





Haemophilus influenzae Invasive Disease Surveillance 2013-2017

Rhode Island Department of Health

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

Center for Acute Infectious Disease Epidemiology

About *Haemophilus influenzae* Invasive Disease



- *Haemophilus influenzae* bacteria, often called *H. Flu*, can cause many different kinds of infections. When the bacteria invade parts of the body that are normally free from germs, like spinal fluid or blood, this is known as "invasive disease." Only invasive *Haemophilus influenzae* disease is reportable in Rhode Island.
- *H. Flu* is spread through respiratory droplets (coughing or sneezing). Many people carry *Haemophilus influenzae* bacteria in their noses and throats but are not ill.
- Invasive *H. Flu* disease can cause different symptoms depending on which part of the body is infected. The most common types of illness are pneumonia (lung infection), bacteremia (bloodstream infection) and meningitis (infection of the meninges, the membrane that covers the brain and spinal cord).
- Children under five years of age, adults 65 year of age and older, American Indians, Alaska Natives, and individuals with immunosuppressive conditions are at the highest risk for developing invasive *H. Flu* disease.
- *H. Flu* invasive disease is severe and typically requires hospitalization and antibiotic treatment.
- There are several serotypes of *Haemophilus influenzae*, distinguished by molecules on the bacteria's outer layer, or capsule. These serotypes are designated a-f. Many *Haemophilus influenzae* organisms are unable to be serotyped because they lack a capsule.
- Serotype b is the only serotype of *H. flu* that has a vaccine.



Data Overview, *Haemophilus influenzae* “*H. Flu*” Invasive Disease

- In 2017, there were 18 cases of *H. Flu* invasive disease in Rhode Island with a rate of 1.7 cases per 100,000 population
- Invasive *H. flu* infections increased slightly each year in RI between 2013 and 2016, then decreased in 2017.
- The rate of *H. flu* in Rhode Island increases with age, with those with those ≥ 80 years of age having the highest 5-year rate, or the highest rate of new cases over the last 5 years.
- From 2013 to 2017, over half of *H. Flu* cases in RI were “nontypeable” (60%), meaning they were caused by organisms without capsules. Serotype f caused 19% of cases.

Reported Cases of *Haemophilus influenzae* Invasive Disease, Rhode Island, 2013-2017

