





Haemophilus influenzae Invasive Disease 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 *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 “sterile sites,” like spinal fluid or blood, this is known as “invasive disease.” Only invasive *Haemophilus influenzae* disease is reportable in Rhode Island.
- 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 membrane that covers the brain and spinal cord). *H. Flu* invasive disease is severe and typically requires hospitalization and antibiotic treatment.
- *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.

About *Haemophilus influenzae* Invasive Disease



- 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.
- 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 is vaccine-preventable.



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

- In 2018, there were 25 cases of *H. Flu* invasive disease in Rhode Island with a rate of 2.4 cases per 100,000 population.
- Rates of invasive *H. flu* infections in RI remain relatively stable over time.
- The rate of *H. flu* in Rhode Island increases with age, with those with those ≥ 80 years of age reporting the highest rate of new cases over the last 5 years. Children 4 years of age and younger also have significant rates of infection.
- From 2014-2018, two thirds of *H. Flu* cases in RI were “nontypeable” (66%), meaning they were caused by organisms without capsules. Only 3 cases (3%) were caused by the vaccine-preventable serotype b.

Reported Cases of *Haemophilus influenzae* Invasive Disease, Rhode Island, 2014-2018

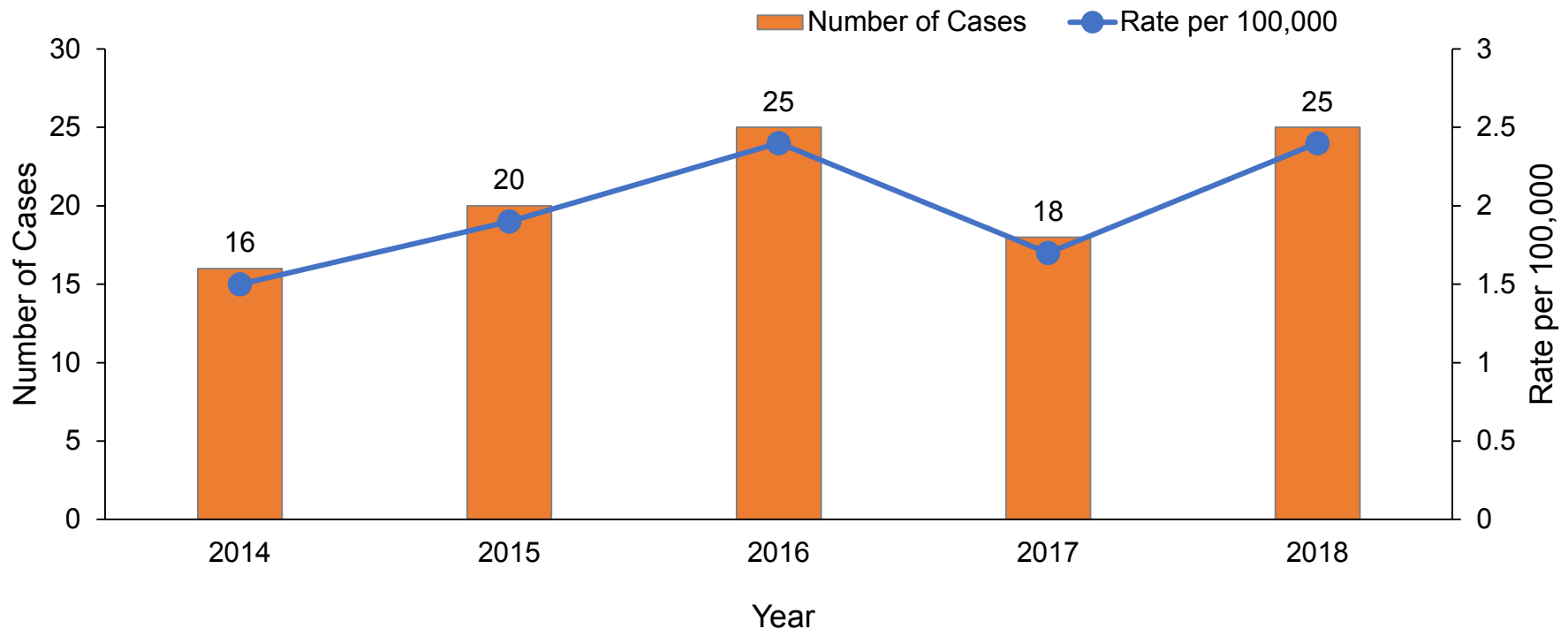


Figure 1: In 2018, there were 25 cases of invasive *H. flu* in Rhode Island, with a rate of 2.4 cases per 100,000 population. Rates of invasive *H. flu* infections have been relatively stable in the last 5 years in Rhode Island.

Cumulative 5-Year Rate of *Haemophilus influenzae* Invasive Disease, Age Group, Rhode Island, 2014-2018

