





Salmonella 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 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.
- 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 2016, there were 123 cases of salmonella infection in Rhode Island, with a rate of 11.7 cases per 100,000 population. This is below the most recent national rate of 17.15 (reported by CDC for 2015) per 100,000.
- Rates of salmonella have remained fairly stable over time in Rhode Island.
- From 2015 to 2016, the rate of salmonella among the 0-4 age group increased from 15.7 per 100,000 to 34.8 per 100,000. Rhode Island has seen this wide range of fluctuation since 2013. (See Table 4: Rate by Age Group and Year)

Reported Cases of Salmonella, Rhode Island, 2012-2016

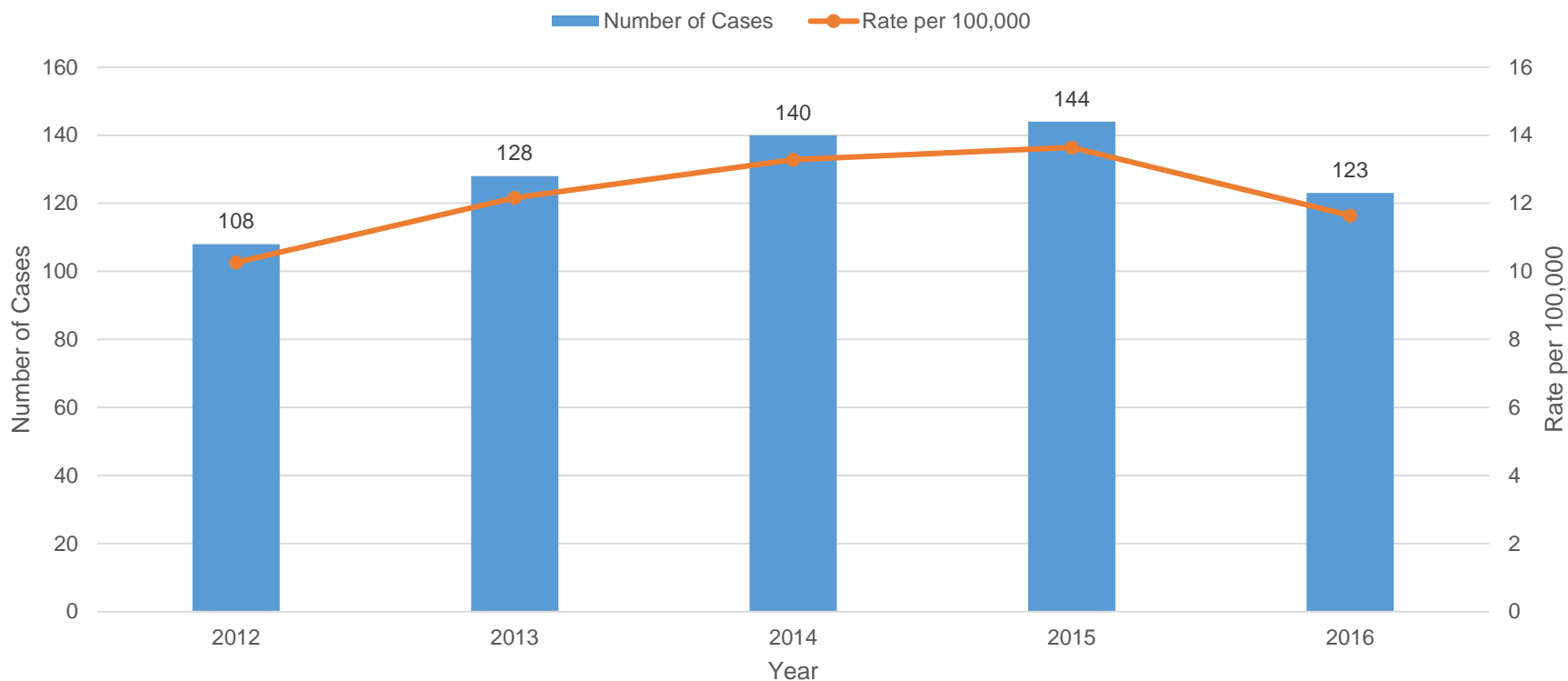


Figure 1: In 2016, there were 123 cases of salmonella infection in Rhode Island, with a rate of 11.7 cases per 100,000 population. Salmonella in Rhode Island has remained fairly stable over time with a slight increase from 2012 to 2015, tapering off again in 2016.

