

Communicable Disease



INTRODUCTION

This section of the report describes selected communicable diseases common among children aged 0–19 years. Information about childhood immunization coverage is also presented. Sexually transmitted diseases are dealt with in the chapter titled *Sexual Health* (see page 71).

Under the *Health Protection and Promotion Act*, all health professionals, hospitals, laboratories and schools in Ontario are required to report specified communicable diseases to the local Medical Officer of Health. These reports form the basis of communicable disease surveillance and are recorded in the provincial Reportable Diseases Information System (RDIS). The data are used to monitor trends, identify outbreaks, assess the need for public health actions or programs, and evaluate the effectiveness of communicable disease control efforts. Most of the data in this section of the report are drawn from RDIS.

CHILDHOOD IMMUNIZATION

Many important childhood diseases can be prevented by immunization. The level of immunization of the child population is an important determinant of the incidence of disease. Immunization against diphtheria, tetanus, polio, measles, mumps, rubella, pertussis, Haemophilus influenza type b, hepatitis B and influenza is provided to Ontario children free of charge.

The *Immunization of School Pupils Act* requires that all school-aged children be vaccinated against measles, mumps, rubella, diphtheria, tetanus and polio, or have a record of medical exemption or statement of conscience or religious belief on file with the local Medical Officer of Health.²⁹ Immunization records for school children are maintained by Peel Health on the provincial Immunization Records Information System (IRIS). Recently, all Peel children aged two to four years attending licensed day care centres were added to this system,^{30,31} and their immunization status is now being monitored.

“Immunization coverage” is determined by comparing the number of children whose immunization status is known to be up-to-date for their age with the number of children enrolled in schools or day cares. The immunization schedule for Ontario specifies the number of required doses of each vaccine by the age of the child.^{29,31}

While immunization programs have been extremely successful in reducing the incidence of vaccine preventable diseases and their effects, cases of these diseases are still reported in Ontario and Peel each year. Some of these cases occur because the population is not fully immunized, while others occur because vaccines are not 100% effective.

Immunization Coverage—Measles, Mumps, Rubella, Diphtheria, Pertussis, Tetanus and Polio

Table 5.1 presents data from IRIS for two combined vaccines: DPT-Polio (diphtheria, pertussis, tetanus and polio) and MMR (measles, mumps and rubella). For Peel, the proportion of the school-aged population known to be fully immunized ranged from 58–88%.

In the table, known coverage rates are lowest for children aged 15 years. Many of these children would have been due for a booster given at 14–16 years of age, and would not have been contacted by the health department until they had passed age 16.

Table 5.1—Proportion of Children Fully Immunized Against DPT-Polio and MMR by Birth Year and Child Age in 2000, Region of Peel

Birth Year	Age in 2000	Per Cent Fully Immunized
1983	17	77
1984	16	69
1985	15	58
1986	14	70
1987	13	78
1988	12	82
1989	11	78
1990	10	83
1991	9	75
1992	8	78
1993	7	82
1994	6	88
1995	5	83
1996	4	73

Source: Immunization Records Information System (IRIS), Region of Peel Health Department, 11/20/2001.

Immunization Coverage—Haemophilus influenza type B

Haemophilus influenza type B vaccine is recommended for children under the age of five years, but is not required in the Region of Peel unless the child is registered in a licensed day care centre. Table 5.2 presents coverage rates among children attending licensed day care centres in Peel. These rates ranged from 70–94%. These proportions were comparable to the 93% coverage among six-year-olds (i.e. those children born in 1992) reported for the province of Ontario in 1998.³¹

Table 5.2—Proportion of Children in Licensed Day Care Centres Immunized Against Haemophilus Influenza Type B, by Birth Year and Child Age in 2000, Region of Peel

Birth Year	Age in 2000	Per Cent Immunized
1991	9	93
1992	8	94
1993	7	91
1994	6	90
1995	5	70
1996	4	85
1997	3	93
1998	2	87

Source: Immunization Records Information System, Region of Peel Health Department, 11/20/2001.

Immunization Coverage—Hepatitis B

Hepatitis B vaccine is not required for school attendance but is recommended and offered to students in Grade 7 (age 12) to protect them prior to engaging in high-risk behaviours for hepatitis B, such as unprotected sex. In Peel, coverage rates have averaged around 95% since immunization was first offered in 1994, as shown in Table 5.3. In 2000/2001, Peel Health began immunizing on a two dose schedule, achieving a 98% coverage rate for children in Grade 7. In order to maintain optimal coverage rates, Peel Health's clinics offer eligible students opportunities to complete the hepatitis B immunization series.

Table 5.3—Proportion of Children in Grade 7 Immunized Against Hepatitis B by School Year, Region of Peel

School Year	Per Cent Immunized
1994/1995	89
1995/1996	94
1996/1997	96
1997/1998	95
1998/1999	95
1999/2000	97
2000/2001	98

Source: Immunization Records Information System, Region of Peel Health Department, 11/20/2001.

