





# **Shiga Toxin-Producing E. coli (STEC) Surveillance 2014-2018**

Rhode Island Department of Health

Division of Preparedness, Response, Infectious  
Disease and Emergency Medical Services

Center for Acute Infectious Disease Epidemiology



# About STEC

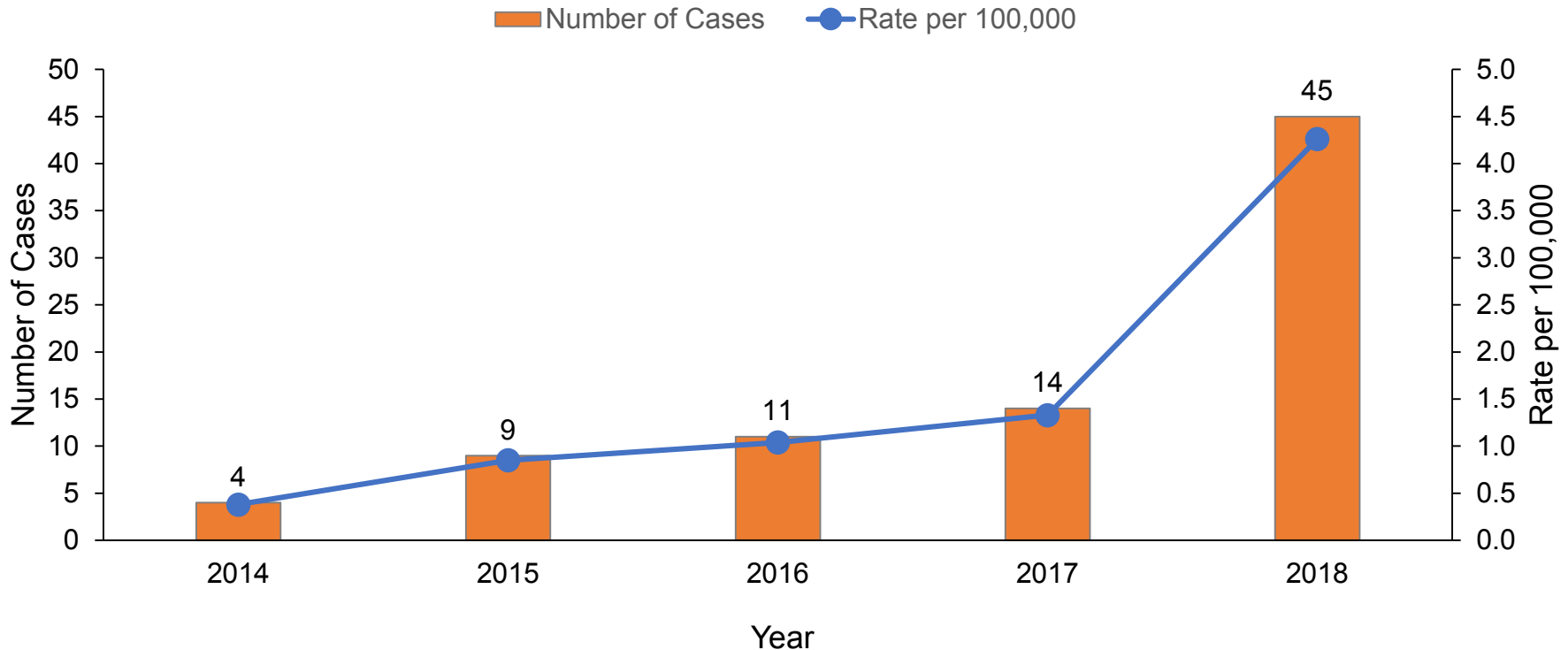
- Shiga-toxin producing E. coli (STEC) is an infection caused by certain strains of E. coli bacteria.
- STEC can be contracted through the fecal-oral route, through the ingestion of contaminated food or water, and through contact with animals.
- Symptoms of STEC often include severe stomach cramps, diarrhea (often bloody), and vomiting. If there is fever, it usually is not very high (less than 101°F). Symptoms begin 1-10 days (typically 3-4 days) after exposure and most people feel better within 5-7 days. Some infections are very mild, but others are severe or even life-threatening.
- There are approximately 265,000 cases of STEC infections each year in the United States.



