



## SEVERE *STAPHYLOCOCCUS AUREUS* INFECTION IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	26
Annual Incidence	
LA County <sup>a</sup>	0.28
California <sup>b</sup>	0.45
United States <sup>c</sup>	N/A
Age at Diagnosis	
Mean	48
Median	49
Range	0-87 years

<sup>a</sup>Cases per 100,000 population

<sup>b</sup>See Yearly Summary Reports of Selected General Communicable Diseases in California at: <http://www.cdph.ca.gov/data/statistics/Pages/CD-YearlyTables.aspx> (2011 data)

<sup>c</sup>Not notifiable.

### DESCRIPTION

*Staphylococcus aureus* (*S. aureus*) is bacteria that can cause a number of diseases as a result of infection of various tissues of the body. *S. aureus*-related illness can range from mild and requiring no treatment to severe and potentially fatal. It is a common cause of skin infections, causing boils, abscesses, and cellulitis. It can also cause invasive skin and soft-tissue infection, necrotizing fasciitis, musculoskeletal infection, and osteomyelitis. Infection can result in severe illness, including bacteremia, sepsis, pneumonia, empyema and necrotizing pneumonia.

Certain groups of people are at greater risk, including people with chronic conditions such as diabetes, cancer, vascular disease, and lung disease. Injecting drug users, those with skin injuries or disorders, intravenous catheters, surgical incisions, and those with a weakened immune system due either to disease or a result of immune suppressing medications all have an increased risk of developing *S. aureus* infections.

For surveillance purposes, a case of community-associated severe *S. aureus* infection is defined as a laboratory-confirmed *S. aureus* infection in a person resulting in admission to an intensive

care unit (ICU) or death who had not been hospitalized or had surgery, dialysis, or residency in a long-term care facility in the year prior to illness, and did not have an indwelling catheter or percutaneous medical device at the onset of illness. If any of these conditions were present, the case would be considered healthcare-associated.

*S. aureus* is one of the most common bacterial causes of skin infections that result in a visit to a doctor or the hospital. However, most of these infections do not result in ICU admission or death. Therefore, the data presented in this report underestimate all disease caused by this organism in Los Angeles County (LAC).

### 2013 TRENDS AND HIGHLIGHTS

- 2013 cases aged <1 year had the highest rate (0.8 per 100,000) which was similar to 2012 (Figure 1).
- As in the previous year, blacks had the highest rate (0.6 per 100,000) (Figure 2).
- The male:female ratio in 2013 was 1:0.4.
- Similar to previous years, the incidence rate was highest in SPA 6 (0.5 per 100,000) (Figure 3).
- Cases were distributed throughout the year with the peak months being January to May (Figure 4).
- Seven (27%) of the reported cases were *S. aureus* infections resistant to methicillin (Figure 5).
- The most frequently reported risk factors were liver disease, diabetes, current smoker, and intravenous drug user (Table 1).
- Severe *S. aureus* cases presented most often with bacteremia and pneumonia (Table 2).
- Fifty-eight percent of cases were reported from two reporting sources in LAC. Thus, underreporting of severe *S. aureus* infections in LAC is likely.



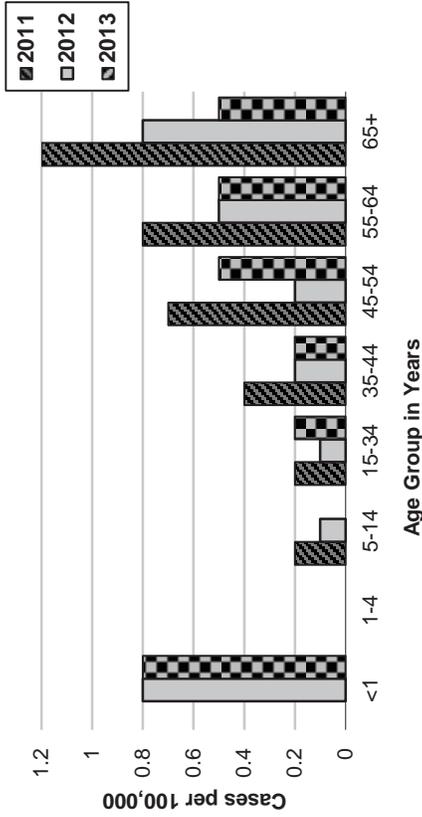
**Reported Severe *Staphylococcus Aureus* Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2009-2013**

Age Group	2009 (N=27)			2010 (N=28)			2011 (N=44)			2012 (N=24)			2013 (N=26)		
	No.	(%)	Rate/ 100,000												
<1	0	0.0	0.0	1	4.0	0.8	0	0.0	0.0	1	4.2	0.8	1	3.8	0.8
1-4	1	3.7	0.2	0	0.0	0	0	0.0	0.0	0	0	0	0	0	0
5-14	2	7.4	0.1	3	10.7	0.2	2	4.5	0.2	1	4.2	0.1	0	0	0
15-34	5	18.5	0.2	6	21.4	0.2	6	13.6	0.2	3	12.5	0.1	7	26.9	0.2
35-44	3	11.1	0.2	3	10.7	0.2	6	13.6	0.5	2	8.3	0.2	2	7.7	0.2
45-54	6	22.2	0.5	7	25.0	0.5	9	20.4	0.7	3	12.5	0.2	6	23.0	0.5
55-64	4	14.8	0.4	3	10.7	0.3	8	18.2	0.8	5	20.8	0.5	5	19.2	0.5
65+	6	22.2	0.6	5	17.9	0.5	13	29.5	1.2	9	37.5	0.8	5	19.2	0.5
Unknown	0	0.0		0	0.0		0	0.0		0			0		
<b>Race/Ethnicity</b>															
Asian	1	3.7	0.1	4	14.2	0.3	7	15.9	0.5	4	16.7	0.3	3	11.5	0.2
Black	3	11.1	0.4	4	14.2	0.5	3	6.8	0.4	4	16.7	0.5	5	19.2	0.6
Hispanic	12	44.4	0.3	7	25.0	0.2	17	38.6	0.4	4	16.7	0.1	10	38.5	0.2
White	11	40.7	0.4	13	46.4	0.5	15	34.1	0.6	10	41.7	0.4	8	30.8	0.3
Other	0	0.0	0.0	0	0.0	0.0	1	2.3		1	4.2		0		
Unknown	0	0.0		0	0.0		1	2.3		1	4.2		1		
<b>SPA</b>															
1	3	11.1	0.8	1	4.0	0.3	0	0.0	0.0	2	8.3	0.5	1	3.8	0.3
2	2	7.4	0.1	6	21.4	0.3	12	27.3	0.6	1	4.2	0.0	6	23.0	0.3
3	4	14.8	0.2	6	21.4	0.4	7	15.9	0.4	8	33.3	0.5	1	3.8	0.1
4	3	11.1	0.3	4	14.2	0.4	2	4.5	0.2	2	8.3	0.2	4	15.4	0.4
5	1	3.7	0.2	2	7.1	0.3	5	11.4	0.8	1	4.2	0.2	2	7.7	0.3
6	9	33.3	0.9	2	7.1	0.2	11	25.0	1.1	5	20.8	0.5	5	19.2	0.5
7	2	7.4	0.1	4	14.2	0.3	5	11.4	0.4	4	16.7	0.3	3	11.5	0.2
8	2	7.4	0.1	2	7.1	0.2	1	2.3	0.1	0	0	0	2	7.7	0.2
Unknown	1	3.7		1	4.0		1	2.3		1	4.2		2	7.7	

