

INVASIVE BACTERIAL DISEASE SURVEILLANCE REPORT, 2011

Emerging Infections Program

Active Bacterial Core Surveillance (ABCs)

Minnesota Department of Health

Diseases Included

- Group A Streptococcus page 5
- Group B Streptococcus page 12
- *Haemophilus influenzae* page 21
- *Neisseria meningitidis* page 28
- *Streptococcus pneumoniae* page 34
- Methicillin-resistant *Staphylococcus aureus* (MRSA) page 42
- Legionellosis page 49

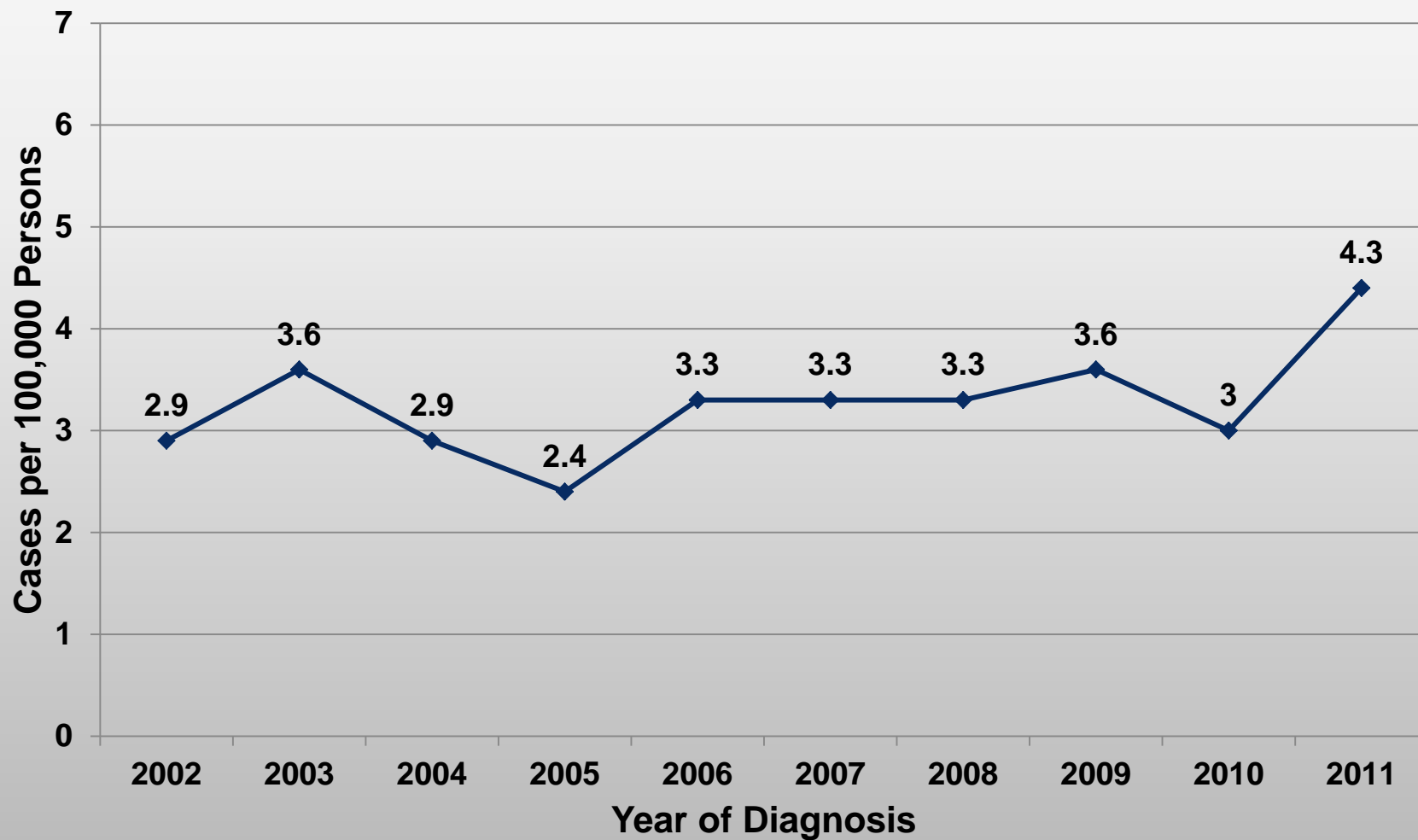
Surveillance Methods

- Cases include Minnesota residents with invasive infections due to Group A Streptococcus, Group B Streptococcus, *Haemophilus influenzae*, *Neisseria meningitidis*, *Streptococcus pneumoniae*, and methicillin-resistant *Staphylococcus aureus* (MRSA).
- Invasive infections are from normally sterile body sites such as blood, cerebrospinal fluid and others. These usually cause serious illnesses (disease).
- Legionellosis is also included in this report and has separate confirmatory testing criteria including urine antigen, culture, paired serology, and PCR or DFA combined with culture or urine antigen.

Surveillance Methods (cont.)

- All hospitals and reference laboratories serving Minnesotans are contacted routinely to identify cases.
- Species confirmation, antibiotic resistance and other testing is performed by the MDH Public Health Laboratory.
- Disease rates are based on Census data.
- The Centers for Disease Control and Prevention (CDC) includes these results from Minnesota and other states and regions in a network called Active Bacterial Core Surveillance (ABCs) which covers a population base of 42 million.

Incidence of Invasive Group A Streptococcal Disease, Minnesota, 2002-2011



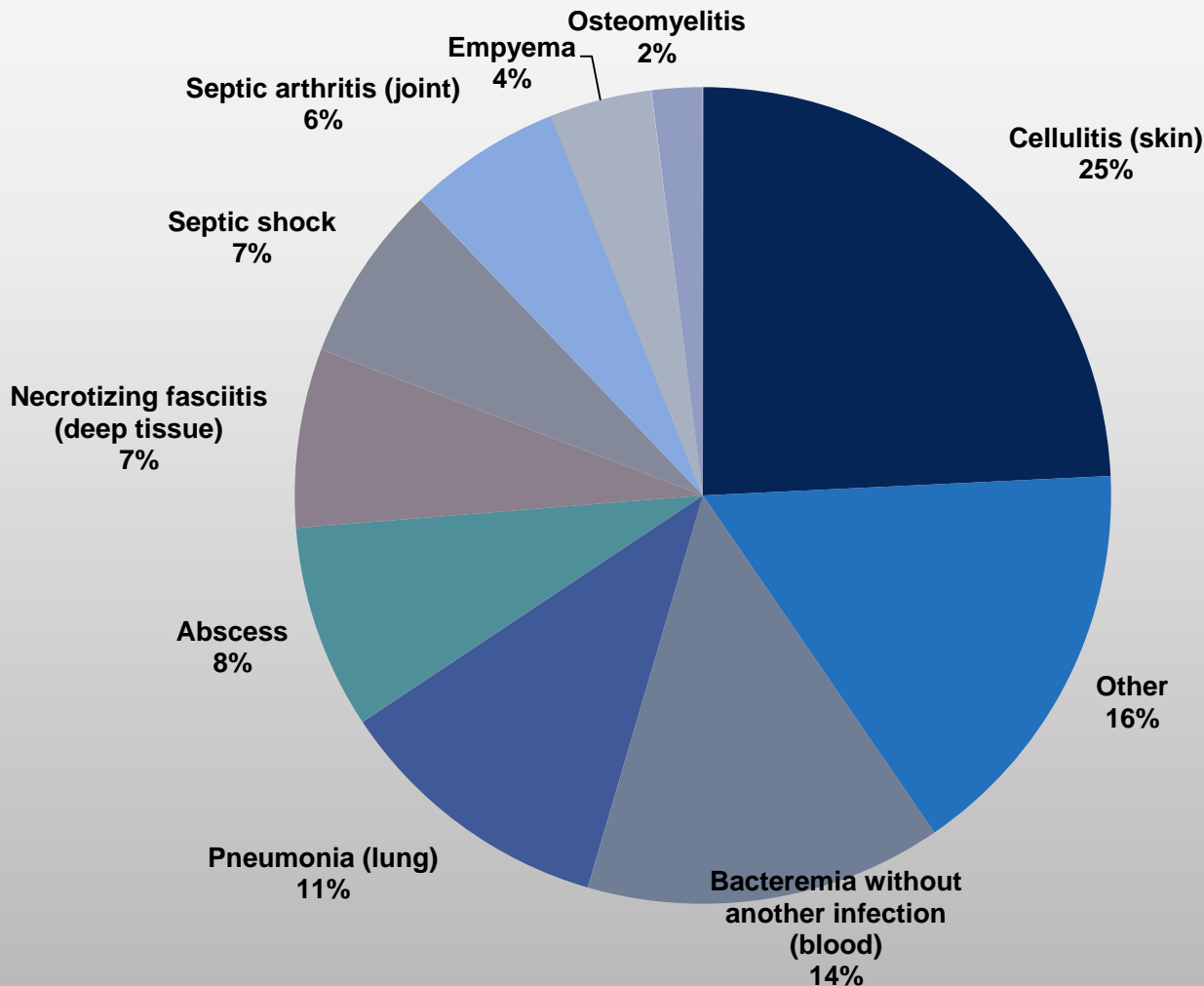
Incidence of Invasive Group A Streptococcal Disease by Gender and Age Group, Minnesota, 2011

Characteristic	Cases (n=231)	Incidence per 100,000 persons
Gender		
Male	121	4.6
Female	110	4.1
Age Group		
Under 1 yr.	1	1.5
1-4 yrs.	7	2.5
5-9 yrs.	12	3.4
10-19 yrs.	15	2.1
20-29 yrs.	11	1.5
30-39 yrs.	20	3.0
40-49 yrs.	30	4.0
50-59 yrs.	33	4.3
60-69 yrs.	49	9.6
70+ yrs.	53	10.8

Invasive Group A Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2011

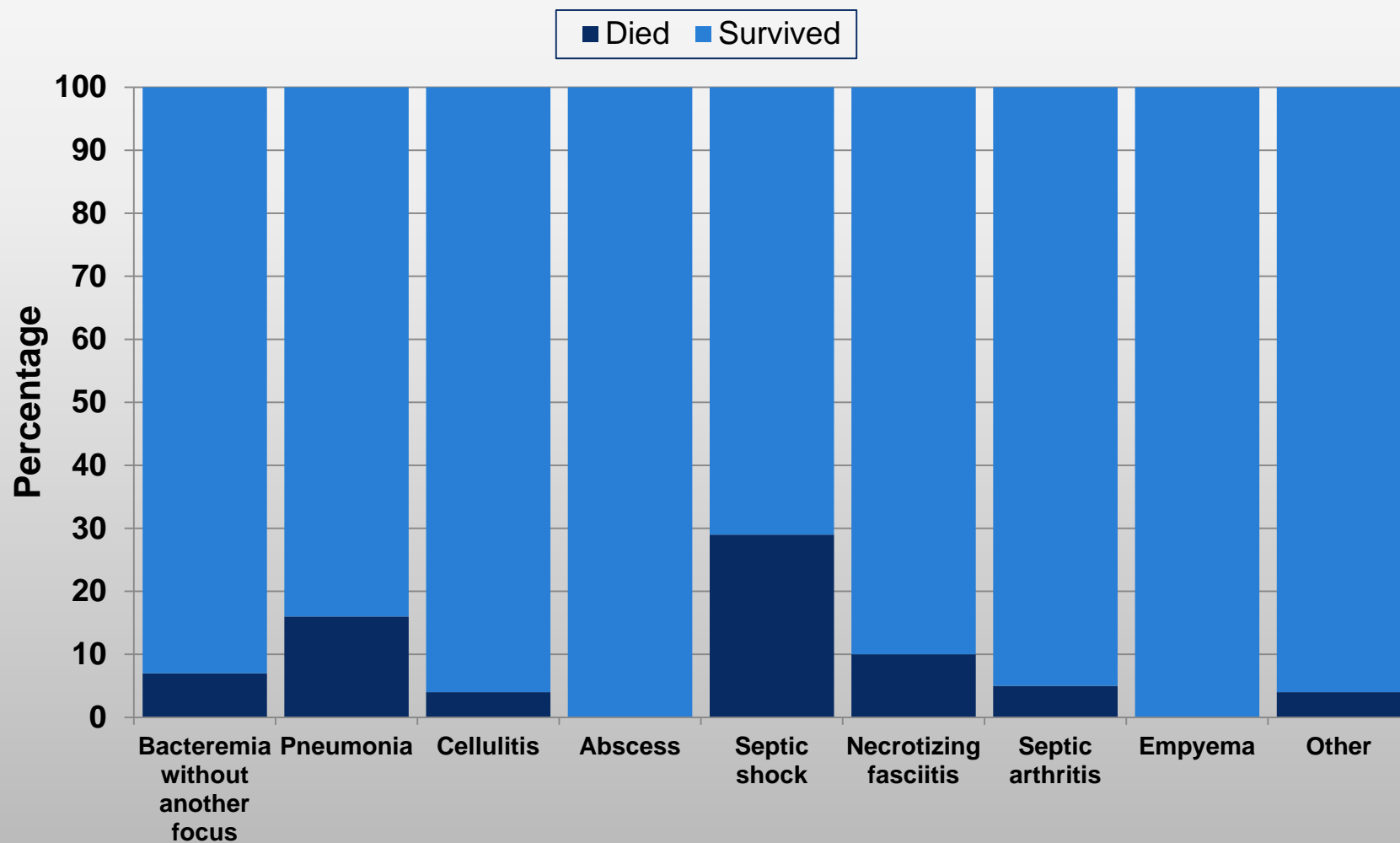
Age Group	Cases	Deaths	% Died
Under 1 yr.	1	0	0%
1-4 yrs.	7	0	0%
5-9 yrs.	12	0	0%
10-19 yrs.	15	0	0%
20-29 yrs.	11	0	0%
30-39 yrs.	20	1	5%
40-49 yrs.	30	2	7%
50-59 yrs.	33	2	6%
60-69 yrs.	49	3	6%
70+ yrs.	53	9	17%
Total	231	17	7%

Invasive Group A Streptococcal Disease by Type of Infection/Syndrome, Minnesota, 2011

