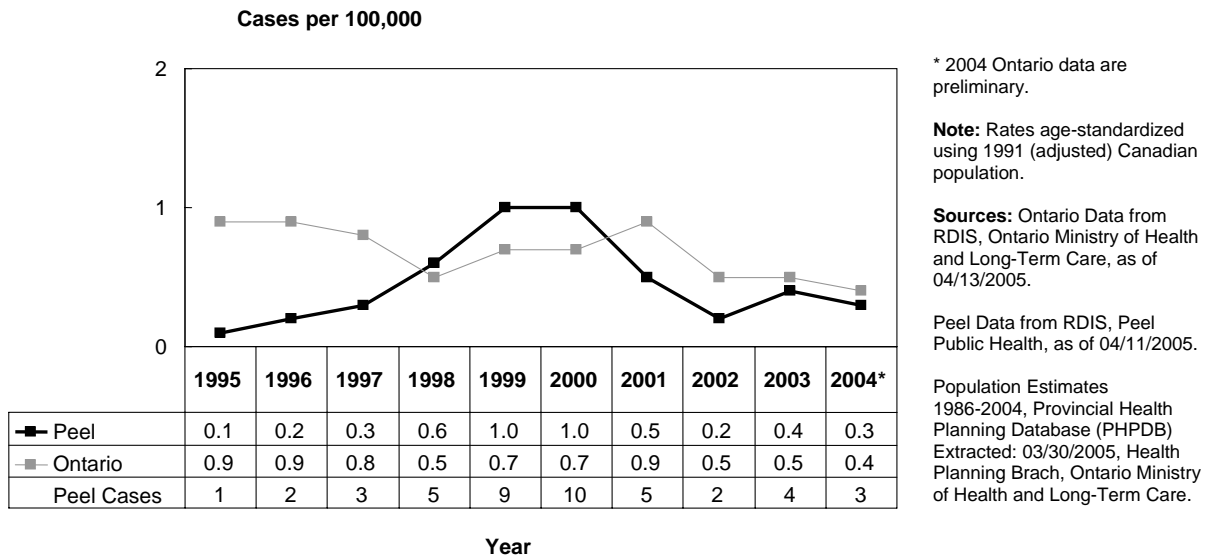
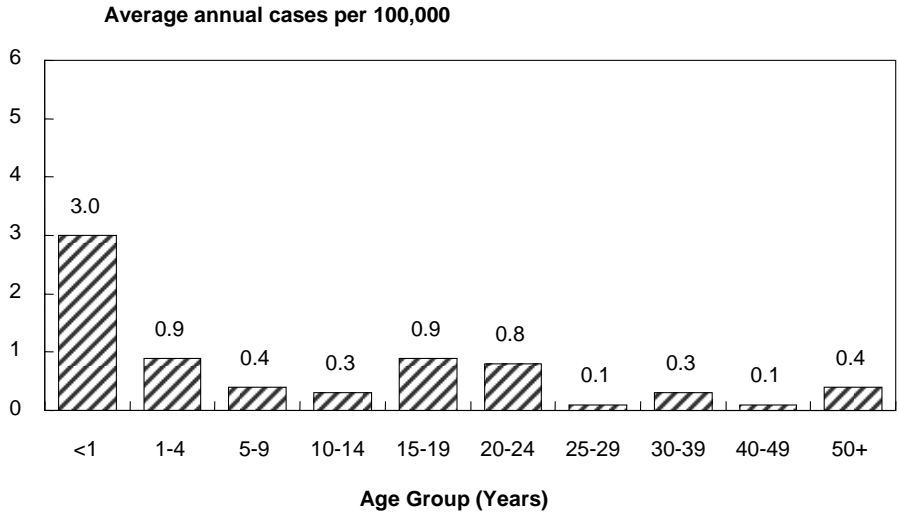


Figure 4.2: Incidence of Meningococcal Disease by Age Group, Region of Peel, 1995-2004 Combined



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

INVASIVE GROUP A STREPTOCOCCAL (GAS) INFECTIONS

Invasive Group A streptococcal (GAS) infections are caused by bacteria that are responsible for a number of different infections. Common infections include pharyngitis, tonsillitis, scarlet fever and ear infections. Although rarely, invasive GAS can also cause severe life-threatening infections resulting in necrotizing fasciitis (flesh eating disease) and toxic shock syndrome.^{6,37}

In 1996, the case definition of invasive GAS was made more inclusive. In 2001, there were two outbreaks of invasive GAS in long-term care facilities in the Region of Peel.

Figure 4.3: Incidence of Invasive Group A Streptococcal Infections, Region of Peel and Ontario, 1995-2004

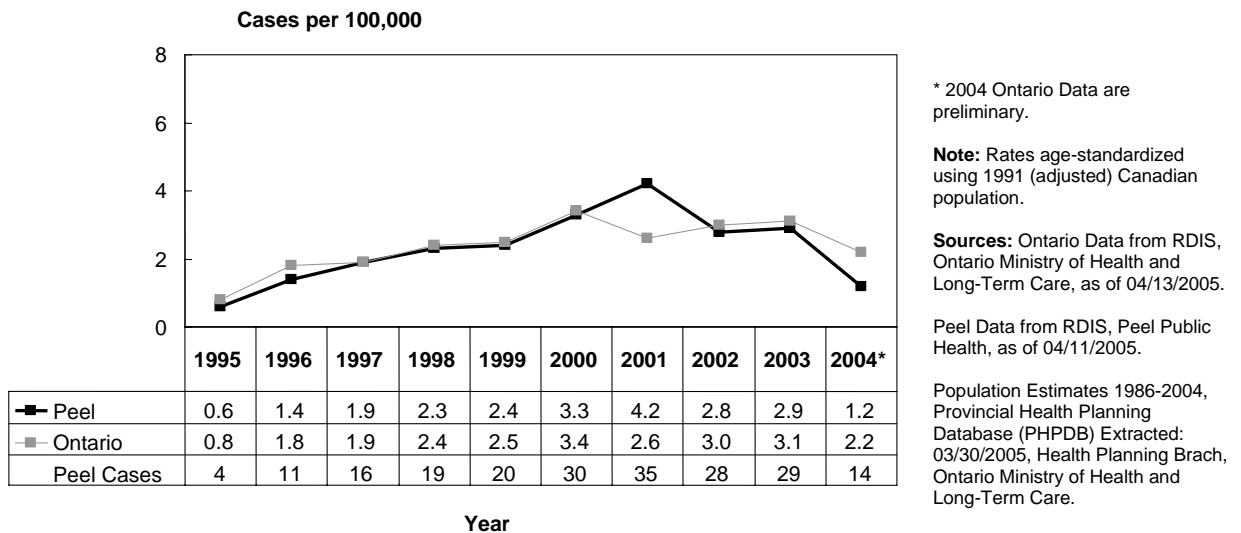
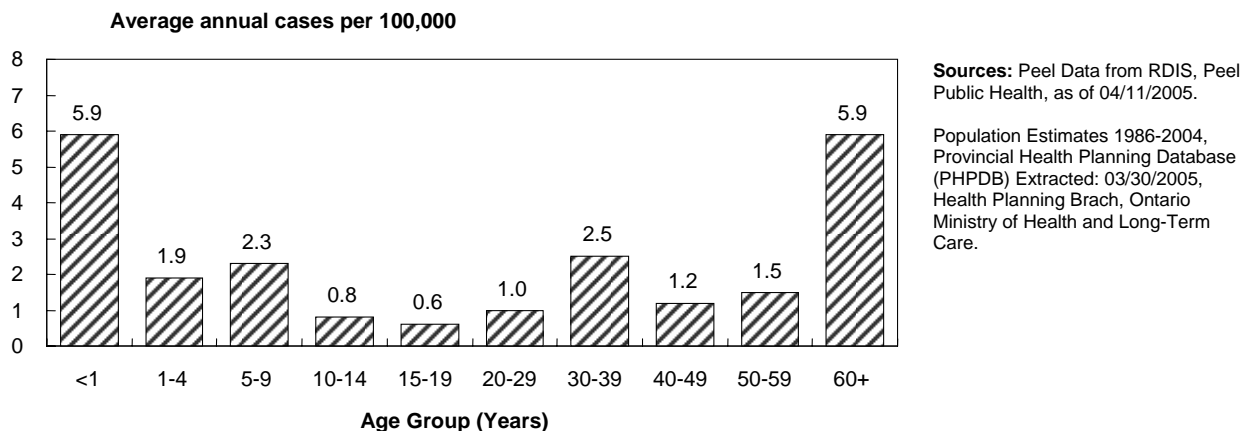


