



# Enteric Disease in Ottawa 2011

# Acknowledgements

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## **Design**

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This report is one of a series of health status reports published by Ottawa Public Health. These comprehensive reports are an important part of the public health mandate to report on population health status and provide the evidence necessary to identify trends and health issues of public health significance in Ottawa. Local evidence helps tailor planning and decision making to enhance the health of the Ottawa population.

The purpose of this particular report is to provide surveillance data about reportable enteric (intestinal) diseases in Ottawa. The data support the Ontario Public Health Standards requirement to conduct surveillance on infectious diseases and drinking water illnesses of public health importance, their associated risk factors, and emerging trends. The Ontario Public Health Standards' goals related to enteric illness include:

- To prevent or reduce the burden of infectious diseases of public health importance
- To prevent or reduce the burden of foodborne illness
- To prevent or reduce the burden of waterborne illness related to drinking water
- To prevent or reduce the burden of waterborne illness and injury related to recreational water use

Enteric illnesses are transmitted primarily through ingestion of contaminated food and water. However, they can also be transmitted person-to-person or animal-to-person through direct or fecal-oral contact. Typical symptoms include diarrhea, nausea, vomiting and fever. Young children, the elderly and people with suppressed immune systems are more likely to develop serious complications, but serious complications can also occur in young, healthy adults.

Most cases of enteric diseases are mild. However, even mild disease can cause lost productivity and other related costs. Severe cases can result in hospitalization, serious chronic conditions, or death. In Ontario, for example, *Escherichia coli* is estimated to have caused an average of 600 deaths and resulted in more than 450,000 cases of illness requiring medical attention (Ontario Burden of Infectious Disease Study, 2010).

## Summary of findings

There were 689 cases of reportable enteric illness in Ottawa in 2010. The most commonly reported were *Campylobacter* enteritis (n=204), salmonellosis (n=176), giardiasis (n=125) and amebiasis (n=81).

Compared with the previous five years, the incidence of cryptosporidiosis and cyclosporiasis is increasing, and fewer cases of *Campylobacter* enteritis and verotoxin-producing *E. coli* (VTEC) were reported.

Diseases that mostly affected children under age 5 in 2010:

- Cryptosporidiosis
- Giardiasis
- Salmonellosis
- Shigellosis
- Verotoxin-producing *E. coli* (VTEC)

# Reportable enteric illness in Ottawa

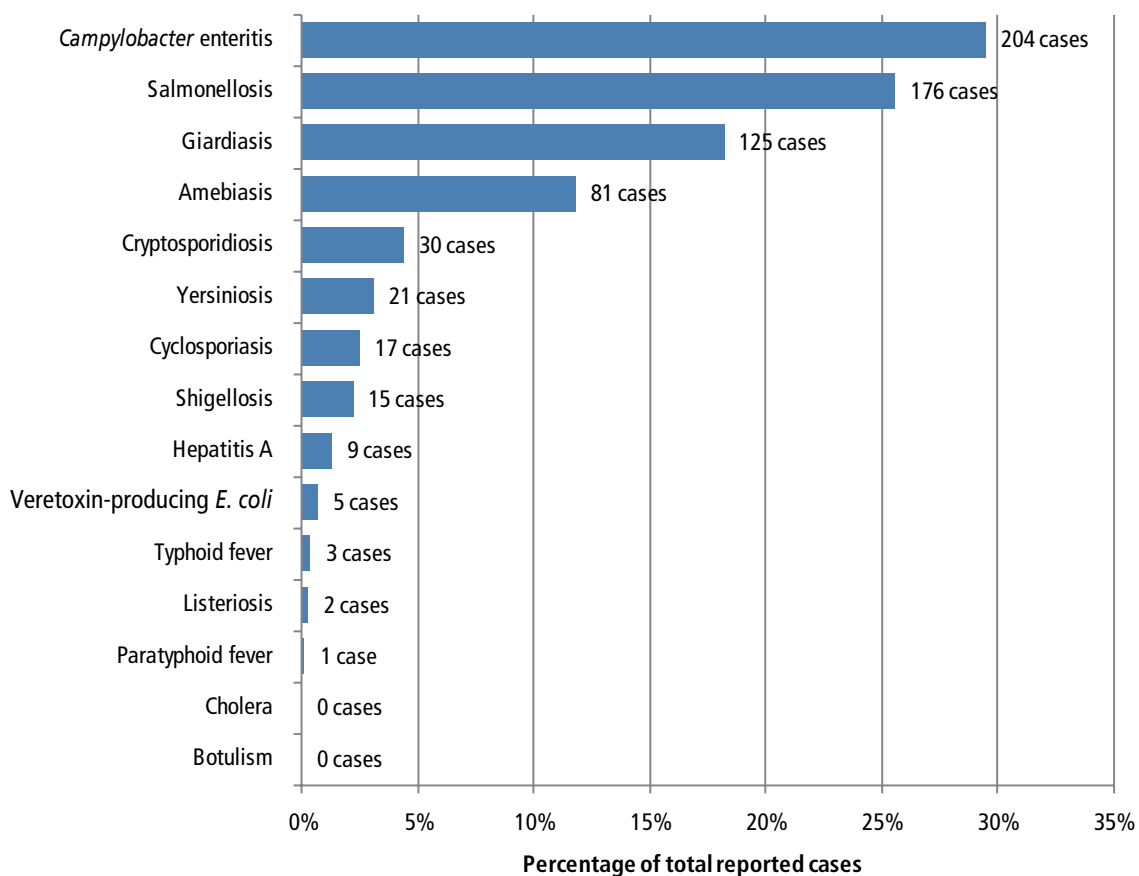
Diseases that mostly affected older adults in 2010:

- Amebiasis
- Listeriosis

In 2010, there were Ottawa-based outbreaks or Ontario-wide outbreaks of the following reportable enteric diseases:

- Salmonellosis
- Cryptosporidiosis

**Figure 1: Reported cases (% of all cases) of enteric illness, Ottawa, 2010**



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011



This report includes all enteric illnesses defined as reportable in the Infectious Disease Protocol of the Ontario Public Health Standards.

Gastrointestinal outbreaks in institutions such as hospitals and long-term care homes are reportable and are investigated by Ottawa Public Health, even if they are caused by diseases that are not otherwise reportable (e.g., norovirus, rotavirus and *Clostridium difficile*). Information on some of these diseases in the institutional setting is available online at [www.health.gov.on.ca/patient\\_safety](http://www.health.gov.on.ca/patient_safety). These outbreaks are outside the scope of this report.

Community outbreaks, if reported by a member of the public, are also investigated regardless of the causative agent. Because community outbreak investigation relies on public reporting, many outbreaks likely go unreported. As such, community outbreaks are not discussed in this report unless they were caused by reportable diseases.

For further details on the organisms mentioned in this report, the diseases they cause and the provincial case definitions, see the Ontario Public Health Standards, Infectious Disease Protocol 2009. Appendix A, at [www.health.gov.on.ca/english/providers/program/pubhealth/oph\\_standards/ophs/progstds/idprotocol/appendixa/appendix\\_a.pdf](http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/idprotocol/appendixa/appendix_a.pdf), provides details on organisms and the diseases they cause. Appendix B, at [www.health.gov.on.ca/english/providers/program/pubhealth/oph\\_standards/ophs/progstds/idprotocol/appendixb/appendix\\_b.pdf](http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/idprotocol/appendixb/appendix_b.pdf), provides provincial case definitions.

## Data presentation

The report provides epidemiological data on 15 enteric illnesses occurring in Ottawa. For each illness, data are presented as follows:

### Summary table

These “at a glance” tables highlight epidemiological indicators such as number of cases, overall incidence, male and female incidence, and age at time of illness. The five-year average summarizes data from 2005 to 2009 and provides a benchmark for a 2010 comparison.

### Incidence by year, Ottawa and the rest of Ontario, 2001–2010

This figure compares the incidence of disease in Ottawa with the rest of Ontario over a 10-year period (where available). Incidence from the rest of Ontario was calculated by subtracting the number of Ottawa cases from the total number of Ontario cases. Please note that the “rest of Ontario rate” is not the same as the overall rate for the whole province, as it does not include Ottawa. Any significant changes over time are discussed in the text.

### Incidence by age and sex, Ottawa, 2010

This figure compares the incidence of disease in each of five age groups (0–4, 5–19, 20–39, 40–59, 60+) and by sex (male and female). Any significant differences are discussed in the text. Where case numbers per year are low, incidence data will state cases per five years instead.

### Number of reported cases by month, Ottawa, 2010

Some enteric illnesses have a seasonal pattern. The figure includes a 95% confidence interval for a five-year mean by month to demonstrate the expected case numbers for that month. These data are not included for all diseases, namely those with low annual numbers.

### Exposure source

The means of transmission (e.g., foodborne, waterborne, person-to-person).

### Exposure setting

The environment in which the exposure occurred. This is only reported if case investigations were done and exposure data is available for enough cases to give a representation.

## Data sources

All of the Ottawa data included in this report were extracted from iPHIS (integrated Public Health Information System), which is a secure province-wide, integrated data and surveillance system required for reporting and managing communicable diseases and outbreaks in Ontario. iPHIS was implemented in Ontario in 2005 and replaced RDIS (Reportable Disease Information System). Pre-2005 data were migrated from the RDIS database to iPHIS to facilitate historical comparisons.

Provincial data were also extracted from iPHIS by the Ontario Ministry of Health and Long-Term Care and made available to public health units on the public health portal ([www.publichealthontario.ca](http://www.publichealthontario.ca)—password required).

The data entered into iPHIS are obtained from laboratory reports, hospital reports, physician interviews and in-depth interviews with cases.

## Data limitations

For the most part, surveillance for these diseases is based on laboratory reporting. To be reported to Ottawa Public Health, cases must seek medical attention and provide stool samples for testing. Some of these diseases tend to end without treatment; hence not all affected individuals seek medical attention. Research suggests that for every reported case of salmonellosis, between 13 and 37 cases go unreported (Thomas MK et al. Estimated numbers of community cases of illness due to *Salmonella*, *Campylobacter* and verotoxigenic *Escherichia coli*: Pathogen-specific community rates. *The Canadian Journal of Infectious Diseases & Medical Microbiology* 2006;17(4):229-234). As a result, this report may under-represent actual incidence of some illnesses.



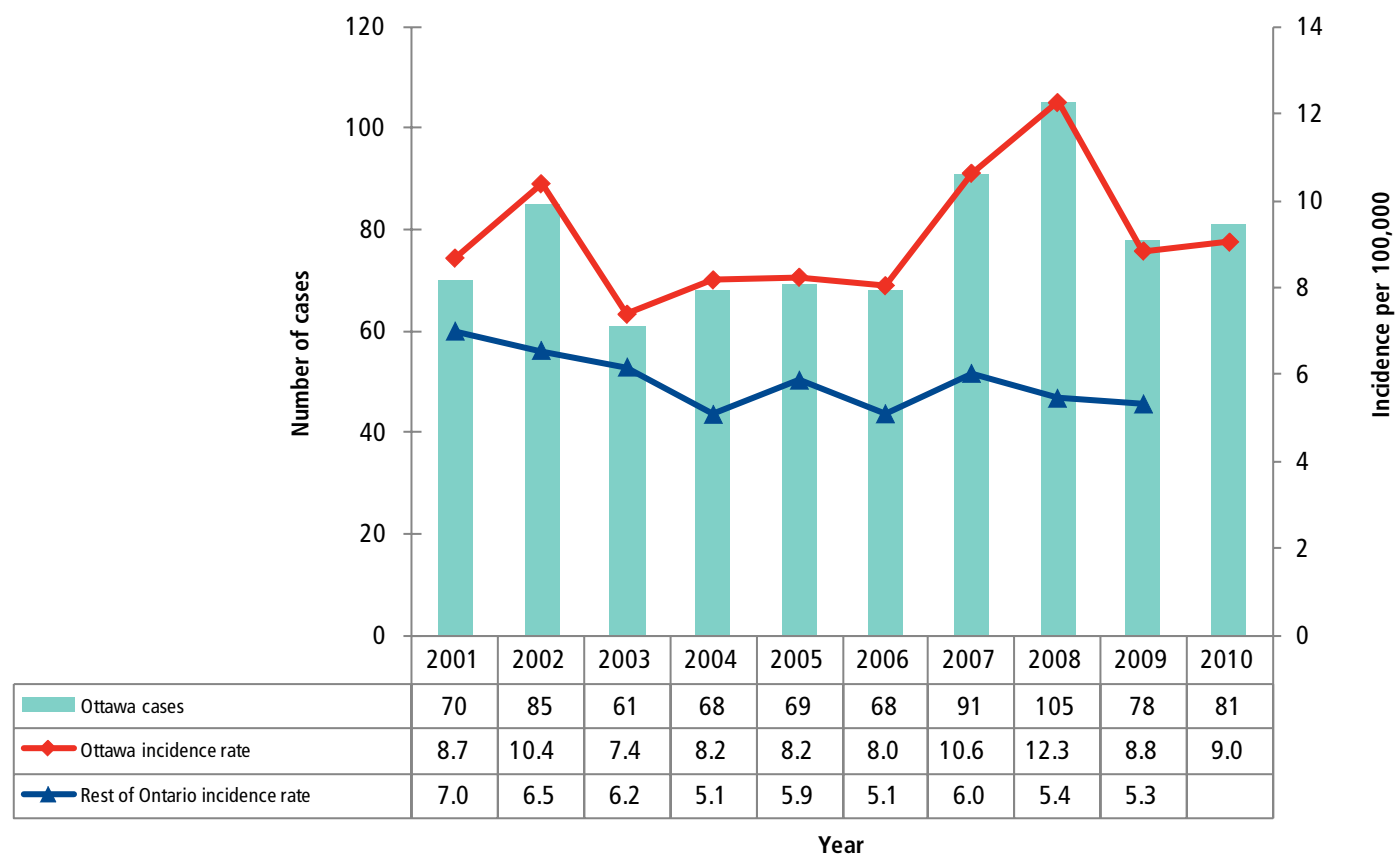
## Total cases: 81

The incidence of amebiasis cases is consistently higher in Ottawa than in the rest of Ontario (Figure 2). In Ottawa, the incidence of amebiasis was highest in older adults and affected more males (56 cases; 69.1%) than females (25 cases; 30.9%).

**Table 1: 2010 summary for amebiasis**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 81       | 82.2                         |
| Incidence (per 100,000) |          |                              |
| Total                   | 9.0      | 9.6                          |
| Female                  | 5.4      | 5.9                          |
| Male                    | 12.8     | 13.4                         |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 44.2     | 38.7                         |
| Median                  | 42.7     | 39.8                         |
| Range                   | 8.0–82.9 | 2.2–88.0                     |

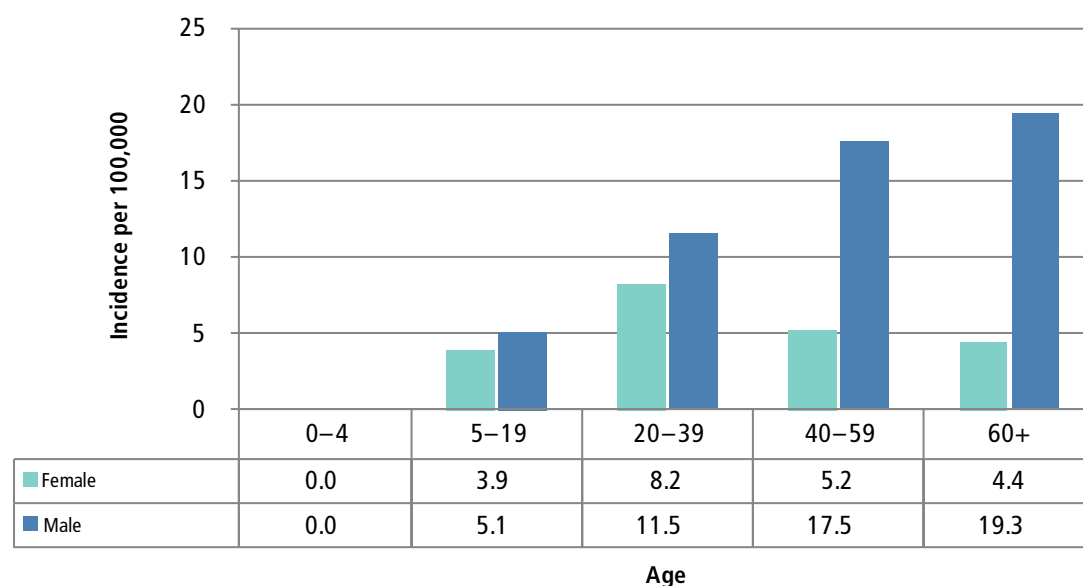
Figure 2: Incidence per 100,000 of amebiasis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