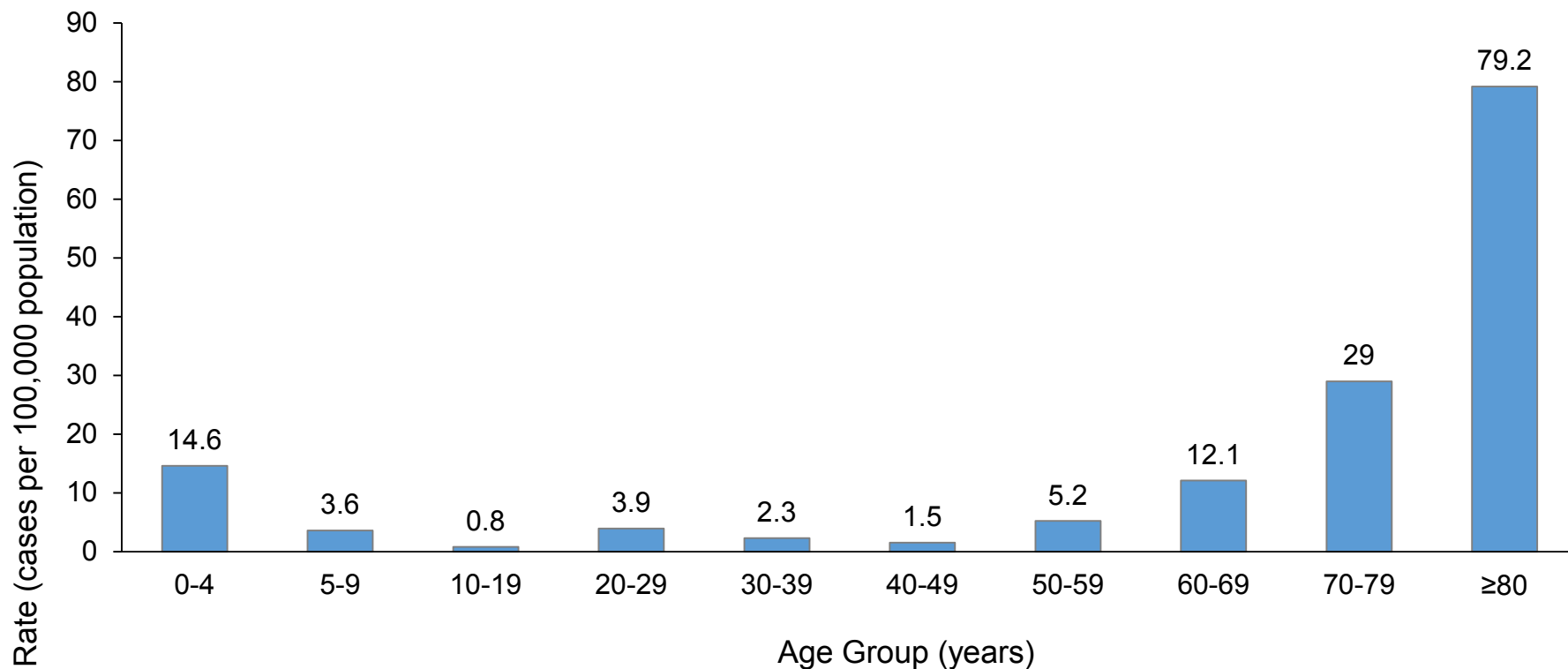


Figure 2: The five-year cumulative rate of *H. flu* invasive infection was highest in adults 80 years and older (79.2 cases in the last five years per 100,000 population). Between 2014 and 2018, 71% of all *H. flu* cases were 60 years or older. This mirrors the national trend in which the highest rate of