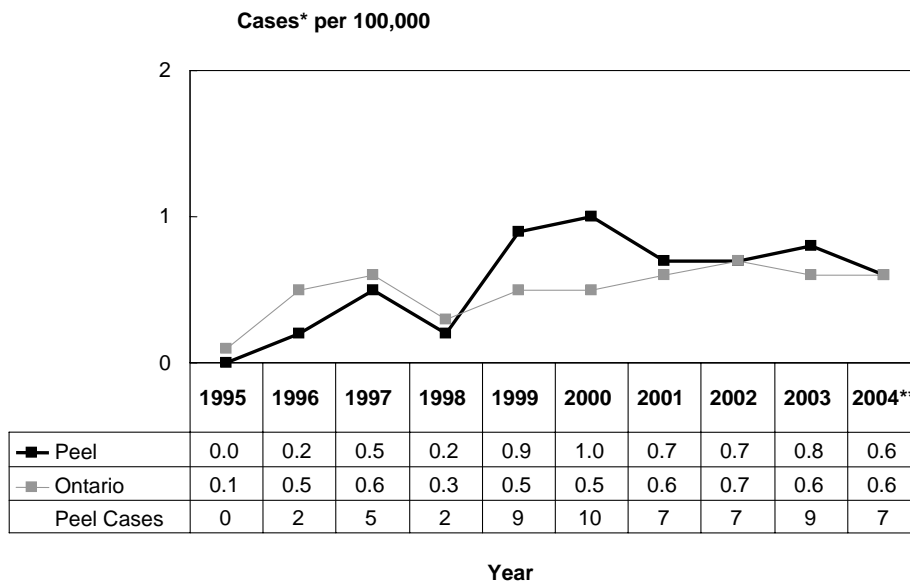
Figure 4.4: Incidence of Invasive Group A Streptococcal Infections by Age Group, Region of Peel, 1995-2004 Combined



GROUP B STREPTOCOCCAL (GBS) INFECTIONS

Group B streptococcal (GBS) infections are a major leading cause of bacterial disease and death among newborns and an important cause of morbidity occurring in women during the last month of gestation or the first few months after delivery; and in non-pregnant adults with chronic medical conditions. Disease in infants usually presents as sepsis, pneumonia or meningitis but also may include cellulitis or osteomyelitis. Disease in women however presents as urinary tract infection, postpartum endometritis and systemic sepsis. GBS can be prevented by screening women at 35 to 37 weeks gestation of pregnancy followed by selective intrapartum antibiotic chemoprophylaxis of all women found to be infected.^{6,38,39}

Figure 4.5: Incidence of Group B Streptococcal Infections, Region of Peel and Ontario, 1995-2004



* All cases were among children less than one year old.

** 2004 Ontario data are preliminary.

Note: Rates age-standardized using 1991 (adjusted) Canadian population.

Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 04/13/2005.

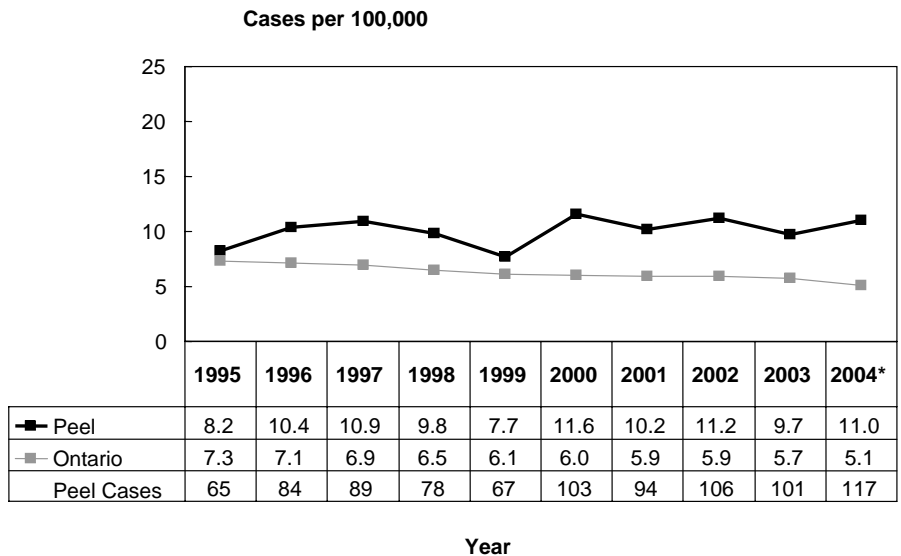
Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

TUBERCULOSIS

Tuberculosis (TB) is a disease caused by bacteria called *Mycobacterium tuberculosis*. It mainly affects the lungs but can affect other parts of the body as well. Tuberculosis is spread through the air from person-to-person when someone with infectious or active TB disease in their lungs or larynx coughs or sneezes. Tuberculosis found in other parts of the body cannot be spread to other people and therefore is inactive. Even though TB is completely curable with antibiotics, it continues to be a major health problem and kills almost two million people worldwide every year.^{6,40,41}

Figure 4.6: Incidence of Active Tuberculosis, Region of Peel and Ontario, 1995-2004



* 2004 Ontario data are preliminary.

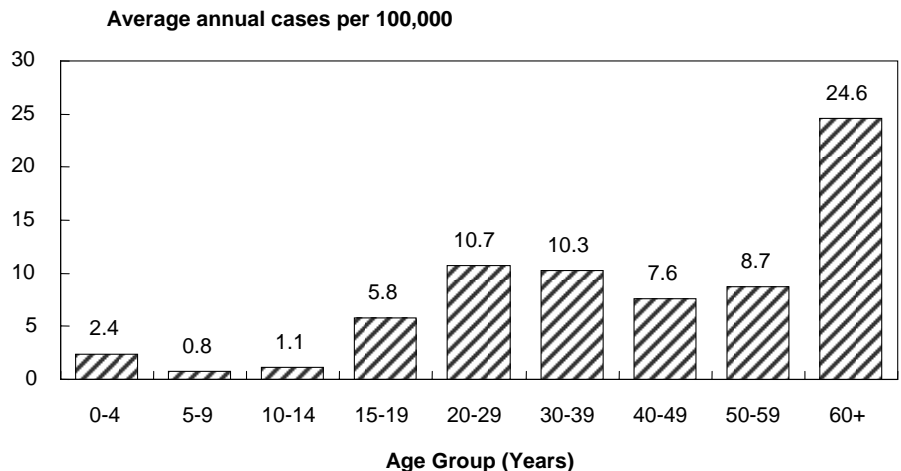
Note: Rates age-standardized using 1991 (adjusted) Canadian population.

Sources: Ontario data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 04/13/2005.

Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

Figure 4.7: Incidence of Active Tuberculosis by Age Group, Region of Peel, 1995-2004 Combined



Sources: Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

Population Estimates 1986-2004, Provincial Health Planning Database (PHPDB) Extracted: 03/30/2005, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

CHAPTER 5: DISEASES SPREAD BY INSECTS

Highlights

- In Peel, approximately 2 to 6 cases of malaria per 100,000 population are reported each year, with the exception of 1996 and 1997 when a dramatic increase in incidence was noted (16.4 and 15.6 cases per 100,000 respectively). Travel to or immigration from the Punjab, India, which was experiencing a malaria outbreak, was a probable cause for this increase.⁴² However, the increased incidence was much higher in Peel compared to either Ontario or Canada.⁴³
- Locally acquired cases of West Nile Virus (WNV) occurred for the first time in 2002 with a total count of 57 in Peel. Since then, the disease definition has been changed. In 2003, there were 10 Peel residents infected with WNV. No human cases were reported in 2004.

INTRODUCTION

Diseases spread by insects are caused by bacteria, parasites and viruses. Blood feeding insects such as fleas, mosquitoes, midges and sandflies transmit these diseases. Although some insect-borne diseases can be transmitted from person-to-person or through blood, this is not their main mode of transmission. Many insect-borne diseases are major health problems for developing countries. Malaria is estimated to infect over 300 million people, killing one million per year.^{44,45}

Fortunately, many insect-borne diseases are so rare in Ontario that they are not required to be reported. The reportable insect-borne diseases in Ontario are: viral hemorrhagic fevers, Lyme disease, malaria, plague, Q fever, West Nile Virus and yellow fever. In Peel, only two of these diseases averaged more than five cases per year. The first is malaria, acquired in areas of the world where this disease occurs from the bite of an infected mosquito. The second, also spread by mosquitoes, is a new disease to Peel: West Nile Virus. West Nile Virus was acquired locally for the first time in 2002. The extent to which it will affect Peel residents in the future is unknown.

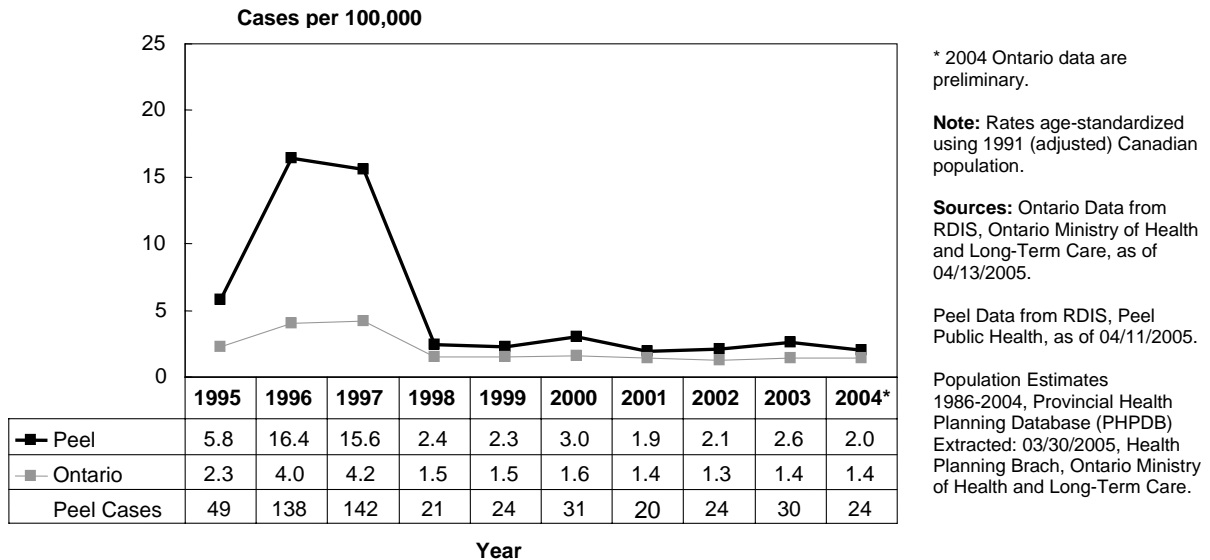
MALARIA

Malaria remains one of the world’s most important and widespread fatal infectious diseases. It is caused by one of four parasite species of the genus *Plasmodium*.

The disease is transmitted to humans through a bite of an infected female *Anopheles* mosquito. While rare, the parasite can also be transmitted by transfusion with infected blood, shared needle use, or from a mother to her unborn child. Symptoms of malaria are non-specific and include fever, chills, headache, nausea, vomiting, muscle pain and malaise.^{6,44}

Malaria is endemic (i.e. constantly present) in the tropical and subtropical parts of the world.⁴² Nearly all cases of malaria in Canada occur in people who have lived in or travelled to areas where malaria is common. The 1995 to 1997 epidemic in Canada was probably associated with Canadians travelling to the Punjab, India, which was experiencing an outbreak of malaria.⁴²

Figure 5.1: Incidence of Malaria, Region of Peel and Ontario, 1995-2004



WEST NILE VIRUS (WNV)

West Nile Virus is a human, horse and bird pathogen that is transmitted through mosquito bites. Since first isolated in 1937, the virus has been known to cause asymptomatic infection and fevers in humans. Less than 1% of infected people develop more serious illness that includes encephalitis and meningitis, which can result in death. In North America, human and animal infections were not documented until the 1999 outbreak in New York City. Since then, the disease has spread to 49 states across the United States and seven provinces in Canada including confirmed cases of human infection in Ontario.⁴⁶

In 2002, cases of locally acquired WNV occurred for the first time in Peel, with a total of 37 confirmed cases and 20 probable cases. Among the 57 confirmed or probable cases, 26% were aged 50 to 59 years, 23% were aged 60 to 69 years and 18% were aged 70 to 79 years, showing that cases were more prevalent among older adults, but not limited to them. Twenty-eight cases of WNV (among confirmed and probable cases) required hospitalization, of which two died.

In 2003, there were ten residents of Peel who had laboratory evidence of WNV infection. Nine of these had confirmed diagnoses of West Nile Fever and one had a diagnosis of West Nile Neurological Manifestations. There were no deaths due to WNV in 2003. While case definitions and laboratory testing methods differed between 2002 and 2003, these results are still much lower than the 57 residents with laboratory evidence of WNV identified in 2002.

In 2004, there were no human cases of WNV reported in the Region of Peel as compared to 14 cases in the Province of Ontario.

More detailed information on WNV is contained in the report entitled "*2004 West Nile Virus in the Region of Peel*".



