

INVASIVE BACTERIAL DISEASE SURVEILLANCE REPORT, 2012

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

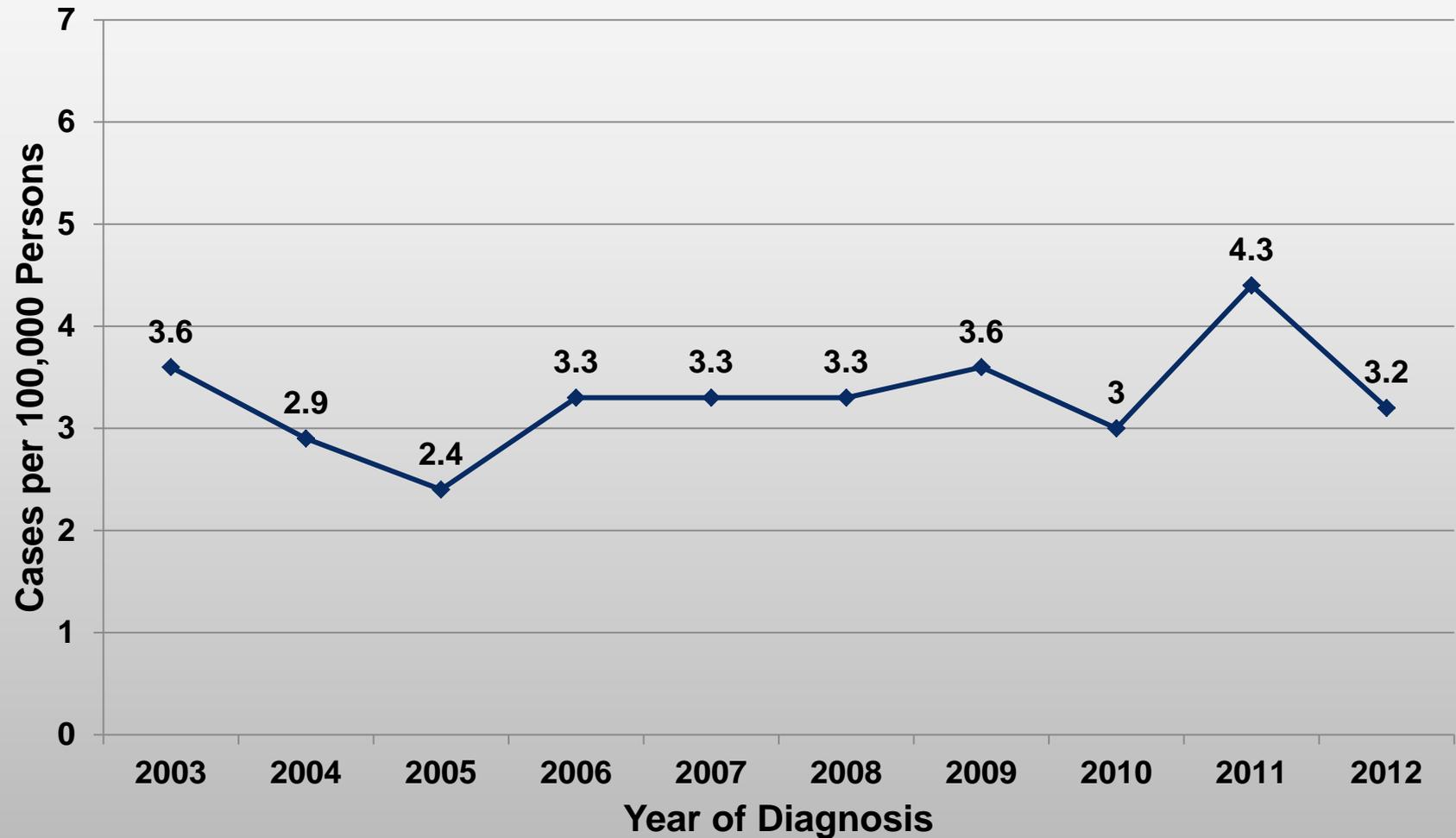
Surveillance Methods

- 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, 2003-2012



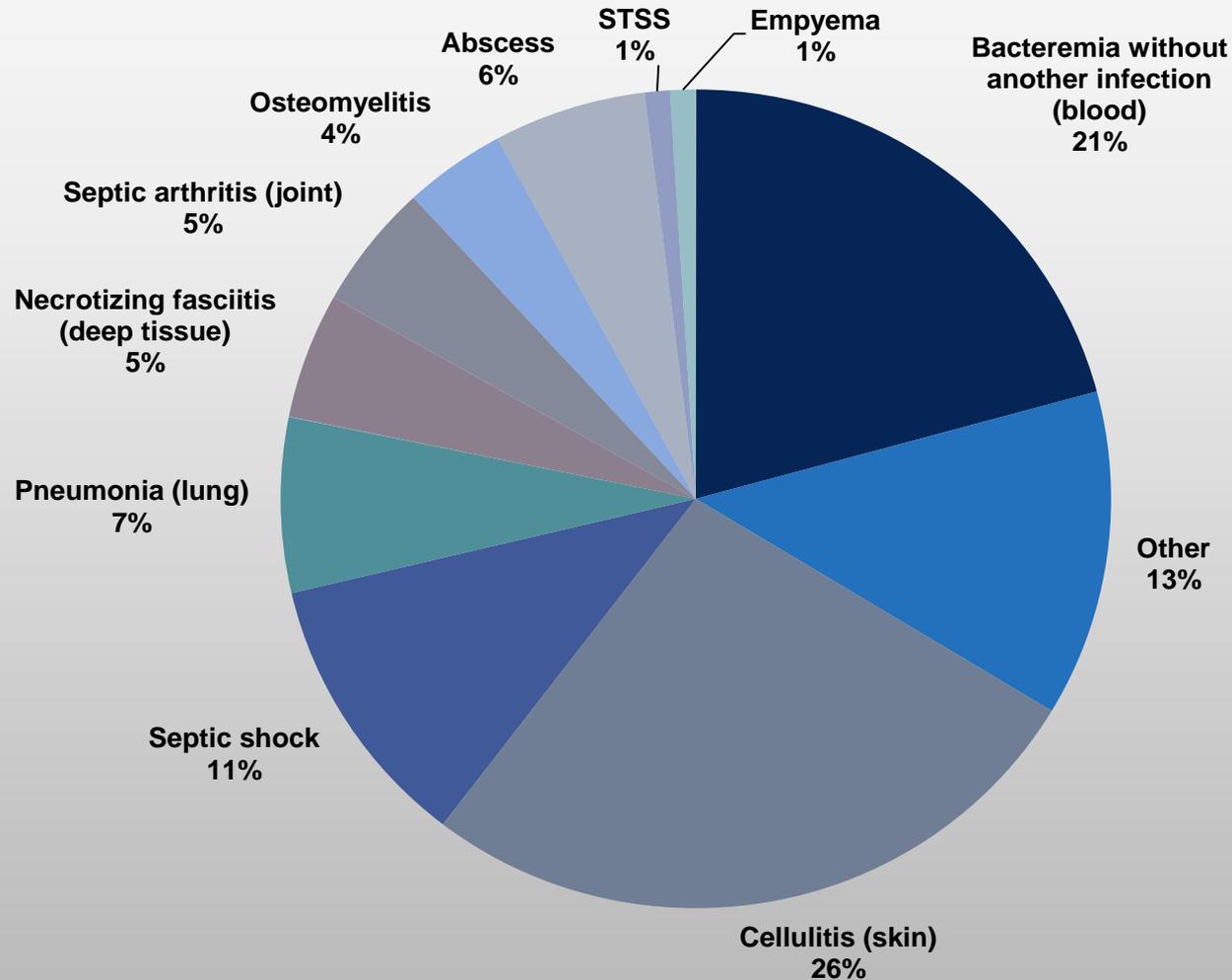
Incidence of Invasive Group A Streptococcal Disease by Gender and Age Group, Minnesota, 2012

Characteristic	Cases (n=169)	Incidence per 100,000 persons
Gender		
Male	84	3.2
Female	85	3.2
Age Group		
Under 1 yr.	5	7.3
1-4 yrs.	6	2.1
5-9 yrs.	4	1.2
10-19 yrs.	3	0.4
20-29 yrs.	14	1.9
30-39 yrs.	20	3.0
40-49 yrs.	26	3.5
50-59 yrs.	30	3.9
60-69 yrs.	18	3.5
70+ yrs.	43	8.7

Invasive Group A Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2012

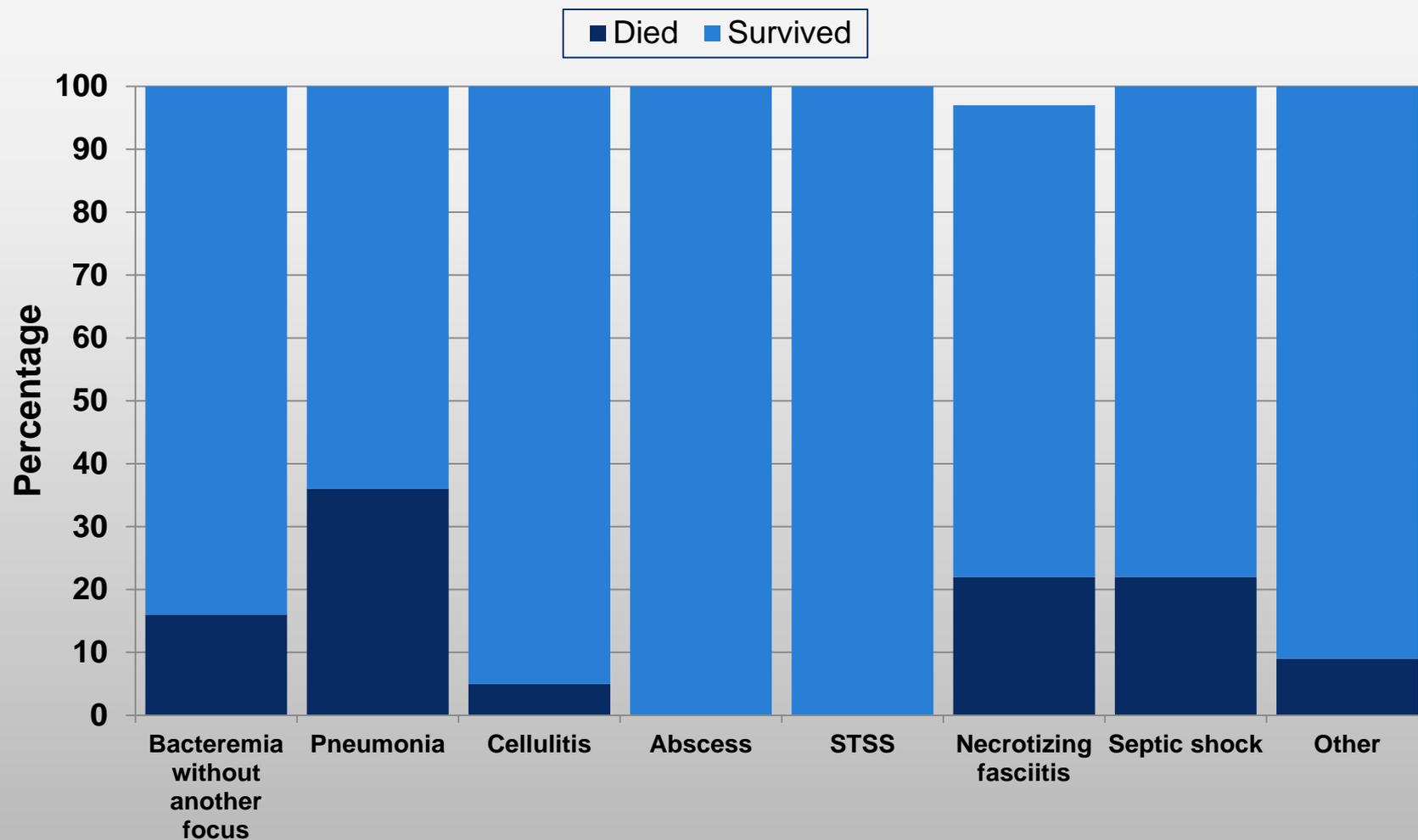
Age Group	Cases	Deaths	% Died
Under 1 yr.	5	1	20%
1-4 yrs.	6	0	0%
5-9 yrs.	4	0	0%
10-19 yrs.	3	0	0%
20-29 yrs.	14	0	0%
30-39 yrs.	20	0	0%
40-49 yrs.	26	0	0%
50-59 yrs.	30	1	3%
60-69 yrs.	18	3	17%
70+ yrs.	43	13	30%
Total	169	18	11%

Invasive Group A Streptococcal Disease by Type of Infection/Syndrome, Minnesota, 2012