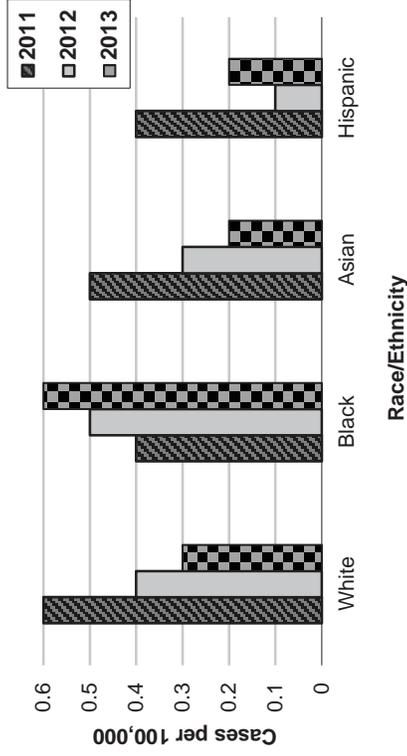
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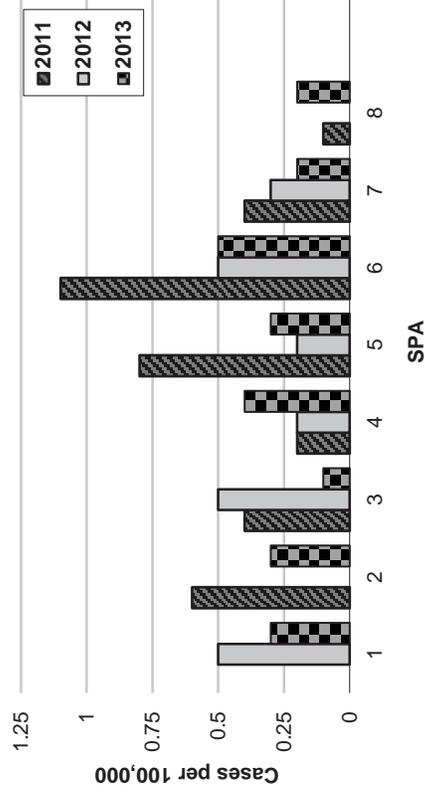
**Figure 1. Incidence Rates\* of Severe *S. aureus* Infection by Age Group LAC, 2011-2013**



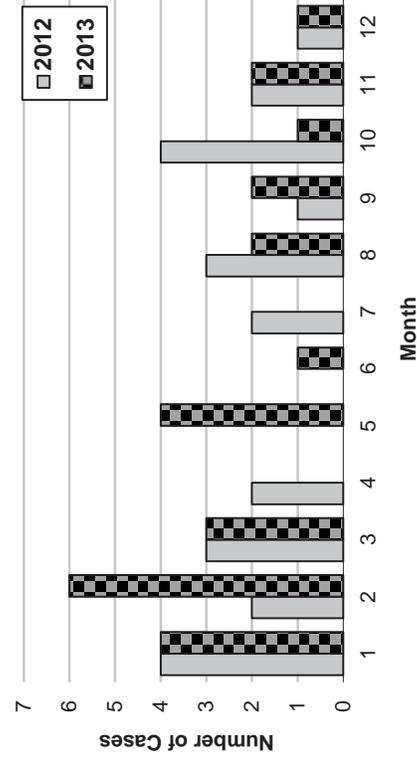
**Figure 2. Severe *S. aureus* Infection Incidence Rates\* by Race/Ethnicity LAC, 2011-2013**



**Figure 3. Incidence Rates\* of Severe *S. aureus* Infection by SPA LAC, 2011-2013**



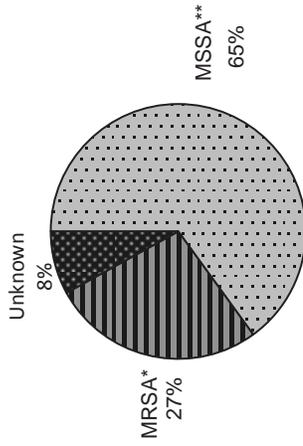
**Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2012-2013**



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**Figure 5. Percent Cases of Severe *S. aureus* Infection by Methicillin-Resistance Type LAC, 2013 (N=26)**



\*MRSA=Methicillin Resistance *Staphylococcus aureus*  
\*\*MSSA=Methicillin Sensitive *Staphylococcus aureus*

**Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2013**

Syndrome	Number	Percent*
Bacteremia (without focus)	19	73
Pneumonia	7	27
Endocarditis	4	15
Skin Infection	4	15
Wound Infection	3	12
Septic emboli	3	12
Meningitis	1	4
Septic arthritis	1	4
Toxic Shock Syndrome	1	4
Other	7	27

\*Overlapping syndromes will total over 100%.

**Table 1. Severe *S. aureus* Medical Conditions by Date of Onset, 2012-2013**

	2012 N = 24 N(%)*	2013 N = 26 N(%)*
Liver Disease	2(8)	8(31)
Diabetes	4(17)	7(27)
Current Smoker	5(21)	6(23)
Intravenous Drug Use	4(17)	5(19)
Alcohol Abuse	3(13)	3(12)
Heart Failure/CHF	2(8)	3(12)
Emphysema	3(13)	2(8)
HIV/AIDS	1(4)	2(8)
Chronic Renal Insufficiency	0(0)	2(8)
Malignancy-Solid	2(8)	1(4)
Malignancy-Hem	0(0)	1(4)
Chronic Dermatitis	2(8)	0
Asthma	2(8)	0
Eczema	3(13)	0
Other	10(41)	8(31)
None	4(17)	7(27)

\*Overlapping risk factors will total over 100%.



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### DESCRIPTION

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Certain groups of people are at greater risk, including people with chronic conditions such as diabetes, cancer, vascular disease, and lung disease. Injecting drug users, those with skin injuries or disorders, intravenous catheters, surgical incisions, and those with a weakened immune system due either to disease or a result of immune suppressing medications all have an increased risk of developing *S. aureus* infections.

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*S. aureus* is one of the most common bacterial causes of skin infections that result in a visit to a doctor or the hospital. However, most of these infections do not result in ICU admission or death. Therefore, the data presented in this report underestimate all disease caused by this organism in Los Angeles County (LAC).