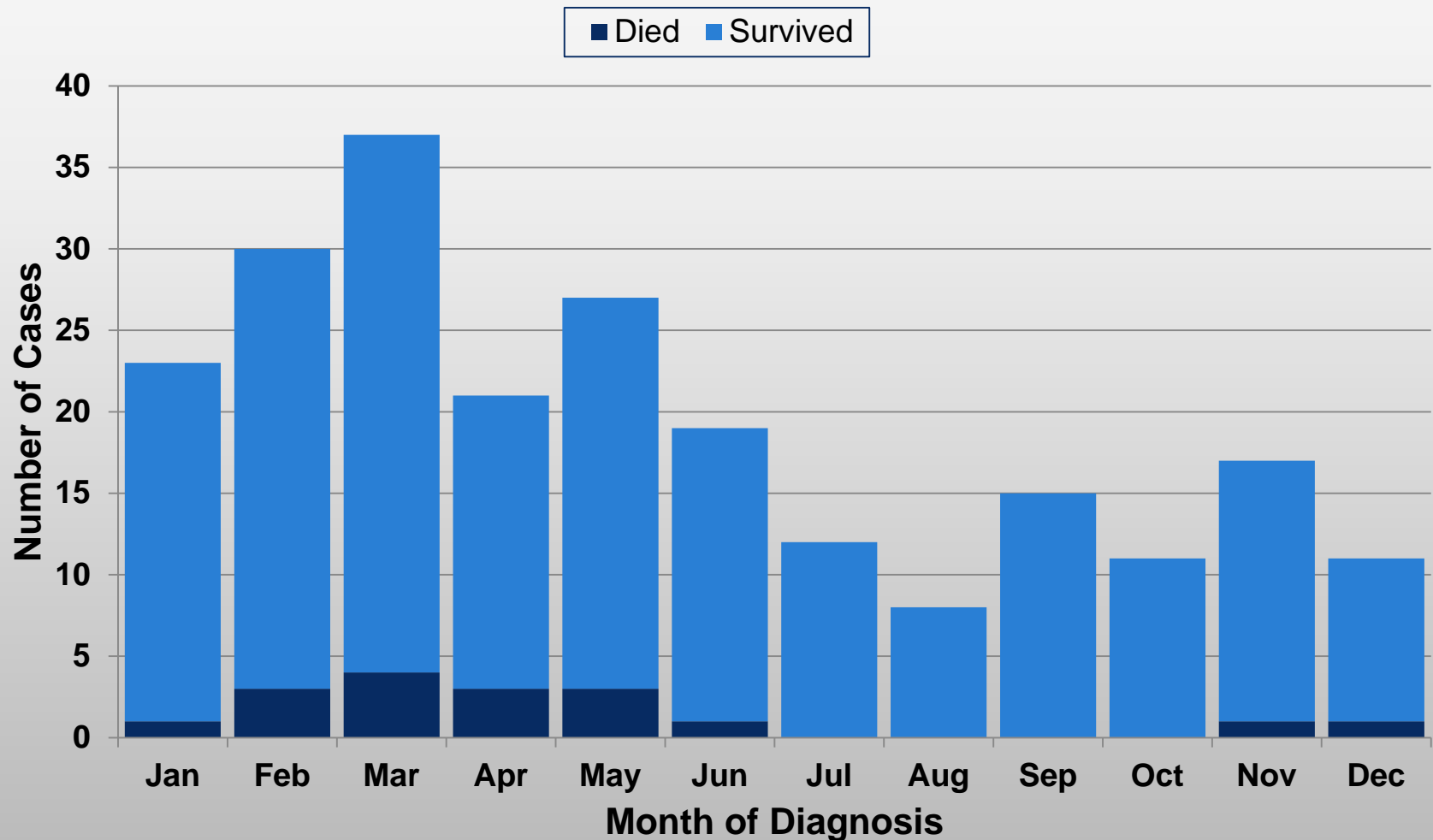


This chart represents 297 infections among 231 cases. (Some cases had >1 infection.)

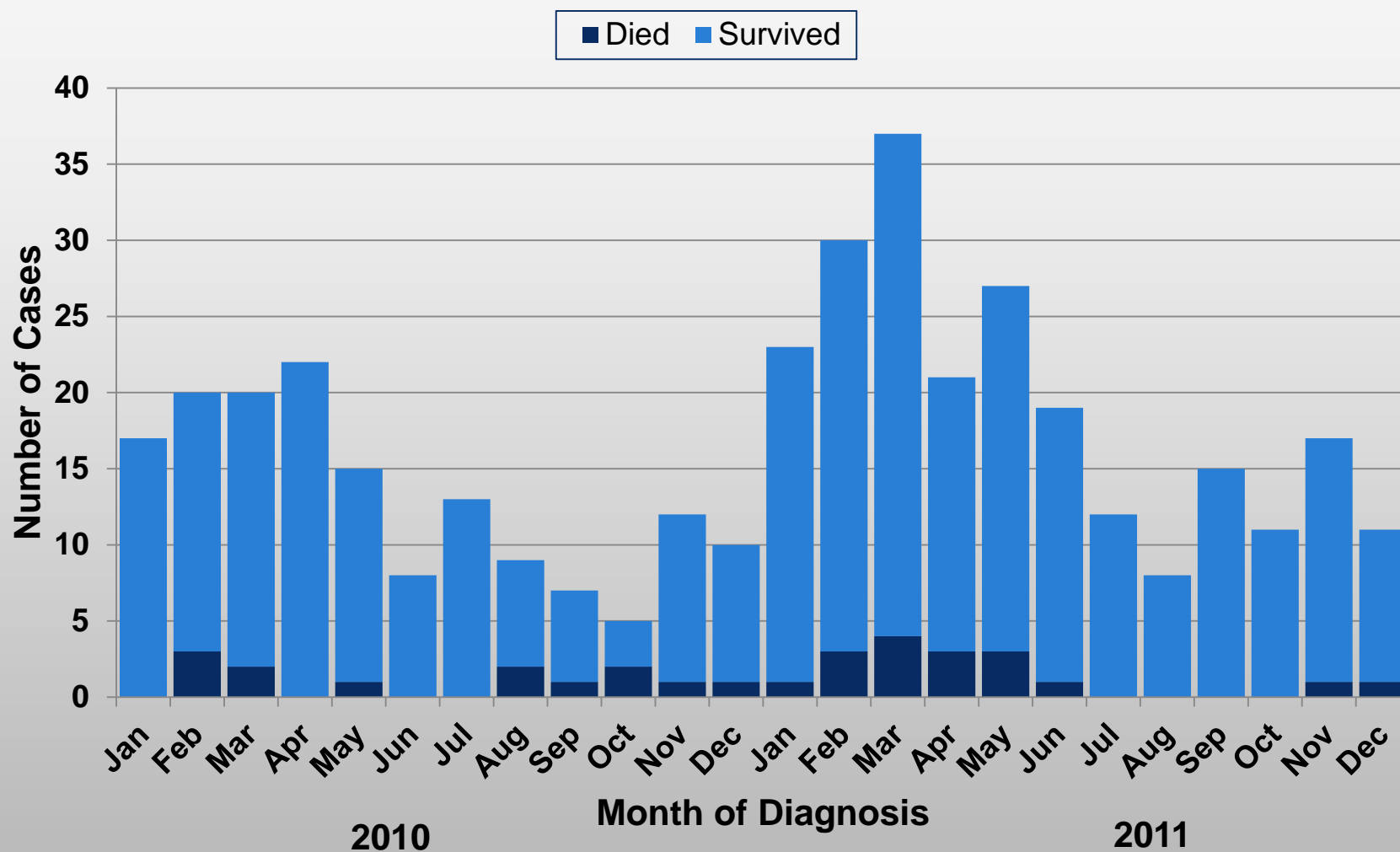
Outcome of Invasive Group A Streptococcal Disease by Type of Infection/Syndrome, Minnesota, 2011



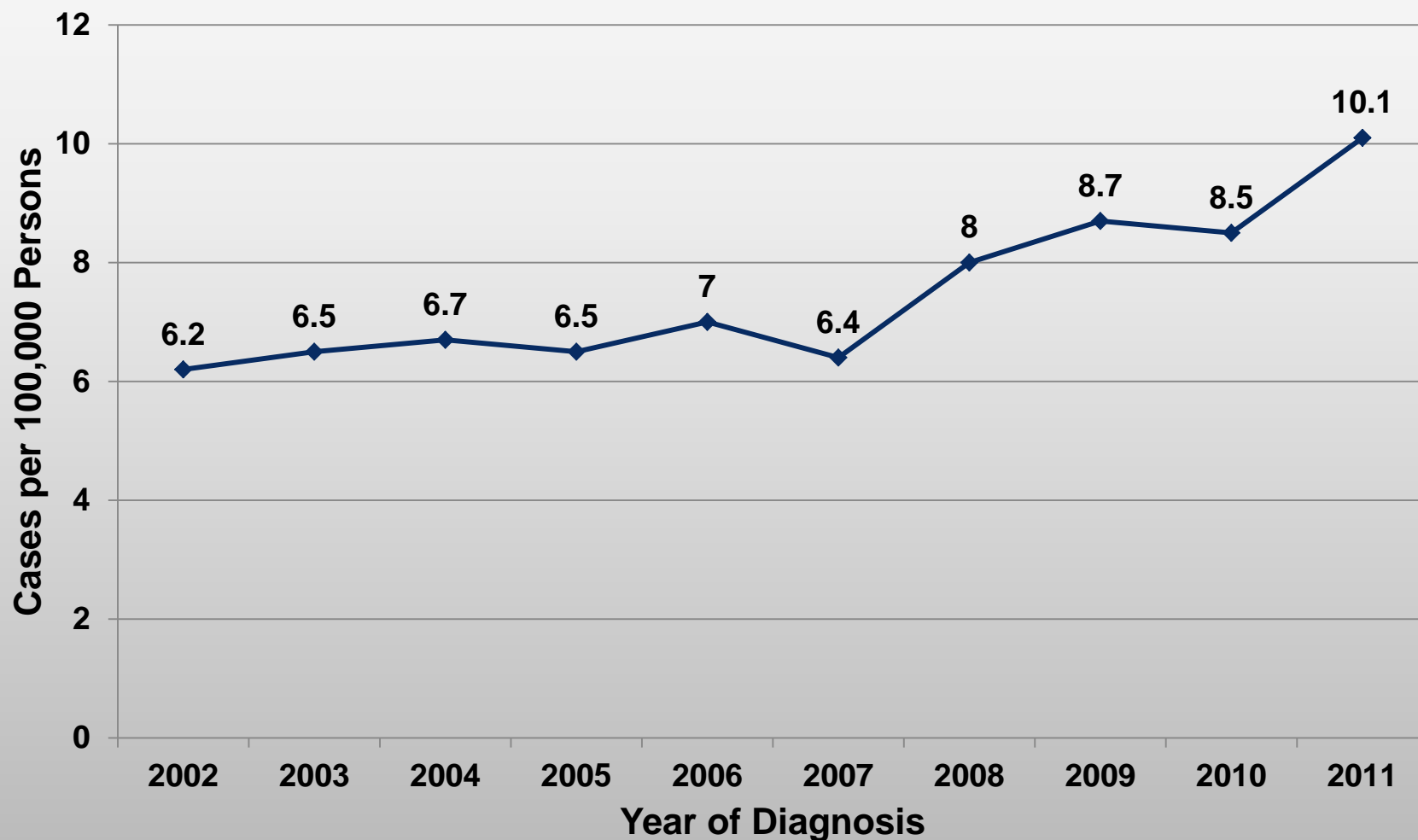
Cases of Invasive Group A Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011



Cases of Invasive Group A Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2010-2011



Incidence of Invasive Group B Streptococcal Disease, Minnesota, 2002-2011



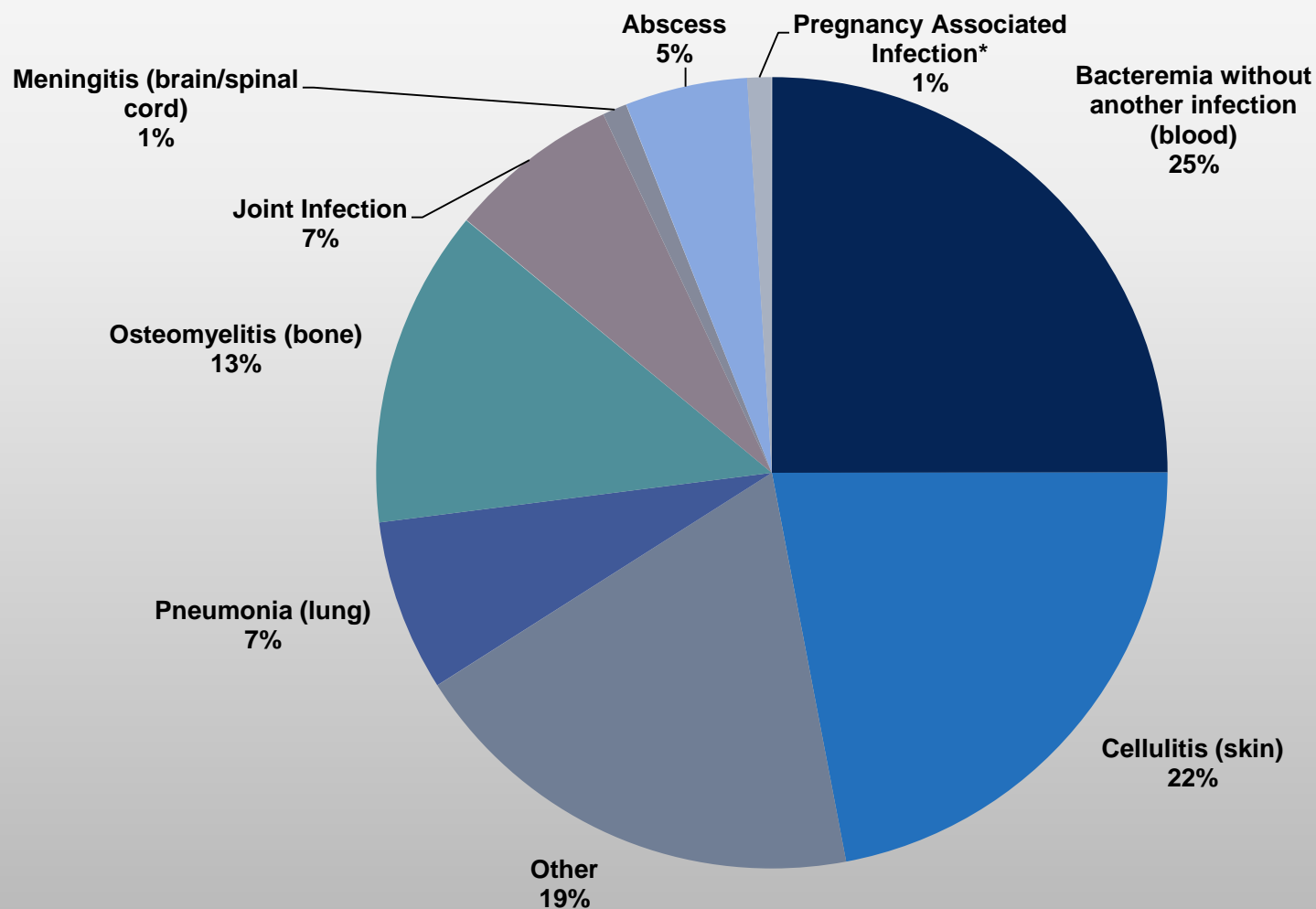
Incidence of Invasive Group B Streptococcal Disease by Gender and Age Group, Minnesota, 2011