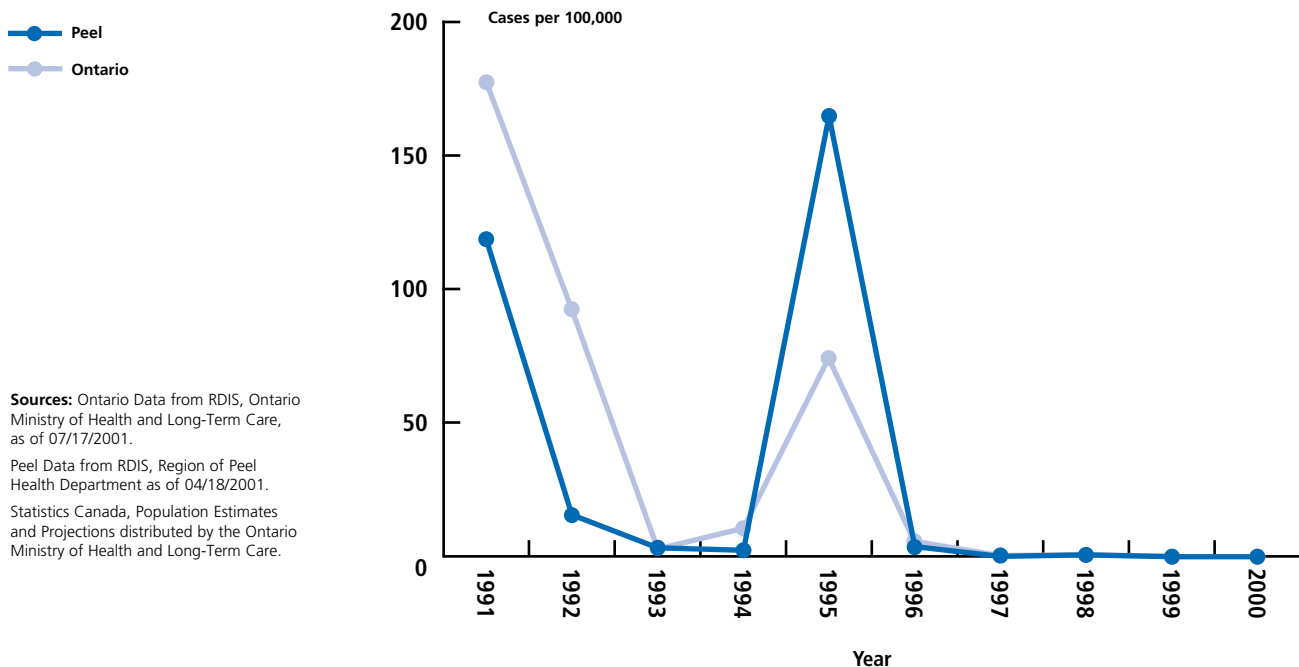
INCIDENCE OF COMMUNICABLE DISEASE IN CHILDREN

Measles

Measles is a highly infectious disease caused by a virus spread by cough and nasal droplets. Its symptoms include fever, sore throat, cough, runny nose, itchy eyes and a red rash that develops first on the face and then spreads to the rest of the body.³² On rare occasions, severe complications, including pneumonia, ear infections, encephalitis (swelling of the brain) and subacute sclerosing panencephalitis (SSPE), may occur. These complications can lead to death.³³

The incidence of measles has fallen dramatically in Peel and Ontario, as shown in Figure 5.1. Previously, a cyclical trend could be identified with outbreaks occurring every two or three years. The last such outbreak occurred in 1995, with an incidence rate of 74.2 cases per 100,000 population aged 0–19 years in Ontario and 164.8 cases per 100,000 in Peel.

Figure 5.1—Incidence of Measles, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.

Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.

Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

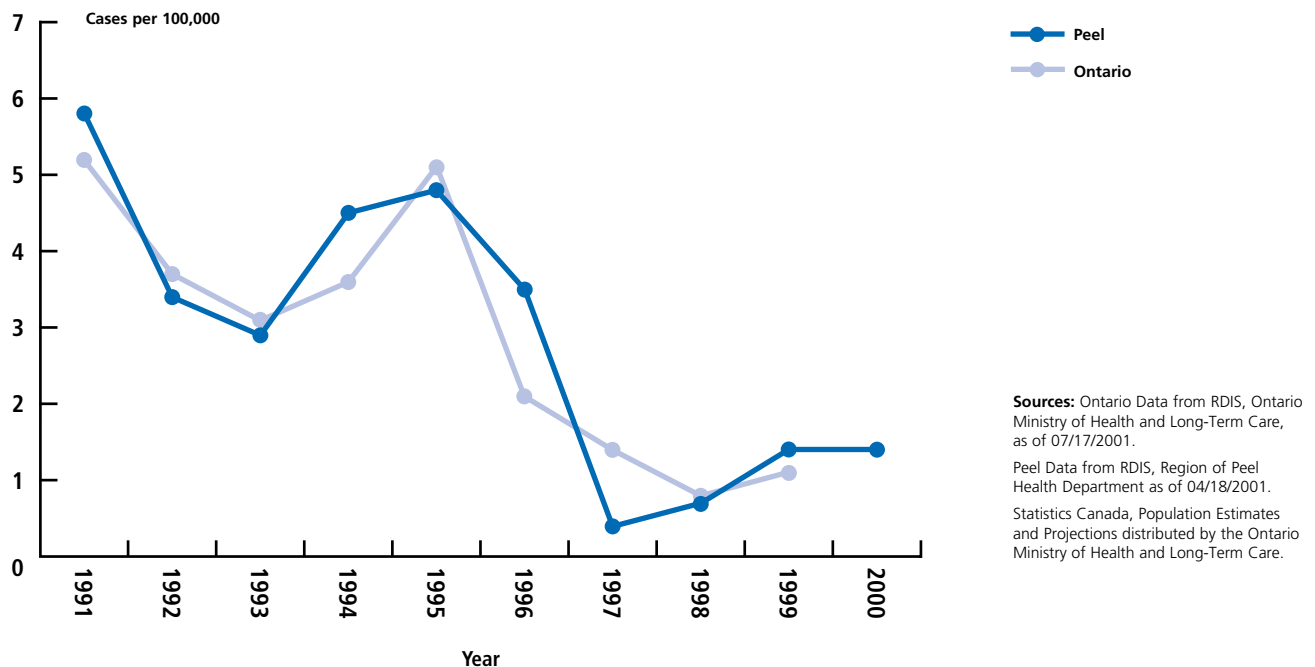
In 1995, the National Advisory Committee on Immunization (NACI) recommended a second dose of measles vaccine be given to all Canadian children.³⁴ In Ontario, a mass immunization campaign was conducted in schools in 1996. By 1997, there were only 22 cases of measles reported throughout the province (0.2 per 100,000) and since 1996, only two cases of measles have been reported in Peel, both in 1998.

Mumps

Mumps is a viral infection spread through saliva. It causes fever, parotitis (inflammation and enlargement of the salivary glands) and may cause encephalitis, orchitis (inflammation of the testicles) in post-pubertal males, oophoritis (inflammation of the ovaries) in females and occasionally causes infertility or deafness.³²

Figure 5.2 shows the incidence of mumps for 0–19 year olds decreased in Peel between 1995 and 1997. Since that time, the incidence of mumps has increased slightly to 1.4 per 100,000 population aged 0–19 years in 2000. A similar trend was seen in Ontario.

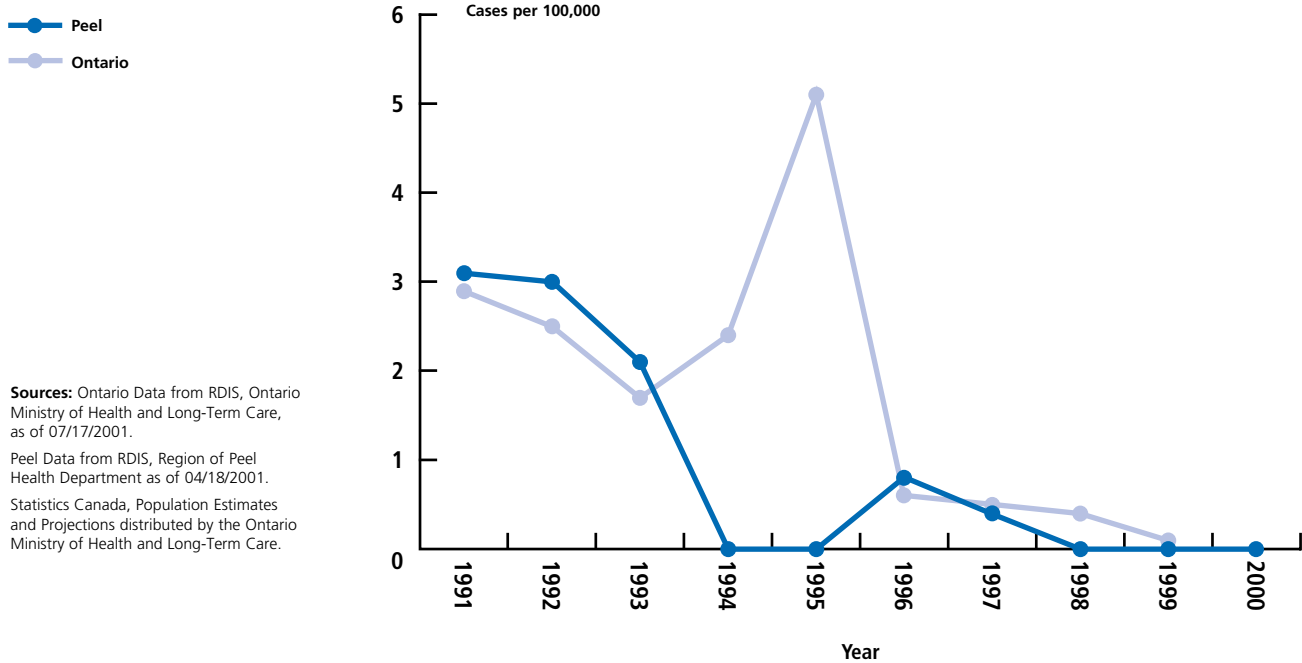
Figure 5.2—Incidence of Mumps, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Rubella