# Data Overview, STEC

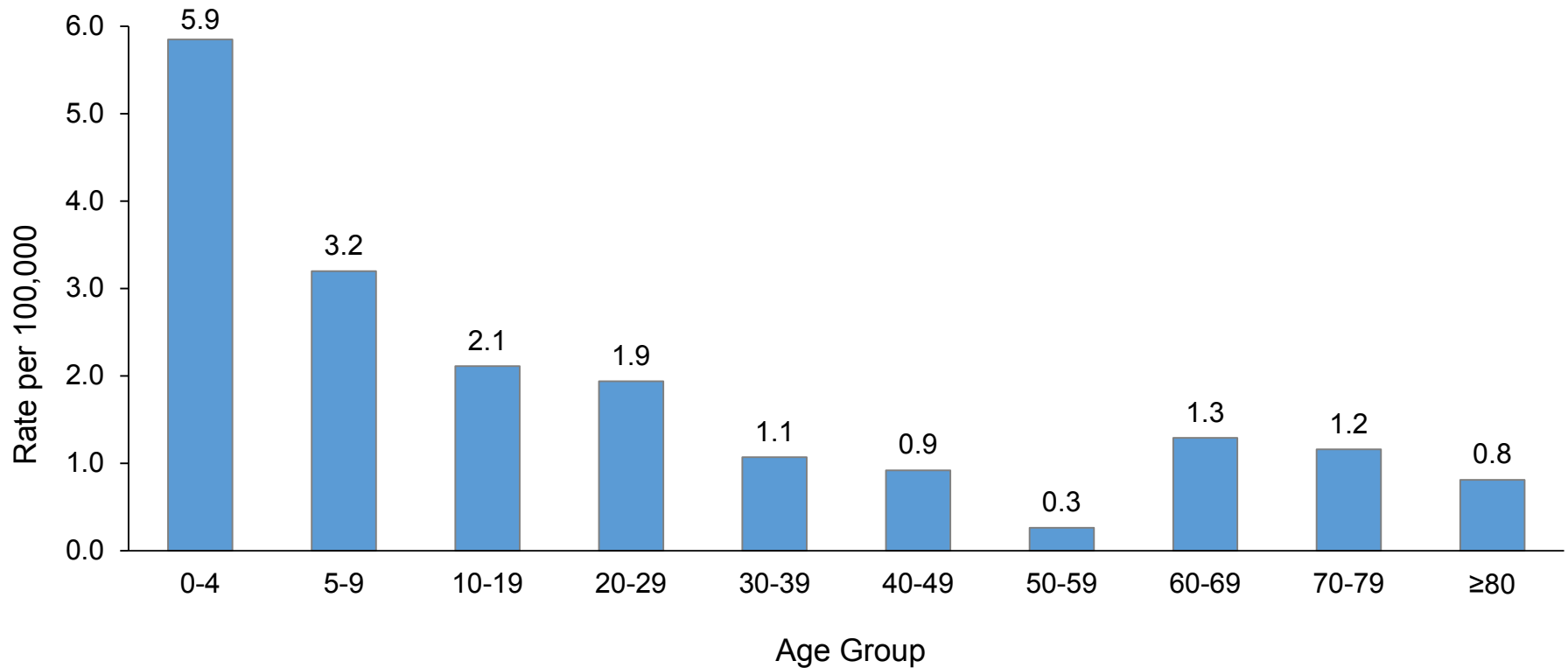
- In 2018, there were 45 cases of STEC reported in Rhode Island for a rate of 4.3 cases per 100,000 people.
- Rhode Island's rate of STEC has steadily increased from 2014 to 2018; however the increasing use of non-culture testing methods is likely influencing this trend. A change in the STEC case definition to include individuals diagnosed using these testing methods explains the dramatic increase observed in 2018 compared to prior years.
- Consistent with national-level data, the high rates of STEC were observed among children less than 5 years old, and reports of STEC peaked during the summer and early fall months.
- Rhode Island has low case counts of STEC infection. In order to ensure patient privacy, data from 2014-2018 have been combined or averaged for analysis by age group, sex, county, and month of infection.