Characteristic	Cases (n=535)	Incidence per 100,000 persons
Gender		
Male	321	12.2
Female	214	8.0
Age Group		
Under 1 yr.	36	52.2
1-4 yrs.	4	1.4
5-9 yrs.	0	0
10-19 yrs.	3	0.4
20-29 yrs.	15	2.1
30-39 yrs.	15	2.2
40-49 yrs.	61	8.0
50-59 yrs.	108	14.4
60-69 yrs.	104	21.6
70+ yrs.	189	39.3

Invasive Group B Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2011

Age Group	Cases	Deaths	% Died
Under 1 yr.	36	2	6%
1-4 yrs.	4	1	25%
5-9 yrs.	0	0	0%
10-19 yrs.	3	0	0%
20-29 yrs.	15	0	0%
30-39 yrs.	15	0	0%
40-49 yrs.	61	0	0%
50-59 yrs.	108	4	4%
60-69 yrs.	104	5	5%
70+ yrs.	189	13	7%
Total	535	25	5%

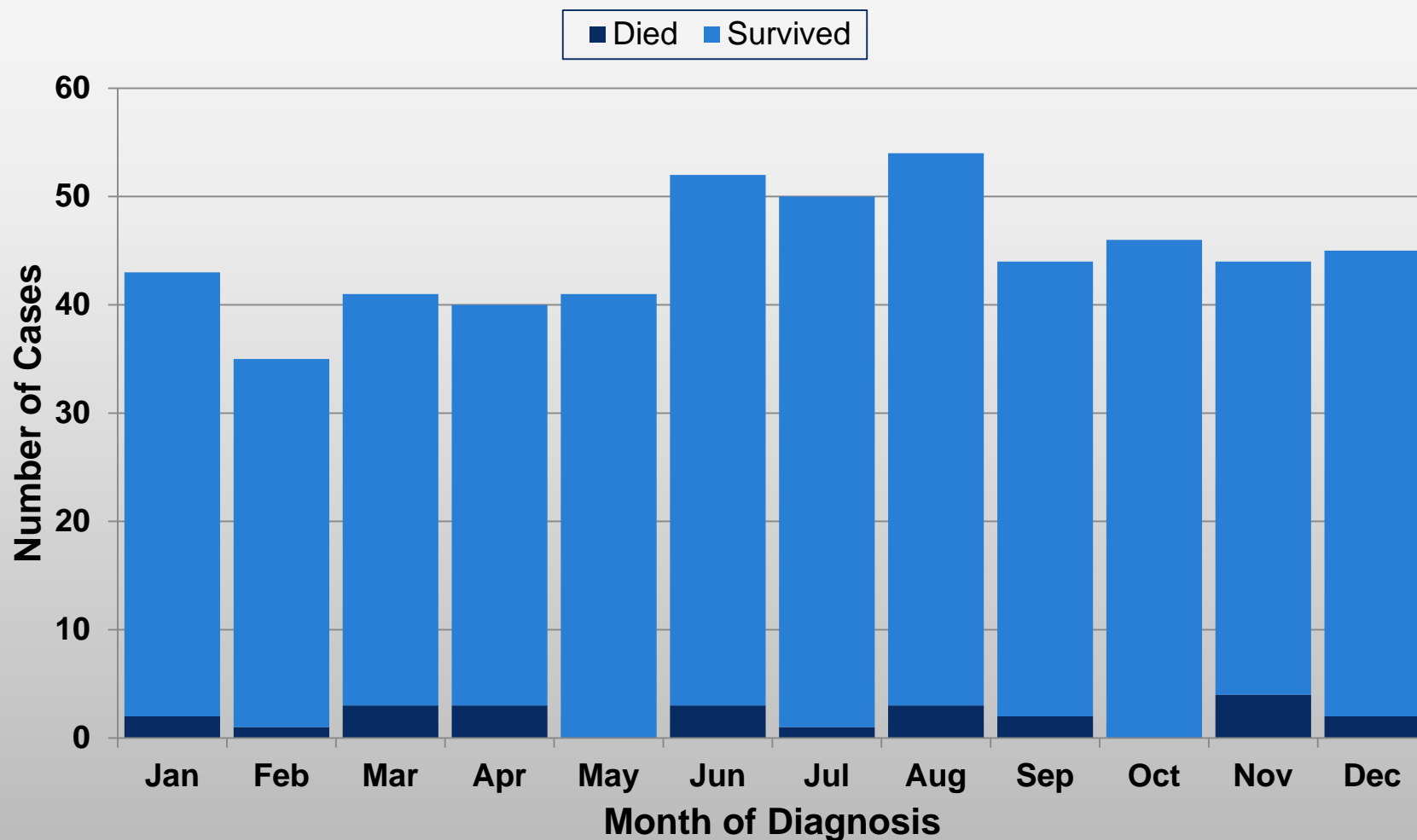
Invasive Group B Streptococcal Disease by Type of Infection/Syndrome, Minnesota 2011



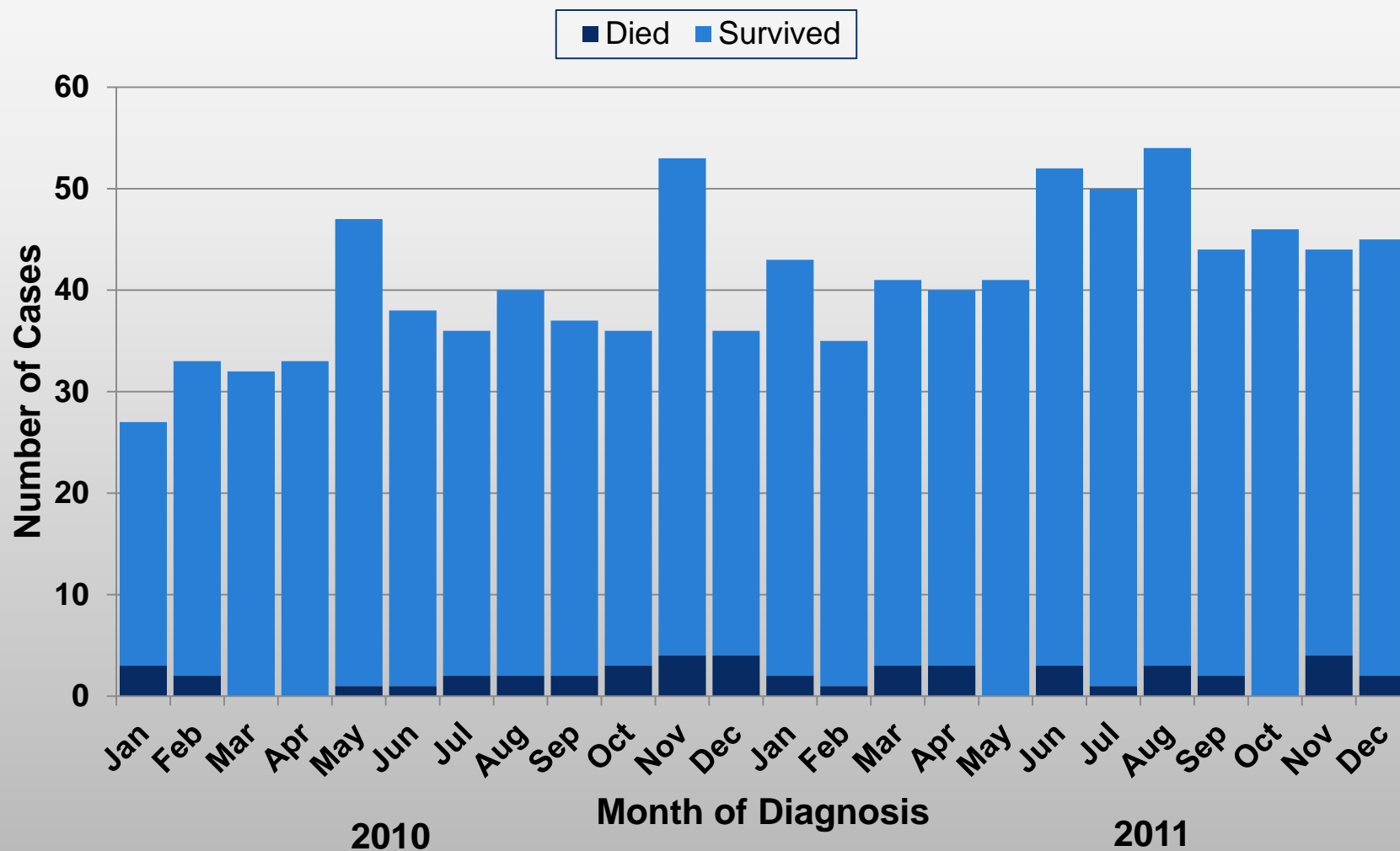
This chart represents 621 infections among 535 cases. (Some cases had >1 infection.)

* Mother had one of the following infections: Endometriosis, Septic Abortion, Choriamnionitis, or Placental Infection with fetal demise.

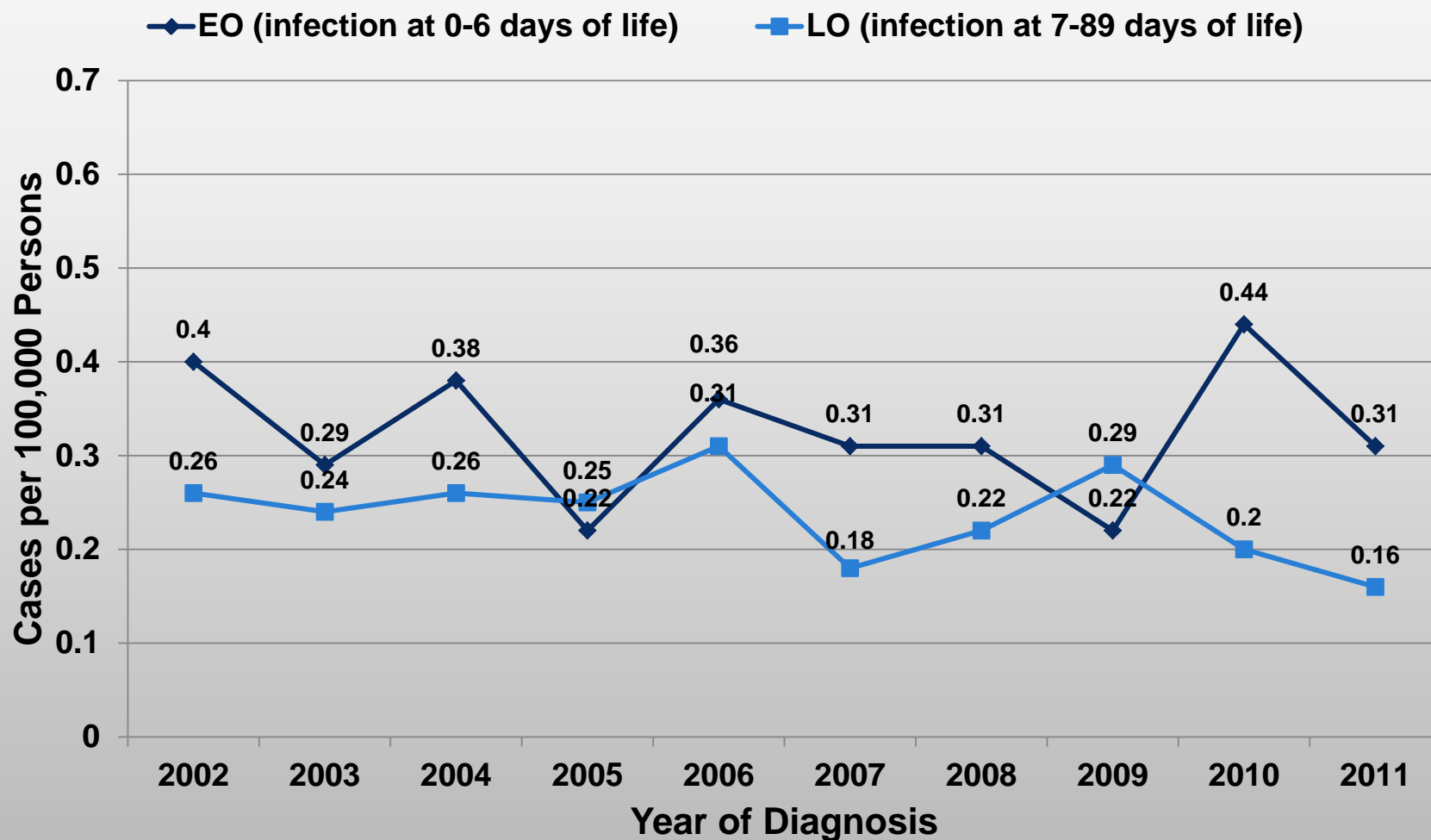
Cases of Invasive Group B Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011



Cases of Invasive Group B Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2010-2011



Incidence of Invasive Early and Late-Onset Group B Streptococcal Disease, Minnesota, 2002-2011