Rubella, which is also known as “German Measles”, is caused by a virus spread by nasal droplets.³² Its symptoms include fever, headache, itchy eyes, adenopathy (swelling of the lymph nodes) and rash. It can also cause joint and muscle pain or arthritis in adolescents and adults. On rare occasions, it can cause encephalopathy.³² If a woman should contract a rubella infection during the first three months of pregnancy, the risk of death or severe malformation of the baby, called congenital rubella syndrome (CRS), is as high as 85%.^{33,35}

Figure 5.3—Incidence of Rubella, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.

Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.

Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

The highest incidence of rubella in Peel children over the past ten years occurred in 1991, when there were seven cases (rate of 3.1 per 100,000 population) (*see Figure 5.3*). Since that time, the incidence rate has decreased, with no cases reported since 1997. In Ontario, the rate was highest in 1995 at 5.1 per 100,000 population (151 cases) but dropped to 0.1 cases per 100,000 (three cases) in 1999.

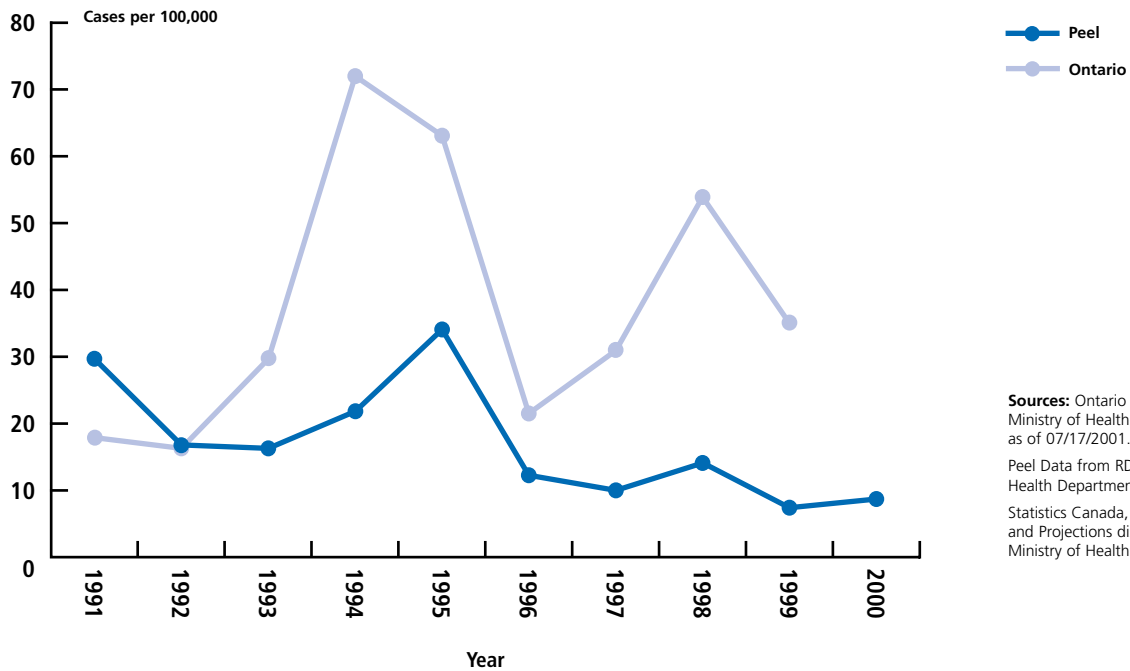
Congenital rubella syndrome (CRS) and congenital rubella infections are rare. In Ontario between 1991 and 1998, eight new cases of CRS were reported, one of which was in Peel in 1997.

Pertussis (Whooping Cough)

Pertussis is a bacterial infection spread by cough and nasal droplets.³² It is highly communicable and potentially fatal, primarily affecting the upper respiratory tract by obstructing it with thick mucous secretions.^{31,34} Symptoms include a runny nose and cough which can develop into the characteristic “whooping” cough.³² Each year in Canada, between one and three infants die from pertussis and an equal number suffer severe brain damage.^{32,33}

The incidence of pertussis in Peel children aged 0–19 years reached peak levels in 1991 (29.7 cases per 100,000) and in 1995 (34.1 cases per 100,000). Since that time, case rates have tapered off to 8.7 per 100,000 in 2000 (*see Figure 5.4 on following page*). In Ontario, higher peaks occurred in 1994, 1995 and 1998.

Figure 5.4—Incidence of Pertussis, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.
 Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.
 Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

Haemophilus Influenza Type B (Hib)

Haemophilus influenzae type b (Hib) is a bacterial infection spread by nasal droplets.^{31,32} It can cause meningitis, epiglottitis (swelling of the epiglottis that can cause obstruction of the airway) and pneumonia, and it can be fatal.³² A vaccine for infants, which became available in 1992, has led to a steady decrease in illness and death from Hib.³²

The incidence of Hib infections in Peel children dropped from eight cases (3.5 per 100,000 aged 0–19 years) in 1991 to two cases in 1995. Only one case was reported in Peel in 2000. In Ontario, the rates decreased from 2.4 per 100,000 aged 0–19 years in 1991 (66 cases) to 0.1 per 100,000 in 1999 (four cases).