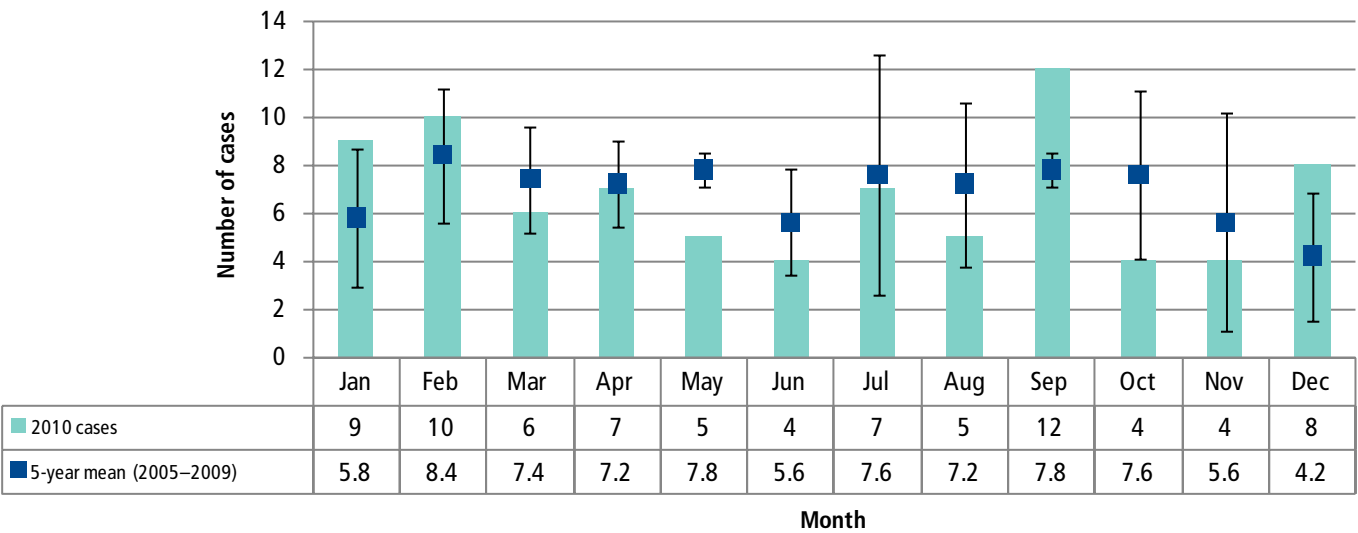
Data note: 2010 rest of Ontario incidence rate is not reported due to a change in case definition

Figure 3: Incidence per 100,000 of amebiasis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 4: Number of reported cases of amebiasis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Exposure source and settings for amebiasis

Summary exposure information is unavailable.

## Total cases: 0

Botulism is a rare disease. The last case in Ottawa was reported in 2005. Prior to that, there were two cases from the same household reported in 1991. In all of Ontario, only one case was reported in 2010. Typically, fewer than five cases are reported annually in all of Ontario.



## Total cases: 204

*Campylobacter* enteritis is the most commonly reported enteric illness in Ottawa. However, its incidence has decreased in Ottawa and the rest of Ontario since 2001.

*Campylobacter* enteritis cases typically peak in July, August and September. The illness affects all age groups although the incidence is slightly higher in males than females.

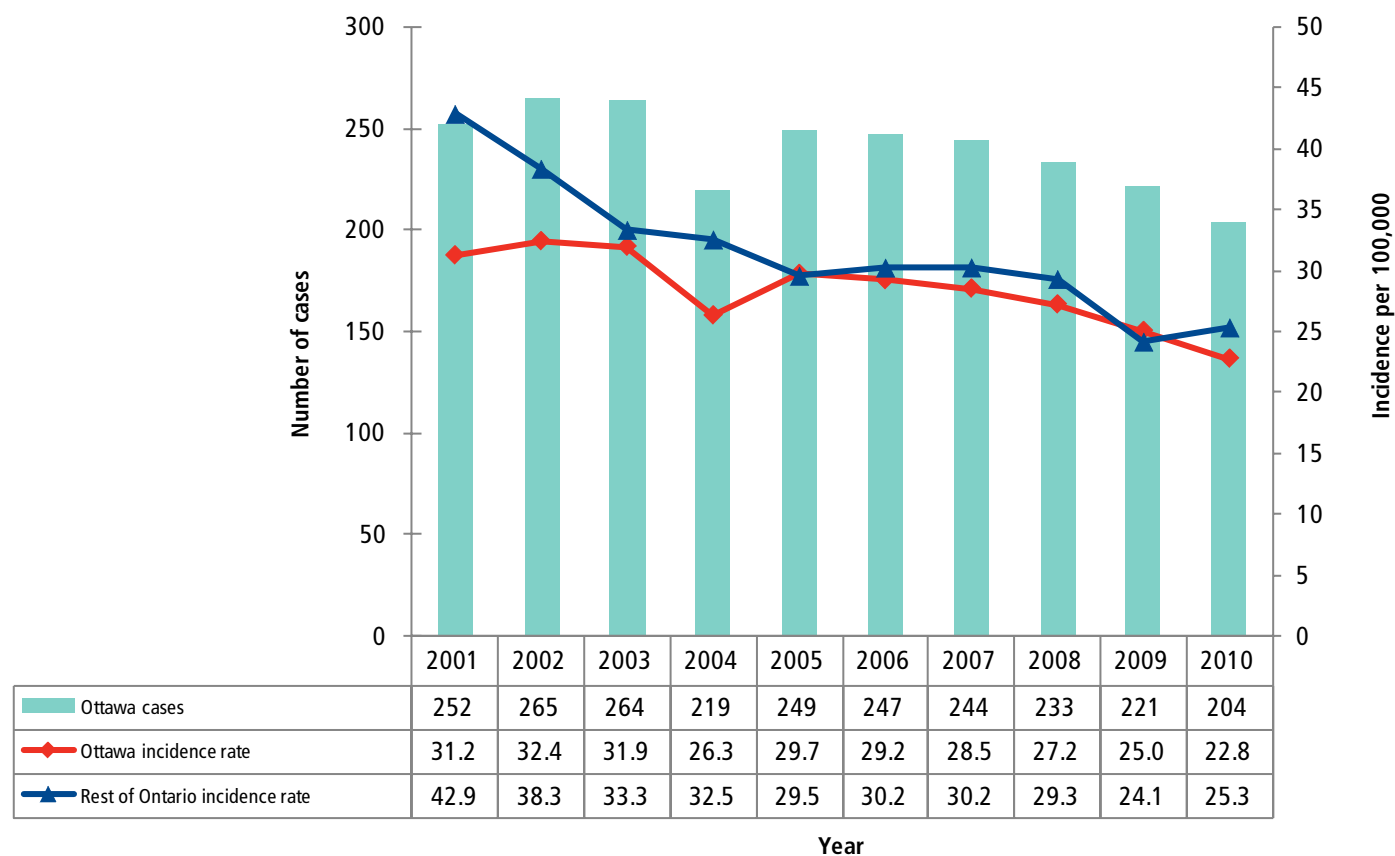
**Table 2: 2010 summary for *Campylobacter* enteritis**

|                         | 2010  | 5-year mean<br>(2005–2009)   |
|-------------------------|-------|------------------------------|
| Number of cases         | 204   | 238.8                        |
| Incidence (per 100,000) |       |                              |
| Total                   | 22.8  | 27.9                         |
| Female                  | 19.6  | 25.4                         |
| Male                    | 26.1  | 30.3                         |
|                         |       | 5-year period<br>(2005–2009) |
| Age at illness (years)  |       |                              |
| Mean                    | 37.8  | 38.8                         |
| Median                  | 35.5  | 37.2                         |
| Range                   | <1–98 | <1–92.9                      |



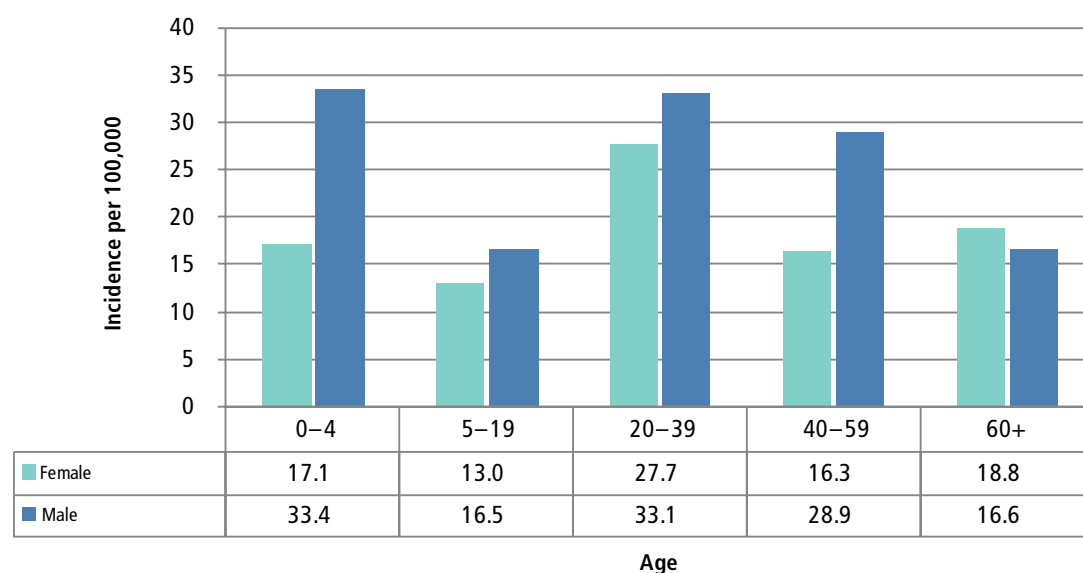
# Campylobacter enteritis

Figure 5: Incidence per 100,000 of *Campylobacter* enteritis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

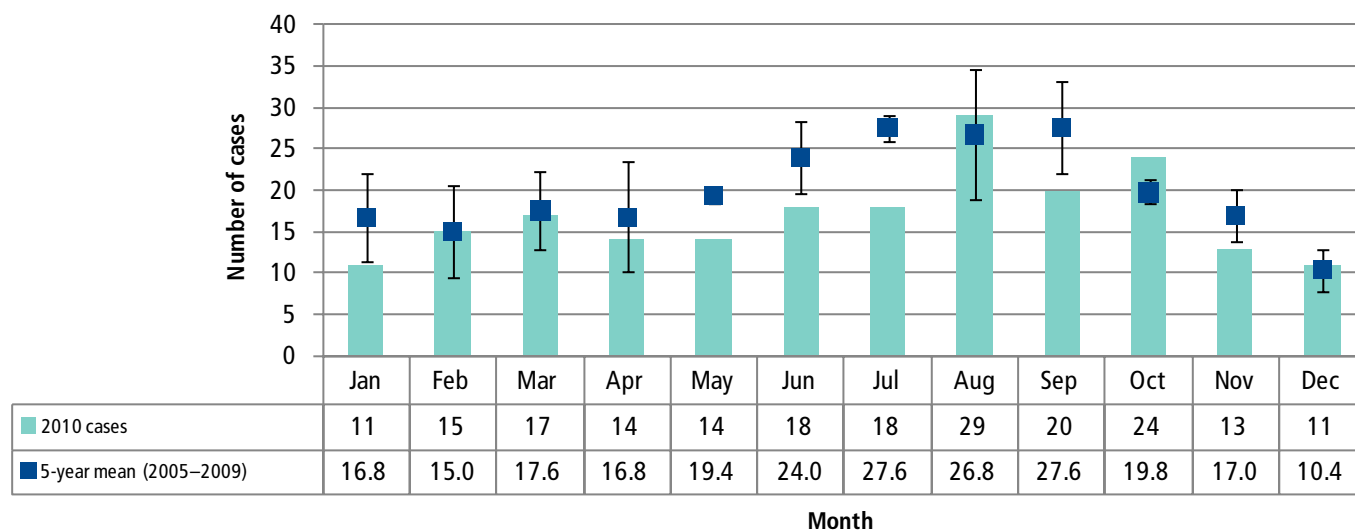
Figure 6: Incidence of *Campylobacter* enteritis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Campylobacter enteritis

Figure 7: Number of reported cases of *Campylobacter* enteritis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

## Exposure source and settings for *Campylobacter* enteritis

Summary exposure information is unavailable.

## Total cases: 0

Cholera is a rare disease in Ottawa. Only six cases have been reported in Ottawa since 1991. Cholera is typically acquired while travelling outside of Canada in countries where uncontaminated food and water are not always available. There were no cases of cholera reported in all of Ontario in 2010 and, typically, fewer than three cases are reported annually.



## Total cases: 30

Cryptosporidiosis cases have been increasing gradually since 2001. In 2010, the highest number in 10 years was reported. The increase is primarily in the 20 to 39 year age group. However, overall incidence is highest in 0–4 year olds.

Cryptosporidiosis occurs seasonally and typically peaks in August.

In October 2010, there was an outbreak of cryptosporidiosis among students at the Veterinary Technician Program at the Seneca College campus in King City. There was one Ottawa case related to this outbreak.

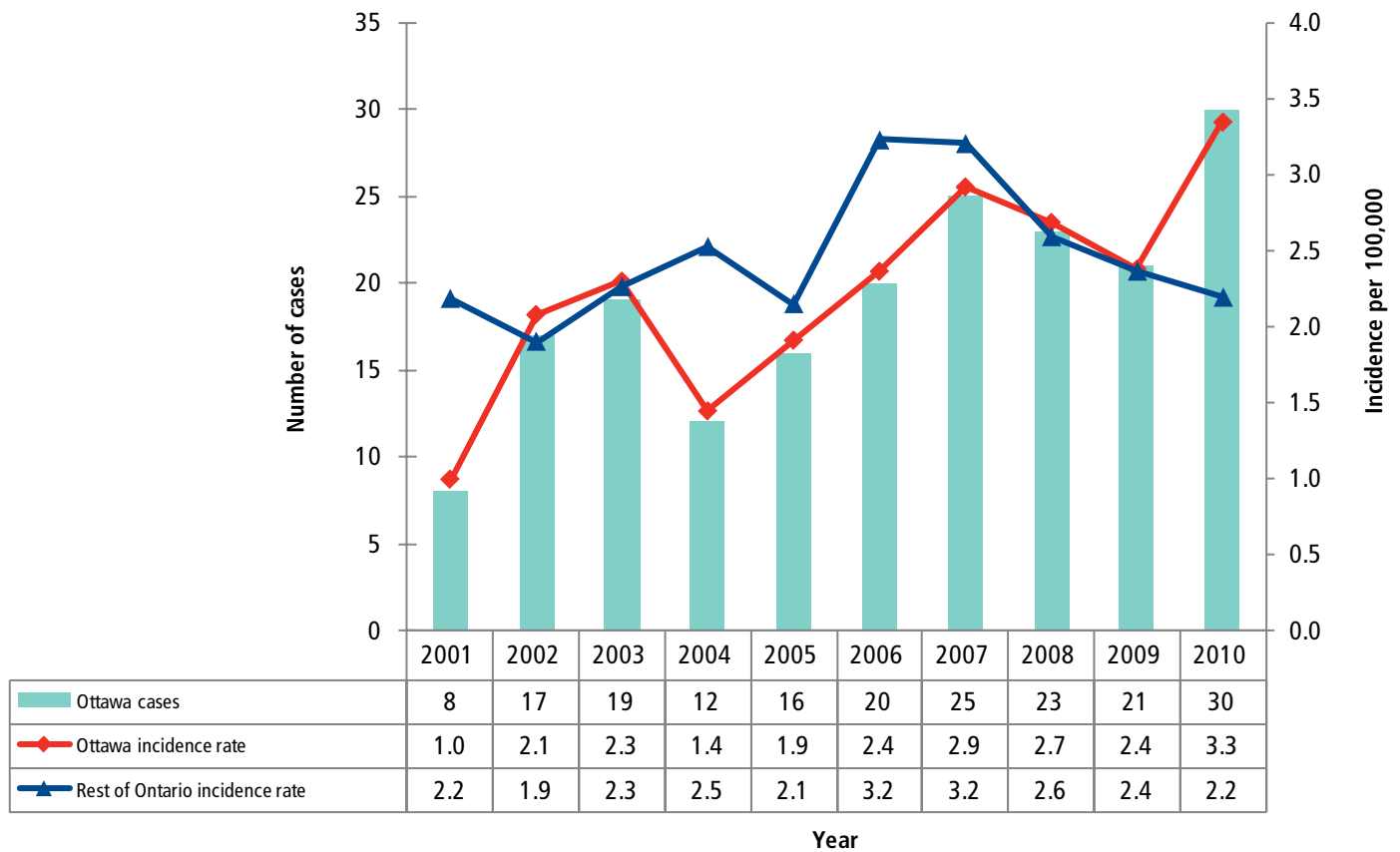
In those cases where the setting was known, the most commonly reported setting for contracting cryptosporidiosis was travel outside of Canada (50%).

