

Invasive Bacterial Disease Surveillance Report 2009

**Emerging Infections Program
Minnesota Department of Health**



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).

All hospitals and reference laboratories serving Minnesotans are contacted routinely to identify cases.

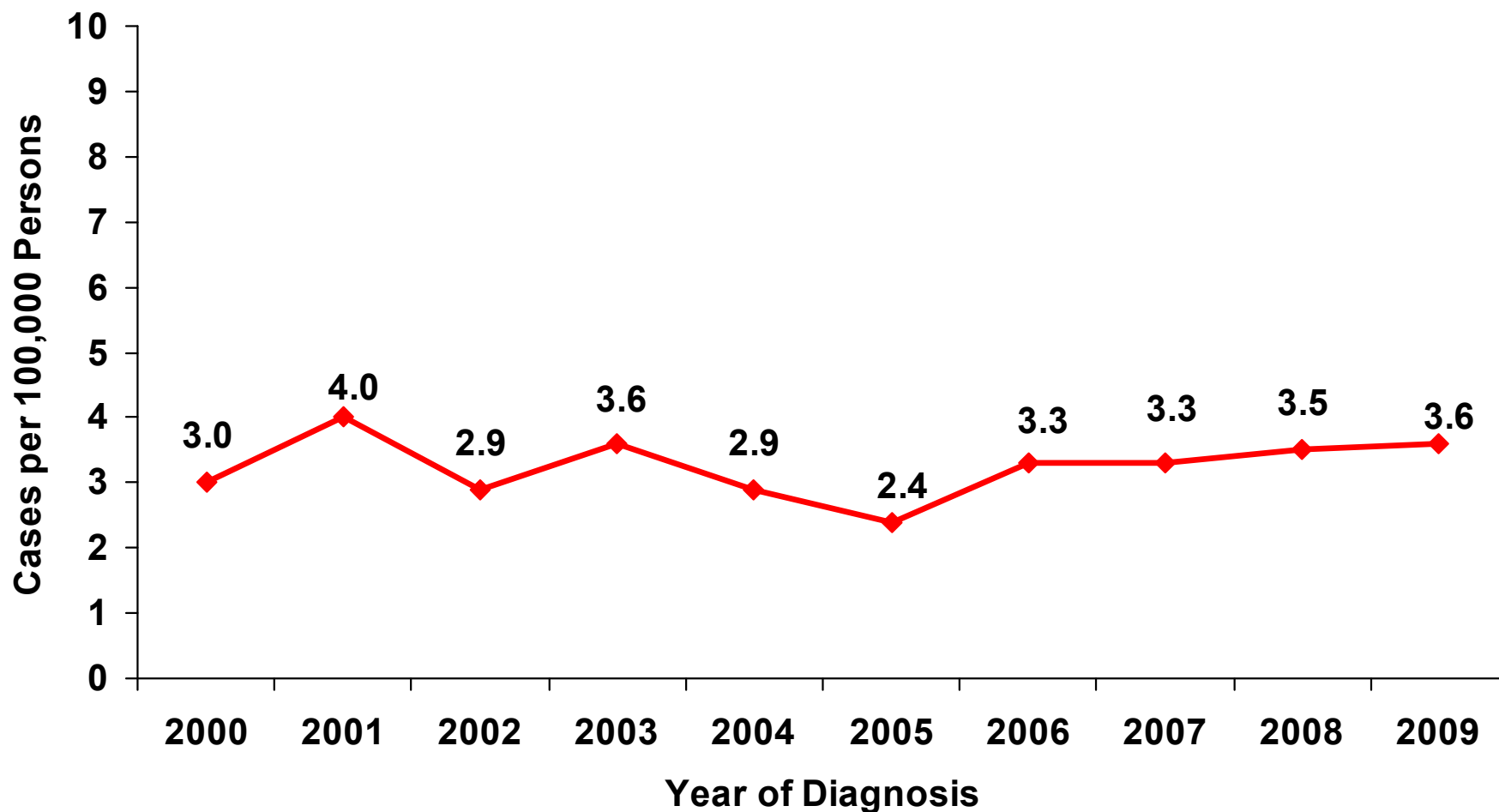
Surveillance Methods (cont.)

Species confirmation, antibiotic resistance and other testing is performed by the MDH Public Health Laboratory.

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 Group A Streptococcal Disease, Minnesota, 2000-2009



Incidence of Invasive Group A Streptococcal Disease by Gender and Age Group, Minnesota, 2009

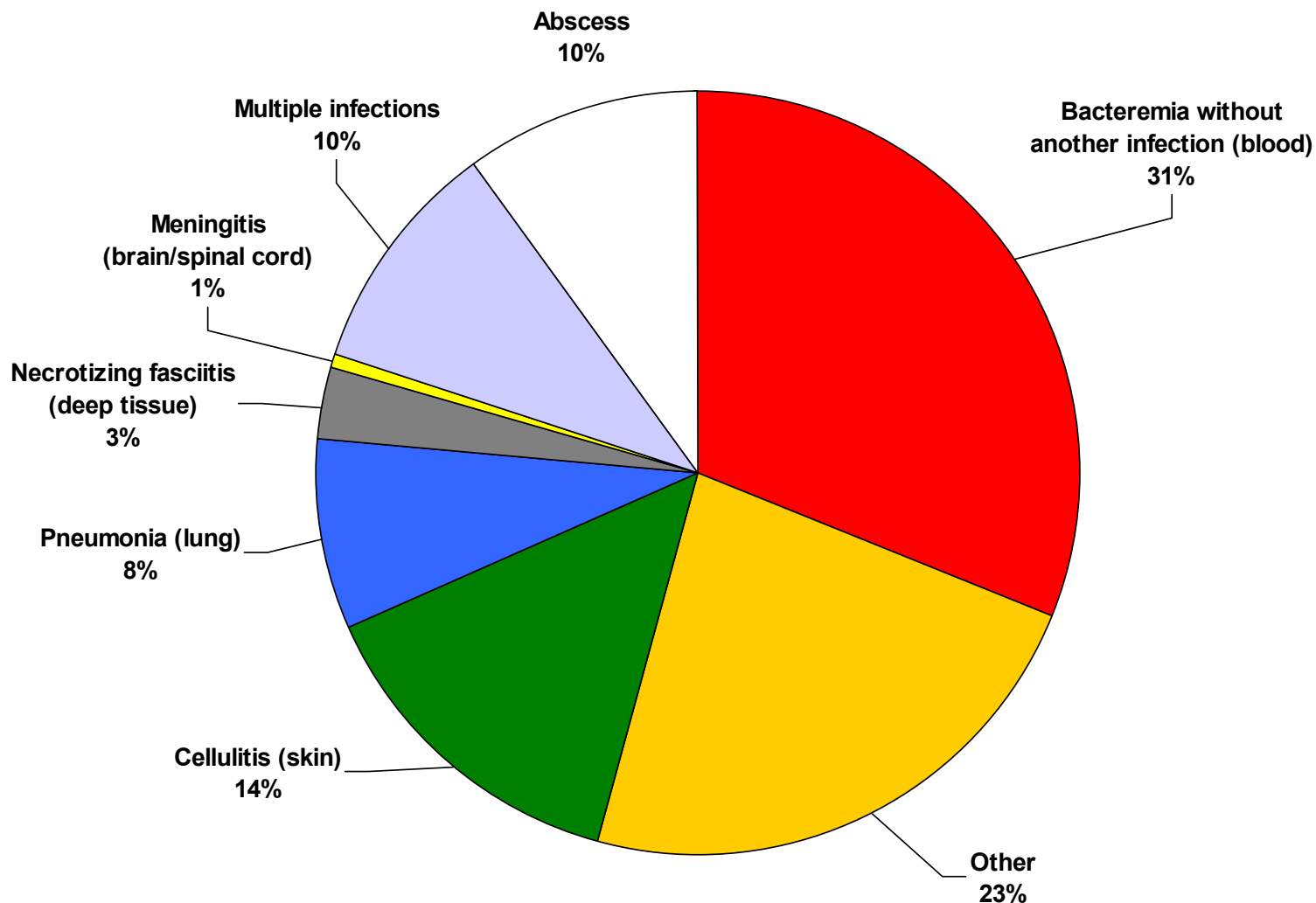
<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 Persons</u>
Gender		
Male	111	4.3
Female	78	3.0
Age Group		
Under 1 yr.	6	8.2
1-4 yrs.	13	4.6
5-9 yrs.	11	3.3
10-19 yrs.	10	1.4
20-29 yrs.	15	2.1
30-39 yrs.	22	3.3
40-49 yrs.	17	2.1
50-59 yrs.	31	4.3
60-69 yrs.	24	5.5
70+ yrs.	40	8.7



Invasive Group A Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2009

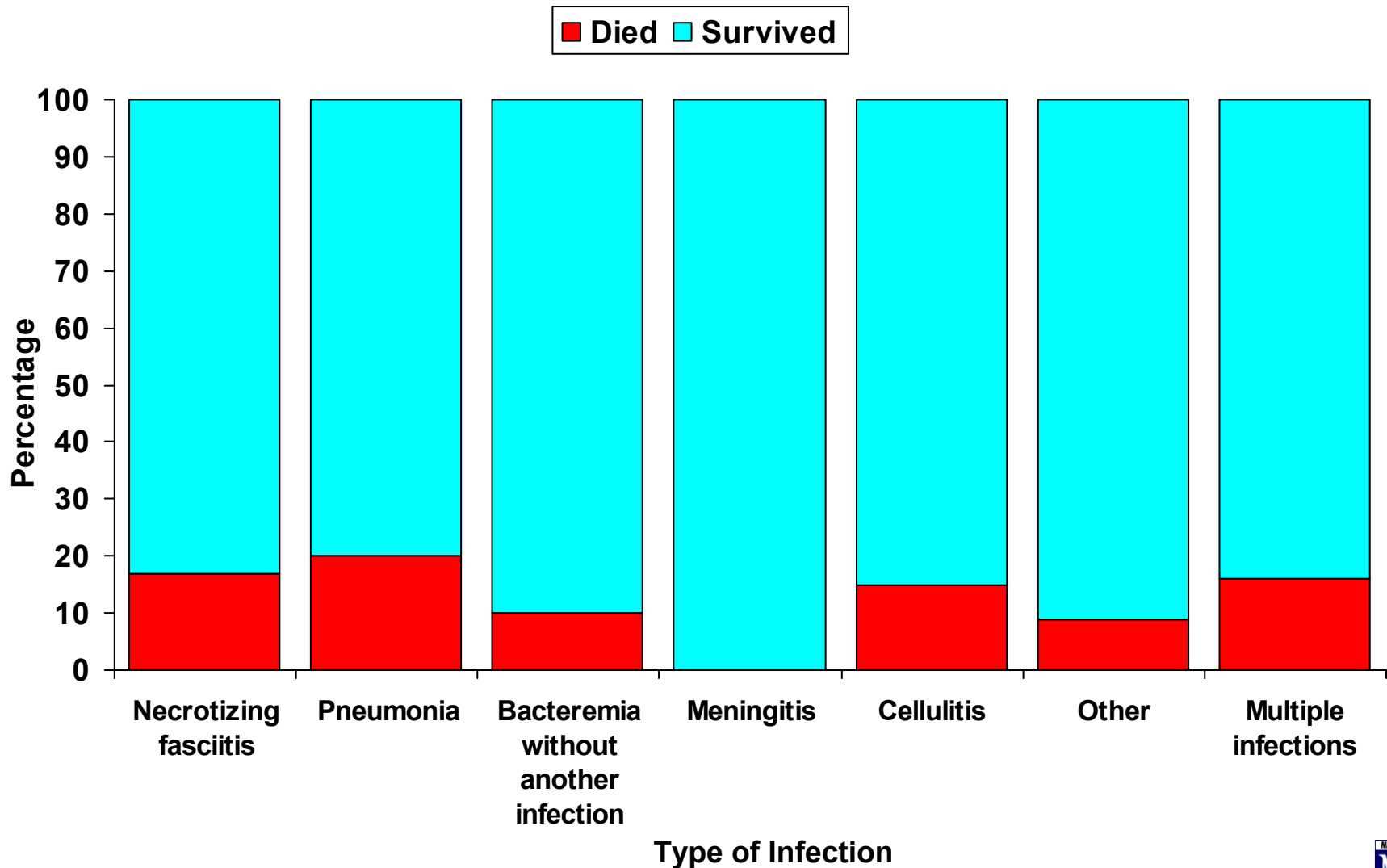
<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	6	1	17%
1-4 yrs.	13	0	0%
5-9 yrs.	11	0	0%
10-19 yrs.	10	0	0%
20-29 yrs.	15	1	7%
30-39 yrs.	22	2	9%
40-49 yrs.	17	1	6%
50-59 yrs.	31	3	10%
60-69 yrs.	24	3	13%
70+ yrs.	40	10	25%
<u>Total</u>	<u>189</u>	<u>21</u>	<u>11%</u>