COMMUNICABLE DISEASE 1995-2004

APPENDIX

TABLE 1
Cases of Reportable Disease,
Region of Peel, 1995-2004

Selected Reportable Diseases	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AIDS	19	18	10	5	4	7	14	7	10	8
Amebiasis	96	91	108	102	91	95	129	121	108	127
Brucellosis	1	1	0	1	1	0	2	2	1	0
Campylobacteriosis	556	523	501	515	442	457	482	422	398	414
Chlamydia	962	876	947	1087	1230	1271	1480	1637	1800	1935
Cholera	0	0	0	0	0	0	1	0	0	0
Cryptosporidiosis*	NA	3	3	7	8	12	13	10	13	17
Cyclosporiasis**	NA	NA	NA	NA	NA	NA	NA	NA	2	5
Cytomegalovirus	0	0	1	0	0	0	1	2	0	1
Encephalitis/Meningitis	18	24	17	19	28	51	70	72	41	57
Giardiasis	221	211	214	204	161	191	205	169	180	175
Gonorrhoea	308	215	194	244	213	318	308	321	365	342
Haemophilus influenzae type b	2	0	0	0	0	1	1	0	1	0
Hepatitis A	52	44	34	18	24	8	22	22	18	31
Hepatitis B	32	16	9	10	2	5	10	9	8	5
Hepatitis C	500	549	505	468	477	445	339	414	412	411
Herpes, Neonatal	0	2	0	0	2	0	0	0	0	0
HIV	39	25	22	24	19	36	21	36	51	51
Influenza***	18	61	101	111	113	41	165	133	557	336
Invasive Pneumococcal Disease	NA	NA	NA	NA	NA	NA	12	82	80	68
Legionella Infections	9	3	5	4	2	6	1	5	2	4
Leprosy	1	2	1	1	3	3	1	0	1	0
Listeriosis	5	0	4	3	4	4	4	9	3	4
Lyme Disease	0	0	1	1	0	7	1	1	2	3
Malaria	49	138	142	21	24	31	20	24	30	24
Measles	440	9	0	2	0	0	0	0	0	4
Meningococcal Disease	1	2	3	5	9	10	5	2	4	3
Mumps	17	11	2	2	4	6	1	3	3	5
Ophthalmia Neonatorum	2	1	2	1	0	1	0	0	0	0
Paratyphoid Fever	3	3	0	5	6	7	1	10	5	16
Pertussis	90	36	30	44	24	29	21	20	10	26
Q Fever	1	0	1	0	0	1	1	0	0	0
Rubella	0	28	7	1	0	0	1	0	1	0
Rubella, Congenital Syndrome	0	0	0	0	0	0	0	0	0	0
Salmonellosis	278	243	235	337	249	241	279	223	220	256
Severe Acute Respiratory Syndrome (SARS)‡	NA	NA	NA	NA	NA	NA	NA	NA	17.0	NA
Shigellosis	34	35	36	51	41	29	26	64	47	31
Streptococcal infections, Group A invasive	4	11	16	19	20	30	35	28	29	14
Streptococcal infections, Group B	0	2	5	2	9	10	7	7	9	7
Syphilis	8	5	4	3	1	2	1	1	10	20
Tetanus	0	0	0	0	0	0	1	0	0	0
Trichinosis	0	0	0	0	0	0	0	0	0	0
Tuberculosis	65	84	89	78	67	103	94	106	101	117
Typhoid Fever	11	3	6	11	14	21	12	13	19	24
Verotoxin-producing Escherichia coli	50	23	27	45	26	24	23	25	26	31
West Nile Virus †	NA	NA	NA	NA	NA	NA	NA	57	10	0
Yersiniosis	68	49	45	49	49	47	43	36	41	48

* Cryptosporidiosis became reportable in 1996.

** The increase in cyclosporiasis cases in 1999 was due to an outbreak in the Greater Toronto Area caused by the importation of contaminated fruit. Cyclosporiasis became reportable in 2000 and entered on RDIS as of January 2003. Data prior to 2000 were collected manually by Peel Public Health Environmental Health Division staff.

*** Influenza data based on seasonal year (i.e. 1995 data are from July 1, 1995 to June 30, 1996). 2004/2005 data include cases up to April 11, 2005 only.

**** Invasive streptococcus pneumoniae infection became reportable in 2003.

‡ Severe Acute Respiratory Syndrome (SARS) began in late March 2003. Cases reported were confirmed or probable.

† West Nile Virus data for 2002 and 2003 include confirmed and probable cases for Peel only. One case reported in 1999 was acquired in New York City.

NA = Data not available

Notes:

1. There was only one case of the following diseases in Peel in the year noted: Chancroid (1996), Hepatitis Non A,B,C,D (1997), Psittacosis/Ornithosis (1995) and Tetanus (2001).
2. There were 2 cases of Hepatitis D noted in 1998 and 2003.
3. There were no cases of the following reportable diseases in Peel from 1995-2004: anthrax, botulism, diphtheria, hantavirus pulmonary syndrome, hemorrhagic fevers, plague, polio, rabies, congenital rubella syndrome, smallpox, tularemia, and yellow fever.
4. Data on institutional outbreaks of gastroenteritis and respiratory infection were not available.
5. Chickenpox (varicella) data were of poor quality.

Sources: Peel data from RDIS, Peel Public Health as of 04/11/2005, except West Nile Virus data, which were taken from 2004 West Nile Virus in the Region of Peel Report and cyclosporiasis data based on manual counts by Peel Public Health Environmental Health Staff. SARS data from Region of Peel Public Health Department.

COMMUNICABLE DISEASE 1995-2004

TABLE 2
Cases of Reportable Disease,
Province of Ontario, 1995-2004

Selected Reportable Diseases	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AIDS	597	407	254	208	188	141	166	131	153	139
Amebiasis	930	837	983	833	768	818	847	819	766	679
Brucellosis	3	2	2	4	2	2	3	5	4	3
Campylobacteriosis	6389	5398	5210	5347	4088	4960	5013	4592	4067	3917
Chlamydia	12125	10746	10661	12492	13387	14688	16242	18248	19172	20557
Cholera	3	1	0	1	0	0	3	1	2	0
Cryptosporidiosis*	NA	266	227	185	207	235	247	229	275	297
Cyclosporiasis**	NA	NA	NA	NA	NA	9	21	52	39	94
Cytomegalovirus	8	5	5	4	11	8	4	6	8	6
Encephalitis/Meningitis	326	319	299	446	435	393	531	576	457	472
Giardiasis	2710	2552	2377	2128	1981	1997	2057	1910	1619	1590
Gonorrhoea	3038	2360	1922	2278	2259	2842	2943	3071	3342	3473
Haemophilus influenzae type b	12	10	8	7	4	11	6	5	8	10
Hepatitis A	499	617	456	318	261	157	175	150	144	175
Hepatitis B	312	227	175	141	139	143	131	146	164	142
Hepatitis C	7320	7779	6274	7016	6475	5780	5523	5451	5370	5276
Herpes, Neonatal	0	5	3	3	10	1	4	5	1	11
HIV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Influenza**	695	1249	2503	2332	2846	781	2244	967	5368	344
Legionella Infections	33	37	45	45	44	41	21	24	25	10
Leprosy	5	6	4	2	6	3	3	2	4	1
Listeriosis	44	26	37	51	31	37	36	42	43	41
Lyme Disease	19	17	17	17	22	44	23	27	26	30
Malaria	253	443	463	159	166	184	160	154	163	170
Measles	2305	189	22	9	2	9	6	1	12	7
Meningococcal Disease	93	95	83	51	80	78	105	59	58	53
Mumps	198	83	63	32	43	33	17	14	13	22
Ophthalmia Neonatorum	9	13	9	7	7	10	7	3	2	5
Paratyphoid Fever	15	12	4	12	17	12	12	27	19	42
Pertussis	2054	722	1044	1867	1213	715	461	529	351	623
Q Fever	12	10	9	8	18	12	11	1	8	6
Rubella	197	72	29	15	3	9	17	2	9	6
Rubella, Congenital Syndrome	1	0	1	0	0	1	0	1	1	2
Salmonellosis	2892	2667	2627	3336	2294	2357	2554	2458	1985	2074
Severe Acute Respiratory Syndrome (SARS) ‡	NA	NA	NA	NA	NA	NA	NA	NA	376	0
Shigellosis	429	314	368	407	265	283	232	849	279	280
Streptococcal infections, Group A invasive	87	206	225	276	303	407	326	382	399	281
Streptococcal infections, Group B	14	52	59	30	47	52	64	68	64	55
Syphilis	67	50	32	31	32	23	24	183	304	364
Tetanus	2	1	1	2	1	1	3	1	0	0
Trichinosis	0	0	0	0	0	0	0	0	0	1
Tuberculosis	800	779	779	742	699	699	698	712	686	634
Typhoid Fever	44	23	31	45	42	53	62	59	50	66
Verotoxin-producing Escherichia coli	583	468	427	402	373	1712	357	392	453	306
West Nile Virus †	NA	NA	NA	NA	NA	NA	NA	405	89	14
Yersiniosis	559	492	400	343	361	333	312	382	324	294

* Cryptosporidiosis became reportable in 1996.