**Table 3: 2010 summary for cryptosporidiosis**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 30       | 21                           |
| Incidence (per 100,000) |          |                              |
| Total                   | 3.3      | 2.5                          |
| Female                  | 3.9      | 2.6                          |
| Male                    | 2.8      | 2.3                          |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 25.4     | 20.9                         |
| Median                  | 23.6     | 20.1                         |
| Range                   | < 1–56.8 | <1–81.4                      |

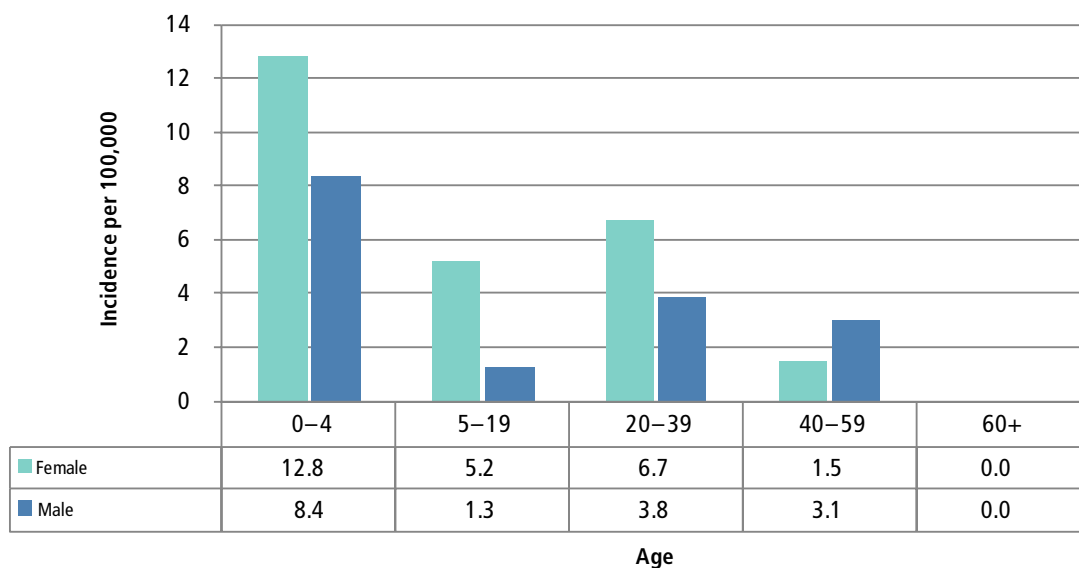


Figure 8: Incidence per 100,000 of cryptosporidiosis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

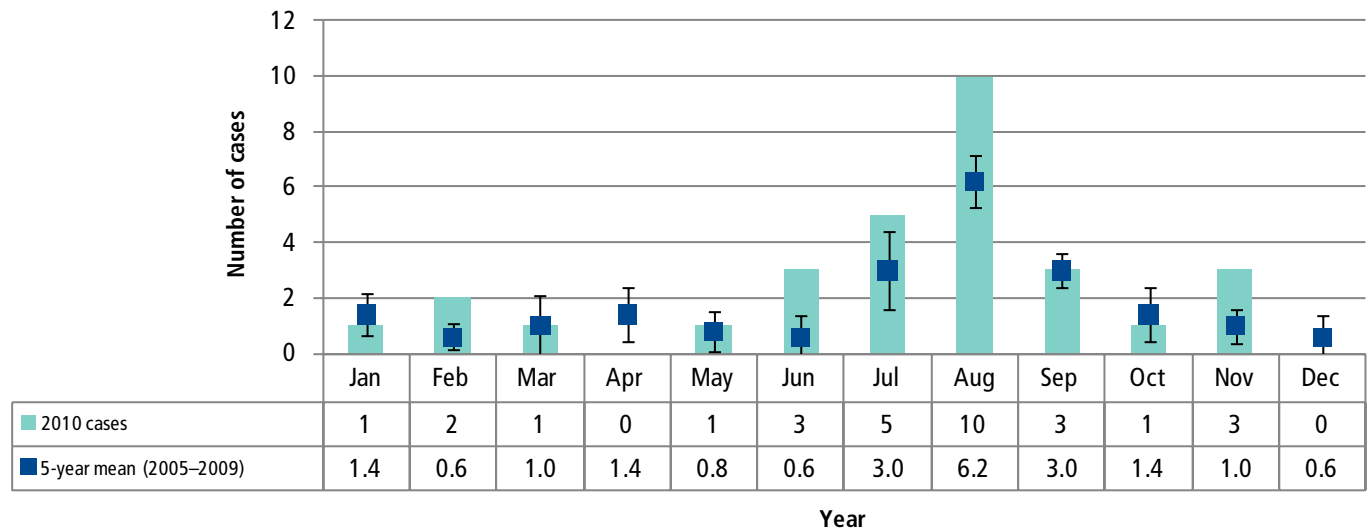
Figure 9: Incidence of cryptosporidiosis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Cryptosporidiosis

Figure 10: Number of reported cases of cryptosporidiosis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 4: Exposure source for reported cases of cryptosporidiosis, Ottawa, 2010

| Reported exposure        | Number of cases* | % of total reported exposures |
|--------------------------|------------------|-------------------------------|
| Water—recreational water | 9                | 28.1                          |
| Animal to person         | 3                | 9.4                           |
| Water—drinking water     | 1                | 3.1                           |
| Foodborne                | 1                | 3.1                           |
| Unknown                  | 18               | 56.3                          |
| <b>Total</b>             | <b>32</b>        |                               |

\* Cases may report more than one possible exposure

**Table 5: Exposure setting for reported cases of cryptosporidiosis, 2010**

| Reported exposure setting             | Number of cases* | % of total reported exposure settings |
|---------------------------------------|------------------|---------------------------------------|
| Travel—outside of Canada              | 12               | 37.5                                  |
| Travel—within Ontario, outside Ottawa | 5                | 15.6                                  |
| Other                                 | 3                | 9.4                                   |
| Private home                          | 2                | 6.3                                   |
| Farm                                  | 1                | 3.1                                   |
| Restaurant                            | 1                | 3.1                                   |
| Unknown                               | 8                | 25.0                                  |
| <b>Total</b>                          | <b>32</b>        |                                       |

\* Cases may report more than one possible exposure

**Total cases: 17**

Cyclosporiasis cases have been increasing in Ottawa and the rest of Ontario since the disease became reportable in 2002. In 2010, there were 17 cases, which was the highest number of cases since reporting began in 2002.

Cyclosporiasis occurs seasonally and peaks in the summer months (typically June).

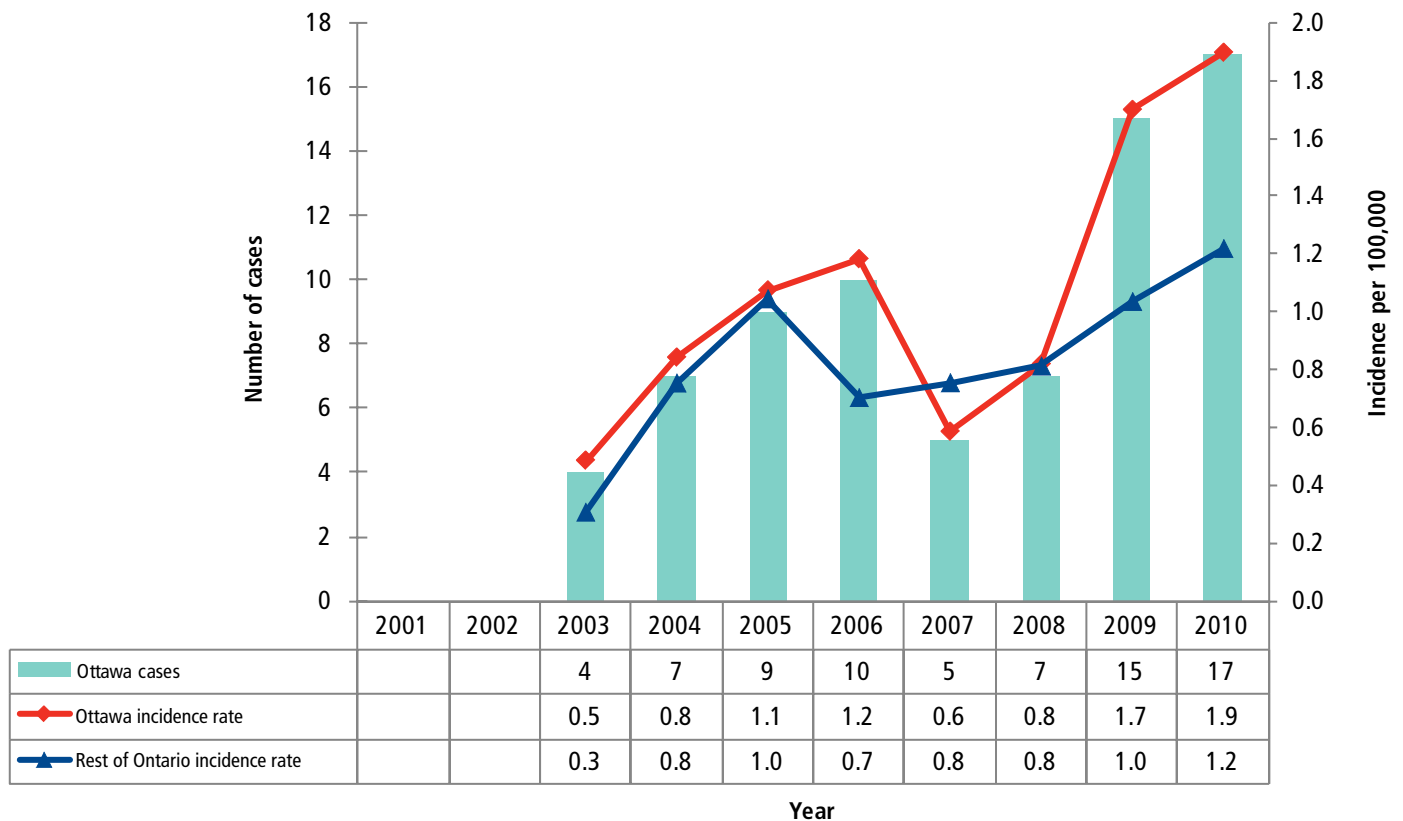
People contracting cyclosporiasis are usually older than 20 years of age. This may reflect the travel activity of this age group since many tropical countries are endemic for cyclosporiasis.

**Table 6: 2010 summary for cyclosporiasis**

|                         | 2010      | 5-year mean<br>(2005–2009)   |
|-------------------------|-----------|------------------------------|
| Number of cases         | 17        | 9.2                          |
| Incidence (per 100,000) |           |                              |
| Total                   | 1.9       | 1.1                          |
| Female                  | 1.3       | 1.4                          |
| Male                    | 2.5       | 0.8                          |
|                         |           | 5-year period<br>(2005–2009) |
| Age at illness (years)  |           |                              |
| Mean                    | 44.9      | 45.6                         |
| Median                  | 48.2      | 44.5                         |
| Range                   | 21.8–74.0 | 17.1–86.1                    |

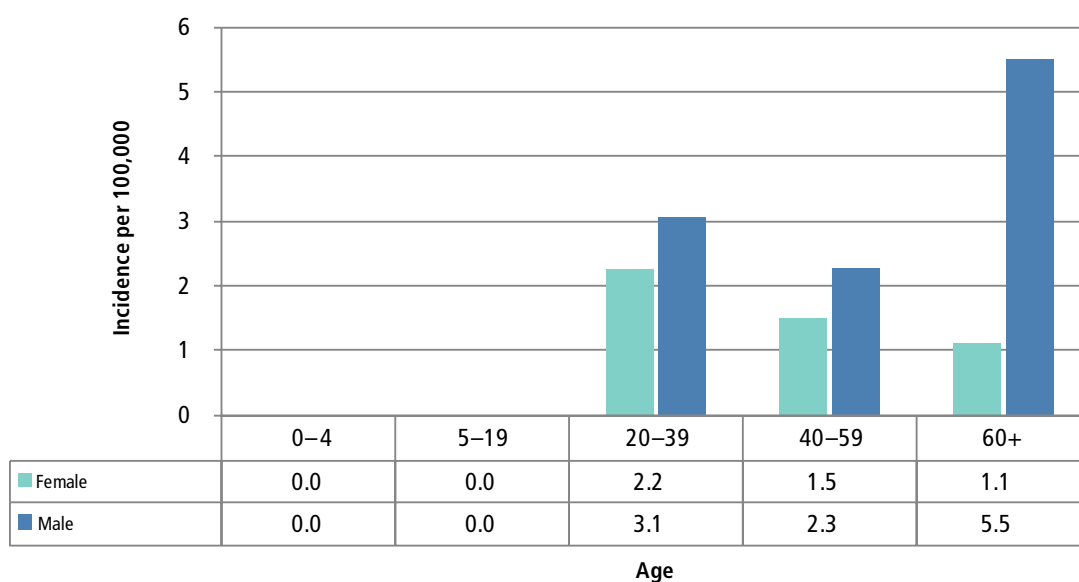


Figure 11: Incidence per 100,000 of cyclosporiasis by year, Ottawa and the rest of Ontario, 2001–2010



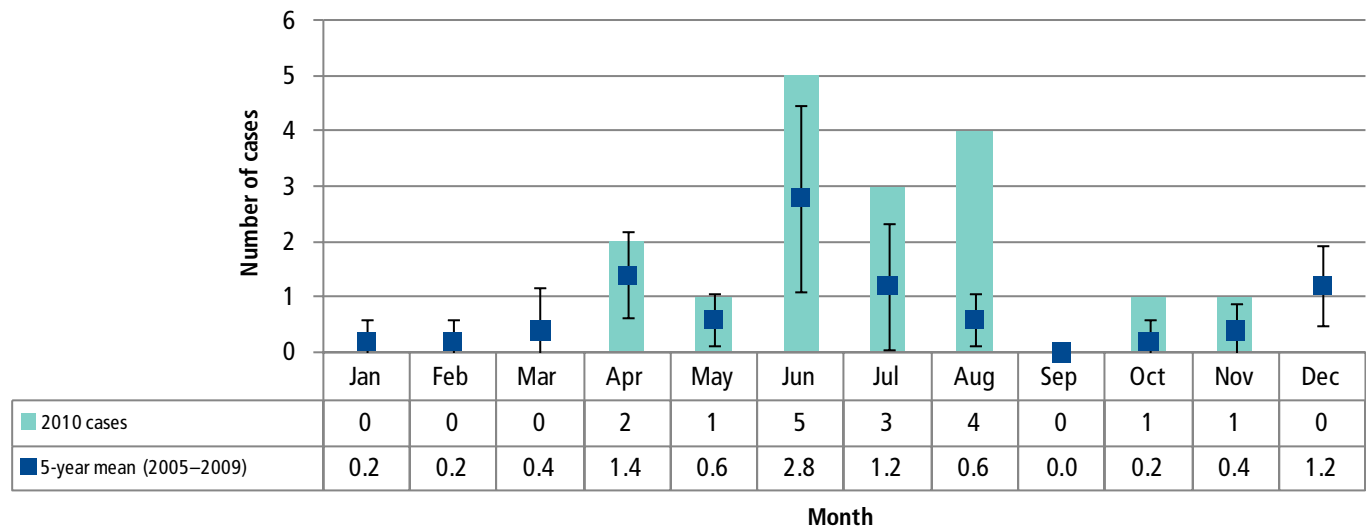
Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011  
 Data note: Cyclosporiasis became reportable in Ontario in 2002

Figure 12: Incidence per 100,000 of cyclosporiasis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 13: Number of reported cases of cyclosporiasis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

## Exposure source and settings for cyclosporiasis

Summary exposure information is unavailable.