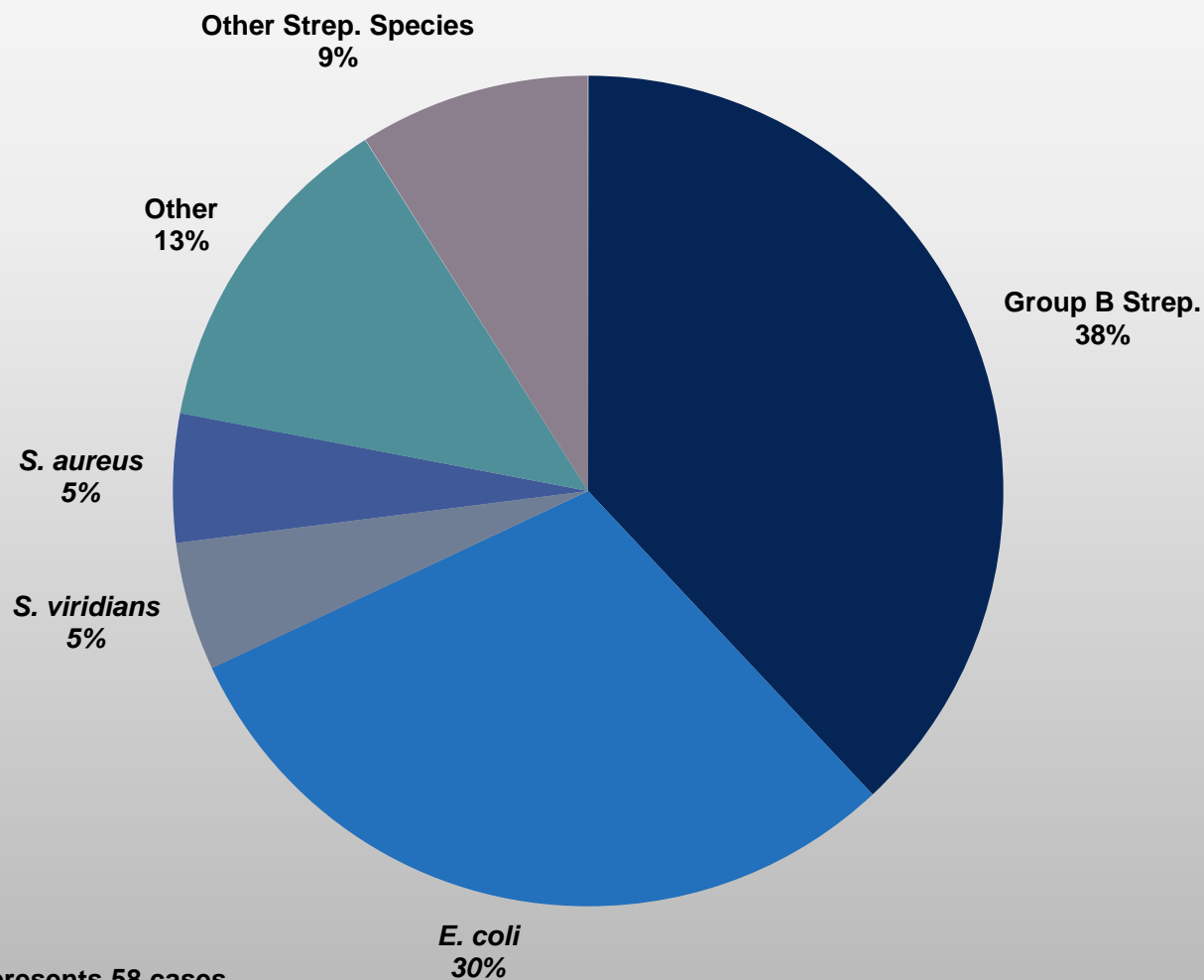


Early-Onset* Group B Streptococcal Disease by Race, Gestational Age and Outcome, Minnesota, 2011

Characteristic	Cases (n=21)	Percent
Race		
White	13	62%
Black	4	19%
Other	4	19%
Gestational Age		
Under 32 weeks	5	24%
32-37 weeks	6	29%
Full-term	10	47%
Outcome		
Died	2	10%
Survived	19	90%

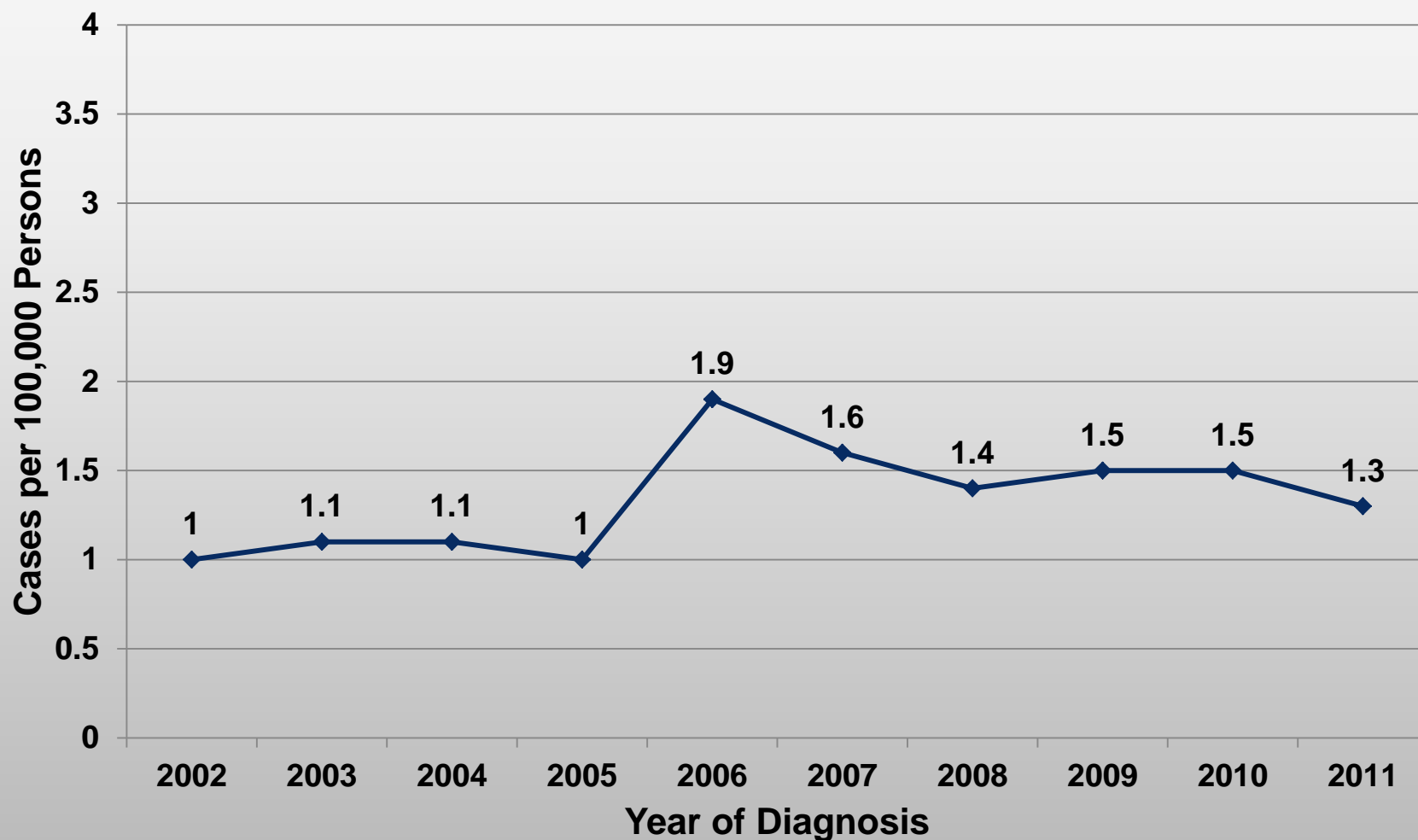
* onset 0-6 days of life

Invasive Neonatal Sepsis Disease in First 6 Days of Life by Pathogen, Minnesota, 2011*



* This chart represents 58 cases.

Incidence of Invasive *Haemophilus influenzae* Disease, Minnesota, 2000-2011



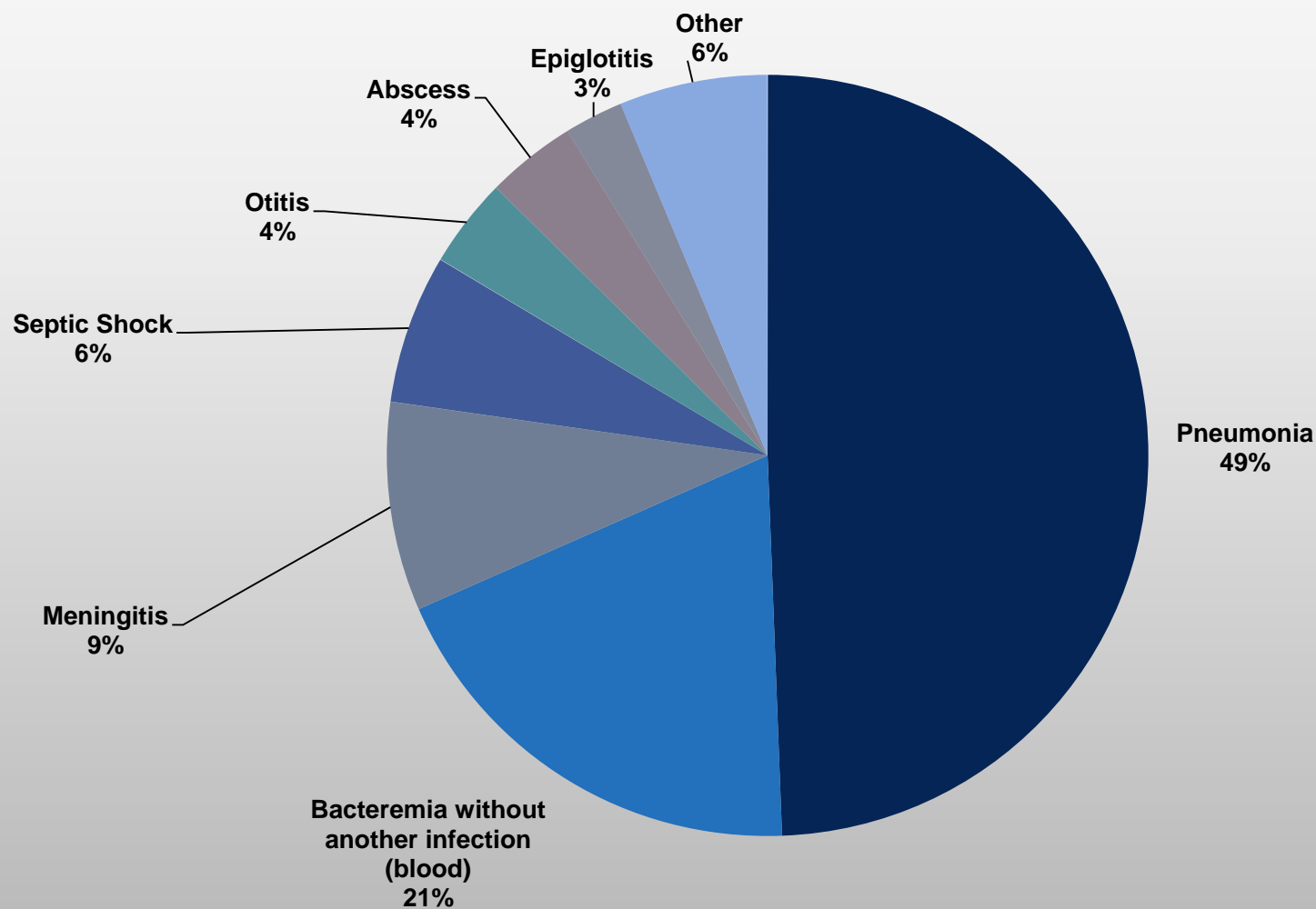
Incidence of Invasive *Haemophilus influenzae* Disease by Gender and Age Group, Minnesota, 2011

Characteristic	Cases (n=71)	Incidence per 100,000 persons
Gender		
Male	25	0.95
Female	46	1.72
Age Group		
Under 1 yr.	3	4.35
1-4 yrs.	1	0.35
5-9 yrs.	1	0.28
10-19 yrs.	1	0.14
20-29 yrs.	3	0.41
30-39 yrs.	1	0.15
40-49 yrs.	6	0.79
50-59 yrs.	7	0.93
60-69 yrs.	14	2.90
70+ yrs.	34	7.08

Invasive *Haemophilus influenzae* Disease Cases and Deaths by Age Group, Minnesota, 2011

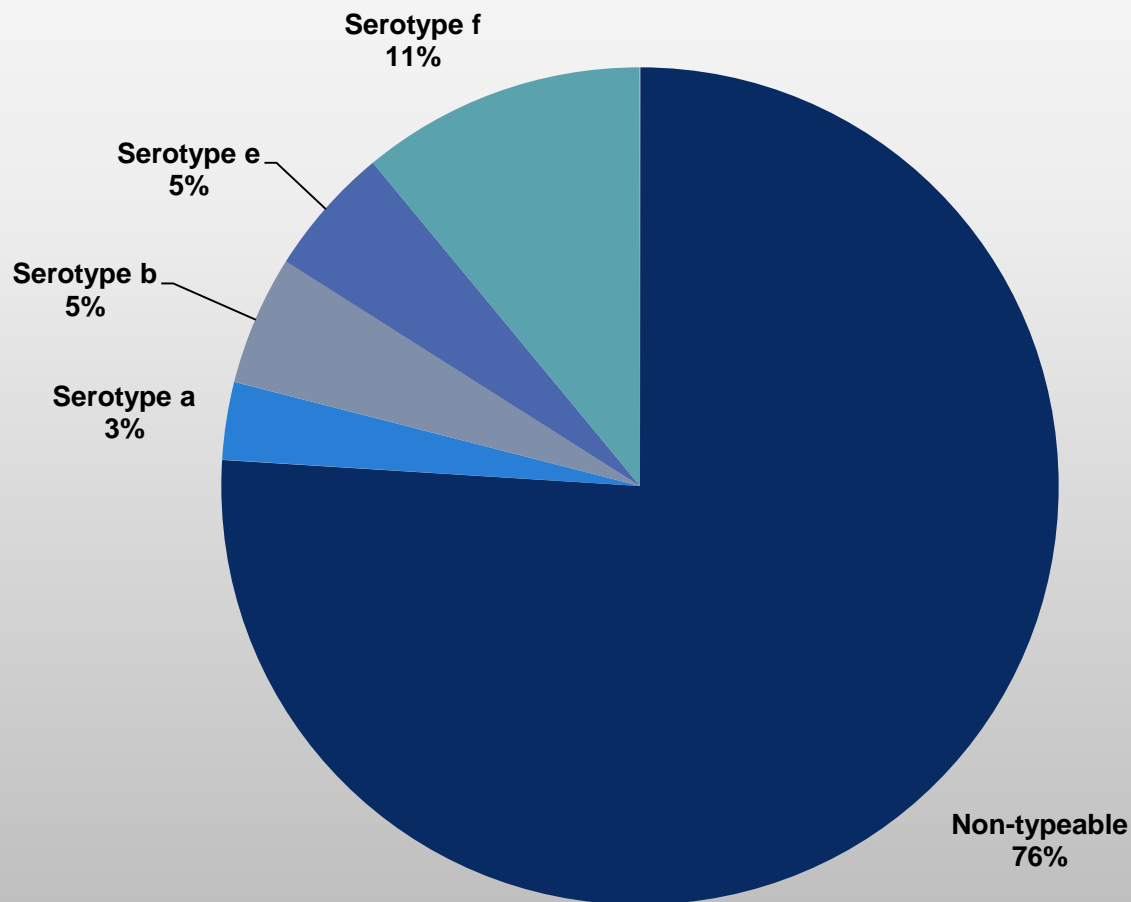
Age Group	Cases	Deaths	% Died
Under 1 yr.	3	0	0%
1-4 yrs.	1	0	0%
5-9 yrs.	1	0	0%
10-19 yrs.	1	0	0%
20-29 yrs.	3	0	0%
30-39 yrs.	1	0	0%
40-49 yrs.	6	0	0%
50-59 yrs.	7	0	0%
60-69 yrs.	14	1	7%
70+ yrs.	34	5	15%
Total	71	6	8%

