





# **Pertussis 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 Pertussis

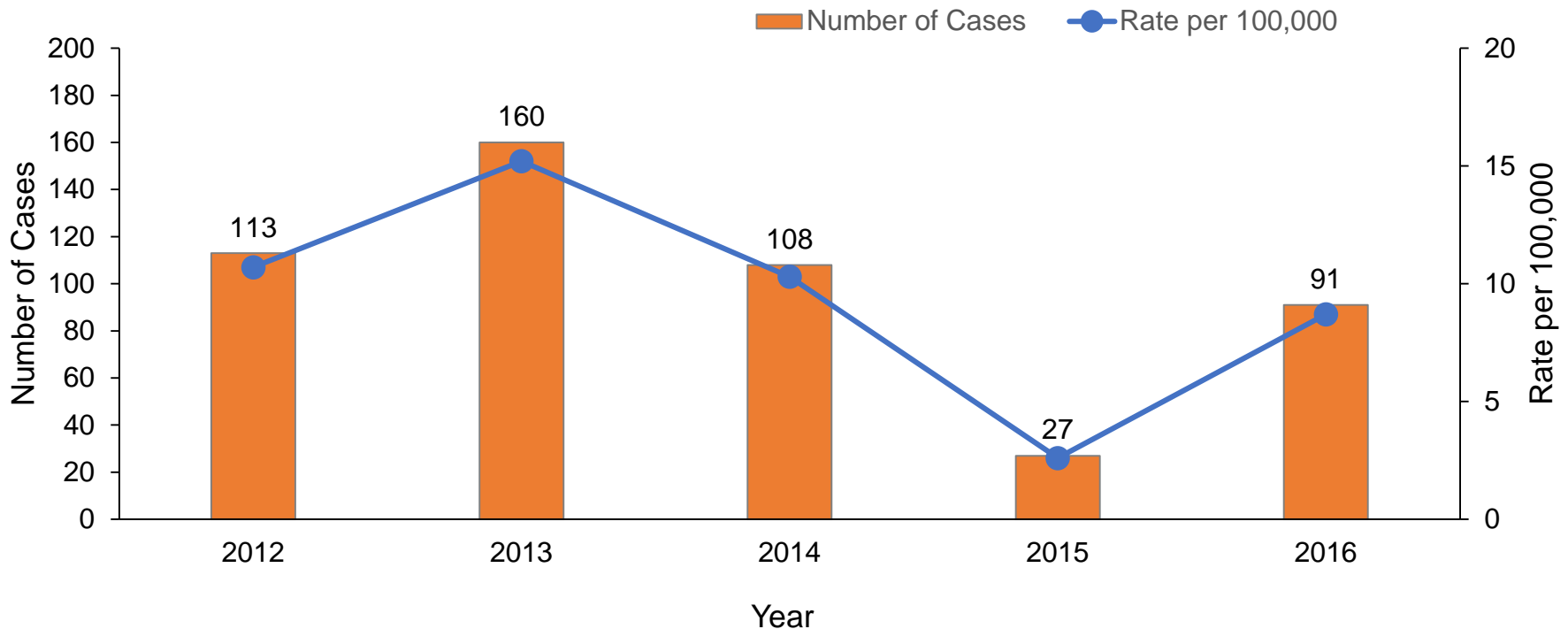
- Pertussis, or whooping cough, is a respiratory illness caused by the bacteria *Bordetella pertussis*.
- Symptoms of pertussis include a persistent cough, coughing fits, vomiting after coughing, and a cough that makes a “whoop” sound.
- Pertussis is spread person-to-person by respiratory secretions 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

