

Foodborne Disease in the Region of Peel



HIGHLIGHTS

- The incidence of selected foodborne diseases was generally higher in Peel than in Ontario between 1993 and 2002. A higher incidence was observed in Peel for campylobacteriosis, salmonellosis, yersiniosis and amebiasis.
- In Peel, the highest incidence of the diseases presented in this report was observed among younger residents.
- In Peel between 1993 and 2002, an overall general decline was observed in the incidence of these enteric/foodborne diseases, with the exception of shigellosis.

BACTERIAL FOODBORNE DISEASE

Campylobacteriosis

Campylobacter (*Campylobacter jejuni*) is the most common bacterial cause of diarrheal illness.^{5,6} Ingestion of undercooked chicken or pork, or drinking contaminated water or raw milk may result in infection. 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

Campylobacteriosis is the most commonly reported enteric illness in Peel and Ontario. In Peel in 2002, 424 cases of campylobacteriosis were reported (see Table 1). The incidence of campylobacteriosis increased from 1993 to

**Table 1—Incidence of Selected Foodborne Diseases,
Region of Peel, 2002**

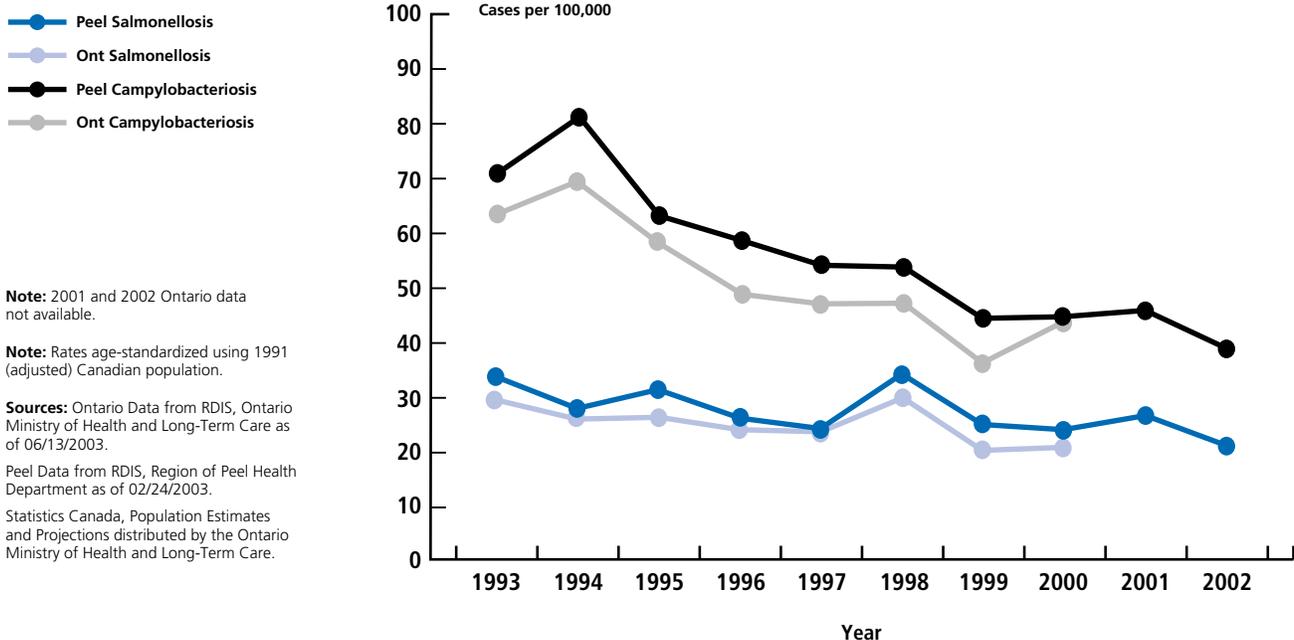
| Selected Pathogen | Number of Cases | Rate (per 100,000) |
|------------------------------|-----------------|--------------------|
| Bacterial | | |
| <i>Campylobacter</i> | 424 | 39.2 |
| <i>Salmonella</i> | 228 | 21.5 |
| VTEC | 25 | 2.2 |
| <i>Yersinia</i> | 35 | 3.4 |
| <i>Shigella</i> | 66 | 6.2 |
| Parasitic | | |
| <i>Giardia</i> | 170 | 15.8 |
| <i>Entamoeba histolytica</i> | 122 | 11.2 |
| Viral | | |
| Hepatitis A | 21 | 1.8 |

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

Source: RDIS, Region of Peel Health Department as of 02/24/2003. Statistics Canada. Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

1994, and then generally declined through time to 2002. A similar trend was also seen in Ontario; however, the incidence of reported *campylobacter* cases in Peel was generally higher than the incidence for Ontario (see Figure 1).