** Influenza data based on seasonal year (i.e. 1995 data are from July 1, 1995 to June 30, 1996). 2004/2005 data include cases up to December 31, 2004 only.

‡ Severe Acute Respiratory Syndrome (SARS) began in late March 2003. Cases reported were confirmed or probable as of June 16, 2003.

† West Nile Virus data for 2002 and 2003 include confirmed and probable cases.

NA = Data not available

Notes:

There were 12 cases of Psittacosis/Ornithosis reported in Ontario from 1994 to 2001.

There were some reportable diseases not included in this table. Please see Table 1.

Sources: Ontario data from RDIS, Ontario Ministry of Health and Long-Term Care as of 04/13/2005.

SARS data from *SARS Bulletin for Healthcare Providers*. Ontario Ministry of Health and Long-Term Care.

WNV data from West Nile Virus Surveillance archive, Ontario Ministry of Health and Long-Term Care.

COMMUNICABLE DISEASE 1995-2004

TABLE 3
Age-Standardized Incidence of Reportable Disease,
Region of Peel, 1995-2004

Selected Reportable Diseases	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AIDS	2.2	2.0	1.0	0.5	0.5	0.7	1.2	0.6	0.9	0.6
Amebiasis	11.5	10.6	12.0	11.1	9.7	10.1	12.4	11.1	9.9	11.0
Brucellosis	0.2	0.1	0.0	<0.1	0.1	0.0	0.2	0.2	0.1	0.0
Campylobacteriosis	62.9	58.5	54.5	54.3	45.1	45.5	46.7	38.7	35.4	36.3
Chlamydia	111.1	100.9	107.0	120.0	133.2	133.4	148.9	158.4	167.4	172.8
Cholera	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Cryptosporidiosis*	NA	0.4	0.3	0.7	0.8	1.2	1.2	0.9	1.2	1.5
Cyclosporiasis**	NA	NA	NA	NA	NA	NA	NA	NA	0.15	0.39
Cytomegalovirus	0.0	0.0	<0.1	0.0	0.0	0.0	<0.1	0.19	0.0	<0.1
Encephalitis/Meningitis	2.0	2.6	1.7	2.0	2.9	4.9	6.7	7.2	3.8	4.8
Giardiasis	25.4	23.1	22.8	21.1	16.4	19.1	19.9	15.5	15.7	15.2
Gonorrhea	35.5	24.7	22.0	26.7	22.8	33.1	30.7	30.9	33.4	30.3
Haemophilus influenzae type b	0.2	0.0	0.0	0.0	0.0	<0.1	0.1	0.0	<0.1	0.0
Hepatitis A	5.8	4.9	3.7	1.8	2.4	0.8	2.0	1.9	1.6	2.6
Hepatitis B	3.8	2.0	1.1	1.1	0.2	0.5	1.0	0.9	0.7	0.4
Hepatitis C	56.6	59.2	53.7	49.8	48.0	43.8	32.7	36.8	35.6	34.2
Herpes, Neonatal	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
HIV	4.3	2.7	2.3	2.5	1.9	3.7	2.1	3.4	4.6	4.2
Influenza***	1.9	7.1	12.7	14.2	14.2	4.2	17.5	12.7	54.4	32.1
Invasive Pneumococcal Disease****	NA	NA	NA	NA	NA	NA	1.4	8.4	7.9	6.6
Legionella Infections	1.5	0.3	0.6	0.6	0.2	0.9	0.2	0.5	0.2	0.4
Leprosy	0.2	0.2	0.2	<0.1	0.3	0.3	<0.1	0.0	<0.1	0.0
Listeriosis	0.7	0.0	0.5	0.5	0.5	0.6	0.6	1.1	0.4	0.3
Lyme Disease	0.0	0.0	<0.1	<0.1	0.0	0.7	<0.1	<0.1	0.2	0.2
Malaria	5.8	16.4	15.6	2.4	2.3	3.0	1.9	2.1	2.6	2.0
Measles	48.8	0.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.4
Meningococcal Disease	0.1	0.2	0.3	0.6	<0.1	<0.1	0.5	0.2	0.4	0.3
Mumps	1.9	1.2	0.2	0.2	0.4	0.6	<0.1	0.3	0.2	0.4
Ophthalmia Neonatorum	0.2	<0.1	0.2	<0.1	0.0	<0.1	0.0	0.0	0.0	0.0
Paratyphoid Fever	0.3	0.3	0.0	0.5	0.6	0.6	0.1	0.9	0.4	1.4
Pertussis	9.6	3.8	3.1	4.4	2.4	2.7	1.9	1.8	0.9	2.2
Q Fever	<0.1	0.0	0.1	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0
Rubella	0.0	3.1	0.7	<0.1	0.0	0.0	<0.1	0.0	<0.1	0.0
Rubella, Congenital Syndrome	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmonellosis	31.6	26.6	24.8	35.3	25.7	24.4	27.0	20.7	19.8	21.9
Severe Acute Respiratory Syndrome (SARS)†	NA	NA	NA	NA	NA	NA	NA	NA	1.5	NA
Shigellosis	4.0	3.9	3.9	5.3	4.2	2.8	2.4	5.9	4.2	2.7
Streptococcal infections, Group A invasive	0.6	1.4	1.9	2.3	2.4	3.3	4.2	2.8	2.9	1.2
Streptococcal infections, Group B	0.0	0.2	0.5	0.2	0.9	1.0	0.7	0.7	0.8	0.6
Syphilis	0.9	0.5	0.4	0.3	0.1	0.3	0.1	<0.1	0.9	1.7
Tetanus	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Trichinosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tuberculosis	8.2	10.4	10.9	9.8	7.7	11.6	10.2	11.2	9.7	11.0
Typhoid Fever	1.2	0.3	0.7	1.2	1.5	2.1	1.2	1.1	1.7	2.1
Verotoxin-producing Escherichia coli	6.0	2.5	3.0	4.6	2.6	2.4	2.1	2.2	2.5	2.7
West Nile Virus †	NA	NA	NA	NA	NA	NA	NA	5.3	0.9	0.0
Yersiniosis	7.8	5.2	4.9	5.0	4.9	4.6	4.2	3.4	3.7	4.1

* Cryptosporidiosis became reportable in 1996.

** The increase in cyclosporiasis cases in 1999 was due to an outbreak in the Greater Toronto Area caused by the importation of contaminated fruit. Cyclosporiasis became reportable in 2000 and entered on RDIS as of January 2003. Data prior to 2000 were collected manually by Peel Public Health Environmental Health Division staff.

*** Influenza data based on seasonal year (i.e. 1995 data are from July 1, 1995 to June 30, 1996). 2004/2005 data include cases up to April 11, 2005 only.

**** Invasive streptococcus pneumoniae infection became reportable in 2003.

† Severe Acute Respiratory Syndrome (SARS) began in late March 2003. Cases reported were confirmed or probable.

† West Nile Virus data for 2002 and 2003 include confirmed and probable cases for Peel only. One case reported in 1999 was acquired in New York City.

NA = Data not available

Notes:

1. There was only one case of the following diseases in Peel in the year noted: Chancroid (1996), Hepatitis Non A,B,C,D (1997), Psittacosis/Ornithosis (1995) and Tetanus (2001).
2. There were 2 cases of Hepatitis D noted in 1998 and 2003.
3. There were no cases of the following reportable diseases in Peel from 1995-2004: anthrax, botulism, diphtheria, hantavirus pulmonary syndrome, hemorrhagic fevers, plague, polio, rabies, congenital rubella syndrome, smallpox, tularemia, and yellow fever.
4. Data on institutional outbreaks of gastroenteritis and respiratory infection were not available.
5. Chickenpox (varicella) data were of poor quality.