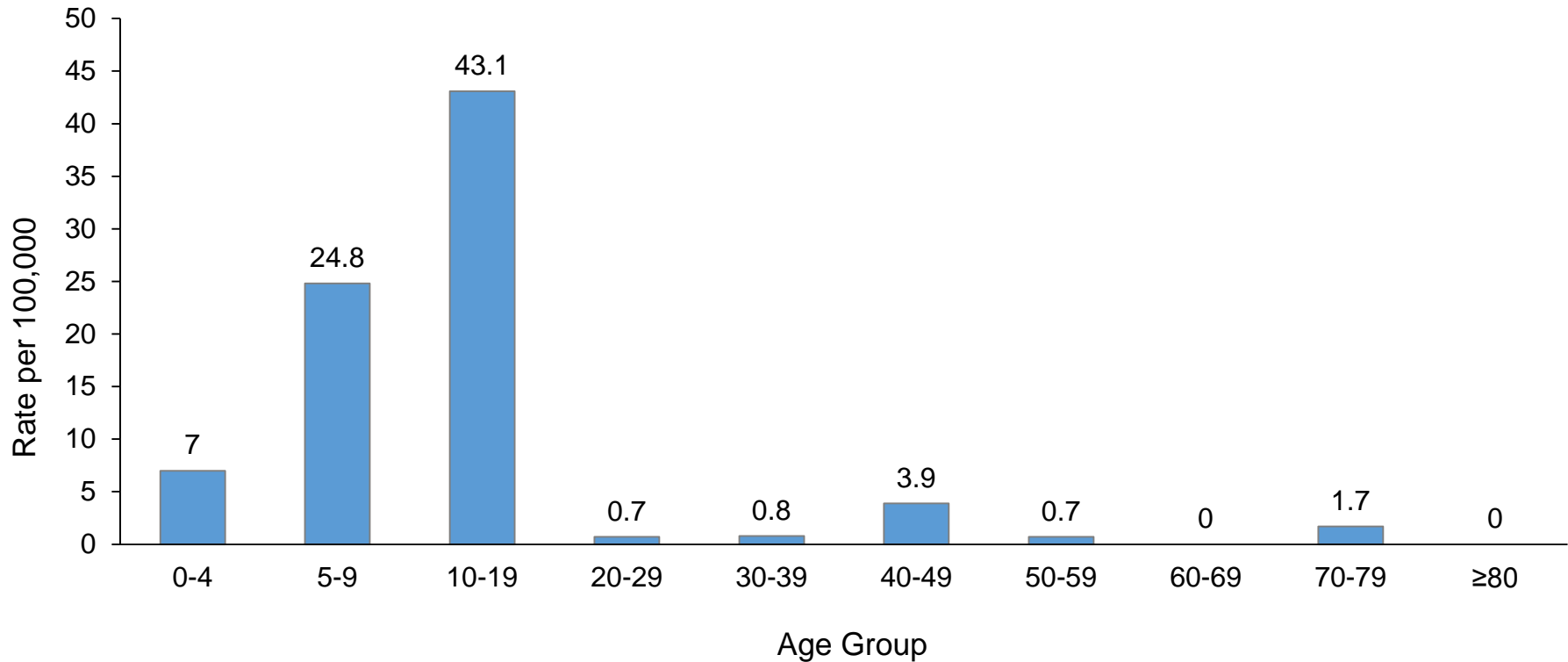
- In 2016, there were 91 cases of pertussis in Rhode Island, with a rate of 8.7 cases per 100,000 population.
- Although 2015 had an unusually low number of pertussis cases, 2016 had a more typical number.
- Pertussis tends to exhibit a cyclical trend, with varying rates of illness between years.
- In 2016, there were 12 outbreaks of pertussis in Rhode Island. Of the 91 total cases of pertussis, 52 (57%) were associated with outbreaks (2 or more cases of pertussis clustered in place and time).