Meningococcal Meningitis

Meningococcal meningitis is an infection caused by the bacteria *Neisseria meningitidis* and is spread by direct contact with an infected person. Symptoms include fever, headache, nausea, vomiting, stiff neck and occasionally, a rash. This infection can be fatal if not treated immediately.³⁵

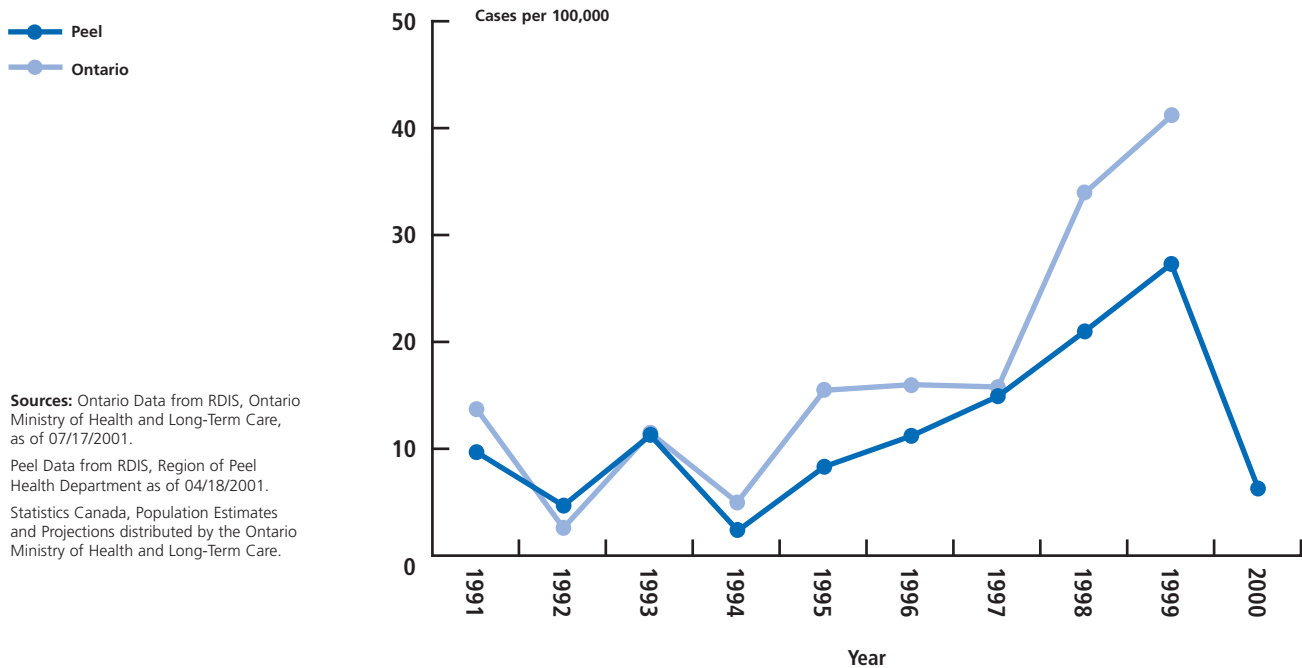
Between 1991 and 2000, there were between one and four cases of meningitis among children 0–19 years in Peel annually, with the exception of 1993 when there were nine cases. The disease was most prevalent in children aged 0–4 years (rate of 1.8 per 100,000 population) and in teens aged 15–19 years (rate of 1.6 per 100,000 population).

Influenza

Influenza is a viral infection of the respiratory tract transmitted in respiratory droplets caused by coughing or sneezing. Symptoms include fever, headache, sore muscles, sore throat and cough.³⁵ Influenza is a self-limited illness in healthy children, but can result in serious complications and death in those with chronic illnesses or weakened immune systems.

Figure 5.5 shows that between 1994 and 1999, the incidence of influenza per 100,000 children aged 0–19 years in Peel increased from 2.4 to 27.3, and then declined to 6.3 per 100,000 in 2000. In Ontario, the incidence rate of influenza in children also increased between 1991 and 1999.