Sources: Peel data from RDIS, Peel Public Health as of 04/11/2005, except West Nile Virus data, which were taken from 2004 West Nile Virus in the Region of Peel Report and cyclosporiasis data based on manual counts by Peel Public Health Environmental Health Staff. SARS data from Region of Peel Public Health Department.

TABLE 4
Age-Standardized Incidence of Reportable Disease,
Province of Ontario, 1995-2004

Selected Reportable Diseases	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AIDS	5.4	3.6	2.3	1.8	1.6	1.2	1.4	1.1	1.2	1.1
Amebiasis	8.6	7.6	8.9	7.4	6.8	7.1	7.2	6.8	6.4	5.6
Brucellosis	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Campylobacteriosis	58.8	49.4	47.3	48.0	36.5	43.7	43.5	39.1	34.2	32.4
Chlamydia	118.3	105.8	104.7	122.4	130.0	140.4	152.8	168.9	175.2	185.3
Cholera	<0.1	<0.1	0.0	<0.1	0.0	0.0	<0.1	<0.1	<0.1	0.0
Cryptosporidiosis*	NA	2.4	2.1	1.7	1.9	2.1	2.3	2.1	2.5	2.7
Cyclosporiasis**	NA	NA	NA	NA	NA	<0.1	0.2	0.4	0.3	0.7
Cytomegalovirus	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1
Encephalitis/Meningitis	3.0	2.9	2.7	4.1	3.9	3.5	4.7	4.9	4.0	4.1
Giardiasis	25.0	23.3	21.6	19.2	17.8	17.8	18.1	16.6	13.8	13.6
Gonorrhea	29.4	23.1	18.7	22.0	21.6	26.8	27.2	28.0	30.1	30.8
Haemophilus influenzae type b	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hepatitis A	4.6	5.7	4.2	2.8	2.3	1.4	1.5	1.3	1.2	1.5
Hepatitis B	2.9	2.1	1.6	1.3	1.2	1.2	1.1	1.2	1.4	1.1
Hepatitis C	64.4	67.9	54.3	60.1	54.1	47.5	44.2	42.3	40.8	39.8
Herpes, Neonatal	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
HIV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Influenza**	6.1	10.9	21.3	20.0	23.7	7.1	18.9	8.7	44.6	2.6
Legionella Infections	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	<0.1
Leprosy	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Listeriosis	0.4	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Lyme Disease	0.2	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.2
Malaria	2.3	4.0	4.2	1.5	1.5	1.6	1.4	1.3	1.4	1.4
Measles	21.6	1.7	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Meningococcal Disease	0.9	0.9	0.8	0.5	0.7	0.7	0.9	0.5	0.5	0.4
Mumps	1.9	0.8	0.6	0.3	0.4	0.3	0.1	0.1	0.1	0.2
Ophthalmia Neonatorum	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Paratyphoid Fever	0.1	0.1	<0.1	0.1	0.2	0.1	0.1	0.3	0.2	0.4
Pertussis	19.0	6.6	9.6	16.9	11.0	6.4	4.0	4.6	3.1	5.5
Q Fever	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Rubella	1.8	0.7	0.3	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Rubella, Congenital Syndrome	<0.1	0.0	<0.1	0.0	0.0	<0.1	0.0	<0.1	<0.1	<0.1
Salmonellosis	26.5	24.3	23.9	30.0	20.5	20.9	22.1	21.3	17.1	17.8
Severe Acute Respiratory Syndrome (SARS)‡	NA	NA	NA	NA	NA	NA	NA	NA	3.1	0.0
Shigellosis	3.9	2.9	3.3	3.7	2.4	2.5	2.0	7.2	2.4	2.4
Streptococcal infections, Group A invasive	0.8	1.8	1.9	2.4	2.5	3.4	2.6	3.0	3.1	2.2
Streptococcal infections, Group B	0.1	0.5	0.6	0.3	0.5	0.5	0.6	0.7	0.6	0.6
Syphilis	0.6	0.5	0.3	0.3	0.3	0.2	0.2	1.5	2.6	3.0
Tetanus	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	0.0
Trichinosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1
Tuberculosis	7.3	7.1	6.9	6.5	6.1	6.0	5.9	5.9	5.7	5.1
Typhoid Fever	0.4	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.6
Verotoxin-producing Escherichia coli	5.3	4.2	3.8	3.6	3.3	14.8	3.1	3.4	3.9	2.6
West Nile Virus †	NA	NA	NA	NA	NA	NA	NA	3.3	0.7	0.1
Yersiniosis	5.1	4.5	3.6	3.1	3.3	3.0	2.9	3.4	2.9	2.7

* Cryptosporidiosis became reportable in 1996.

** Influenza data based on seasonal year (i.e. 1995 data are from July 1, 1995 to June 30, 1996). 2004/2005 data include cases up to December 31, 2004 only.

‡ Severe Acute Respiratory Syndrome (SARS) began in late March 2003. Cases reported were confirmed or probable as of June 16, 2003.

† West Nile Virus data for 2002 and 2003 include confirmed and probable cases.

NA = Data not available

Notes:

There were 12 cases of Psittacosis/Ornithosis reported in Ontario from 1994 to 2001.

There were some reportable diseases not included in this table. Please see Table 1.

Sources: Ontario data from RDIS, Ontario Ministry of Health and Long-Term Care as of 04/13/2005.

SARS data from SARS Bulletin for Healthcare Providers. Ontario Ministry of Health and Long-Term Care.

WNV data from West Nile Virus Surveillance archive, Ontario Ministry of Health and Long-Term Care.

DATA SOURCES AND METHODS

The communicable diseases contained in this report are required to be reported to the local Medical Officer of Health under the Health Protection and Promotion Act (HPPA). Since 1990, reportable diseases have been monitored through a public health surveillance system called the Reportable Diseases Information System (RDIS). Data for Peel for the years 1995 to 2004 were collected by Peel Public Health. Data for Ontario for the same time period were obtained from the Public Health Branch of the Ontario Ministry of Health and Long-Term Care. Only selected reportable diseases were included in this report. A more complete listing of reportable diseases in Ontario can be found in Appendix tables 1 through 4.

Comparative data for Ontario were provided in the figures and appendices when available and appropriate. Data for the year 2004 were the latest that were available for Peel and Ontario. It is recognized that data for the Region of Peel and Ontario may change in future years when additional information becomes available, especially for some diseases such as tuberculosis which can take longer to be reported to the Peel Public Health. The Peel-specific Reportable Disease Information System (RDIS) data were downloaded on April 11, 2005. The Ontario RDIS data provided by the Ministry of Health and Long-Term Care were downloaded on April 14, 2005. Peel data for West Nile Virus were taken from the *2004 West Nile Virus in the Region of Peel Report*. West Nile Virus has been reported on RDIS since January 2003. The cyclosporiasis data were based on manual counts by Peel Public Health Environmental Health Staff before 2003. Since January 2003, cyclosporiasis and invasive streptococcus pneumoniae infection also have become reportable on RDIS. Severe Acute Respiratory Syndrome (SARS) data for Peel and Ontario were taken from data reported to the Region and the Province during the outbreak of spring 2003.

Age can be a factor in whether a person acquires a disease and in the progression of that disease. When comparing two populations, differences in the respective age distributions can be controlled by using a process called "age-standardization". This minimizes the effect of differences in age distributions between populations so that observed differences can then be attributed to factors other than age.