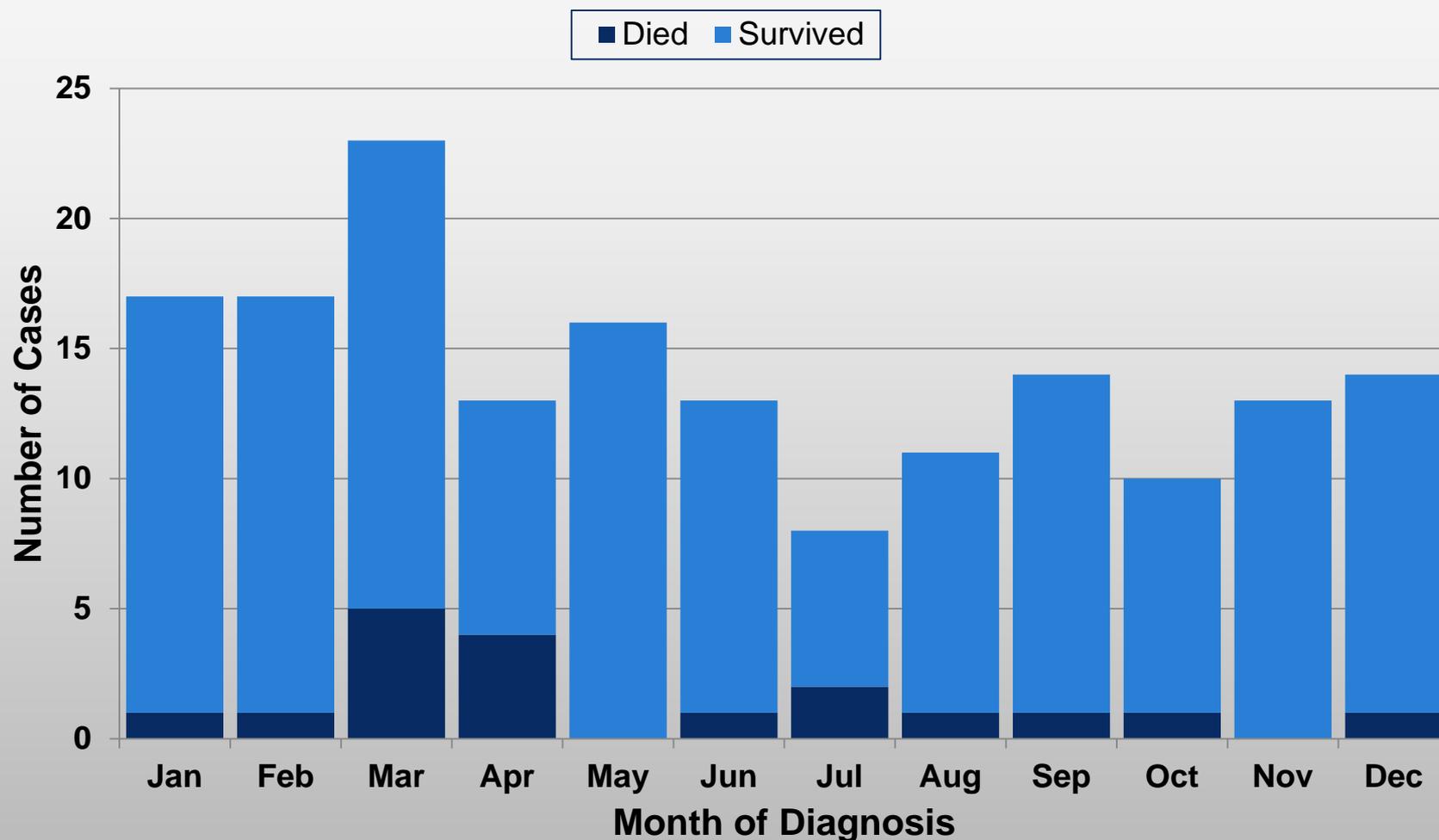


This chart represents 215 infections among 169 cases (some cases had >1 infection).

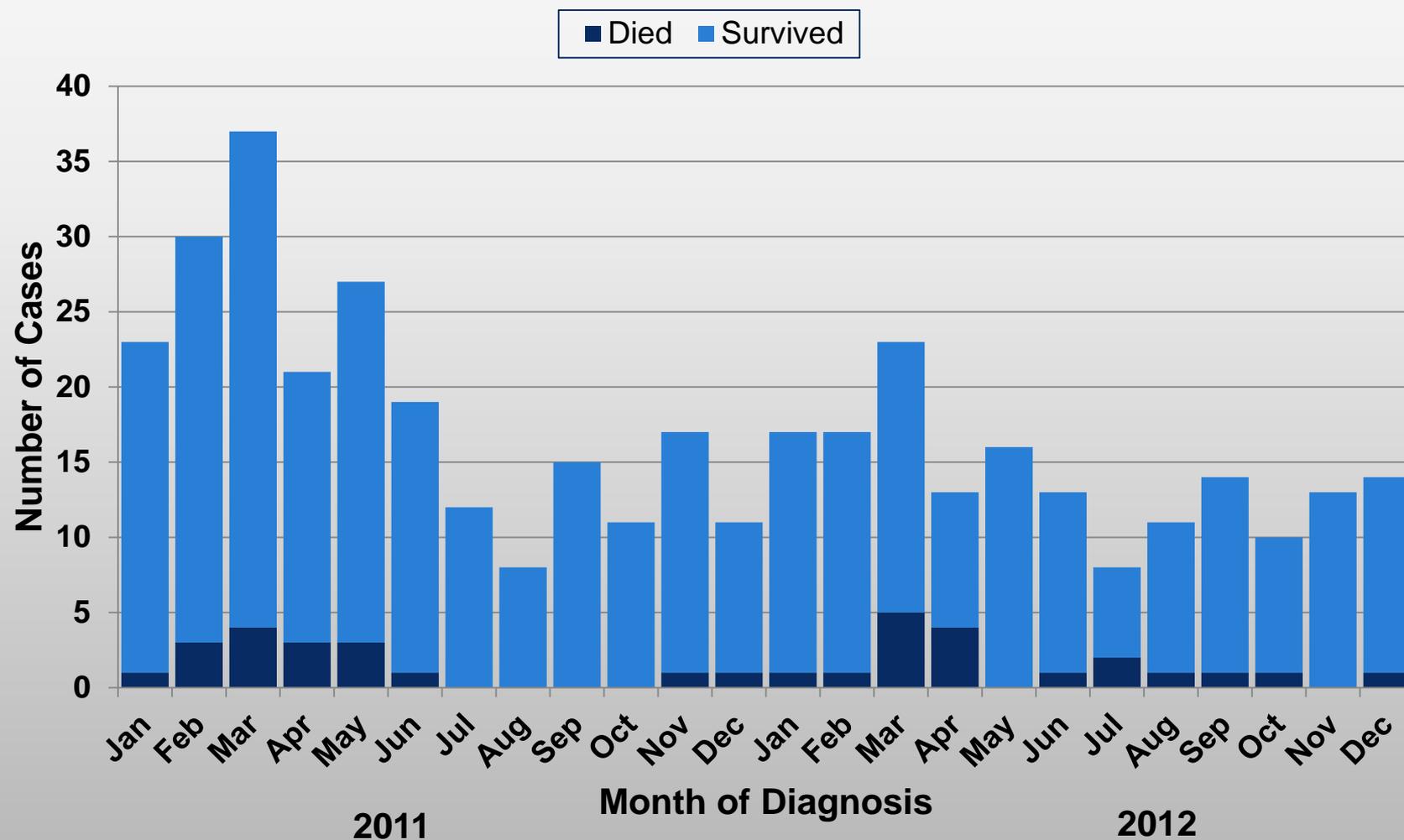
Outcome of Invasive Group A Streptococcal Disease by Type of Infection/Syndrome, Minnesota, 2012



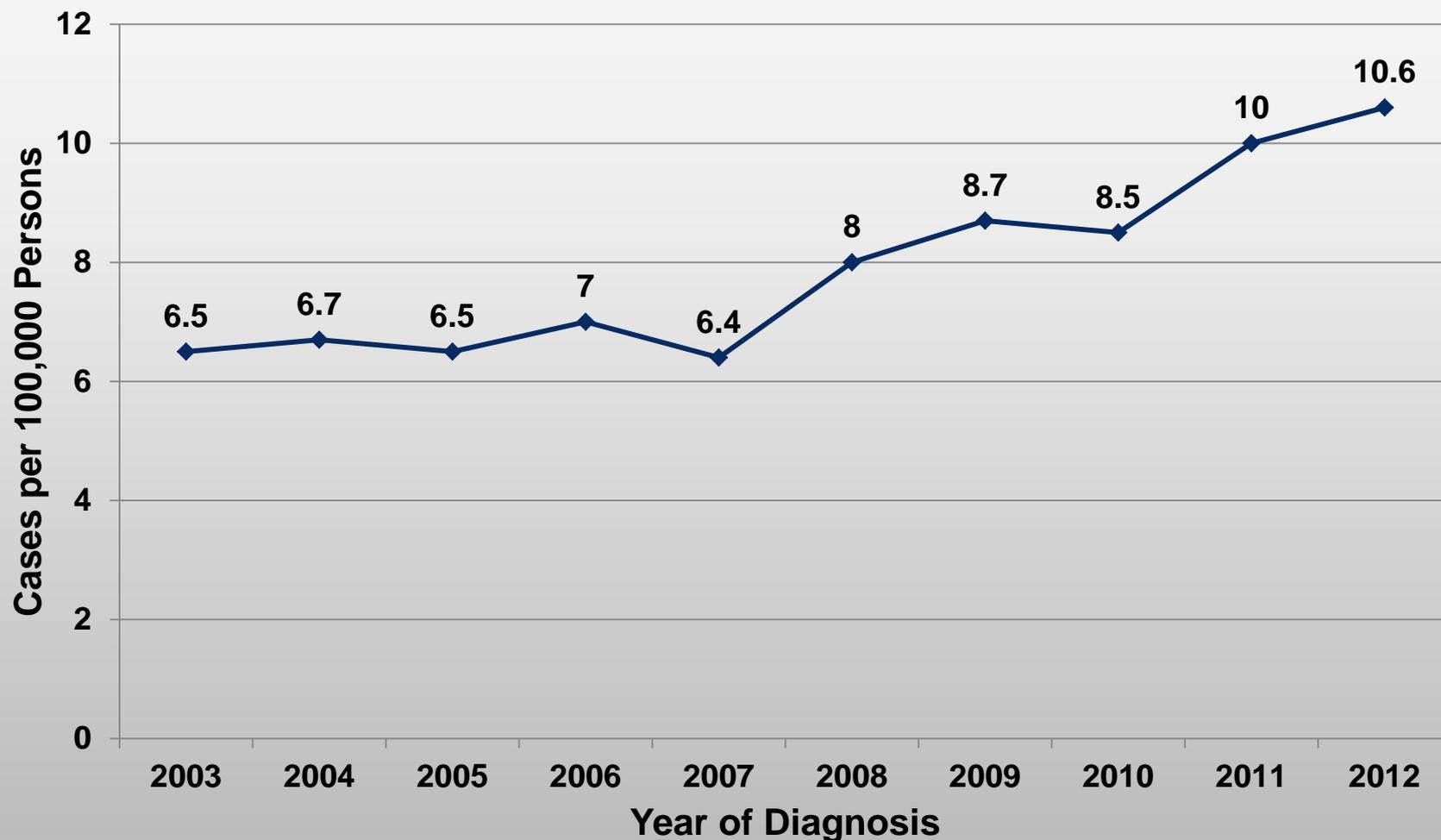
Cases of Invasive Group A Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2012



Cases of Invasive Group A Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011-2012



Incidence of Invasive Group B Streptococcal Disease, Minnesota, 2003-2012



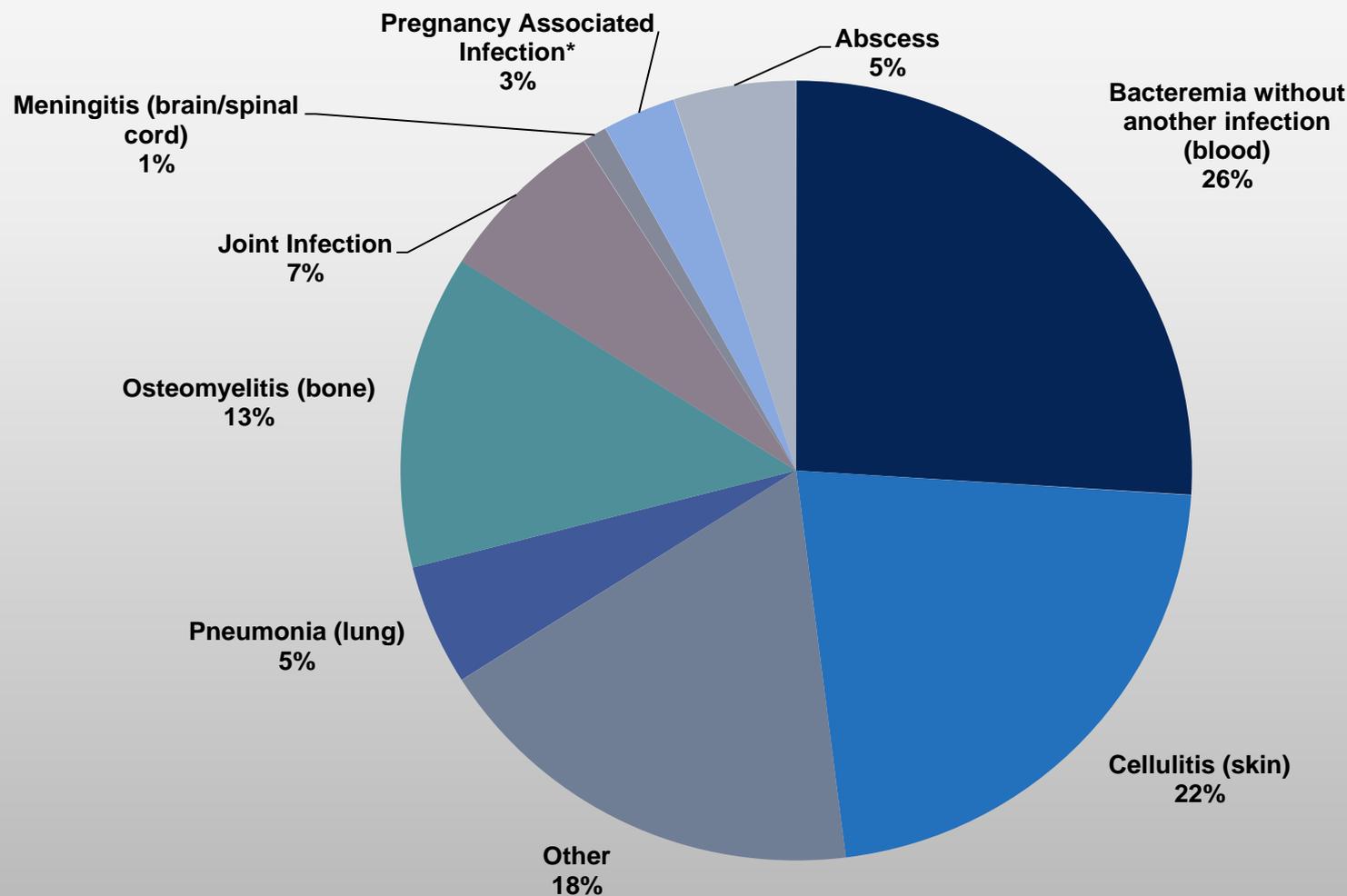
Incidence of Invasive Group B Streptococcal Disease by Gender and Age Group, Minnesota, 2012

Characteristic	Cases (n=564)	Incidence per 100,000 persons
Gender		
Male	331	12.5
Female	233	8.7
Age Group		
Under 1 yr.	27	39.5
1-4 yrs.	0	0
5-9 yrs.	0	0
10-19 yrs.	3	0.4
20-29 yrs.	21	2.9
30-39 yrs.	31	4.6
40-49 yrs.	54	7.3
50-59 yrs.	109	14.2
60-69 yrs.	134	26.3
70+ yrs.	185	37.6