Invasive Group A Streptococcal Disease by Type of Infection, Minnesota, 2009

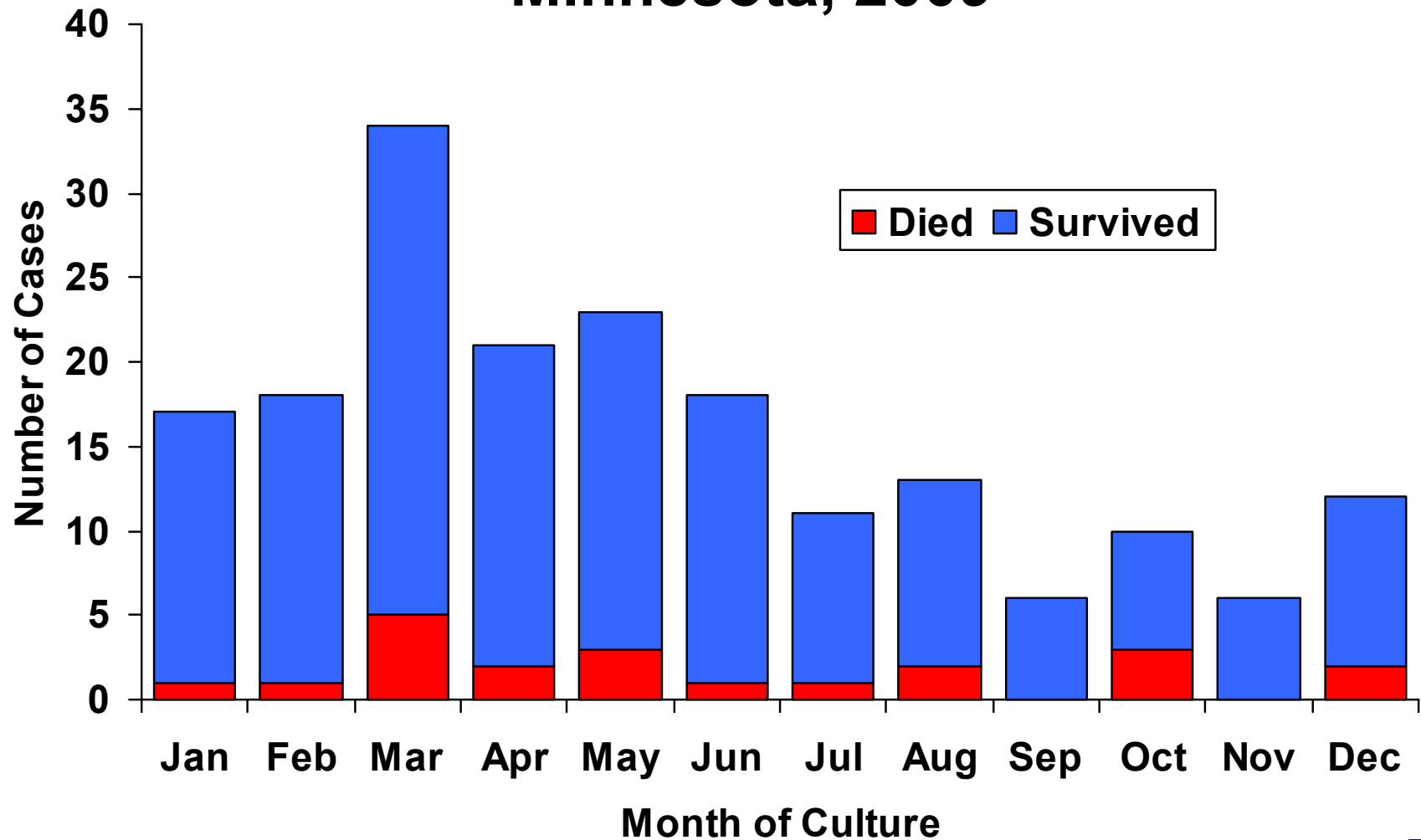




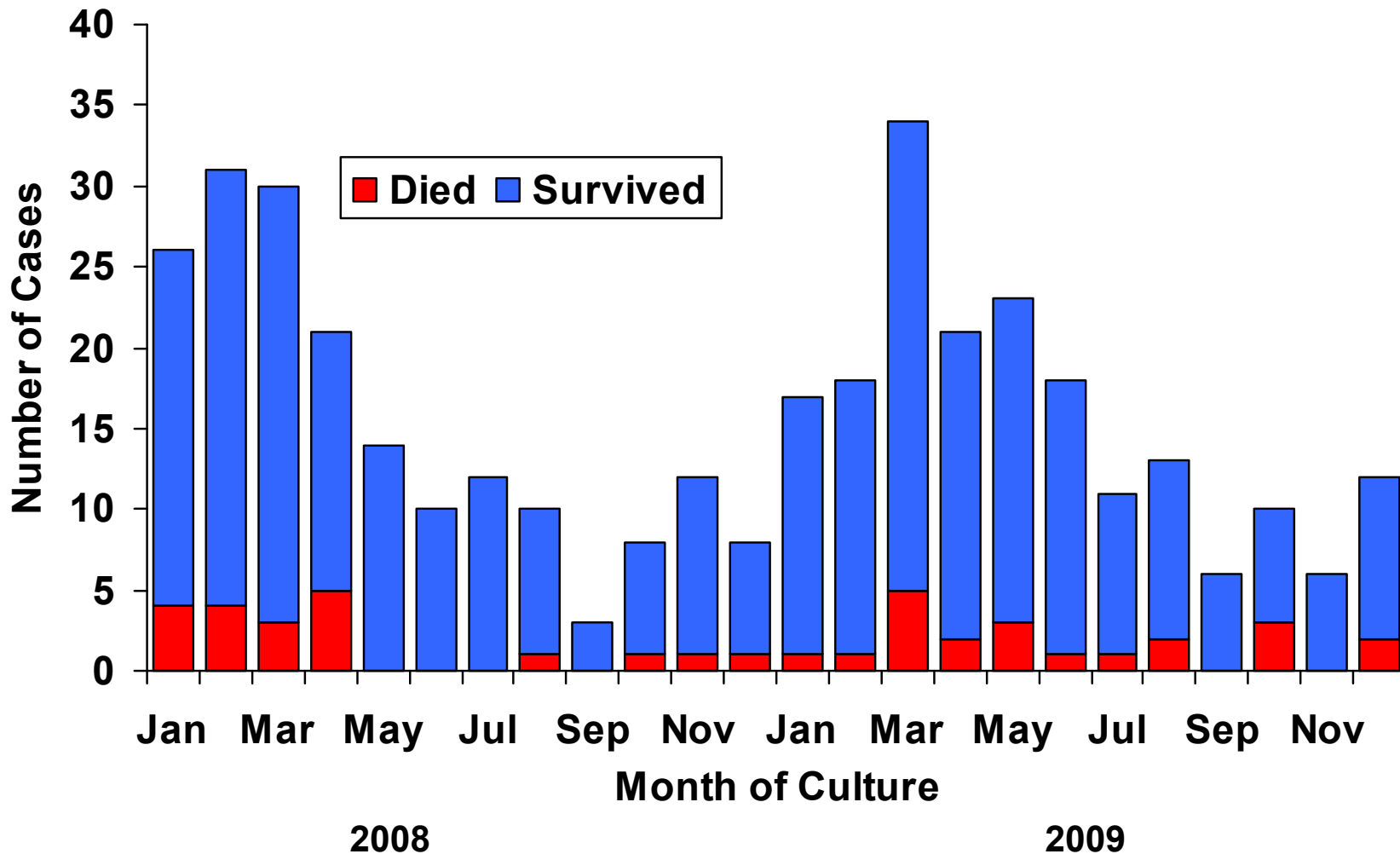
Outcome of Invasive Group A Streptococcal Disease Cases by Type of Infection, Minnesota, 2009



Cases of Invasive Group A Streptococcal Disease by Month of Culture and Outcome Minnesota, 2009

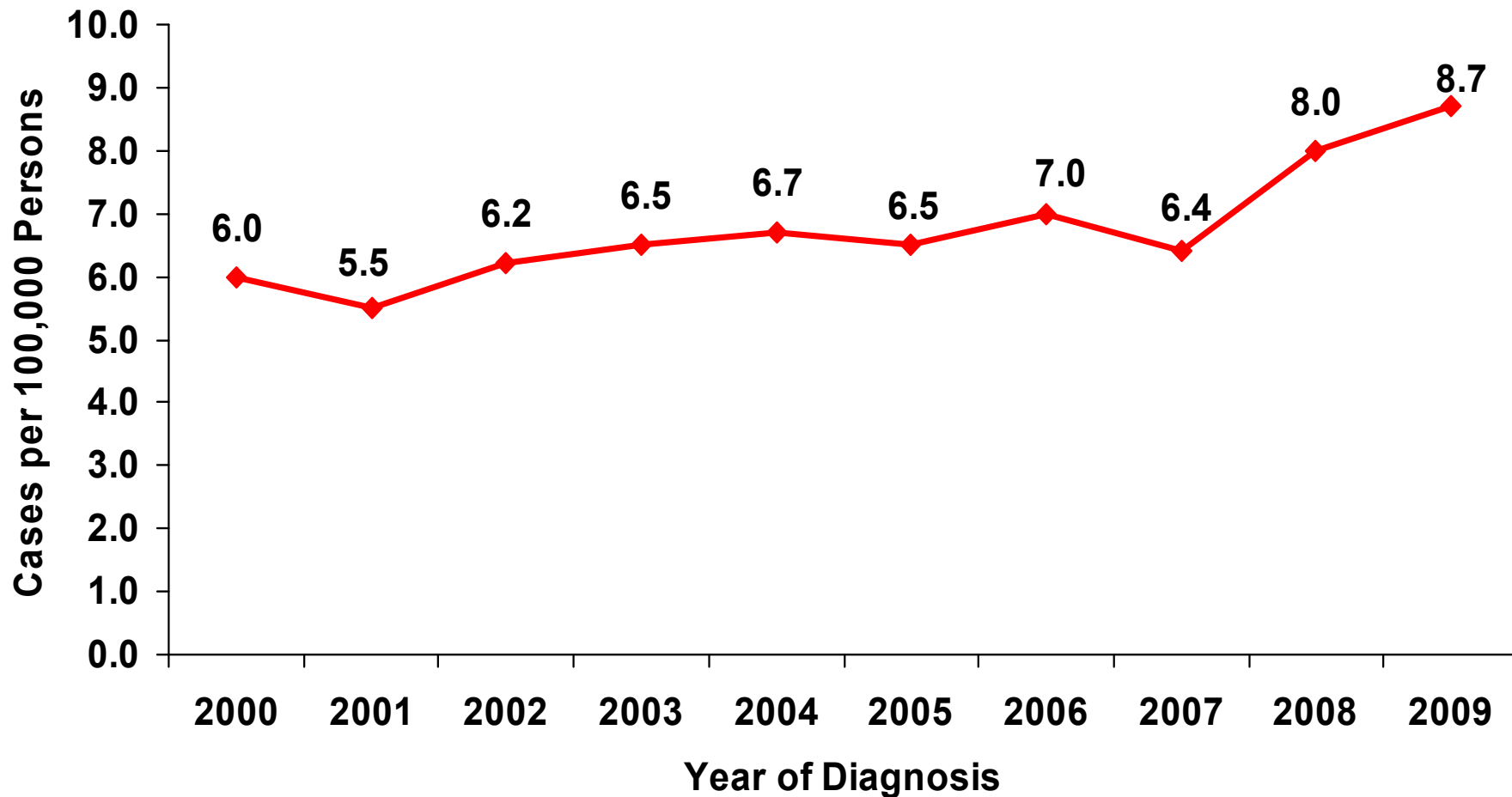


Cases of Invasive Group A Streptococcal Disease by Month of Culture and Outcome Minnesota, 2008 – 2009