### Total cases: 125

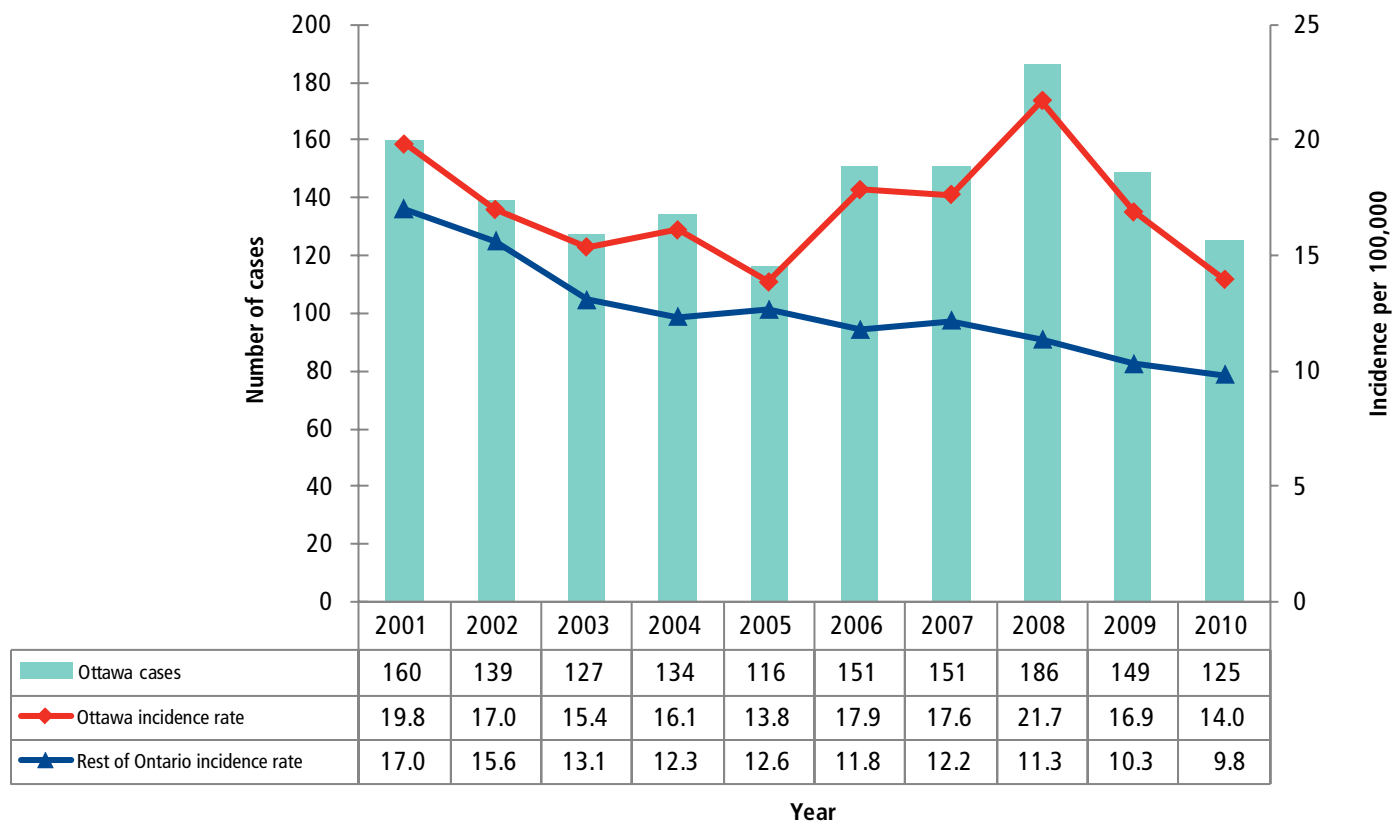
Children under five years of age are most likely to contract giardiasis; the incidence decreases with age. It is one of the most common causes of day-care centre outbreaks of diarrhea. Males have higher rates of giardiasis than females in each age group.

Giardiasis cases are historically reported most frequently in the month of September.

**Table 7: 2010 summary for giardiasis**

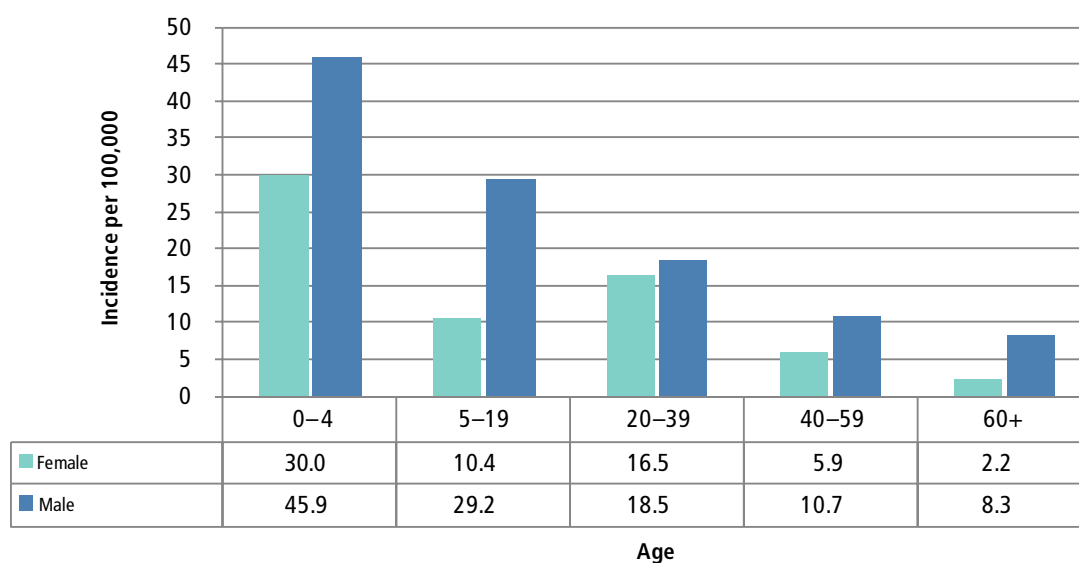
|                         | 2010    | 5-year mean<br>(2005–2009)   |
|-------------------------|---------|------------------------------|
| Number of cases         | 125     | 150.6                        |
| Incidence (per 100,000) |         |                              |
| Total                   | 14.0    | 17.6                         |
| Female                  | 10.2    | 15.8                         |
| Male                    | 17.8    | 19.2                         |
|                         |         | 5-year period<br>(2005–2009) |
| Age at illness (years)  |         |                              |
| Mean                    | 26.8    | 29.3                         |
| Median                  | 25.6    | 27.5                         |
| Range                   | <1–98.4 | <1–85.6                      |

Figure 14: Incidence per 100,000 of giardiasis by year, Ottawa and the rest of Ontario, 2001–2010



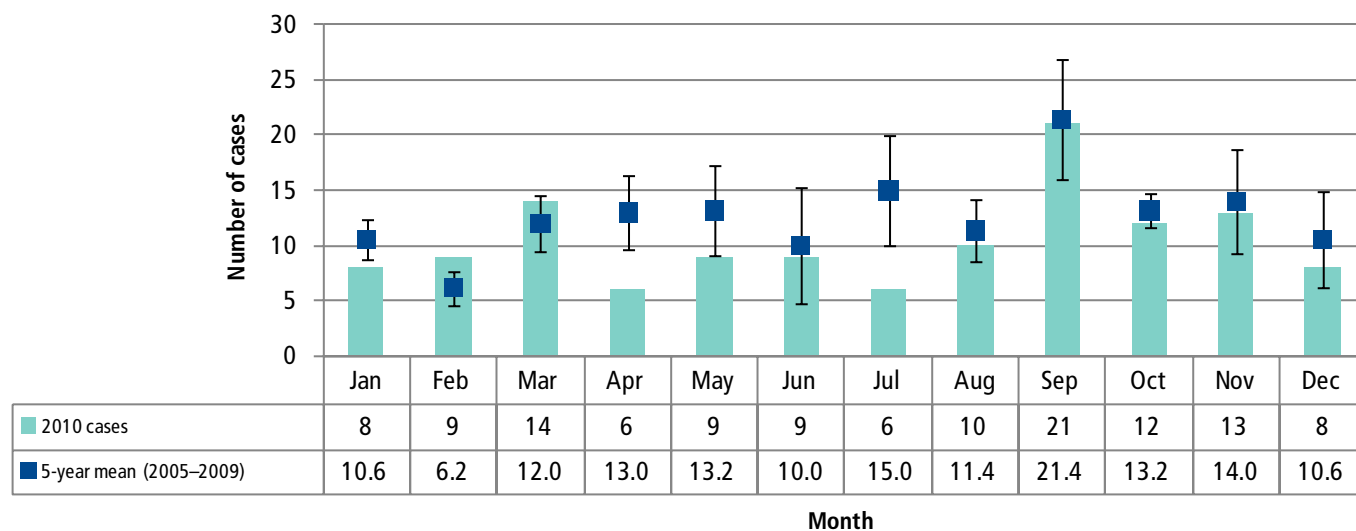
Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 15: Incidence per 100,000 of giardiasis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 16: Number of reported cases of giardiasis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

## Exposure source and settings for giardiasis

Summary exposure information is unavailable.



### Total cases: 9

Four of Ottawa's nine cases of hepatitis A in 2010 were likely contracted while travelling outside of Canada.

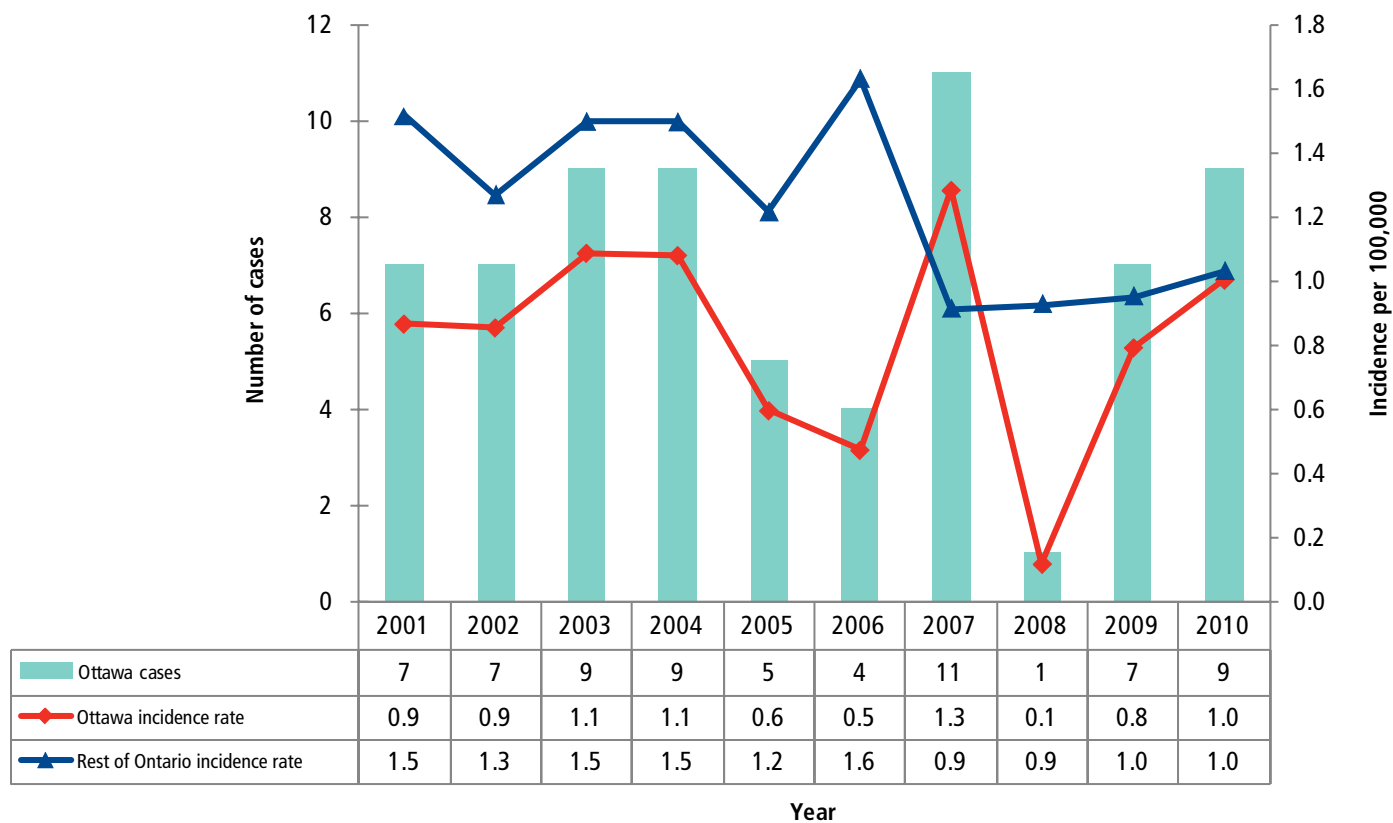
One non-travel-related case in a resident of a long-term care home was reported in December 2010. This case was part of an Ontario cluster identified through laboratory genotyping. A common source was not identified and there were no known links between the Ottawa case and the other Ontario cases.

**Table 8: 2010 summary for hepatitis A**

|                         | 2010      | 5-year mean<br>(2005–2009)   |
|-------------------------|-----------|------------------------------|
| Number of cases         | 9         | 5.6                          |
| Incidence (per 100,000) |           |                              |
| Total                   | 1.0       | 0.7                          |
| Female                  | 1.3       | 0.6                          |
| Male                    | 0.7       | 0.7                          |
|                         |           | 5-year period<br>(2005–2009) |
| Age at illness (years)  |           |                              |
| Mean                    | 44.4      | 32.2                         |
| Median                  | 49.1      | 35.7                         |
| Range                   | 10.9–84.7 | 2.3–65.5                     |

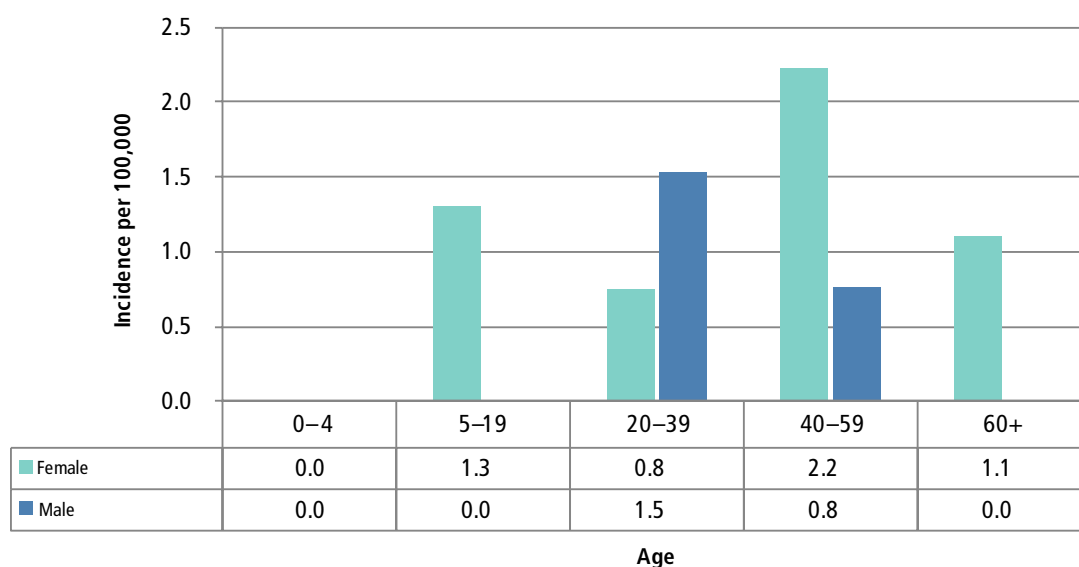
# Hepatitis A

Figure 17: Incidence per 100,000 of hepatitis A by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

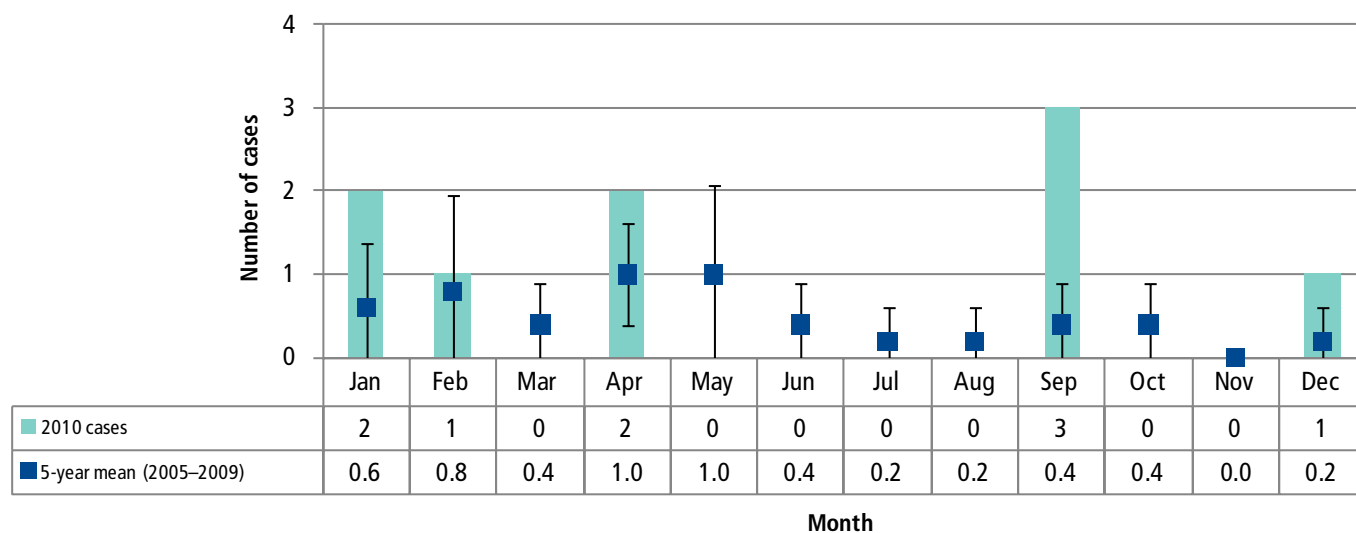
Figure 18: Incidence per 100,000 of hepatitis A by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Hepatitis A

Figure 19: Number of reported cases of hepatitis A by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 9: Exposure source for reported cases of hepatitis A, Ottawa, 2010

| Reported exposure | Number of cases* | % of total reported exposure |
|-------------------|------------------|------------------------------|
| Foodborne         | 3                | 30                           |
| Person to person  | 1                | 10                           |
| Unknown           | 6                | 60                           |
| <b>Total</b>      | <b>10</b>        |                              |

\* Cases may report more than one possible exposure

**Table 10: Exposure setting for reported cases of hepatitis A, Ottawa, 2010**

| Reported exposure setting                | Number of cases* | % of total reported exposure settings |
|------------------------------------------|------------------|---------------------------------------|
| Travel—outside of Canada                 | 4                | 40                                    |
| Store—grocery/supermarket                | 2                | 20                                    |
| Institutional—long-term care home        | 1                | 10                                    |
| Private home                             | 1                | 10                                    |
| Travel—within Ontario, outside of Ottawa | 1                | 10                                    |
| Unknown or missing                       | 1                | 10                                    |
| <b>Total</b>                             | <b>10</b>        |                                       |

\* Cases may report more than one possible exposure



## Total cases: 3

Listeriosis typically affects older adults (average age 65 years). When patients are older or have compromised immune systems, severe illness can result from *Listeria* infection.