Invasive Group B Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2012

Age Group	Cases	Deaths	% Died
Under 1 yr.	27	3	11%
1-4 yrs.	0	0	0%
5-9 yrs.	0	0	0%
10-19 yrs.	3	0	0%
20-29 yrs.	21	2	10%
30-39 yrs.	31	1	3%
40-49 yrs.	54	1	2%
50-59 yrs.	109	9	8%
60-69 yrs.	134	5	4%
70+ yrs.	185	14	8%
Total	564	35	6%

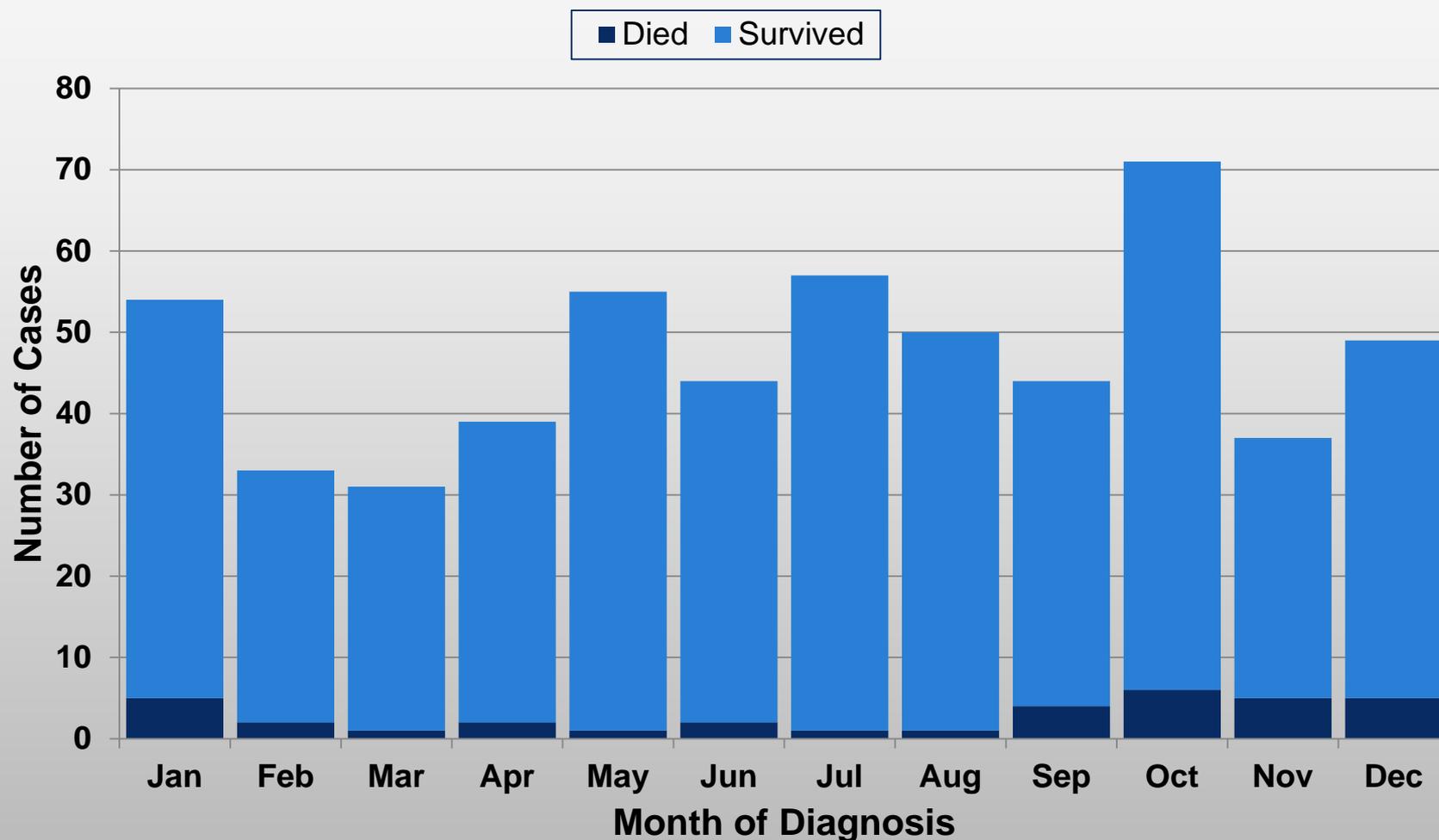
Invasive Group B Streptococcal Disease by Type of Infection/Syndrome, Minnesota 2012



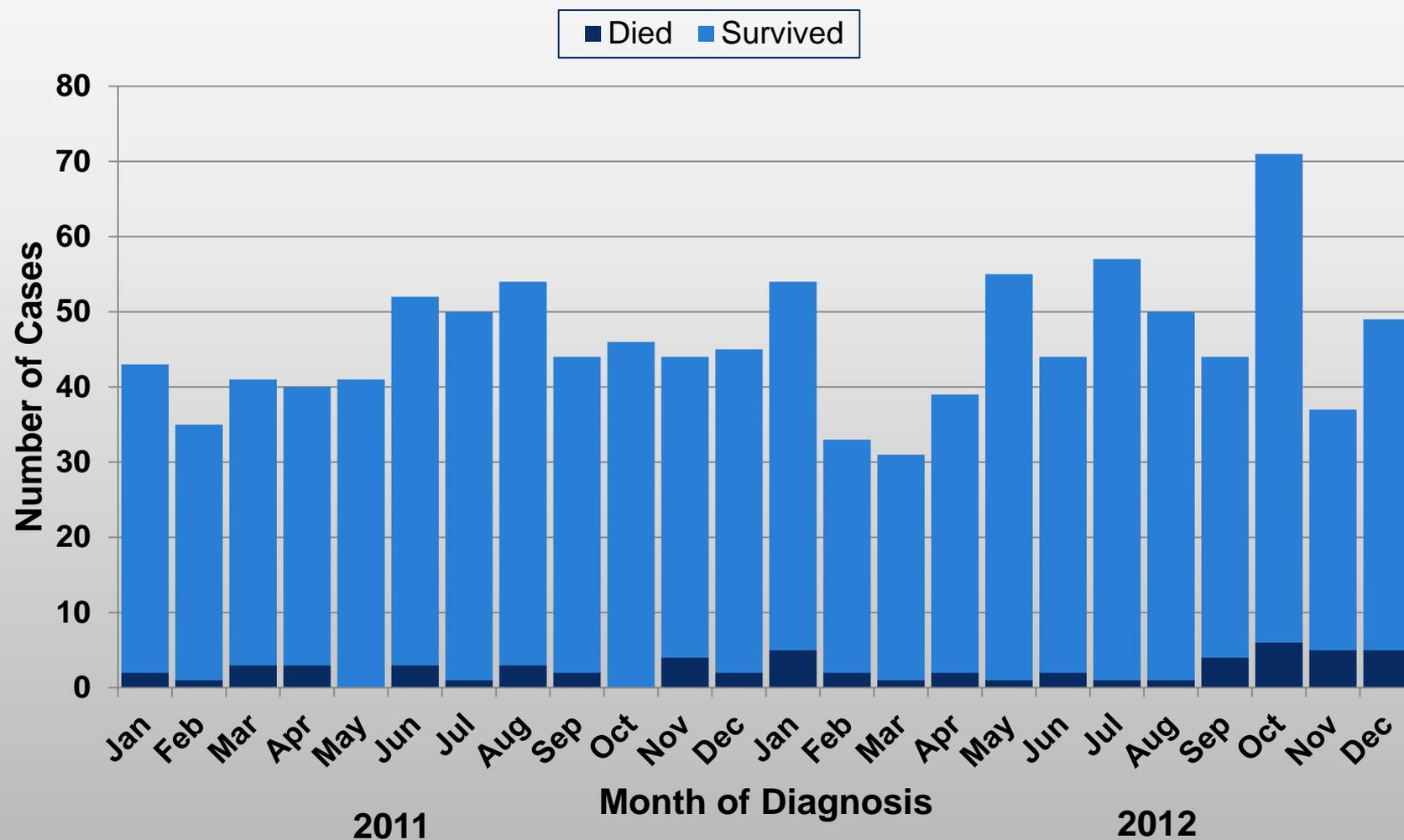
This chart represents 648 infections among 564 cases. (Some cases had >1 infection.)

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

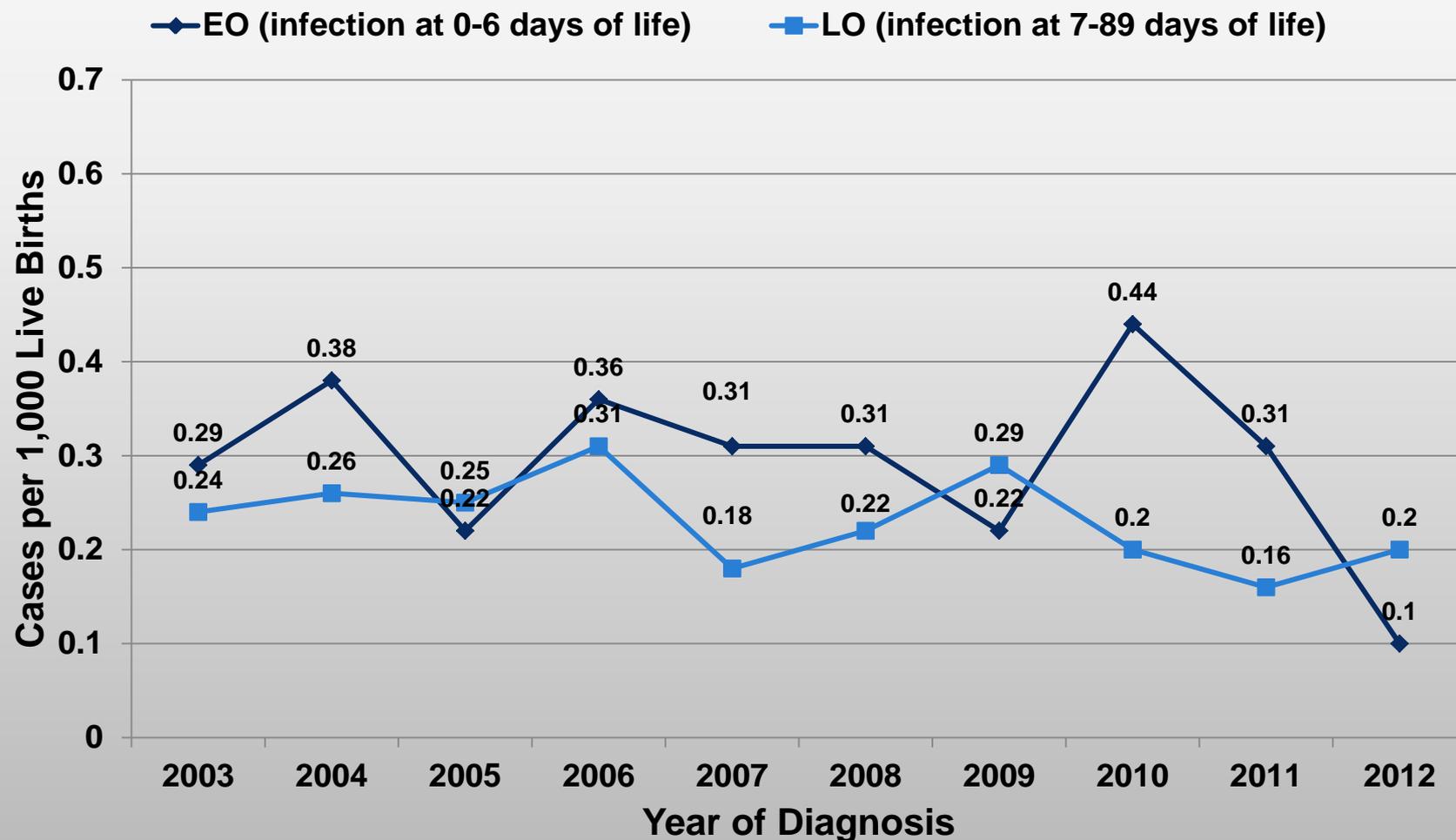
Cases of Invasive Group B Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2012



Cases of Invasive Group B Streptococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011-2012



Incidence of Invasive Early and Late-Onset Group B Streptococcal Disease, Minnesota, 2003-2012

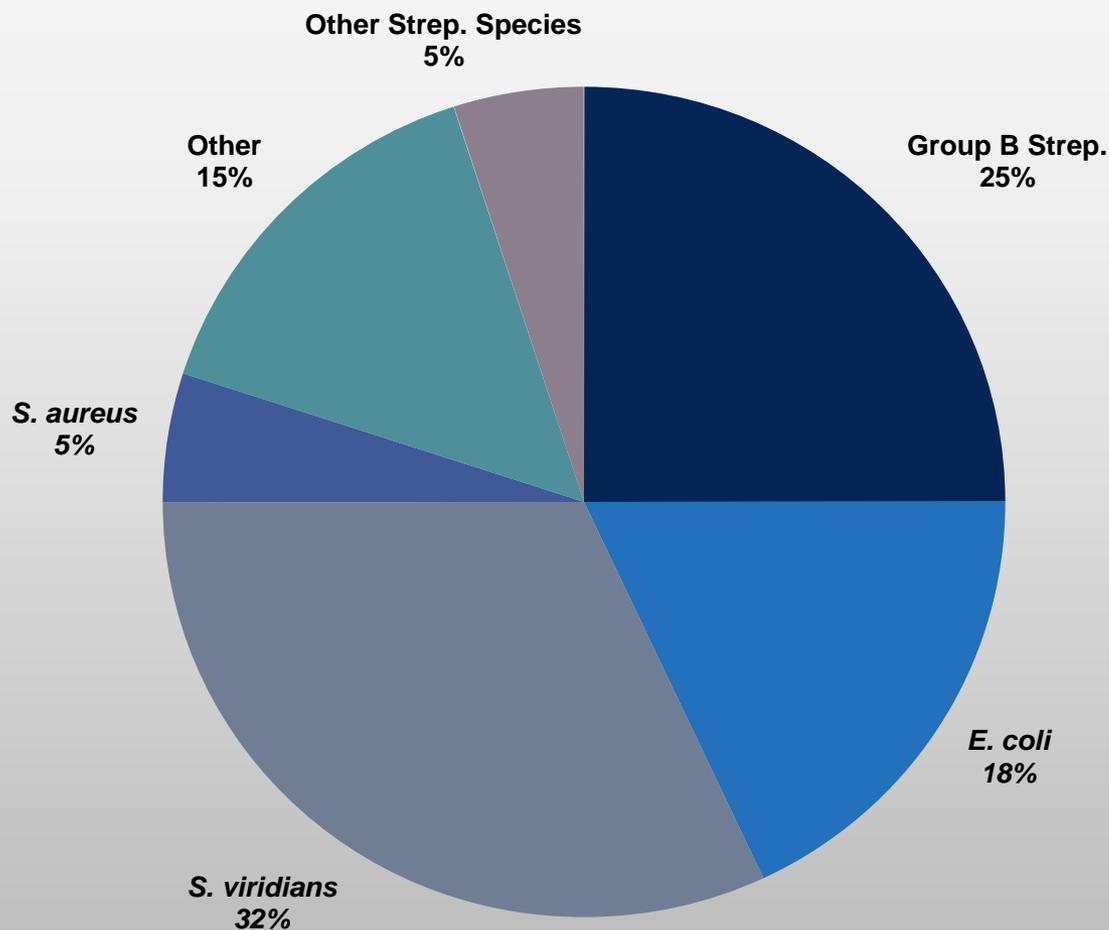


Early-Onset* Group B Streptococcal Disease by Race, Gestational Age and Outcome, Minnesota, 2012