Incidence of Invasive Group B Streptococcal Disease Minnesota, 2000-2009





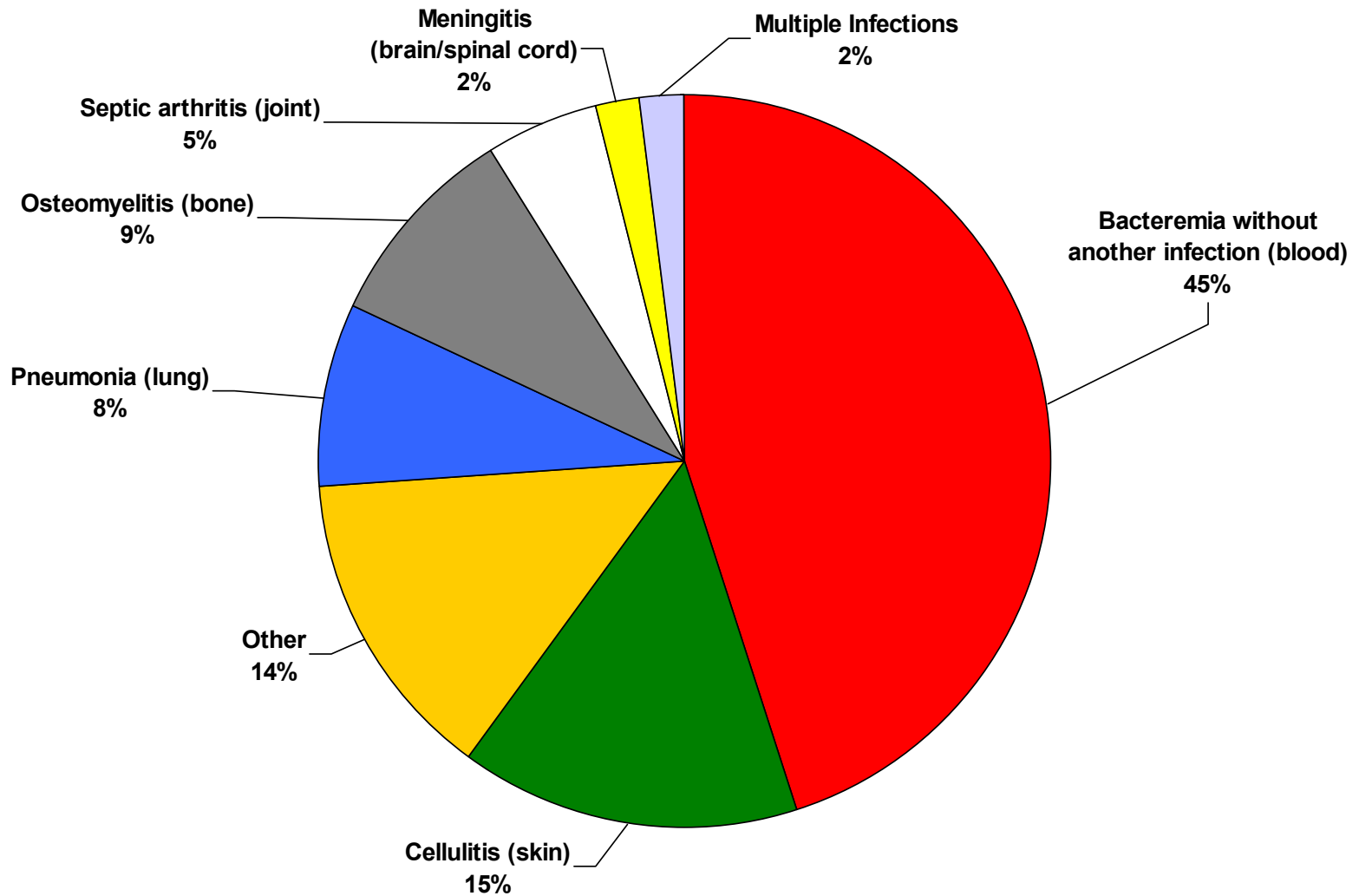
Incidence of Invasive Group B Streptococcal Disease by Gender and Age Group, Minnesota, 2009

<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 persons</u>
Gender		
Male	240	9.3
Female	214	8.2
Age Group		
Under 1 yr.	39	53.0
1-4 yrs.	0	0
5-9 yrs.	0	0
10-19 yrs.	2	0.3
20-29 yrs.	16	2.2
30-39 yrs.	23	3.4
40-49 yrs.	37	4.6
50-59 yrs.	79	11.0
60-69 yrs.	102	23.2
70+ yrs.	156	33.7

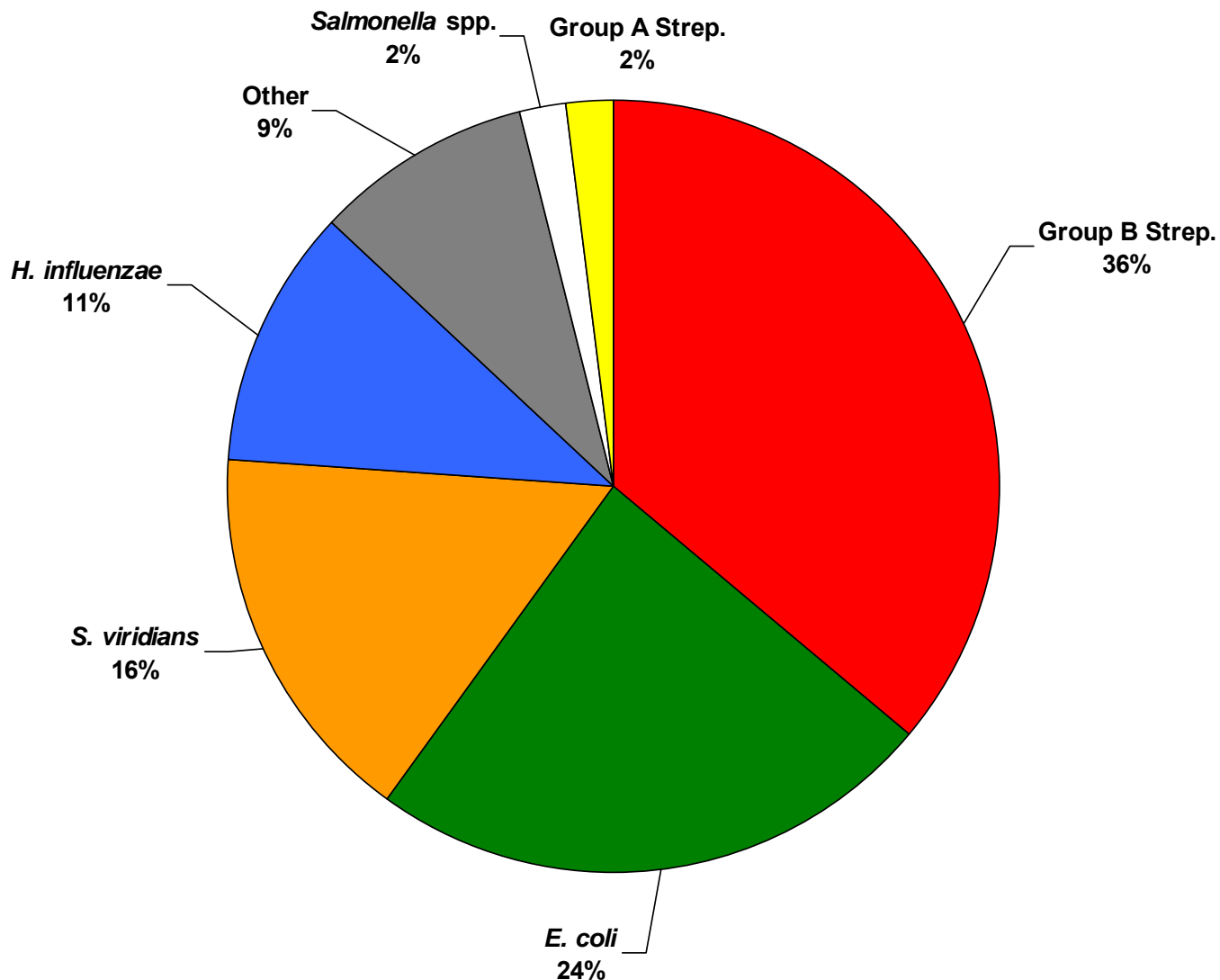
Invasive Group B Streptococcal Disease Cases and Deaths by Age Group, Minnesota, 2009

<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	39	1	3%
1-4 yrs.	0	0	--
5-9 yrs.	0	0	--
10-19 yrs.	2	0	0%
20-29 yrs.	16	0	0%
30-39 yrs.	23	1	4%
40-49 yrs.	37	0	0%
50-59 yrs.	79	1	1%
60-69 yrs.	102	6	6%
70+ yrs.	156	16	10%
<u>Total</u>	<u>454</u>	<u>25</u>	<u>6%</u>

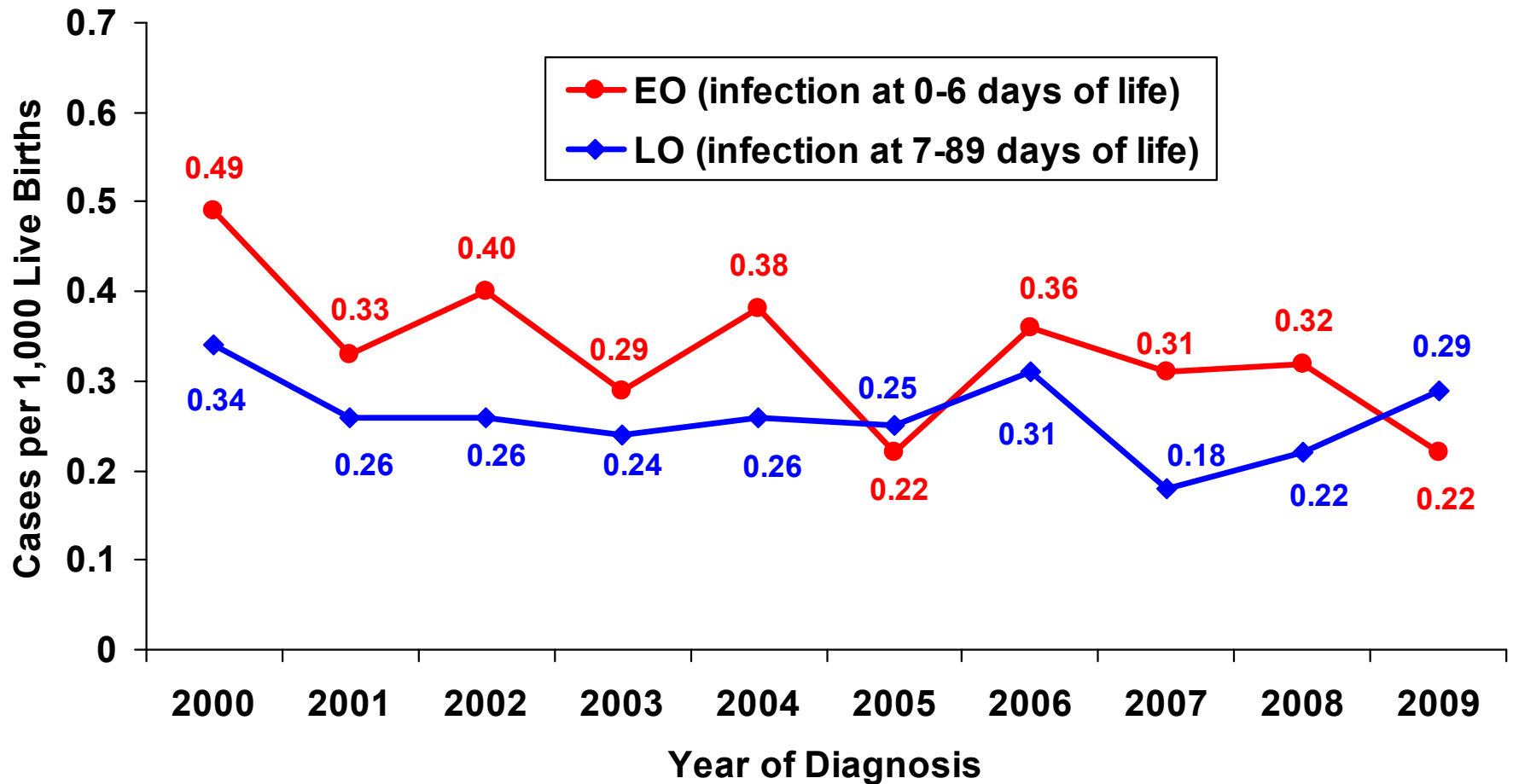
Invasive Group B Streptococcal Disease by Type of Infection, Minnesota, 2009



Neonatal Sepsis-Invasive Disease in First Six Days of Life by Pathogen, Minnesota, 2009



Incidence of Invasive Early and Late Onset Group B Streptococcal Disease, Minnesota, 2000-2009



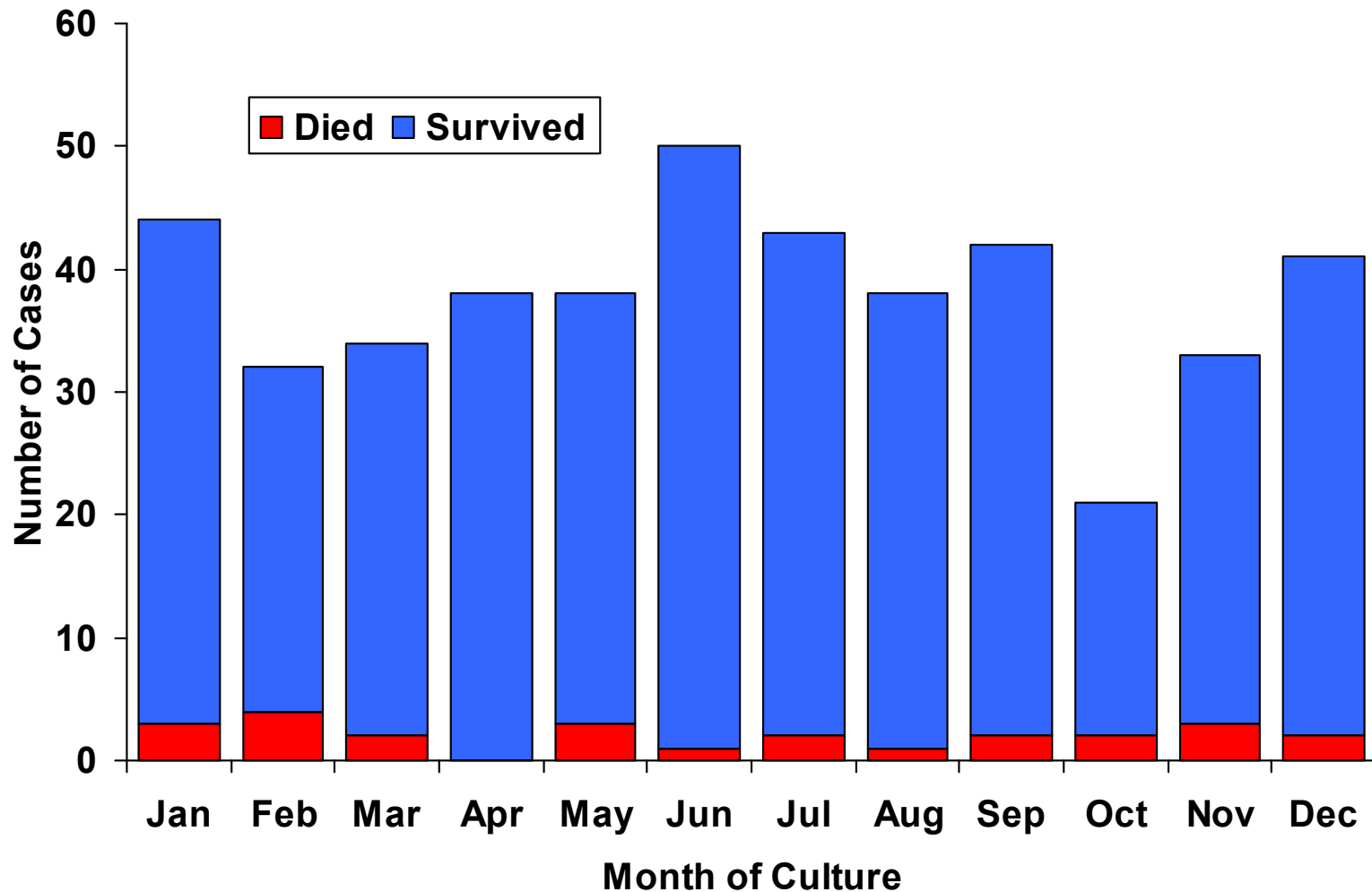


Early Onset* Group B Streptococcal Disease by Race, Gestational Age and Survival, Minnesota, 2009

