





# Salmonella 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 Salmonella

- Salmonella is a bacterial infection that causes diarrhea, fever, and abdominal cramps 12-72 hours following infection.
- Salmonella is transmitted through the fecal-oral route, and infection can be caused by consumption of contaminated food or the handling of infected animals such as reptiles, amphibians, and poultry. Human-to-human transmission is also possible through the fecal-oral route.
- Most cases of salmonella resolve in 4-7 days without treatment.



# About Salmonella (cont.)

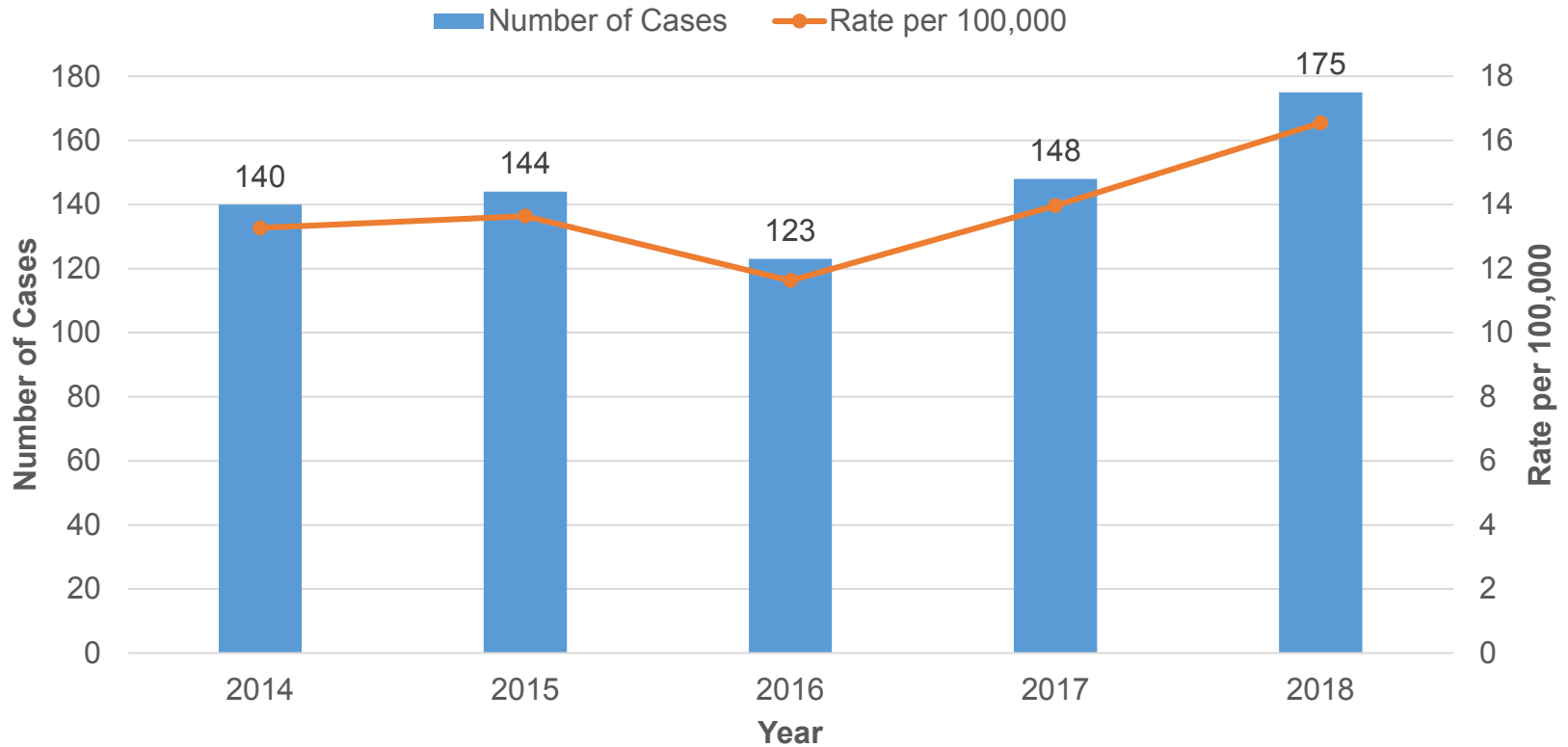
- The elderly, infants, and those with compromised immune systems are at higher risk for severe illness.
- Salmonella infections can be prevented by cooking poultry, ground beef, and eggs thoroughly, and by avoiding cross-contamination between raw meat/eggs and cooked foods.
- Washing hands after contact with reptiles and birds can prevent human infection, as many of these animals carry salmonella in their gastrointestinal tracts.