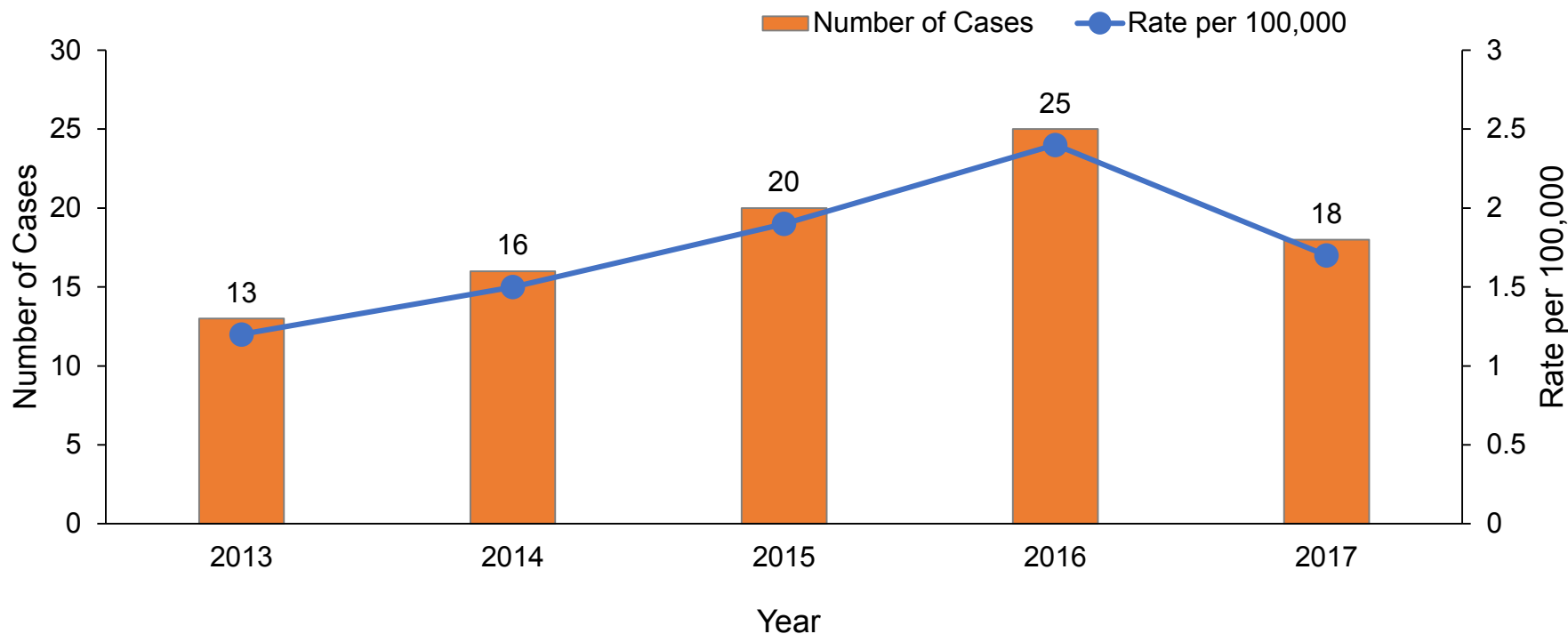


Figure 1: *Haemophilus influenzae* invasive disease is not common in RI. In 2017, there were 18 cases, with a rate of 1.7 cases per 100,000 population. Invasive *H. flu* infections increased slightly each year in RI between 2013 and 2016, then decreased in 2017.

Cumulative 5-Year Rate of *Haemophilus influenzae* Invasive Disease, Age Group, Rhode Island, 2013-2017