Rate of Salmonella, by Age Group, Rhode Island, 2016

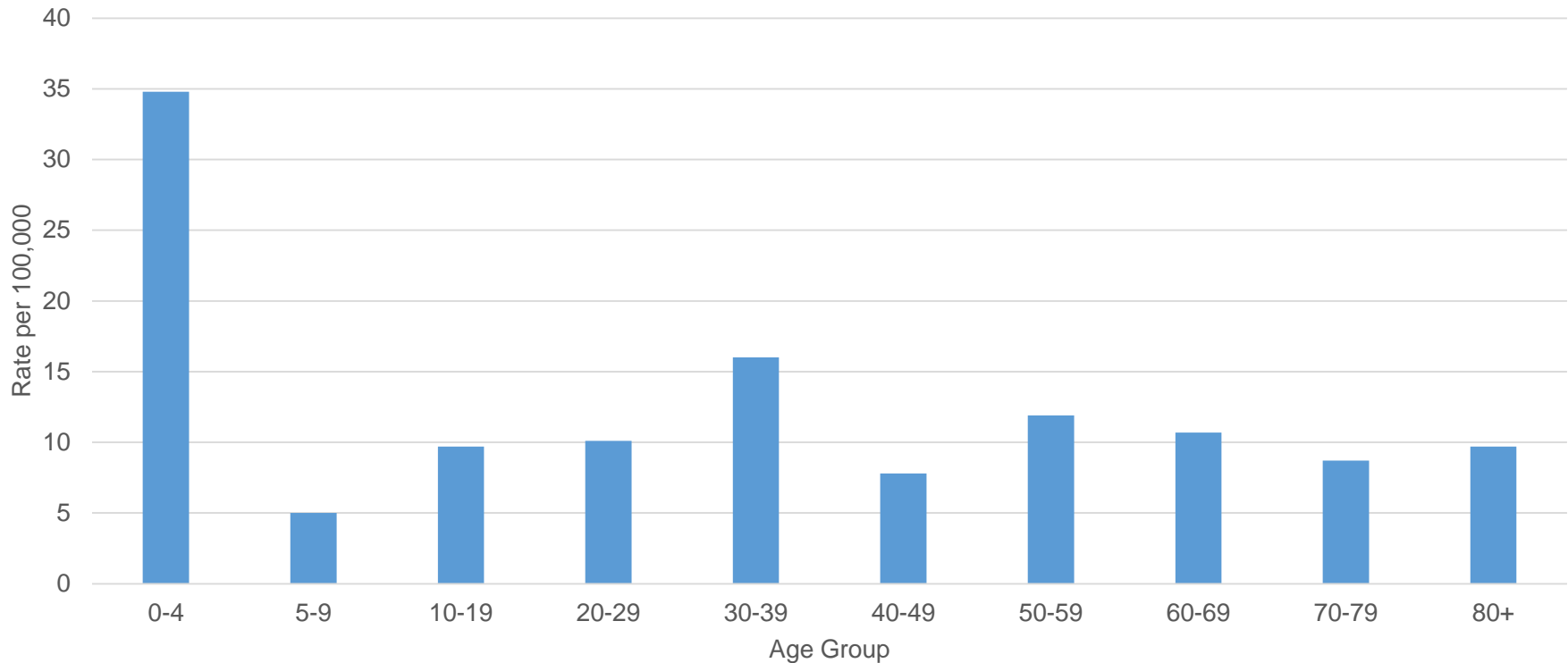


Figure 2: Typically, children under the age of 5 have the highest rates of salmonella both nationally and in Rhode Island. In 2016, this is clear in Rhode Island as the rate of salmonella among the 0-4 age group far exceeds any other age group at 34.8 cases per 100,000.