Invasive *Haemophilus influenzae* Disease by Type of Infection/Syndrome, Minnesota, 2011*



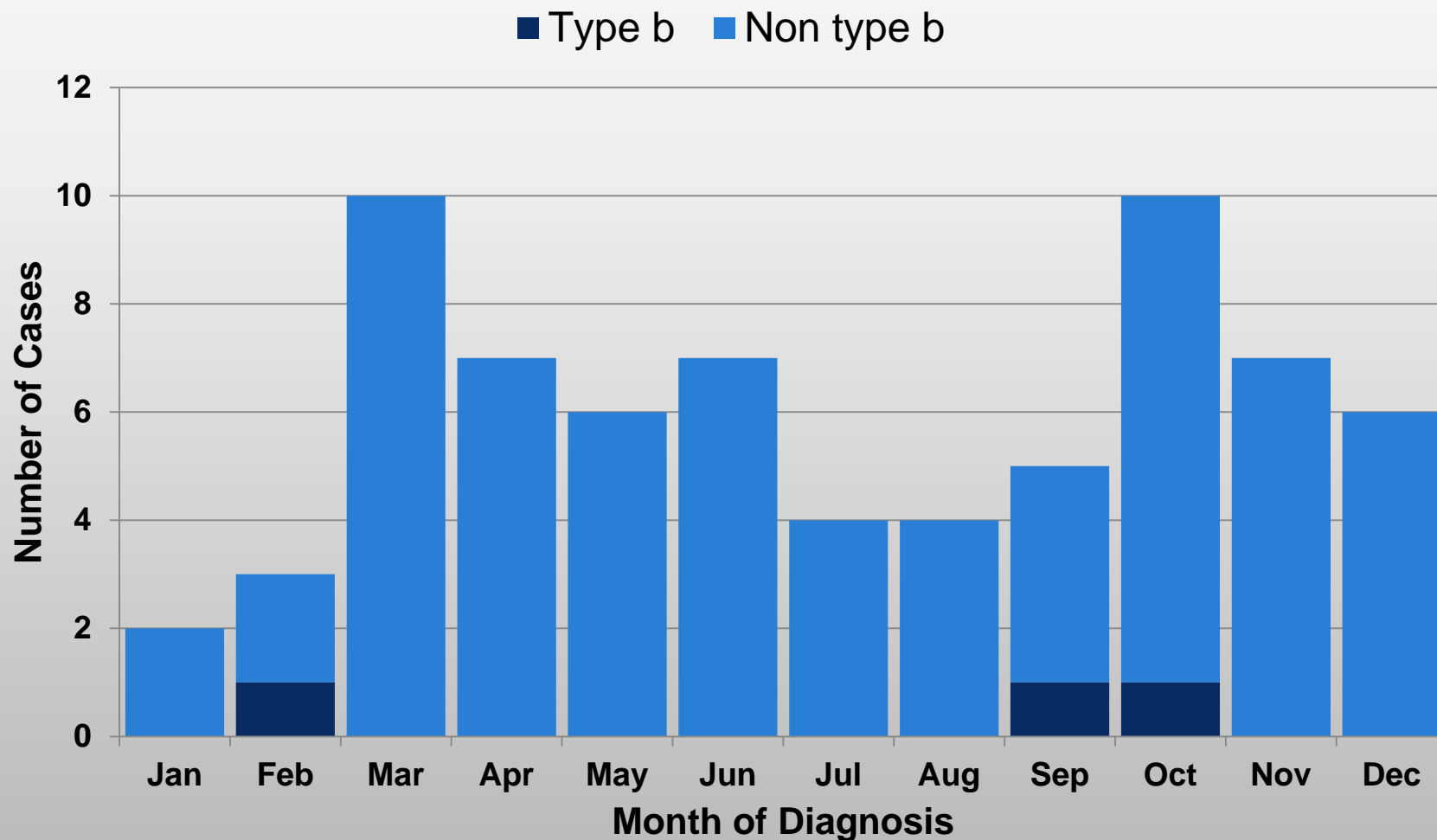
*This chart represents 79 infections among 71 cases

Invasive *Haemophilus influenzae* Disease by Serotype, Minnesota 2011 (n=62*)

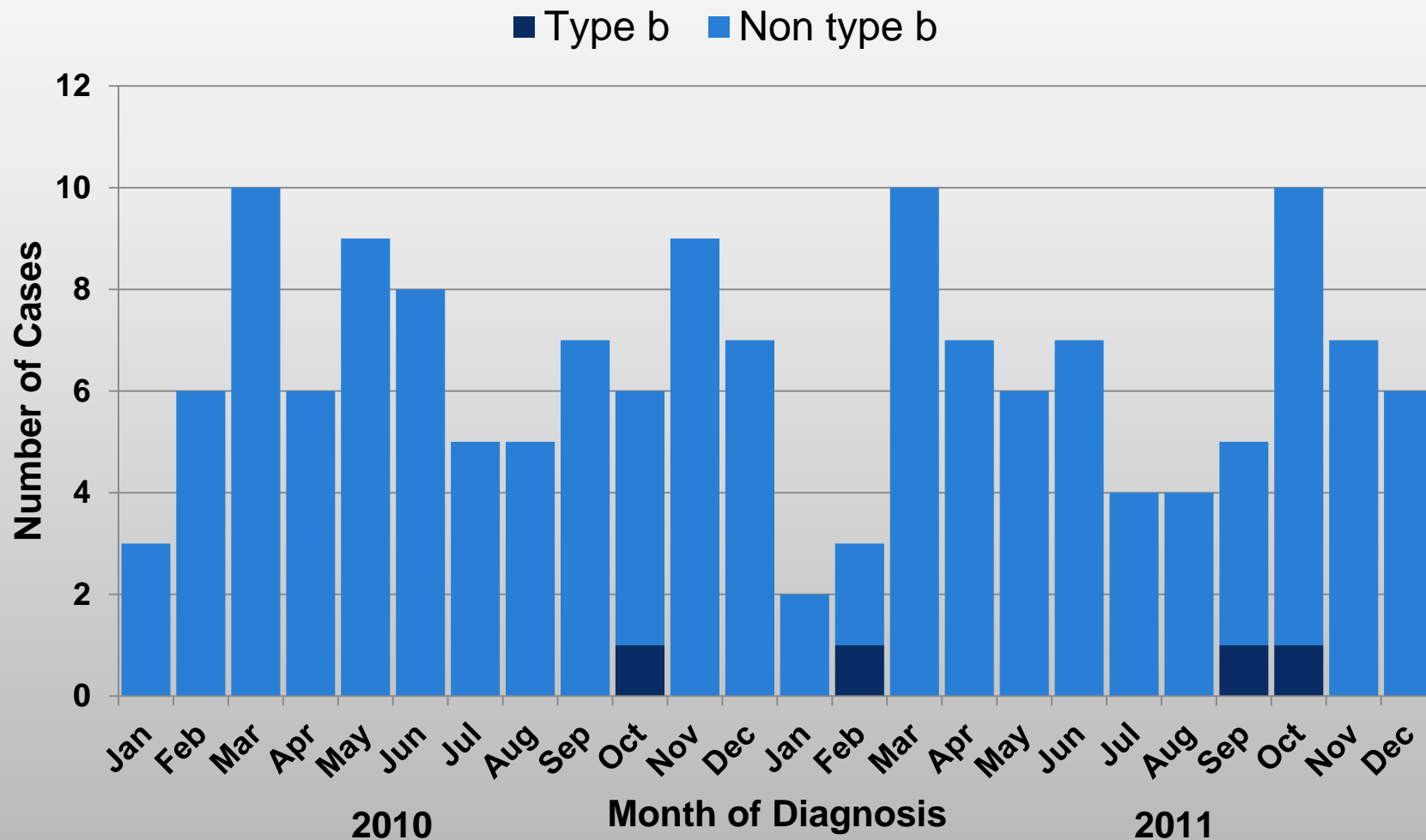


* 9 case isolates not available for serotyping

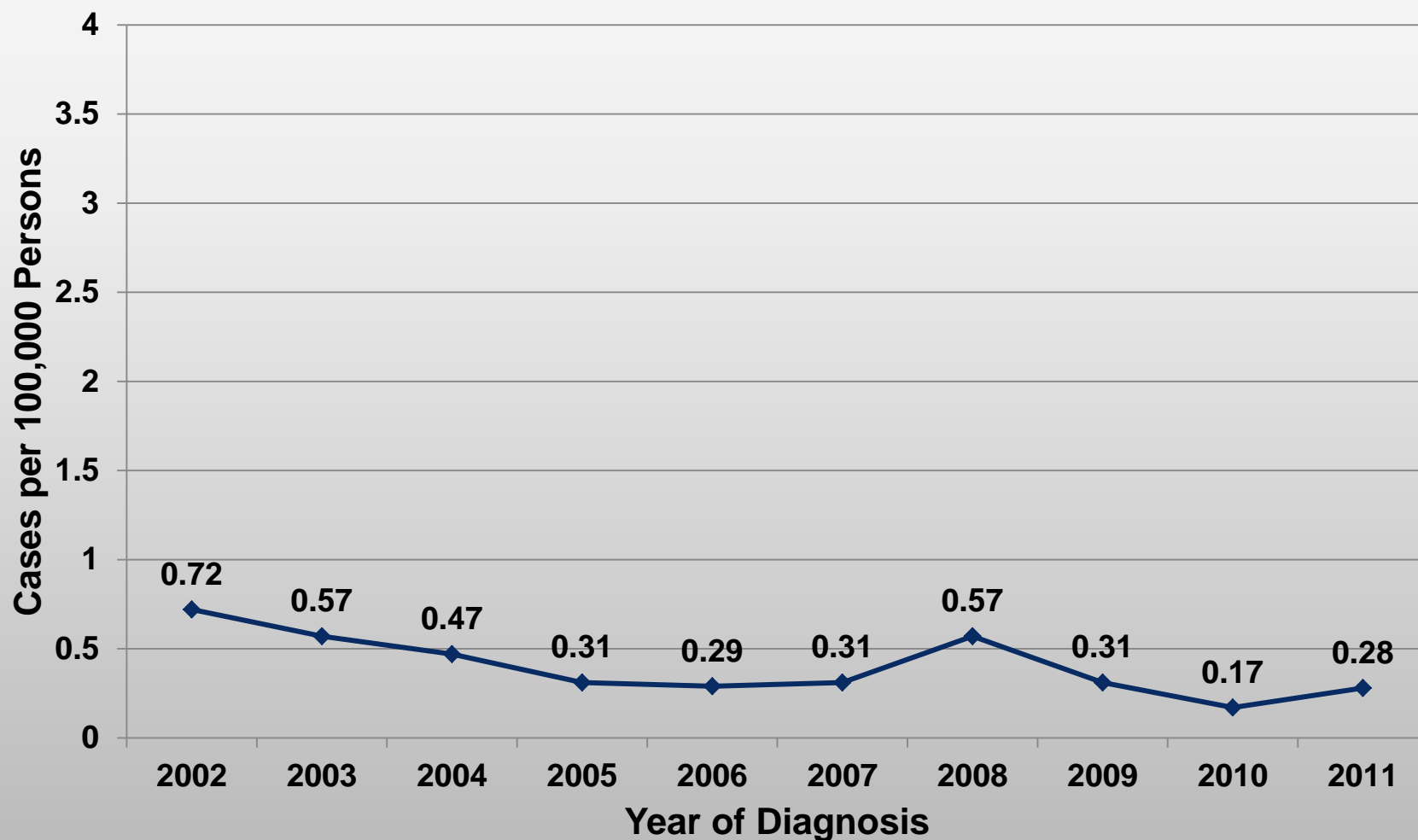
Cases of Invasive *Haemophilus influenzae* Disease by Month of Diagnosis and Serotype, Minnesota, 2011



Cases of Invasive *Haemophilus influenzae* Disease by Month of Diagnosis and Serotype, Minnesota, 2010-2011



Incidence of Invasive *Neisseria meningitidis* Disease, Minnesota, 2002-2011



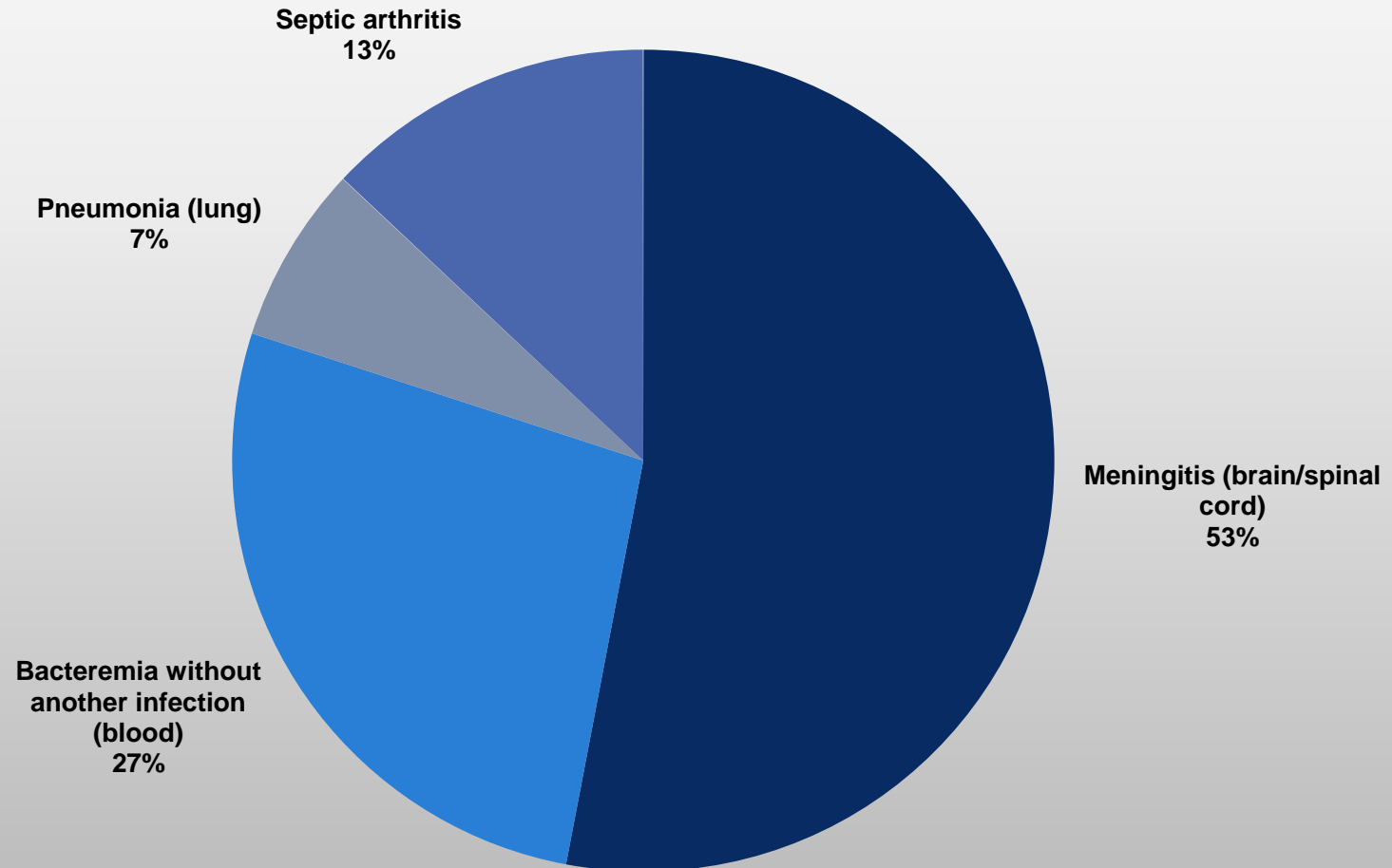
Incidence of Invasive *Neisseria meningitidis* Disease by Gender and Age Group, Minnesota, 2011