# Reported Cases of STEC, Rhode Island, 2014-2018



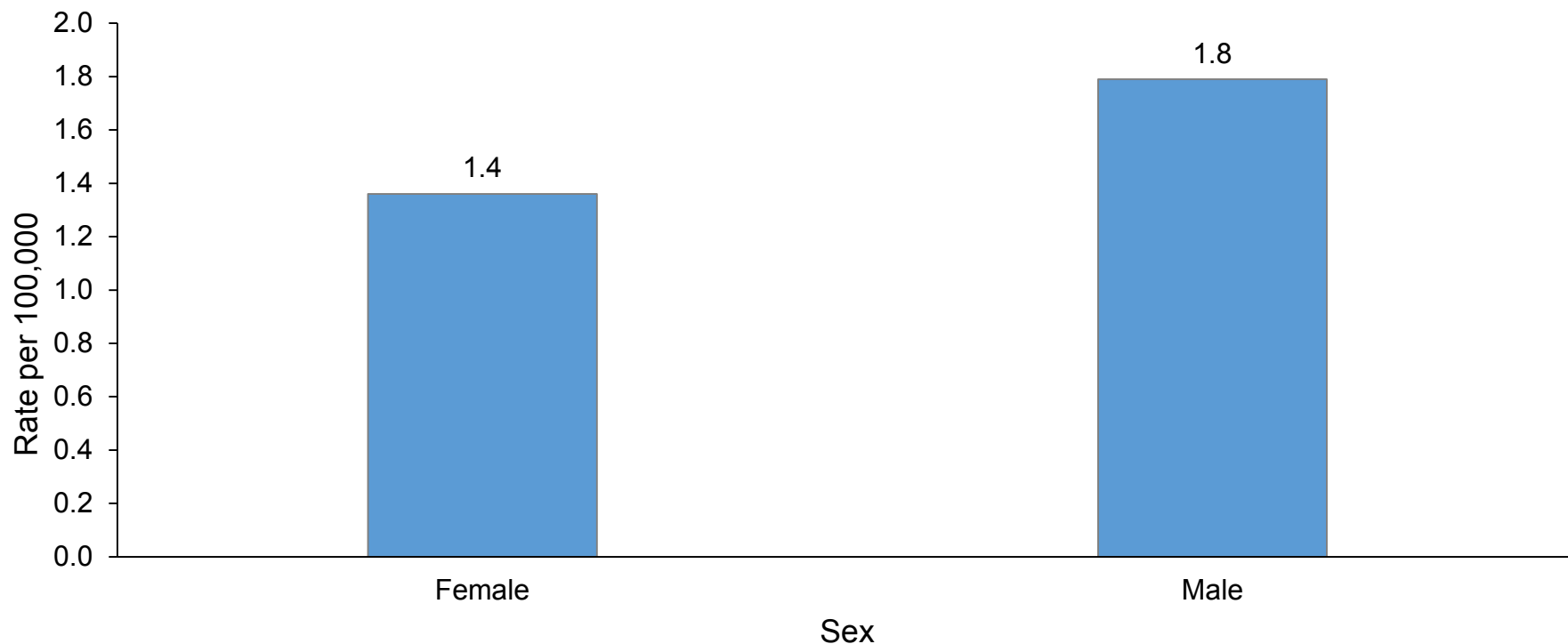
**Figure 1:** Rhode Island’s incidence rate of STEC has increased each year from 2014 to 2018, and a dramatic increase was observed in 2018. This trend is likely influenced by the increasing use of non-culture testing methods in recent years. These types of tests detect Shiga toxin, but do not differentiate between O157 and non-O157 STEC, which often leads to laboratories performing a reflex culture and being more likely to confirm an infection. The STEC case definition was also modified in 2018 to include individuals diagnosed using these testing methods, which explains the dramatic increase observed in 2018.