Figure 1: Incidence of Campylobacteriosis and Salmonellosis, Region of Peel and Ontario, 1993–2002

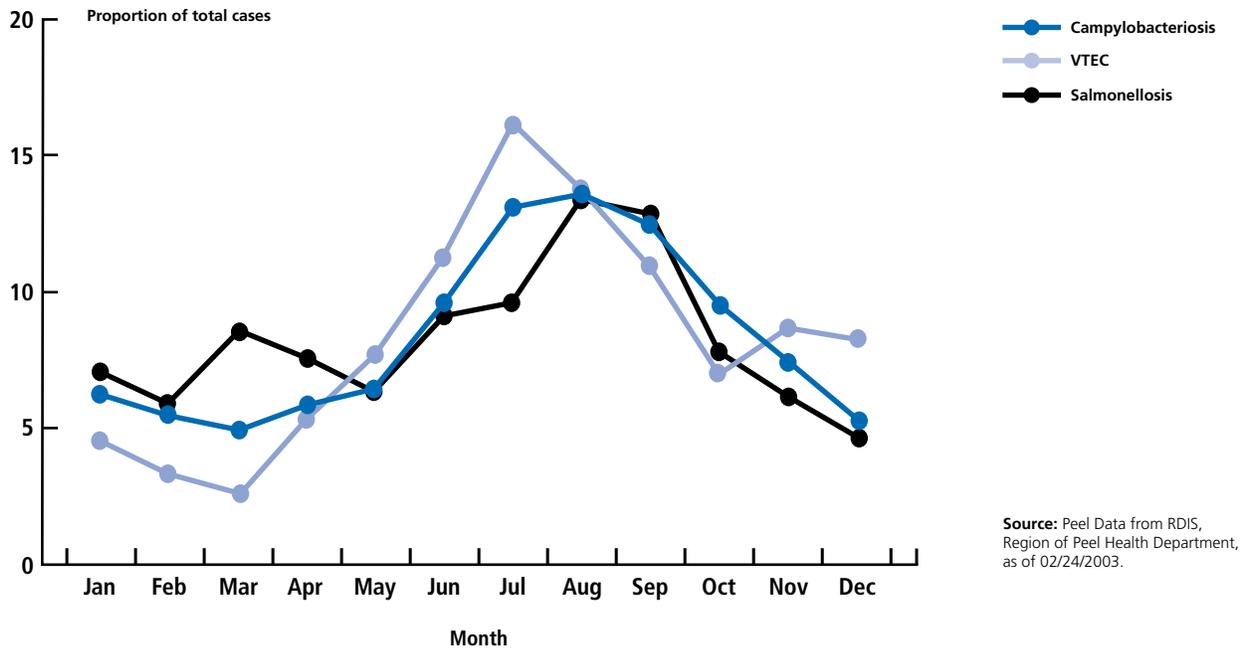


In Peel, a seasonal trend was observed in the distribution of reported campylobacteriosis. Cases occurred much more frequently in the summer months (late summer and early fall) than in winter (see Figure 2 on the following page) during the ten-year period being examined.

Salmonellosis

Salmonellosis is another bacterial infection caused by a group of bacteria called *Salmonella*, with *Salmonella typhimurium* and *Salmonella enteritidis* being the most commonly reported.^{5,7,8} Ingestion of contaminated foods such as raw or undercooked eggs, poultry or meat may transmit infection. Raw eggs may be unrecognized in some foods such as homemade salad dressings, ice cream, mayonnaise and frostings. Most persons who become infected develop diarrhea, fever and abdominal cramps. The illness is usually short-lived, lasting from a few days to a week, and most persons recover without treatment.^{7,8}

Figure 2: Distribution of Reported Cases of Campylobacteriosis, Salmonellosis and Verotoxin-Producing Escherichia coli (VTEC), by Month of Year Region of Peel, 1993–2002



Salmonellosis is the second most commonly reported enteric infection following campylobacteriosis. In Peel in 2002, 228 cases of salmonellosis were reported (see Table 1 on page 7). The actual number of infections may be greater because many milder cases are not diagnosed or reported. Overall, the incidence in Peel declined from 1993 to 2002. A similar trend was also seen in Ontario, although the incidence of reported salmonellosis cases in Peel was slightly higher than the incidence for Ontario (see Figure 1 on the previous page). The large increase in the number of cases and incidence from 1997 to 1998 in both Peel and Ontario may have been associated with a province-wide outbreak of *Salmonella enteritidis* caused by contaminated, commercially-manufactured luncheon products.⁹

As with campylobacteriosis, a seasonal trend was seen in the distribution of reported salmonellosis. Cases occurred much more frequently during the summer months than in winter during the ten-year period (see Figure 2).