disease occurs in those 65 and older, and those under five years of age.

Rate of *Haemophilus influenzae* Invasive Disease, Sex and Year, Rhode Island, 2014-2018

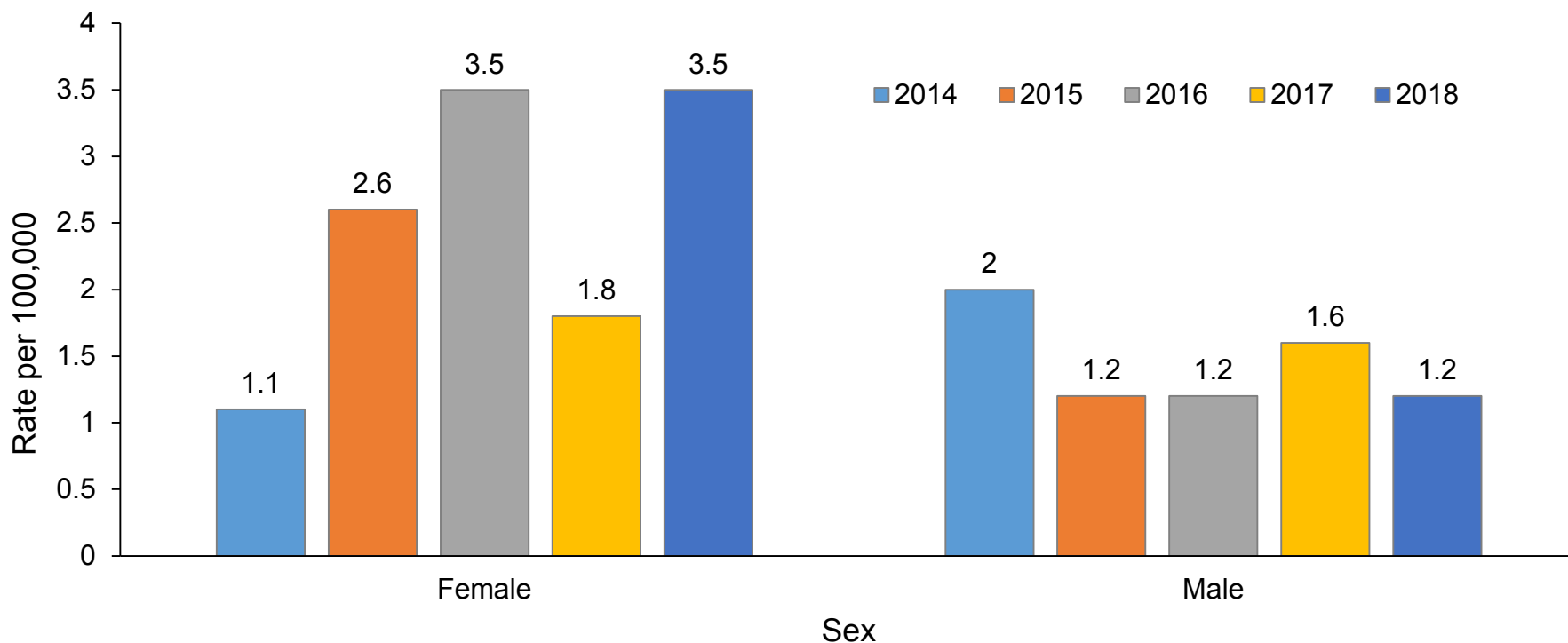


Figure 3: Over the last 5 years, the rate (cases per 100,000 population) of *H. flu* infection was slightly higher in females than in males.