Since 2006, listeriosis has caused seven deaths in Ottawa (28% of reported cases). The average age of those who died was 80 years—15 years older than the average for all *Listeria* cases.

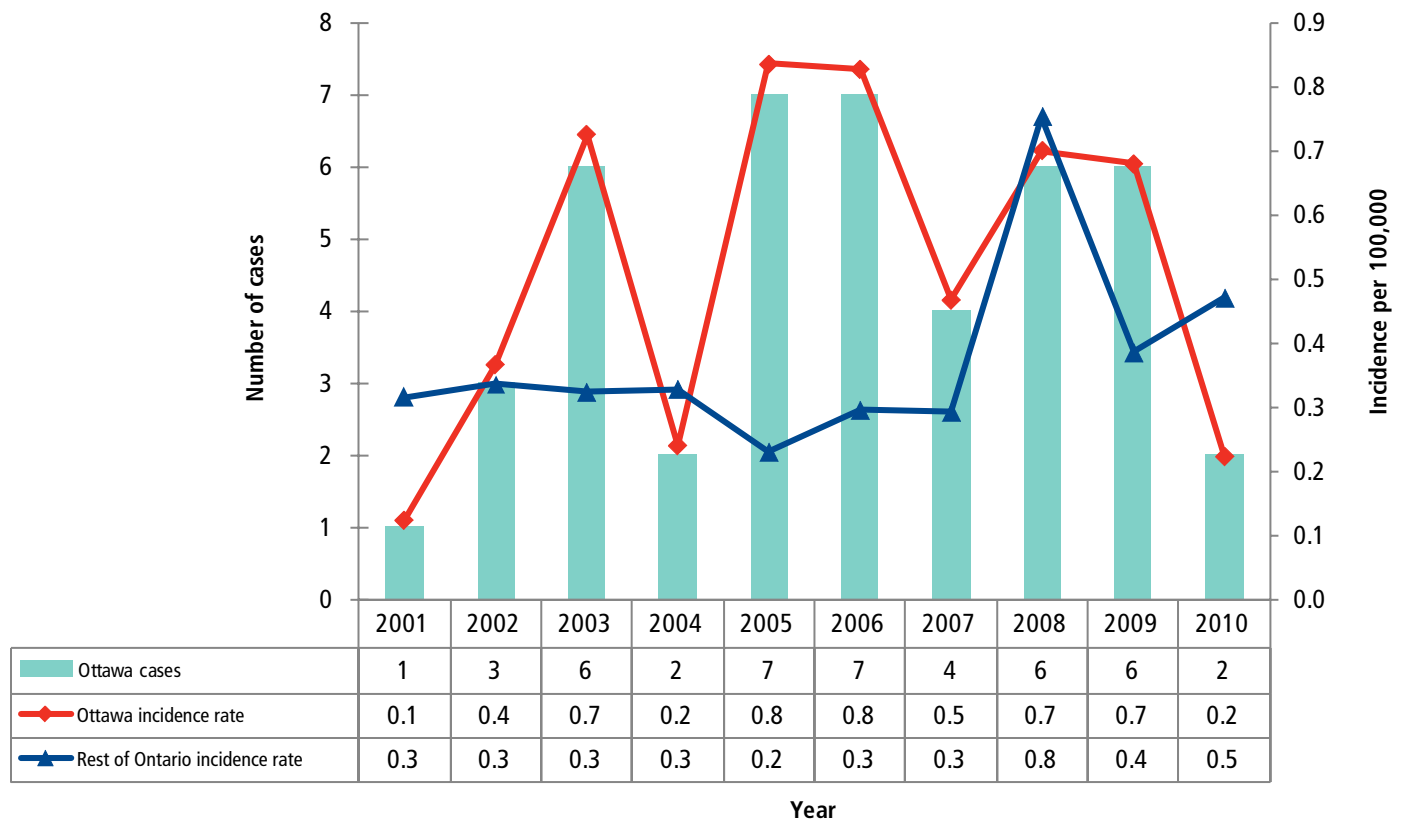
Listeriosis is also harmful to the very young and can be passed from the mother to her fetus. In 2010, there was one such case of maternal transmission reported in Ottawa.

**Table 11: 2010 summary for listeriosis**

|                         | 2010                      | 5-year mean<br>(2005–2009)   |
|-------------------------|---------------------------|------------------------------|
| Number of cases         | 2 confirmed<br>1 probable | 6                            |
| Incidence (per 100,000) |                           |                              |
| Total                   | 0.2                       | 0.7                          |
| Female                  | 0.4                       | 0.7                          |
| Male                    | 0.0                       | 0.7                          |
|                         |                           | 5-year period<br>(2005–2009) |
| Age at illness (years)  |                           |                              |
| Mean                    | 40.3                      | 65.1                         |
| Median                  | 40.3                      | 70.2                         |
| Range                   | <1–80.6                   | <1–98.2                      |

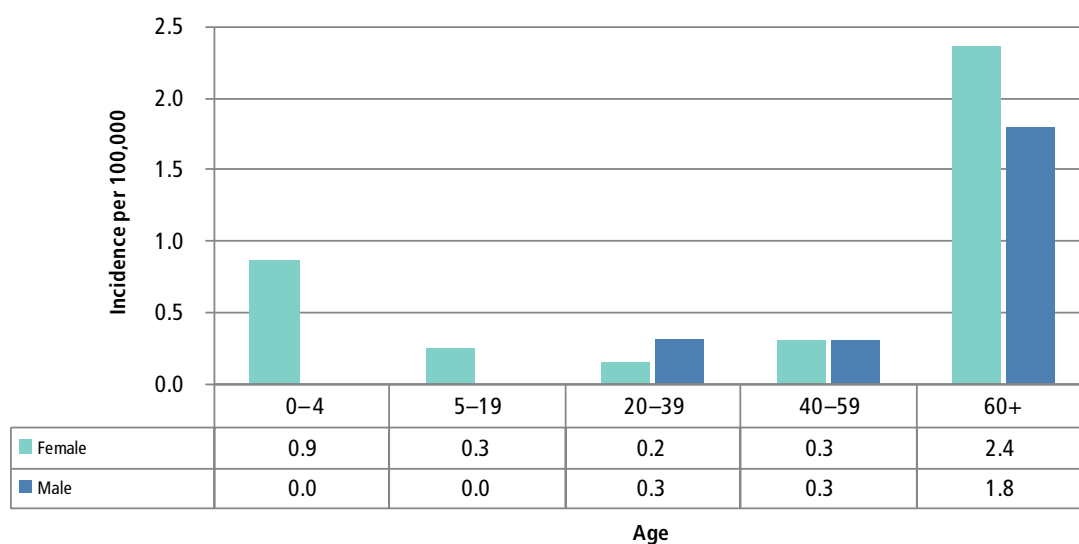


Figure 20: Incidence per 100,000 of listeriosis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 21: Incidence per 100,000 of listeriosis by age and sex, Ottawa, 2006–2010 (5-year incidence)



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

## Exposure source for reported cases of listeriosis

The exposure source for listeriosis is often unknown, as the disease has an incubation of 3 to 70 days—often long after people can recall what they ate. For 2010, one exposure was unknown. The source of infection for the mother who transmitted listeriosis to her child before birth was not known.



## Total cases: 1

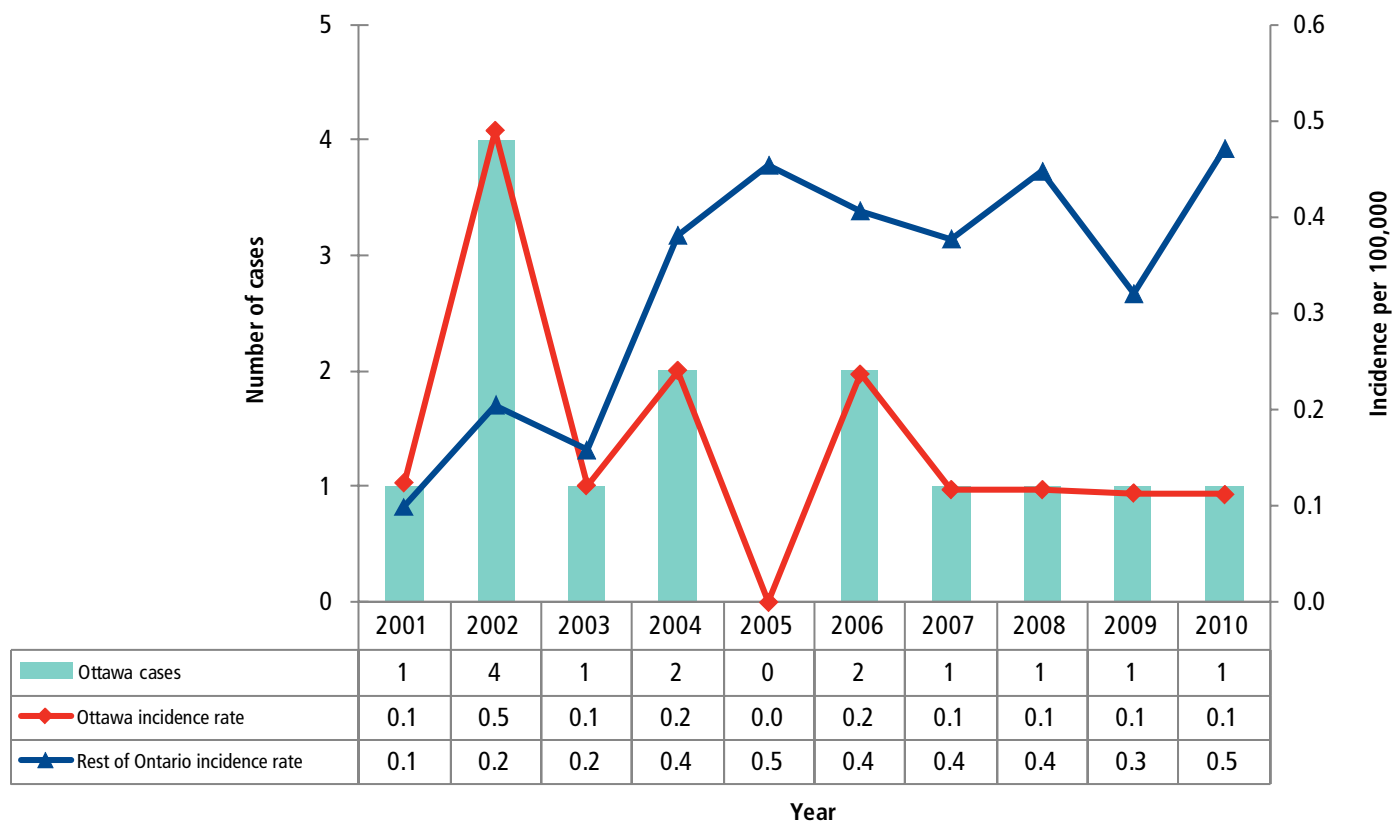
There are few cases of *Salmonella paratyphi* reported in Ottawa and infection is always associated with travel to a country outside of North America.

**Table 12: 2010 summary for paratyphoid fever**

|                         | 2010 | 5-year mean<br>(2005–2009)   |
|-------------------------|------|------------------------------|
| Number of cases         | 1    | 1                            |
| Incidence (per 100,000) |      |                              |
| Total                   | 0.1  | 0.1                          |
| Female                  | 0.0  | 0.1                          |
| Male                    | 0.2  | 0.1                          |
|                         |      | 5-year period<br>(2005–2009) |
| Age at illness (years)  |      |                              |
| Mean                    | 34.9 | 29.9                         |
| Median                  | 34.9 | 29.9                         |
| Range                   | –    | 5.2–66.5                     |

# Paratyphoid fever

Figure 22: Incidence per 100,000 of paratyphoid fever by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

## Exposure source for reported cases of paratyphoid fever

Paratyphoid fever is typically acquired while travelling outside of Canada in countries where uncontaminated food and water are not always available. Since 2005, the countries where paratyphoid fever was probably acquired are: India, Bangladesh and Pakistan.



### Total cases: 176

At several points during 2010, there were significantly more salmonellosis cases than in 2009 during the same period. The mean age of cases was 31.8 years of age although the incidence is highest among 0–4 year olds.

In June 2010, Ottawa Public Health investigated an outbreak of *Salmonella typhimurium*. Nine young adults who frequented the same shawarma restaurant late at night or early in the morning contracted the disease. They ranged from 19 to 26 years of age with a median age of 21 years; five were female and four were male. One person required hospitalization.

There were several Ontario enhanced surveillance directives reported for salmonellosis during 2010. These directives are issued when the Ministry of Health and Long-Term Care identifies a significant cluster or increase in salmonellosis. These directives were issued for *S. enteritidis*, *S. oranienburg*, *S. heidelberg* and *S. newport*.

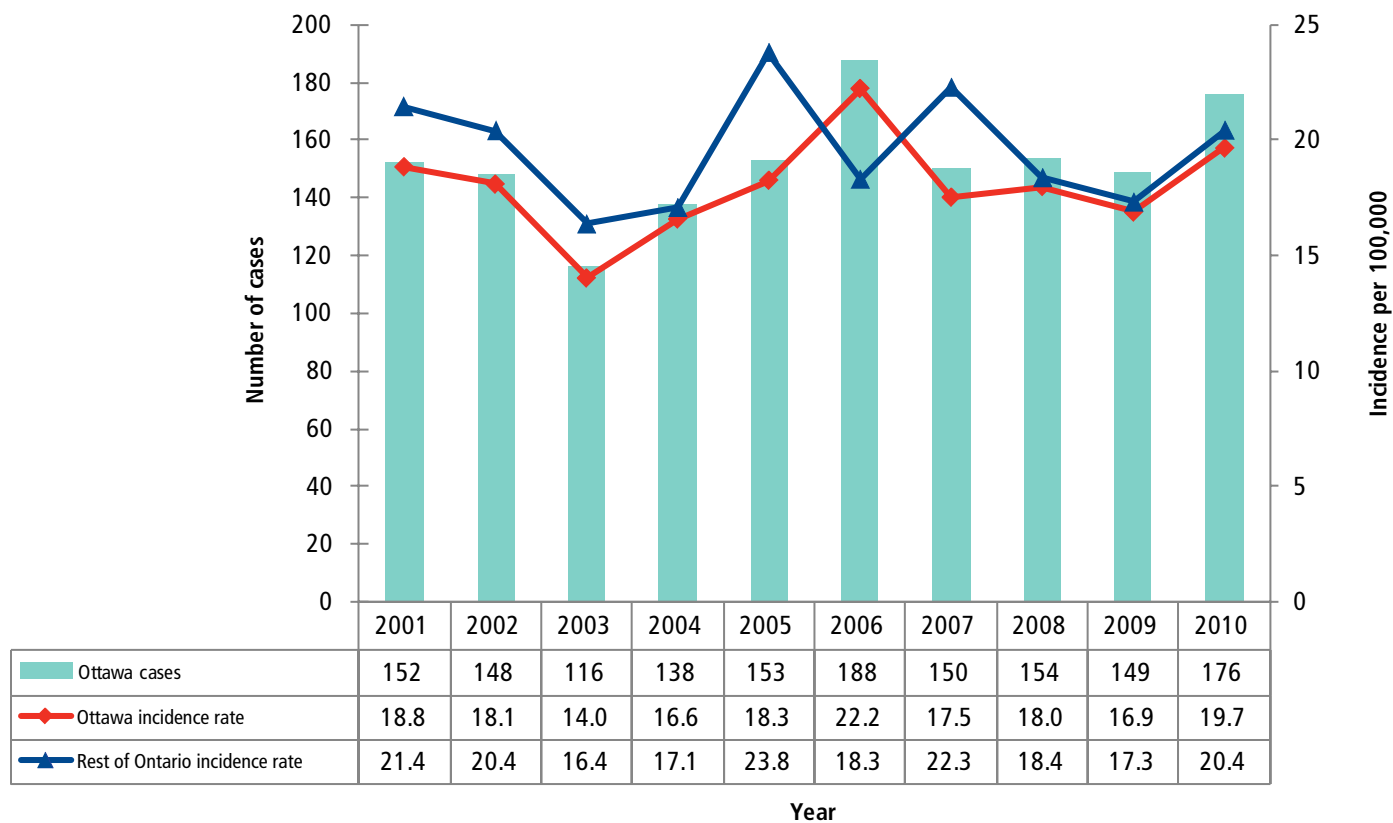
Of the 49 people who contracted salmonellosis outside of Canada, 29 (59.2%) reported acquiring the disease at all-inclusive resorts in the Caribbean/Mexico.

