





Pertussis 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 Pertussis

- Pertussis, or whooping cough, is a respiratory illness caused by the bacteria *Bordetella pertussis*.
- Symptoms of pertussis include a persistent cough, coughing fits, vomiting after coughing, and a cough that makes a “[whoop](#)” sound.
- Pertussis is spread person-to-person by respiratory secretions from coughing or sneezing in close proximity.
- Babies under 1 year of age are at higher risk of infection from pertussis because they are too young to receive vaccine. If they contract pertussis, they are at higher risk of complications from infection.
- Pertussis is a vaccine-preventable disease, although immunity can wane with time. Vaccination of pregnant women is especially important to protect newborn infants.

Data Overview, Pertussis



- In 2018, there were 34 cases of pertussis in Rhode Island. This represents a marked decrease from 2017 and 2016, when 84 and 91 cases of pertussis were reported, respectively. Pertussis is a cyclical disease, with peaks and dips every few years.
- The highest rates (cases per 100,000 population) of pertussis in Rhode Island occurred in children 0-4 years of age. Of the 34 cases of pertussis in 2018, 27 (79%) occurred in children 19 years old and younger.
- Pertussis in Rhode Island largely occurs in vaccinated individuals. Of the 27 children with pertussis in 2018, 21 (78%) were up-to-date on pertussis vaccination. Only 3 cases of pertussis occurred in unvaccinated children. Vaccination recommendations for pertussis can be found [here](#).
- In 2018, there were 3 outbreaks (2 or more cases of pertussis clustered in place and time) in Rhode Island. Of the 34 total cases of pertussis, 12 (35%) were outbreak-associated. All 3 outbreaks occurred in high schools. While there were fewer pertussis outbreaks in 2018 than in 2017, the percentage of total cases associated with outbreaks was consistent. In 2017, there were 9 outbreaks of pertussis in Rhode Island. Of the 84 total cases of pertussis, 27 (32%) were associated with outbreaks. The last 2 years represent a decrease in the number of outbreaks and percentage of cases associated with outbreaks. In 2016, there were 12 outbreaks of pertussis, and 52 out of 91 cases were associated with these outbreaks (57% of cases).