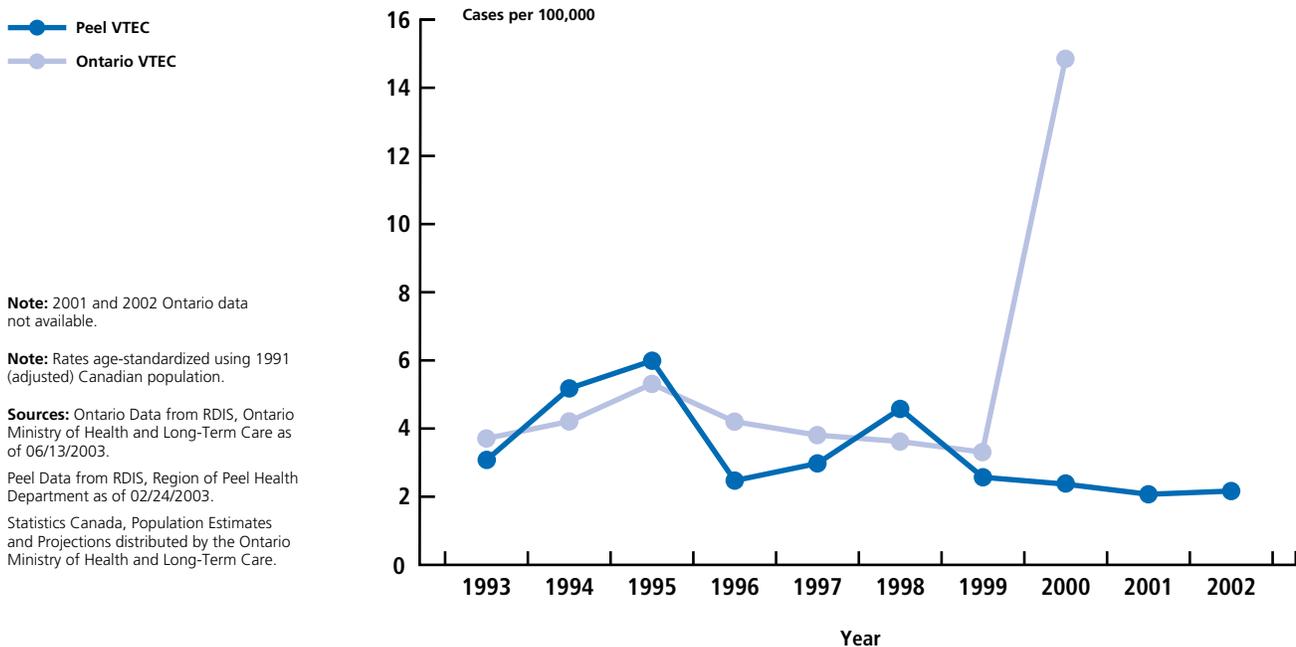
Verotoxin-Producing *Escherichia coli*

The most common verotoxin-producing *Escherichia coli* (VTEC) associated with infection is *E. coli* 0157:H7.^{5,10} Although most strains of *E. coli* are harmless and live in the intestines of healthy humans and animals, VTEC produces a powerful toxin and can cause severe illness or death. VTEC may be transmitted by other animal food products and infection can also occur after drinking unpasteurized milk or contaminated water. In May and June of 2000, the community of Walkerton, Ontario experienced a major outbreak of *E. coli* that was linked to the municipal water supply.¹¹ VTEC was implicated in the Walkerton incident with 198 confirmed cases, 7 deaths and 27 cases of Hemolytic Uremic Syndrome, a serious complication of this strain of *E. coli*. The spike shown in Figure 3 depicts the increase in the incidence of cases in Ontario due to this outbreak.

In Peel in 2002, 25 cases of VTEC were reported (see Table 1 on page 7). Overall, the incidence of VTEC decreased during the ten-year period although a slight increase was observed in 1995 (see Figure 3). The peak in 1995 could have been associated with an outbreak that occurred in a Brampton hospital.¹² With the exception of the year 2000, the incidence in Peel was generally comparable to the incidence in Ontario.

As with campylobacteriosis and salmonellosis, a summer seasonal trend was seen in the distribution of reported VTEC cases (see Figure 2 on the previous page).

Figure 3: Incidence of Verotoxin-Producing *Escherichia coli* (VTEC), Region of Peel and Ontario, 1993–2002



Note: 2001 and 2002 Ontario data not available.

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

Sources: Ontario Data from RDIS, Ontario Ministry of Health and Long-Term Care as of 06/13/2003.

Peel Data from RDIS, Region of Peel Health Department as of 02/24/2003.