Chicken and eggs were the most commonly reported exposure among food items (47.7% of all reported food items). Reptiles were the most commonly reported exposure among animal sources (33% of all reported source animals).

**Table 13: 2010 summary for salmonellosis**

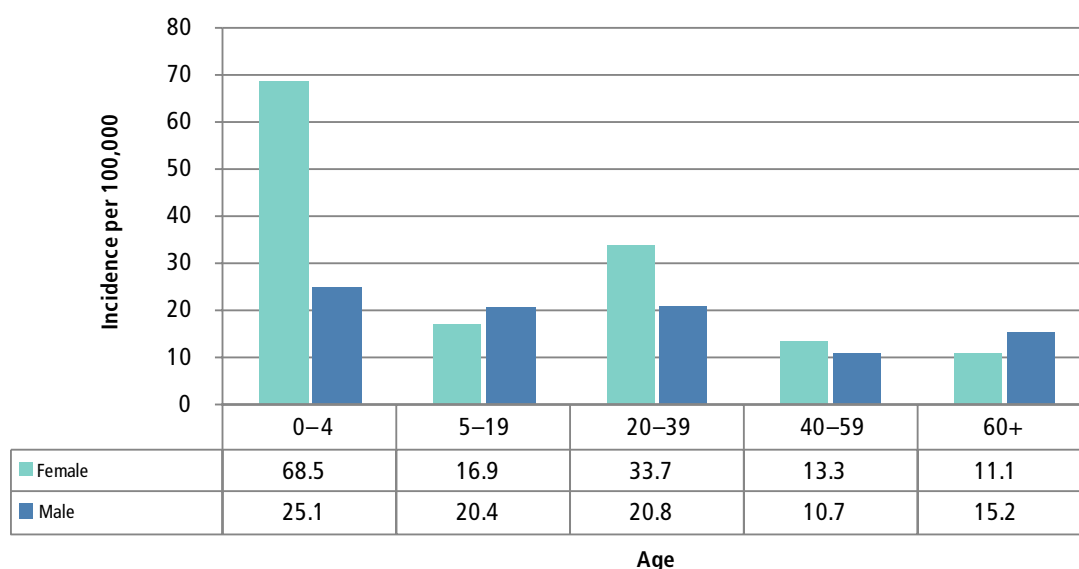
|                         | 2010    | 5-year mean<br>(2005–2009)   |
|-------------------------|---------|------------------------------|
| Number of cases         | 176     | 158.8                        |
| Incidence (per 100,000) |         |                              |
| Total                   | 19.7    | 18.6                         |
| Female                  | 22.2    | 18.4                         |
| Male                    | 17.0    | 18.6                         |
|                         |         | 5-year period<br>(2005–2009) |
| Age at illness (years)  |         |                              |
| Mean                    | 31.8    | 31.4                         |
| Median                  | 29.0    | 26.6                         |
| Range                   | <1–84.8 | <1–88.4                      |

Figure 23: Incidence per 100,000 of salmonellosis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

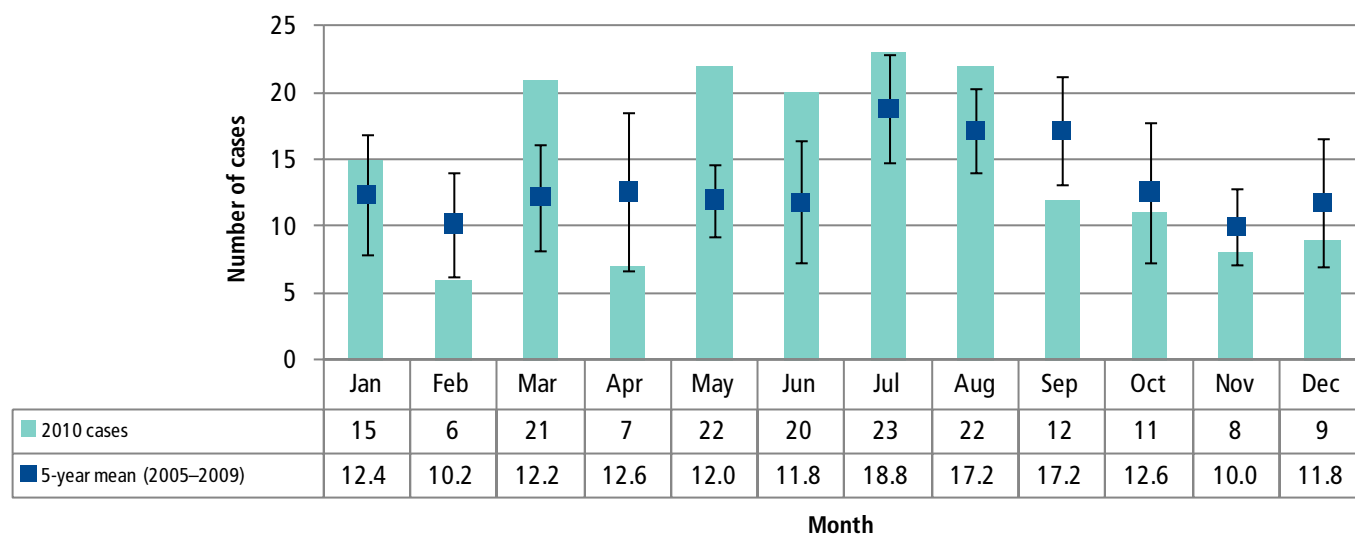
Figure 24: Incidence per 100,000 of salmonellosis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Salmonellosis

Figure 25: Number of reported cases of salmonellosis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 14: Reported cases of salmonellosis by serotype, Ottawa, 2010 and 5-year average (2005–2009)

| 2010 Rank | Serotype                      | Reported cases 2010 (% of total cases) | Mean reported cases 2005–2009 (% of total) | 2005–2009 Rank |
|-----------|-------------------------------|----------------------------------------|--------------------------------------------|----------------|
| 1         | <i>Salmonella enteritidis</i> | 66 (37.5)                              | 35 (21.9)                                  | 2              |
| 2         | <i>Salmonella typhimurium</i> | 24 (13.6)                              | 15 (9.5)                                   | 3              |
| 3         | <i>Salmonella heidelberg</i>  | 16 (9.1)                               | 15 (9.5)                                   | 3              |
| 4         | <i>Salmonella unspecified</i> | 8 (4.5)                                | 50 (31.7)                                  | 1              |
| 5         | <i>Salmonella saintpaul</i>   | 5 (2.8)                                | 3 (1.8)                                    | 8              |
| 6         | <i>Salmonella havana</i>      | 4 (2.3)                                | <1 (0.1)                                   | 29             |
| 6         | <i>Salmonella infantis</i>    | 4 (2.3)                                | 3 (1.9)                                    | 7              |
| 6         | <i>Salmonella newport</i>     | 4 (2.3)                                | 2 (1.4)                                    | 10             |
| 9         | <i>Salmonella brandenburg</i> | 3 (1.7)                                | –                                          | –              |
| 9         | <i>Salmonella mississippi</i> | 3 (1.7)                                | <1 (0.1)                                   | 29             |
| 9         | <i>Salmonella virchow</i>     | 3 (1.7)                                | 1 (0.5)                                    | 21             |
| 9         | <i>Salmonella bareilly</i>    | 3 (1.7)                                | –                                          | –              |

**Table 15: Exposure source for reported cases of salmonellosis, Ottawa, 2010**

| Reported exposure             | Number of cases* | % of total reported exposures |
|-------------------------------|------------------|-------------------------------|
| Foodborne                     | 86               | 48.9                          |
| Animal to person              | 12               | 6.8                           |
| Person to person              | 3                | 1.7                           |
| Waterborne—recreational water | 2                | 1.1                           |
| Item to person                | 1                | 0.6                           |
| Unknown                       | 72               | 40.9                          |
| <b>TOTAL</b>                  | <b>176</b>       |                               |

\* Cases may report more than one possible exposure

**Table 16: Exposure setting for reported cases of salmonellosis, 2010**

| Reported exposure setting | Number of cases* | % of total reported exposure settings |
|---------------------------|------------------|---------------------------------------|
| Travel—outside of Canada  | 49               | 27.8                                  |
| Private home              | 37               | 21.0                                  |
| Restaurant                | 37               | 21.0                                  |
| Store—grocery store       | 6                | 3.4                                   |
| Travel—within Canada      | 3                | 1.7                                   |
| Other                     | 3                | 1.7                                   |
| Institutional             | 2                | 1.1                                   |
| Farm                      | 1                | 0.6                                   |
| Farmer's market           | 1                | 0.6                                   |
| Petting zoo               | 1                | 0.6                                   |
| Store—convenience store   | 1                | 0.6                                   |
| Unknown                   | 34               | 19.3                                  |
| <b>Total</b>              | <b>176</b>       |                                       |

\* Cases may report more than one possible exposure

## Number of cases: 15

The incidence of shigellosis has been stable since 2003. The exceptionally high number of shigellosis cases in 2002 (Figure 26) was a result of an outbreak of *Shigella sonnei* that was linked to Greek pasta salad. Most cases of the outbreak occurred in Ottawa.

The infection rate is highest in children under age five and the mean age of all reported cases is low (34.1 years). Most cases of shigellosis (80%) in Ottawa are caused by *Shigella sonnei*.

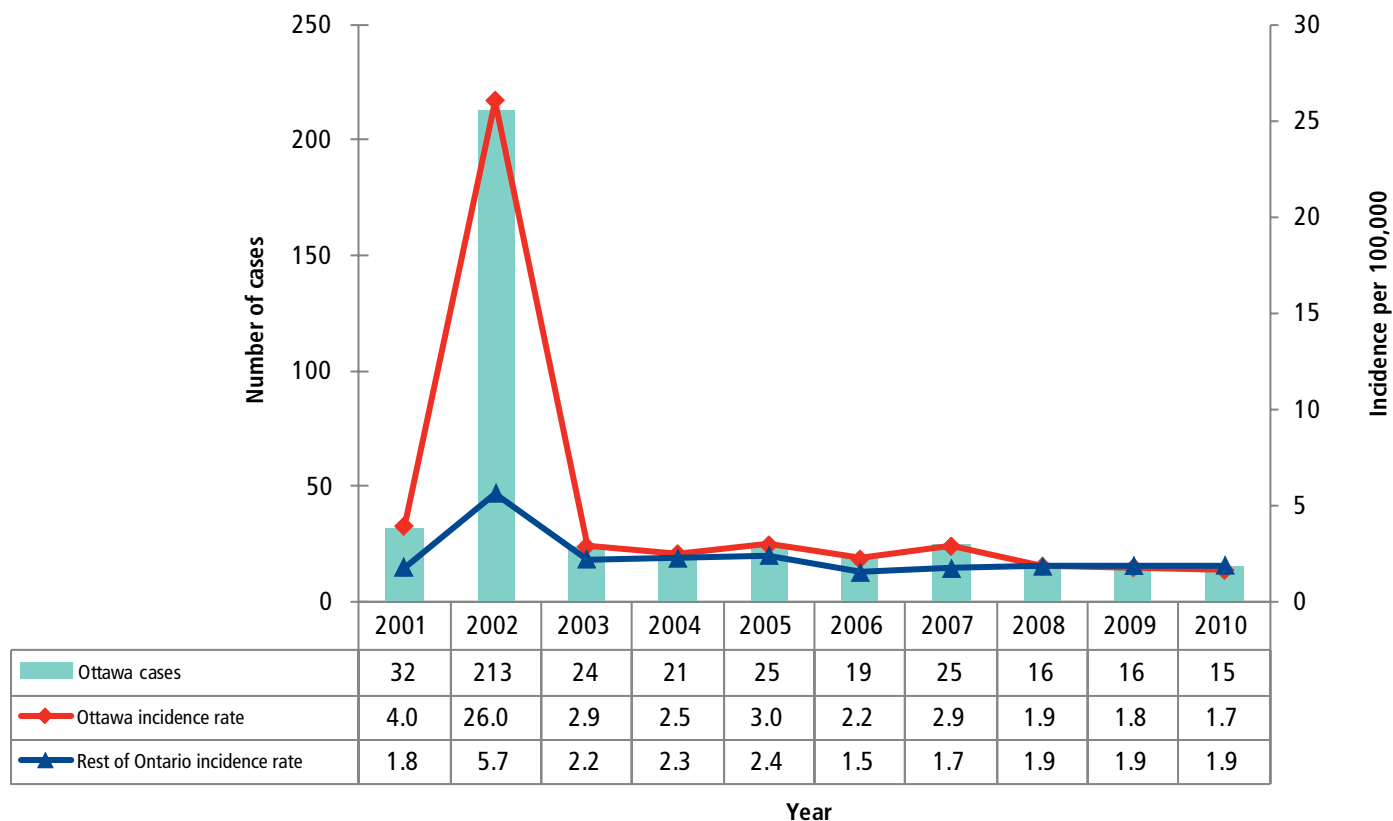
Travel outside of Canada is the most commonly reported exposure setting for shigellosis (72%).