# Data Overview, Salmonella

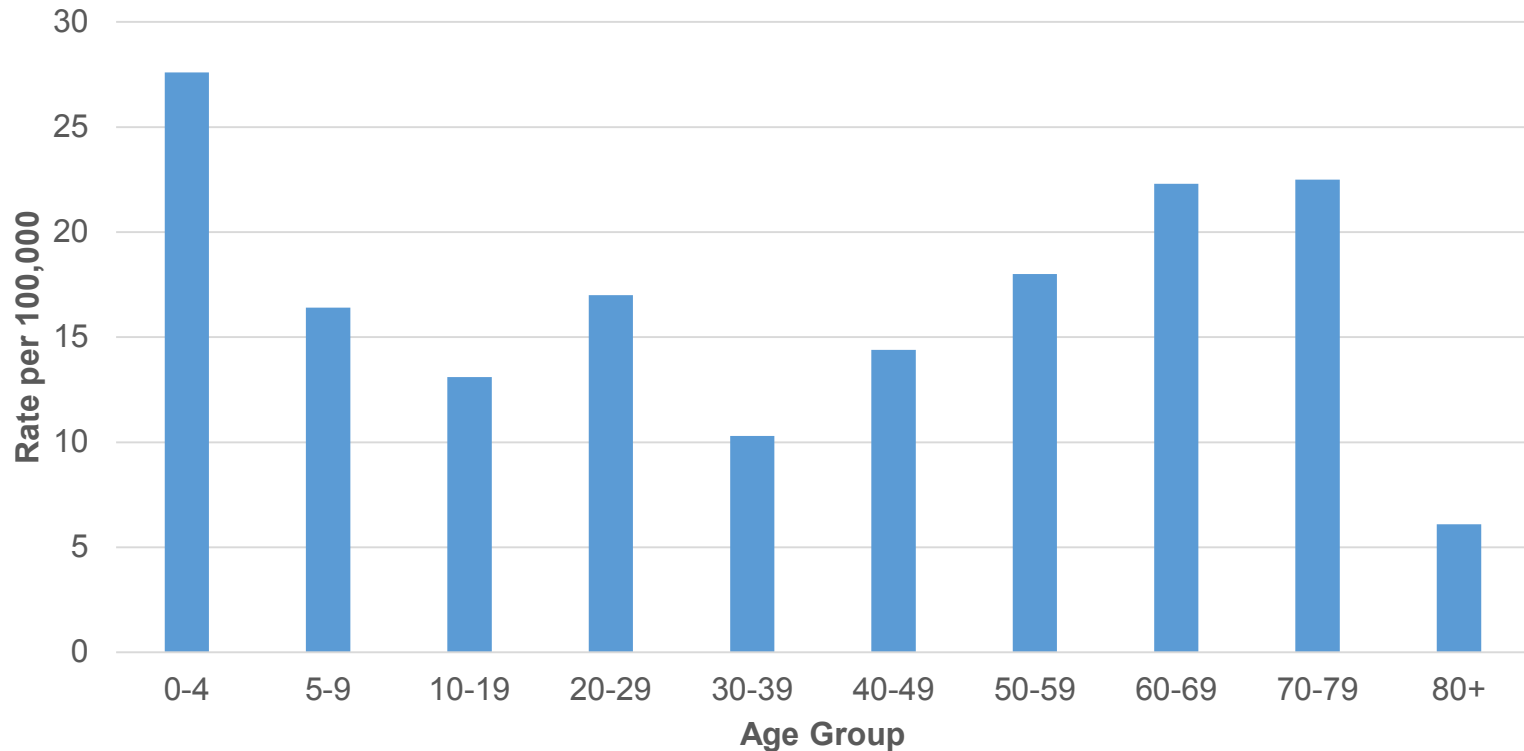
- In 2018, there were 175 cases of salmonella infection in Rhode Island, with an incidence rate of 16.6 cases per 100,000 people. This is higher than the CDC estimated national incidence rate of 14.5 cases per 100,000 people.
- From 2014 to 2017 the overall rates of salmonellosis had remained fairly stable in Rhode Island, staying between 11 and 14 cases per 100,000 people. In 2018 there was an increase in reported salmonella infections.
- From 2017 to 2018, the average rate of salmonella infections for children between 0-9 years of age decreased from an average rate of 24.6 to 22.0 per 100,000 people. From 2017 to 2018 the average rate for adults age 60 years and older increased from an average of 15.8 to an average of 17.0 per 100,000 people. (See Table 4: Rate by Age Group and Year)