Rate of Salmonella, by Sex and Year, Rhode Island, 2012-2016

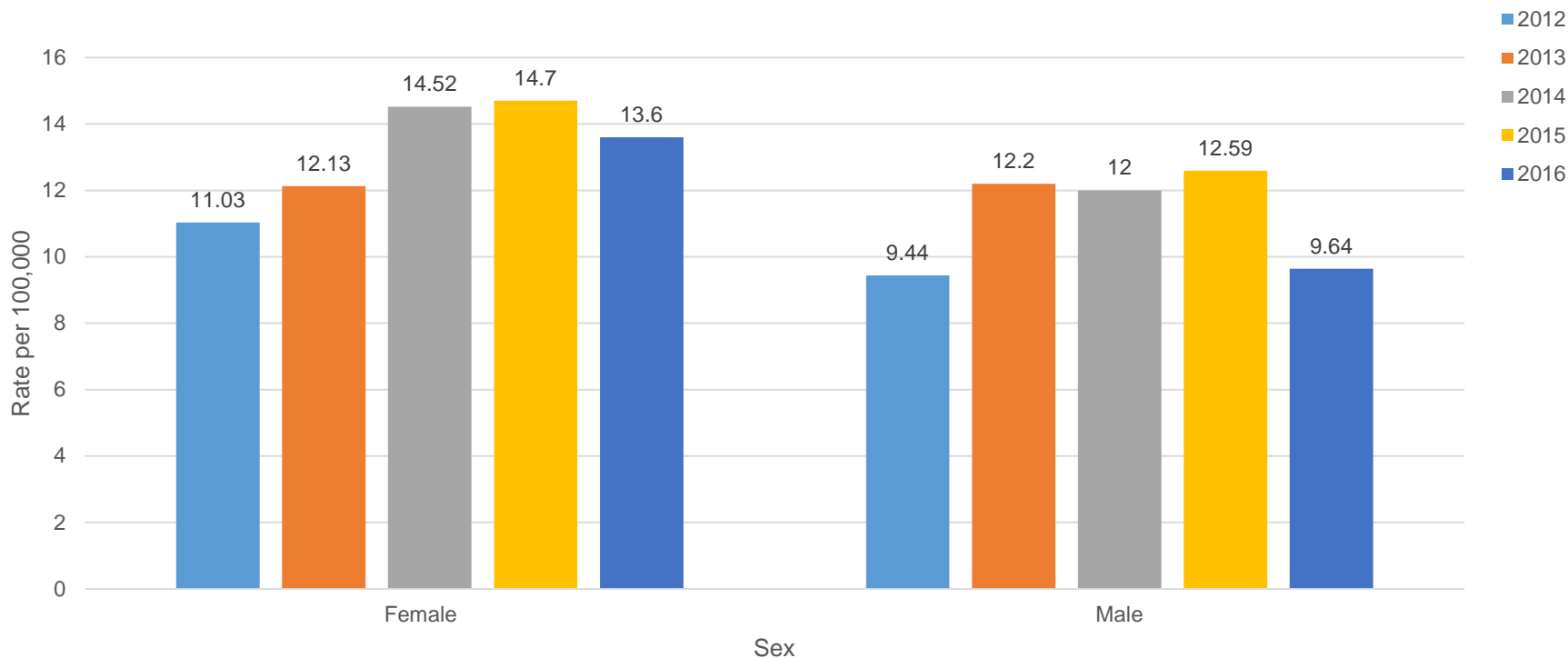


Figure 3: Salmonella was reported in males and females at approximately the same rates over the last five years. In 2016, there were 74 cases in females and 49 cases in males. Nationally, rates of salmonella infection are nearly the same in males and females.