In this report, direct age-standardization was used for reporting total rates of most of the diseases that occurred in Peel. For the more commonly reported diseases such as chlamydia or salmonellosis, age-specific rates were provided for 2004. In some instances, sex-specific data were provided. For less frequently reported diseases (those with low annual case numbers) such as hepatitis B and syphilis, age and sex-specific rates were based on average annual rates for the Region of Peel for the years 1995 to 2004.

For some diseases such as pertussis, influenza, salmonellosis, meningococcal disease, and group A streptococcal infections, it is important to look at incidence in children less than one year old since this age group experiences markedly higher rates of these diseases. The Population Estimates from 1995 to 2004 for single-year age groups were downloaded from the Provincial Health Planning Database (PHPDB) on March 30, 2005 and were used to calculate age-specific rates in Peel residents in the report.

Age-standardization was not used for acquired immunodeficiency syndrome (AIDS) and human immunodeficiency virus (HIV) because these conditions primarily affect more men than women. Moreover, age-standardized rates were not used for Severe Acute Respiratory Syndrome (SARS) and West Nile Virus (WNV) because the age of cases was not known at the provincial level. In all these instances, crude incidence rates were used as indicated.

Incidence rates were age-standardized using the 1991 Canadian population provided by Statistics Canada, Population Estimates and Projection and Distributed by the Ontario Ministry of Health and Long-Term Care.

REFERENCES

Sexually Transmitted and Bloodborne Infections

1. United States Centers for Disease Control & Prevention. *HIV/AIDS Surveillance Report* [serial on the Internet]. 1998 Jun [cited 2005 May 10]; 10(No.1):[inclusive page numbers]. Available from: <http://www.cdc.gov/hiv/stats/hasr1001.pdf>
2. Health Canada, Centre for Infectious Disease Prevention, Bureau of HIV/AIDS, STD and TB, Division of STD Prevention and Control. *1998/1999 Sexually Transmitted Diseases (STD) Surveillance Report*. Canadian Communicable Disease Report [serial on the Internet]. 2000 Oct [updated 2002 Nov 18; cited 2005 May 10]; 26 (Suppl 6). Available from: <http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/00pdf/cdr26s6e.pdf>
3. Barker, K. "Memorandum to all Medical Officers of Health and STD Program Managers Re: Increasing Syphilis Cases in Ontario". Public Health Branch, Ontario Ministry of Health and Long-Term Care. April 18, 2004.
4. Weir, E. *Upsurge of genital Chlamydia trachomatis infection*. CMAJ [serial on the Internet]. 2004 Oct [cited 2005 May 10];171(8):[about 3 p.]. Available from: <http://www.cmaj.ca/cgi/content/full/171/8/855>
5. Public Health Agency of Canada. *HIV/AIDS—What you need to know about Sexually Transmitted Infections (STI)* [homepage on the Internet]. 2002 [updated 2003 Feb 14; cited 2005 May 10]. [about 3 screens]. Available from: http://www.phac-aspc.gc.ca/publicat/std-mts/sti_o.html
6. Heymann D., Editor. *Control of Communicable Diseases Manual*. 18th ed. American Public Health Association; 2004.
7. Health Canada. *Diseases and Conditions—AIDS* [homepage on the Internet]. [updated 2005 Feb 14; cited 2005 May 10]. [about 2 screens]. Available from: <http://www.hc-sc.gc.ca/english/diseases/aids.html>
8. United States Centers for Disease Control and Prevention, National Center for HIV, STD, and TB Prevention, Divisions of HIV/AIDS Prevention. *Frequently Asked Questions - How long does it take for HIV to cause AIDS* [homepage on the Internet]. [updated 2005 May 10; cited 2005 May 10]. [about 1 screen]. Available from: <http://www.cdc.gov/hiv/pubs/faq/faq4.htm>

9. Public Health Agency of Canada. *Chlamydia – What you need to know about Sexually Transmitted Infections* [homepage on the Internet]. 2002 [updated 2003 February; cited 2005 May 10]. [about 2 screens]. Available from:
http://www.phac-aspc.gc.ca/publicat/std-mts/sti_g.html
10. Health Canada. *Gonorrhea – It's Your Health* [homepage on the Internet]. 2004 [cited 2005 May 10]. [about 3 screens]. Available from:
<http://www.hc-sc.gc.ca/english/iyh/diseases/gonorrhea.html>
11. Public Health Agency of Canada. *Gonorrhea – What you need to know about Sexually Transmitted Infections* [homepage on the Internet]. 2002 [updated 2003 Feb 14; cited 2005 May 10]. [about 2 screens]. Available from:
http://www.phac-aspc.gc.ca/publicat/std-mts/sti_h.html
12. Public Health Agency of Canada, Centre for Infectious Disease Prevention and Control, Population and Public Health Branch. *Infectious Syphilis in Canada*. STD Epi Update [serial on the Internet]. 2002 Feb [updated 2004 Aug 6; cited 2005 May 10]. [about 7 screens]. Available from:
http://www.phac-aspc.gc.ca/publicat/epiu-aepi/std-mts/infpsyph_e.html
13. Public Health Agency of Canada. *Hepatitis B – What you need to know about Sexually Transmitted Infections* [homepage on the Internet]. 2002 [updated 2003 Feb 14; cited 2005 May 10]. [about 2 screens]. Available from:
http://www.phac-aspc.gc.ca/publicat/std-mts/sti_m.html
14. Zou S, Tepper M and Giulivi A. *Current Status of Hepatitis C in Canada*. Canadian Journal of Public Health. 2000 Jul-Aug; 91(Supp 1):S10-S15.
15. Public Health Agency of Canada, Community Acquired Infections Division and the Departmental Program Evaluation Division, Hepatitis C Section, *Hepatitis C Prevention, Support and Research Program* [monograph on the Internet]. 2003 Nov 12 [cited 2005 May 10]. [about 5 screens]. Available from:
http://www.phac-aspc.gc.ca/hepc/hepatitis_c/pdf/hepcMidterm/i_problem.html

Vaccine Preventable Diseases

16. National Advisory Committee on Immunization. *An Advisory Committee Statement - Update: Statement on Influenza Vaccination for the 2003 to 2004 Season*. Canada Communicable Disease Report [serial on the Internet]. 2004 Mar 1(30) [cited 2005 May 10]. Available from: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/04pdf/acs-dcc-30-2.pdf>
17. United States Centres for Disease Control and Prevention, National Immunization Program. *6 Common Misconceptions about Vaccination* [monograph on the Internet]. Atlanta, GA, USA. 2001 Jul [updated 2004 May 12; cited 2005 May 10]. [about 10 screens]. Available from: <http://www.cdc.gov/nip/publications/6mishome.htm>
18. Health Canada. *Chickenpox Vaccine – It's Your Health* [homepage on the Internet]. 2004 January [updated 2005 Feb 9; cited 2005 May 10]. [about 3 screens]. Available from: <http://www.hc-sc.gc.ca/english/iyh/medical/chickenpox.html>
19. Ontario Ministry of Health and Long-Term Care. Varicella (Chicken Pox Vaccine)—Public Information [homepage on the Internet]. 2004 December [cited 2005 May 19]. [about 3 screens]. Available from: <http://www.health.gov.on.ca/english/public/pub/immun/varicella.html>
20. Public Health Agency of Canada. *Canadian Immunization Guide. Sixth Edition* [monograph on the Internet]. Canadian Medical Association; 2002 [cited 2005 May 10]. Available from: <http://www.phac-aspc.gc.ca/publicat/cig-gci/>
21. Region of Peel Health Department. *Communicable Disease Report 1994-2003* [serial on the Internet]. 2004 [cited 2005 May 10]. Available from: <http://www.peelregion.ca/health/health-status-report/comm-dis-94-03/pdfs/final-report.pdf>