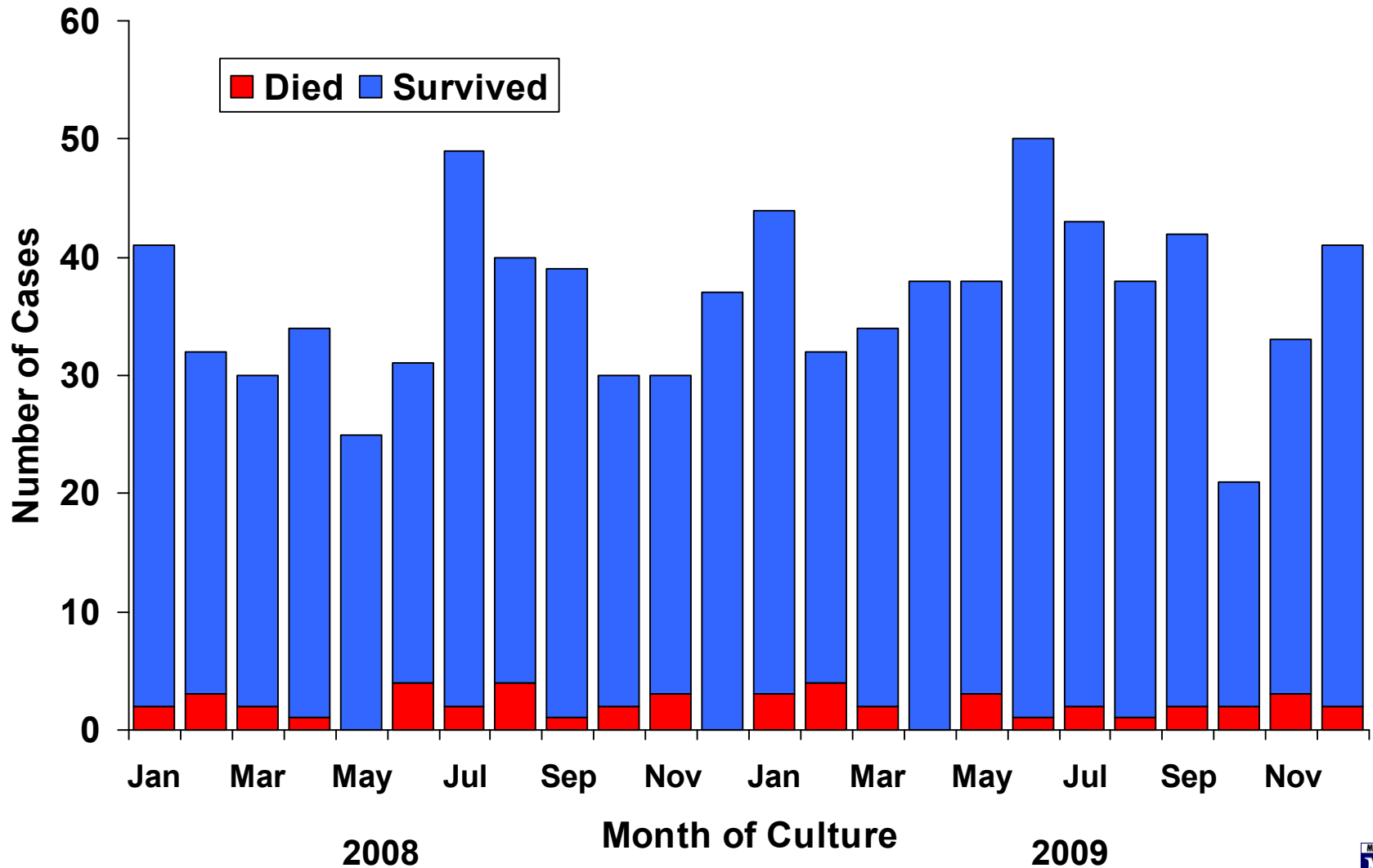
<u>Characteristic</u>	<u>Number</u>	<u>Percent</u>
Race		
White	11	69%
Black	2	12%
Other	3	19%
Gestational Age		
Under 32 weeks	3	19%
32-37 weeks	5	31%
Full term	8	50%
Outcome		
Died	0	--
Survived	16	100%
Total Cases	16	

* Onset 0-6 Days of Life

Cases of Invasive Group B Streptococcal Disease by Month of Culture and Outcome, Minnesota, 2009

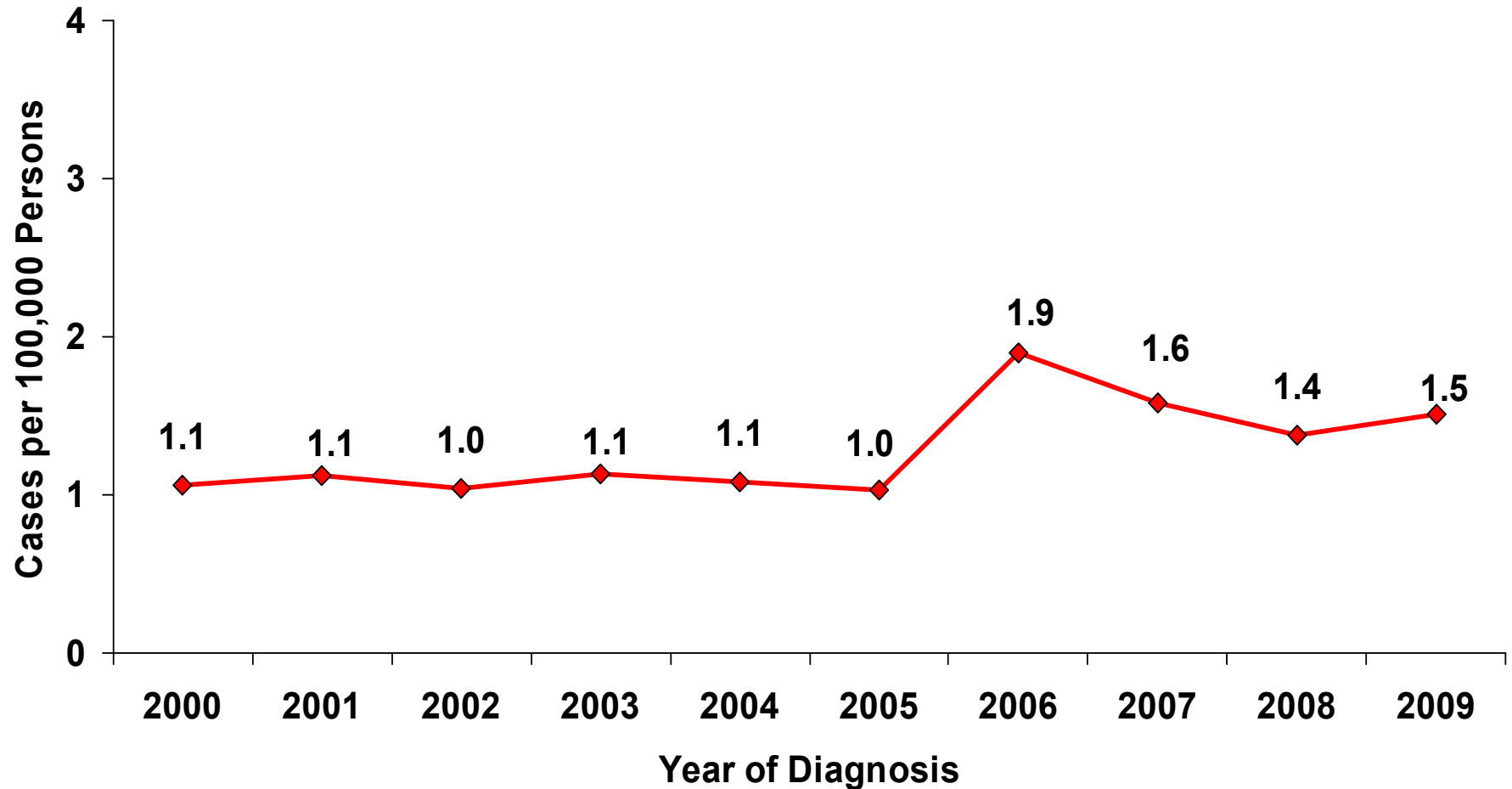


Cases of Invasive Group B Streptococcal Disease by Month of Culture and Outcome, Minnesota, 2008 – 2009





Incidence of Invasive *Haemophilus influenzae* Disease, Minnesota, 2000-2009



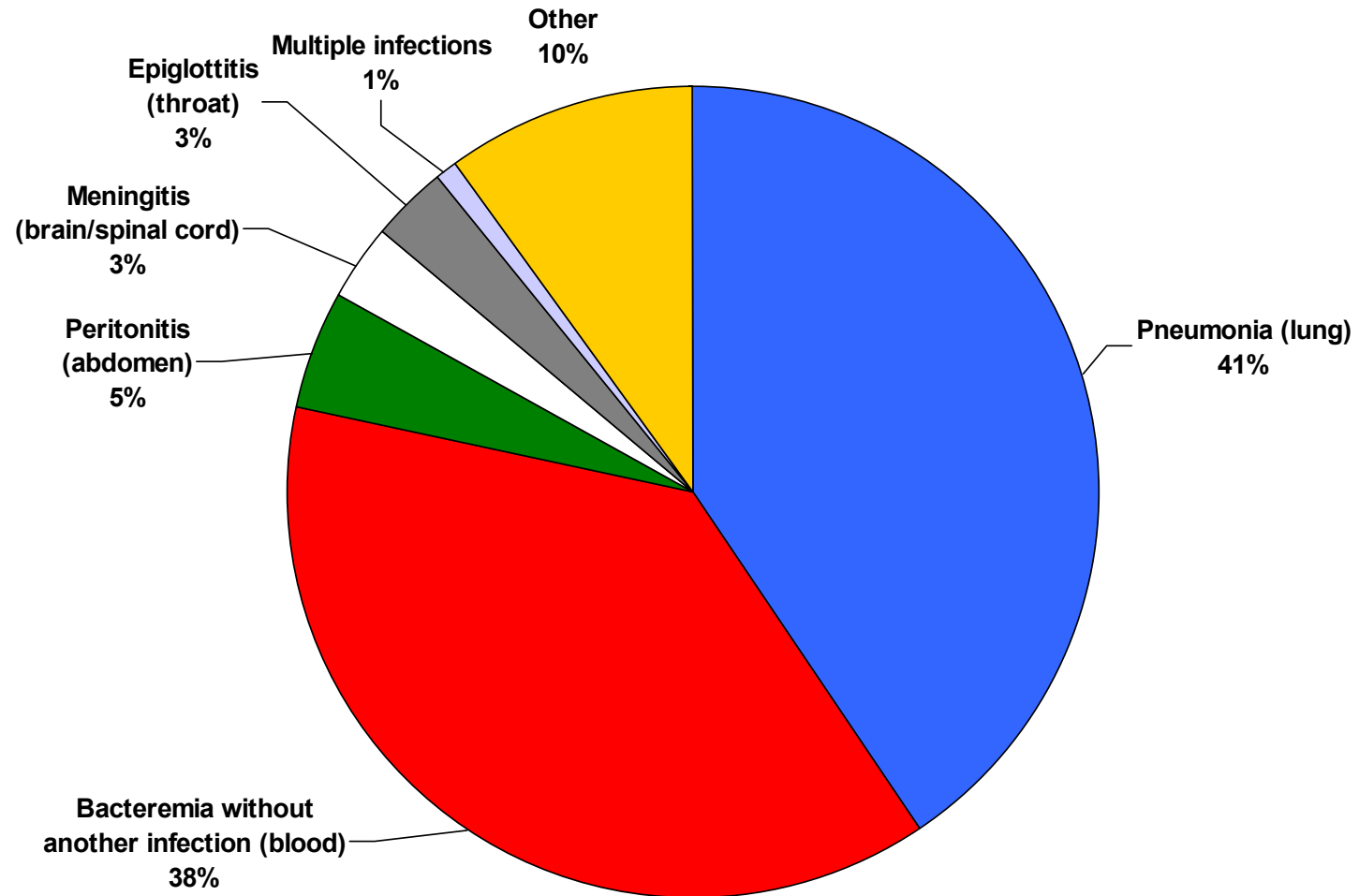
Incidence of Invasive *Haemophilus influenzae* Disease by Gender and Age Group, Minnesota, 2009