### 2013 TRENDS AND HIGHLIGHTS

- 2013 cases aged <1 year had the highest rate (0.8 per 100,000) which was similar to 2012 (Figure 1).
- As in the previous year, blacks had the highest rate (0.6 per 100,000) (Figure 2).
- The male:female ratio in 2013 was 1:0.4.
- Similar to previous years, the incidence rate was highest in SPA 6 (0.5 per 100,000) (Figure 3).
- Cases were distributed throughout the year with the peak months being January to May (Figure 4).
- Seven (27%) of the reported cases were *S. aureus* infections resistant to methicillin (Figure 5).
- The most frequently reported risk factors were liver disease, diabetes, current smoker, and intravenous drug user (Table 1).
- Severe *S. aureus* cases presented most often with bacteremia and pneumonia (Table 2).
- Fifty-eight percent of cases were reported from two reporting sources in LAC. Thus, underreporting of severe *S. aureus* infections in LAC is likely.



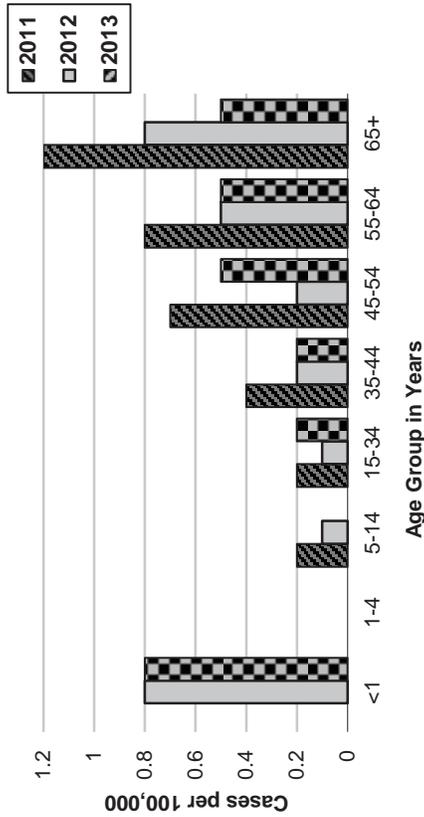
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Los Angeles County, 2009-2013**

Age Group	2009 (N=27)			2010 (N=28)			2011 (N=44)			2012 (N=24)			2013 (N=26)		
	No.	(%)	Rate/ 100,000												
<1	0	0.0	0.0	1	4.0	0.8	0	0.0	0.0	1	4.2	0.8	1	3.8	0.8
1-4	1	3.7	0.2	0	0.0	0	0	0.0	0.0	0	0	0	0	0	0
5-14	2	7.4	0.1	3	10.7	0.2	2	4.5	0.2	1	4.2	0.1	0	0	0
15-34	5	18.5	0.2	6	21.4	0.2	6	13.6	0.2	3	12.5	0.1	7	26.9	0.2
35-44	3	11.1	0.2	3	10.7	0.2	6	13.6	0.5	2	8.3	0.2	2	7.7	0.2
45-54	6	22.2	0.5	7	25.0	0.5	9	20.4	0.7	3	12.5	0.2	6	23.0	0.5
55-64	4	14.8	0.4	3	10.7	0.3	8	18.2	0.8	5	20.8	0.5	5	19.2	0.5
65+	6	22.2	0.6	5	17.9	0.5	13	29.5	1.2	9	37.5	0.8	5	19.2	0.5
Unknown	0	0.0		0	0.0		0	0.0		0			0		
<b>Race/Ethnicity</b>															
Asian	1	3.7	0.1	4	14.2	0.3	7	15.9	0.5	4	16.7	0.3	3	11.5	0.2
Black	3	11.1	0.4	4	14.2	0.5	3	6.8	0.4	4	16.7	0.5	5	19.2	0.6
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Unknown	0	0.0		0	0.0		1	2.3		1	4.2		1		
<b>SPA</b>															
1	3	11.1	0.8	1	4.0	0.3	0	0.0	0.0	2	8.3	0.5	1	3.8	0.3
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5	1	3.7	0.2	2	7.1	0.3	5	11.4	0.8	1	4.2	0.2	2	7.7	0.3
6	9	33.3	0.9	2	7.1	0.2	11	25.0	1.1	5	20.8	0.5	5	19.2	0.5
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Unknown	1	3.7		1	4.0		1	2.3		1	4.2		2	7.7	

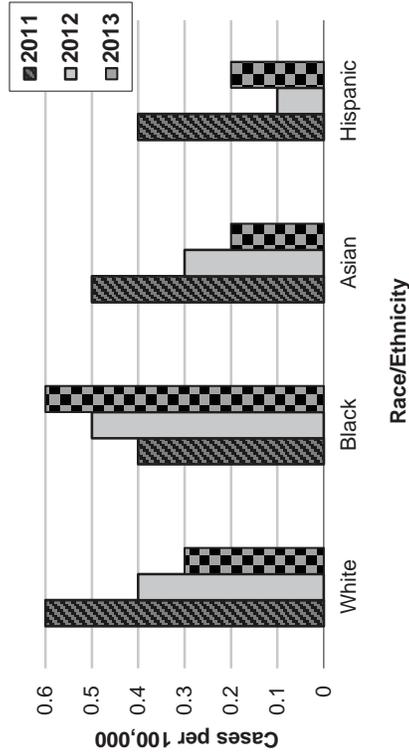
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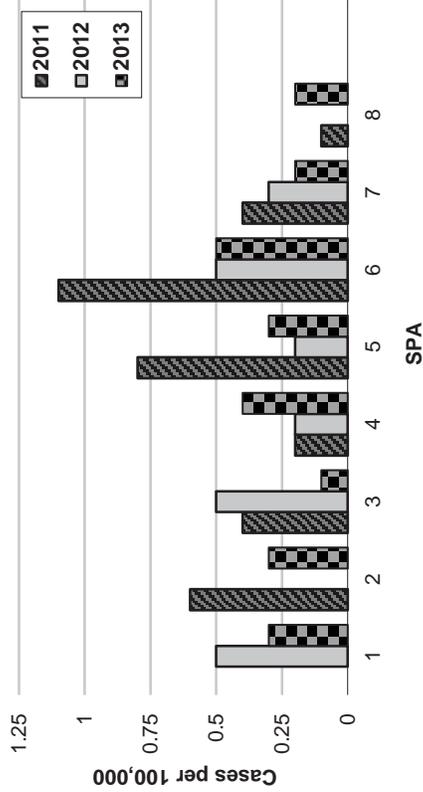
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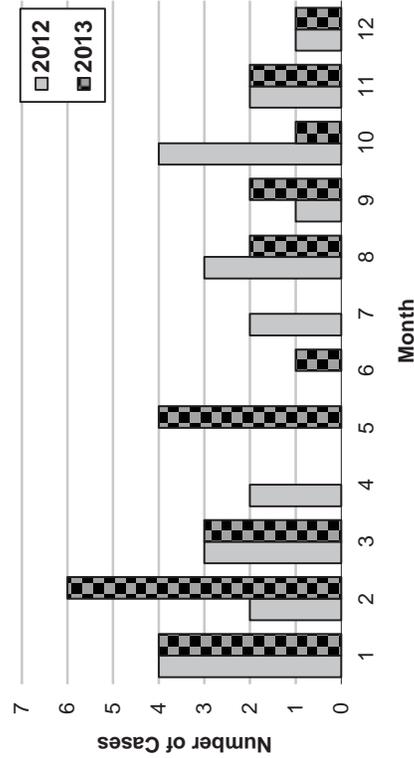
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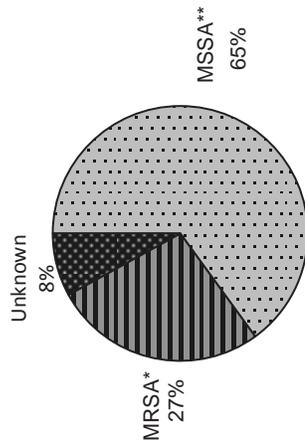
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**Figure 5. Percent Cases of Severe *S. aureus* Infection by Methicillin-Resistance Type LAC, 2013 (N=26)**