**Table 17: 2010 summary for shigellosis**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 15       | 20.2                         |
| Incidence (per 100,000) |          |                              |
| Total                   | 1.7      | 2.4                          |
| Female                  | 1.5      | 2.3                          |
| Male                    | 1.8      | 2.4                          |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 34.1     | 33.4                         |
| Median                  | 29.2     | 34.2                         |
| Range                   | 3.3–74.9 | <1–86.9                      |

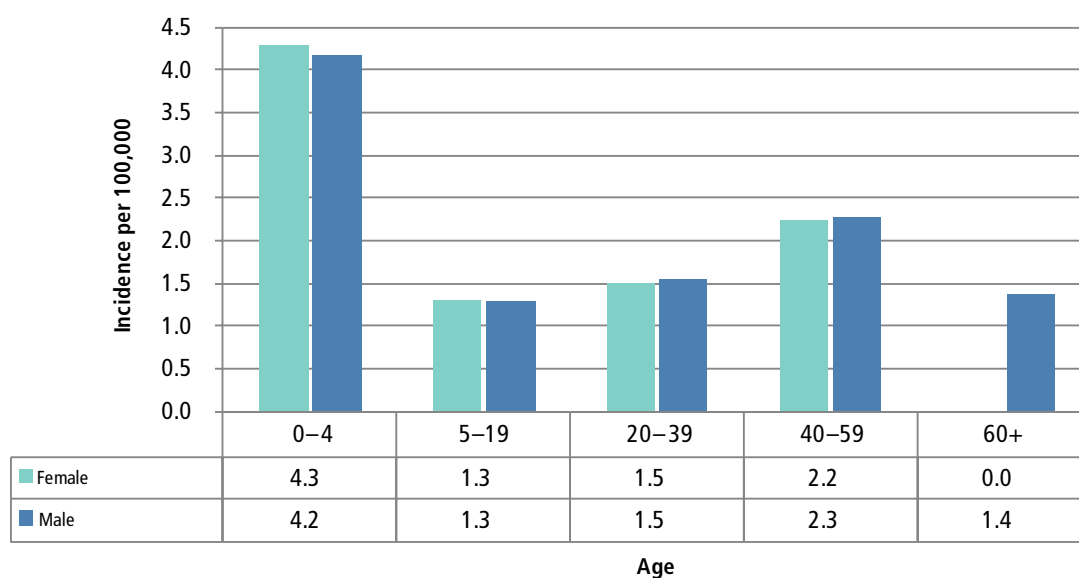
# Shigellosis

Figure 26: Incidence per 100,000 of shigellosis by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

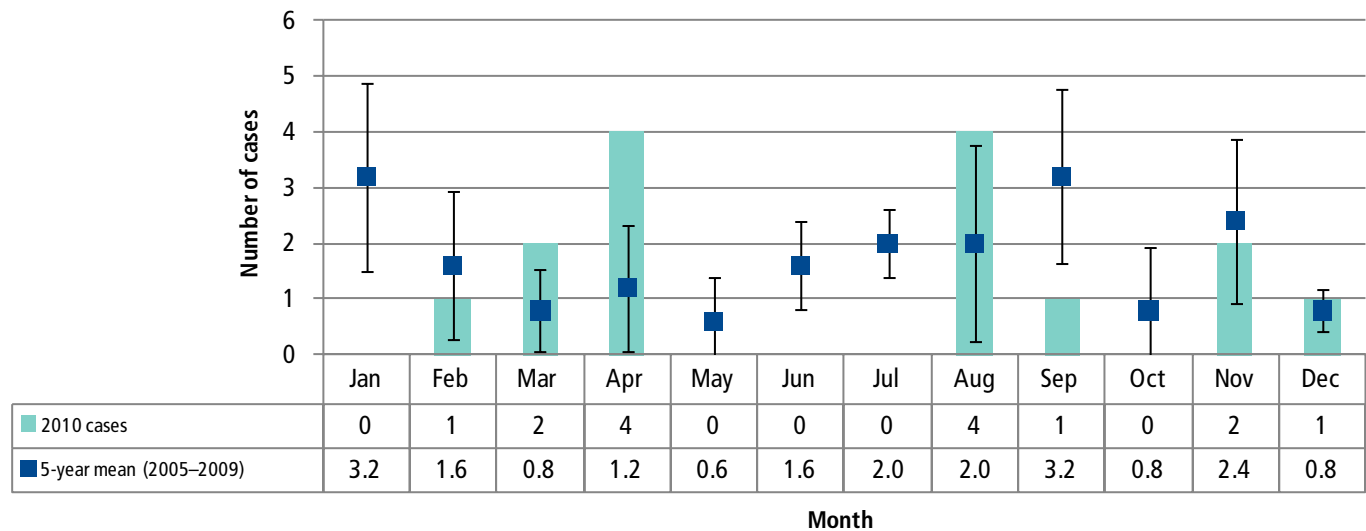
Figure 27: Incidence per 100,000 of shigellosis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Shigellosis

Figure 28: Number of reported cases of shigellosis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 18: Number of reported cases of shigellosis by agent, Ottawa, 2010 and 5-year mean (2005–2009)

|                             | 2010 cases | % 2010 cases | 2005–2009 mean | 2005–2009 mean % |
|-----------------------------|------------|--------------|----------------|------------------|
| <i>Shigella sonnei</i>      | 12         | 80.0         | 9.8            | 48.5             |
| <i>Shigella dysenteriae</i> | 2          | 13.3         | 0.6            | 3.0              |
| <i>Shigella flexneri</i>    | 1          | 6.7          | 4.6            | 22.8             |
| <i>Shigella boydii</i>      | 0          | 0.0          | 1.0            | 5.0              |
| <i>Shigella unspecified</i> | 0          | 0.0          | 4.2            | 20.8             |
| <b>Total</b>                | <b>15</b>  |              | <b>101</b>     |                  |

**Table 19: Exposure source for reported cases of shigellosis, Ottawa, 2010**

| Reported exposure        | Number of cases* | % of total reported exposures |
|--------------------------|------------------|-------------------------------|
| Foodborne                | 2                | 11.1                          |
| Water—recreational water | 1                | 5.6                           |
| Unknown                  | 15               | 83.3                          |
| <b>Total</b>             | <b>18</b>        |                               |

\* Cases may report more than one possible exposure

**Table 20: Exposure setting for reported cases of shigellosis, 2010**

| Reported exposure setting | Number of cases* | % of total reported exposure settings |
|---------------------------|------------------|---------------------------------------|
| Travel—outside of Canada  | 13               | 72.2                                  |
| Restaurant                | 2                | 11.1                                  |
| Travel—within Ontario     | 1                | 5.6                                   |
| Unknown                   | 2                | 11.1                                  |
| <b>Total</b>              | <b>18</b>        |                                       |

\* Cases may report more than one possible exposure



## Number of cases: 3

There is less typhoid fever in Ottawa (0.3/100,000) than in the rest of Ontario (0.7/100,000).

Typhoid fever is most common in 20–39 year olds, who are more likely to travel.

Typically, people who contract typhoid fever have recently travelled to a country outside of North America where uncontaminated water and food were not always available. One non-travel related case of typhoid fever was reported in December 2010. The exposure source was not identified.

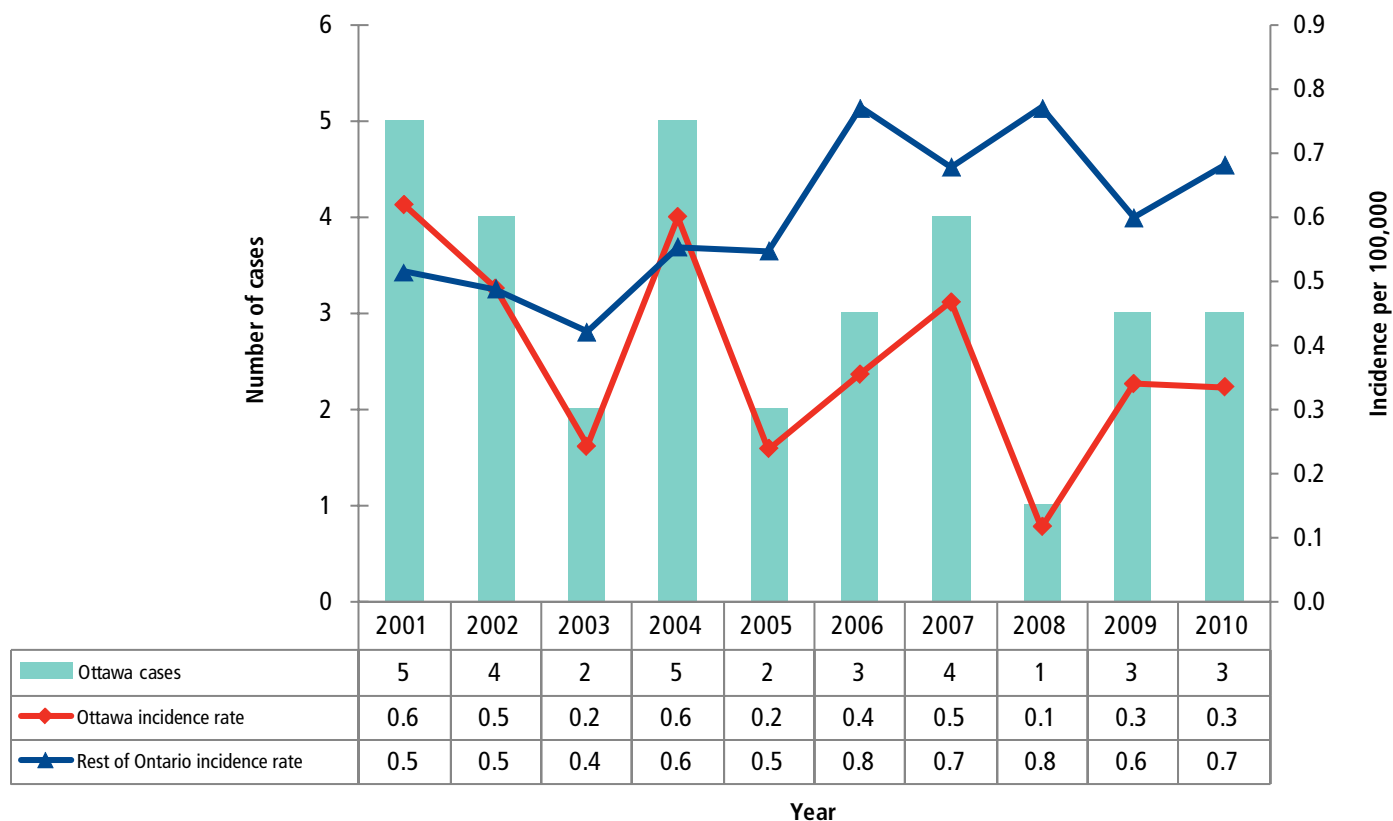
**Table 21: 2010 summary for typhoid fever**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 3        | 2.6                          |
| Incidence (per 100,000) |          |                              |
| Total                   | 0.3      | 0.3                          |
| Female                  | 0.4      | 0.2                          |
| Male                    | 1.2      | 0.4                          |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 27.3     | 28.3                         |
| Median                  | 20.7     | 27.4                         |
| Range                   | 9.2–52.2 | 10.4–48.5                    |



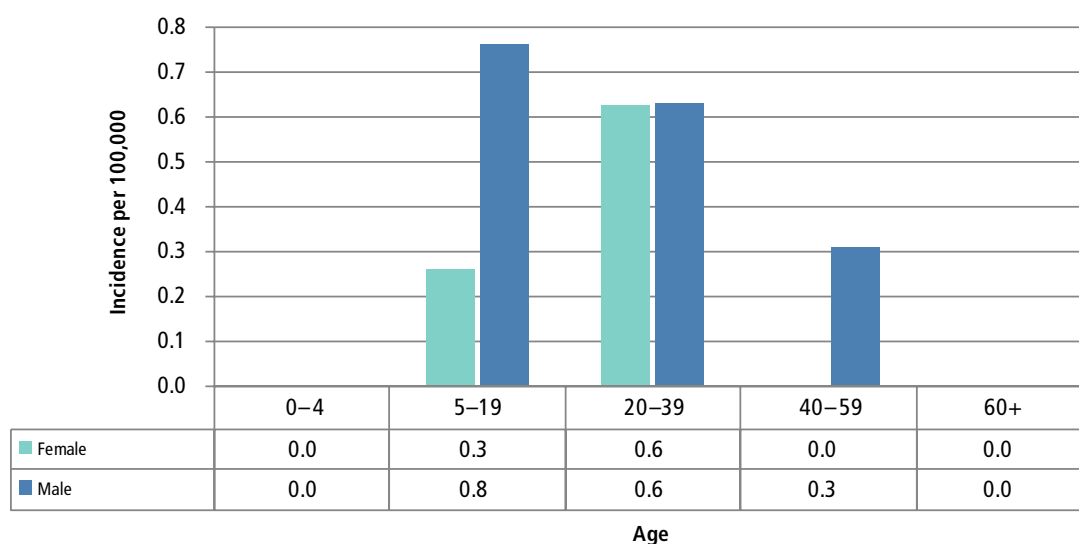
# Typhoid fever

Figure 29: Incidence per 100,000 of typhoid fever by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 30: Incidence per 100,000 of typhoid fever by age and sex, Ottawa, 2006–2010 (5-year incidence)



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

**Table 22: Exposure source for reported cases of typhoid fever, Ottawa, 2010**

| Reported exposure source | Number of cases* | % of total reported exposures |
|--------------------------|------------------|-------------------------------|
| Unknown                  | 3                | 100.0                         |
| <b>Total</b>             | <b>3</b>         |                               |

\* Cases may report more than one possible exposure

**Table 23: Exposure setting for reported cases of typhoid fever, 2010**

| Reported exposure setting | Number of cases* | % of total reported exposure settings |
|---------------------------|------------------|---------------------------------------|
| Travel—outside of Canada  | 2                | 66.6                                  |
| Unknown                   | 1                | 33.3                                  |
| <b>Total</b>              | <b>3</b>         |                                       |

\* Cases may report more than one possible exposure



## Number of cases: 5

The incidence of verotoxin-producing *E. coli* (VTEC) has been decreasing in Ottawa and the rest of Ontario since 2002. Infection with *E. coli* (VTEC) is most common in children under age five and the mean age of all reported cases is low (11.9 years).

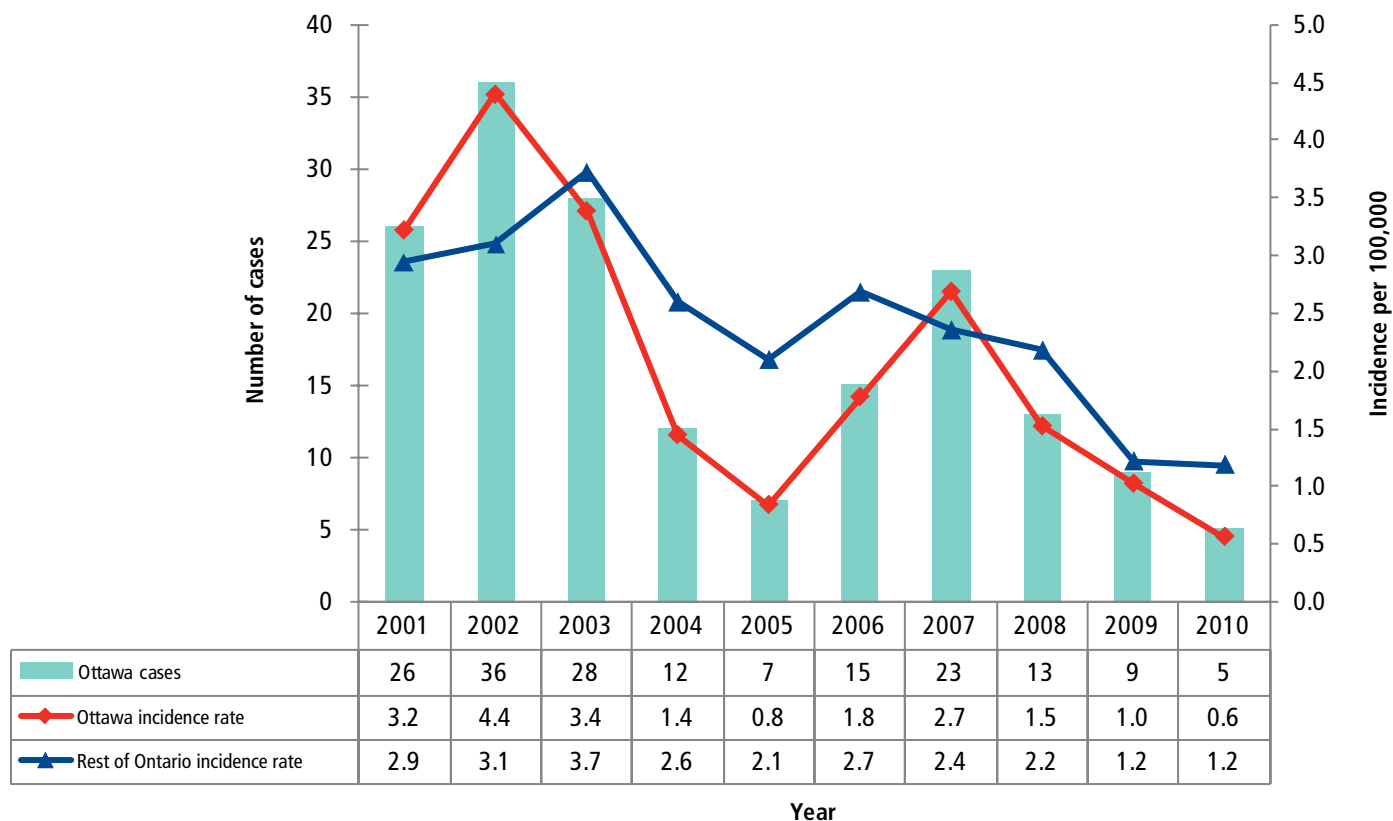
VTEC occurs seasonally and typically peaks in August.