<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 persons</u>
Gender		
Male	31	1.2
Female	48	1.8
Age Group		
Under 1 yr.	7	9.5
1-4 yrs.	5	1.8
5-9 yrs.	1	0.3
10-19 yrs.	3	0.4
20-29 yrs.	0	--
30-39 yrs.	3	0.4
40-49 yrs.	4	0.5
50-59 yrs.	8	1.1
60-69 yrs.	12	2.7
70+ yrs.	36	7.8

Invasive *Haemophilus influenzae* Disease Cases and Deaths by Age Group, Minnesota, 2009

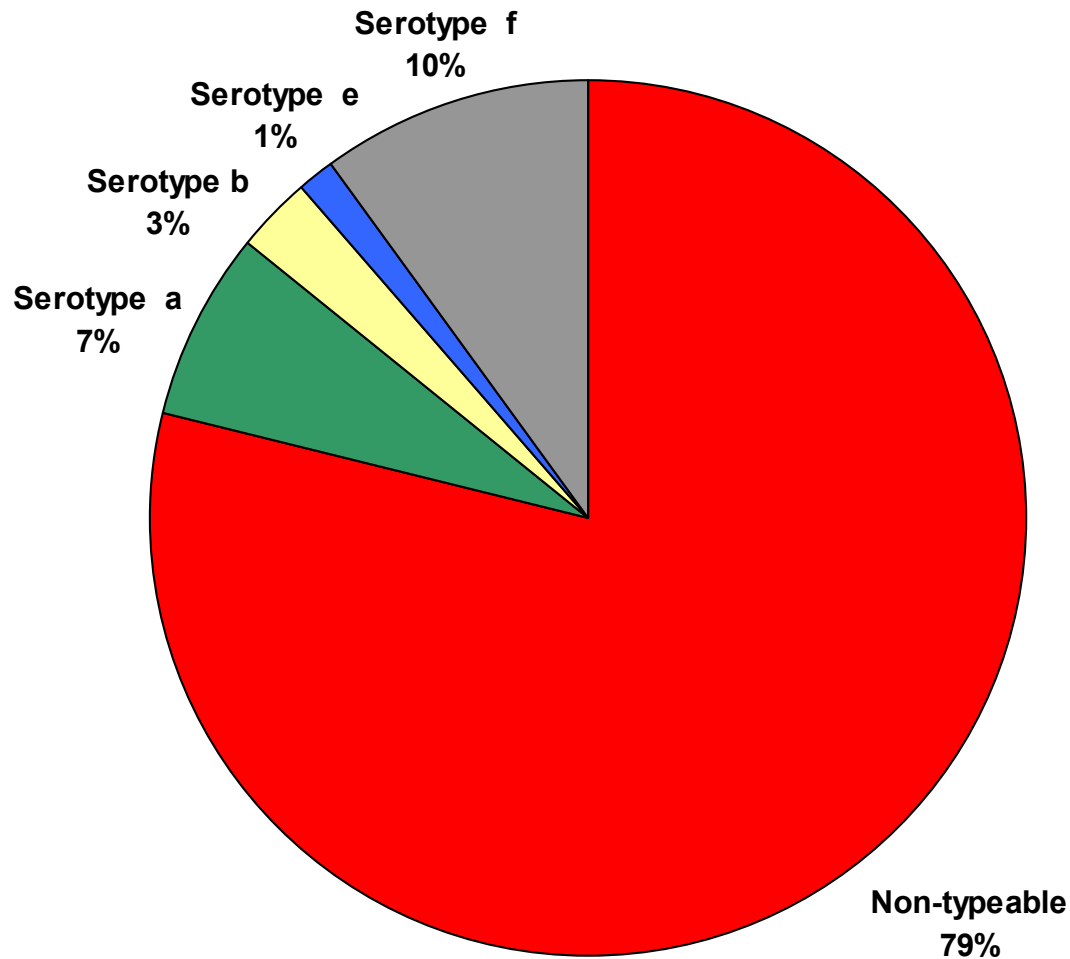
<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	7	0	0%
1-4 yrs.	5	1	20%
5-9 yrs.	1	0	0%
10-19 yrs.	3	1	33%
20-29 yrs.	0	--	--
30-39 yrs.	3	0	0%
40-49 yrs.	4	1	25%
50-59 yrs.	8	1	13%
60-69 yrs.	12	2	17%
70+ yrs.	36	3	8%
<u>Total</u>	<u>79</u>	<u>9</u>	<u>11%</u>

Invasive *Haemophilus influenzae* Disease by Type of Infection, Minnesota, 2009



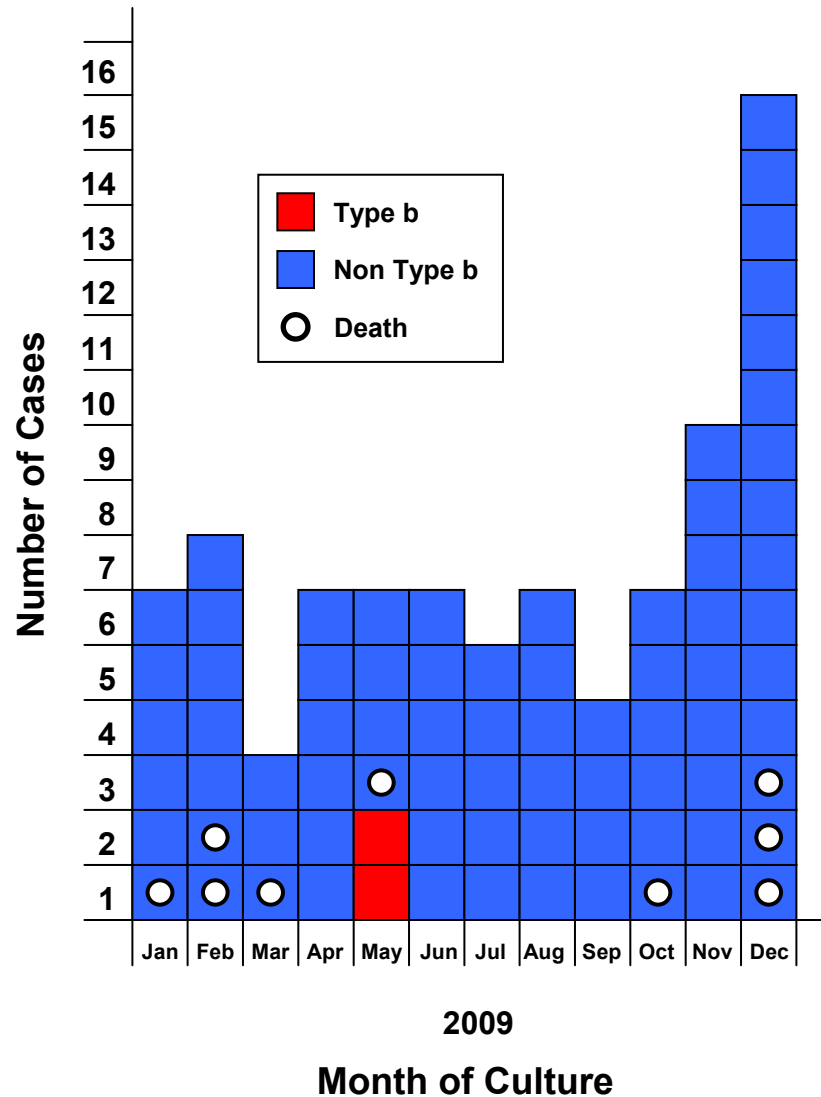


Invasive *Haemophilus influenzae* Disease by Serotype, Minnesota, 2009



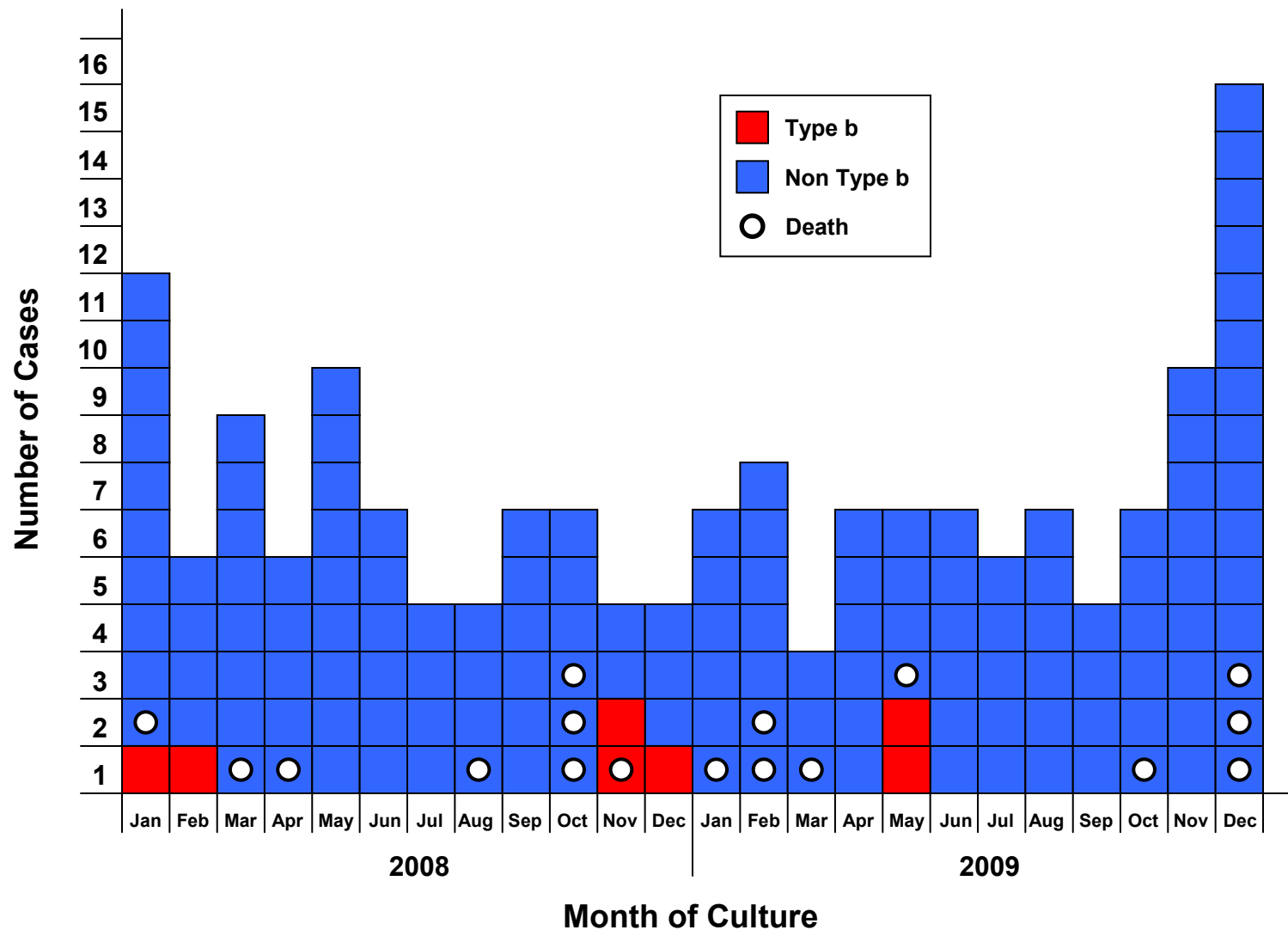


Cases of Invasive *H. influenzae* Disease by Month of Culture, Serotype and Outcome, Minnesota, 2009