Rate of *Haemophilus influenzae* Invasive Disease, County and Year, Rhode Island, 2014-2018

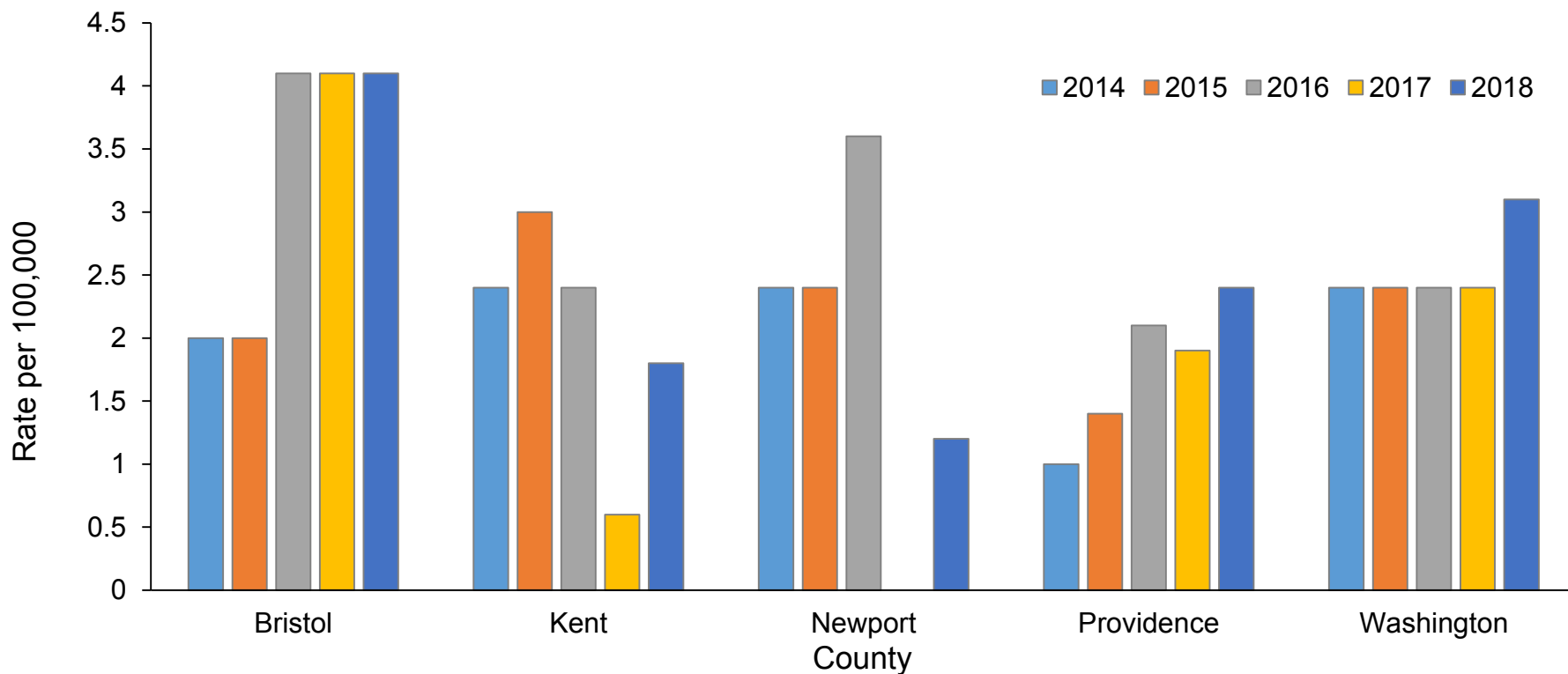


Figure 4: In 2016-2018, the rate of *H. Flu* invasive disease was the highest in Bristol County, with 4 cases per 100,000 population. Over the last five years, Providence County has had the lowest rates of *H. Flu* invasive disease. Small numbers of cases in each county make it difficult to discern a geographic pattern of this disease.