Characteristic	Cases (n=15)	Incidence per 100,000 persons
Gender		
Male	6	0.23
Female	9	0.34
Age Group		
Under 1 yr.	4	5.80
1-4 yrs.	2	0.70
5-9 yrs.	0	0
10-19 yrs.	0	0
20-29 yrs.	1	0.14
30-39 yrs.	0	0
40-49 yrs.	1	0.13
50-59 yrs.	3	0.40
60-69 yrs.	1	0.21
70+ yrs.	3	0.62

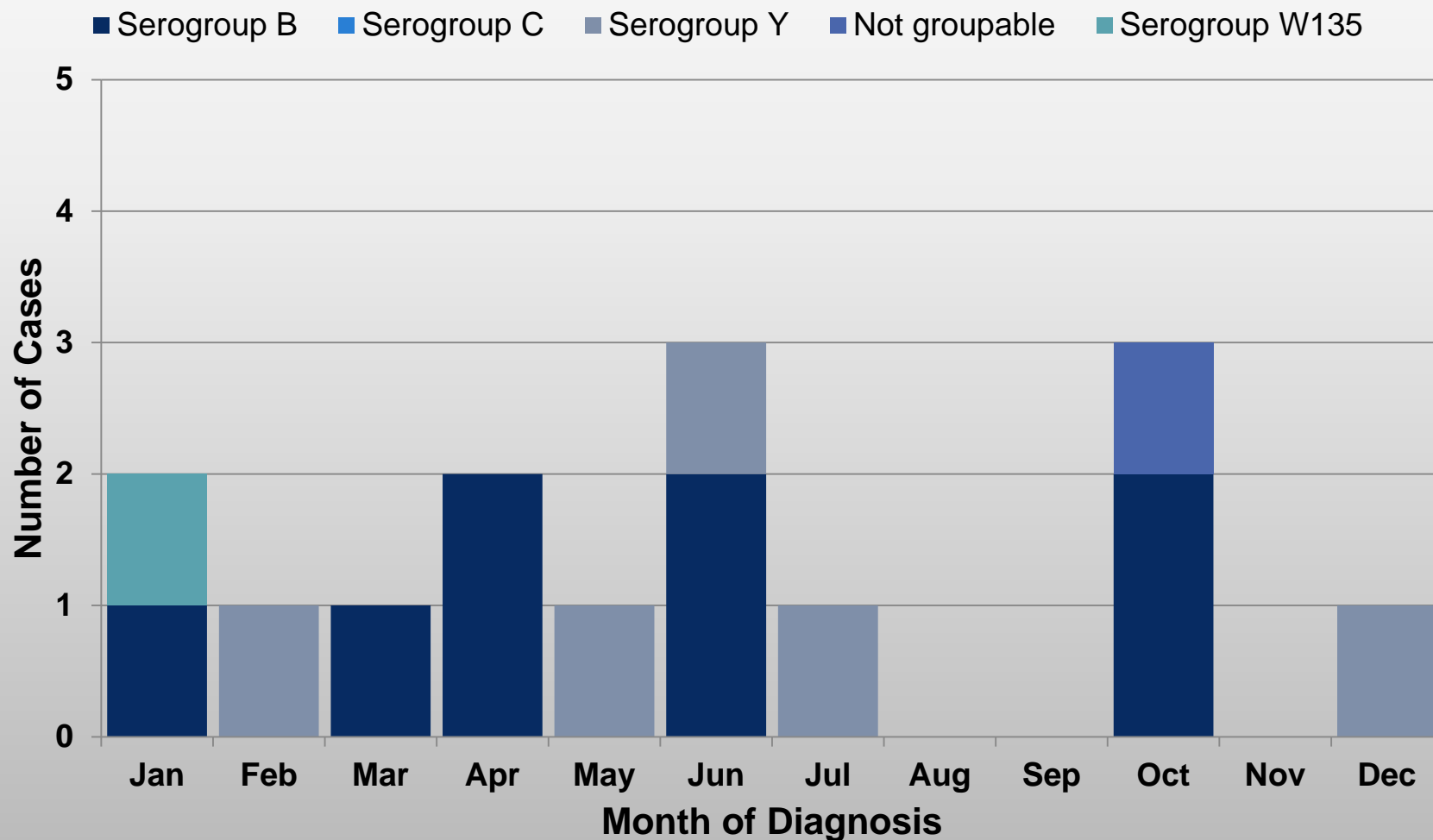
Invasive *Neisseria meningitidis* Disease Cases and Deaths by Age Group, Minnesota, 2011

Age Group	Cases	Deaths	% Died
Under 1 yr.	4	0	0%
1-4 yrs.	2	0	0%
5-9 yrs.	0	0	--
10-19 yrs.	0	0	--
20-29 yrs.	1	0	0%
30-39 yrs.	0	0	--
40-49 yrs.	1	0	0%
50-59 yrs.	3	0	0%
60-69 yrs.	1	0	0%
70+ yrs.	3	0	0%
Total	15	0	0%

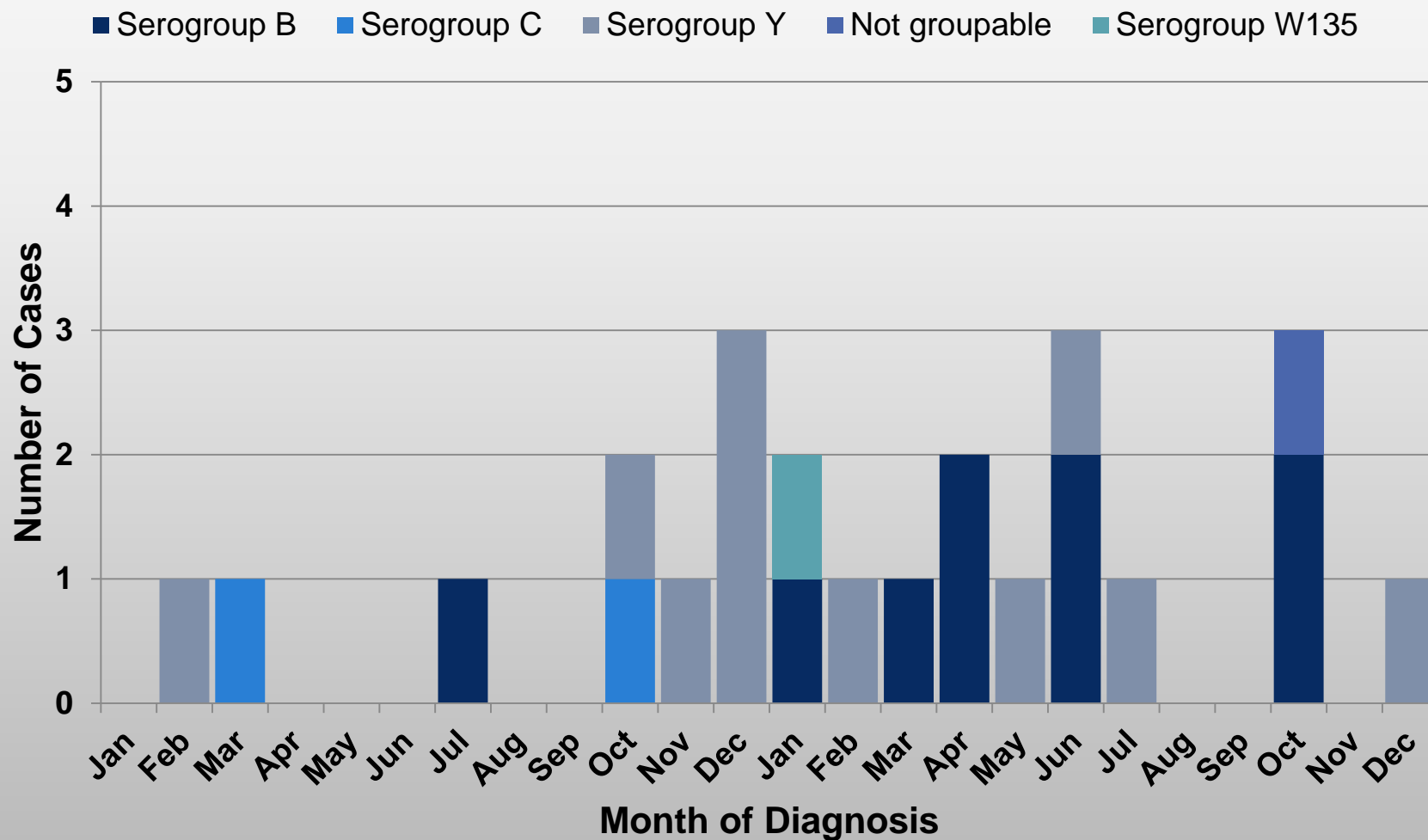
Invasive *Neisseria meningitidis* by Type of Infection/Syndrome, Minnesota 2011



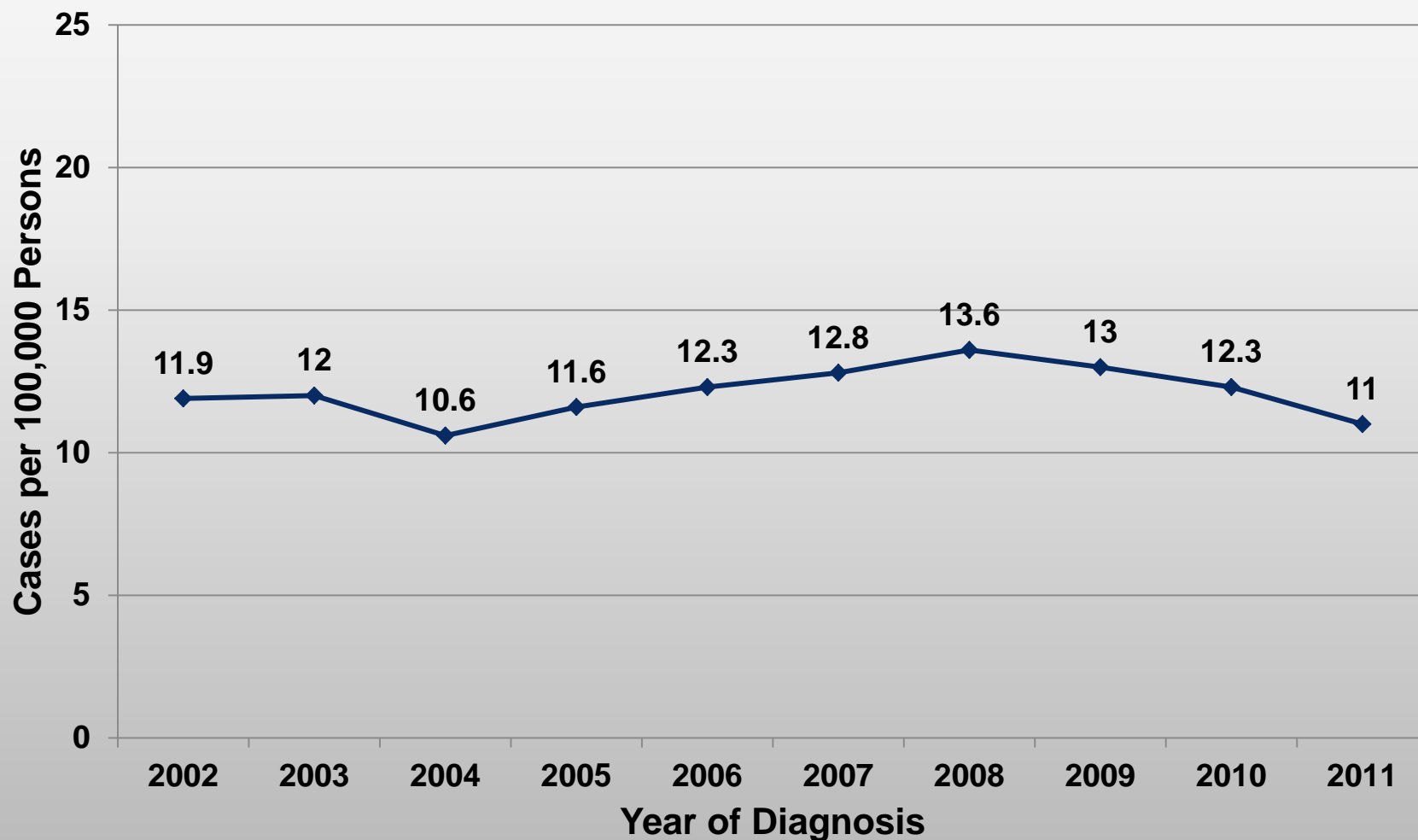
Cases of Invasive *Neisseria meningitidis* Disease by Month of Diagnosis and Serotype, Minnesota, 2011



Cases of Invasive *Neisseria meningitidis* Disease by Month of Diagnosis and Serotype, Minnesota, 2010-2011