Rate of Salmonella, by County and Year, Rhode Island, 2012-2016

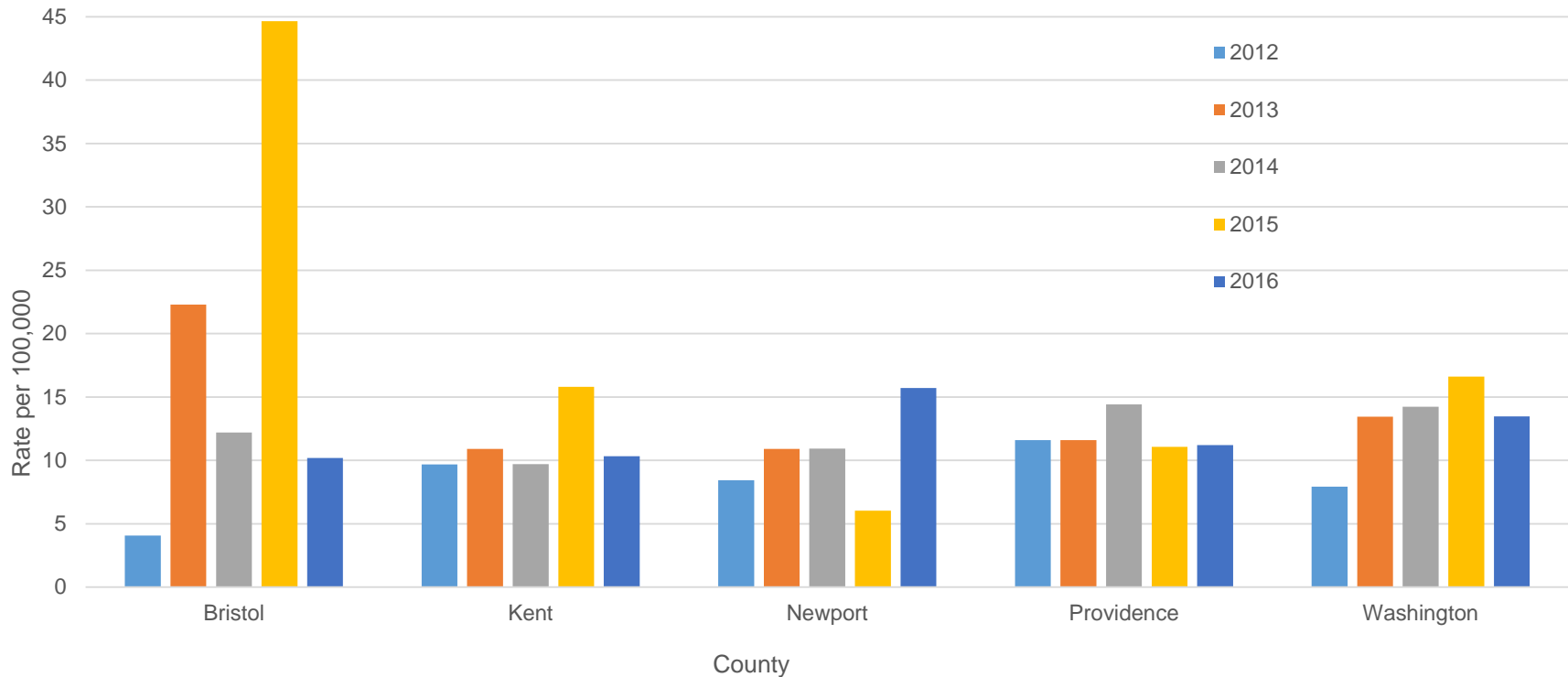


Figure 4: In 2016, Newport County had the highest rate of salmonella. Bristol County returned to a baseline rate of salmonella after an outbreak last year. With the exception of Bristol County in 2012, over the last 5 years, salmonella has infected individuals from all five counties in Rhode Island at similar rates.