Reported Cases of *Haemophilus influenzae* Invasive Disease by Month and Year, Rhode Island, 2014-2018

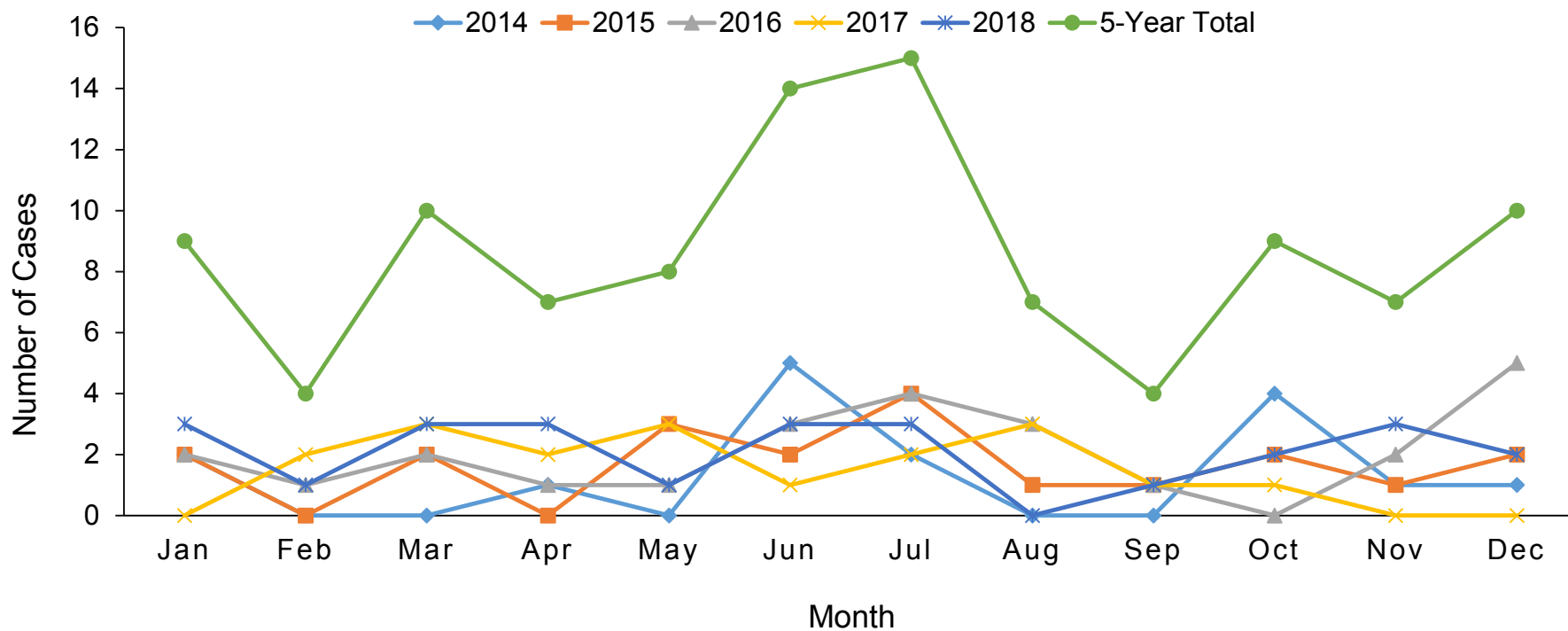


Figure 5: *Haemophilus Influenzae* invasive disease occurs year-round in Rhode Island, with a peak in the cumulative cases in June and July.