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



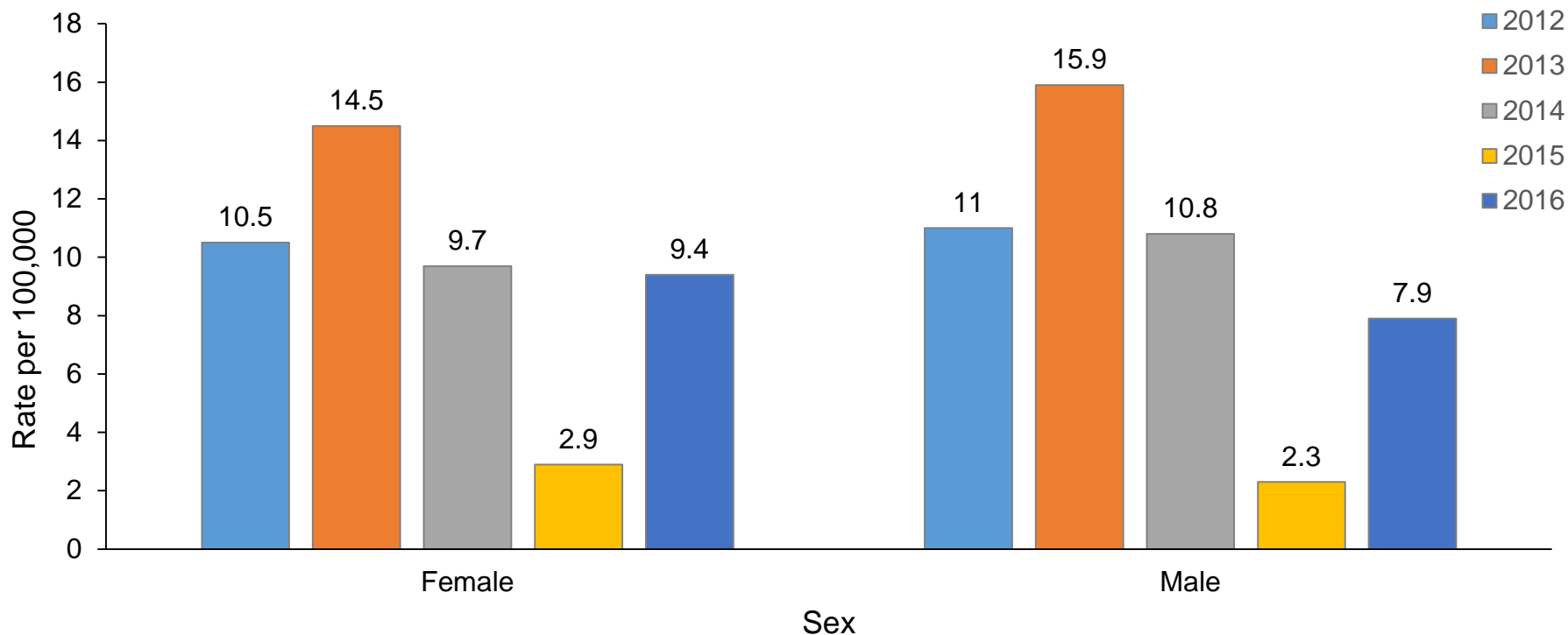
**Figure 1:** In 2016, there were 91 cases of pertussis in Rhode Island, with a rate of 8.7 cases per 100,000 population. Although this appears to be a large increase from 2015, it is not unusual to see this type of pattern with pertussis, which has a cyclical trend and peaks every 2-5 years.

# Rate of Pertussis, Age Group, Rhode Island, 2016



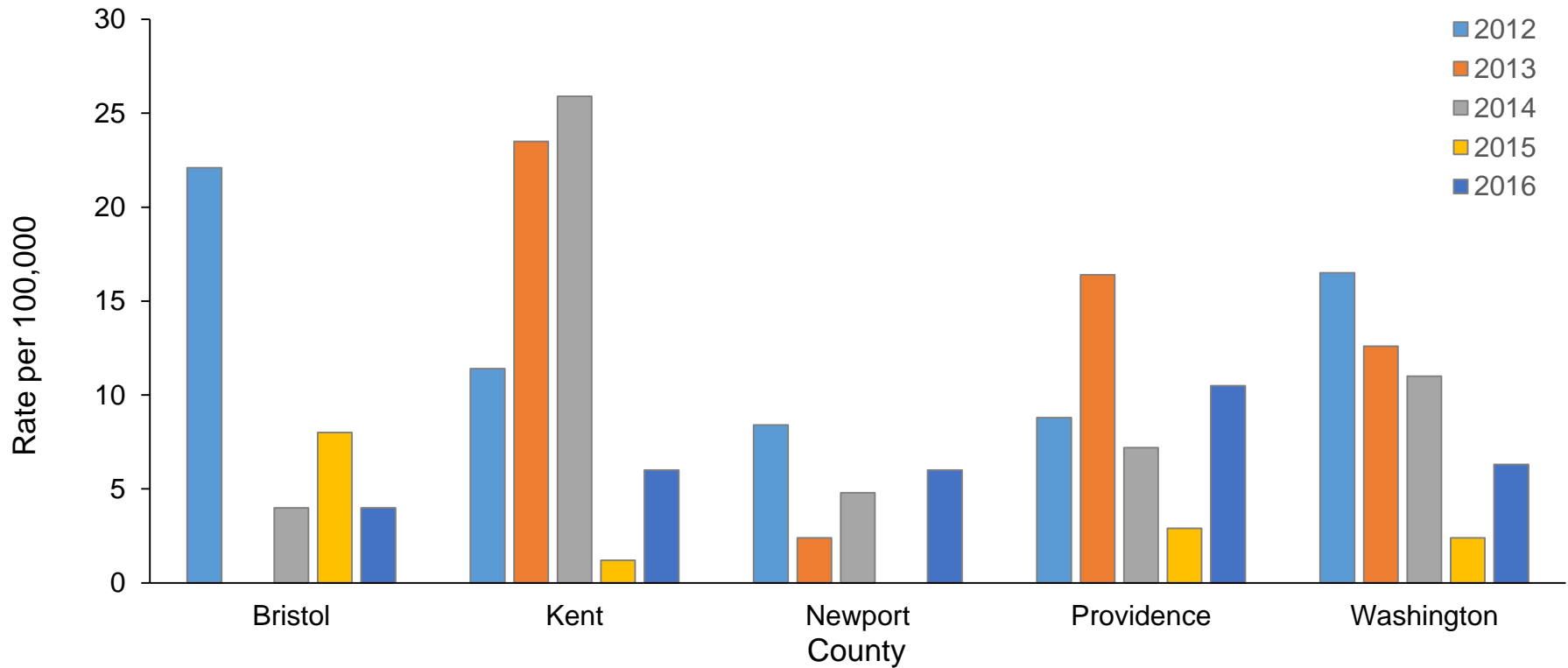
**Figure 2:** The highest rate of pertussis cases in Rhode Island is in the adolescent age group of 10-19 years, followed by the 5-9 year-olds, and 0-4 year-olds. These data follow national trends in which pertussis affects the adolescent age group most, due to waning vaccine immunity.

