

## 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.<sup>6</sup> 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).<sup>22,23</sup> 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:

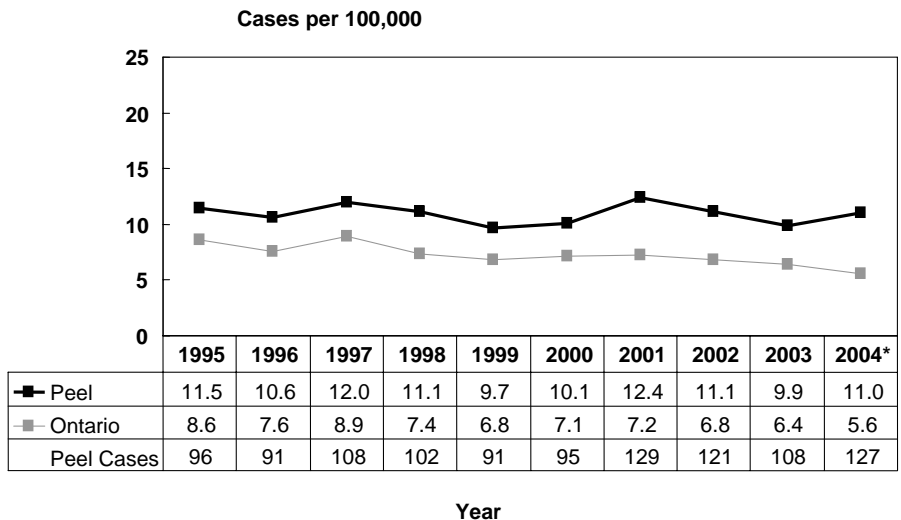
- poor personal hygiene,
- increased likelihood of severe illness due to susceptibility of dehydration in infants and young children,

- 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.<sup>6,22-25</sup>

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



\* 2004 Ontario data are preliminary.

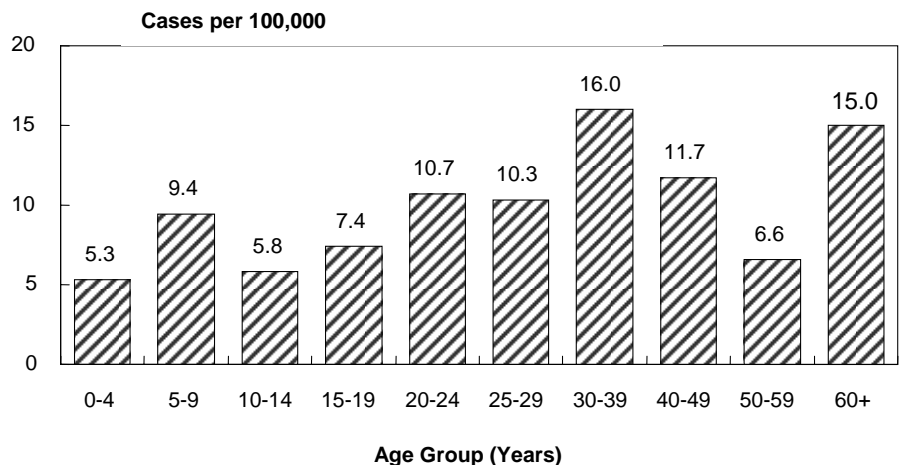
**Note:** Rates age-standardized using 1991 (adjusted) Canadian population.