Characteristic	Cases (n=10)	Percent
Race		
White	6	60%
Black	0	--
Other	4	40%
Gestational Age		
Under 32 weeks	1	10%
32-37 weeks	3	30%
Full-term	6	60%
Outcome		
Died	2	20%
Survived	8	80%

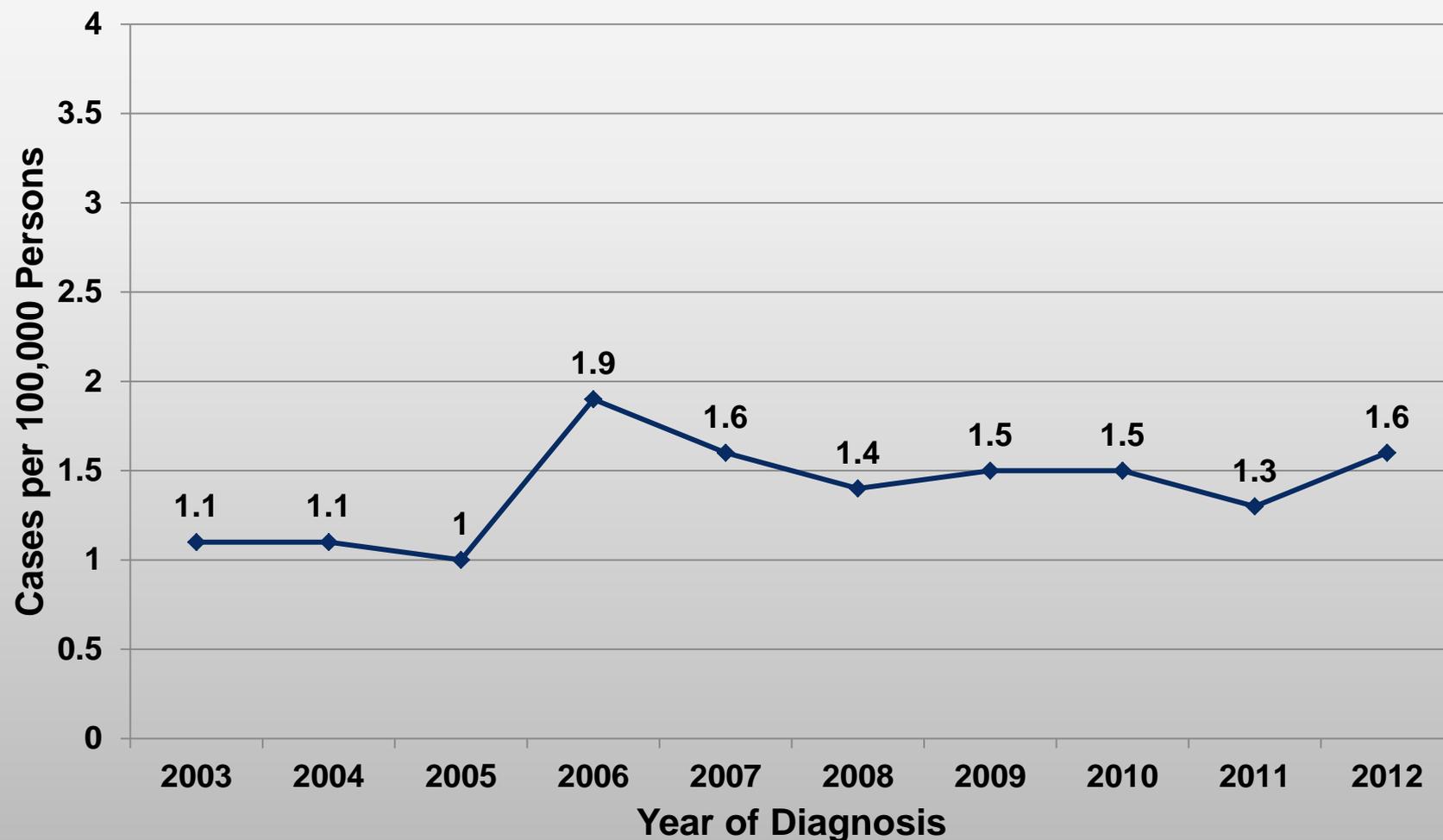
* onset 0-6 days of life

Invasive Neonatal Sepsis Disease in First 6 Days of Life by Pathogen, Minnesota, 2012*



* This chart represents 40 cases.

Incidence of Invasive *Haemophilus influenzae* Disease, Minnesota, 2003-2012



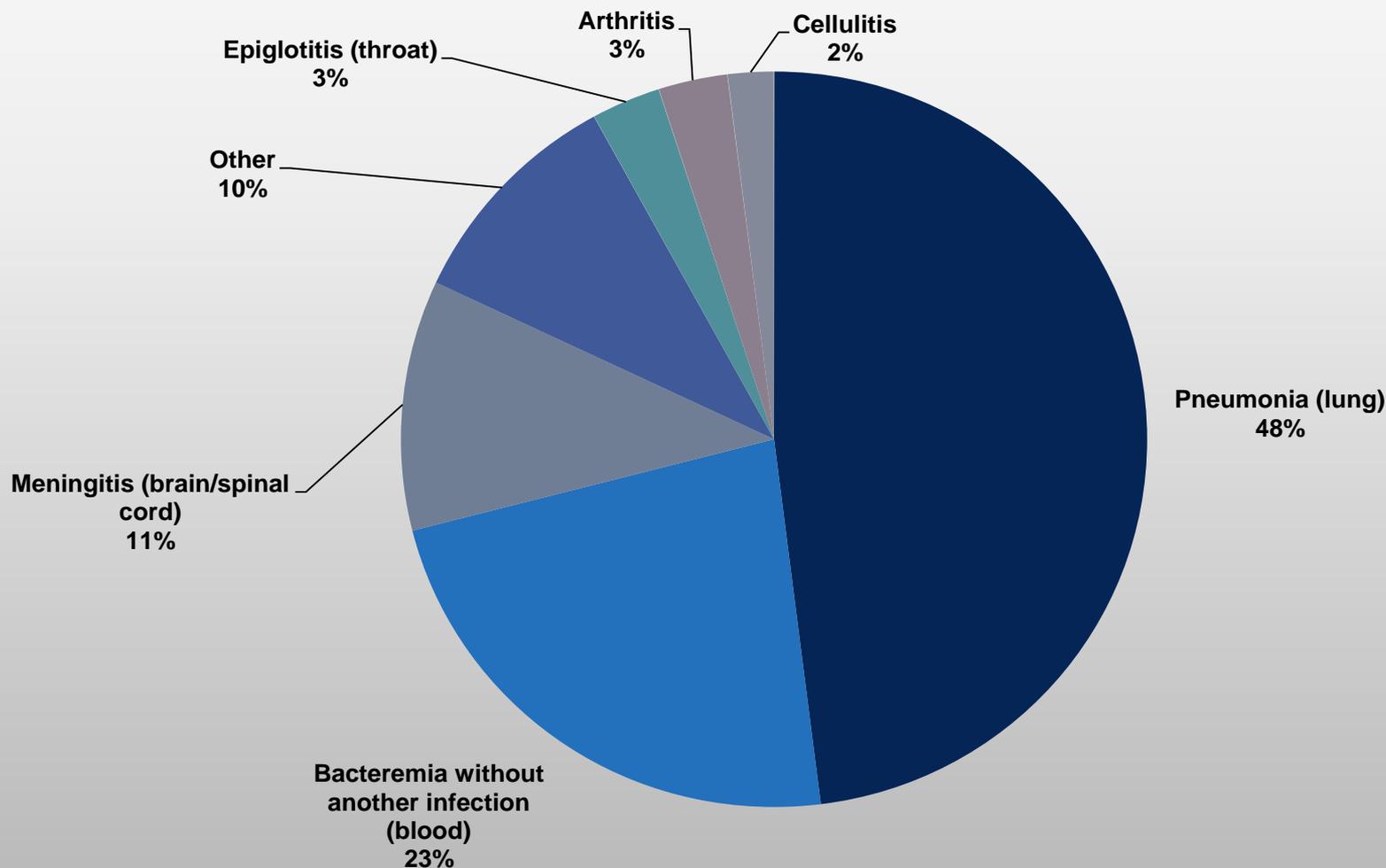
Incidence of Invasive *Haemophilus influenzae* Disease by Gender and Age Group, Minnesota, 2012

Characteristic	Cases (n=86)	Incidence per 100,000 persons
Gender		
Male	34	1.28
Female	52	1.93
Age Group		
Under 1 yr.	9	13.17
1-4 yrs.	5	1.76
5-9 yrs.	0	--
10-19 yrs.	0	--
20-29 yrs.	0	--
30-39 yrs.	1	0.15
40-49 yrs.	4	0.54
50-59 yrs.	11	1.43
60-69 yrs.	17	3.34
70+ yrs.	39	7.92

Invasive *Haemophilus influenzae* Disease Cases and Deaths by Age Group, Minnesota, 2012

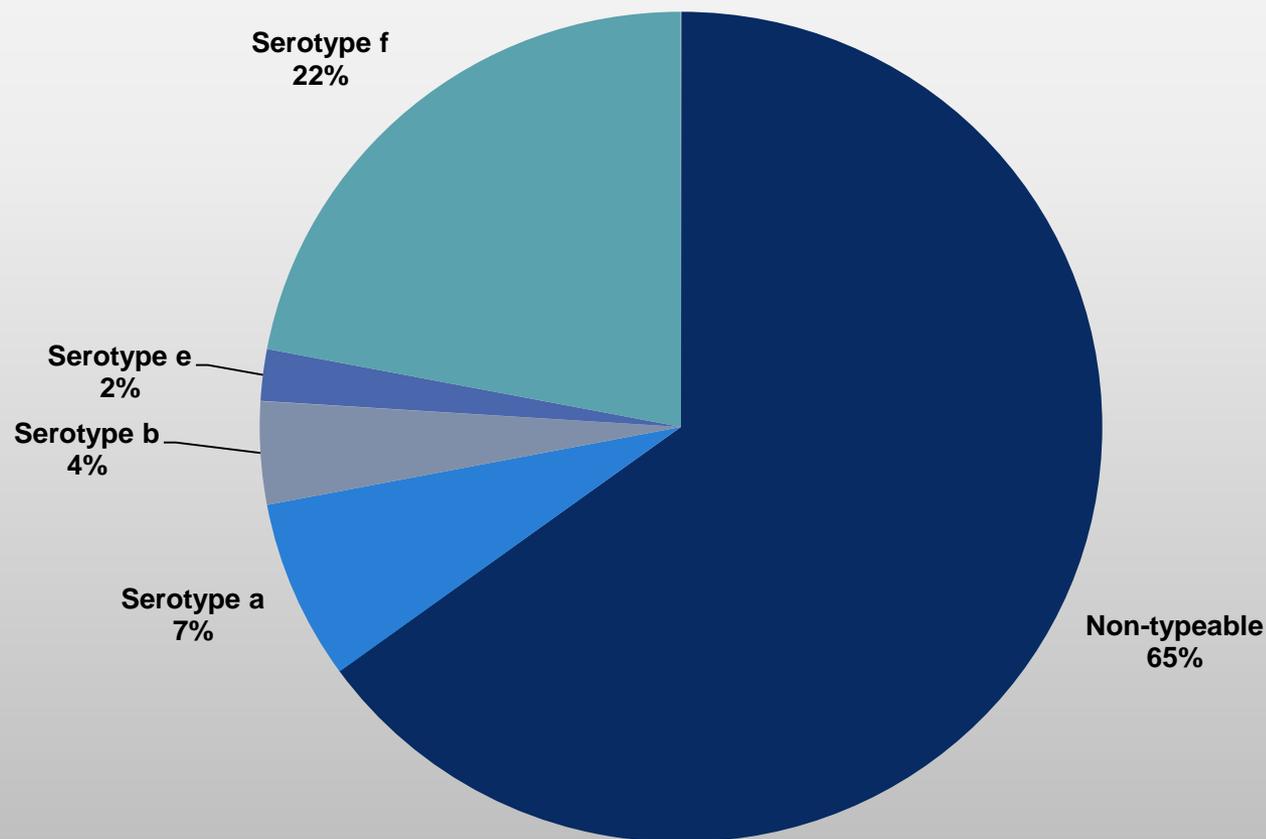
Age Group	Cases	Deaths	% Died
Under 1 yr.	9	0	0%
1-4 yrs.	5	0	0%
5-9 yrs.	0	0	0%
10-19 yrs.	0	0	0%
20-29 yrs.	0	0	0%
30-39 yrs.	1	0	0%
40-49 yrs.	4	0	0%
50-59 yrs.	11	1	9%
60-69 yrs.	17	2	12%
70+ yrs.	39	8	21%
Total	86	11	13%