# 5-Year Average Rate of STEC, Age Group, Rhode Island, 2014-2018



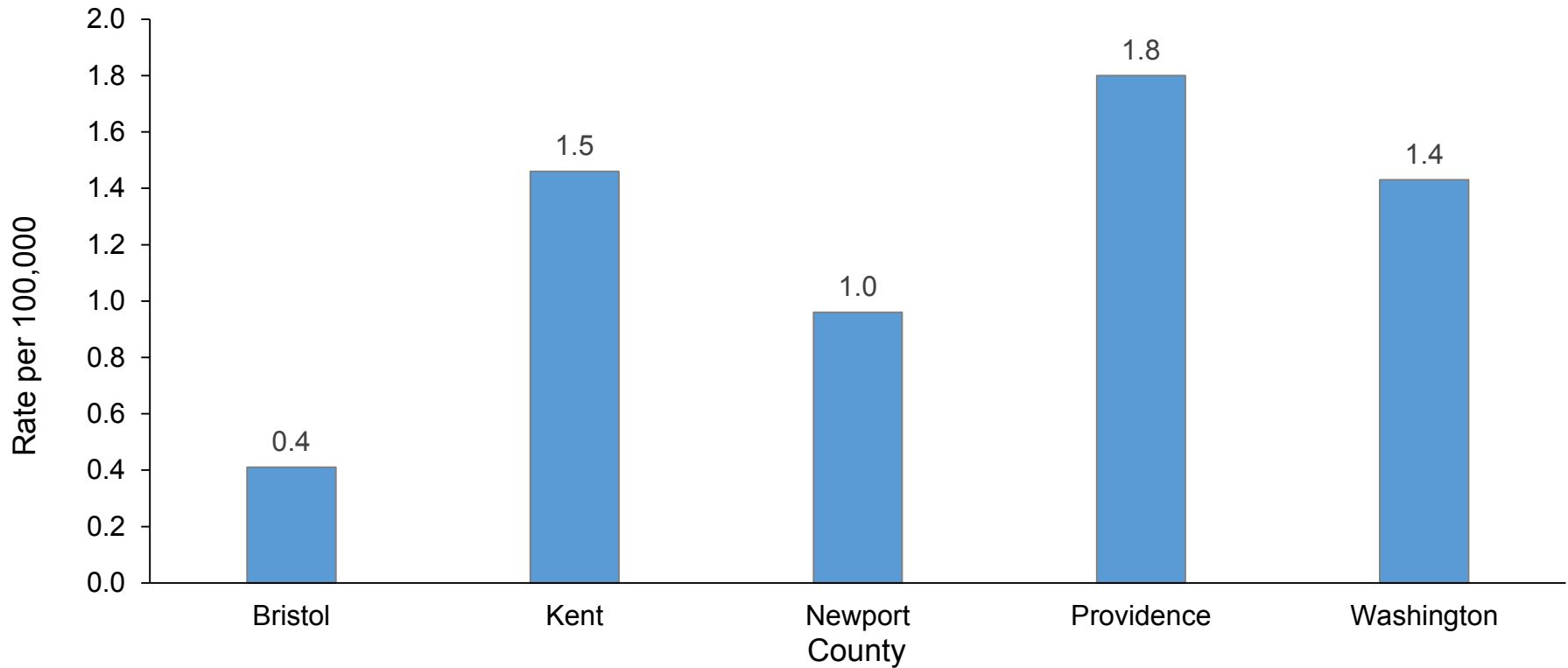
**Figure 2:** From 2014 to 2018, the highest incidence rate of STEC in Rhode Island was observed among children less than 5 years old. Children less than 5 years old have also been observed to have the highest incidence rate of STEC nationally.