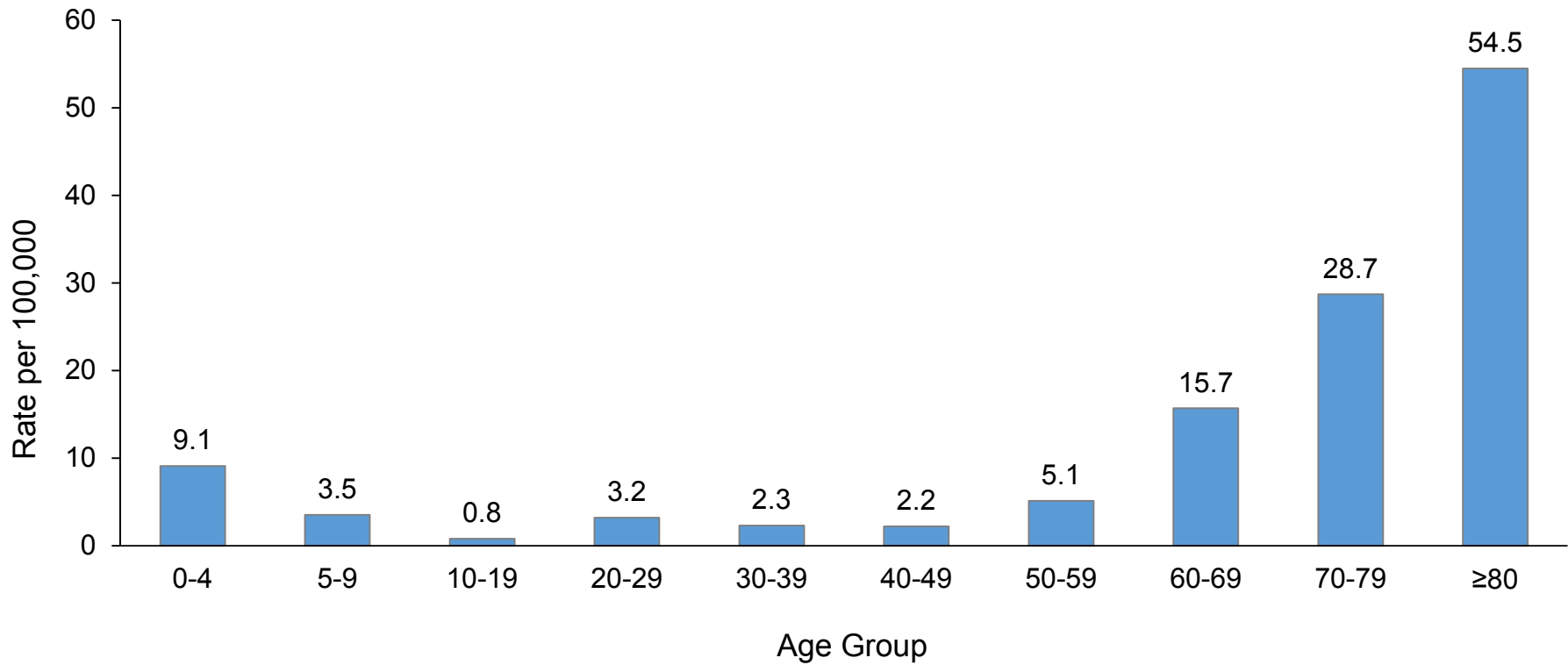


Figure 2: Cumulatively, the five-year incidence of *H. flu* invasive infection was highest in adults 80 years of age and older (54.5 cases for the last five years per 100,000 population). Between 2013 and 2017, 71% of all cases were 60 years of age or older. This mirrors the national trend in which the highest rate of disease occurs in those ≥65 years of age, and those <5 years of age.

Rate of *Haemophilus influenzae* Invasive Disease, Sex and Year, Rhode Island, 2013-2017