Reported Cases of Pertussis, Rhode Island, 2014-2018

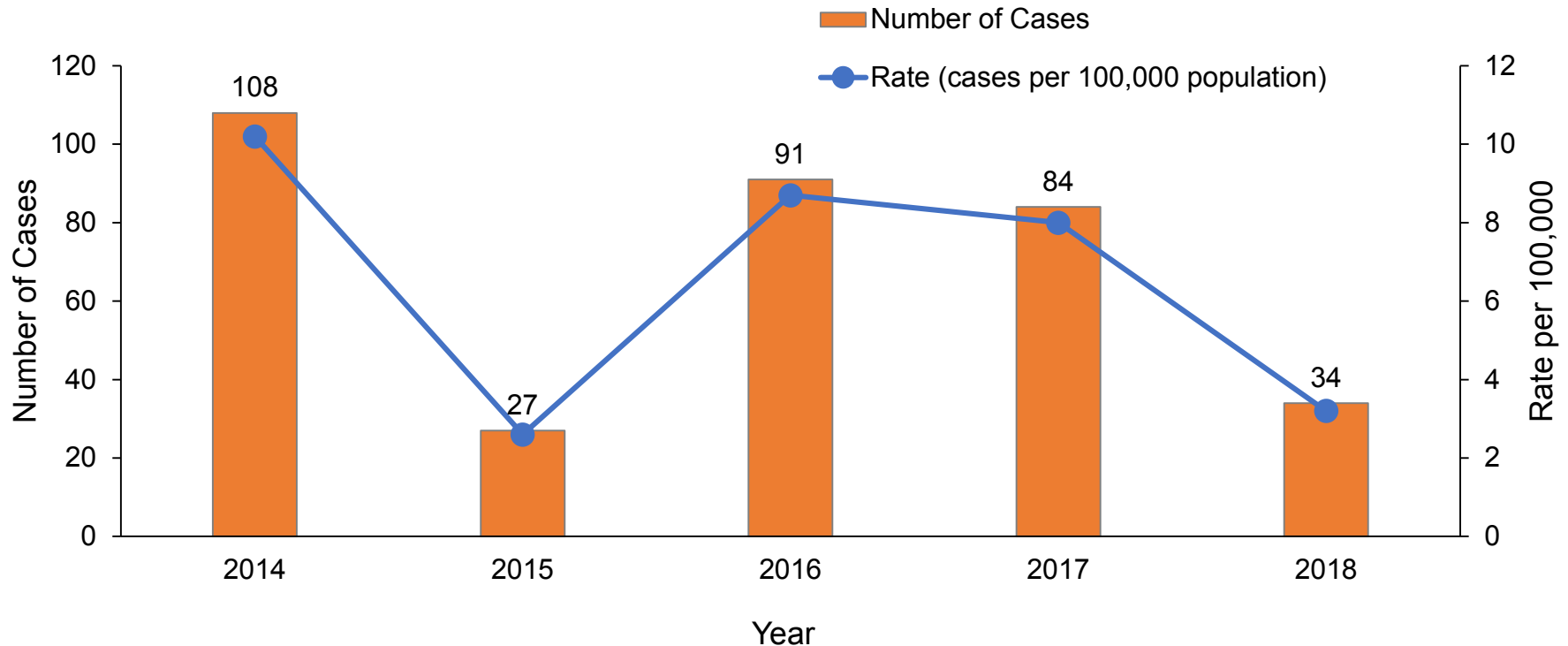


Figure 1: In 2018, there were 34 cases of pertussis in Rhode Island, with a rate of 3.2 cases per 100,000 population. Pertussis typically displays a cyclical trend, peaking every 2-5 years, so the dips in case counts in 2015 and 2018 are not unexpected.