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



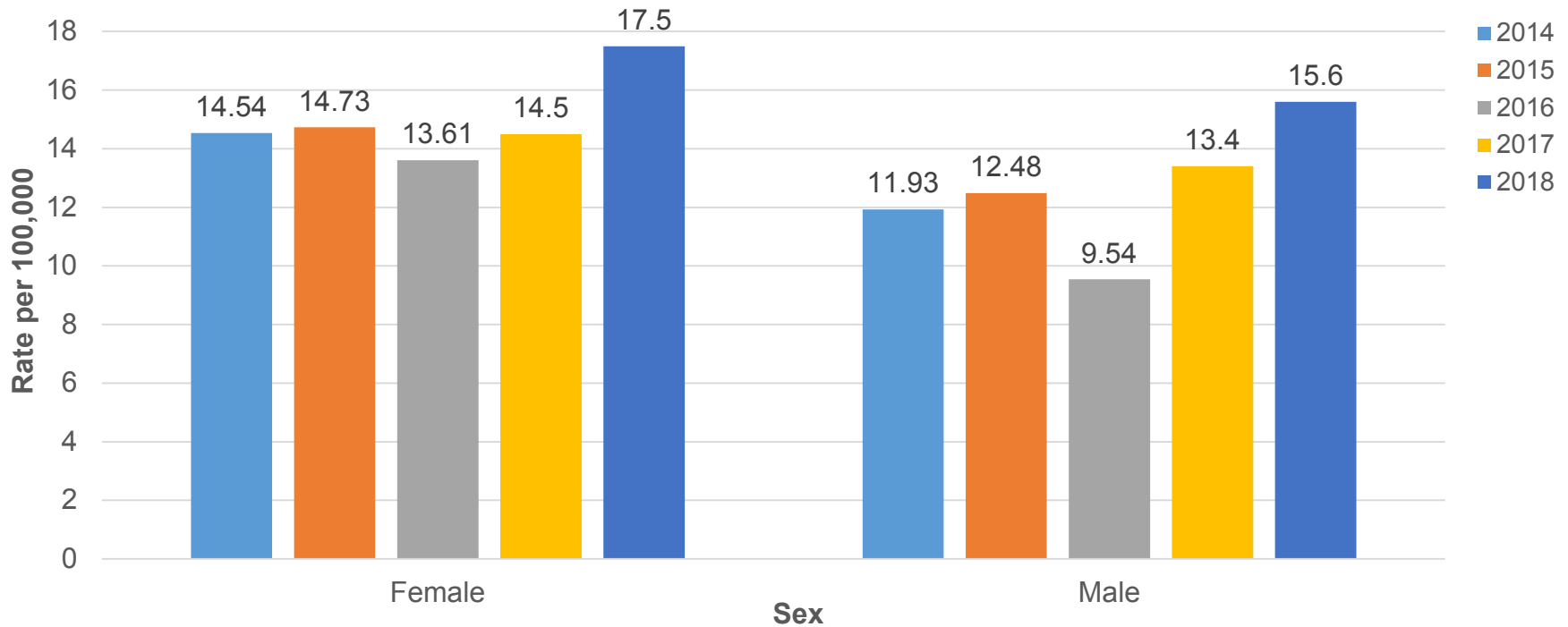
**Figure 1:** In 2018, there were 175 cases of salmonella infection in Rhode Island, with a rate of 16.6 cases per 100,000 people. Salmonella in Rhode Island has remained fairly stable over time with a slight decrease from 2015 to 2016, then increasing in 2017 and 2018.

# Rate of Salmonella, by Age Group, Rhode Island, 2018



**Figure 2:** Children are reported to be at highest risk for salmonella infection. Children under 5 years of age have the highest reported rate of salmonella infection nationally. In 2018, Rhode Island children in age group 0-4 years of age had the highest incidence rate of reported salmonella infections at 27.6 cases per 100,000 people.