Reported Cases of Salmonella, by Month and Year, Rhode Island, 2012-2016

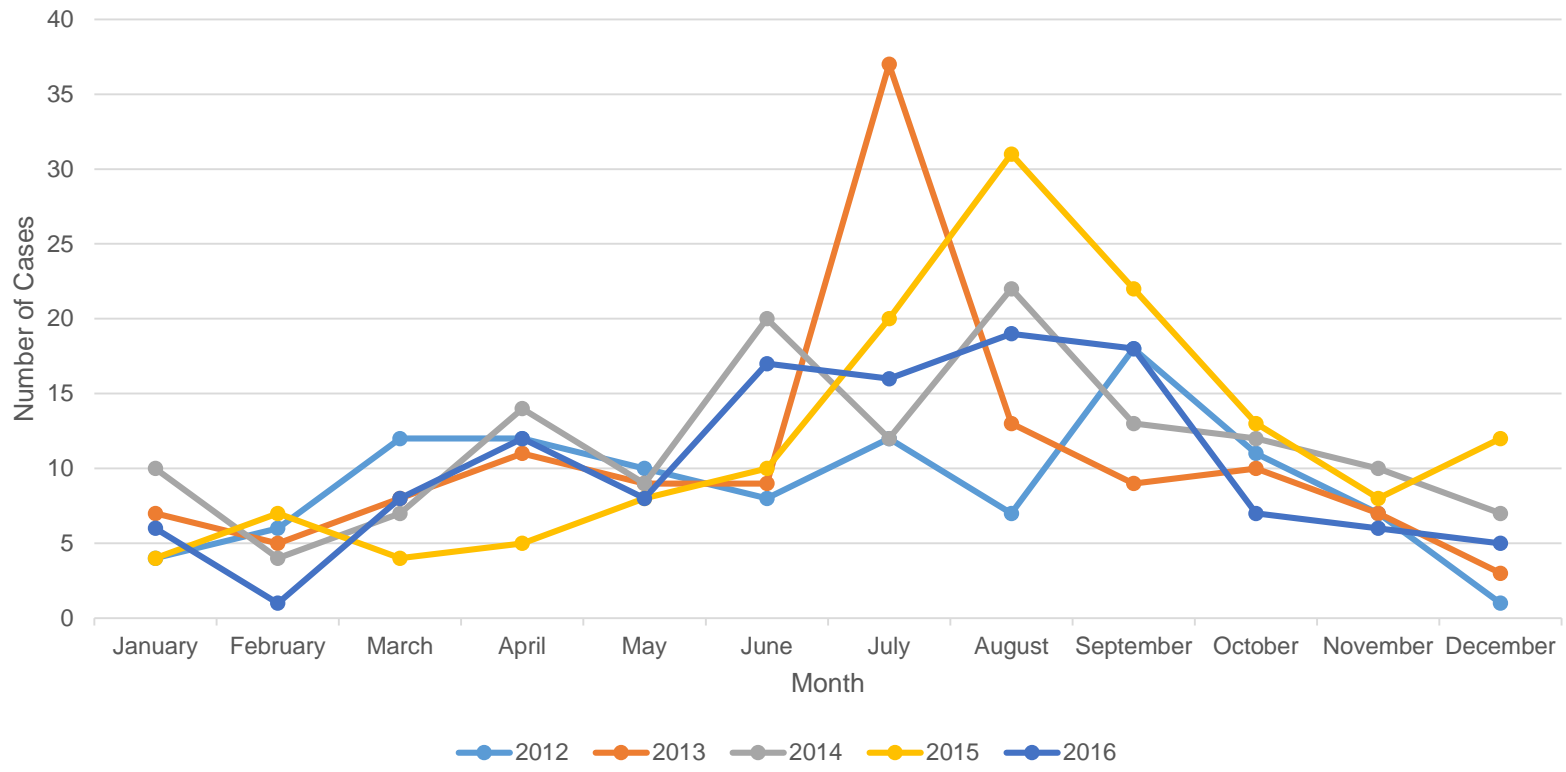


Figure 5: Salmonella infections occur year-round in Rhode Island. Nationally, as well as in Rhode Island, the lowest rates of salmonella occur in winter and cases peak in the summer, demonstrating seasonal trends. Outbreaks are the exception to this seasonality. For example, in March 2011, there was an 83-person outbreak of salmonella, which created a dramatic peak during winter months.