Rate of Pertussis, Age Group, Rhode Island, 2018

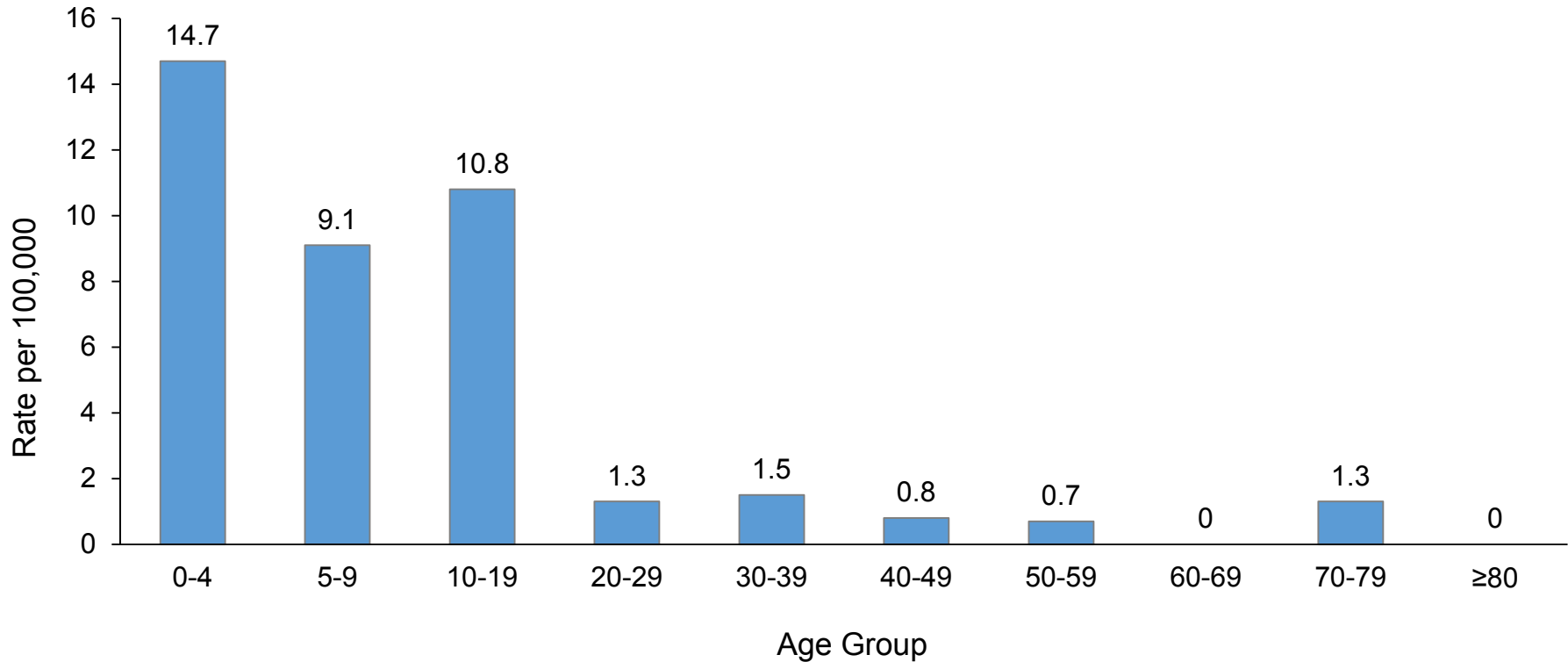


Figure 2: The highest rates (cases per 100,000 population) of pertussis cases in Rhode Island were in the youngest age group of 0-4 year-olds, followed by 10-19 year-olds and 5-9 year-olds. Nationally, infants under one year of age have the highest rate of pertussis, and rates are much higher among children than among adults.

