





# **Shiga Toxin-Producing E. coli (STEC) Surveillance 2012-2016**

Rhode Island Department of Health

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

Center for Acute Infectious Disease Epidemiology



# About STEC

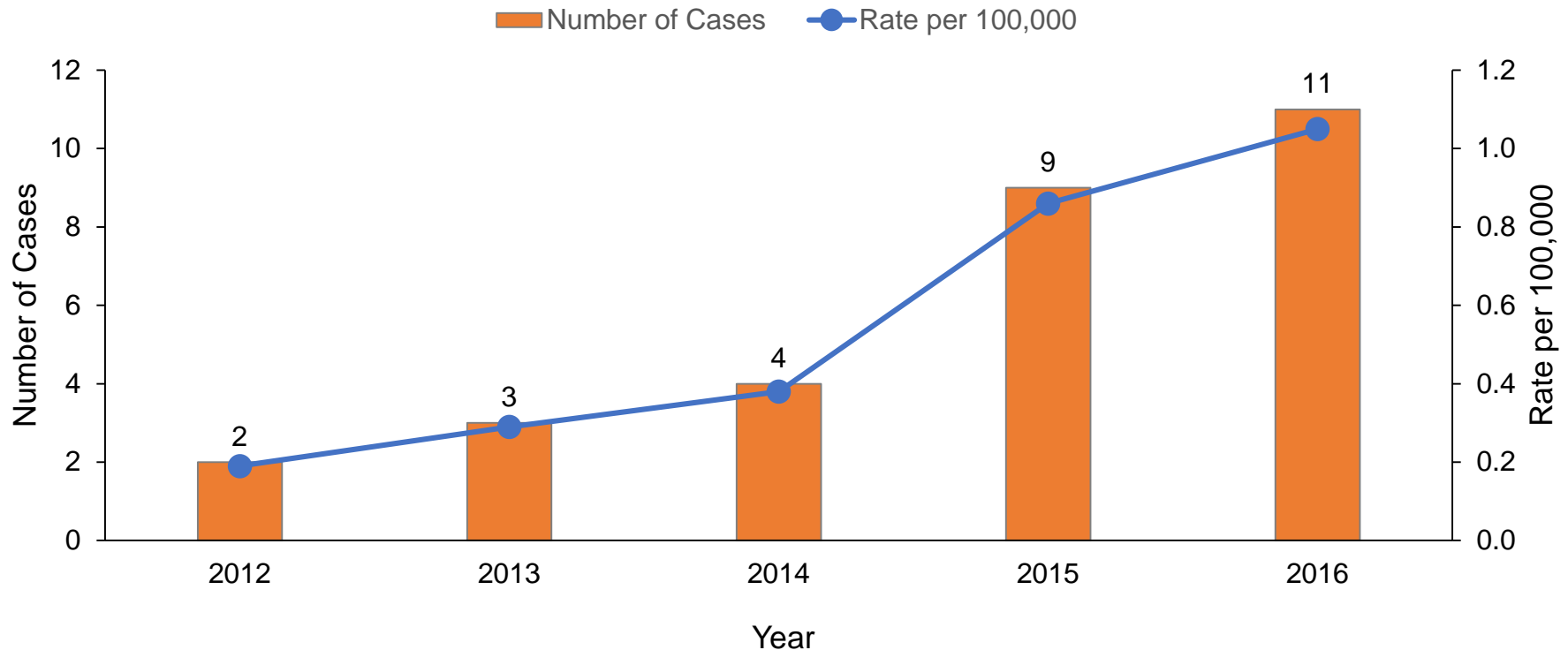
- Shiga-toxin E. coli (STEC) is an infection caused by certain strains of E. coli bacteria.
- STEC can be contracted through the fecal-oral route through ingesting contaminated food or water, and through contact with animals.
- Symptoms of STEC often include severe stomach cramps, diarrhea (often bloody), 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