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Other	7	27

\*Overlapping syndromes will total over 100%.

**Table 1. Severe *S. aureus* Medical Conditions by Date of Onset, 2012-2013**

	2012 N = 24 N(%)*	2013 N = 26 N(%)*
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In February 2008 in response to the significant public health burden and potential severity of community-associated *S. aureus* infections, the

California Department of Public Health added severe cases of *S. aureus* infections, including methicillin-resistant *S. aureus* (MRSA), to the state list of reportable diseases and conditions. This is not a nationally notifiable disease.

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### 2012 TRENDS AND HIGHLIGHTS

- Cases >65 years of age and cases aged <1 year had the highest rate (0.8 per 100,000) (Figure 1).
- The incidence rate of Hispanics in 2012 (0.1 per 100,000) decreased four-fold compared to 2011 (0.4 per 100,000) (Figure 2).
- The male:female ratio was 1:1.
- Incidence rates decreased in four SPAs in 2012 compared with 2011, and increased in two SPAs. In 2012, the incidence rate was highest in SPAs 1, 3, and 6 (0.5 per 100,000). (Figure 3).
- Seven (29%) of the reported cases were *S. aureus* infections resistant to methicillin (Figure 5).
- The most frequently reported risk factors were being a current smoker, diabetic, and intravenous drug user (Table 1).
- Severe *S. aureus* cases presented most often with bacteremia and pneumonia (Table 2).
- Forty-two percent of cases were reported from 2 reporting sources in LAC. Thus, underreporting of severe *S. aureus* infections in LAC is likely.



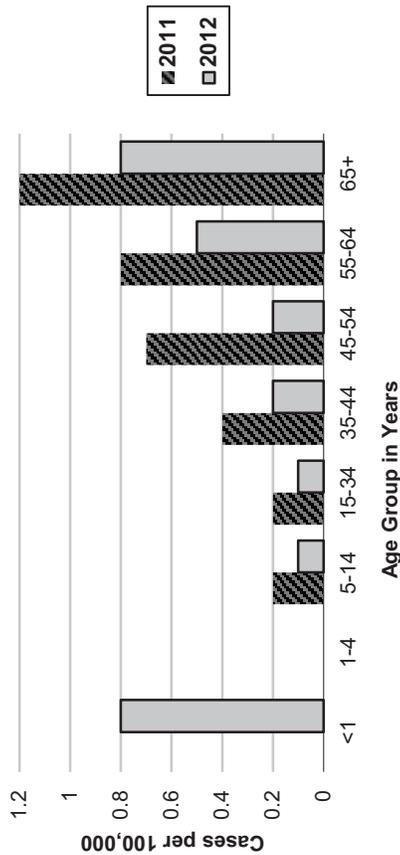
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55-64	4	16.0	0.4	4	14.8	0.4	3	10.7	0.3	8	18.2	0.8	5	20.8	0.5
65+	8	32.0	0.8	6	22.2	0.6	5	17.9	0.5	13	29.5	1.2	9	37.5	0.8
Unknown	0	0.0		0	0.0		0	0.0		0	0.0		0		
<b>Race/Ethnicity</b>															
Asian	3	12.0	0.2	1	3.7	0.1	4	14.2	0.3	7	15.9	0.5	4	16.7	0.3
Black	4	16.0	0.5	3	11.1	0.4	4	14.2	0.5	3	6.8	0.4	4	16.7	0.5
Hispanic	5	20.0	0.1	12	44.4	0.3	7	25.0	0.1	17	38.6	0.4	4	16.7	0.1
White	13	52.0	0.4	11	40.7	0.4	13	46.4	0.5	15	34.1	0.6	10	41.7	0.4
Other	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	1	2.3	0.0	1	4.2	0.0
Unknown	0	0.0		0	0.0		0	0.0		1	2.3		1	4.2	
<b>SPA</b>															
1	2	8.0	0.5	3	11.1	0.8	1	4.0	0.3	0	0.0	0.0	2	8.3	0.5
2	5	20.0	0.2	2	7.4	0.1	6	21.4	0.3	12	27.3	0.6	1	4.2	0.0
3	8	32.0	0.5	4	14.8	0.3	6	21.4	0.3	7	15.9	0.4	8	33.3	0.5
4	1	4.0	0.1	3	11.1	0.2	4	14.2	0.3	2	4.5	0.2	2	8.3	0.2
5	3	12.0	0.5	1	3.7	0.2	2	7.1	0.3	5	11.4	0.8	1	4.2	0.2
6	2	8.0	0.2	9	33.3	0.9	2	7.1	0.2	11	25.0	1.1	5	20.8	0.5
7	1	4.0	0.1	2	7.4	0.1	4	14.2	0.3	5	11.4	0.4	4	16.7	0.3
8	3	12.0	0.3	2	7.4	0.2	2	7.1	0.2	1	2.3	0.1	0	0	0
Unknown		0.0		1	3.7		1	4.0		1	2.3		1	4.2	

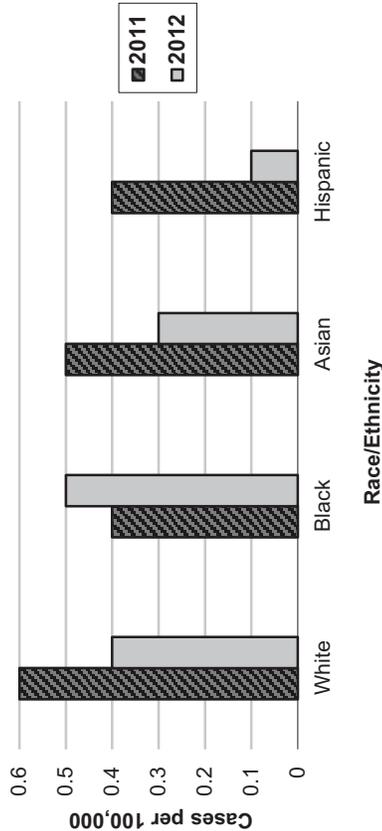
\* Rates calculated based on less than 19 cases or events are considered unreliable.