Rate of Pertussis, Sex and Year, Rhode Island, 2014-2018

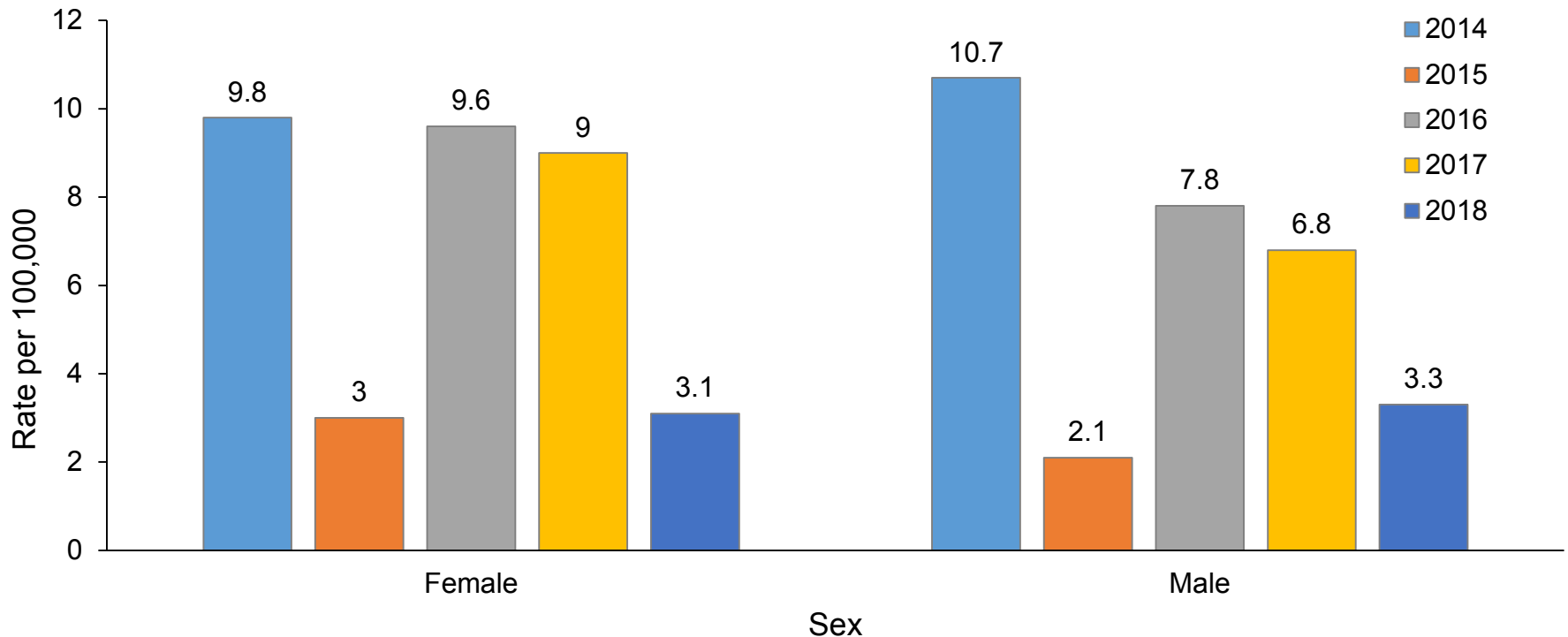


Figure 3: Pertussis was reported in males and females at approximately the same rates (cases per 100,000 population) over the last five years. In 2018, there were 17 cases in females and 17 cases in males. Nationally, rates of pertussis are nearly the same in males and females.

Rate of Pertussis, County and Year, Rhode Island, 2014-2018

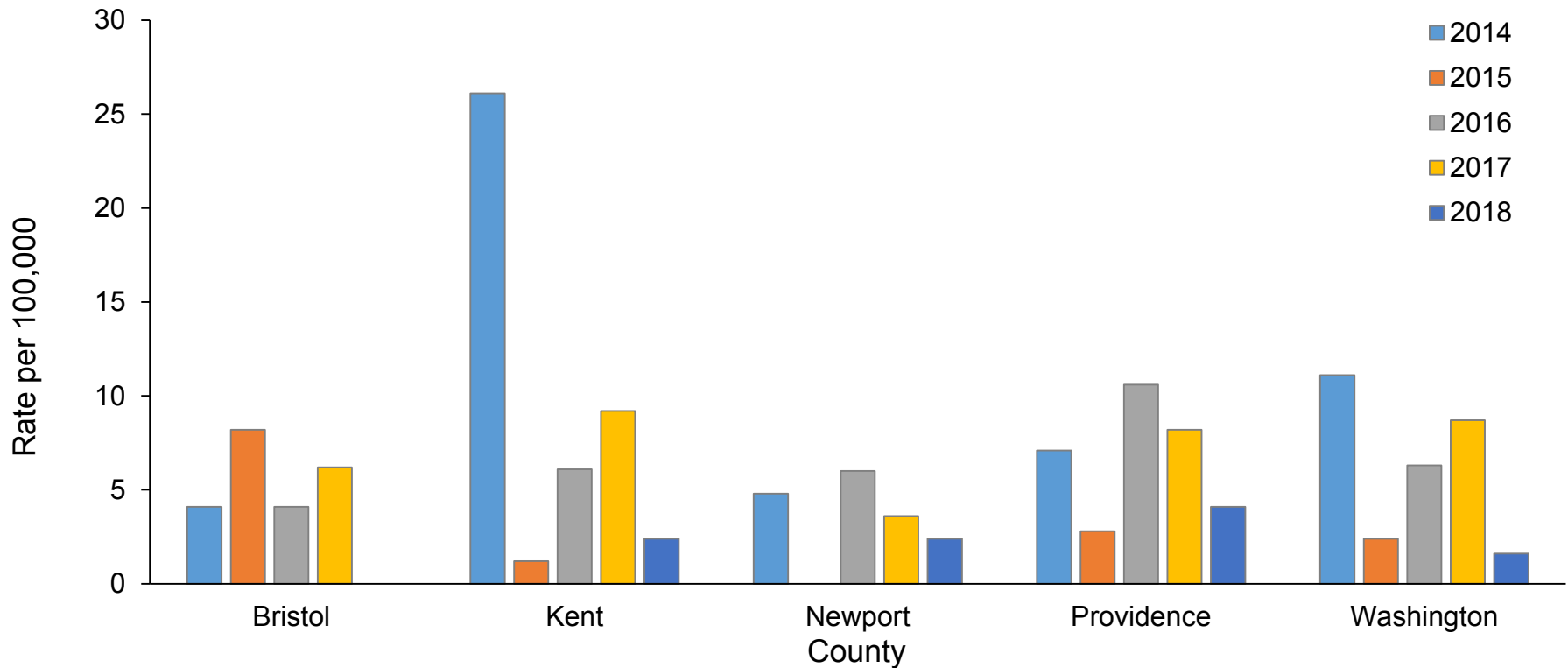


Figure 4: In 2018, the highest rate of pertussis cases occurred in Providence County (4.1 cases per 100,000 population). The 2014 peak rate of pertussis in Kent County was due to a series of 4 outbreaks that occurred in schools located there, with 29 total cases associated.