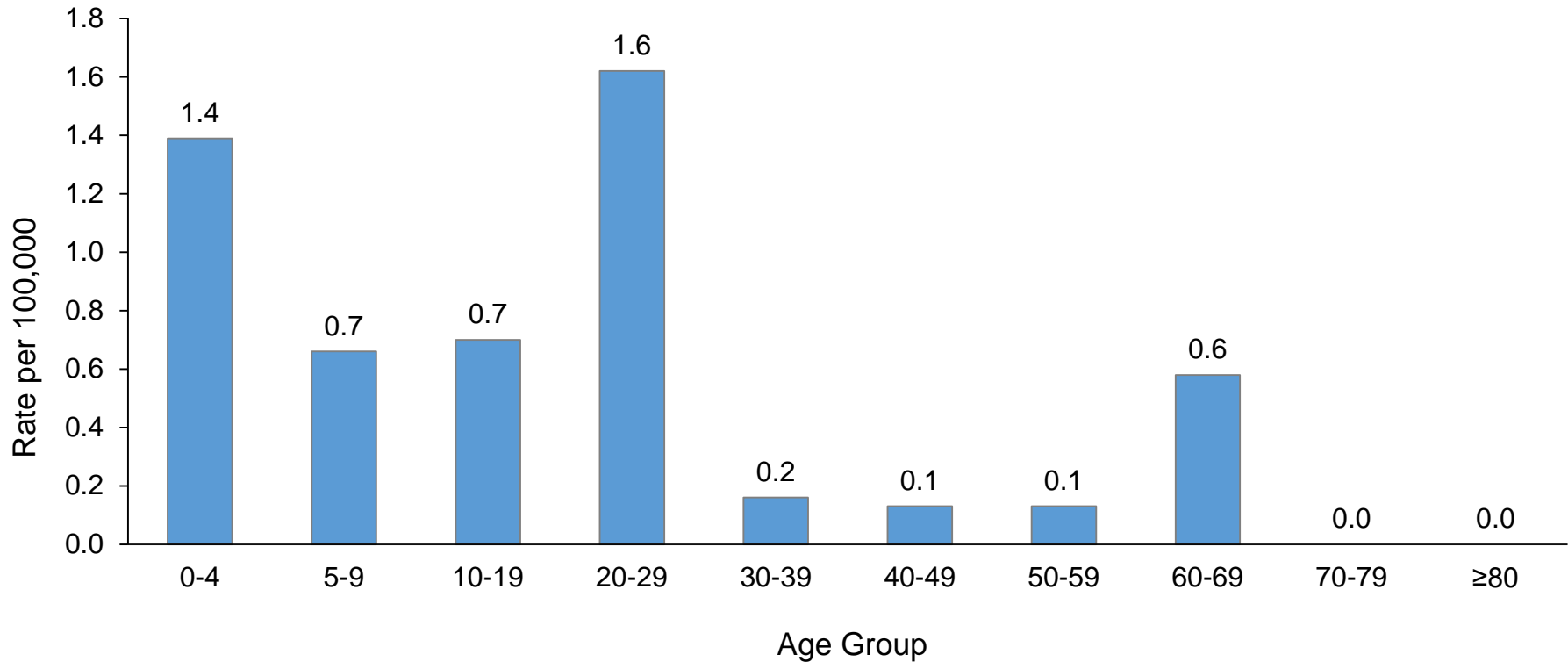
- In 2016, there were 11 cases of STEC reported in Rhode Island for a rate of 1.1 cases per 100,000 people.
- The rate of STEC in 2016 was higher than rates reported during 2012-2015; however rates of STEC in Rhode Island have been below the national average during all of these years.
- Consistent with 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 2012-2016 have been combined or averaged for analysis by age group, sex, county, and month of infection.