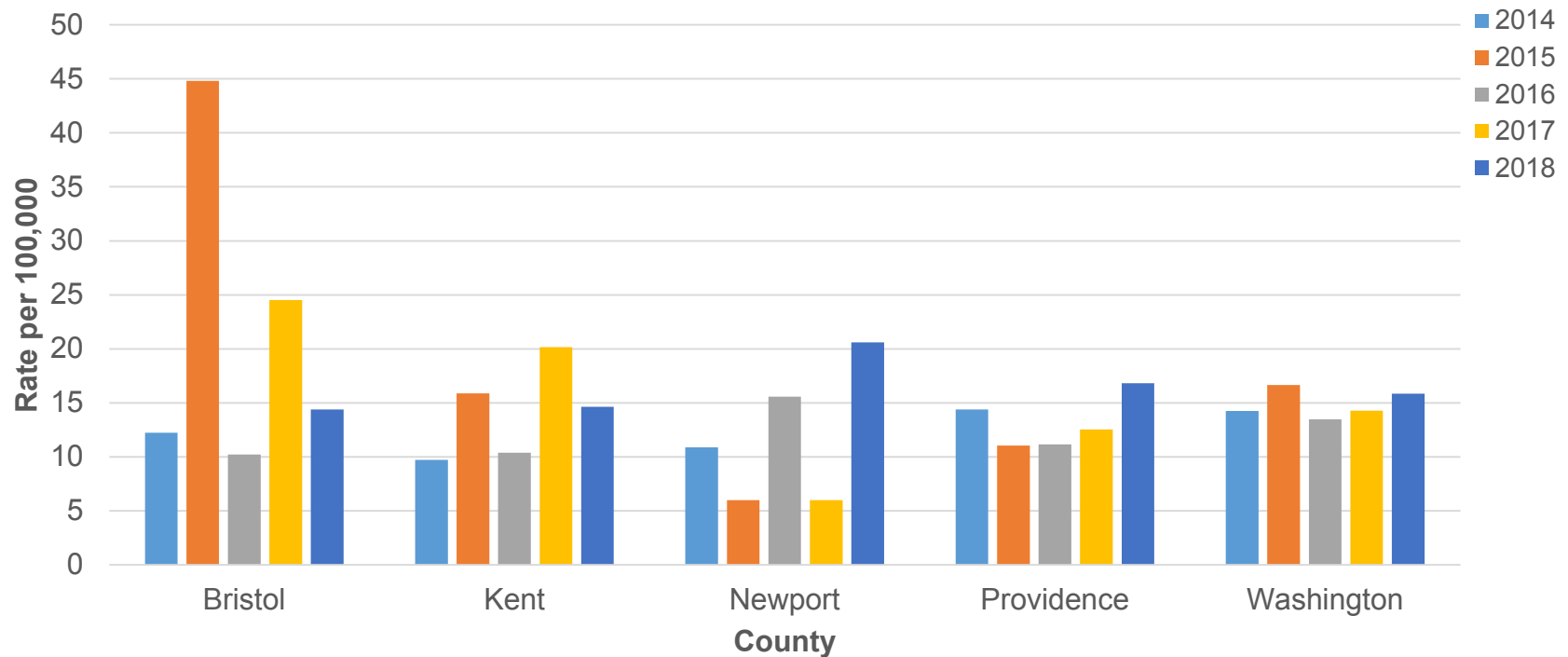
# Rate of Salmonella, by Sex and Year, Rhode Island, 2014-2018



**Figure 3:** Salmonella was reported in males and females at approximately the same rates over the last five years. In 2018, there were 95 cases in females and 80 cases in males. Nationally, rates of salmonella infection are nearly the same in males and females.