Salmonella Frequency and Rates by Year, Rhode Island, 2012-2016



Table 1. Frequency by Year

	2012	2013	2014	2015	2016
Number of Cases	108	128	140	144	123

Table 2. Rate by Year

	2012	2013	2014	2015	2016
Rate per 100,000	10.3	12.2	13.3	13.7	11.7

Salmonella Frequency, by Age Group and Year, Rhode Island, 2012-2016



Table 3. Frequency by Age Group and Year

	2012	2013	2014	2015	2016
0-4	13	9	20	9	20
5-9	6	7	3	4	3
10-19	11	17	10	12	14
20-29	20	15	26	44	15
30-39	8	17	15	20	20
40-49	13	13	9	18	12
50-59	20	24	23	12	18
60-69	9	9	13	9	11
70-79	2	9	16	10	5
≥80	6	8	5	6	5
Total	108	128	140	144	123

Salmonella Rates, by Age Group and Year, Rhode Island, 2012-2016



Table 4. Rate by Age Group and Year

	2012	2013	2014	2015	2016
0-4	22.6	15.7	34.8	15.7	34.8
5-9	9.9	11.6	5.0	6.6	5
10-19	7.7	11.8	7.0	8.3	9.7
20-29	13.5	10.1	17.6	29.7	10.1
30-39	6.4	13.6	12.0	16	16
40-49	8.4	8.4	5.8	11.7	7.8
50-59	13.2	15.8	15.2	7.9	11.9
60-69	8.8	8.8	12.7	8.8	10.7
70-79	3.5	15.6	27.7	17.3	8.7
≥80	11.7	15.6	9.7	11.7	9.7

Salmonella Frequency and Rates, by Sex and Year, Rhode Island, 2012-2016



Table 5. Frequency by Sex and Year

	2012	2013	2014	2015	2016
Female	60	66	79	80	74
Male	48	62	61	64	49
Total	108	128	140	144	123

Table 6. Rate by Sex and Year

	2012	2013	2014	2015	2016
Female	11.0	12.1	14.5	14.7	13.6
Male	9.4	12.2	12.0	12.6	9.6

Salmonella Frequency, by County and Year, Rhode Island, 2012-2016



Table 7. Frequency by County and Year

	2012	2013	2014	2015	2016
Bristol	2	11	6	22	5
Kent	16	18	16	26	17
Newport	7	9	9	5	13
Providence	73	73	91	70	71
Washington	10	17	18	21	17
All	108	128	140	144	123

Salmonella Rates by County and Year, Rhode Island, 2012-2016



Table 8. Rate by County and Year

	2012	2013	2014	2015	2016
Bristol	4.0	22.3	12.2	44.7	10.2
Kent	9.6	10.9	9.7	15.8	10.3
Newport	8.5	10.9	10.9	6.0	15.7
Providence	11.7	11.6	14.4	11.1	11.2
Washington	7.9	13.5	14.2	16.6	13.5

Salmonella Frequency, by Month and Year, Rhode Island, 2012-2016



Table 9. Frequency by Month and Year

	2012	2013	2014	2015	2016
Jan	4	7	10	4	6
Feb	6	5	4	7	1
Mar	12	8	7	4	8
Apr	12	11	14	5	12
May	10	9	9	8	8
Jun	8	9	20	10	17
Jul	12	37	12	20	16
Aug	7	13	22	31	19
Sep	18	9	13	22	18
Oct	11	10	12	13	7
Nov	7	7	10	8	6
Dec	1	3	7	12	5
All	108	128	140	144	123

Top 6 Salmonella Serotypes, Rhode Island, 2016



Table 10. Salmonella Frequency by Serotype, 2016

Serotype	Count	Percentage of 2016 Salmonella Isolates (n=120)
Salmonella Enteritidis	26	22%
Salmonella Typhimurium	19	16%
Salmonella Newport	16	13%
Salmonella Braenderup	10	8%
Salmonella Infantis	6	5%
Salmonella Javiana	5	4%

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 2016, is one of the most common serotypes in the country. It is frequently associated with chickens or eggs but has also been linked to outbreaks involving sprouts and ground beef.



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

- <http://www.cdc.gov/salmonella/general/index.html>
- <http://www.cdc.gov/salmonella/outbreaks.html>
- <http://www.cdc.gov/salmonella/reportspubs/salmonella-atlas/serotype-snapshots.html>
- <http://www.cdc.gov/salmonella/reportspubs/salmonella-atlas/serotyping-importance.html>
- http://www.cdc.gov/foodnet/PDFs/2012_annual_report_508c.pdf
- https://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s_cid=mm6453a1_w