**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**



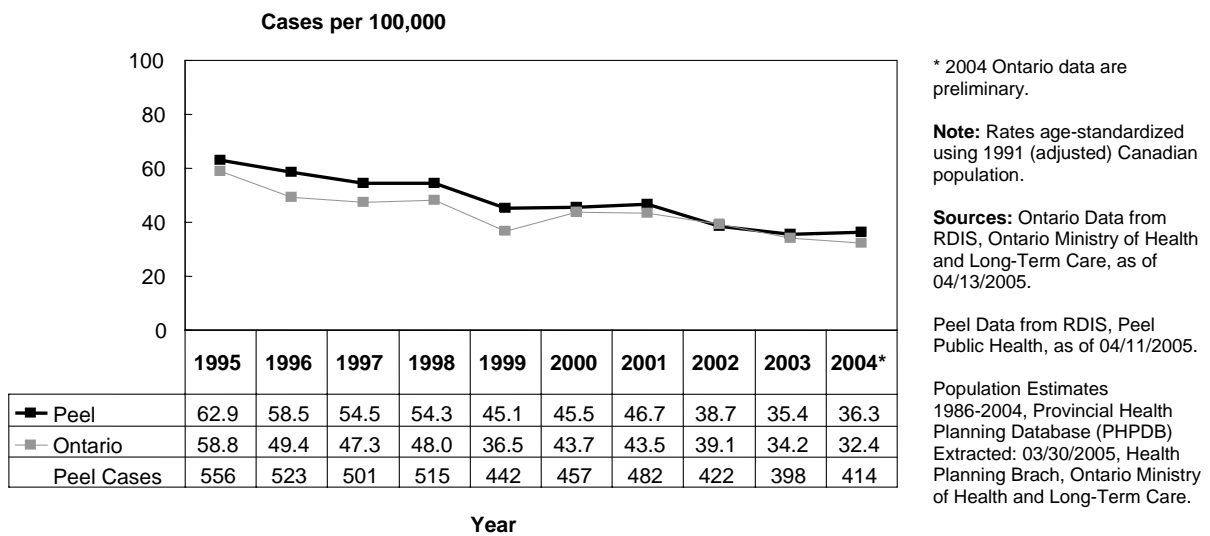
**Sources:** Peel Data from RDIS, Peel Public Health, as of 04/11/2005.