**Table 24: 2010 summary for verotoxin-producing *E. coli* (VTEC)**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 5        | 13.4                         |
| Incidence (per 100,000) |          |                              |
| Total                   | 0.6      | 1.6                          |
| Female                  | 0.7      | 1.9                          |
| Male                    | 0.4      | 1.2                          |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 11.9     | 27.1                         |
| Median                  | 8.1      | 19.9                         |
| Range                   | 1.1–32.5 | <1–84.8                      |

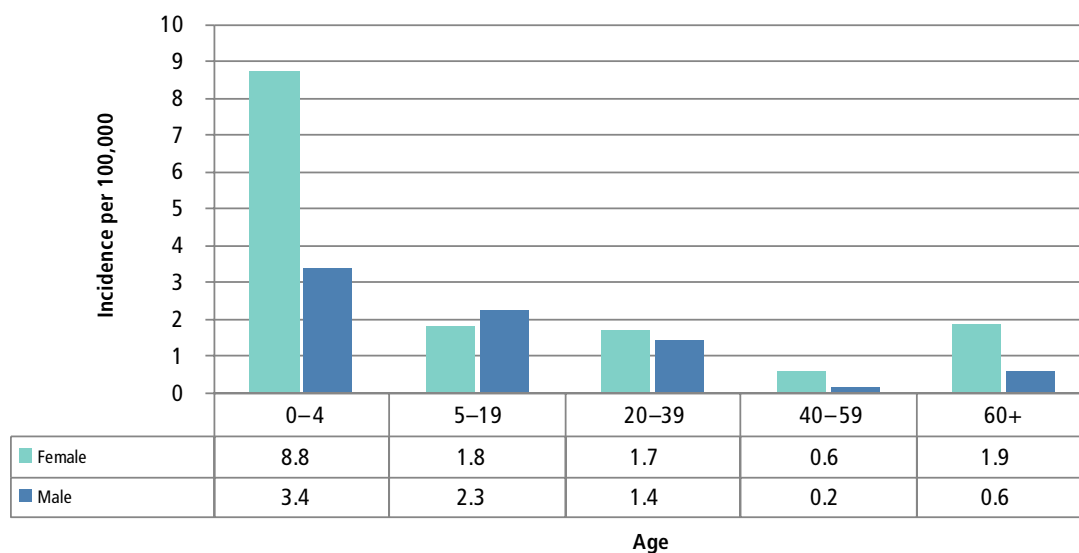
# Verotoxin-producing *E. coli*

Figure 31: Incidence per 100,000 of verotoxin-producing *E. coli* by year, Ottawa and the rest of Ontario, 2001–2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

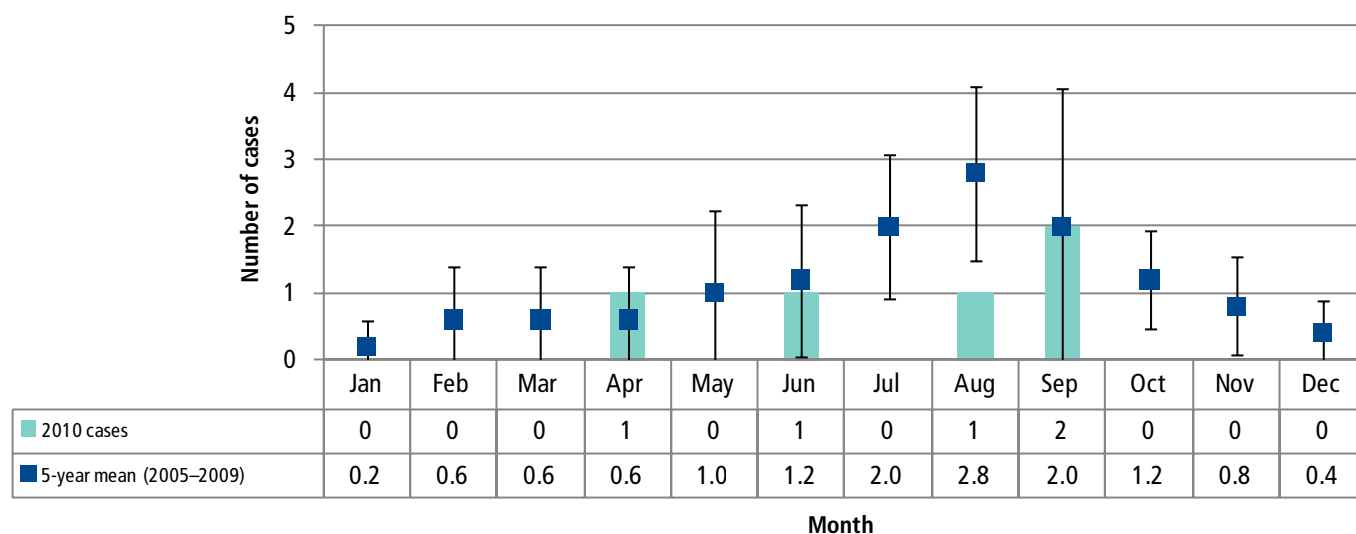
Figure 32: Incidence per 100,000 of verotoxin-producing *E. coli* by age and sex, Ottawa, 2006–2010 (5-year mean)



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

# Verotoxin-producing *E. coli*

Figure 33: Number of reported cases of verotoxin-producing *E. coli* by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 25: Exposure source for reported cases of verotoxin-producing *E. coli*, Ottawa, 2010

| Reported exposure        | Number of cases* | % of total reported exposures |
|--------------------------|------------------|-------------------------------|
| Water—recreational water | 1                | 20                            |
| Person to person         | 1                | 20                            |
| Unknown                  | 3                | 60                            |
| <b>Total</b>             | <b>5</b>         |                               |

\* Cases may report more than one possible exposure

Table 26: Exposure setting for reported cases of verotoxin-producing *E. coli*, 2010

| Reported exposure setting | Number of cases* | % of total reported exposure settings |
|---------------------------|------------------|---------------------------------------|
| Farmers' market           | 1                | 20                                    |
| Private home              | 1                | 20                                    |
| Travel—within Canada      | 1                | 20                                    |
| Unknown                   | 2                | 40                                    |
| <b>Total</b>              | <b>5</b>         |                                       |

\* Cases may report more than one possible exposure



### Number of cases: 21

For 2010, Ottawa had the highest number of cases of yersiniosis in 10 years. This increase is likely the result of a local cluster. Five confirmed cases were linked to the same exposure, a local meat premises. Cases reported buying meat directly from the premises or from a secondary retailer that resold its products. A specific type of sausage was referenced by three cases. Onset dates ranged between August and December 2010. The people affected ranged in age from 1 to 56 years.

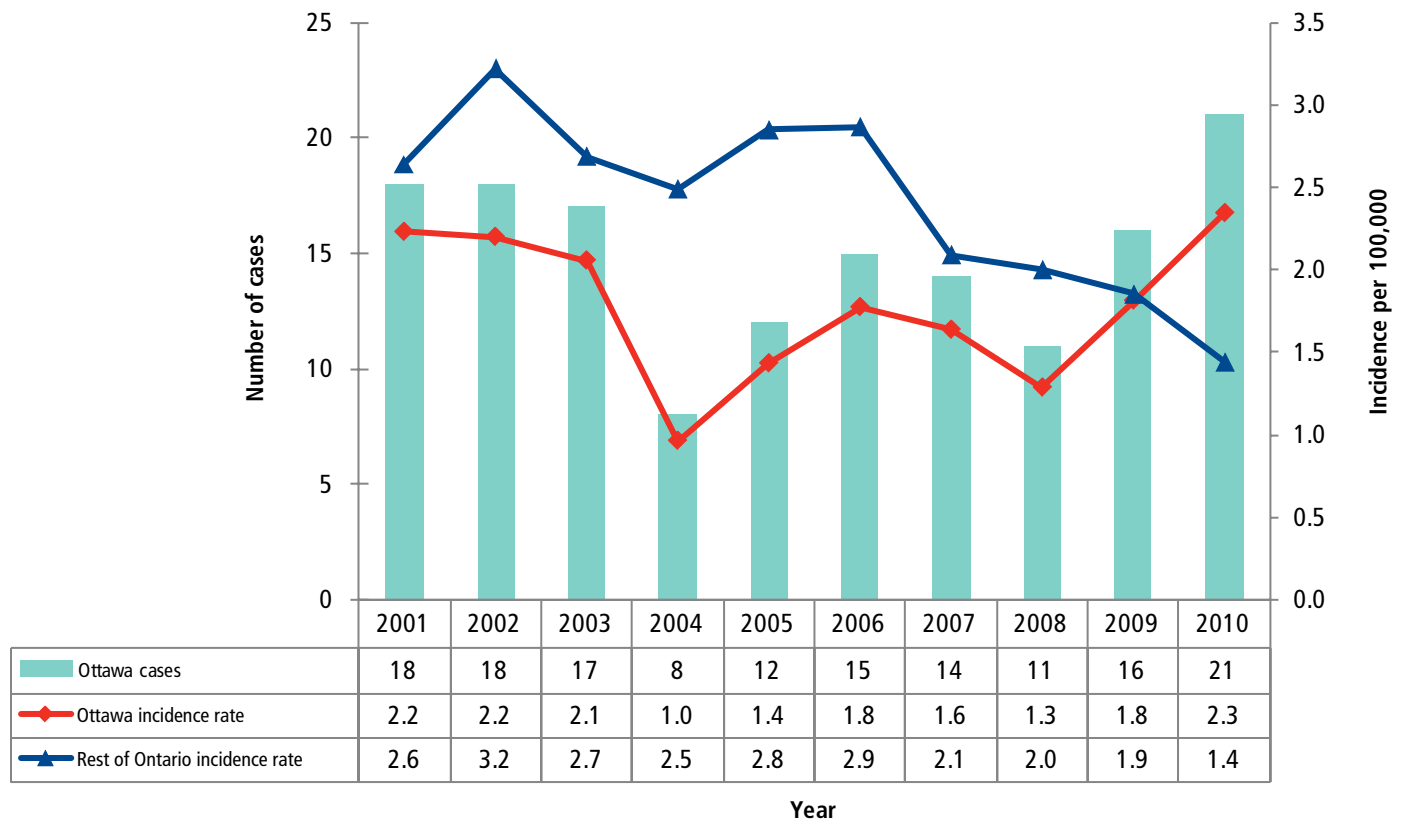
Most (92%) of all Ottawa cases reported that their likely exposure source was meat, typically pork products.

**Table 27: 2010 summary for yersiniosis**

|                         | 2010     | 5-year mean<br>(2005–2009)   |
|-------------------------|----------|------------------------------|
| Number of cases         | 21       | 13.6                         |
| Incidence (per 100,000) |          |                              |
| Total                   | 2.3      | 1.6                          |
| Female                  | 1.7      | 1.6                          |
| Male                    | 3.0      | 1.6                          |
|                         |          | 5-year period<br>(2005–2009) |
| Age at illness (years)  |          |                              |
| Mean                    | 31.0     | 27.5                         |
| Median                  | 24.4     | 26.2                         |
| Range                   | 1.8–64.8 | <1–86.3                      |

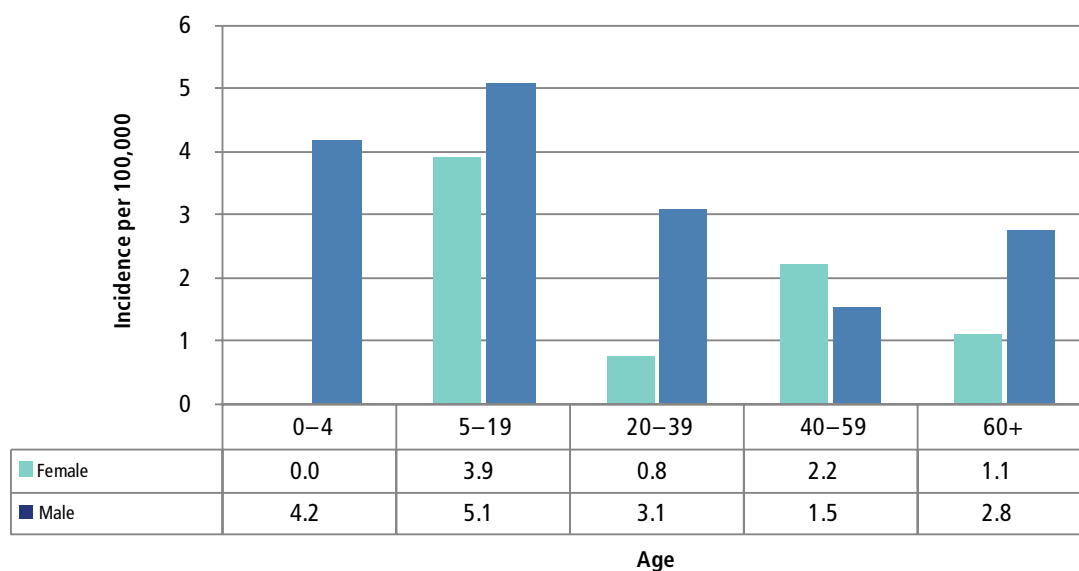


Figure 34: Incidence per 100,000 of yersiniosis by year, Ottawa and the rest of Ontario, 2001–2010



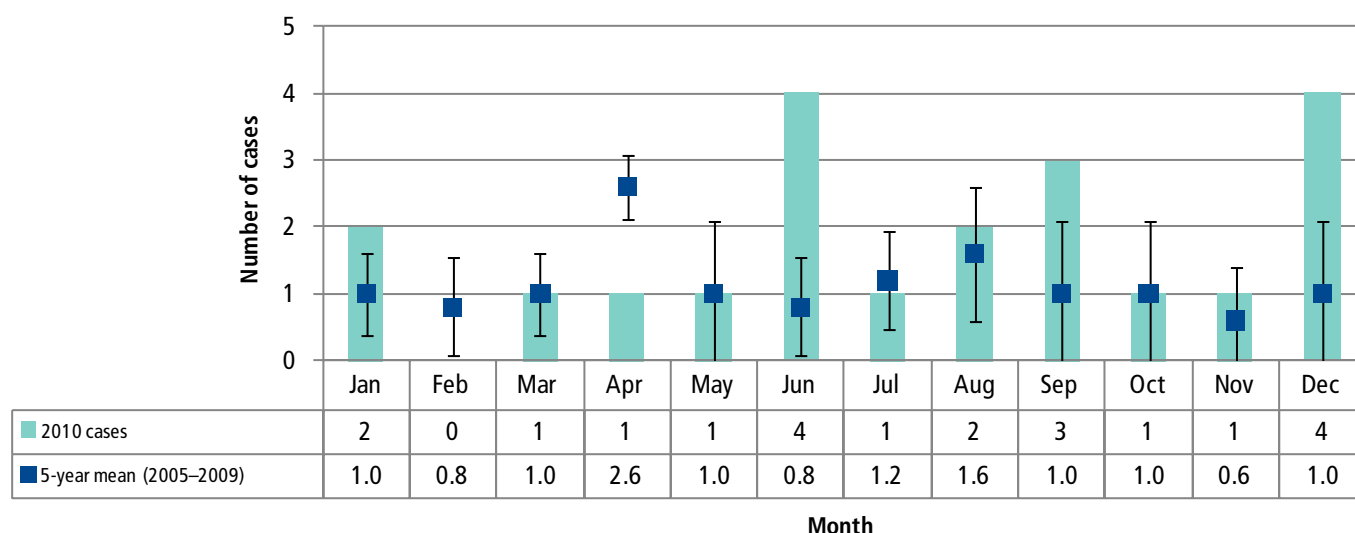
Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 35: Incidence per 100,000 of yersiniosis by age and sex, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Figure 36: Number of reported cases of yersiniosis by month, Ottawa, 2010



Source: iPHIS, Ottawa Public Health, data extracted 20 May 2011

Table 28: Exposure source for reported cases of yersiniosis, Ottawa, 2010

| Reported exposure | Number of cases* | % of total reported exposures |
|-------------------|------------------|-------------------------------|
| Foodborne         | 12               | 92.3                          |
| Unknown           | 1                | 7.7                           |
| <b>Total</b>      | <b>13</b>        |                               |

\* Cases may report more than one possible exposure

Table 29: Exposure setting for reported cases of yersiniosis, 2010

| Reported exposure setting   | Number of cases* | % of total reported exposure settings |
|-----------------------------|------------------|---------------------------------------|
| Private home                | 4                | 30.8                                  |
| Processing plant—commissary | 3                | 23.1                                  |
| Butcher shop                | 2                | 15.4                                  |
| Restaurant                  | 2                | 15.4                                  |
| Deli                        | 1                | 7.7                                   |
| Unknown or missing          | 1                | 7.7                                   |
| <b>Total</b>                | <b>13</b>        |                                       |

\* Cases may report more than one possible exposure

**Age at illness**

The case's age at episode date

**Age range**

The youngest case age and the eldest case age within the reporting time period. When the minimum age is under the age of one year, the age is represented as "<1".

**Enteric**

Relating to or situated in the intestine

**Epidemiology**

The scientific and medical study of the causes and transmission of disease within a population

**Episode date**

Episode date is a calculated field and represents the earliest date of the following: date of onset of symptoms, laboratory specimen collection date, or date reported to public health.

**Five-year mean**

Total number of cases over a five-year time period divided by 5 (the number of years within the time period)

**Incidence per 100,000**

Total number of new cases reported with an episode date in the calendar year of report divided by the number of people residing in Ottawa according to the census projection of 2010

**Male incidence**

Total number of new male cases reported with an episode date in the calendar year of report divided by the number of males residing in Ottawa according to the census projection of 2010

**Female incidence**

Total number of new female cases reported with an episode date in the calendar year of report divided by the number of males residing in Ottawa according to the census projection of 2010

**Mean**

The average number of cases over a given time

**Median**

The point at which 50% of the data is above the point and 50% is below. This is a better measure of the central point of the data if the data are skewed.

**Number of cases**

Number of confirmed cases reported to Ottawa Public Health with an episode date in the calendar year of report