Figure 5.5—Incidence of Influenza, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



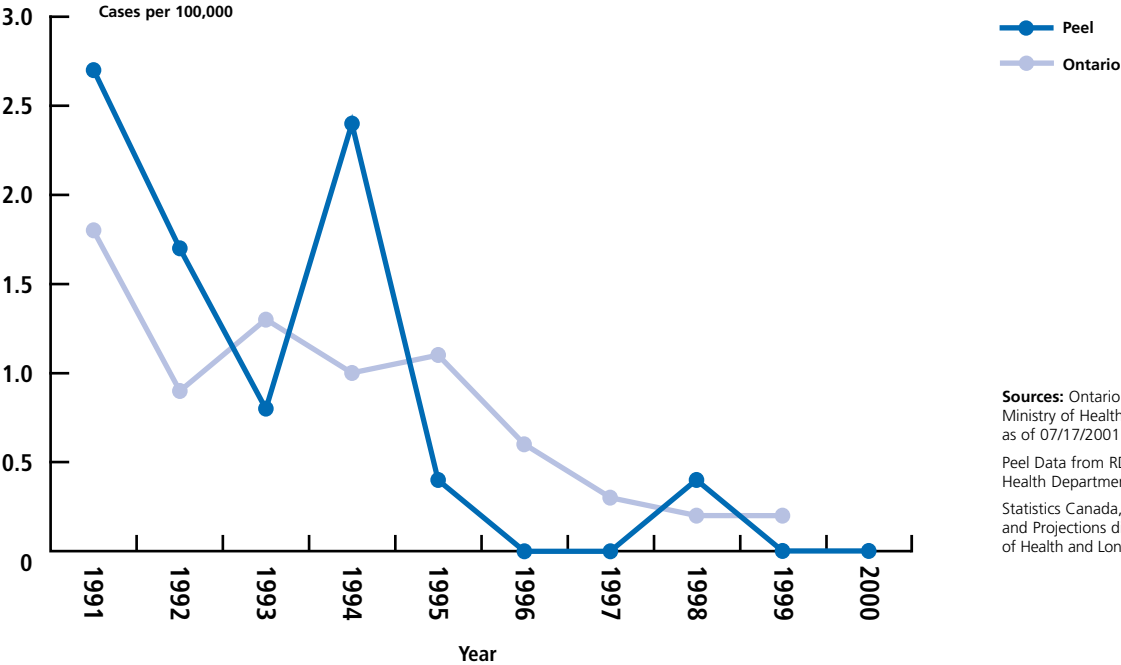
The 2000–2001 influenza season was a comparatively mild one in Canada, but it also was the first year of a universal influenza immunization program in Ontario. Peel Health held immunization clinics in secondary schools that year in order to increase vaccine coverage, which may have contributed to the decrease in influenza incidence.

Hepatitis B

Hepatitis B infections are caused by a virus that can be transmitted through sexual contact with an infected person or by sharing personal items, including toothbrushes and razors, as well as needles used for injecting drugs, with an infected person.^{31,36} The infection causes inflammation of the liver, with symptoms of tiredness, loss of appetite and jaundice. Hepatitis B can lead to chronic liver disease, cirrhosis and cancer of the liver.³⁶

In Peel, the incidence of hepatitis B in children aged 0–19 years has fallen since the introduction of the Grade 7 school immunization program in 1994. Since 1995, only two cases of hepatitis B in children aged 0–19 years have been reported. In Ontario, rates of hepatitis B have shown a steady decline, from 1.8 per 100,000 in 1991 to 0.2 per 100,000 in 1999, as shown in Figure 5.6.

Figure 5.6—Incidence of Hepatitis B, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.
 Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.
 Statistics Canada, Population Estimates and Projections distributed by the Ministry of Health and Long-Term Care.

Enteric Illnesses

Enteric illnesses are infections of the gastrointestinal tract and are common in children. They cause symptoms ranging from mild diarrhea, vomiting and stomach cramps to severe, life-threatening illnesses.

Enteric infections occur when the microorganism or its toxins enter the body via contaminated food or water.

Enteric illnesses represent the second most common group of reportable diseases after sexually transmitted diseases. Most reported cases are based on laboratory diagnosis; however, many milder cases are not diagnosed or reported. The true number of infections in the community is likely much greater than the number reported.