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

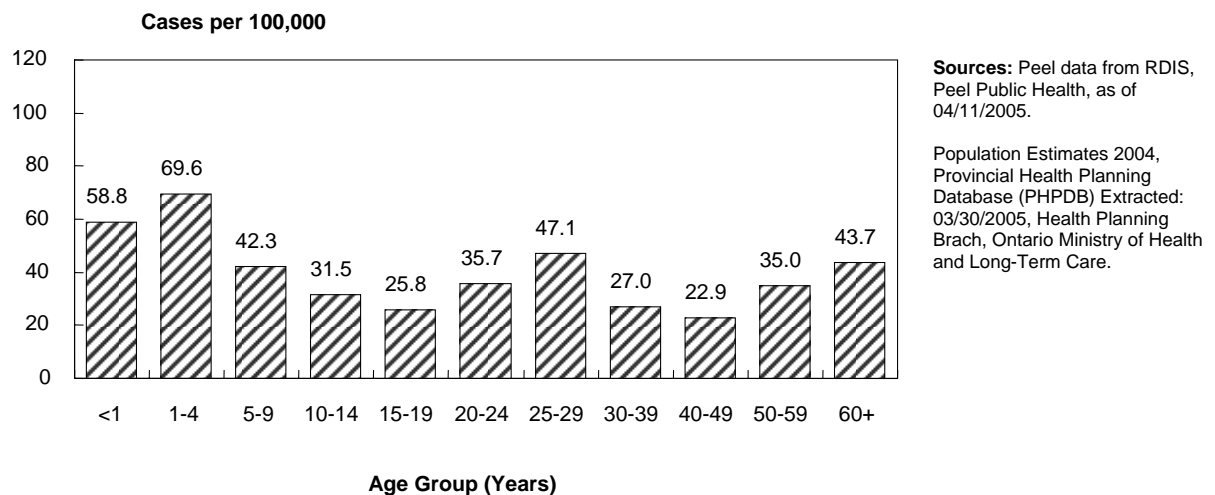
### **CAMPYLOBACTERIOSIS**

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**



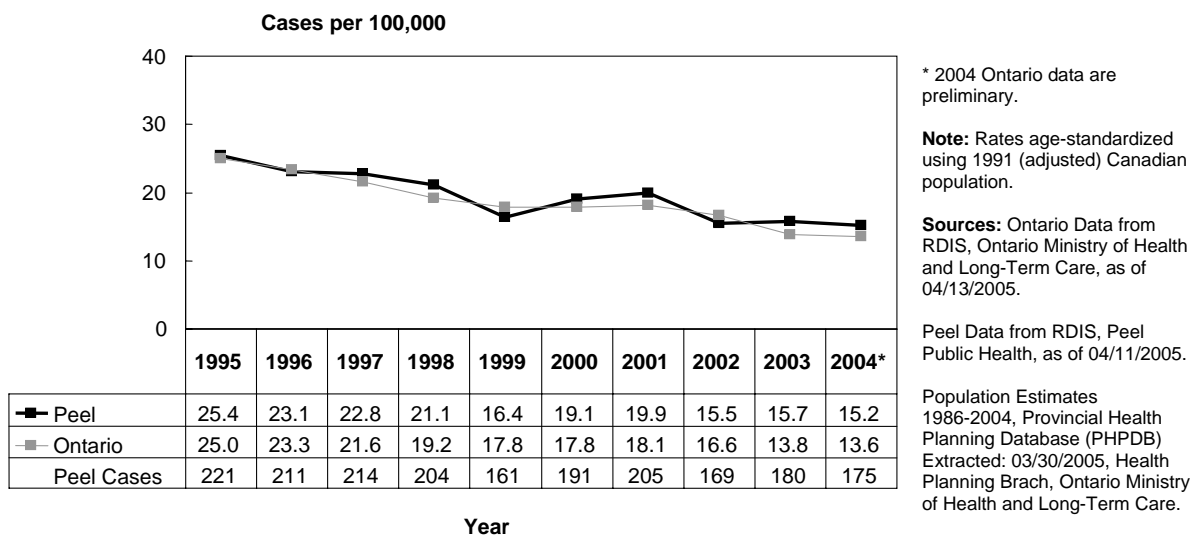
**Figure 3.4: Incidence of Campylobacteriosis by Age Group, Region of Peel, 2004**