# Reported Cases of STEC, Rhode Island, 2012-2016



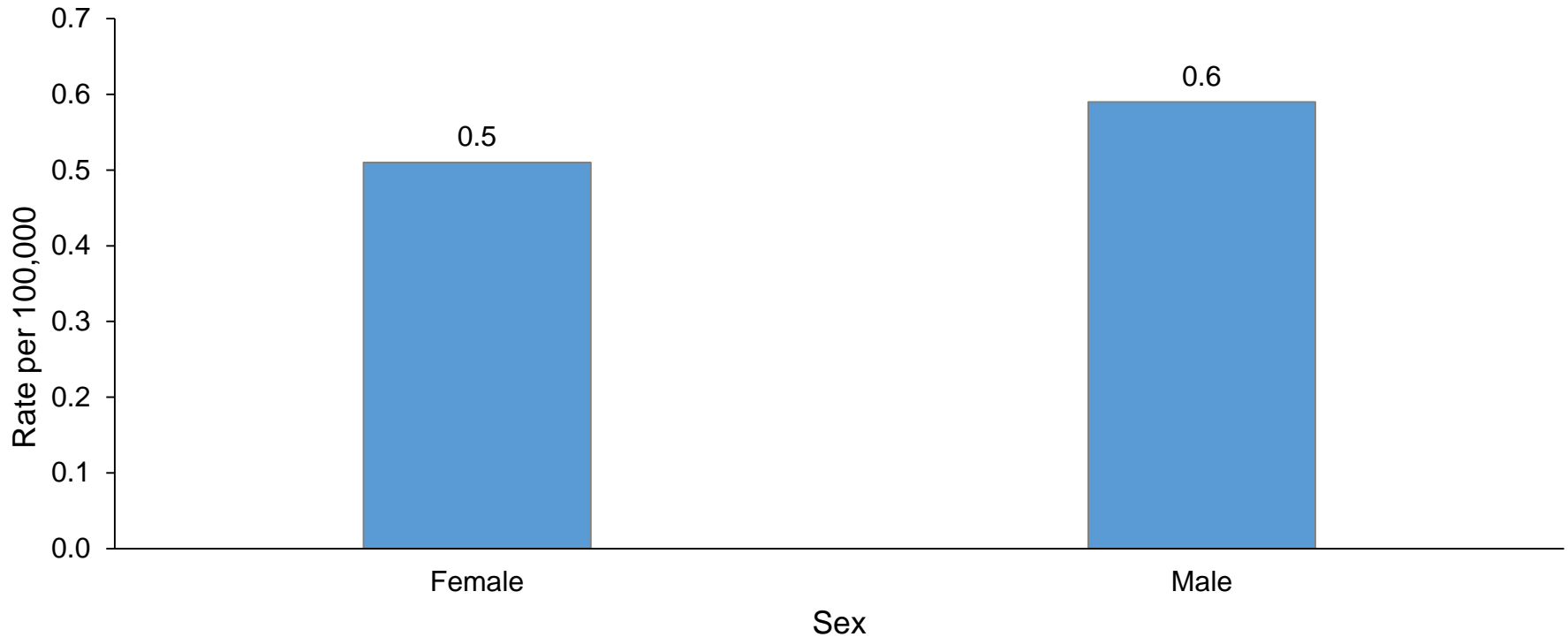
**Figure 1:** Rhode Island's incidence rate of STEC has increased each year from 2012 to 2016. The elevated rates in 2015 and 2016 compared to 2012 through 2014 may be due to the increasing use of non-culture testing methods. These types of tests detect Shiga toxin, but do not differentiate between O157 and non-O157 STEC, which often leads to laboratories performing a reflex culture and being more likely to confirm an infection. Despite the increasing trend over time, Rhode Island's STEC incidence rate has been below the national incidence rate during all of these years.

# 5-Year Average Rate of STEC, Age Group, Rhode Island, 2012-2016



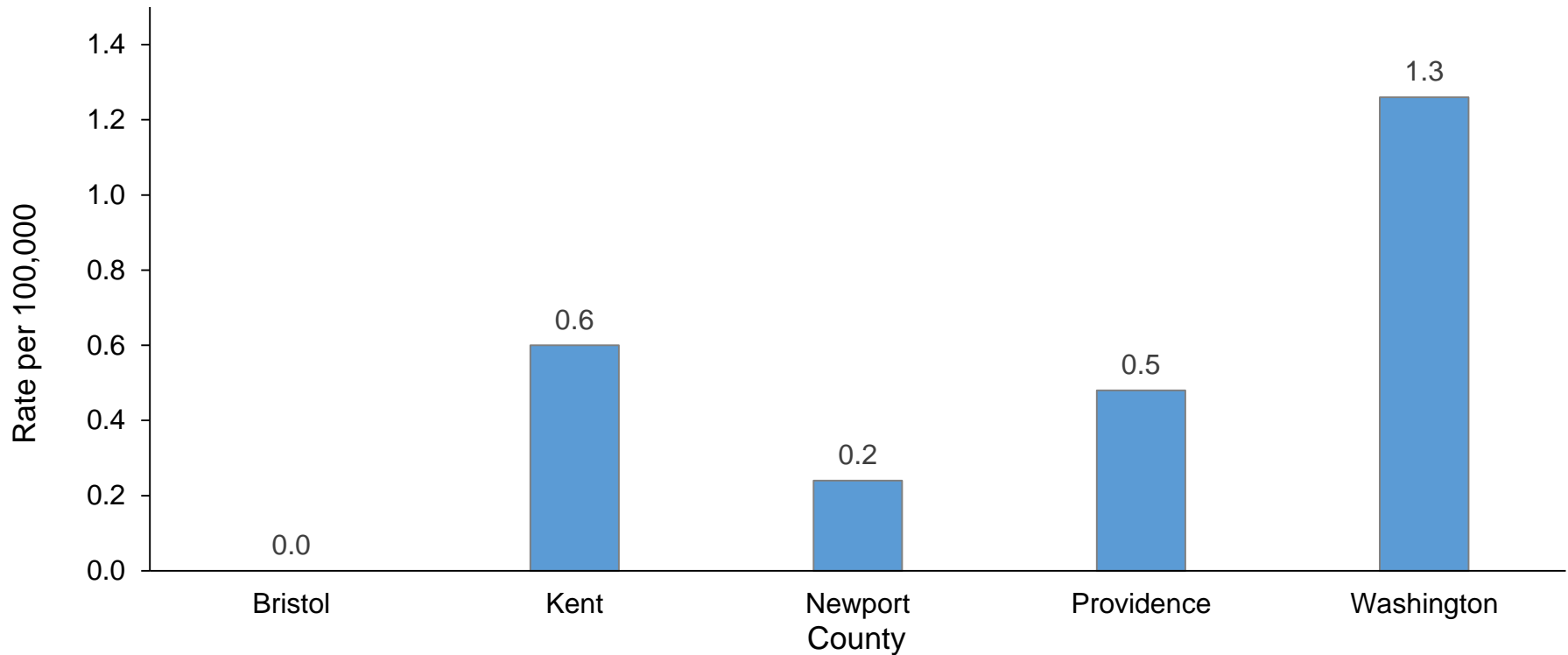
**Figure 2:** From 2012 to 2016, the highest incidence rate of STEC in Rhode Island was observed among adults 20-29 years old, followed by children less than 5 years old. Children less than 5 years old have been observed to have the highest incidence rate of STEC nationally.