Incidence of Invasive Pneumococcal Disease, Minnesota, 2002-2011



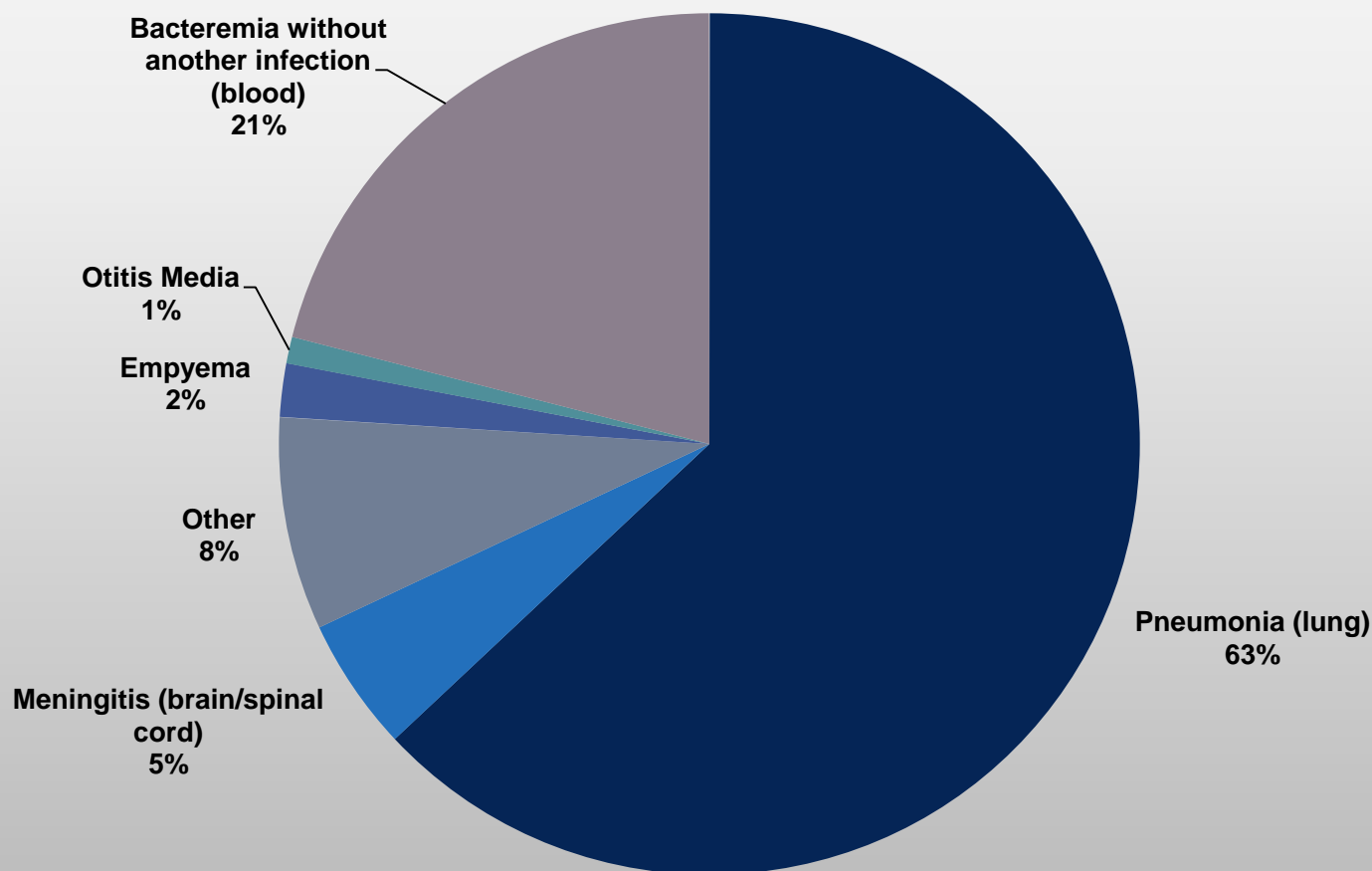
Incidence of Invasive Pneumococcal Disease by Gender and Age Group, Minnesota, 2011

Characteristic	Cases (n=582)	Incidence per 100,000 persons
Gender		
Male	285	10.8
Female	297	11.1
Age Group		
Under 1 yr.	23	33.3
1-4 yrs.	27	9.4
5-19 yrs.	11	1.0
20-29 yrs.	15	2.1
30-39 yrs.	36	5.4
40-49 yrs.	47	6.2
50-64 yrs.	151	14.6
65-79 yrs.	149	31.3
80+ yrs.	123	59.5

Invasive Pneumococcal Disease Cases and Deaths by Age Group, Minnesota, 2011

Age Group	Cases	Deaths	% Died
Under 1 yr.	23	2	9%
1-4 yrs.	27	0	0%
5-19 yrs.	11	1	9%
20-29 yrs.	15	1	7%
30-39 yrs.	36	2	6%
40-49 yrs.	47	2	4%
50-64 yrs.	151	13	9%
65-79 yrs.	149	26	17%
80+ yrs.	123	24	20%
Total	582	71	12%

Invasive Pneumococcal Disease by Type of Infection/Syndrome, Minnesota 2011*



*This figure represents 622 infections among 582 cases

Invasive Pneumococcal Isolates by Serotype Included in 13-Valent Conjugate Vaccine* by Age Group, Minnesota, 2011

Age Group	Isolates	# included in PCV-13	% included in PCV-13
Under 1 yr.	23	6	26%
1-4 yrs.	25	7	28%
5-19 yrs.	11	6	55%
20-29 yrs.	15	8	53%
30-39 yrs.	36	17	47%
40-49 yrs.	44	21	47%
50-64 yrs.	148	44	30%
65-79 yrs.	143	52	36%
80+ yrs.	119	29	24%
Total	564	190	34%

*Serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F

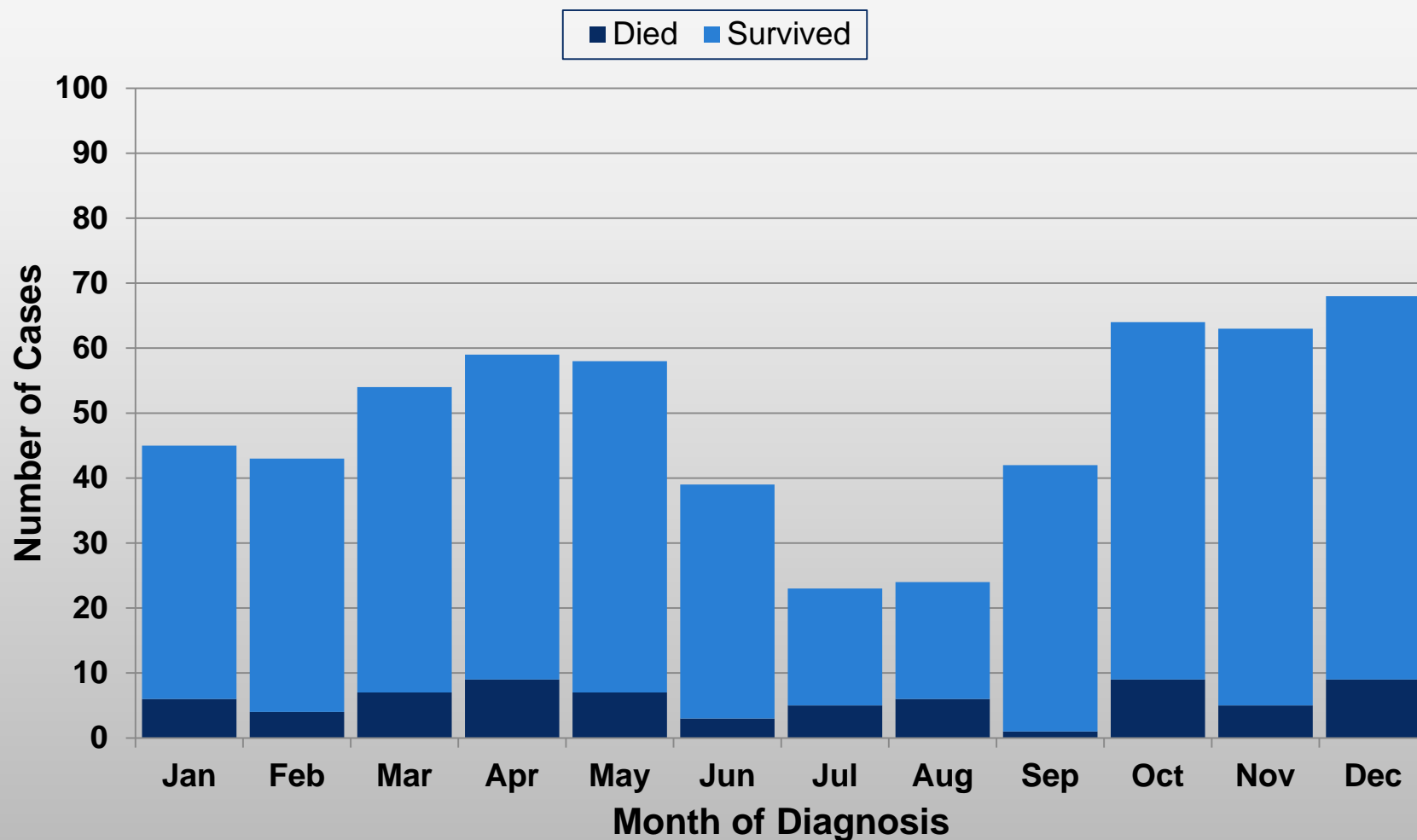
Invasive Pneumococcal Isolates by Resistance to Antimicrobial Agents, Minnesota, 2011 (n=560)

	Total Resistant Isolates	% Resistant Isolates
Penicillin resistance (R)*		
Meningitis breakpoints	133	24%
Non-meningitis breakpoints	8	1%
Resistance to drug classes**		
No resistance	325	58%
R to 1 drug class	100	18%
R to 2-3 drug classes	60	11%
R to 4-5 drug classes	75	13%

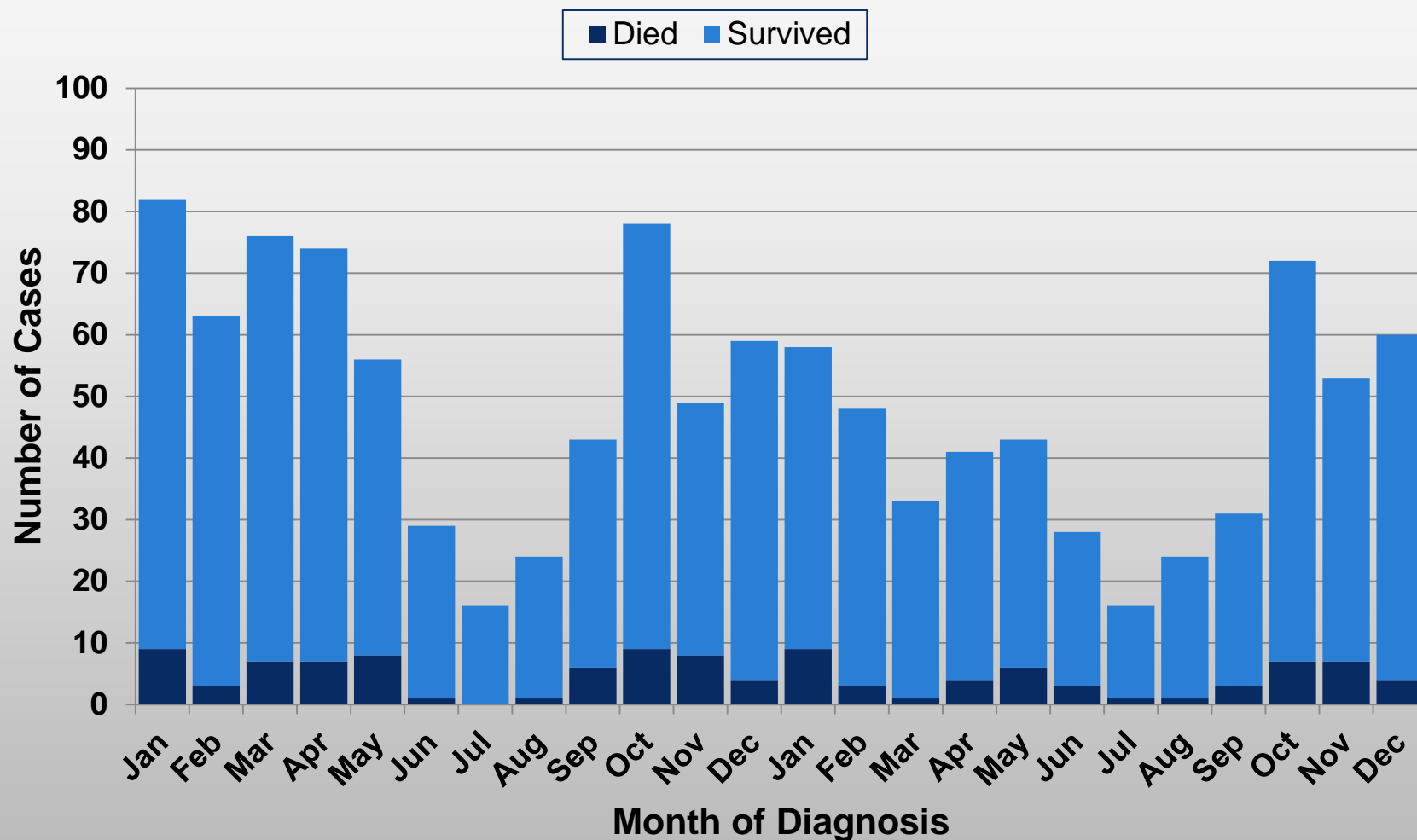
* Isolates with MIC \geq 0.12 μ g/ml are Penicillin-R for meningitis, \geq 8 μ g/ml for non-meningitis.