Invasive *Haemophilus influenzae* Disease by Type of Infection/Syndrome, Minnesota 2012



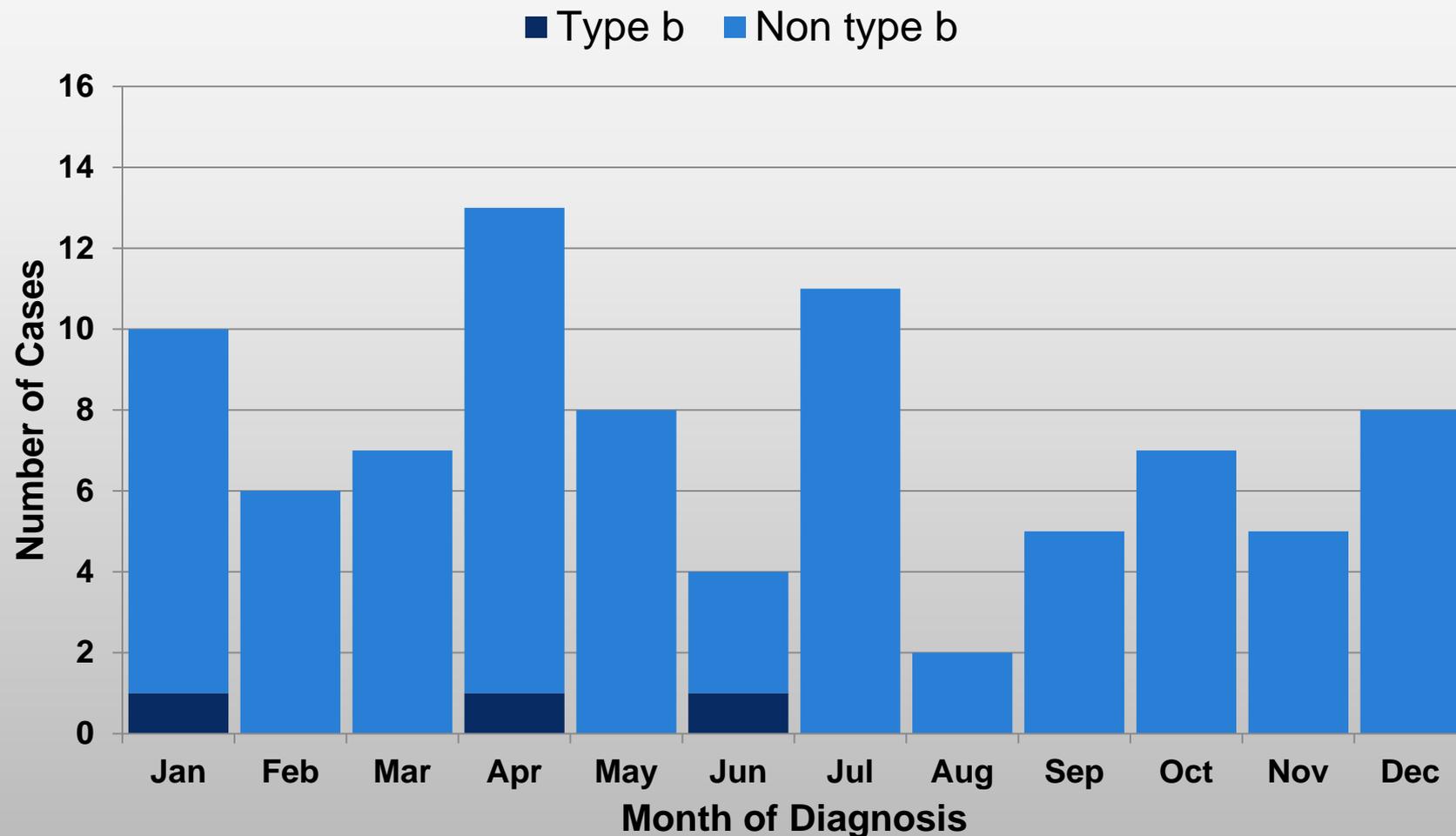
This graph represents 92 infections in 86 cases (some cases had > 1 infection).

Invasive *Haemophilus influenzae* Disease by Serotype, Minnesota 2012 (n=83*)

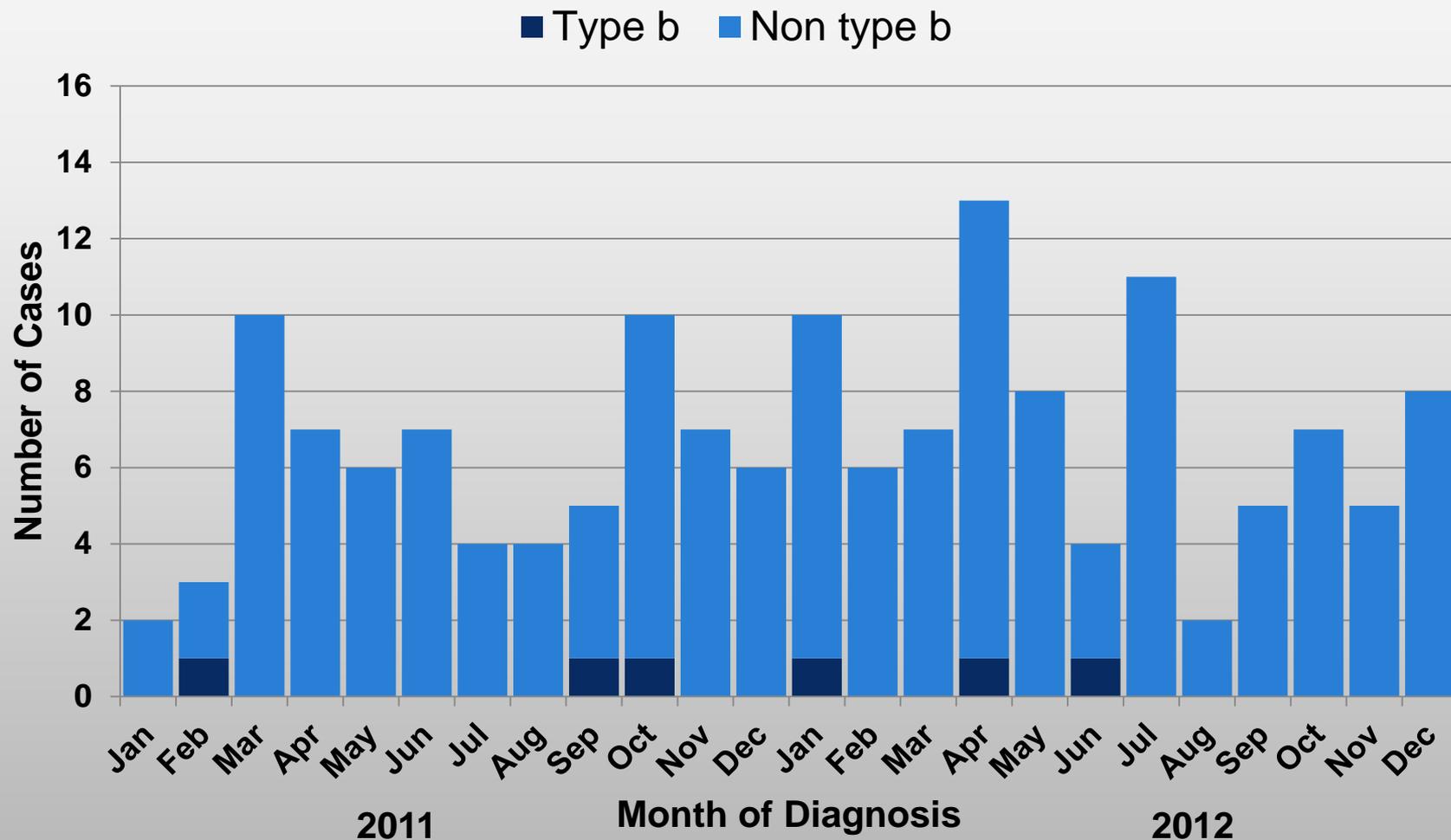


* 3 case isolates not available for serotyping

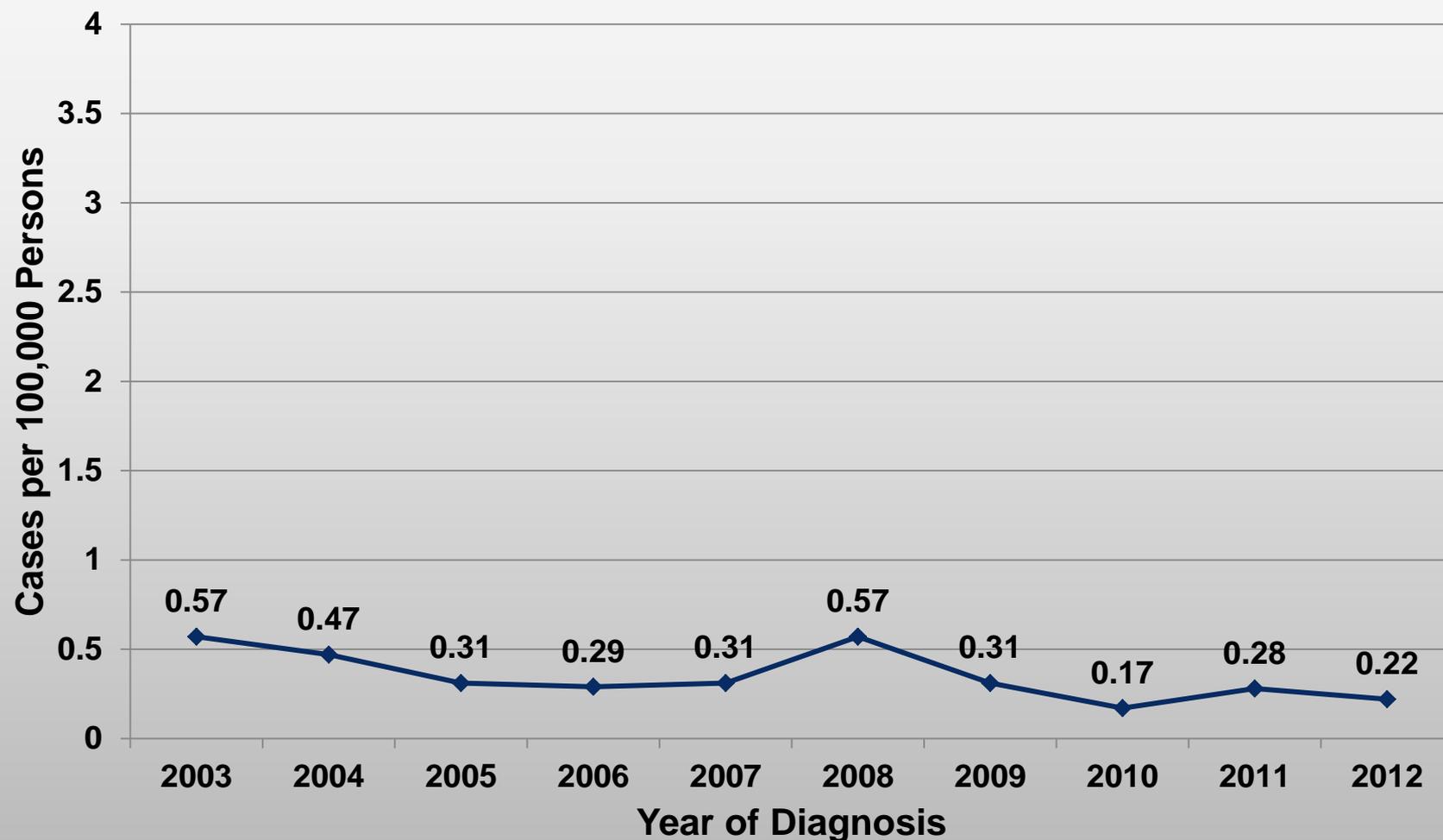
Cases of Invasive *Haemophilus influenzae* Disease by Month of Diagnosis, Serotype and Outcome, Minnesota, 2012



Cases of Invasive *Haemophilus influenzae* Disease by Month of Diagnosis and Serotype, Minnesota, 2011-2012



Incidence of Invasive *Neisseria meningitidis* Disease, Minnesota, 2003-2012



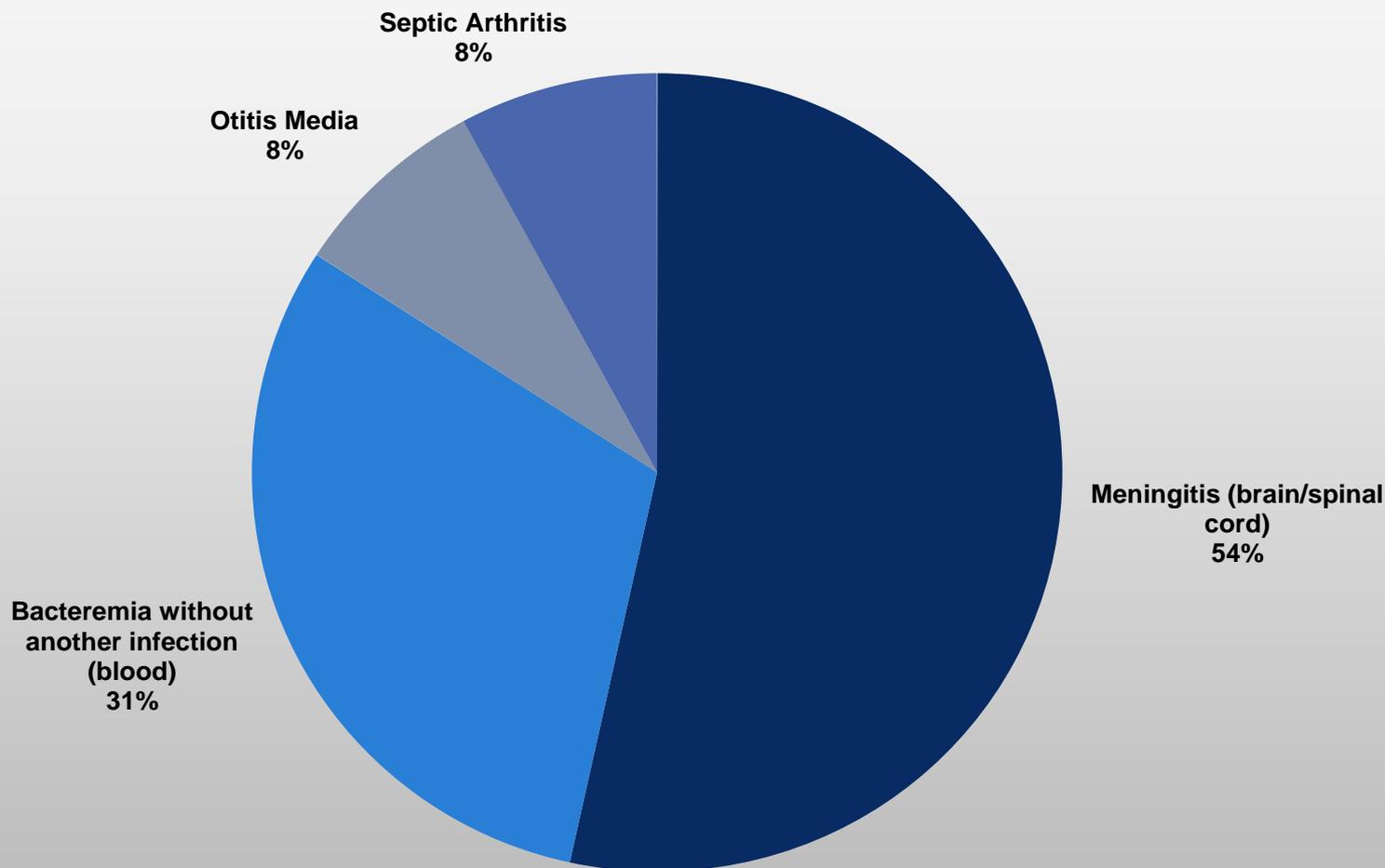
Incidence of Invasive *Neisseria meningitidis* Disease by Gender and Age Group, Minnesota, 2012