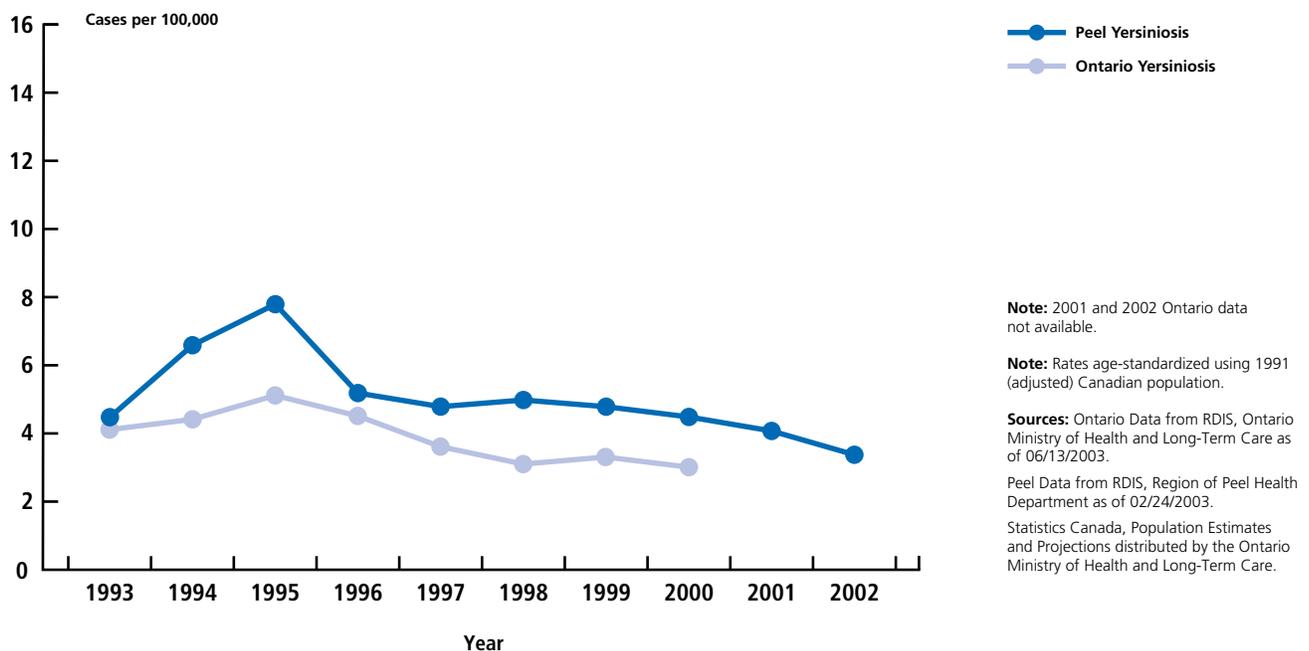
Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

Yersiniosis

Yersiniosis is a bacterial infection most often caused by *Yersinia enterocolitica*. It is a relatively less frequent cause of diarrhea and abdominal pain than other enteric infections, and occurs more frequently in children.^{5,13} Symptoms include fever, stomach pain and diarrhea which is often bloody; these develop four to seven days after exposure and may last three weeks or longer. The infection can sometimes be confused with appendicitis, as the abdominal pain often occurs on the right side. Other complications include skin rash, joint pain or spread of the bacteria to the blood stream.¹³

In Peel in 2002, 35 cases of yersiniosis were reported (see Table 1 on page 7). The incidence in Peel was consistently higher than in Ontario (see Figure 4). The highest age-specific incidence was observed among children four years of age or younger, followed by those aged five to nine. No seasonal trend was observed.