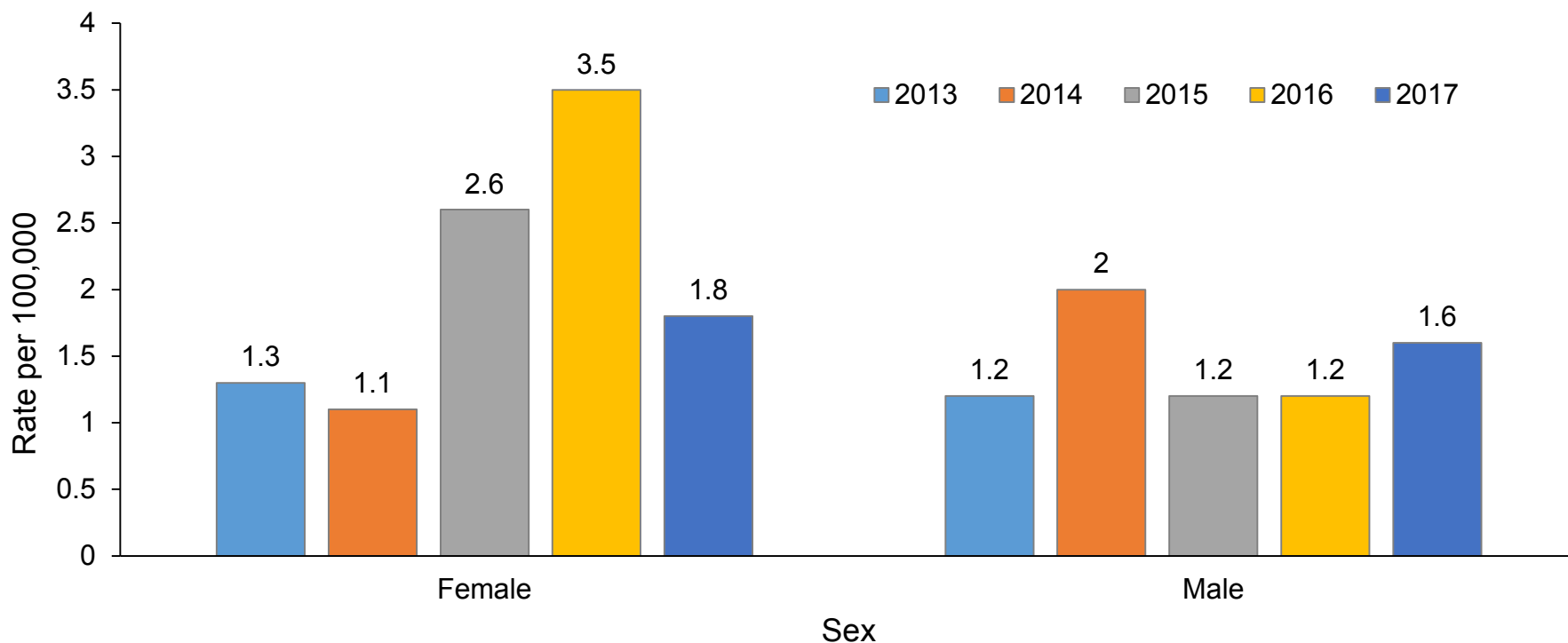


Figure 3: Over the last 5 years, the incidence rate of *H. flu* infection was slightly higher in females than in males.

Rate of *Haemophilus influenzae* Invasive Disease, County and Year, Rhode Island, 2013-2017