Characteristic	Cases (n=12)	Incidence per 100,000 persons
Gender		
Male	6	0.23
Female	6	0.22
Age Group		
Under 1 yr.	1	1.46
1-4 yrs.	2	0.70
5-9 yrs.	0	0
10-19 yrs.	1	0.14
20-29 yrs.	2	0.28
30-39 yrs.	0	0
40-49 yrs.	2	0.27
50-59 yrs.	1	0.13
60-69 yrs.	0	0
70+ yrs.	3	0.61

Invasive *Neisseria meningitidis* Disease Cases and Deaths by Age Group, Minnesota, 2012

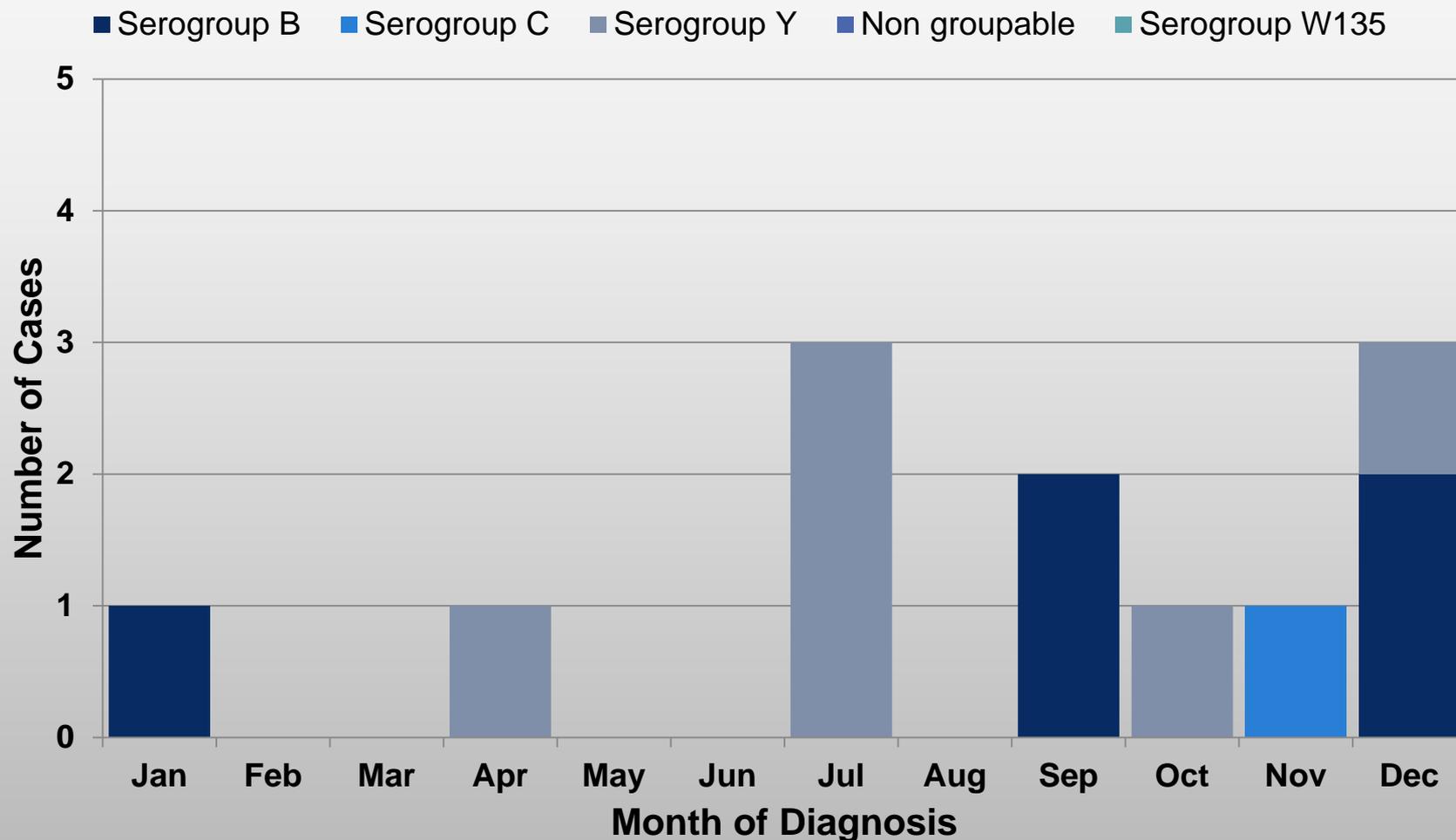
Age Group	Cases	Deaths	% Died
Under 1 yr.	1	0	0%
1-4 yrs.	2	0	0%
5-9 yrs.	0	0	--
10-19 yrs.	1	0	0%
20-29 yrs.	2	0	0%
30-39 yrs.	0	0	--
40-49 yrs.	2	0	0%
50-59 yrs.	1	1	100%
60-69 yrs.	0	0	--
70+ yrs.	3	0	0%
Total	12	1	8%

Invasive *Neisseria meningitidis* by Type of Infection/Syndrome, Minnesota 2012*

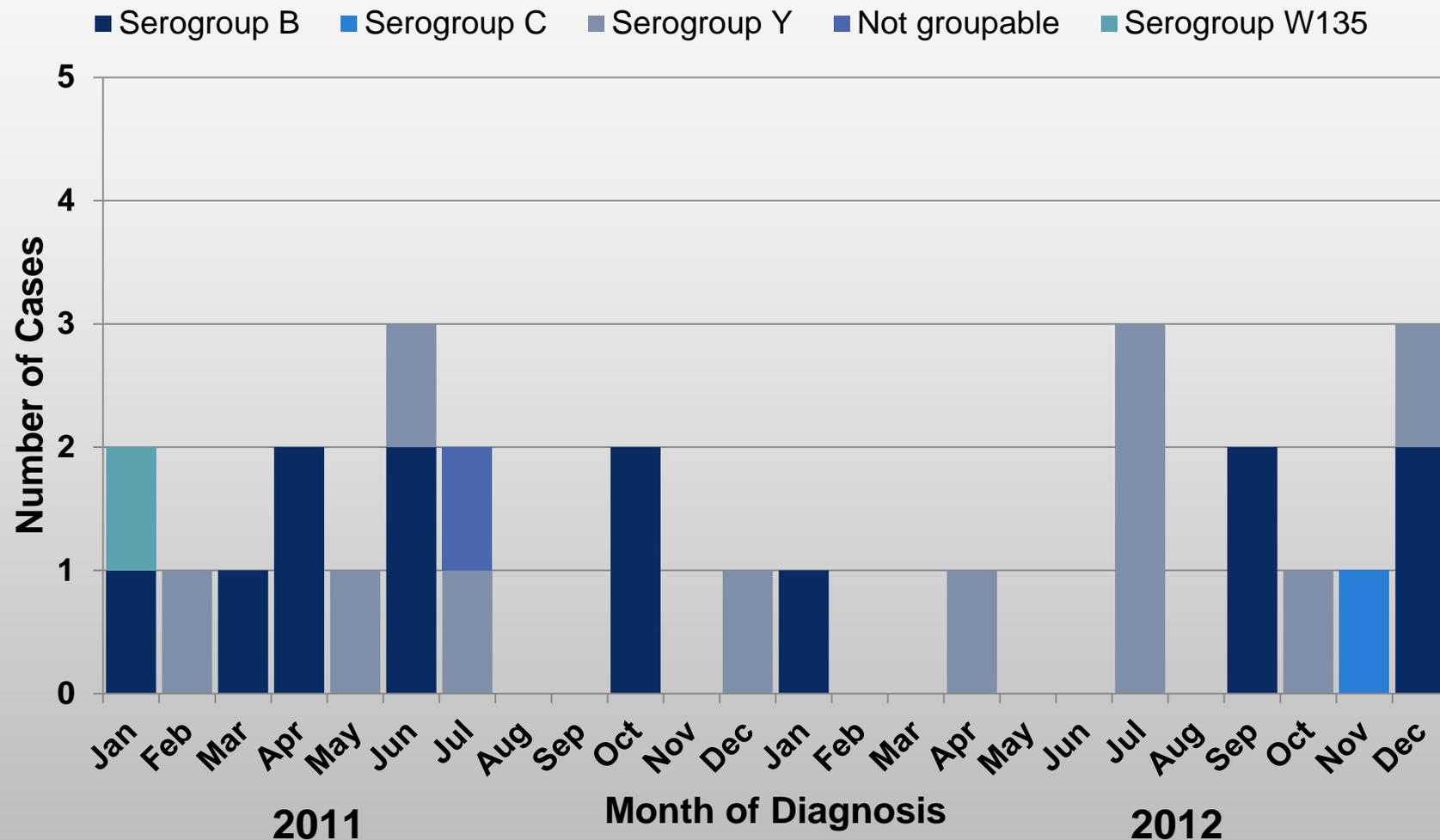


*This chart represents 13 infections among 12 cases (some cases has > 1 infection).

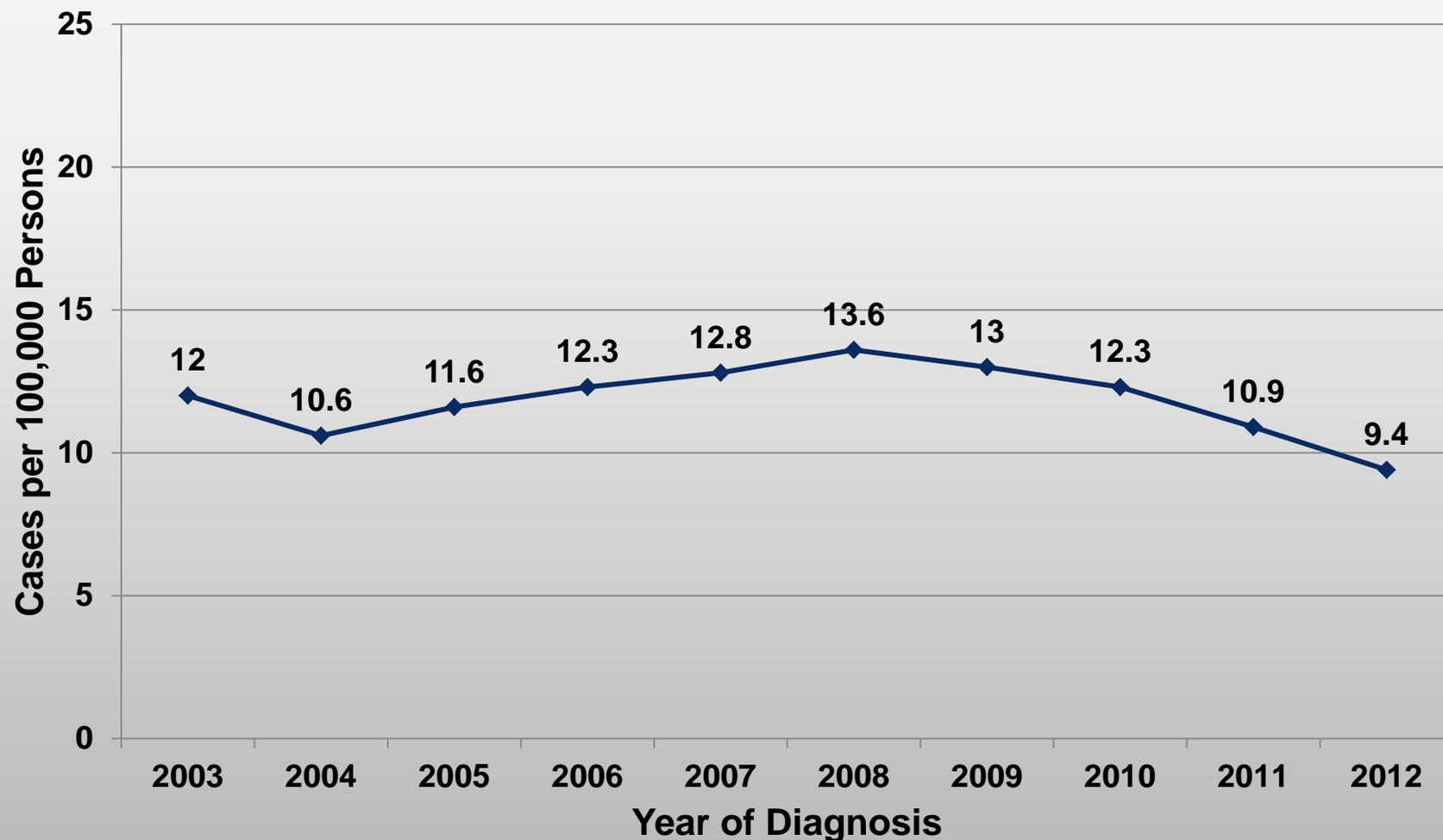
Cases of Invasive *Neisseria meningitidis* Disease by Month of Diagnosis and Serotype, Minnesota, 2012