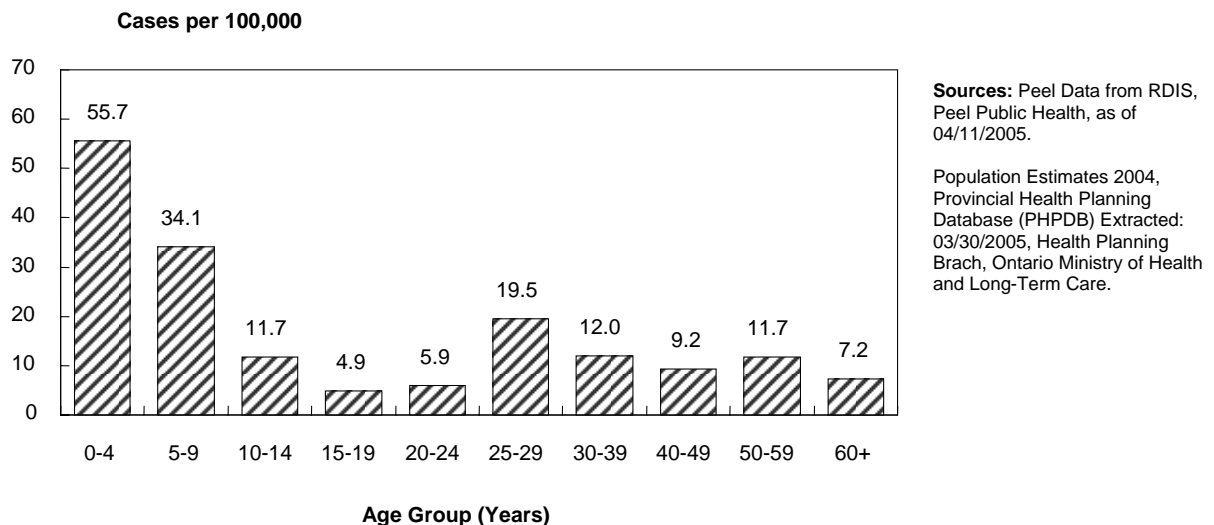
**GIARDIASIS**

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.<sup>6,22,23,27</sup>

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



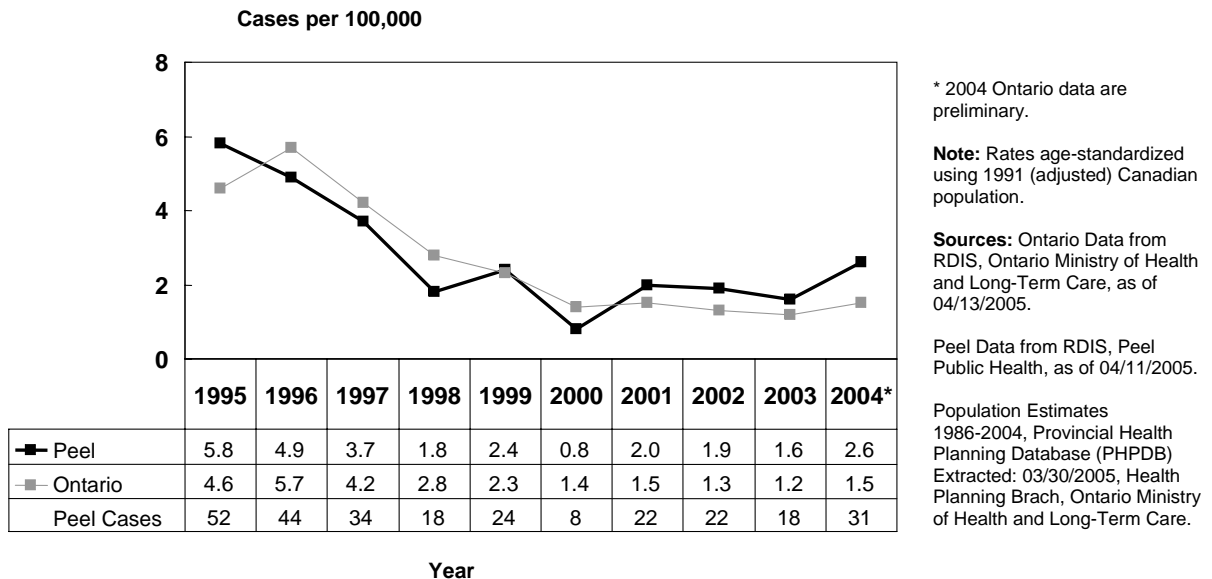
**Figure 3.6: Incidence of Giardiasis by Age Group, Region of Peel, 2004**