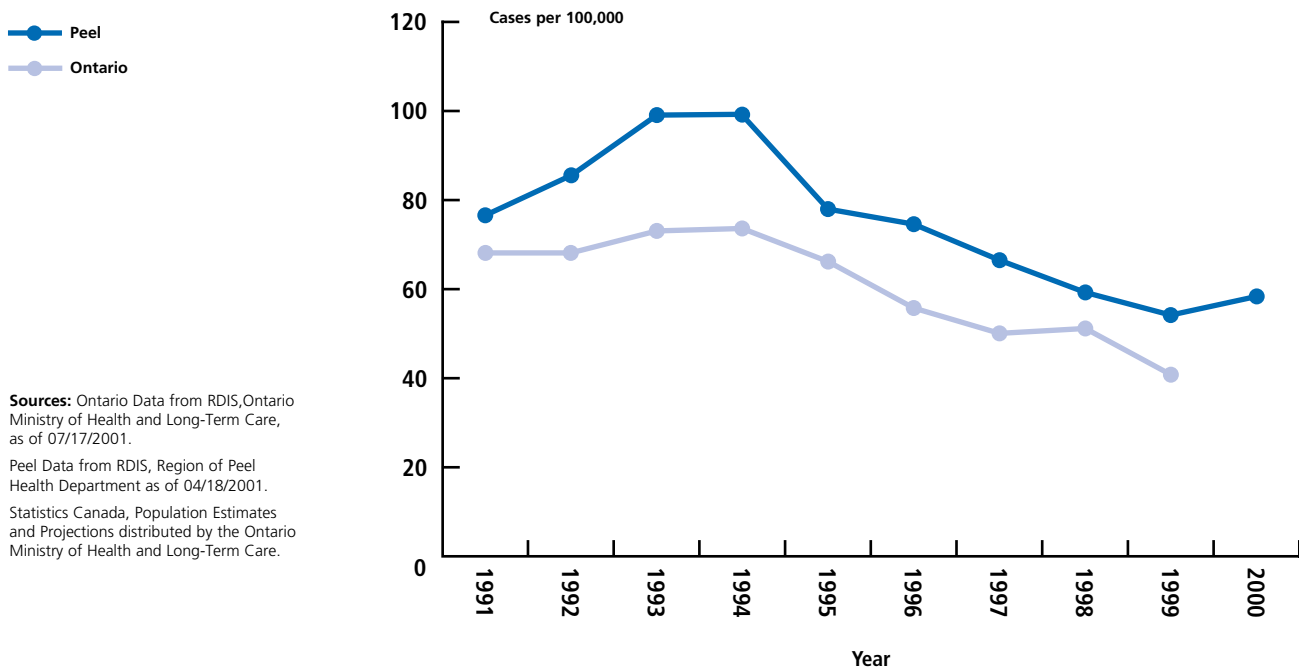
This report presents data on three of the most common enteric infections in childhood: *campylobacteriosis*, *salmonellosis* and *giardiasis*.

Campylobacteriosis

Campylobacter is the most common bacterial cause of enteric illness.^{35,37} Infection may result from the ingestion of raw milk, undercooked chicken or pork, or contaminated water. Infection may also be contracted from close contact with infected pets, farm animals or other infected persons.

Campylobacter infection was the most commonly reported enteric illness in Peel and Ontario. In Peel, the incidence of Campylobacter infection increased between 1991 and 1994, but has declined since. In 2000 in Peel, there were 168 cases reported in children aged 0–19 years for an incidence rate of 58.4 per 100,000. A similar trend was also seen in Ontario, but the incidence of reported Campylobacter in Peel was generally higher than that for Ontario (see Figure 5.7).

Figure 5.7—Incidence of Campylobacteriosis, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



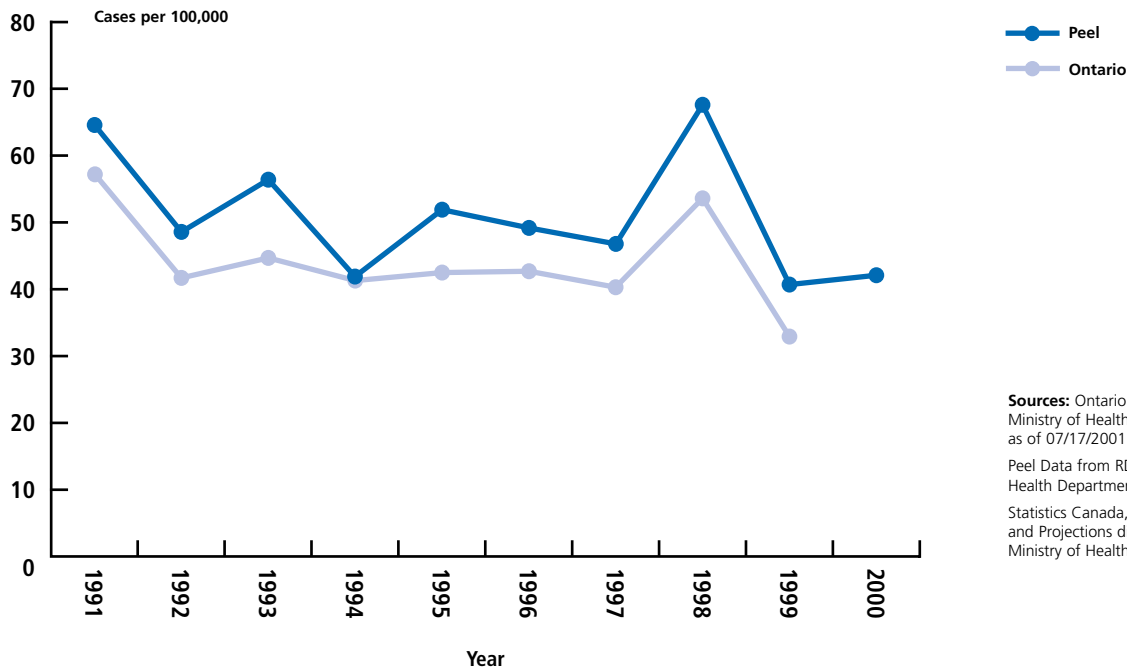
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 Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

Salmonellosis

Salmonellosis is a bacterial enteric infection caused by a group of bacteria called Salmonella. Salmonella is typically transmitted to people through contaminated food, such as raw or undercooked eggs, poultry or meat, or through the faeces of an infected person or animal. The illness is usually short-lived, lasting from a few days to a week, and most persons recover without treatment.^{38,39}