# Rate of Pertussis, Sex and Year, Rhode Island, 2012-2016



**Figure 3:** Pertussis was reported in males and females at approximately the same rates over the last five years. In 2016, there were 51 cases in females and 40 cases in males. Nationally, rates of pertussis are nearly the same in males and females.

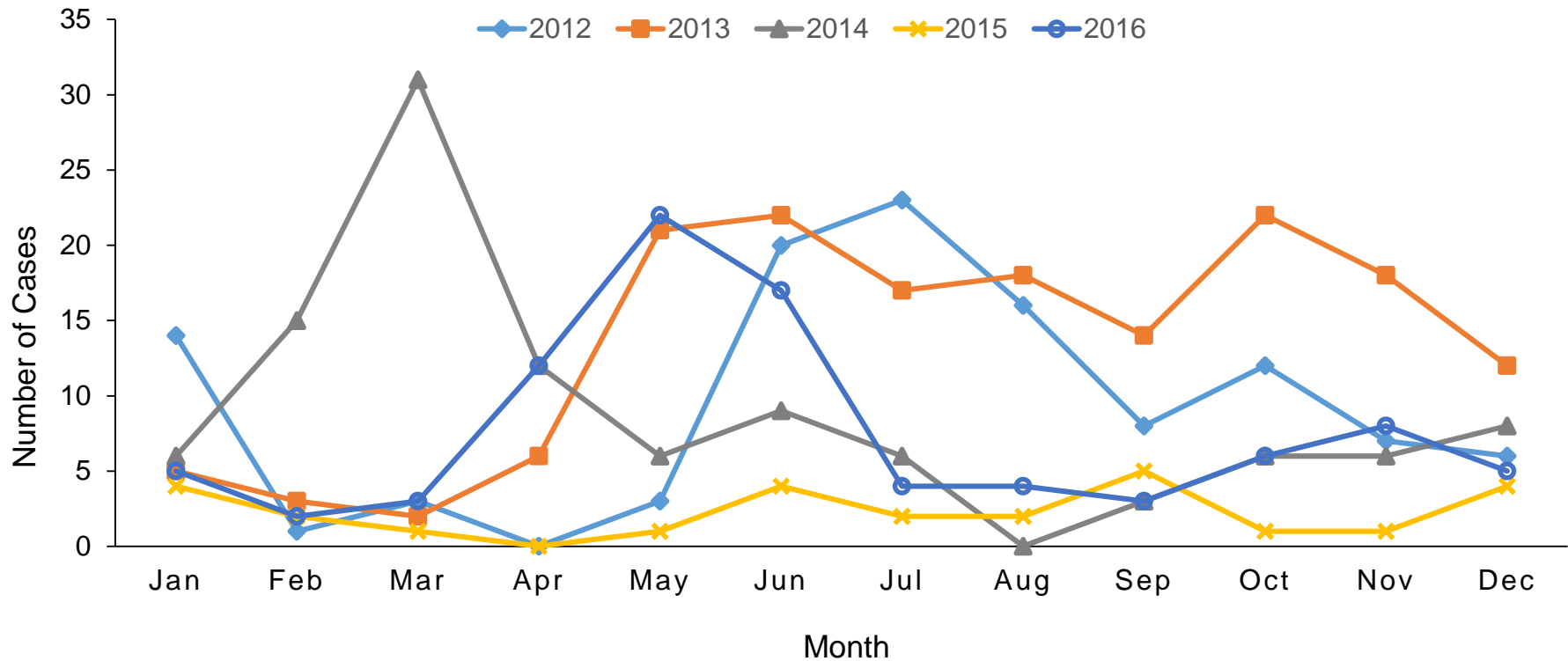
# Rate of Pertussis, County and Year, Rhode Island, 2012-2016



**Figure 4:** In 2016, the highest rate of pertussis cases occurred in Providence County with a rate of 10.5 cases per 100,000 population. Several of the large outbreaks in 2016 occurred in schools within Providence County.