Figure 4: Incidence of Yersiniosis, Region of Peel and Ontario, 1993–2002



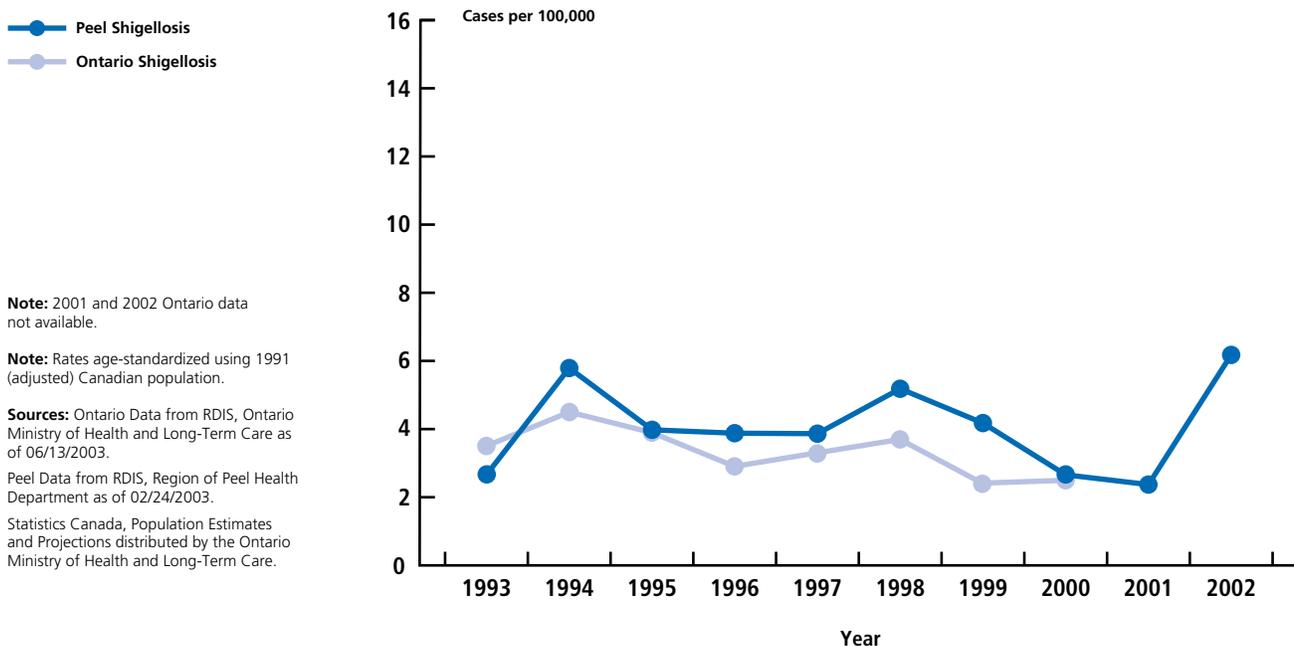
Shigellosis

Shigellosis is an infectious disease caused by a family of bacteria called *Shigella*.^{5,14} It is particularly common and causes recurrent illness in settings such as day care centres and homes with small children, where hygiene and hand-washing can be inadequate and toilet training incomplete.^{5,14} *Shigella* infections can also occur by eating contaminated food, or drinking or swimming in contaminated water.¹⁴

Some persons with the infection may have no symptoms but can still pass the bacteria to others. Symptoms include fever, stomach cramps and diarrhea which is often bloody.¹⁴ Sometimes the diarrhea is so severe that hospitalization is required. A high fever, which could lead to seizures in children less than two years of age, is another complication of shigellosis.

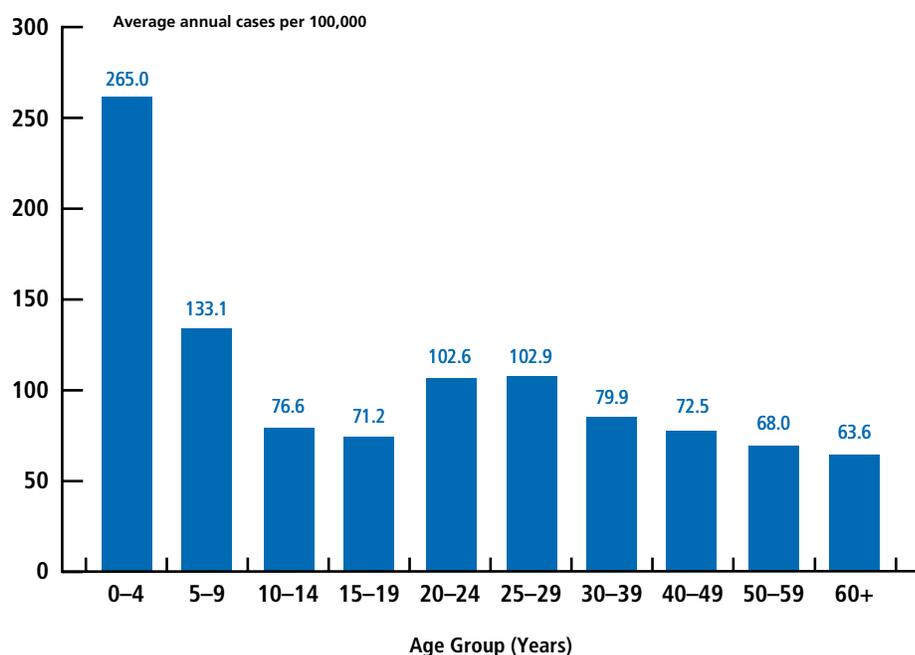
In Peel in 2002, 66 cases were reported (see Table 1 on page 7). The incidence fluctuated over the period 1993 to 2002 (see Figure 5). The highest age-specific incidence was seen among children zero to four, followed by those five to nine years of age.

Figure 5: Incidence of Shigellosis, Region of Peel and Ontario, 1993–2002



The highest age-specific incidence of campylobacteriosis, salmonellosis, verotoxin-producing *Escherichia coli* (VTEC), yersiniosis and shigellosis was seen among young children zero to four years of age. This was observed for each of these individual bacterial foodborne diseases as well as for all diseases combined (see Figure 6 on the following page).