Salmonellosis is the second most commonly reported enteric infection after campylobacteriosis. In 2000, 121 cases of salmonellosis were reported in Peel children aged 0–19 years for an incidence rate of 42.1 per 100,000 (see Figure 5.8). In Peel and Ontario, incidence rates have fluctuated between 1991 and 2000, but were slightly higher in Peel across all years. A province-wide outbreak of Salmonella enteritidis, attributed to a commercially manufactured food product, may have contributed to the large increase in both cases and rates of salmonellosis in Peel and Ontario in 1998.⁴⁰

Figure 5.8—Incidence of Salmonellosis, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.

Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.

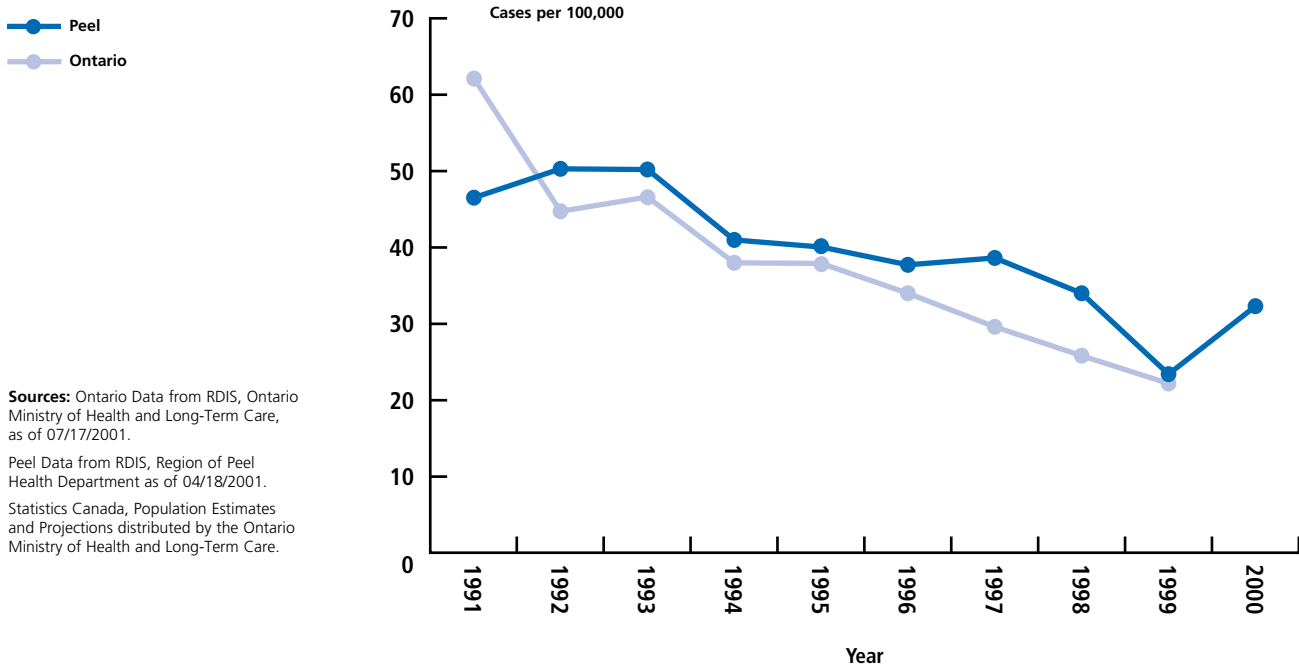
Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

Giardiasis

Giardiasis is an illness caused by a microscopic parasite called Giardia lamblia. It is usually spread from person-to-person by hand-to-mouth transfer of the organism's cysts from the faeces of an infected individual.^{35,41} Giardiasis is the third most commonly reported enteric infection and is common in day nurseries.

In 2000, 93 cases of giardiasis were reported in Peel children aged 0–19 years (see Figure 5.9). The incidence of giardiasis declined slightly between 1991 and 1999 in Peel and in Ontario.

Figure 5.9—Incidence of Giardiasis, Children Aged 0–19 Years, Region of Peel and Ontario, 1991–2000



Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care, as of 07/17/2001.
 Peel Data from RDIS, Region of Peel Health Department as of 04/18/2001.
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SUMMARY

Immunization coverage rates among Peel children were fairly high. On average, 72% of children aged four to 17 were immunized for DPT-Polio and MMR, 87% of children aged two to nine for Haemophilus influenza type B, and 95% of Grade 7 students (since 1994) for hepatitis B.

The incidence of vaccine-preventable diseases, such as measles, mumps, rubella, pertussis and Haemophilus influenza type B, have declined substantially between 1991 and 2000 in Peel. Higher immunization coverage will be needed to ensure continued prevention of these diseases in the future.

While their incidence declined between 1991 and 2000, enteric infections, such as campylobacteriosis, salmonellosis and giardiasis, continue to be very common childhood diseases.