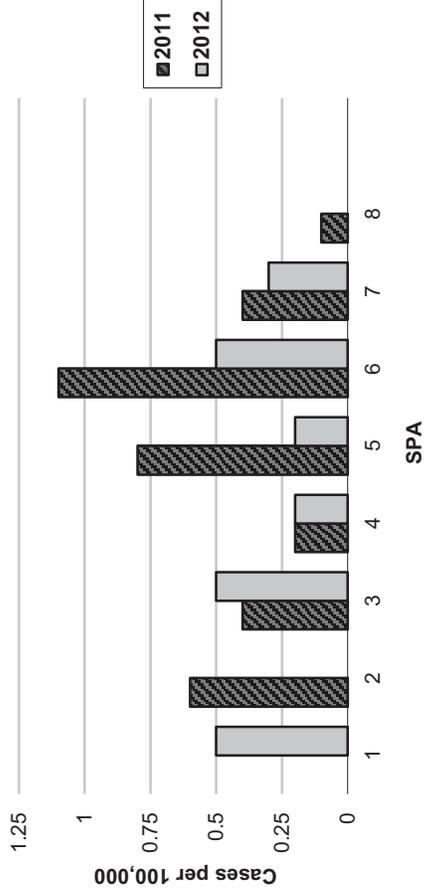
**Figure 1. Incidence Rates\* of Severe *S. aureus* Infection by Age Group LAC, 2011-2012**



**Figure 2. Severe *S. aureus* Infection Incidence Rates\* by Race/Ethnicity LAC, 2011-2012**

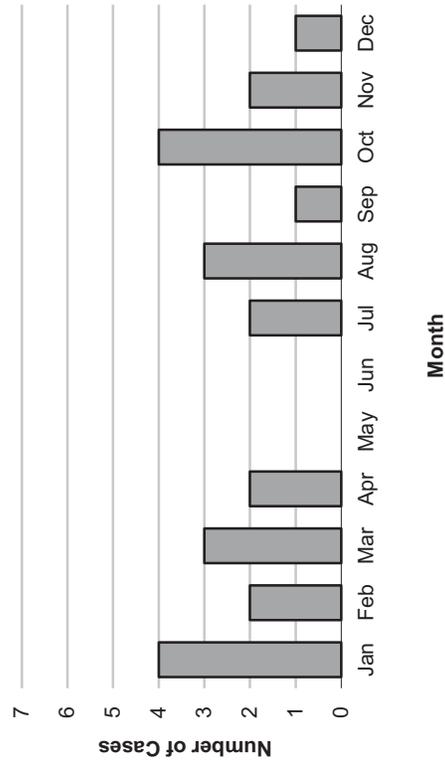


**Figure 3. Incidence Rates\* of Severe *S. aureus* Infection by SPA LAC, 2011-2012**



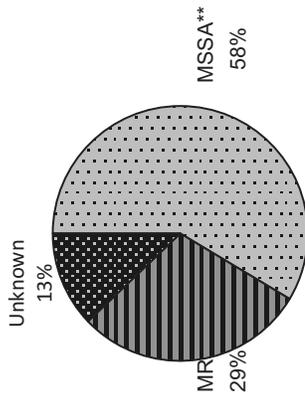
\*Rates calculated based on less than 19 cases or events are considered unreliable

**Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2012 (N=24)**





**Figure 5. Percent Cases of Severe *S. aureus* Infection by Methicillin-Resistance Type LAC, 2012 (N=24)**



\*MRSA=Methicillin Resistance *Staphylococcus aureus*  
\*\*MSSA=Methicillin Sensitive *Staphylococcus aureus*

**Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2012**

Syndrome	Number	Percent*
Bacteremia (without focus)	17	71
Pneumonia	9	38
Endocarditis	5	21
Skin Infection	4	17
Wound Infection	2	8
Septic emboli	1	4
Meningitis	1	4
Other	3	13

\*Overlapping syndromes will total over 100%.

**Table 1. Severe *S. aureus* Medical Conditions by Date of Onset, 2011-2012**

	2011 N = 44 N(%)*	2012 N = 24 N(%)*
Current Smoker	7(16)	5(21)
Diabetes	14(32)	4(17)
Intravenous Drug Use	5(11)	4(17)
Alcohol Abuse	4(9)	3(13)
Emphysema	3(7)	3(13)
Eczema	0(0)	3(13)
Liver Disease	4(9)	2(8)
Asthma	4(9)	2(8)
Malignancy-Solid	1(5)	2(8)
Chronic Dermatitis	0(0)	2(8)
Heart Failure/CHF	4(9)	2(8)
HIV/AIDS	1(2)	1(4)
Chronic Renal Insufficiency	1(2)	0(0)
Other	17(39)	10(41)
None	8(18)	4(17)

\*Overlapping risk factors will total over 100%.



## SEVERE *STAPHYLOCOCCUS AUREUS* INFECTION IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	28
Annual Incidence	
LA County <sup>a</sup>	0.29
California <sup>b</sup>	N/A
United States <sup>b</sup>	N/A
Age at Diagnosis	
Mean	42
Median	46
Range	0-88 years

<sup>a</sup>Cases per 100,000 population.

<sup>b</sup>Not notifiable.

### DESCRIPTION

*Staphylococcus aureus* is a well known bacterial cause of skin infections, causing boils, abscesses, and cellulitis. Infection can result in severe illness, including invasive skin and soft-tissue infection, necrotizing fasciitis, musculoskeletal infection like pyomyositis and osteomyelitis, severe pneumonia, empyema, necrotizing pneumonia, disseminated infections with septic emboli, bacteremia, sepsis syndrome, and death. For surveillance purposes, severe *S. aureus* infection in a previously healthy person is defined as isolation of *S. aureus* from either a sterile or non-sterile site in a patient that has died or has been admitted to the hospital intensive care unit (ICU). In addition, the patient must be previously healthy, (i.e., no hospitalizations, surgery, dialysis, residence in long-term care, or percutaneous device/indwelling catheter within the past year).

*Staphylococcus aureus* is one of the most common bacterial causes of skin infections that result in a visit to a doctor or the hospital. However, most of these infections do not result in ICU admission or death. Therefore, the data presented in this report underestimate all disease caused by this organism in Los Angeles County (LAC).