# 5-Year Average Rate of STEC, Sex, Rhode Island, 2014-2018



**Figure 3.** The five-year average incidence rate of STEC in Rhode Island from 2014 to 2018 was slightly higher among males compared to females.

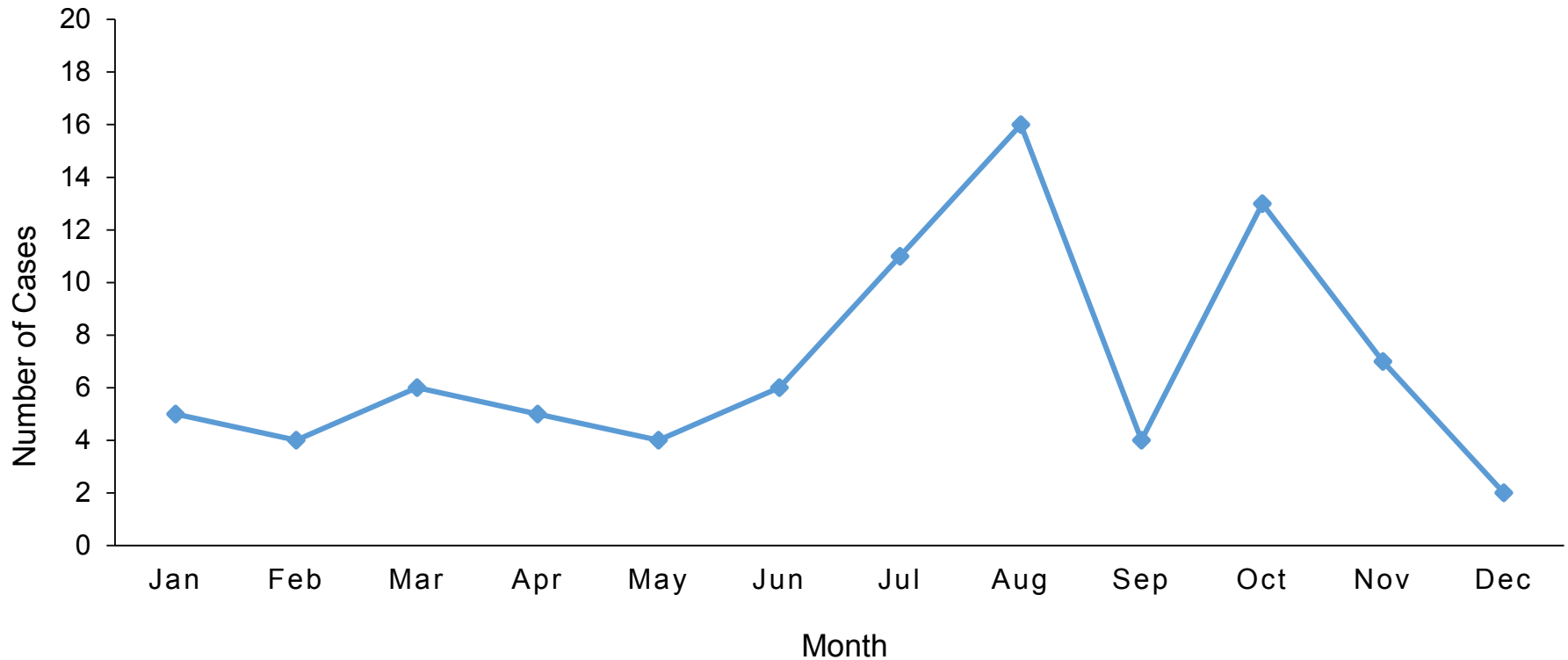
# 5-Year Average Rate of STEC, County, Rhode Island, 2014-2018



**Figure 4:** From 2014-2018, Providence County had the highest average rate of STEC reported (1.8 cases per 100,000 people).