Reported Cases of *Haemophilus influenzae* Invasive Disease by Serotype, Rhode Island, 2014-2018 Cumulative Cases (n=101)

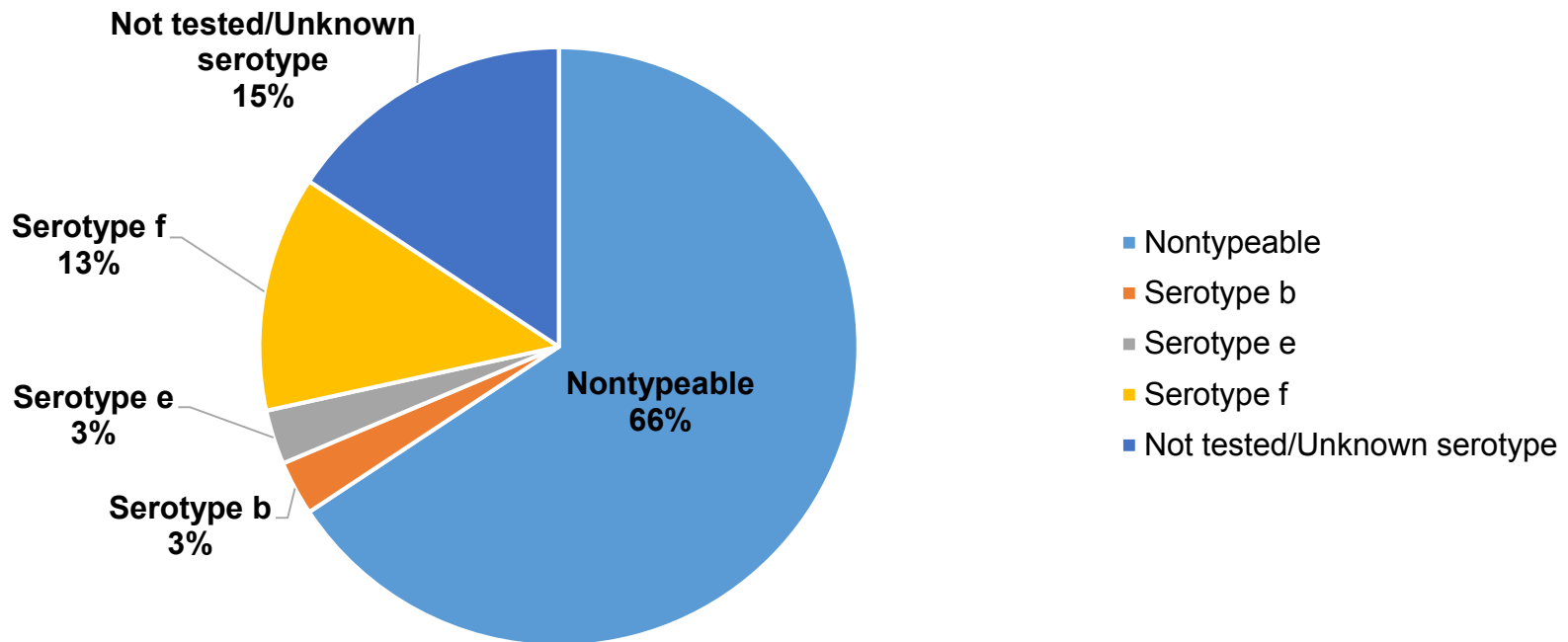


Figure 6: *Haemophilus influenzae* bacteria are classified as either “typeable” or “nontypeable” based on their structure. Of those that are typeable, there are 6 serotypes (letters a-f). Serotype b (more commonly known as “Hib”) is currently the only type of *H. Flu* for which a vaccine exists. From 2014 to 2018, most of the 101 cases in Rhode Island (66%) were “nontypeable” and only 3% 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, 2014-2018



Table 1. Frequency by Year

	2014	2015	2016	2017	2018
Number of Cases	16	20	25	18	25

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

	2014	2015	2016	2017	2018
Rate per 100,000	1.5	1.9	2.4	1.7	2.4

Haemophilus Influenzae Invasive Disease Frequency, Age Group and Year, Rhode Island, 2014-2018