# Reported Cases of Pertussis, Month and Year, Rhode Island, 2012-2016



**Figure 5:** In 2016, a large number of pertussis outbreaks occurred in RI between April and June. Typically, pertussis does not occur with a seasonal trend.

# Pertussis 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>	113	160	108	27	91

**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>	10.7	15.2	10.3	2.6	8.7

# Pertussis Frequency, Age Group and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>0-4</b>	23	30	12	1	4
<b>5-9</b>	28	39	18	4	15
<b>10-19</b>	47	73	68	18	62
<b>20-29</b>	4	5	1	0	1
<b>30-39</b>	3	2	3	1	1
<b>40-49</b>	6	7	1	2	6
<b>50-59</b>	1	1	2	0	1
<b>60-69</b>	0	2	1	1	0
<b>70-79</b>	0	1	1	0	1
<b>≥80</b>	1	0	1	0	0
<b>Total</b>	113	160	108	27	91

# Pertussis Rates, Age Group and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>0-4</b>	40.0	52.2	20.9	1.7	7.0
<b>5-9</b>	46.3	64.5	29.8	6.6	24.8
<b>10-19</b>	32.7	50.7	47.3	12.5	43.1
<b>20-29</b>	2.7	3.4	0.7	0.0	0.7
<b>30-39</b>	2.4	1.6	2.4	0.8	0.8
<b>40-49</b>	3.9	4.5	0.7	1.3	3.9
<b>50-59</b>	0.7	0.7	1.3	0.0	0.7
<b>60-69</b>	0.0	2.0	1.0	1.0	0.0
<b>70-79</b>	0.0	1.7	1.7	0.0	1.7
<b>≥80</b>	2.0	0.0	2.0	0.0	0.0

# Pertussis Frequency and Rates, Sex and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Female</b>	57	79	53	16	51
<b>Male</b>	56	81	55	11	40
<b>Total</b>	<b>113</b>	<b>160</b>	<b>108</b>	<b>27</b>	<b>91</b>

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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Female</b>	10.5	14.5	9.7	2.9	9.4
<b>Male</b>	11.0	15.9	10.8	2.3	7.9

# Pertussis Frequency, County and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Bristol</b>	11	0	2	4	2
<b>Kent</b>	19	39	43	2	10
<b>Newport</b>	7	2	4	0	5
<b>Providence</b>	55	103	45	18	66
<b>Washington</b>	21	16	14	3	8
<b>All</b>	<b>113</b>	<b>160</b>	<b>108</b>	<b>27</b>	<b>91</b>

# Pertussis Rates by County and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Bristol</b>	22.1	0.0	4.0	8.0	4.0
<b>Kent</b>	11.4	23.5	25.9	1.2	6.0
<b>Newport</b>	8.4	2.4	4.8	0.0	6.0
<b>Providence</b>	8.8	16.4	7.2	2.9	10.5
<b>Washington</b>	16.5	12.6	11.0	2.4	6.3

# Pertussis Frequency, Month and Year, Rhode Island, 2012-2016



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

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Jan</b>	14	5	6	4	5
<b>Feb</b>	1	3	15	2	2
<b>Mar</b>	3	2	31	1	3
<b>Apr</b>	0	6	12	0	12
<b>May</b>	3	21	6	1	22
<b>Jun</b>	20	22	9	4	17
<b>Jul</b>	23	17	6	2	4
<b>Aug</b>	16	18	0	2	4
<b>Sep</b>	8	14	3	5	3
<b>Oct</b>	12	22	6	1	6
<b>Nov</b>	7	18	6	1	8
<b>Dec</b>	6	12	8	4	5
<b>All</b>	<b>113</b>	<b>160</b>	<b>108</b>	<b>27</b>	<b>91</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/pertussis/index.html>
- <https://www.cdc.gov/pertussis/vaccines.html>
- <https://www.cdc.gov/pertussis/downloads/pertuss-surv-report-2015-provisional.pdf>
- <http://www.health.ri.gov/diseases/vaccine-preventable/?parm=12>
- <http://www.pkids.org/diseases/pertussis.html>