### 2010 TRENDS AND HIGHLIGHTS

- Cases aged less than one year had the highest rate (0.7 per 100,000) followed by cases aged 45-54 years (0.5 per 100,000), and cases aged greater than 65 years (0.5 per 100,000) (Figure 1).
- Blacks (0.5 per 100,000) and whites (0.5 per 100,000) had the highest rates of severe *S. aureus* infection. Hispanics had the lowest rate at 0.1 cases per 100,000 (Figure 2).
- The incidence rates for all eight SPAs ranged from 0.2 per 100,000 to 0.3 per 100,000 (Figure 3).
- The number of cases of severe *S. aureus* infection peaked during the month of November (Figure 4).
- The percentage of *S. aureus* infections resistant to methicillin was 39% (Figure 5).
- Diabetes and liver disease were reported more than any other risk factors (Table 1).
- Severe *S. aureus* cases presented most often with bacteremia, and pneumonia (Table 2).
- Forty-three percent of cases were reported by only four hospitals in LAC. Thus, underreporting of severe *S. aureus* infections in LAC is likely.



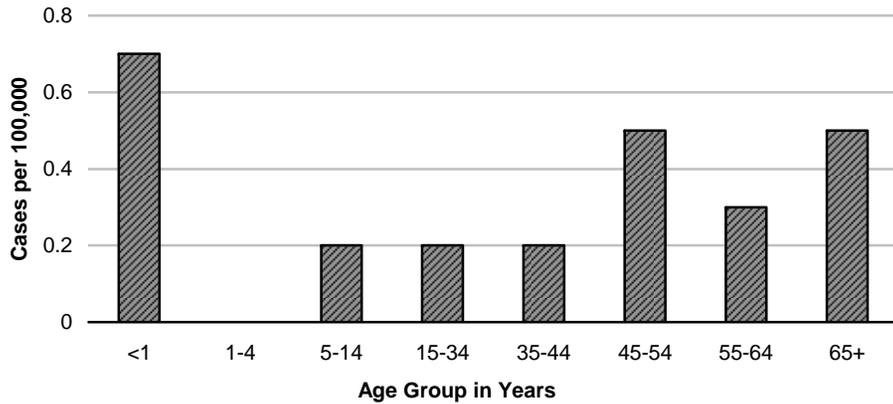
**Reported Severe *Staphylococcus Aureus* Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2008-2010**

	2006			2007			2008 (N=25)			2009 (N=27)			2010 (N=28)		
	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000
<b>Age Group</b>															
<1	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.7	0	0.0	0.0	1	4.0	0.7
1-4	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	0.0	1	3.7	0.2	0	0.0	0
5-14	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.1	2	7.4	0.1	3	10.7	0.2
15-34	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.0	5	18.5	0.2	6	21.4	0.2
35-44	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.1	3	11.1	0.1	3	10.7	0.2
45-54	N/A	N/A	N/A	N/A	N/A	N/A	7	28.0	0.5	6	22.2	0.4	7	25.0	0.5
55-64	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	0.4	4	14.8	0.4	3	10.7	0.3
65+	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	0.8	6	22.2	0.6	5	17.9	0.5
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0		0	0.0		0	0.0	
<b>Race/Ethnicity</b>															
Asian	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.2	1	3.7	0.1	4	14.2	0.3
Black	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	0.5	3	11.1	0.4	4	14.2	0.5
Hispanic	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	0.1	12	44.4	0.3	7	25.0	0.1
White	N/A	N/A	N/A	N/A	N/A	N/A	13	52.0	0.4	11	40.7	0.4	13	46.4	0.5
Other	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0		0	0.0		0	0.0	
<b>SPA</b>															
1	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.5	3	11.1	0.8	1	4.0	0.3
2	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	0.2	2	7.4	0.1	6	21.4	0.3
3	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	0.5	4	14.8	0.3	6	21.4	0.3
4	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.1	3	11.1	0.2	4	14.2	0.3
5	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.5	1	3.7	0.2	2	7.1	0.3
6	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.2	9	33.3	0.9	2	7.1	0.2
7	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.1	2	7.4	0.1	4	14.2	0.3
8	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.3	2	7.4	0.2	2	7.1	0.2
Unknown	N/A	N/A	N/A	N/A	N/A	N/A		0.0		1			1		

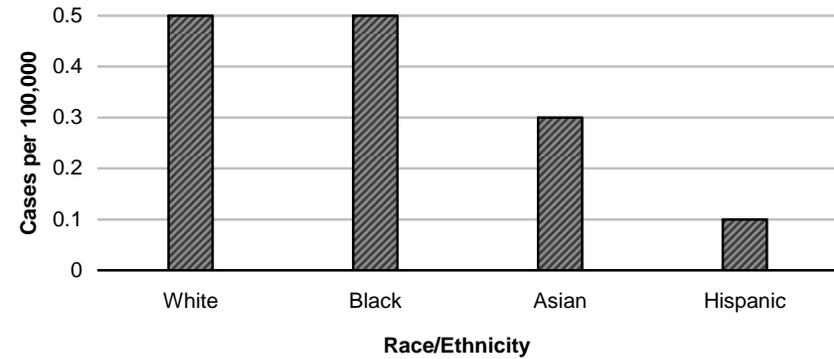
\*Rates calculated based on less than 19 cases or events are considered unreliable.



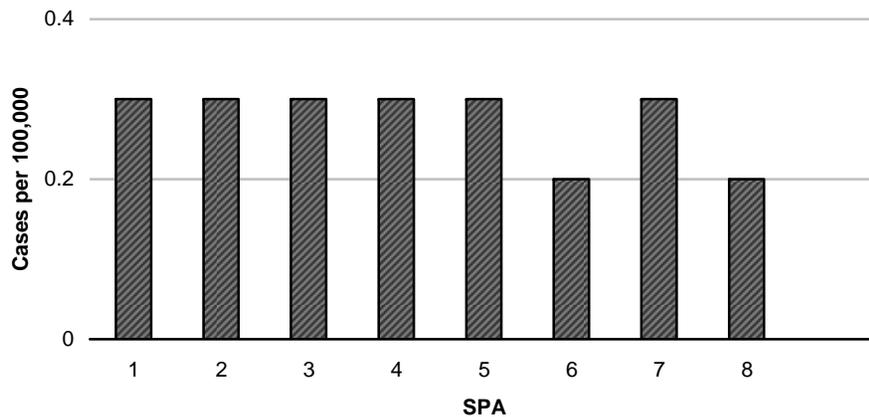
**Figure 1. Incidence Rates\* of Severe *S. aureus* Infection by Age Group LAC, 2010 (N=28)**