Cases of Invasive *Neisseria meningitidis* Disease by Month of Diagnosis and Serotype, Minnesota, 2011-2012



Incidence of Invasive Pneumococcal Disease, Minnesota, 2003-2012



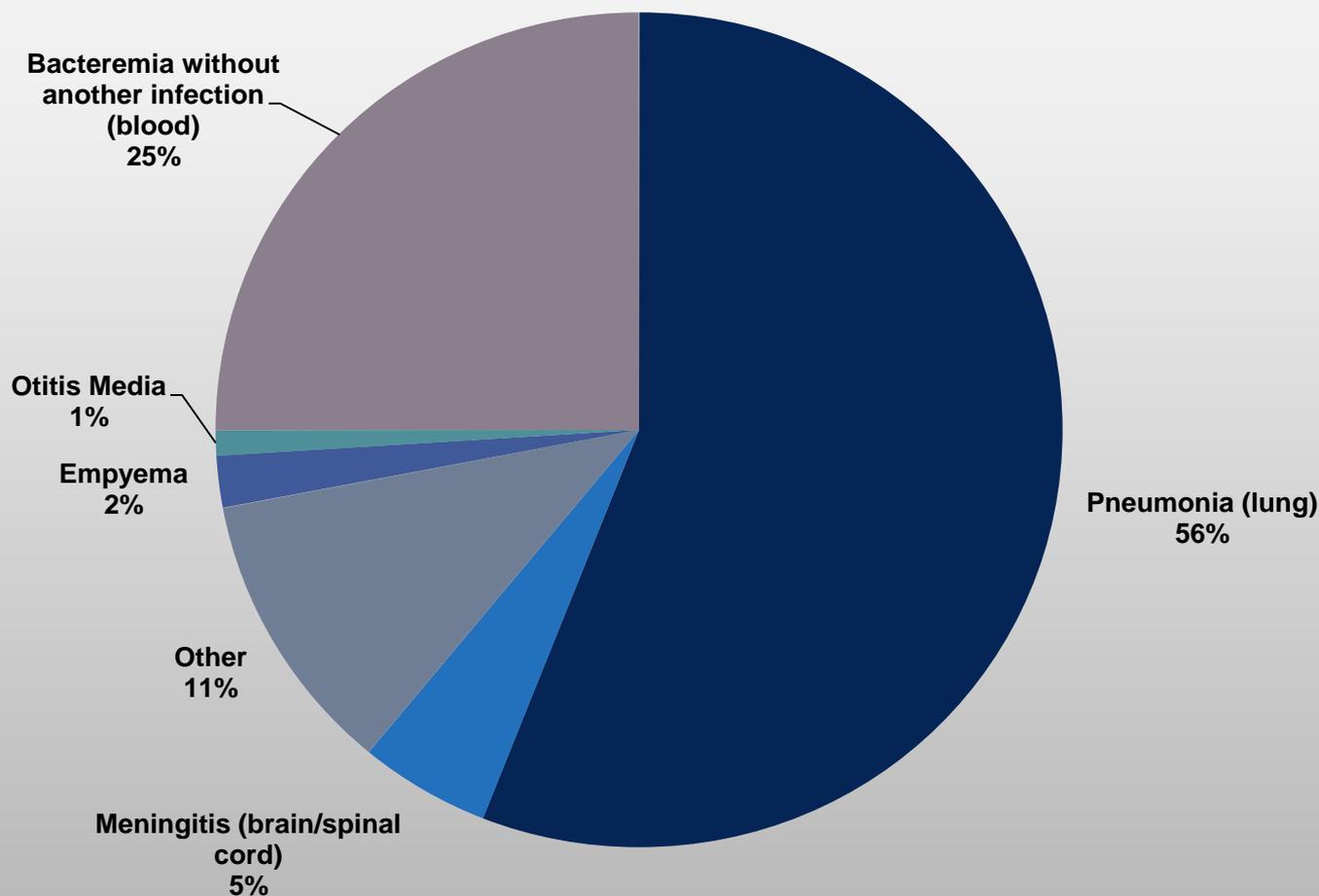
Incidence of Invasive Pneumococcal Disease by Gender and Age Group, Minnesota, 2012

Characteristic	Cases (n=503)	Incidence per 100,000 persons
Gender		
Male	256	9.6
Female	247	9.2
Age Group		
Under 1 yr.	14	20.5
1-4 yrs.	19	6.7
5-19 yrs.	16	1.5
20-29 yrs.	12	1.7
30-39 yrs.	23	3.4
40-49 yrs.	48	6.5
50-64 yrs.	168	15.7
65-79 yrs.	112	22.9
80+ yrs.	91	43.1

Invasive Pneumococcal Disease Cases and Deaths by Age Group, Minnesota, 2012

Age Group	Cases	Deaths	% Died
Under 1 yr.	14	0	0%
1-4 yrs.	19	0	0%
5-19 yrs.	16	0	0%
20-29 yrs.	12	0	0%
30-39 yrs.	23	0	0%
40-49 yrs.	48	1	2%
50-64 yrs.	168	17	10%
65-79 yrs.	112	10	9%
80+ yrs.	91	15	16%
Total	503	43	9%

Invasive Pneumococcal Disease by Type of Infection/Syndrome, Minnesota 2012*



*This chart represents 543 infections among 503 cases (some cases had > 1 infection).

Invasive Pneumococcal Isolates by Serotype Included in 13-Valent Conjugate Vaccine* by Age Group, Minnesota, 2012

Age Group	Isolates	# included in PCV-13	% included in PCV-13
Under 1 yr.	14	1	7%
1-4 yrs.	19	1	5%
5-19 yrs.	16	4	25%
20-29 yrs.	12	4	33%
30-39 yrs.	22	13	59%
40-49 yrs.	46	13	28%
50-64 yrs.	164	44	27%
65-79 yrs.	104	30	29%
80+ yrs.	86	19	22%
Total	483	129	27%

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

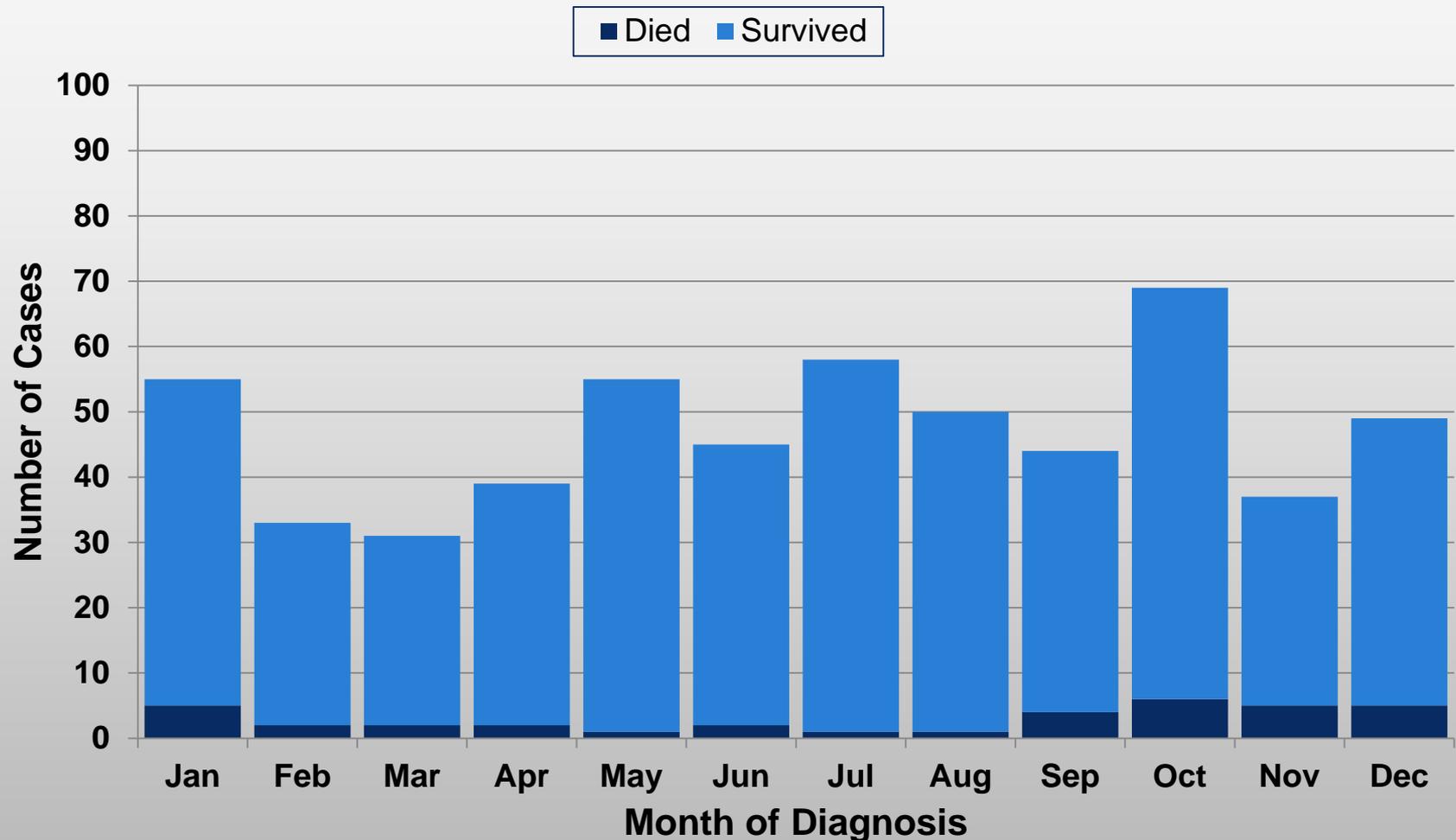
Invasive Pneumococcal Isolates by Resistance to Antimicrobial Agents, Minnesota, 2012 (n=478 viable isolates)

	Total Resistant Isolates	% Resistant Isolates
Penicillin resistance (R)*		
Meningitis breakpoints	95	20%
Non-meningitis breakpoints	7	2%
Resistance to drug classes**		
No resistance	281	59%
R to 1 drug class	114	24%
R to 2-3 drug classes	55	11%
R to 4-5 drug classes	28	6%

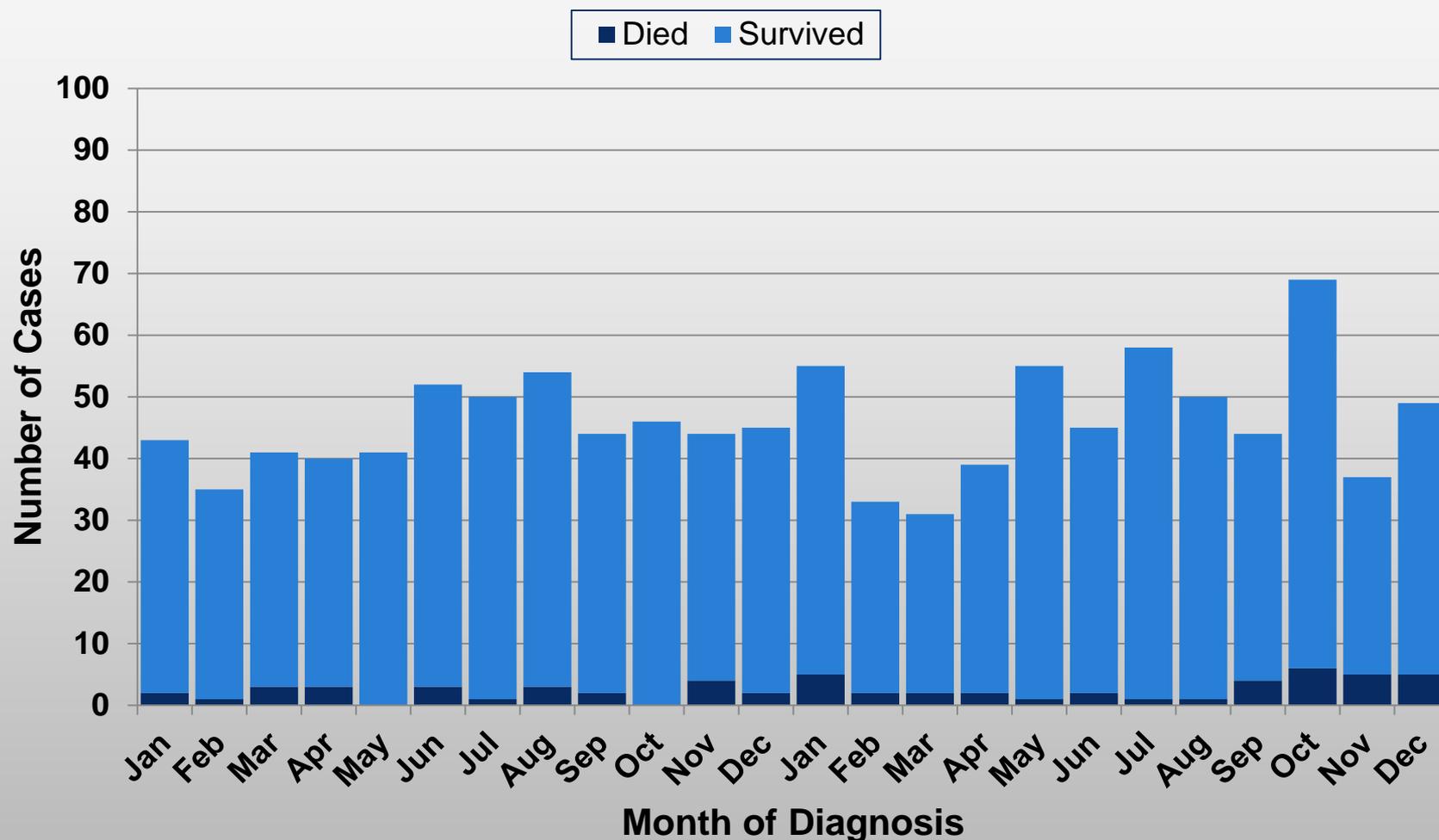
* Isolates with MIC \geq 0.12 μ g/ml are Penicillin-R for meningitis, \geq 8 μ g/ml for non-meningitis.