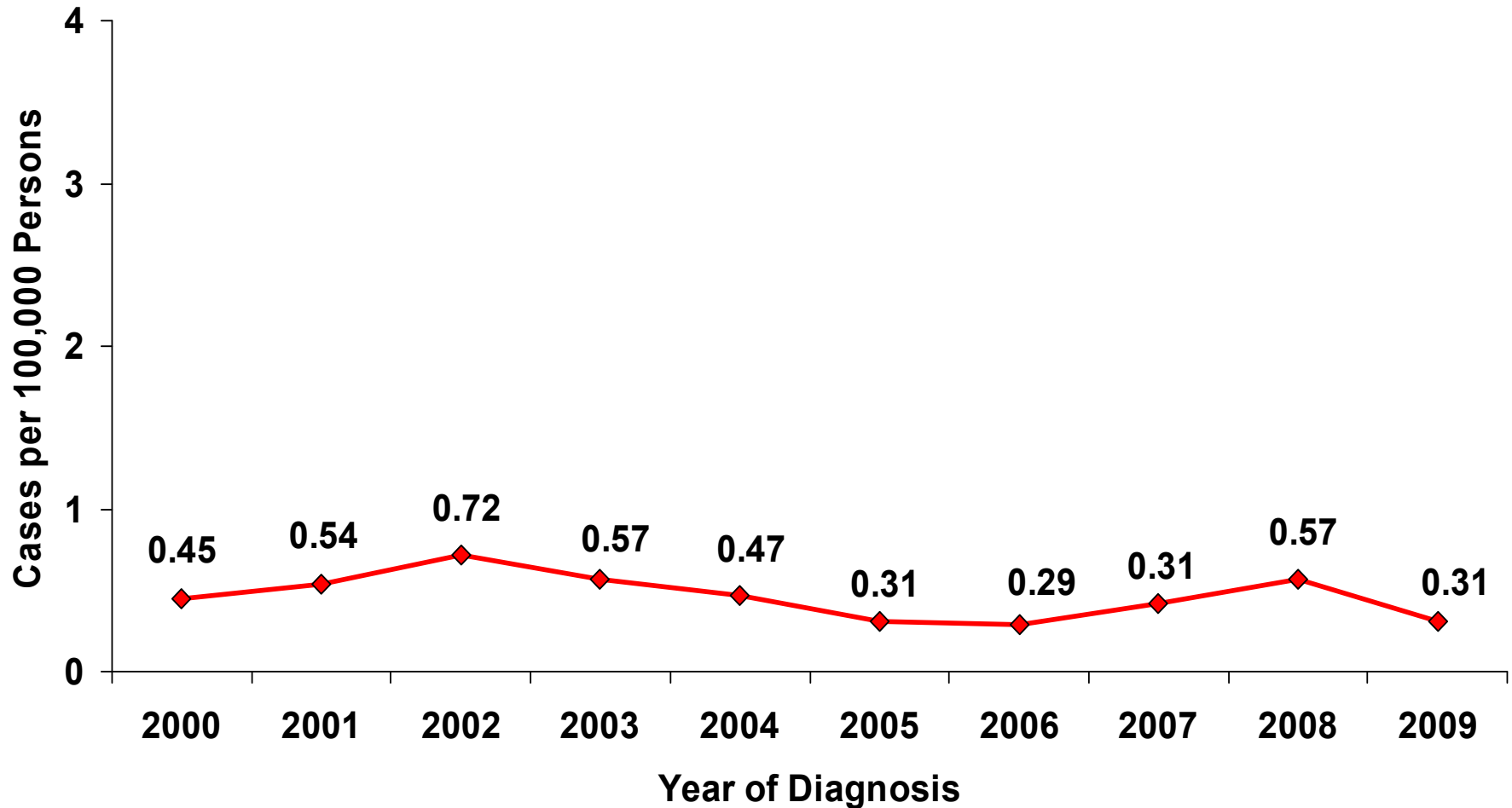


Cases of Invasive *H. influenzae* Disease by Month of Culture Serotype and Outcome, Minnesota, 2008 – 2009





Incidence of Invasive *Neisseria meningitidis* Disease, Minnesota, 2000-2009





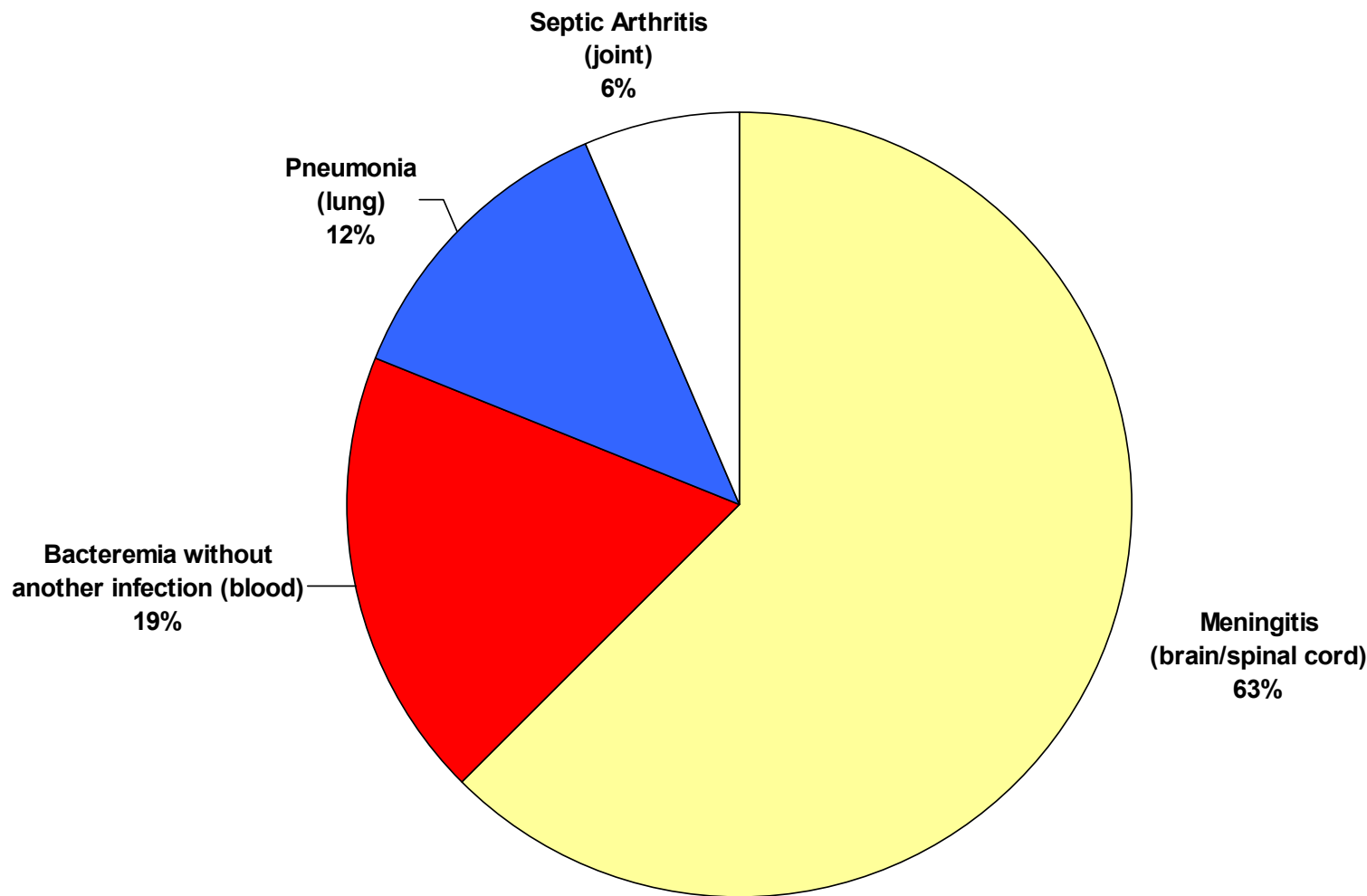
Incidence of Invasive *Neisseria meningitidis* Disease by Gender and Age Group, Minnesota, 2009

<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 persons</u>
Gender		
Male	6	0.23
Female	10	0.38
Age Group		
Under 1 yr.	3	4.08
1-4 yrs.	2	0.70
5-9 yrs.	0	--
10-19 yrs.	3	0.42
20-29 yrs.	2	0.27
30-39 yrs.	1	0.15
40-49 yrs.	1	0.13
50-59 yrs.	2	0.28
60-69 yrs.	1	0.23
70+ yrs	1	0.22

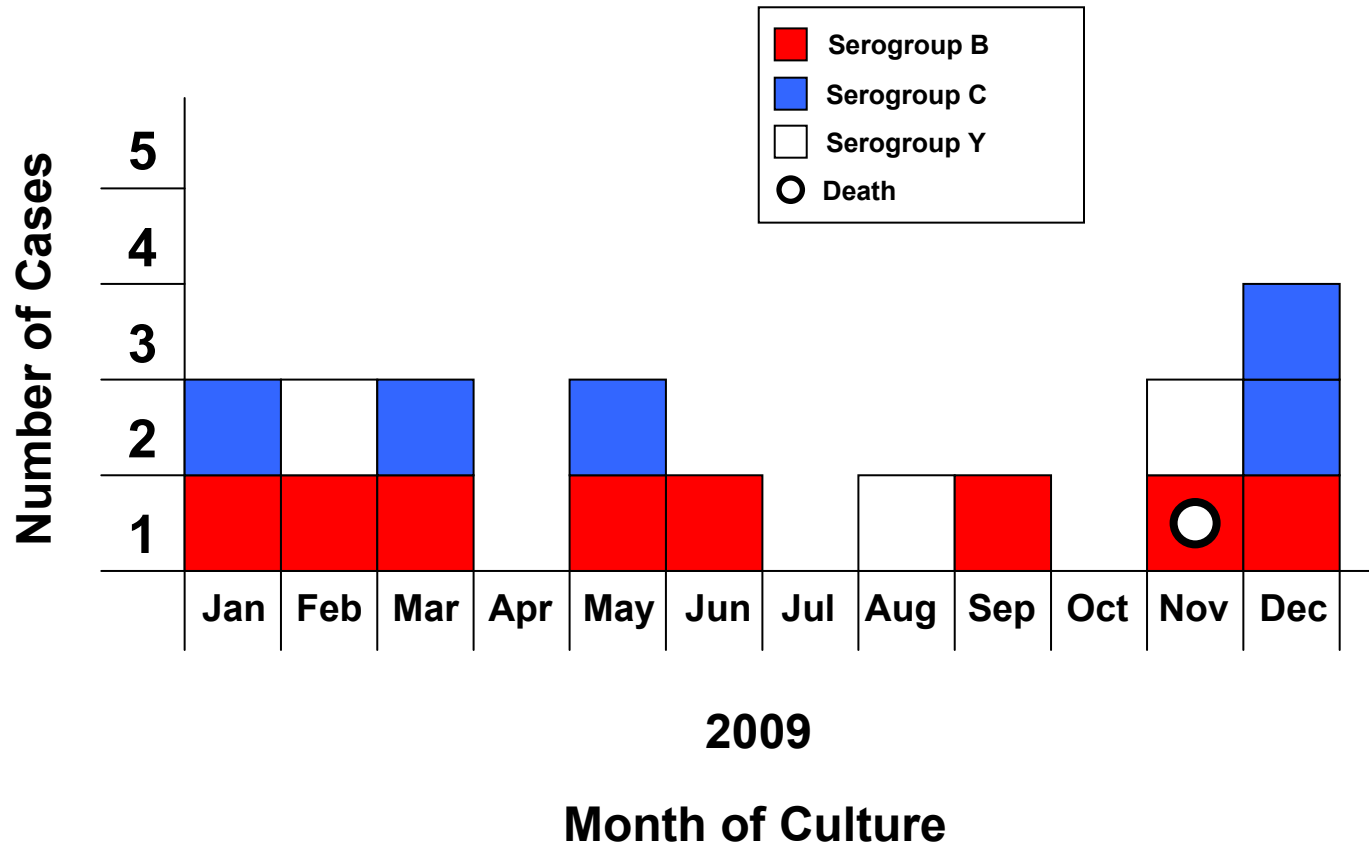
Invasive *Neisseria meningitidis* Disease Cases and Deaths by Age Group, Minnesota, 2009

<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	3	0	0%
1-4 yrs.	2	0	0%
5-9 yrs.	0	--	--
10-19 yrs.	3	0	0%
20-29 yrs.	2	0	0%
30-39 yrs.	1	0	0%
40-49 yrs.	1	0	0%
50-59 yrs.	2	0	0%
60-69	1	1	100%
70+ yrs.	1	0	0%
<u>Total</u>	<u>16</u>	<u>1</u>	<u>6%</u>