Diseases Spread by Food and Water

22. Region of Peel Health Department. *State of the Region's Health 2003—Focus on Foodborne Disease* [serial on the Internet]. 2003 [cited 2005 May 10]. Available from: <http://www.peelregion.ca/health/health-status-report/foodborne-disease/pdfs/hs-report-full-2003.pdf>

23. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics—Disease Information: Foodborne Infections* [homepage on the Internet]. [updated 2005 Jan 10; cited 2005 May 10]. [about 18 screens]. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm
24. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Parasitic Diseases. *Health Topics—Parasitic Disease Information: Amebiasis – Fact Sheet* [homepage on the internet]. [updated 2004 Jan 21; cited 2005 May 10]. [about 4 screens]. Available from: http://www.cdc.gov/ncidod/dpd/parasites/amebiasis/factsht_amebiasis.htm
25. Public Health Agency of Canada. *Amoebiasis—Notifiable Diseases On-Line* [homepage on the Internet]. [updated 2003 Dec 11; cited 2005 May 10]. [about 2 screens]. Available from: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/amoe_e.html
26. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics—Disease Information: Campylobacter Infections* [homepage on the Internet]. [update 2003 Sep 3; cited 2005 May 10]. [about 5 screens]. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/campylobacter_g.htm
27. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Parasitic Diseases. *Health Topics—Parasitic Disease Information: Giardiasis—Fact Sheet* [homepage on the Internet]. [updated 2004 Sep 17; cited 2005 May 10]. [about 7 screens]. Available from: http://www.cdc.gov/ncidod/dpd/parasites/giardiasis/factsht_giardia.htm
28. Public Health Agency of Canada. *Hepatitis A - Notifiable Diseases On-Line* [homepage on the Internet]. [updated 2003 Dec 11; cited 2005 May 10]. [about 2 screens]. Available from: http://dsol-smed.hc-sc.gc.ca/dsol-smed/ndis/diseases/hepa_e.html
29. United States Centre for Disease Control and Prevention, National Center for Infectious Diseases, Division of Viral Hepatitis. *Health Topics: Viral Hepatitis A—Fact Sheet* [homepage on the Internet]. [updated 2005 May 1; cited 2005 May 10]. [about 3 screens]. Available from: <http://www.cdc.gov/ncidod/diseases/hepatitis/a/fact.htm>

30. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topic—Disease Information: Salmonellosis* [homepage on the Internet]. [updated 2004 Sep 7; cited 2005 May 10]. [about 5 screens]. Available from:
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/salmonellosis_g.htm
31. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics—Disease Information: Shigellosis* [homepage on the Internet]. [updated 2003 Sep 3; cited 2005 May 10]. [about 6 screens]. Available from:
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/shigellosis_g.htm
32. Bruce-Grey-Owen Sound Health Unit. *Waterborne outbreak of gastroenteritis associated with a contaminated municipal water supply, Walkerton, Ontario, May-June 2000*. Canada Communicable Disease Report [serial on the Internet]. 2000 Oct 15 [updated 2002 Nov 18; cited 2005 May 10]: [about 3 screens]. Available from:
<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/00vol26/dr2620eb.html>
33. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics—Disease Information: Yersinia enterocolitica* [homepage on the Internet]. [updated 2004 Feb 17; cited 2005 May 10]. [about 4 screens]. Available from:
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/yersinia_g.htm

Diseases Spread by Close Personal Contact

34. Squires S, Pelletier L, Mungai M, Tsand R, Collins F, Stoltz J. *Invasive Meningococcal Disease in Canada, 1 January 1997 to 31 December 1998*. Canada Communicable Disease Report 2000 Nov 1;26 (21):177-82.
35. Ontario Ministry of Health and Long-Term Care. *Immunization: Three new vaccines added to routine childhood schedule* [homepage on the Internet]. 2004 Dec [cited 2005 May 10]. [about 2 screens]. Available from:
http://www.health.gov.on.ca/english/public/pub/immun/new_vaccinations.html

36. Region of Peel Health Department. *Child Health Report 2004* [monograph on the Internet]. 2004 [cited 2005 May 10]. Available from: <http://www.peelregion.ca/health/health-status-report/childhealth2004/pdf/childhealth2004.pdf>
37. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics—Disease Information: Group A Streptococcal (GAS) Disease (strep throat, necrotizing fasciitis, impetigo)* [homepage on the Internet]. [updated 2003 Dec 5; cited 2005 May 10]. [about 4 screens]. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm
38. Baker C, Edwards M. *Group B streptococcal infections*. In: Remington H, Klein J, eds. *Infectious diseases of the fetus and newborn infants*. 4th ed. Philadelphia, Pennsylvania: WB Saunders, 1995:980 to 1054.
39. United States Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Bacterial and Mycotic Diseases. *Health Topics: Group B Streptococcal (GBS) Disease* [homepage on the Internet]. [updated 2004 Sep 23; cited 2005 May 10]. [about 2 screens]. Available from: <http://www.cdc.gov/groupbstrep/>
40. Public Health Agency of Canada. *Tuberculosis Information Sheet* [homepage on the Internet]. 1998 Oct [updated 1999 Jan 4; cited 2005 May 10]. [about 4 screens]. Available from: http://www.phac-aspc.gc.ca/publicat/info/inftb_e.html
41. Region of Peel Health Department. *Communicable Disease Report 2002—Focus on Tuberculosis* [monograph on the Internet]. 2002 [cited 2005 May 10]. Available from: <http://www.peelregion.ca/health/health-status-report/commun-diseases/pdfs/cd-report-2002-full.pdf>

Diseases Spread by Insects

42. MacLean J, Demers A-M, Ndao M, Kokoskin E, Ward B, Gyorkos T. *Malaria epidemics and surveillance systems in Canada*. *Emerg Infect Dis* [serial on the Internet]. 2004 Jul [cited 2005 May 10]: [about 12 p.]. Available from: <http://www.cdc.gov/ncidod/EID/vol10no7/03 to 0826.htm>

43. Public Health Agency of Canada. *Malaria—Notifiable Diseases On-Line* [homepage on the Internet]. [updated 2003 Dec 11; cited 2005 May 10]. [about 2 screens]. Available from: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/malr_e.html
44. World Health Organization. *What is Malaria* [homepage on the Internet]? [cited 2003 Nov 27]. [about 2 screens]. Available from: http://www.rbm.who.int/cmc_upload/0/000/015/372/RBMInfosheet_1.htm
45. Public Health Agency of Canada, Travel Medicine Program. *Disease Information— Malaria* [homepage on the Internet]. 2001 Feb [updated 2005 Jan 28; cited 2005 May 10]. [about 5 screens]. Available from: http://www.phac-aspc.gc.ca/tmp-pmv/info/pal_mal_e.html
46. Region of Peel Public Health Department. *2004 West Nile Virus in the Region of Peel*. 2004

ACKNOWLEDGEMENTS

This report was authored by: Min Su, Epidemiologist; Dr. Eileen de Villa, Associate Medical Officer of Health; and Kit Ping Wong, Health Analyst.

Dr. Howard Shapiro, Acting Medical Officer of Health, provided comments on the framework of this report.

Additional input was provided by staff from Epidemiology, Business and Information Services. Peel-specific data were provided by Peel Public Health staff from the Communicable Disease and Environmental Health Divisions.

Special thanks to Angie Fazzone from the Public Health Branch, Ontario Ministry of Health and Long-Term Care, who provided Ontario level Reportable Disease Information System (RDIS) data for this report.

Administrative support was provided by Cathy Fisher, Administrative Assistant, Epidemiology. Cover design and report template were provided by Region of Peel Communication Services.

Please use the following citation when referencing this document: Peel Public Health. *Communicable Disease 1995-2004*; 2005.