** 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, 2012



Cases of Invasive Pneumococcal Disease by Month of Diagnosis and Outcome, Minnesota, 2011-2012



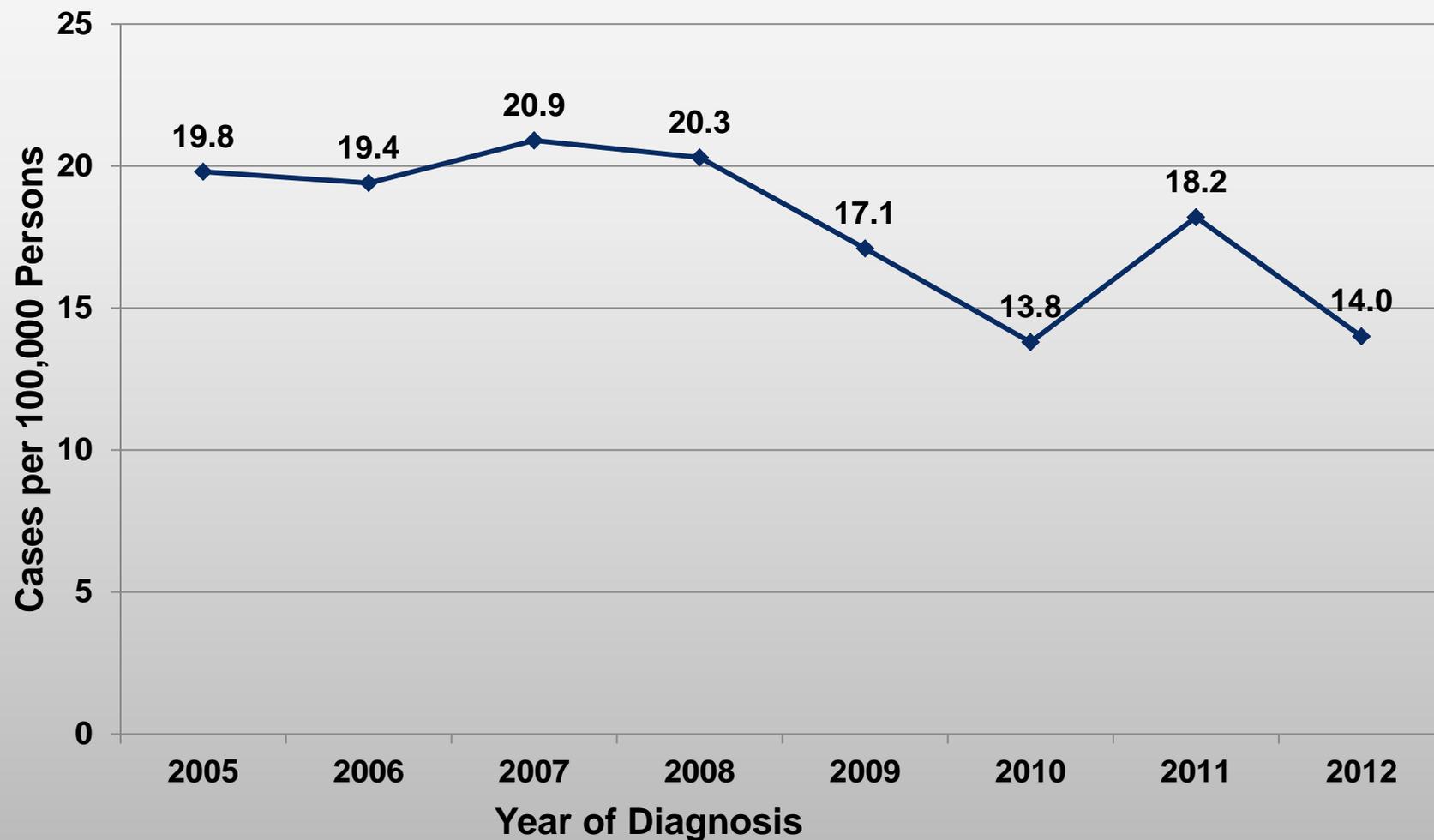
Invasive MRSA Surveillance Methods

- 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 42 million.

Incidence of Invasive MRSA Disease, Ramsey and Hennepin Counties, 2004-2012



* Data from years 2004-2007 includes Ramsey County only.

Incidence of Invasive MRSA Disease by Gender and Age Group, Ramsey and Hennepin Counties, Minnesota, 2012

Characteristic	Cases (n=233)	Incidence per 100,000 persons
Gender		
Male	147	18.0
Female	86	10.2
Age Group		
Under 1 yr.	3	13.0
1-4 yrs.	5	5.4
5-9 yrs.	2	1.9
10-19 yrs.	3	1.5
20-29 yrs.	11	4.2
30-39 yrs.	11	4.6
40-49 yrs.	31	13.2
50-59 yrs.	44	19.4
60-69 yrs.	53	39.5
70+ yrs.	70	49.4

Invasive MRSA Disease Cases and Deaths by Age Group, Ramsey and Hennepin Counties, Minnesota, 2012

Age Group	Cases	Deaths	% Died
Under 1 yr.	3	0	0%
1-4 yrs.	5	0	0%
5-9 yrs.	2	0	0%
10-19 yrs.	3	0	0%
20-29 yrs.	11	0	0%
30-39 yrs.	11	1	9%
40-49 yrs.	31	1	3%
50-59 yrs.	44	4	9%
60-69 yrs.	53	4	8%
70+ yrs.	70	14	20%
Total	233	24	10%

Incidence of Invasive MRSA Disease by Case Type, Ramsey and Hennepin Counties, Minnesota, 2012

Case Type	Cases	Incidence per 100,000 persons
Healthcare-associated	194	11.7
Community-associated	39	2.3

- 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.

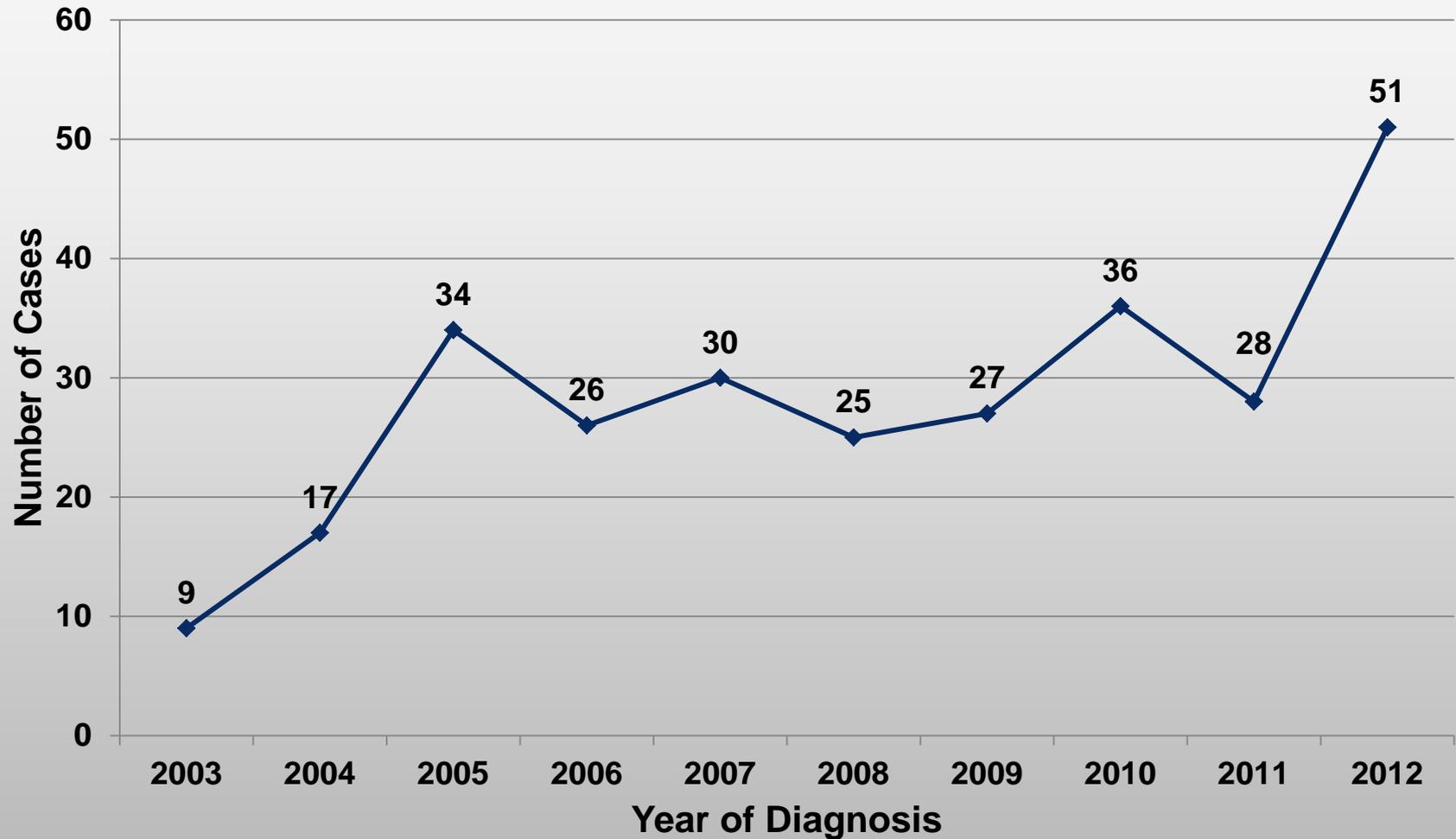
Invasive MRSA Disease by Type of Infection, Ramsey and Hennepin Counties, Minnesota, 2012

Type of Infection*	Cases
Bacteremia (blood)	152
Without another source of infection	63
With another source of infection	89
Pneumonia (lung)	25
Osteomyelitis (bone)	35
Cellulitis/skin abscess (skin)	16
Endocarditis (heart)	10
More than one infection type	120
Other infection**	141

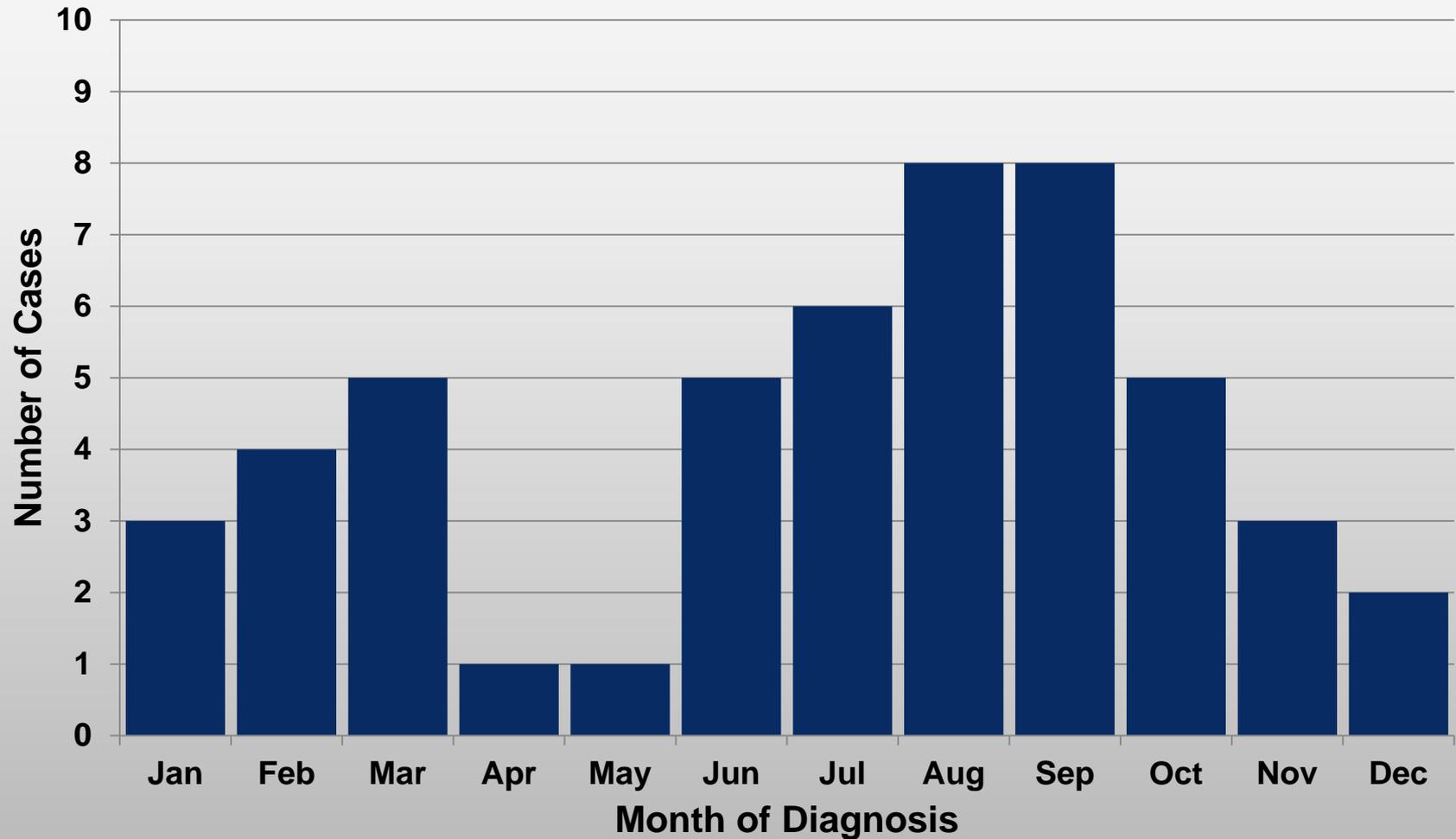
* Cases may have had more than 1 type of infections

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

Confirmed Legionnaires' Disease Cases Minnesota, 2003-2012



Confirmed Legionnaires' Disease by Month of Diagnosis, Minnesota, 2012



Confirmed Legionnaires' Disease Cases by Age Group and Gender, Minnesota, 2012

Age Group	Male	Female	Total
18-29 yrs.	0	0	0
30-39 yrs.	1	1	2
40-49 yrs.	2	3	5
50-59 yrs.	9	3	12
60-69 yrs.	7	9	16
70+ yrs.	13	3	16
Total	32 (63%)	19 (37%)	51

Possible Exposures Among Confirmed Legionnaires' Disease Cases, Minnesota 2012