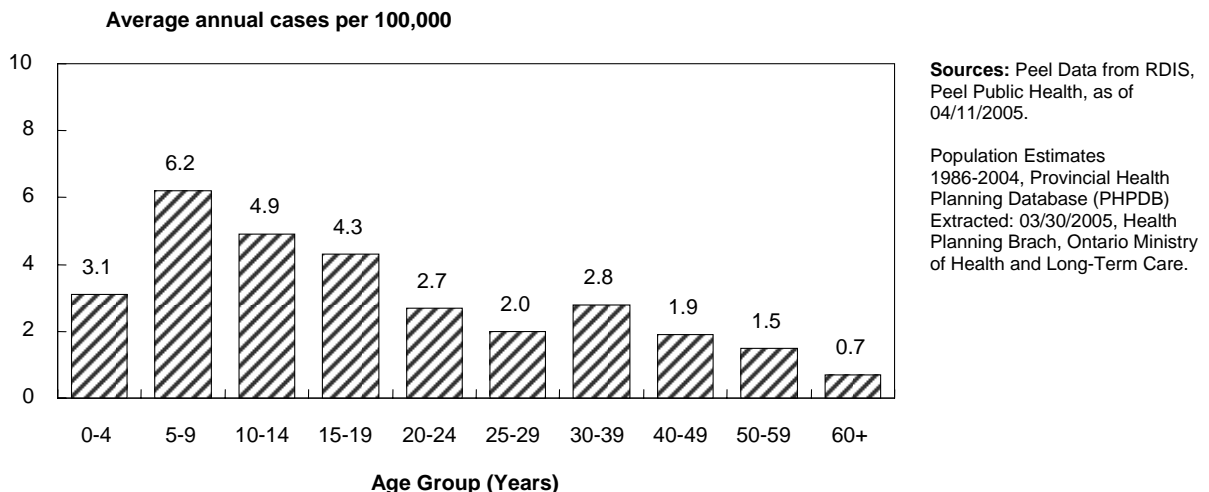
## HEPATITIS A

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.<sup>6,22,23,28,29</sup>

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



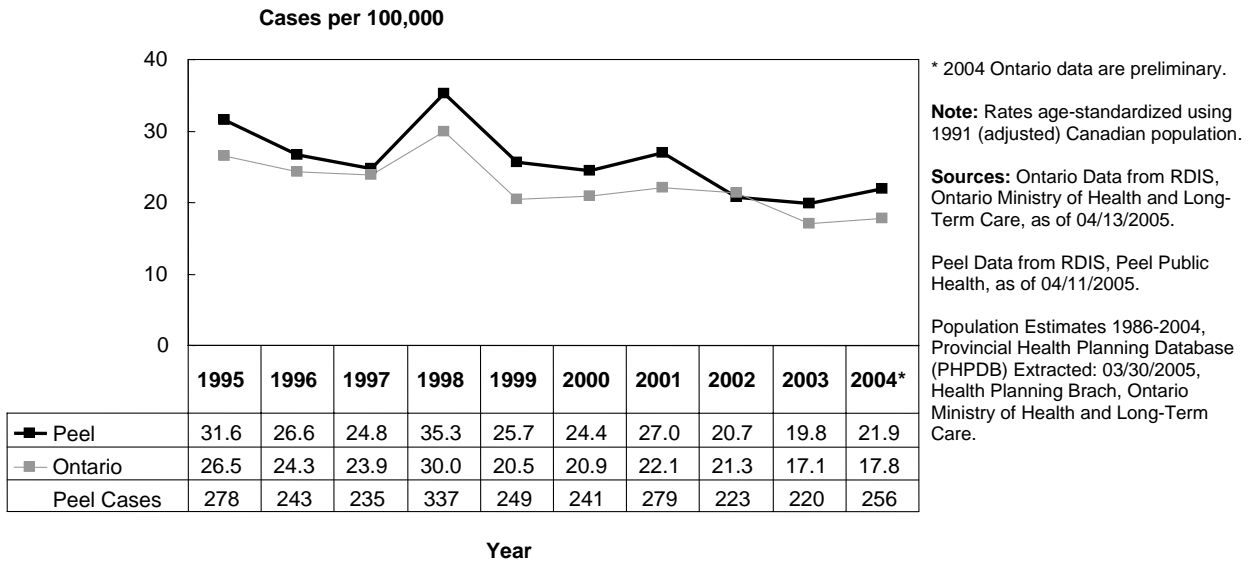
**Figure 3.8: Incidence of Hepatitis A by Age Group, Region of Peel, 1995-2004 Combined**