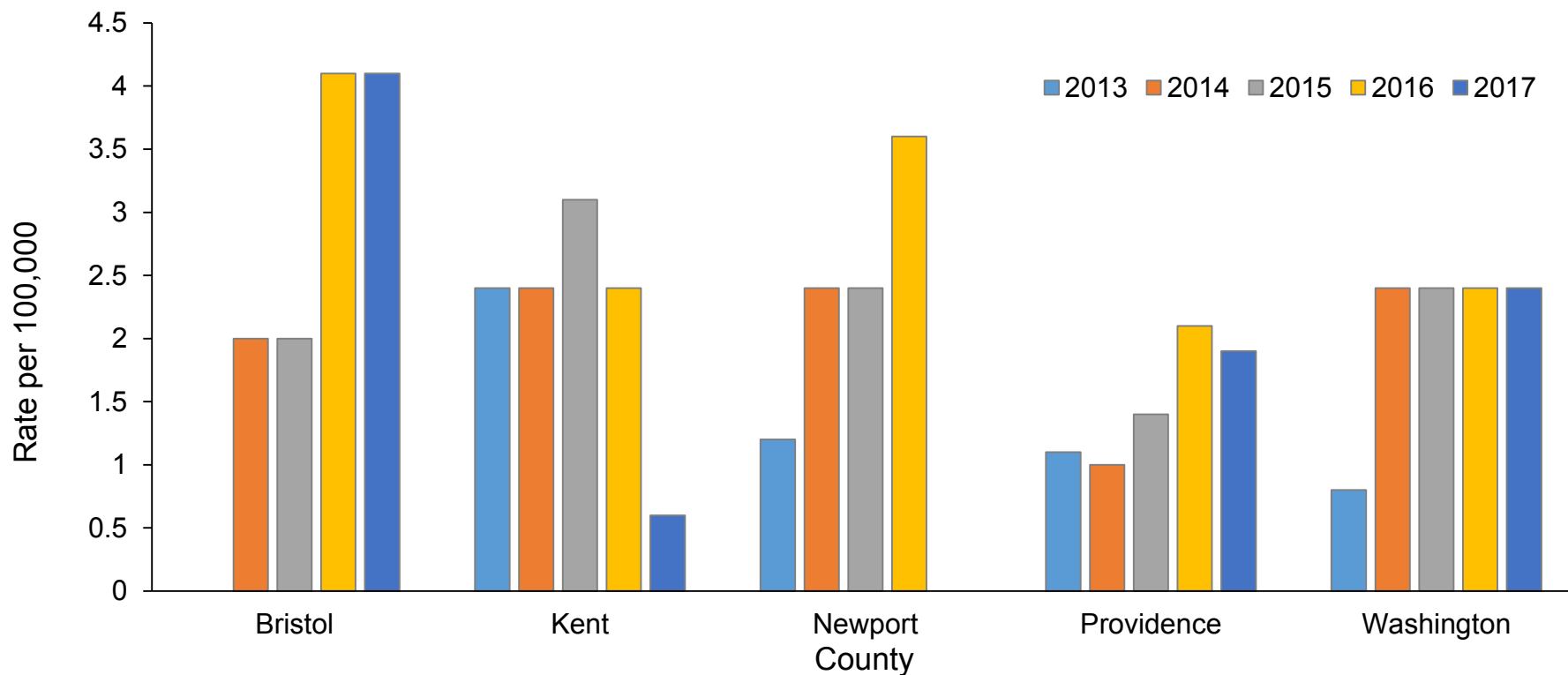


Figure 4: In 2017, the rate of *H. Flu* invasive disease was the highest in Bristol County, with 4 cases per 100,000 population. Over the last five years, Providence County has had the lowest rates of *H. Flu* invasive disease.

Reported Cases of *Haemophilus influenzae* Invasive Disease by Month and Year, Rhode Island, 2013-2017