** Twelve drug classes assessed; R to beta-lactams was assessed by penicillin MIC \geq 0.12 μ g/ml.

Cases of Invasive Pneumococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011



Cases of Invasive Pneumococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2010-2011



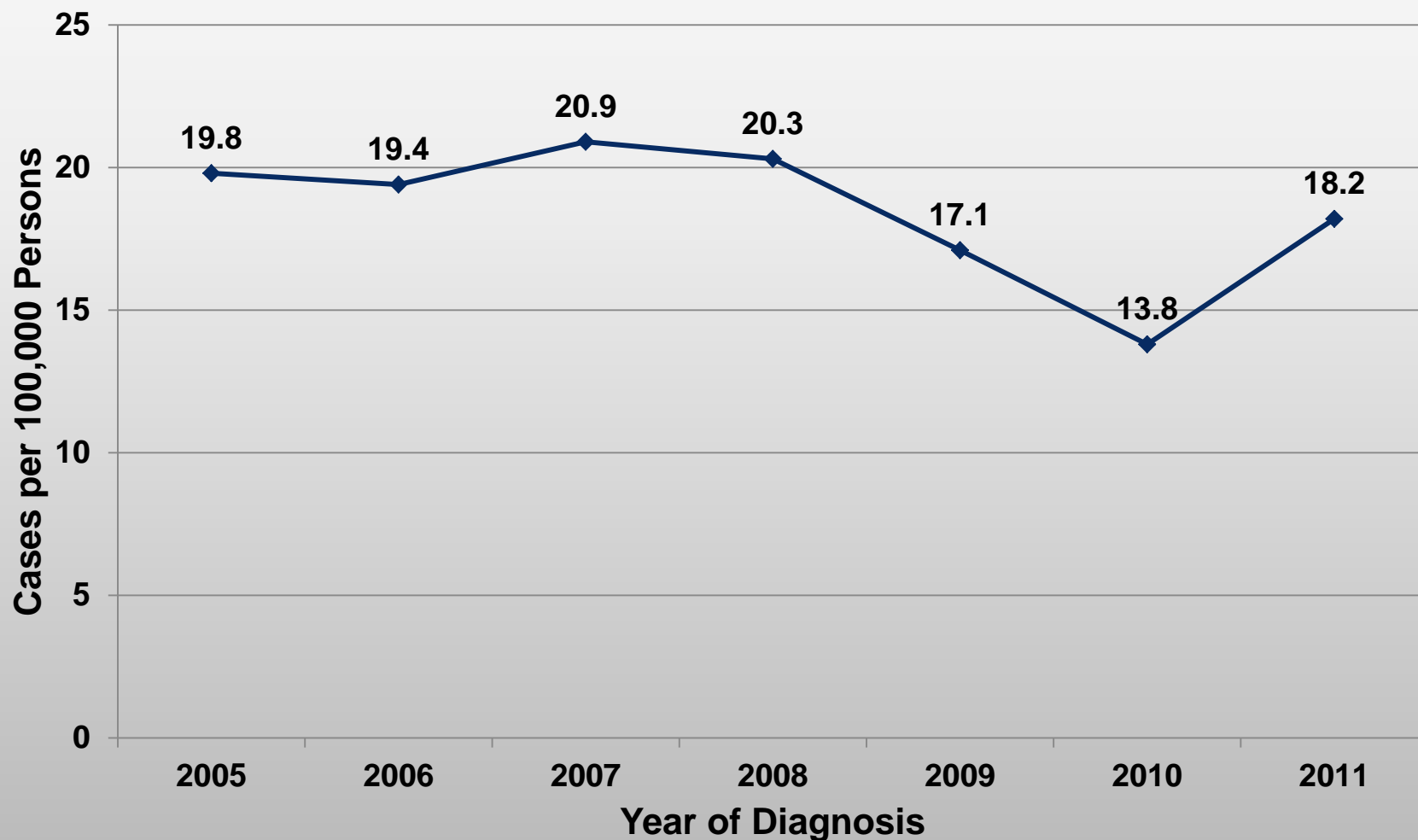
Invasive MRSA Surveillance Methods

- Cases include Hennepin and Ramsey County, Minnesota residents with invasive infections due to methicillin-resistant *Staphylococcus aureus* (MRSA).
- Invasive infections are from normally sterile body sites such as blood, cerebrospinal fluid and others. These usually cause serious illnesses (disease).
- All metro area hospitals and reference laboratories serving Minnesotans are contacted routinely to identify cases.

Invasive MRSA Surveillance Methods (cont.)

- Species confirmation, antibiotic resistance, and other testing is performed by the MDH Public Health.
- Disease rates are based on census population data.
- The Centers for Disease Control and Prevention (CDC) includes these results from Minnesota and other states and regions in a network called Active Bacterial Core Surveillance (ABCs) which covers a population base of 41 million.

Incidence of Invasive MRSA Disease, Ramsey and Hennepin Counties, 2005-2011



* Data from years 2005-2007 includes Ramsey County only.

Incidence of Invasive MRSA Disease by Gender and Age Group, Ramsey and Hennepin Counties, Minnesota, 2011

Characteristic	Cases (n=302)	Incidence per 100,000 persons
Gender		
Male	185	22.5
Female	117	13.8
Age Group		
Under 1 yr.	6	26.0
1-4 yrs.	6	6.4
5-9 yrs.	0	0
10-19 yrs.	7	3.5
20-29 yrs.	11	4.2
30-39 yrs.	22	9.2
40-49 yrs.	32	13.6
50-59 yrs.	57	25.2
60-69 yrs.	53	39.5
70+ yrs.	108	76.3

Invasive MRSA Disease Cases and Deaths by Age Group, Ramsey and Hennepin Counties, Minnesota, 2011

Age Group	Cases	Deaths	% Died
Under 1 yr.	6	0	0%
1-4 yrs.	6	0	0%
5-9 yrs.	0	0	--
10-19 yrs.	7	0	0%
20-29 yrs.	11	0	0%
30-39 yrs.	22	1	5%
40-49 yrs.	32	3	9%
50-59 yrs.	57	4	7%
60-69 yrs.	53	5	9%
70+ yrs.	108	29	27%
Total	302	42	14%

Incidence of Invasive MRSA Disease by Case Type, Ramsey and Hennepin Counties, Minnesota, 2011

Case Type	Cases	Incidence per 100,000 persons
Healthcare-associated	264	15.9
Community-associated	37	2.2

* 1 case had unknown case type

- Healthcare-associated if case had one or more of the following: MRSA infection was identified more than 3 days after hospital admission; history of hospitalization, surgery, dialysis or residence in a long-term care facility in the previous year; or, presence of an indwelling catheter.
- Community-associated: none of the previously mentioned criteria were met.

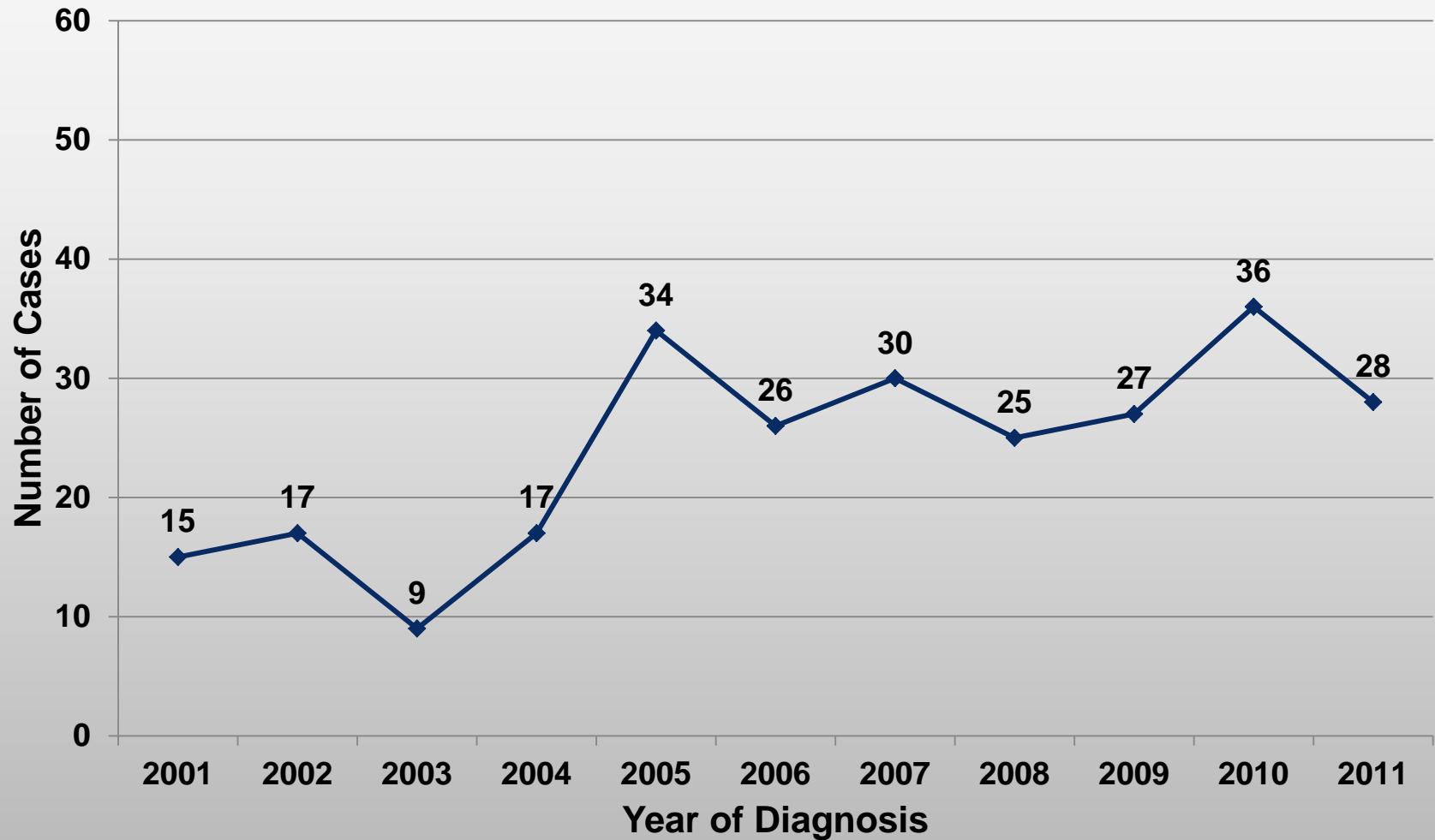
Invasive MRSA Disease by Type of Infection, Ramsey and Hennepin Counties, Minnesota, 2011

Type of Infection*	Cases
Bacteremia (blood)	202
Without another source of infection	85
With another source of infection	117
Pneumonia (lung)	36
Osteomyelitis (bone)	26
Cellulitis (skin)	25
Endocarditis (heart)	5
More than one infection type	163
Other infection**	193

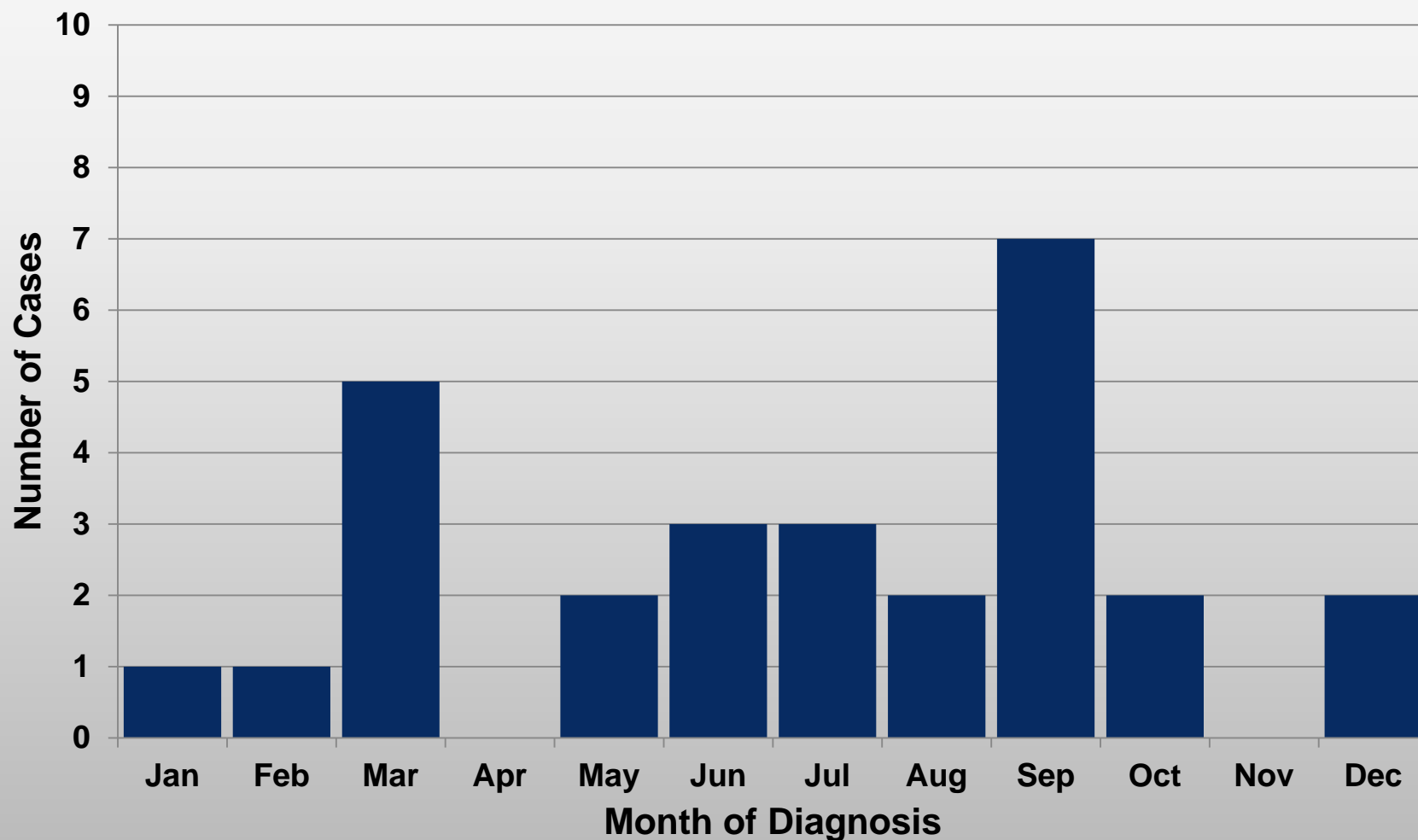
* Cases may have had more than 1 type of infections

** Other infections included urinary tract, internal organ abscess, empyema (pus), septic arthritis (joint), meningitis (brain/spinal cord)

Confirmed Legionnaires' Disease Cases Minnesota, 2001-2011



Confirmed Legionnaires' Disease by Month of Diagnosis, Minnesota, 2011



Confirmed Legionnaires' Disease Cases by Age Group and Gender, Minnesota, 2011

Age Group	Male	Female	Total
18-29 yrs.	0	0	0
30-39 yrs.	0	1	1
40-49 yrs.	2	1	3
50-59 yrs.	4	2	6
60-69 yrs.	6	4	10
70+ yrs.	4	4	8
Total	16 (57%)	12 (43%)	28

Possible Exposures Among Confirmed Legionnaires' Disease Cases, Minnesota, 2011