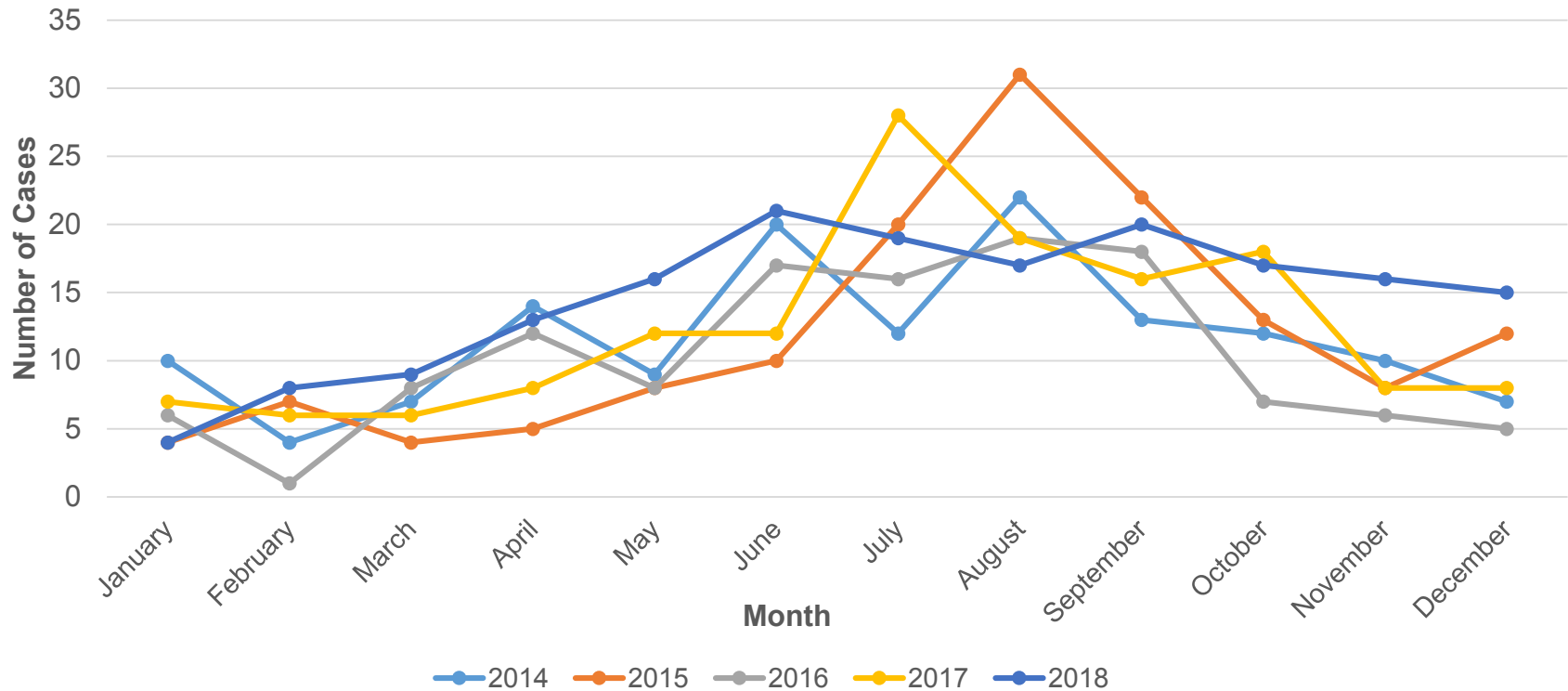


# Rate of Salmonella, by County and Year, Rhode Island, 2014-2018



**Figure 4:** The majority of reported salmonella cases are sporadic cases. However, Bristol county had the highest rate of salmonella in 2015 and 2017 due to an outbreak at a local university in 2015, and an outbreak at a local food establishment in 2017. Kent County had its highest rate of salmonella in 2017 due to having a number of cases associated with a live poultry outbreak.

# Reported Cases of Salmonella, by Month and Year, Rhode Island, 2014-2018



**Figure 5:** Salmonella infections occur year-round in Rhode Island. Nationally, as well as in Rhode Island, the lowest rates of salmonella occur in winter and cases peak in the summer, demonstrating seasonal trends.

# Salmonella 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>	140	144	123	148	175

**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>	13.27	13.64	11.63	13.97	16.55

# Salmonella Frequency, by Age Group and Year, Rhode Island, 2014-2018



**Table 3. Frequency by Age Group and Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>0-4</b>	20	9	20	20	15
<b>5-9</b>	3	4	3	7	9
<b>10-19</b>	10	12	14	10	17
<b>20-29</b>	26	44	15	16	26
<b>30-39</b>	15	20	20	19	14
<b>40-49</b>	9	18	12	14	18
<b>50-59</b>	23	12	18	21	27
<b>60-69</b>	13	9	11	21	29
<b>70-79</b>	16	10	5	15	17
<b>≥80</b>	5	6	5	5	3
<b>Total</b>	140	144	123	148	175