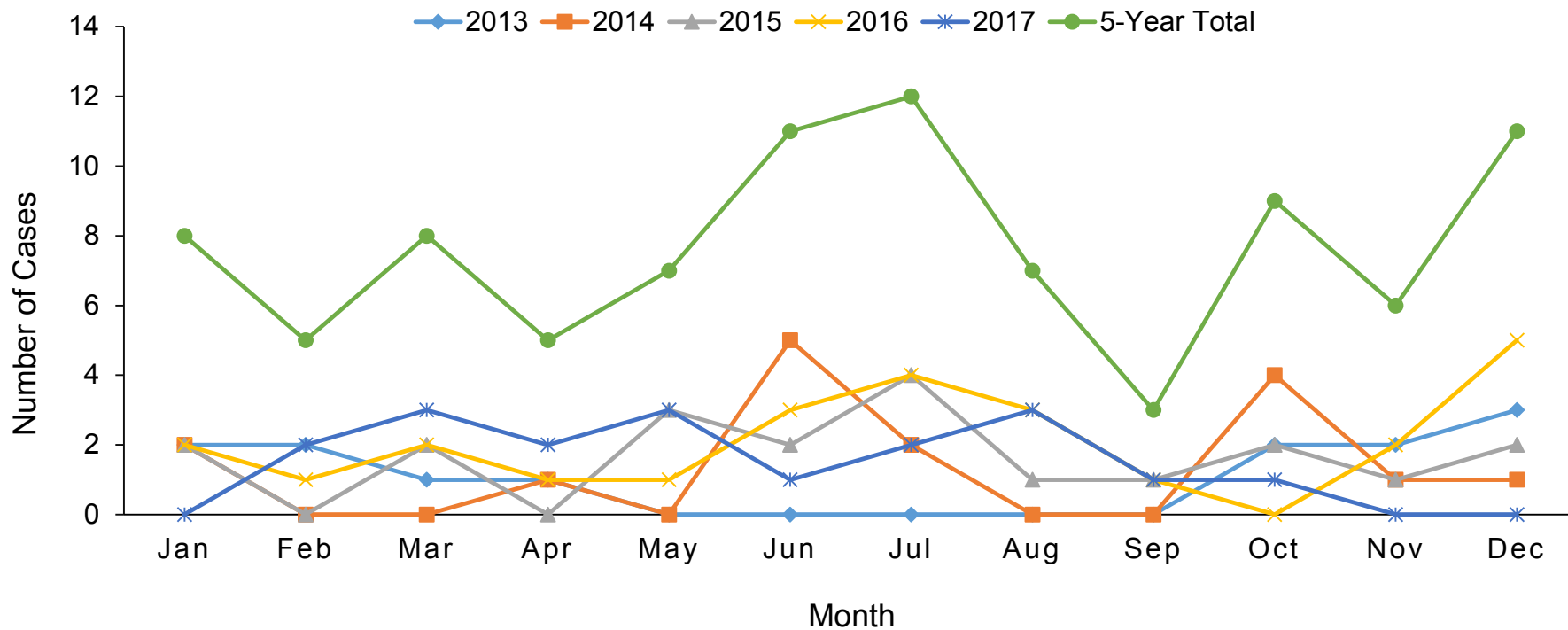


Figure 5: *Haemophilus Influenzae* invasive disease occurs year-round in Rhode Island, with slight peaks in June/July and December.

Reported Cases of *Haemophilus influenzae* Invasive Disease by Serotype, Rhode Island, 2013-2017 Cumulative Cases

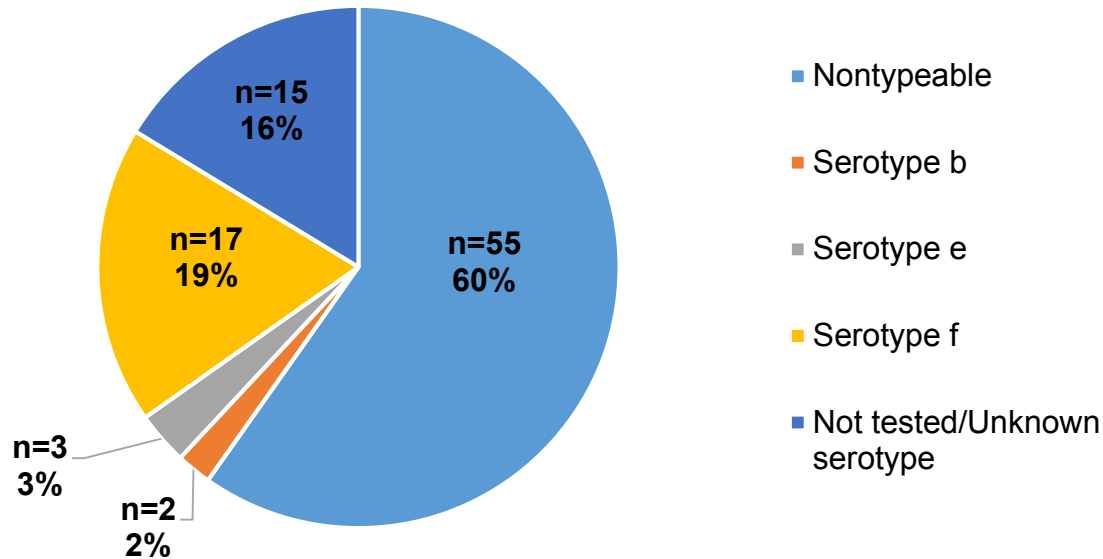


Figure 6: *Haemophilus influenzae* bacteria are classified as either “typeable” or “nontypeable” based on their structure. Of those that are typeable, there are 6 serotypes (letters a-f). Serotype b (more commonly known as “Hib”) is currently the only type of *H. Flu* for which a vaccine exists. From 2013 to 2017, most of the cases in RI (60%) were “nontypeable” and only 2% were serotype b. These data are similar to the national trend in which nontypeable *H. Flu* is the most common type of infection identified.