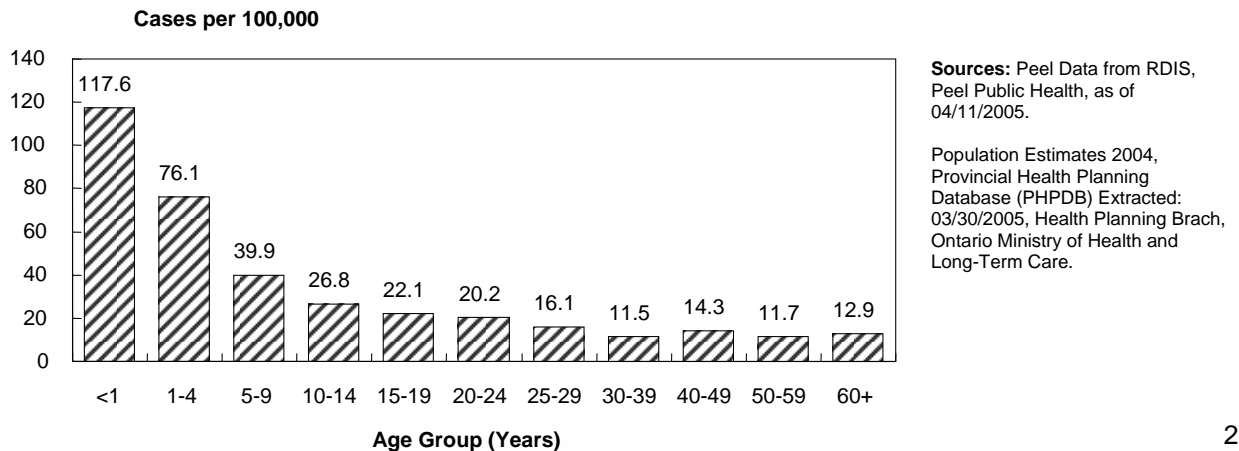
**SALMONELLOSIS**

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.<sup>6,22,23,29</sup>

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



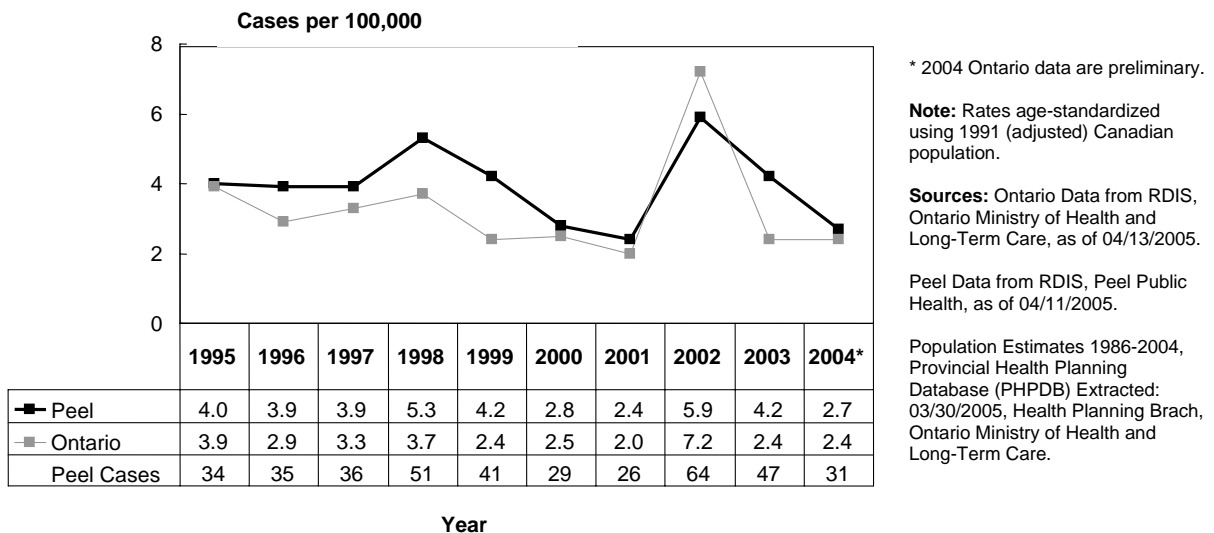
**Figure 3.10: Incidence of Salmonellosis by Age Group, Region of Peel, 2004**



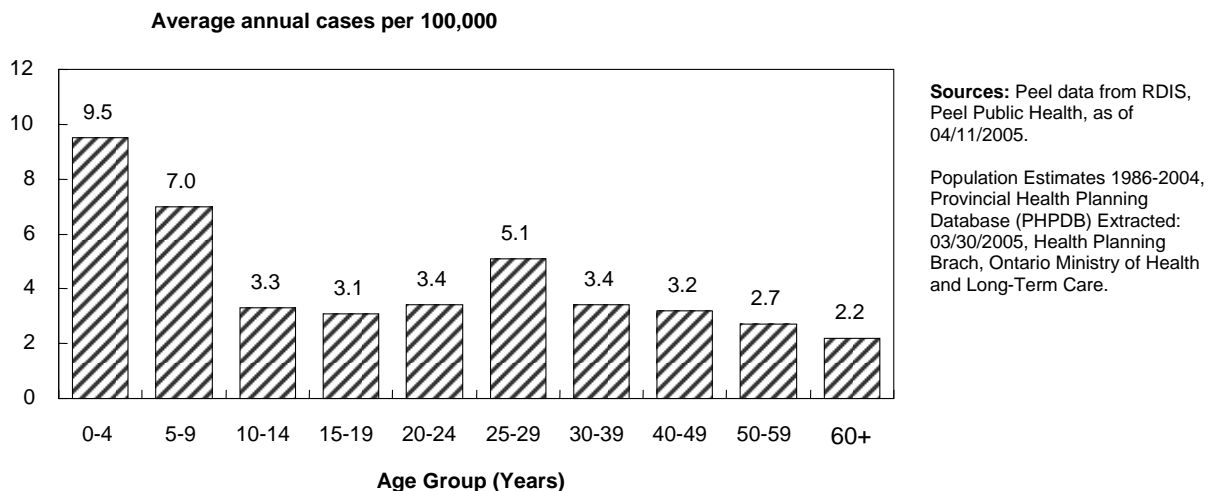
## SHIGELLOSIS

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.<sup>6,22,23,31</sup> The increase in the incidence of shigellosis in 2002 was due to a large outbreak in Ontario associated with a prepared food product.<sup>22</sup>