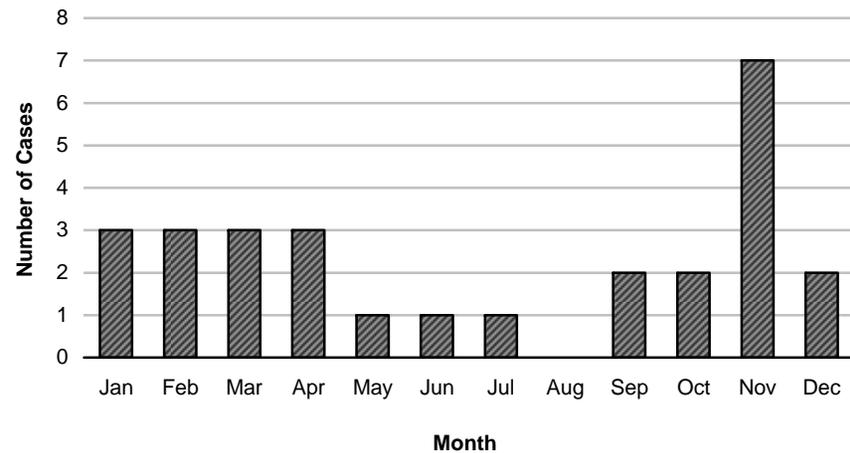
**Figure 2. Severe *S. aureus* Infection Incidence Rates\* by Race/Ethnicity LAC, 2010 (N=28)**



**Figure 3. Incidence Rates\* of Severe *S. aureus* Infection by SPA LAC, 2010 (N=28)**



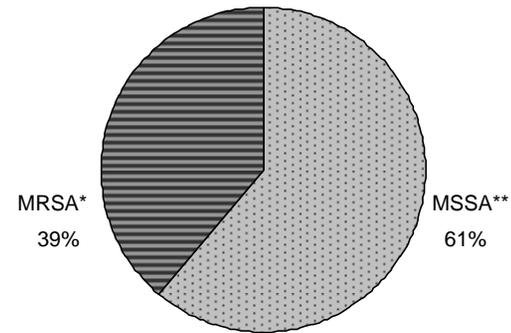
**Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2010 (N=28)**



\*Rates calculated based on less than 19 cases or events are considered unreliable



**Figure 5. Percent Cases of Severe *S. aureus* Infection by Methicillin-Resistance Type LAC, 2010 (N=28)**



\*MRSA=Methicillin Resistance *Staphylococcus aureus*

\*\*MSSA=Methicillin Sensitive *Staphylococcus aureus*

x

**Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2010**

Syndrome	Number	Percent*
Bacteremia (without focus)	16	57
Pneumonia	11	40
Septic emboli	4	14
Wound Infection	4	14
Endocarditis	4	14
Skin Infection	3	11
Osteomyelitis	2	7
Meningitis	1	4
Septic Arthritis	1	4
Other	6	21

\*Overlapping syndromes will total over 100%.

**Table 1. Severe *S. aureus* Risk Factors by Date of Onset, 2009-2010**

	2009 N = 27 %*	2010 N = 28 %*
Diabetes	15	32
Current Smoker	7	4
Emphysema	0	0
Alcohol Abuse	0	4
Asthma	4	4
Intravenous Drug Use	15	4
HIV/AIDS	4	4
Malignancy	4	0
Liver Disease	0	14
Other Skin Condition	0	4
Other	41	29
None	22	39

\*Overlapping risk factors will total over 100%.



## SEVERE *STAPHYLOCOCCUS AUREUS* INFECTION IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	27
Annual Incidence	
LA County <sup>a</sup>	0.28
California	N/A
United States	N/A
Age at Diagnosis	
Mean	46
Median	48
Range	1 - 90 years

<sup>a</sup>Cases per 100,000 population.

### DESCRIPTION

*Staphylococcus aureus* is a well known bacterial cause of skin infections, causing boils, abscesses, and cellulitis. Infection can result in severe illness, including invasive skin and soft-tissue infection, necrotizing fasciitis, musculoskeletal infection like pyomyositis and osteomyelitis, severe pneumonia, empyema, necrotizing pneumonia, disseminated infections with septic emboli, bacteremia, sepsis syndrome, and death. Statewide surveillance of severe *S. aureus* infections in previously healthy persons began in February 2008. For surveillance purposes, severe *S. aureus* infection in a previously healthy person is defined as isolation of *S. aureus* from either a sterile or non-sterile site in a patient that has died or has been admitted to the hospital intensive care unit (ICU). In addition, the patient must be previously healthy, (i.e., no hospitalizations, surgery, dialysis, residence in long-term care, or percutaneous device/indwelling catheter within the past year).

*Staphylococcus aureus* is one of the most common bacterial causes of skin infections that result in a visit to a doctor or the hospital. However, most of these infections do not result in ICU admission or death. Therefore, the data presented in this report underestimate all disease caused by this organism in Los Angeles County (LAC).

### 2009 TRENDS AND HIGHLIGHTS

- Cases aged 65 years and older had the highest rate (0.6 per 100,000) followed by cases aged 45-54 years and 55-64 years both groups of which had a rate of 0.4 cases per 100,000 (Figure 1).
- Blacks and whites had the highest rates of severe *S. aureus* infection at 0.4 cases per 100,000. Asians had the lowest rate at 0.1 cases per 100,000 (Figure 2).
- Service Planning Areas (SPAs) 1 and 6 had the highest rates of severe *S. aureus* infection at 0.8 and 0.9 cases per 100,000, respectively (Figure 3).
- The number of cases of severe *S. aureus* infection peaked during the month of February (Figure 4).
- The percentage of *S. aureus* infections resistant to methicillin was 59% (Figure 5).
- Diabetes and intravenous drug use were reported more than any other risk factors (Table 1).
- Severe *S. aureus* cases presented most often with pneumonia, wound infections, and skin infections (Table 2).
- Forty-one percent of cases were reported by only three hospitals in LAC. Thus, it is suspected that there has been significant underreporting of severe *S. aureus* infections in LAC.



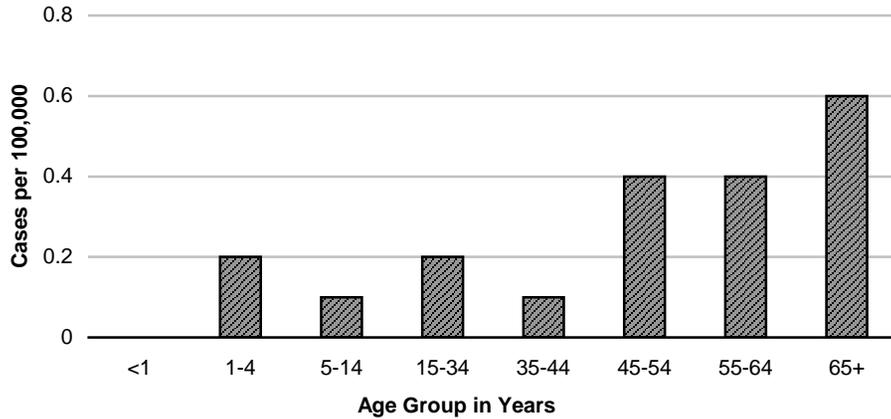
**Reported Severe *Staphylococcus Aureus* Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2005-2009**