Figure 6: Incidence of Selected Bacterial Foodborne Diseases (Campylobacteriosis, Salmonellosis, Verotoxin-Producing Escherichia coli (VTEC), Shigellosis and Yersiniosis) by Age Group, Region of Peel, 1993–2002 Combined



Sources: Peel Data from RDIS, Region of Peel Health Department, as of 02/24/2003.
 Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

PARASITIC FOODBORNE DISEASE

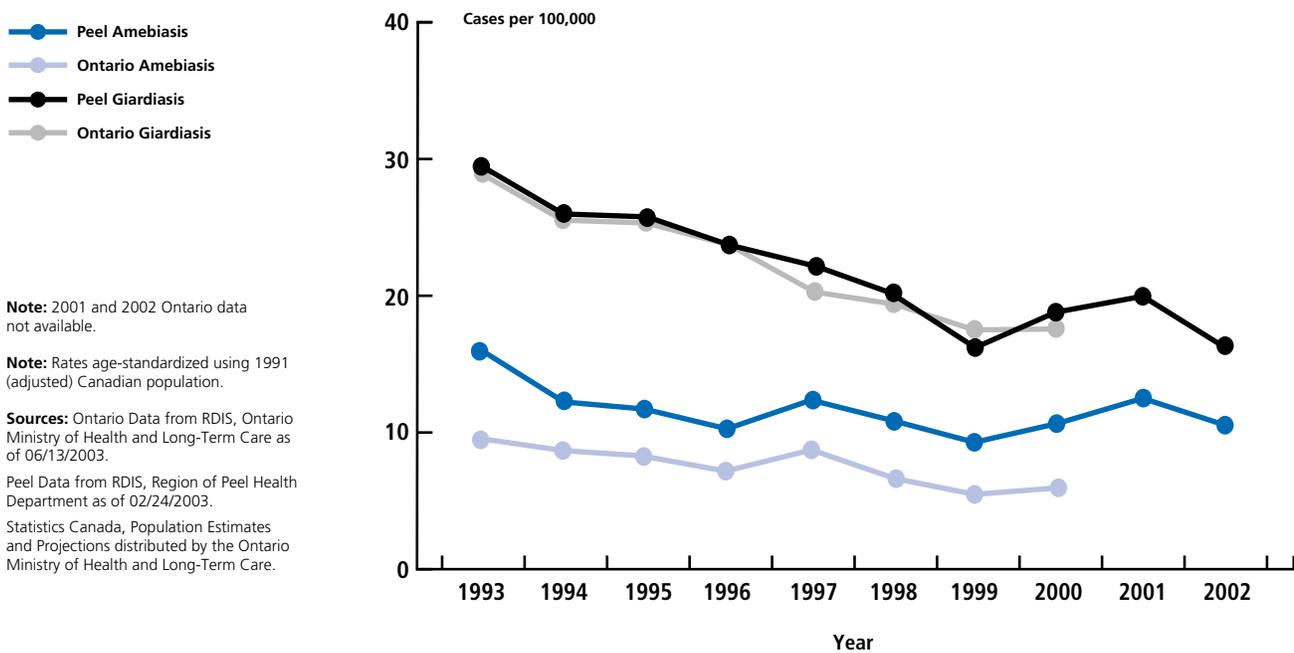
Giardiasis

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.^{5,15} It can also be acquired by drinking contaminated water or coming in contact with contaminated surfaces. Giardiasis is very common in institutions and in day care centres.¹⁵

Giardiasis is the third most commonly reported enteric infection following campylobacteriosis and salmonellosis. In Peel in 2002, 170 cases of giardiasis were reported (see Table 1 on page 7). Incidence in Ontario was similar to that in Peel (see Figure 7 on the following page).

In Peel in 2002, the highest age-specific incidence was observed among children zero to four and five to nine years of age (see Figure 8 on page 15). This pattern reflects the fact that giardiasis is a very common illness in day care settings. No seasonal trend was observed.

Figure 7: Incidence of Amebiasis and Giardiasis, Region of Peel and Ontario, 1993–2002