# Cumulative 5-Year Cases of STEC, Month, Rhode Island, 2014-2018



**Figure 5:** When the five-year period 2014-2018 is analyzed cumulatively, reported STEC cases peaked during the summer and early fall. This seasonal trend is also observed nationally.

# STEC Frequency and Rates by Year, Rhode Island, 2014-2018



**Table 1. Frequency by Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Number of Cases</b>	4	9	11	14	45

**Table 2. Rate by Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Rate per 100,000</b>	0.4	0.9	1.0	1.3	4.3

# 5-Year Cumulative STEC Frequency, Age Group, Rhode Island, 2014-2018



**Table 3. 5-Year Cumulative Frequency by Age Group**

	2014-2018
<b>0-4</b>	16
<b>5-9</b>	9
<b>10-19</b>	14
<b>20-29</b>	15
<b>30-39</b>	7
<b>40-49</b>	6
<b>50-59</b>	2
<b>60-69</b>	8
<b>70-79</b>	4
<b>≥80</b>	2
<b>Total</b>	83

# 5-Year Average STEC Rates, Age Group, Rhode Island, 2014-2018



<b>Table 4. 5-Year Average Rate by Age Group</b>	
	<b>2014-2018</b>
<b>0-4</b>	5.9
<b>5-9</b>	3.2
<b>10-19</b>	2.1
<b>20-29</b>	1.9
<b>30-39</b>	1.1
<b>40-49</b>	0.9
<b>50-59</b>	0.3
<b>60-69</b>	1.3
<b>70-79</b>	1.2
<b>≥80</b>	0.8

# 5-Year Cumulative STEC Frequency and Average Rates, Gender, Rhode Island, 2014-2018



**Table 5. 5-Year Cumulative Frequency by Sex**

	<b>2014-2018</b>
<b>Female</b>	37
<b>Male</b>	46
<b>Total</b>	83

**Table 6. 5-Year Average Rate by Sex**

	<b>2014-2018</b>
<b>Female</b>	1.4
<b>Male</b>	1.8

# 5-Year Cumulative STEC Frequency, County, Rhode Island, 2014-2018



<b>Table 7. 5-Year Cumulative Frequency by County</b>	
	<b>2014-2018</b>
<b>Bristol</b>	1
<b>Kent</b>	12
<b>Newport</b>	4
<b>Providence</b>	57
<b>Washington</b>	9
<b>All</b>	83

# 5-Year Average STEC Rates, County, Rhode Island, 2014-2018



<b>Table 7. 5-Year Average Rate by County</b>	
	<b>2014-2018</b>
<b>Bristol</b>	0.4
<b>Kent</b>	1.5
<b>Newport</b>	1.0
<b>Providence</b>	1.8
<b>Washington</b>	1.4

# 5-Year Cumulative STEC Frequency, Month, Rhode Island, 2014-2018



**Table 9. 5-Year Cumulative Frequency by Month**

	2014-2018
<b>Jan</b>	5
<b>Feb</b>	4
<b>Mar</b>	6
<b>Apr</b>	5
<b>May</b>	4
<b>Jun</b>	6
<b>Jul</b>	11
<b>Aug</b>	16
<b>Sep</b>	4
<b>Oct</b>	13
<b>Nov</b>	7
<b>Dec</b>	2
<b>All</b>	83





# Notes on Data

- Case counts include patients classified as confirmed and probable cases.
- “Event Date” (used to classify cases by month and year) is generated based on the availability of data in the following order:
  1. Illness onset date
  2. Specimen collection date
  3. Date of report to public health agency
- Rate is calculated per 100,000 population.
- Population denominators are based on the Annual Estimates of the Resident Population: April 1, 2010-July 1, 2018, U.S. Census Bureau.



# References

- <https://www.cdc.gov/ecoli/general/index.html>
- <http://www.cdc.gov/foodnet/reports/index.html>