# Salmonella Rates, by Age Group and Year, Rhode Island, 2014-2018



**Table 4. Rate by Age Group and Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>0-4</b>	36.4	16.4	36.6	36.5	27.6
<b>5-9</b>	5.2	7.1	5.4	12.6	16.4
<b>10-19</b>	7.4	9.0	10.5	7.6	13.1
<b>20-29</b>	16.9	28.4	9.6	10.3	17.0
<b>30-39</b>	11.9	15.6	15.3	14.3	10.3
<b>40-49</b>	6.5	13.4	9.2	11	14.4
<b>50-59</b>	14.6	7.7	11.6	13.7	18.0
<b>60-69</b>	11.1	7.4	8.7	16.4	22.3
<b>70-79</b>	25.1	15.2	7.4	20.8	22.5
<b>≥80</b>	10.0	12.2	10.2	10.3	6.1

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



**Table 5. Frequency by Sex and Year**

	2014	2015	2016	2017	2018
<b>Female</b>	79	80	74	79	95
<b>Male</b>	61	64	49	69	80
<b>Total</b>	140	144	123	148	175

**Table 6. Rate by Sex and Year**

	2014	2015	2016	2017	2018
<b>Female</b>	14.5	14.7	13.6	14.5	17.5
<b>Male</b>	11.9	12.5	9.5	13.4	15.6

# Salmonella Frequency, by County and Year, Rhode Island, 2014-2018



**Table 7. Frequency by County and Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Bristol</b>	6	22	5	12	7
<b>Kent</b>	16	26	17	33	24
<b>Newport</b>	9	5	13	5	17
<b>Providence</b>	91	70	71	80	107
<b>Washington</b>	18	21	17	18	20
<b>All</b>	140	144	123	148	175

# Salmonella Rates by County and Year, Rhode Island, 2014-2018



**Table 8. Rate by County and Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Bristol</b>	12.2	44.8	10.2	24.5	14.4
<b>Kent</b>	9.7	15.9	10.4	20.2	14.7
<b>Newport</b>	10.9	6.0	15.6	6.0	20.6
<b>Providence</b>	14.4	11.1	11.2	12.6	16.8
<b>Washington</b>	14.3	16.7	13.5	14.3	15.9



# Salmonella Frequency, by Month and Year, Rhode Island, 2014-2018



**Table 9. Frequency by Month and Year**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Jan</b>	10	4	6	7	4
<b>Feb</b>	4	7	1	6	8
<b>Mar</b>	7	4	8	6	9
<b>Apr</b>	14	5	12	8	13
<b>May</b>	9	8	8	12	16
<b>Jun</b>	20	10	17	12	21
<b>Jul</b>	12	20	16	28	19
<b>Aug</b>	22	31	19	19	17
<b>Sep</b>	13	22	18	16	20
<b>Oct</b>	12	13	7	18	17
<b>Nov</b>	10	8	6	8	16
<b>Dec</b>	7	12	5	8	15
<b>All</b>	140	144	123	148	175

# Top 6 Salmonella Serotypes, Rhode Island, 2018



**Table 10. Salmonella Frequency by Serotype, 2018**

Serotype	Count	Percentage of 2018 Salmonella Isolates (n=175)
Salmonella Enteritidis	39	22.3%
Salmonella Typhimurium	22	12.6%
Salmonella Infantis	16	9.1%
Salmonella Newport	12	6.9%
Salmonella Mbandaka	3	1.7%
Salmonella Saintpaul	2	1.1%

**Table 10.** By identifying structures on the bacteria’s surface, scientists can classify salmonella into serotypes. Serotyping salmonella can help link related cases and identify a source of infection. Salmonella Enteritidis, Rhode Island’s most frequently identified serotype in 2018, is one of the most common serotypes in the country. Salmonella Enteritidis has many sources of exposure including, but not limited to, ground beef, chickens, eggs, backyard flocks, fruits, vegetables, and other animals. In 2018, Rhode Island had 1 case of salmonella Enteritidis associated with a multistate live poultry outbreak.



# 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 annual estimates from the US Census (Factfinder.gov).



# References

- <http://www.cdc.gov/salmonella/general/index.html>
- <https://www.cdc.gov/salmonella/outbreaks-2018.html>
- <https://www.cdc.gov/salmonella/reportspubs/salmonella-atlas/serotype-snapshots.html>
- <http://www.cdc.gov/salmonella/reportspubs/salmonella-atlas/serotyping-importance.html>
- <https://www.cdc.gov/nationalsurveillance/pdfs/2016-Salmonella-report-508.pdf>