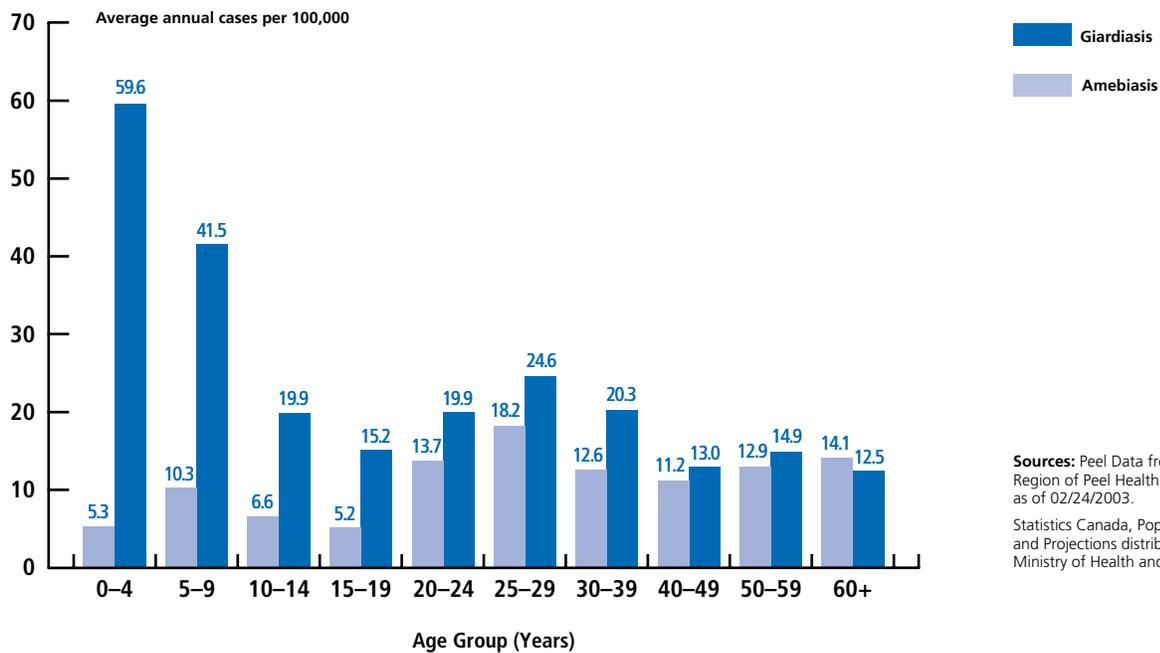


Amebiasis

Amebiasis is an infection caused by a parasite called *Entamoeba histolytica*. Transmission occurs by eating food that has become contaminated with feces from an infected person or drinking water contaminated with amebic cysts.^{5,16,17} Although anyone can become infected, amebiasis in Canada is most common in people who travel to developing countries or 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.^{16,17}

In Peel in 2002, 122 cases of amebiasis were reported (*see Table 1 on page 7*). Between 1993 and 2002, the incidence was relatively stable with an overall slight decline (*see Figure 7*). The incidence in Peel was generally higher than that for Ontario. Unlike other enteric diseases, the highest age-specific incidence of amebiasis was observed among young adults 25 to 29 years of age (*see Figure 8 on the following page*).

Figure 8: Incidence of Amebiasis and Giardiasis by Age Group, Region of Peel, 1993–2002 Combined



Sources: Peel Data from RDIS, Region of Peel Health Department, as of 02/24/2003.
 Statistics Canada, Population Estimates and Projections distributed by the Ontario Ministry of Health and Long-Term Care.

VIRAL FOODBORNE DISEASE

Hepatitis A

Hepatitis A is an infection of the liver caused by the hepatitis A virus (HAV) which 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.^{5,18,19} In Canada, infection may occur among household or sexual contacts, travellers returning from countries where the virus is common or in communities where sanitation is inadequate. Symptoms include jaundice (yellowing of the skin and eyes), fatigue, fever, loss of appetite, nausea, diarrhea, abdominal pain or dark urine.^{18,19}

In Peel in 2002, 21 cases of hepatitis A were reported (*see Table 1 on page 7*). Between 1993 and 1995, the incidence of hepatitis A in Peel increased slightly, after which an overall general decrease was observed; stable incidence was seen in 2001 and 2002 (*see Figure 9 on the following page*). There have been no major outbreaks of hepatitis A in Peel in recent years. Hepatitis A vaccine and immune globulin are both effective in the prevention of the disease.^{18,19}

Overall, the incidence of hepatitis A was higher among younger residents. The highest incidence was observed among children five to nine years of age (*see Figure 10 on the following page*). Between 1993 and 2002, most hepatitis A cases were observed during late summer and early fall.