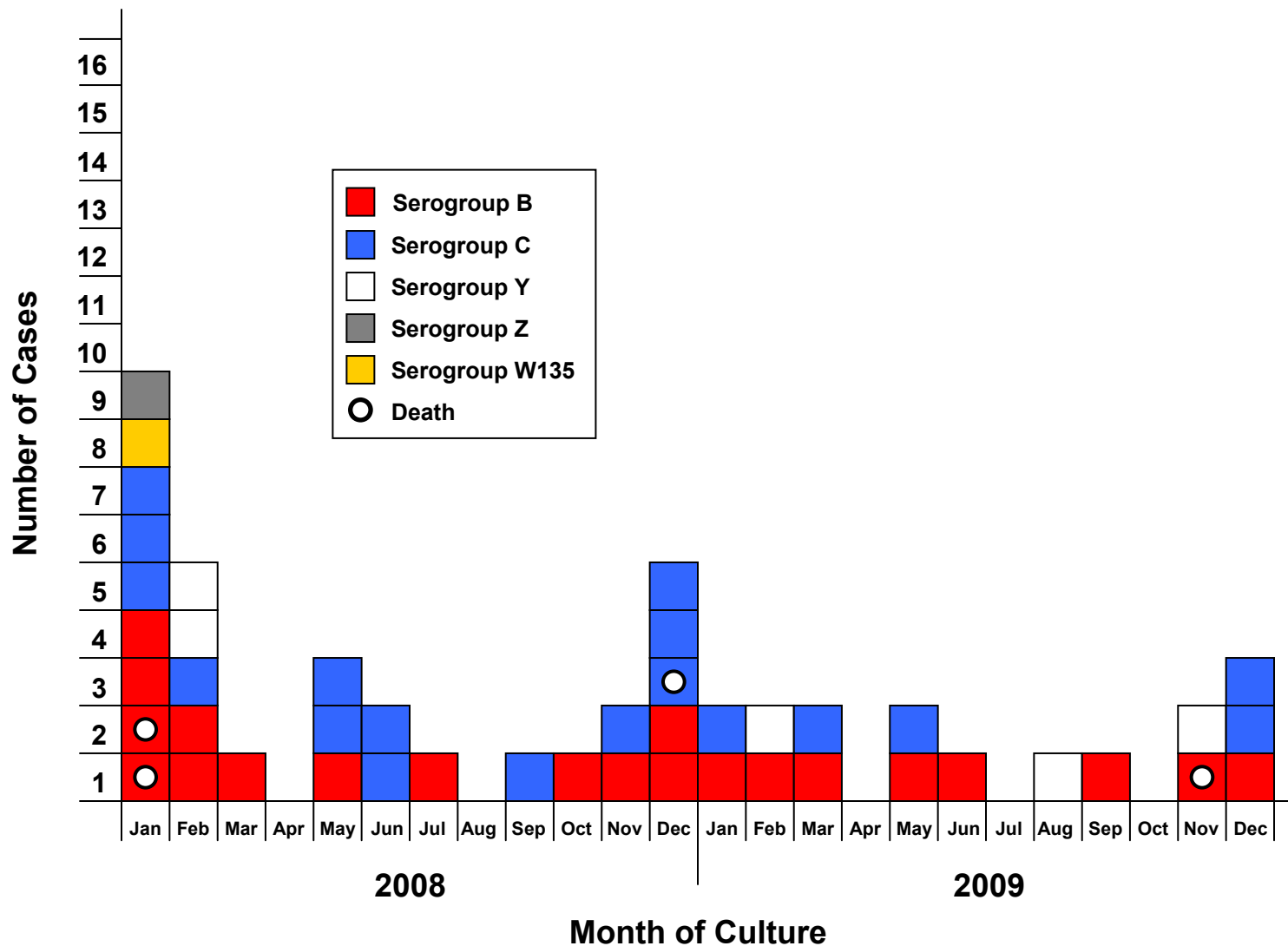
Invasive *Neisseria meningitidis* by Type of Infection, Minnesota, 2009



Cases of Invasive *Neisseria meningitidis* Disease by Month of Culture, Serogroup and Outcome, Minnesota, 2009

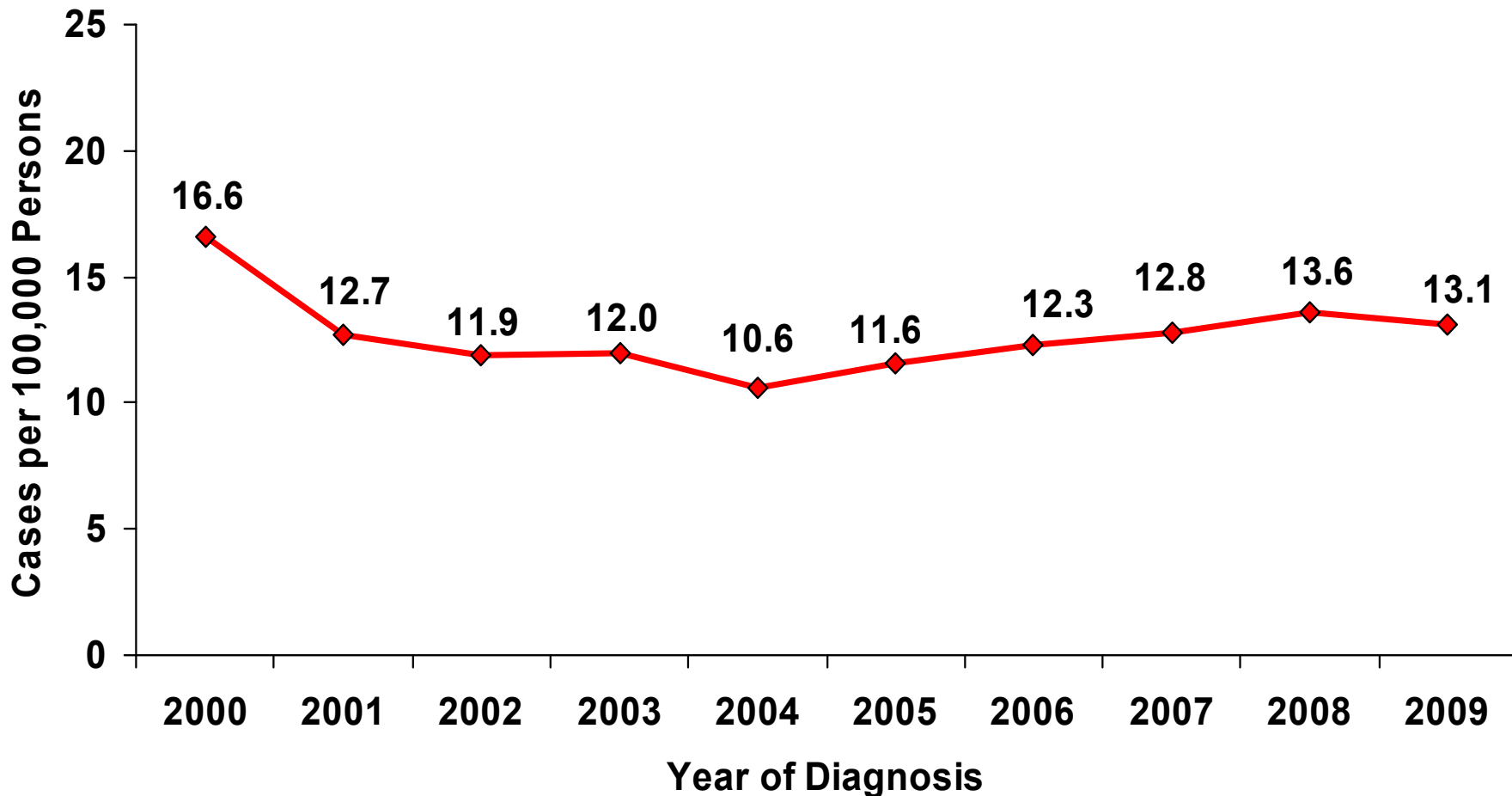


Cases of Invasive *Neisseria meningitidis* Disease by Month of Culture, Serogroup and Outcome, Minnesota, 2008 – 2009





Incidence of Invasive Pneumococcal Disease Minneapolis-St. Paul Metropolitan Area, 2000-2001 and Minnesota, 2002-2009



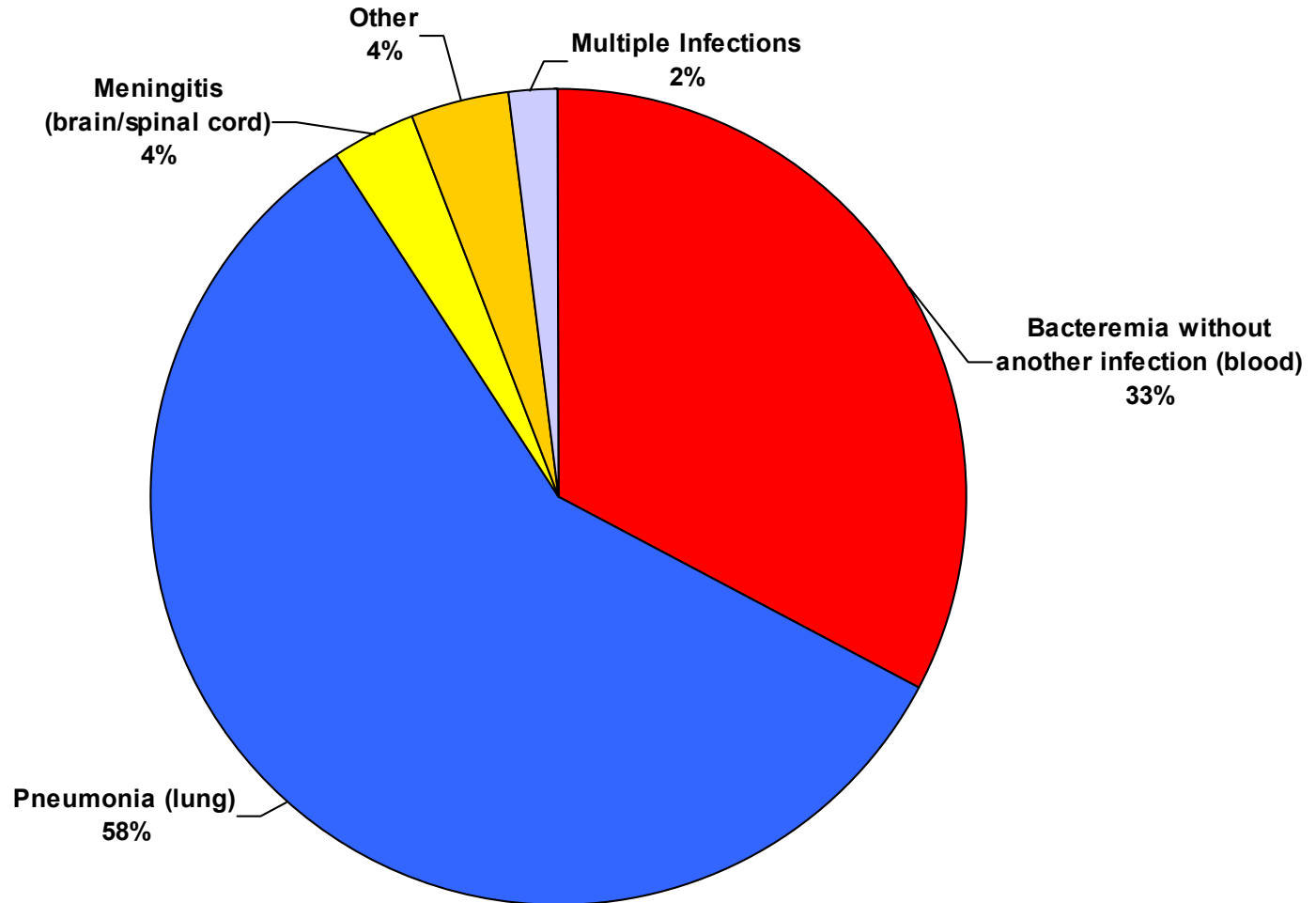
Incidence of Invasive Pneumococcal Disease by Gender and Age Group, Minnesota, 2009

<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 persons</u>
Gender		
Male	359	13.8
Female	327	12.5
Age Group		
Under 1 yr.	32	43.5
1-4 yrs.	66	23.2
5-19 yrs.	36	3.5
20-29 yrs.	26	3.6
30-39 yrs.	39	5.8
40-49 yrs.	132	16.6
50-64 yrs.	116	12.0
65-79 yrs.	131	29.2
80+ yrs.	108	53.4

Invasive Pneumococcal Disease Cases and Deaths by Age Group, Minnesota, 2009

<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	32	2	6%
1-4 yrs.	66	2	3%
5-19 yrs.	36	2	6%
20-29 yrs.	26	2	8%
30-39 yrs.	39	3	8%
40-49 yrs.	132	7	5%
50-64 yrs.	116	12	10%
65-79 yrs.	131	10	8%
80+ yrs.	108	24	22%
<u>Total</u>	<u>686</u>	<u>64</u>	<u>9%</u>

Invasive Pneumococcal Disease by Type of Infection, Minnesota, 2009



Invasive Pneumococcal Isolates by Serotype Included in 13 Valent Conjugate Vaccine* by Age Group, Minnesota, 2009

<u>Age Group</u>	<u>Isolates</u>	<u># Included in PCV 13</u>	<u>% Included in PCV 13</u>
Under 1 yr.	31	21	68%
1-4 yrs.	64	45	70%
5-19 yrs.	30	23	77%
20-29 yrs.	24	14	58%
30-39 yrs.	38	19	50%
40-49 yrs.	118	66	56%
50-64 yrs.	111	68	61%
65-79 yrs.	125	66	53%
80+ yrs.	98	42	43%
Total	639	364	57%

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

Invasive Pneumococcal Isolates by Resistance to Antimicrobial Agents, Minnesota, 2009