Reported Cases of Pertussis, Month and Year, Rhode Island, 2014-2018

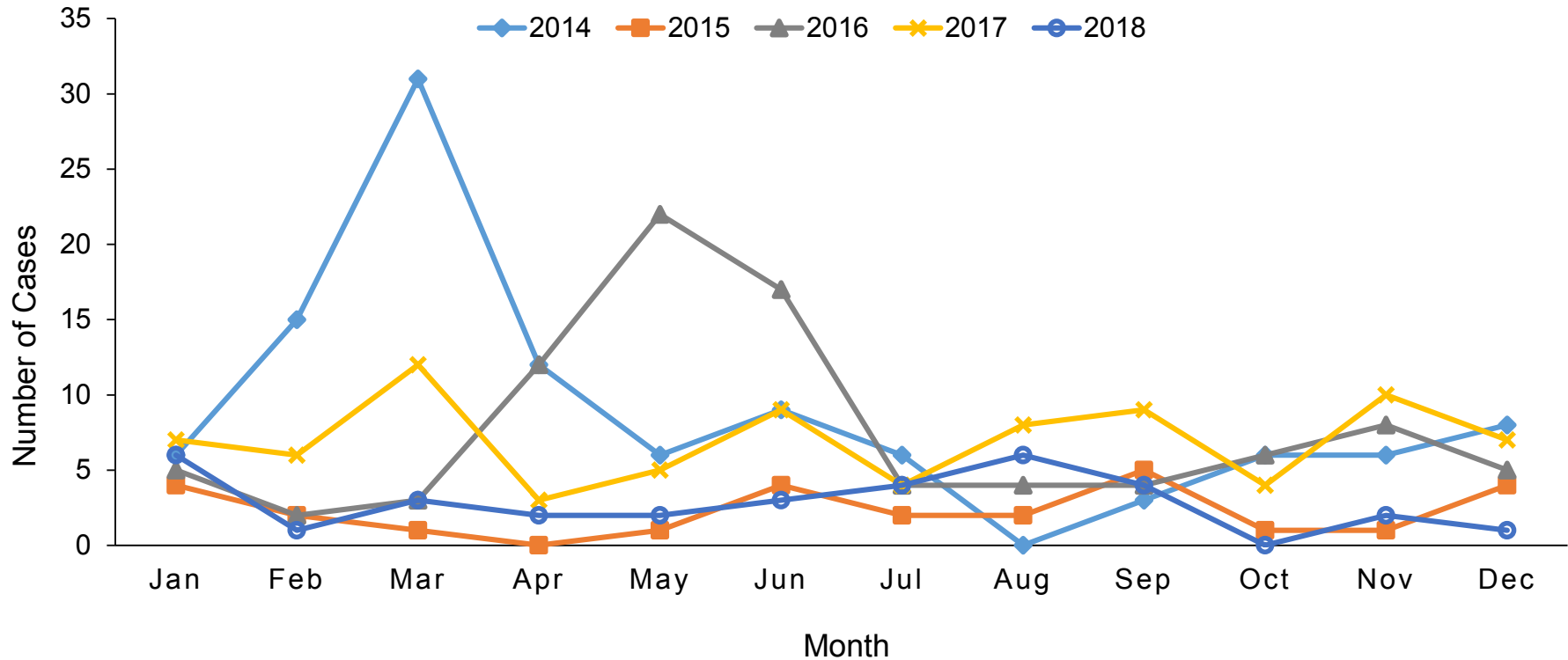


Figure 5: Typically, pertussis does not occur with a seasonal trend. The peaks in April-June 2016 and March 2014 can be explained by multiple large school-based outbreaks.