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



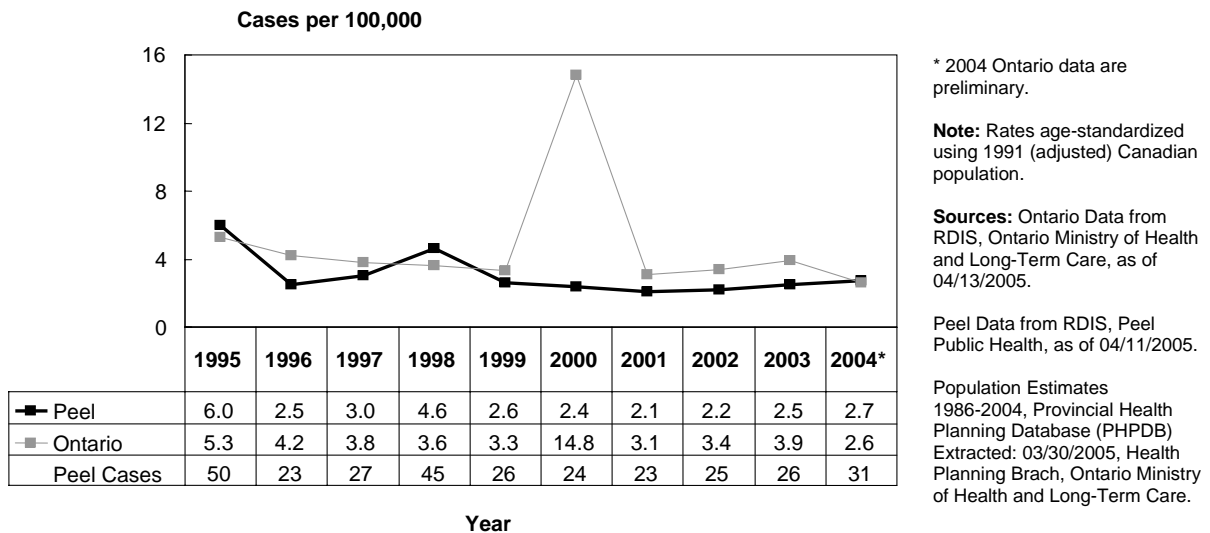
**Figure 3.12: Incidence of Shigellosis by Age Group, Region of Peel, 1995-2004 Combined**



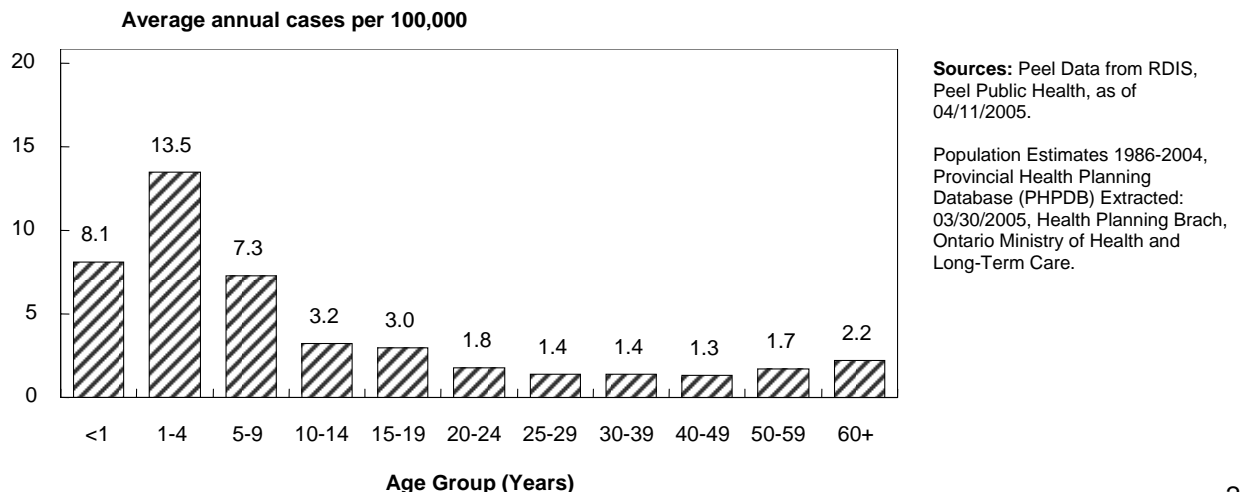
**VEROTOXIN-PRODUCING *ESCHERICHIA COLI* (VTEC)**

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.<sup>6,22,23</sup> In 2000, a major VTEC outbreak occurred in Walkerton, Ontario that was linked to a contaminated municipal water supply (see figure 3.13).<sup>32</sup>