	2005			2006			2007			2008 (N=25)			2009 (N=27)		
	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000
<b>Age Group</b>															
<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.7	0	0.0	0.0
1-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	0.0	1	3.7	0.2
5-14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.1	2	7.4	0.1
15-34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.0	5	18.5	0.2
35-44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.1	3	11.1	0.1
45-54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7	28.0	0.5	6	22.2	0.4
55-64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	0.4	4	14.8	0.4
65+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	0.8	6	22.2	0.6
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0		0	0.0	
<b>Race/Ethnicity</b>															
Asian	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.2	1	3.7	0.1
Black	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	0.5	3	11.1	0.4
Hispanic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	0.1	12	44.4	0.3
White	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	52.0	0.4	11	40.7	0.4
Other	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	0.0	0	0.0	0.0
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0		0	0.0	
<b>SPA</b>															
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.5	3	11.1	0.8
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	0.2	2	7.4	0.1
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	0.5	4	14.8	0.3
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.1	3	11.1	0.2
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.5	1	3.7	0.2
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	0.2	9	33.3	0.9
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0.1	2	7.4	0.1
8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	0.3	2	7.4	0.2
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0		1		

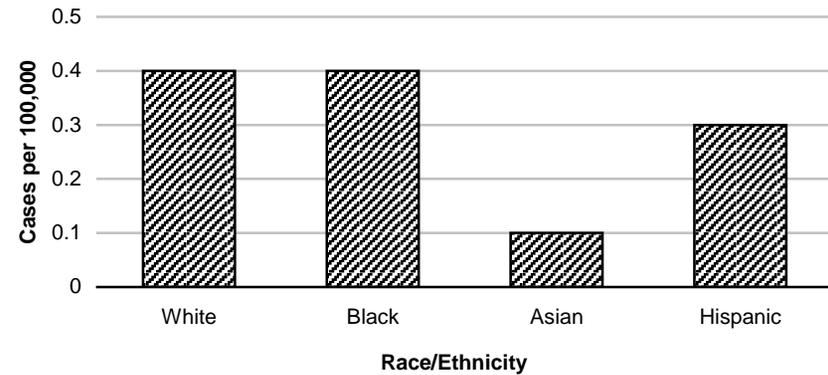
\*Rates calculated based on less than 19 cases or events are considered unreliable.



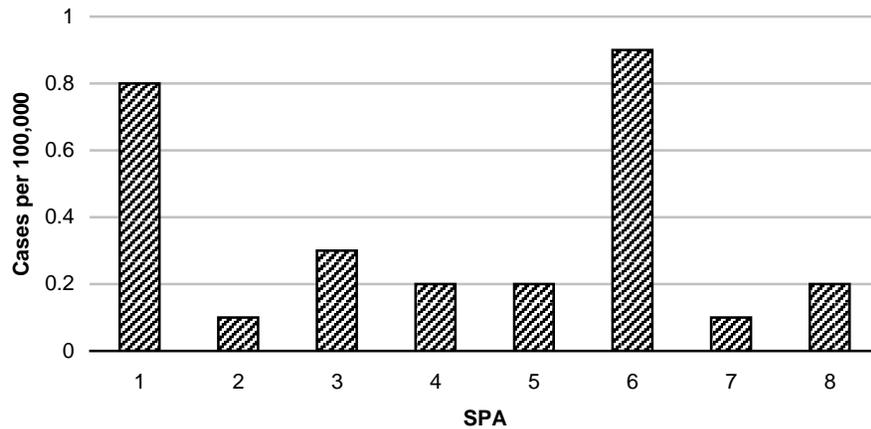
**Figure 1. Incidence Rates of Severe *S. aureus* Infection by Age Group LAC, 2009 (N=27)**



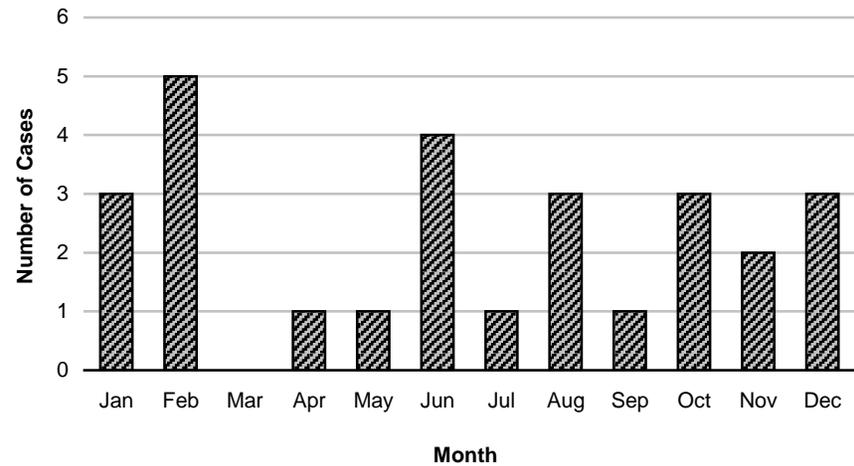
**Figure 2. Severe *S. aureus* Infection Incidence Rates by Race/Ethnicity LAC, 2009 (N=27)**



**Figure 3. Incidence Rates of Severe *S. aureus* Infection by SPA LAC, 2009 (N=27)**

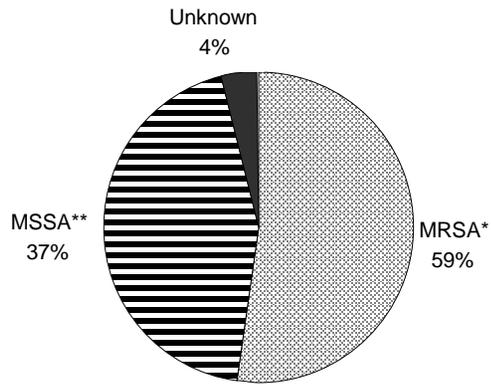


**Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2009 (N=27)**





**Figure 5. Percent Cases of Severe *S. aureus* Infection by Type LAC, 2009 (N=27)**



\*MRSA=Methicillin Resistance *Staphylococcus aureus*  
 \*\*MSSA=Methicillin Sensitive *Staphylococcus aureus*

**Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2009**

Syndrome	Number	Percent*
Pneumonia	12	44
Bacteremia (without focus)	3	11
Wound Infection	5	19
Skin Infection	5	19
Meningitis	3	11
Septic Arthritis	1	4
Osteomyelitis	1	4
Bursitis	0	0
Endocarditis	2	7

\*Overlapping syndromes will total over 100%.

**Table 1. Percentage of Severe *S. aureus* Risk Factors – Based on Date of Onset Between 1/1/08-12/31/2009**

	2008	2009
	N = 25	N = 27
	%**	%**
Diabetes	28	15
Current Smoker	28	7
Emphysema	20	0
Alcohol Abuse	16	0
Asthma	16	4
Intravenous Drug Use	8	15
HIV/AIDS	4	4
Malignancy	4	4
Other	24	41
None	16	22

\*Persons with unknown risk factor information excluded.

\*\*Overlapping risk factors will total over 100%.