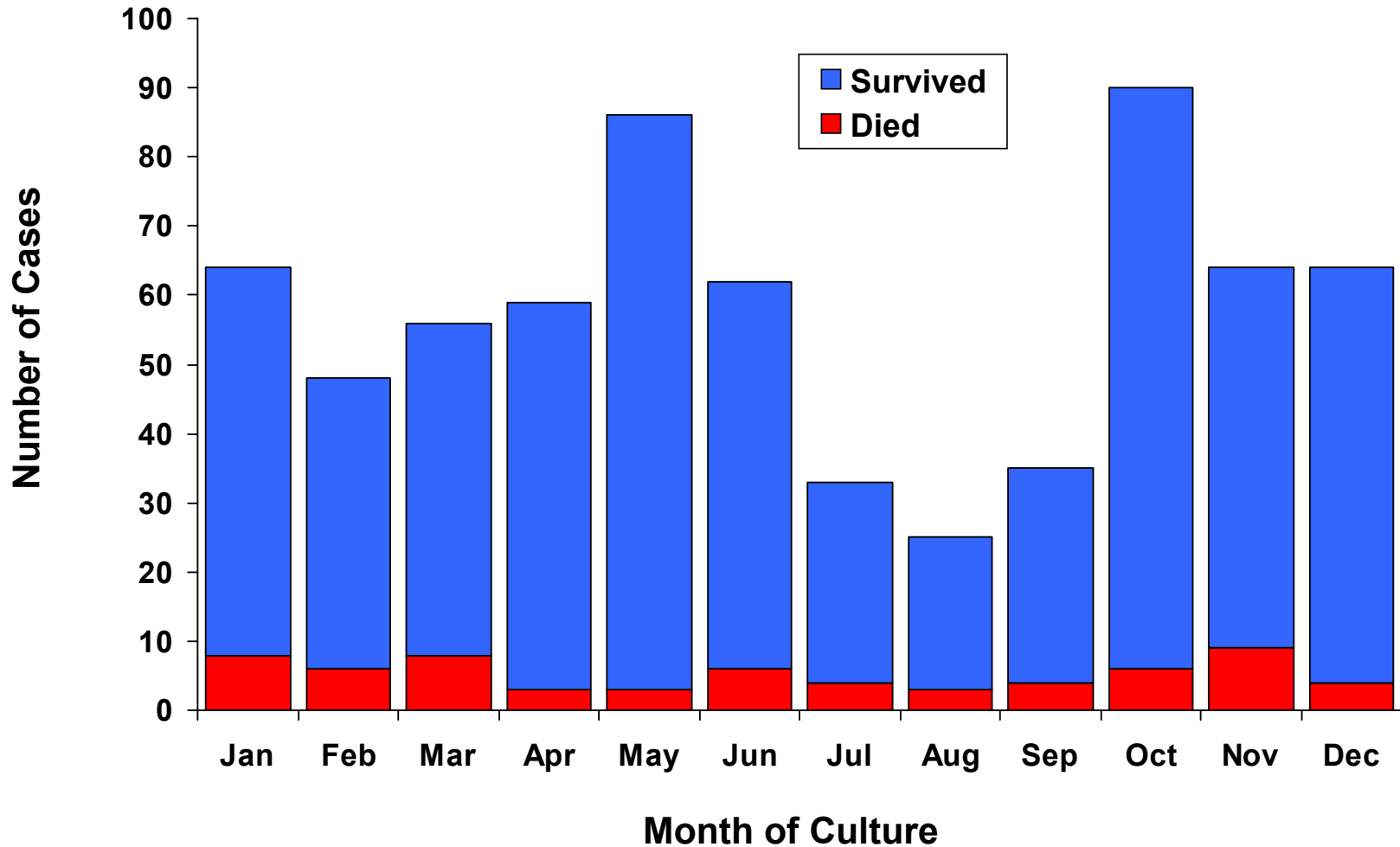
	Total Resistant Isolates	% Resistant Isolates
Penicillin resistance (R)*		
Meningitis breakpoints	153	24%
Non-meningitis breakpoints	7	1%
Resistance to drug classes**		
R to 1 drug class	81	13%
R to 2-3 drug classes	52	8%
R to 4-6 drug classes	84	13%
Total Isolates	639	34%

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

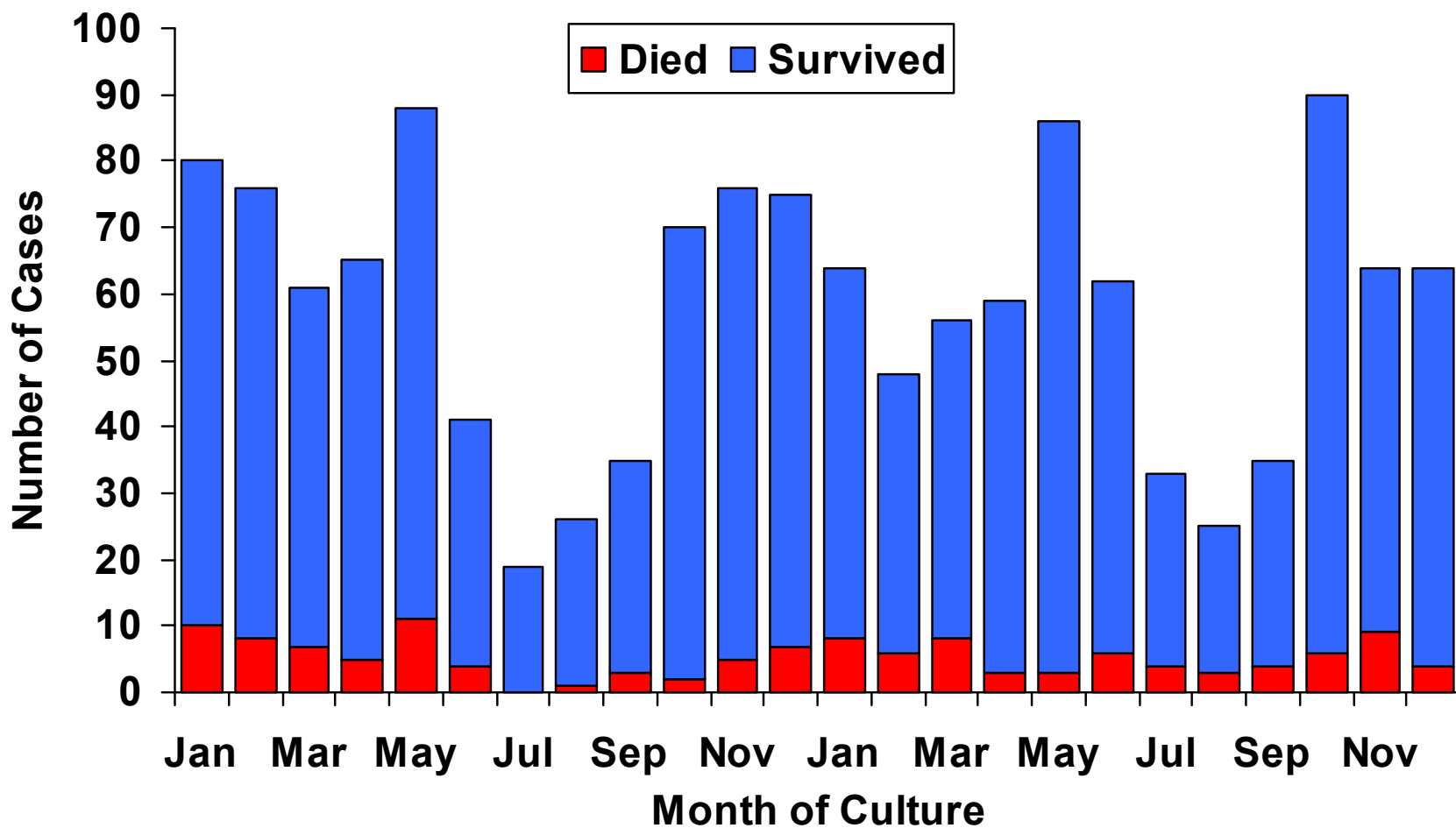
** Eleven drug classes assessed; R to beta-lactams was assessed by penicillin MIC \geq 0.12 μ g/ml.



Cases of Invasive Pneumococcal Disease by Month of Culture and Outcome, Minnesota, 2009



Cases of Invasive Pneumococcal Disease by Month of Culture and Outcome Minnesota, 2008 – 2009

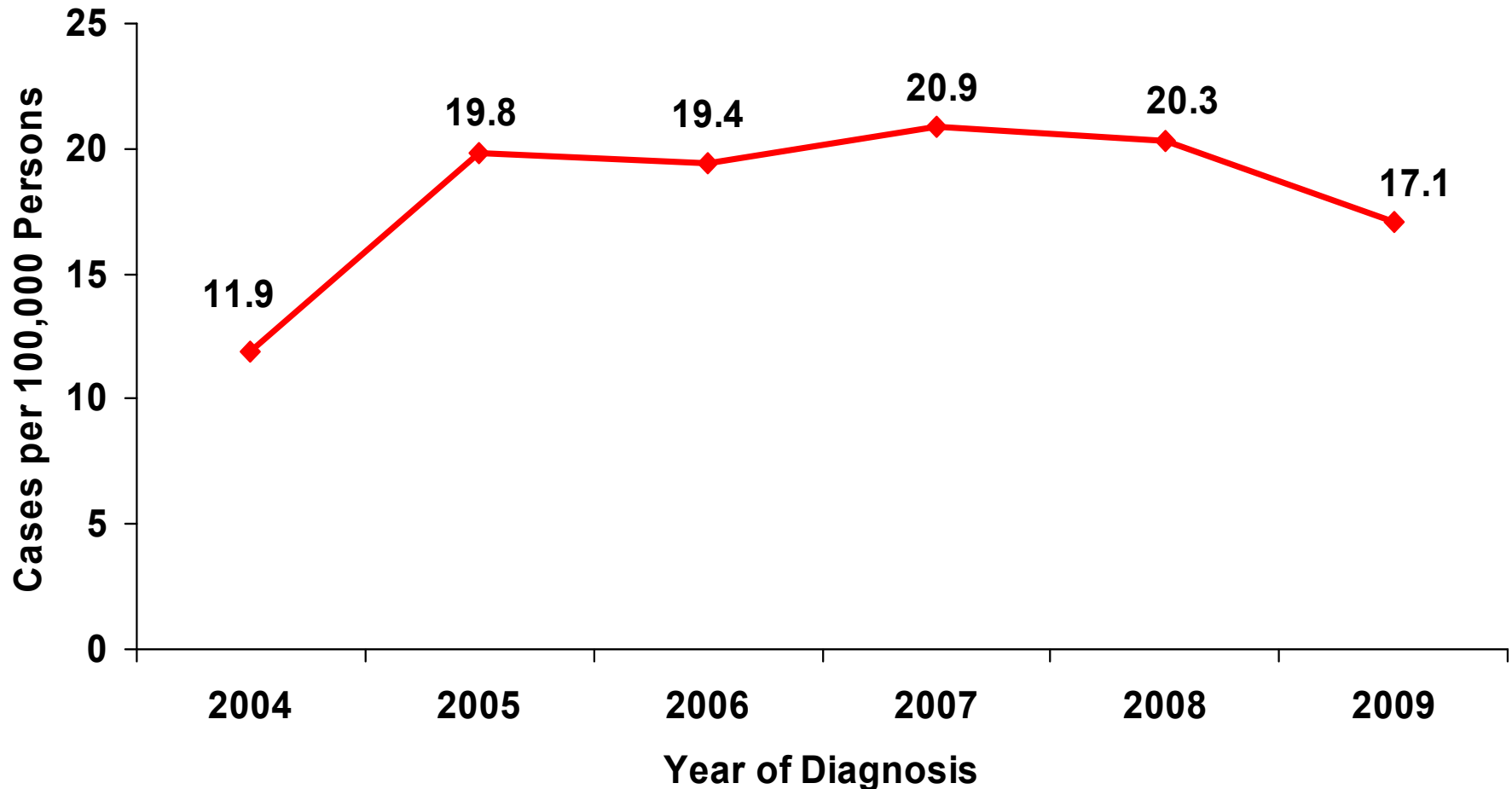


2008

2009



Incidence of Invasive MRSA Disease Ramsey and Hennepin Counties*, Minnesota, 2004-2009



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



Incidence of Invasive MRSA Disease by Gender and Age Group, Ramsey and Hennepin Counties, Minnesota, 2009

<u>Characteristic</u>	<u>Cases</u>	<u>Incidence per 100,000 persons</u>
Gender		
Male	171	21.1
Female	111	13.2
Age Group		
Under 1 yr.	2	8.5
1-4 yrs.	3	3.2
5-9 yrs.	3	2.8
10-19 yrs.	1	0.5
20-29 yrs.	13	6.3
30-39 yrs.	12	5.1
40-49 yrs.	34	13.1
50-59 yrs.	54	23.0
60-69 yrs.	58	42.3
70+ yrs.	101	75.2

Invasive MRSA Disease Cases and Deaths by Age Group, Ramsey and Hennepin Counties, Minnesota, 2009

<u>Age Group</u>	<u>Cases</u>	<u>Deaths</u>	<u>% Died</u>
Under 1 yr.	2	0	0%
1-4 yrs.	3	1	33%
5-9 yrs.	3	0	0%
10-19 yrs.	1	0	0%
20-29 yrs.	13	0	0%
30-39 yrs.	12	0	0%
40-49 yrs.	34	1	3%
50-59 yrs.	54	5	9%
60-69 yrs.	58	9	16%
70+ yrs.	101	19	19%
Total	281	35	12%

Incidence of Invasive MRSA Disease by Case Type, Ramsey and Hennepin Counties, Minnesota, 2009

Case Type	Cases	Incidence per 100,000 persons
Healthcare-associated	242	14.7
Community-associated	38	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, 2009

<u>Type of Infection*</u>	<u>Cases</u>
Bacteremia (blood)	166
Without another source of infection	90
With another source of infection	76
Pneumonia (lung)	35
Osteomyelitis (bone)	41
Cellulitis (skin)	14
Endocarditis (heart)	3
More than one infection type	102
Other infection**	34

* 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)