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



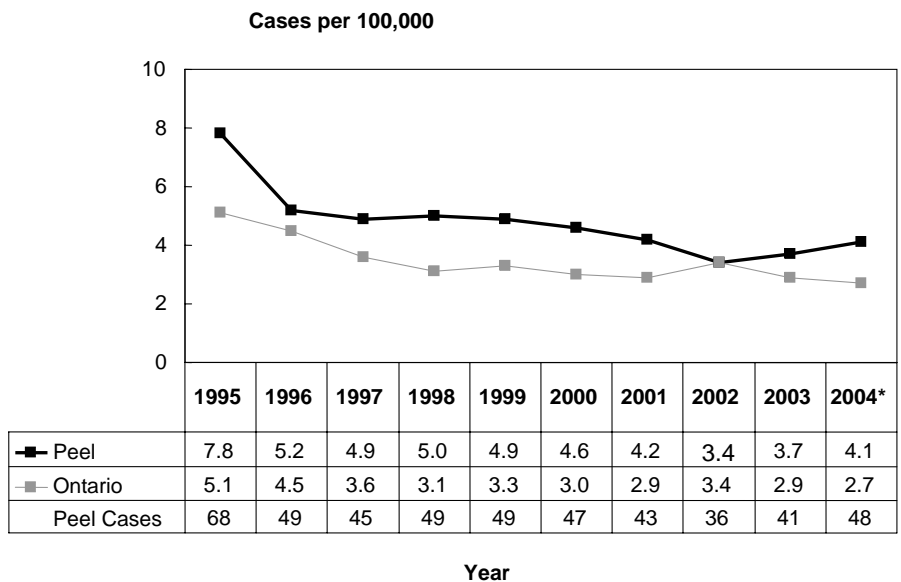
**Figure 3.14: Incidence of Verotoxin-Producing *Escherichia coli* (VTEC) by Age Group, Region of Peel, 1995-2004 Combined**



**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.<sup>6,22,23,33</sup>

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



\* 2004 Data are preliminary.

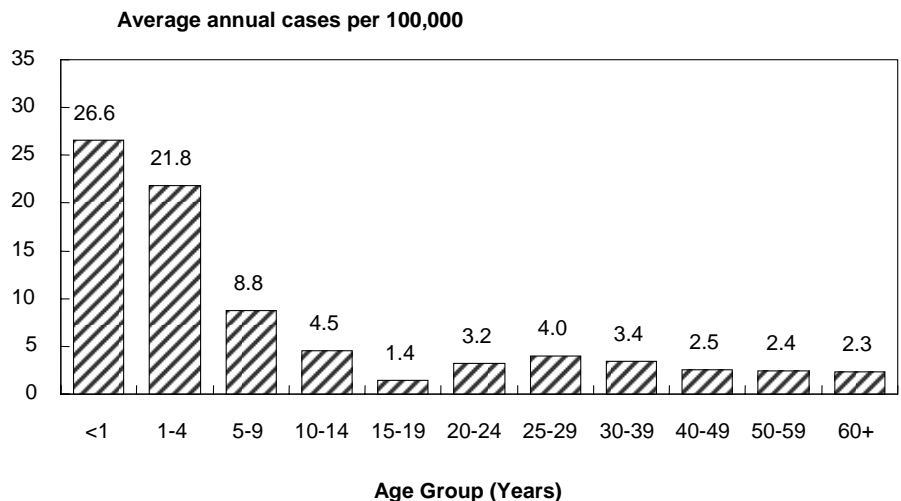
**Note:** Rates age-standardized using 1991 (adjusted) Canadian population.

**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 3.16: Incidence of Yersiniosis 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.