# 5-Year Average Rate of STEC, Gender, Rhode Island, 2012-2016



**Figure 3.** The five-year average incidence rate of STEC in Rhode Island from 2012 to 2016 was slightly higher among males compared to females.

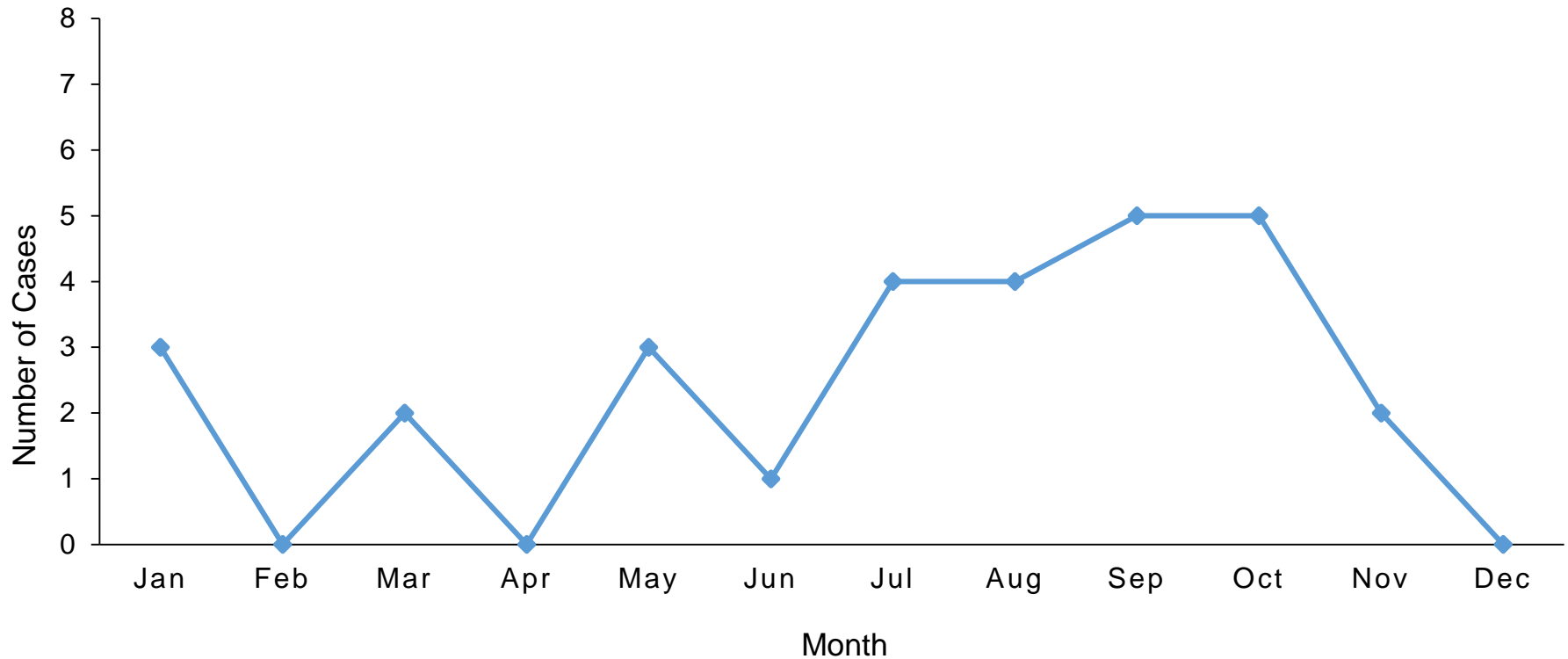
# 5-Year Average Rate of STEC, County, Rhode Island, 2012-2016