Figure 9: Incidence of Hepatitis A, Region of Peel and Ontario, 1993–2002

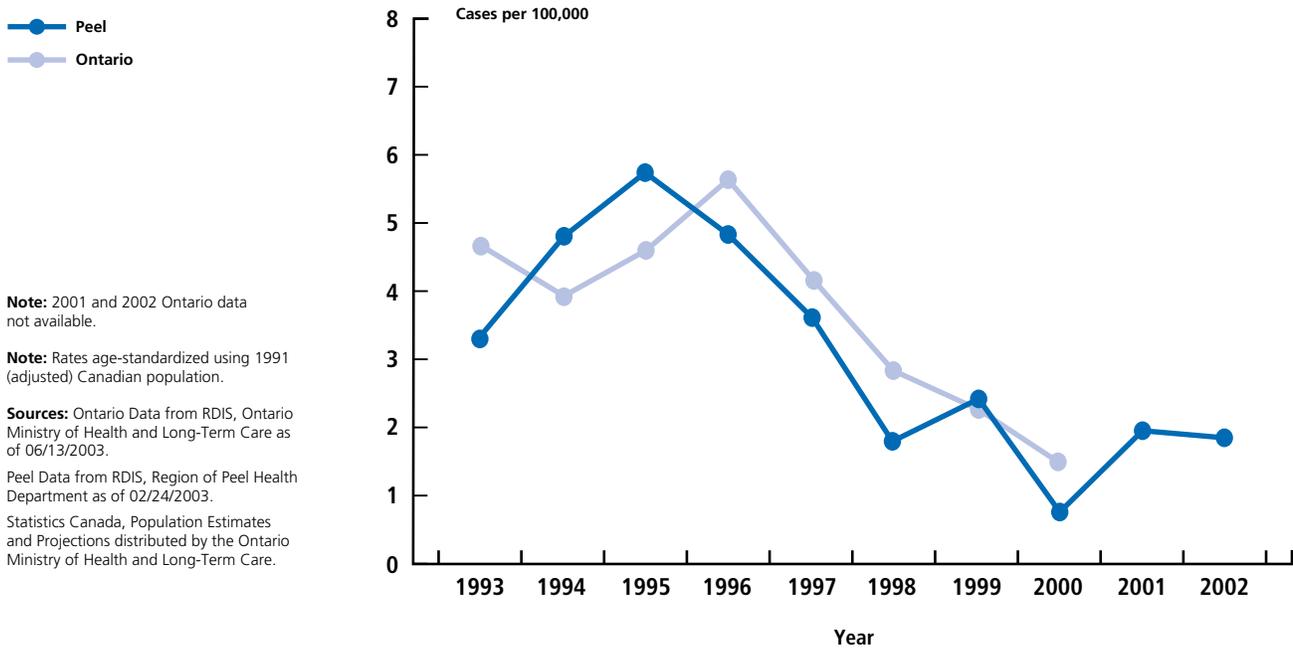
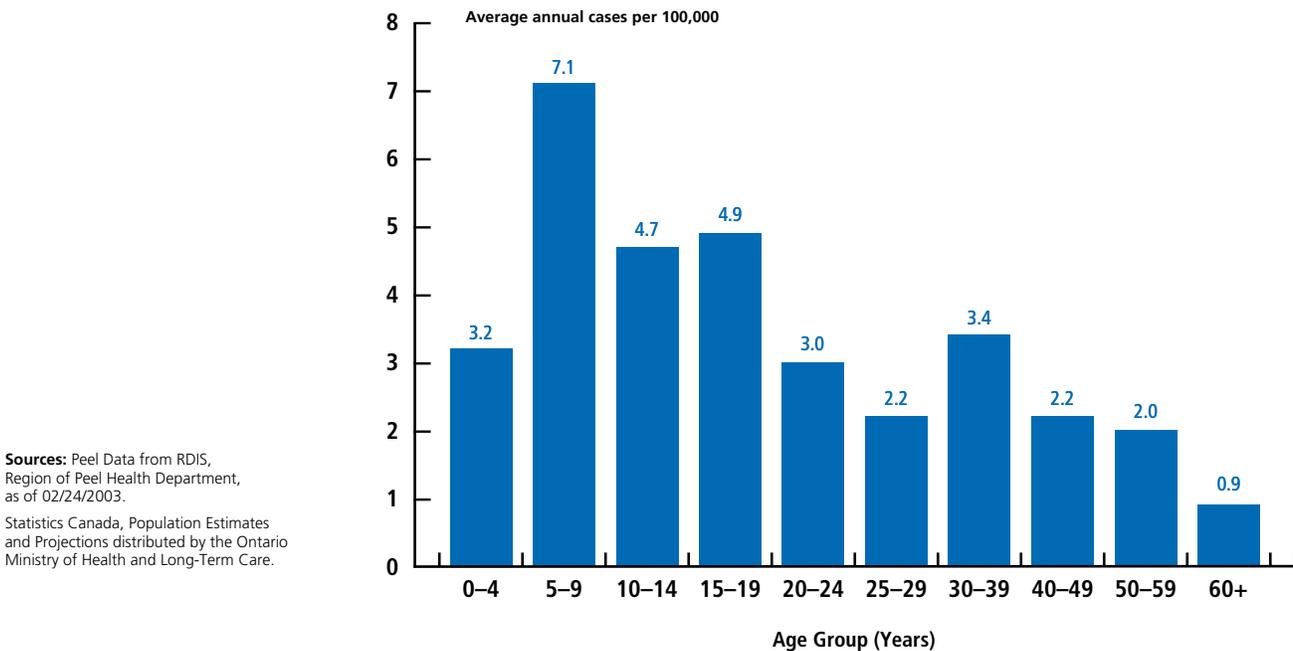


Figure 10: Incidence of Hepatitis A by Age Group, Region of Peel, 1993–2002 Combined



OTHER FOODBORNE DISEASES

There are a number of less common foodborne diseases that can be transmitted through microorganisms in food and water. These include, but are not limited to, botulism, listeriosis, cryptosporidiosis, cyclosporiasis and trichinosis. In Peel between 1993 and 2002, there were a total of 158 cases of listeriosis, cryptosporidiosis, trichinosis and cyclosporiasis combined, with no cases of botulism. While less common than the diseases discussed in this book, these other foodborne diseases can have serious symptoms and even result in death.