Pertussis Frequency and Rates by Year, Rhode Island, 2014-2018



Table 1. Frequency by Year

	2014	2015	2016	2017	2018
Number of Cases	108	27	91	84	34

Table 2. Rate (cases per 100,000 population) by Year

	2014	2015	2016	2017	2018
Rate per 100,000	10.2	2.6	8.7	8.0	3.2

Pertussis Frequency, Age Group and Year, Rhode Island, 2014-2018



Table 3. Frequency by Age Group and Year

	2014	2015	2016	2017	2018
0-4	12	1	4	5	8
5-9	18	4	15	10	5
10-19	68	18	62	50	14
20-29	1	0	2	6	2
30-39	3	1	1	6	2
40-49	1	2	6	4	1
50-59	2	0	1	2	1
60-69	1	1	0	0	0
70-79	1	0	1	0	1
≥80	1	0	0	1	0
Total	108	27	92	84	34

Pertussis Rates, Age Group and Year, Rhode Island, 2014-2018



Table 4. Rate (cases per 100,000 population) by Age Group and Year

	2014	2015	2016	2017	2018
0-4	21.9	1.8	7.3	9.2	14.7
5-9	31.1	7.0	26.7	18.0	9.1
10-19	50.3	13.4	46.6	38.0	10.8
20-29	0.7	0.0	1.3	3.9	1.3
30-39	2.4	0.8	0.8	4.5	1.5
40-49	0.7	1.5	4.6	3.1	0.8
50-59	1.3	0.0	0.7	1.3	0.7
60-69	0.9	0.8	0.0	0.0	0.0
70-79	1.6	0.0	1.5	0.0	1.3
≥80	2.0	0.0	0.0	2.0	0.0

Pertussis Frequency and Rates, Sex and Year, Rhode Island, 2014-2018



Table 5. Frequency by Sex and Year

	2014	2015	2016	2017	2018
Female	53	16	52	49	17
Male	55	11	40	35	17
Total	108	27	92	84	34

Table 6. Rate (cases per 100,000 population) by Sex and Year

	2014	2015	2016	2017	2018
Female	9.8	3.0	9.6	9.0	3.1
Male	10.7	2.1	7.8	6.8	3.3

Pertussis Frequency, County and Year, Rhode Island, 2014-2018



Table 7. Frequency by County and Year

	2014	2015	2016	2017	2018
Bristol	2	4	2	3	0
Kent	43	2	10	15	4
Newport	4	0	5	3	2
Providence	45	18	67	52	26
Washington	14	3	8	11	2
All	108	27	92	84	34

Pertussis Rates by County and Year, Rhode Island, 2014-2018



Table 8. Rate (cases per 100,000 population) by County and Year

	2014	2015	2016	2017	2018
Bristol	4.1	8.2	4.1	6.2	0
Kent	26.1	1.2	6.1	9.2	2.4
Newport	4.8	0.0	6.0	3.6	2.4
Providence	7.1	2.8	10.6	8.2	4.1
Washington	11.1	2.4	6.3	8.7	1.6

Pertussis Frequency, Month and Year, Rhode Island, 2014-2018



Table 9. Frequency by Month and Year

	2014	2015	2016	2017	2018
Jan	6	4	5	7	6
Feb	15	2	2	6	1
Mar	31	1	3	12	3
Apr	12	0	12	3	2
May	6	1	22	5	2
Jun	9	4	17	9	3
Jul	6	2	4	4	4
Aug	0	2	4	8	6
Sep	3	5	4	9	4
Oct	6	1	6	4	0
Nov	6	1	8	10	2
Dec	8	4	5	7	1
All	108	27	92	84	34



Notes on Data

- Case counts include patients classified as confirmed and probable cases according to the [CDC case definition](#).
- “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/pertussis/index.html>
- <https://www.cdc.gov/pertussis/vaccines.html>
- <https://www.cdc.gov/pertussis/downloads/pertuss-surv-report-2015-provisional.pdf>
- <http://www.pkids.org/diseases/pertussis.html>