**Figure 4:** From 2012-2016, Washington County had the highest reported rate of STEC (1.3 cases per 100,000 people), followed by Kent County (0.6 cases per 100,000 people). No cases were reported in Bristol County over this time period.



# Cumulative 5-Year Cases of STEC, Month, Rhode Island, 2012-2016



**Figure 5:** When the five-year period 2012-2016 is analyzed cumulatively, reported STEC cases peak during the summer and early fall. This seasonal trend is also observed nationally.

# STEC Frequency and Rates by Year, Rhode Island, 2012-2016



**Table 1. Frequency by Year**

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Number of Cases</b>	2	3	4	9	11

**Table 2. Rate by Year**

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Rate per 100,000</b>	0.2	0.3	0.4	0.9	1.1

# 5-Year Cumulative STEC Frequency, Age Group, Rhode Island, 2012-2016



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

	2012-2016
<b>0-4</b>	4
<b>5-9</b>	2
<b>10-19</b>	5
<b>20-29</b>	12
<b>30-39</b>	1
<b>40-49</b>	1
<b>50-59</b>	1
<b>60-69</b>	3
<b>70-79</b>	0
<b>≥80</b>	0

# 5-Year Average STEC Rates, Age Group, Rhode Island, 2012-2016



<b>Table 4. 5-Year Average Rate by Age Group</b>	
	<b>2012-2016</b>
<b>0-4</b>	1.4
<b>5-9</b>	0.7
<b>10-19</b>	0.7
<b>20-29</b>	1.6
<b>30-39</b>	0.2
<b>40-49</b>	0.1
<b>50-59</b>	0.1
<b>60-69</b>	0.6
<b>70-79</b>	0.0
<b>≥80</b>	0.0

# 5-Year Cumulative STEC Frequency and Average Rates, Gender, Rhode Island, 2012-2016



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

	2012-2016
<b>Female</b>	14
<b>Male</b>	15
<b>Total</b>	29

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

	2012-2016
<b>Female</b>	0.5
<b>Male</b>	0.6

# 5-Year Cumulative STEC Frequency, County, Rhode Island, 2012-2016



<b>Table 7. 5-Year Cumulative Frequency by County</b>	
	<b>2012-2016</b>
<b>Bristol</b>	0
<b>Kent</b>	5
<b>Newport</b>	1
<b>Providence</b>	15
<b>Washington</b>	8
<b>All</b>	29

# 5-Year Average STEC Rates, County, Rhode Island, 2012-2016



<b>Table 7. 5-Year Average Rate by County</b>	
	<b>2012-2016</b>
<b>Bristol</b>	0.0
<b>Kent</b>	0.6
<b>Newport</b>	0.2
<b>Providence</b>	0.5
<b>Washington</b>	1.3

# 5-Year Cumulative STEC Frequency, Month, Rhode Island, 2012-2016



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

	2012-2016
<b>Jan</b>	3
<b>Feb</b>	0
<b>Mar</b>	2
<b>Apr</b>	0
<b>May</b>	3
<b>Jun</b>	1
<b>Jul</b>	4
<b>Aug</b>	4
<b>Sep</b>	5
<b>Oct</b>	5
<b>Nov</b>	2
<b>Dec</b>	0
<b>All</b>	29



# STEC Serotype Frequency, Year, Rhode Island, 2012-2016



Table 10. Frequency of Serotypes	Year				
	2012	2013	2014	2015	2016
O26	1	0	0	3	0
O45	0	0	0	0	0
O77	0	1	0	0	0
O103	0	0	0	1	0
O111	0	0	0	0	0
O121	0	1	0	0	1
O134	0	0	0	0	0
O157:H7	1	1	3	1	7
O157:NM	0	0	0	1	0
Non O157:H7, Serogroup Unknown	0	0	1	2	3
Unknown	0	0	0	1	0
<b>Total</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>9</b>	<b>11</b>



# 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. The population denominator is based on 2010 US Census Population.



# References

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