Table 3. Frequency by Age Group and Year

	2014	2015	2016	2017	2018	5-Year Total
0-4	2	1	1	1	3	8
5-9	0	0	2	0	0	2
10-19	0	0	1	0	0	1
20-29	2	2	0	1	1	6
30-39	0	1	1	0	1	3
40-49	0	0	2	0	0	2
50-59	1	2	1	3	1	8
60-69	3	2	3	5	2	15
70-79	5	4	7	1	3	20
≥80	3	8	7	7	14	39
Total	16	20	25	18	25	104

Haemophilus Influenzae Invasive Disease 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	5-year cumulative rate
0-4	3.6	1.8	1.8	1.8	5.5	14.6
5-9	0	0	3.6	0	0	3.6
10-19	0	0	0.8	0	0	0.8
20-29	1.3	1.3	0.0	0.7	0.7	3.9
30-39	0	0.8	0.8	0	0.7	2.3
40-49	0	0	1.5	0	0	1.5
50-59	0.6	1.3	0.7	2.0	0.7	5.2
60-69	2.6	1.6	2.4	3.9	1.5	12.1
70-79	7.8	6.1	10.4	1.4	4.0	29.0
≥80	6.0	16.2	14.3	14.3	28.6	79.2

Haemophilus Influenzae Invasive Disease Frequency and Rates, Sex and Year, Rhode Island, 2014-2018



Table 5. Frequency by Sex and Year

	2014	2015	2016	2017	2018	5-Year Total
Female	6	14	19	10	19	68
Male	10	6	6	8	6	36
Total	16	20	25	18	25	104

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

	2014	2015	2016	2017	2018
Female	1.1	2.6	3.5	1.8	3.5
Male	2.0	1.2	1.2	1.6	1.2

Haemophilus influenzae Invasive Disease Frequency, County and Year, Rhode Island, 2014-2018



Table 7. Frequency by County and Year

	2014	2015	2016	2017	2018
Bristol	1	1	2	2	2
Kent	4	5	4	1	3
Newport	2	2	3	0	1
Providence	6	9	13	12	15
Washington	3	3	3	3	4
All	16	20	25	18	25

Haemophilus Influenzae Invasive Disease 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	2.0	2.0	4.1	4.1	4.1
Kent	2.4	3.0	2.4	0.6	1.8
Newport	2.4	2.4	3.6	0	1.2
Providence	1.0	1.4	2.1	1.9	2.4
Washington	2.4	2.4	2.4	2.4	3.1

Haemophilus Influenzae Invasive Disease Frequency, Month and Year, Rhode Island, 2014-2018



Table 9. Frequency by Month and Year

	2014	2015	2016	2017	2018	5-Year Total
Jan	2	2	2	0	3	9
Feb	0	0	1	2	1	4
Mar	0	2	2	3	3	10
Apr	1	0	1	2	3	7
May	0	3	1	3	1	8
Jun	5	2	3	1	3	14
Jul	2	4	4	2	3	15
Aug	0	1	3	3	0	7
Sep	0	1	1	1	1	4
Oct	4	2	0	1	2	9
Nov	1	1	2	0	3	7
Dec	1	2	5	0	2	10
All	16	20	25	18	25	104

Haemophilus Influenzae Invasive Disease Serotypes by Year, Rhode Island, 2014-2018



Table 8. Serotype by Year

	2014	2015	2016	2017	2018	5-year total
Not Typeable	8	8	21	12	18	67
Serotype b	1	1	0	0	1	3
Serotype e	0	2	0	0	1	3
Serotype f	2	3	3	4	1	13
Unknown or not tested	5	6	1	2	2	16
Total	16	20	25	18	25	104



Notes on Data

- Case counts include patients classified as confirmed 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/hi-disease/index.html>
- <https://www.cdc.gov/abcs/reports-findings/surv-reports.html>