Haemophilus influenzae Invasive Disease Frequency and Rate by Year, Rhode Island, 2013-2017



Table 1. Frequency by Year

	2013	2014	2015	2016	2017
Number of Cases	13	16	20	25	18

Table 2. Rate by Year

	2013	2014	2015	2016	2017
Rate per 100,000	1.2	1.5	1.9	2.4	1.7

Haemophilus Influenzae Invasive Disease Frequency, Age Group and Year, Rhode Island, 2013-2017



Table 3. Frequency by Age Group and Year

	2013	2014	2015	2016	2017	5-Year Total
0-4	0	2	1	1	1	5
5-9	0	0	0	2	0	2
10-19	0	0	0	1	0	1
20-29	0	2	2	0	1	5
30-39	1	0	1	1	0	3
40-49	1	0	0	2	0	3
50-59	1	1	2	1	3	8
60-69	6	3	2	3	5	19
70-79	2	5	4	7	1	19
≥80	2	3	8	7	7	27
Total	13	16	20	25	18	92

Haemophilus Influenzae Invasive Disease Rates, Age Group and Year, Rhode Island, 2013-2017



Table 4. Rate by Age Group and Year

	2013	2014	2015	2016	2017	5-year cumulative rate
0-4	0	3.6	1.8	1.8	1.8	9.1
5-9	0	0	0	3.6	0	3.5
10-19	0	0	0	0.8	0	0.8
20-29	0	1.3	1.3	0.0	0.6	3.2
30-39	0.8	0	0.8	0.8	0	2.3
40-49	0.7	0	0	1.5	0	2.2
50-59	0.6	0.6	1.3	0.7	2.0	5.1
60-69	5.3	2.6	1.6	2.4	3.9	15.7
70-79	3.2	7.8	6.1	10.4	1.4	28.7
≥80	4.0	6.0	16.2	14.3	14.4	54.5

Haemophilus Influenzae Invasive Disease Frequency and Rates, Sex and Year, Rhode Island, 2013-2017



Table 5. Frequency by Sex and Year

	2013	2014	2015	2016	2017	5-Year Total
Female	7	6	14	19	10	56
Male	6	10	6	6	8	36
Total	13	16	20	25	18	92

Table 6. Rate by Sex and Year

	2013	2014	2015	2016	2017
Female	1.3	1.1	2.6	3.5	1.8
Male	1.2	2.0	1.2	1.2	1.6

Haemophilus influenzae Invasive Disease Frequency, County and Year, Rhode Island, 2013-2017



Table 7. Frequency by County and Year

	2013	2014	2015	2016	2017
Bristol	0	1	1	2	2
Kent	4	4	5	4	1
Newport	1	2	2	3	0
Providence	7	6	9	13	12
Washington	1	3	3	3	3
All	13	16	20	25	18

Haemophilus Influenzae Invasive Disease Rates by County and Year, Rhode Island, 2013-2017



Table 8. Rate by County and Year

	2013	2014	2015	2016	2017
Bristol	0.0	2.0	2.0	4.1	4.1
Kent	2.4	2.4	3.1	2.4	0.6
Newport	1.2	2.4	2.4	3.6	0
Providence	1.1	1.0	1.4	2.1	1.9
Washington	0.8	2.4	2.4	2.4	2.4

Haemophilus Influenzae Invasive Disease Frequency, Month and Year, Rhode Island, 2013-2017



Table 9. Frequency by Month and Year

	2013	2014	2015	2016	2017	5-Year Total
Jan	2	2	2	2	0	8
Feb	2	0	0	1	2	5
Mar	1	0	2	2	3	8
Apr	1	1	0	1	2	5
May	0	0	3	1	3	7
Jun	0	5	2	3	1	11
Jul	0	2	4	4	2	12
Aug	0	0	1	3	3	7
Sep	0	0	1	1	1	3
Oct	2	4	2	0	1	9
Nov	2	1	1	2	0	6
Dec	3	1	2	5	0	11
All	13	16	20	25	18	92



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.
- Population denominators are based on the Annual Estimates of the Resident Population: April 1, 2010-July 1, 2017, U.S. Census Bureau.



References

- <https://www.cdc.gov/hi-disease/index.html>
- <https://www.cdc.gov/abcs/reports-findings/surv-reports.html>