



SEVERE *STAPHYLOCOCCUS AUREUS* INFECTION IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	9
Annual Incidence	
LA County ^a	0.09
California ^b	0.20
United States ^c	N/A
Age at Diagnosis	
Mean	57
Median	58
Range	34–78 years

^aCases per 100,000 population

^bSee Yearly Summary Reports of Selected General Communicable Diseases in California at:

<https://www.cdph.ca.gov/data/statistics/Documents/YearlySummaryReportsofSelectedGeneralCommDiseasesinCA2011-2015.pdf>

^cNot 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 such as 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. Those who are intravenous drug users, with skin injuries or disorders, with intravenous catheters, with surgical incisions, and with weakened immune systems due to disease or to immune-suppressing medications have an increased risk of developing *S. aureus* infections.

In February 2008, in response to the significant public health burden and potential severity of community-associated *S. aureus* infections, the CDPH 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.

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). Additionally, this definition includes laboratory-confirmed infections in deaths who had not been hospitalized or had surgery, dialysis, or residency in a long-term care facility in the year prior to illness. Lastly, this definition includes laboratory-confirmed infections in those who 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 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 LAC.

2015 TRENDS AND HIGHLIGHTS

- Cases ≥ 65 years old had the highest rate (0.3 per 100,000) in 2015.
- Blacks, Hispanics, and Whites had the same rate (0.1 per 100,000) (Figure 2) while 22.2% of cases had no designated race/ethnicity.
- The male to female ratio in 2015 was 2:1.
- The incidence rate was highest in SPA 4 (0.2 per 100,000) (Figure 3).
- Cases were distributed throughout the year, peak months being January, February, and August (Figure 4).
- Nearly one-fourth ($n=2$, 22.2%) of the reported cases were MRSA infections (Figure 5).
- The most frequently reported risk factors were alcohol abuse, diabetes, obesity, and intravenous drug use (Table 1).



- Pneumonia, septic shock, septic emboli, and endocarditis were among the common presentations for *S. aureus* infections (Table 2).



**Reported Severe *Staphylococcus Aureus* Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
LAC, 2011-2015**

	2011 (N=44)			2012 (N=24)			2013 (N=26)			2014 (N=17)			2015 (N=9)		
	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000
Age Group															
<1	0	0.0	0.0	1	4.2	0.8	1	3.8	0.8	0	0.0	0.0	0	0.0	0.0
1-4	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
5-14	2	4.5	0.2	1	4.2	0.1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
15-34	6	13.6	0.2	3	12.5	0.1	7	26.9	0.2	3	17.6	0.1	1	11.1	0.0
35-44	6	13.6	0.4	2	8.3	0.2	2	7.7	0.2	3	17.6	0.2	1	11.1	0.1
45-54	9	20.5	0.7	3	12.5	0.2	6	23.1	0.5	3	17.6	0.2	1	11.1	0.1
55-64	8	18.2	0.8	5	20.8	0.5	5	19.2	0.5	3	17.6	0.3	2	22.2	0.2
65+	13	29.5	1.2	9	37.5	0.8	5	19.2	0.5	5	29.4	0.4	4	44.4	0.3
Unknown	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Race/Ethnicity															
Asian	7	15.9	0.5	4	16.7	0.3	3	11.5	0.2	4	23.5	0.3	0	0.0	0.0
Black	3	6.8	0.4	4	16.7	0.5	5	19.2	0.6	2	11.8	0.3	1	11.1	0.1
Hispanic	17	38.6	0.4	4	16.7	0.1	10	38.5	0.2	3	17.6	0.1	3	33.3	0.1
White	15	34.1	0.5	10	41.7	0.4	8	30.8	0.3	0	0.0	0.0	3	33.3	0.1
Other	1	2.3	-	1	4.2	-	0	-	-	1	5.9	-	0	-	-
Unknown	1	2.3	-	1	4.2	-	0	-	-	7	41.2	-	2	22.2	-
SPA															
1	0	0.0	0.0	2	8.3	0.5	1	3.8	0.3	0	0.0	0.0	0	0.0	0.0
2	12	27.3	0.5	1	4.2	0.0	6	23.1	0.3	2	11.8	0.1	1	11.1	0.0
3	7	15.9	0.4	8	33.3	0.5	1	3.8	0.1	6	35.3	0.4	2	22.2	0.1
4	2	4.5	0.2	2	8.3	0.2	4	15.4	0.4	5	29.4	0.4	2	22.2	0.2
5	5	11.4	0.8	1	4.2	0.2	2	7.7	0.3	1	5.9	0.2	0	0.0	0.0
6	11	25.0	1.0	5	20.8	0.5	5	19.2	0.5	1	5.9	0.1	1	11.1	0.1
7	5	11.4	0.4	4	16.7	0.3	3	11.5	0.2	0	0.0	0.0	0	0.0	0.0
8	1	2.3	0.1	0	0.0	0.0	2	7.7	0.2	2	11.8	0.2	1	11.1	0.1
Unknown	1	2.3	-	1	4.2	-	2	7.7	-	0	-	-	2	22.2	-

*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, 2014-2015

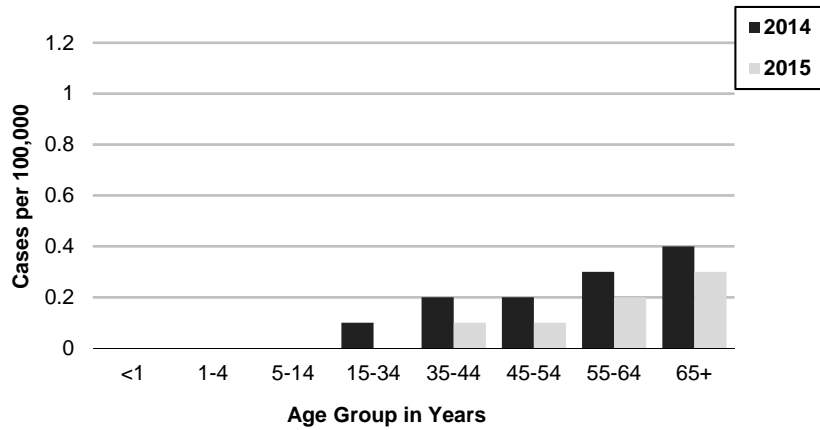


Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity, LAC, 2014-2015

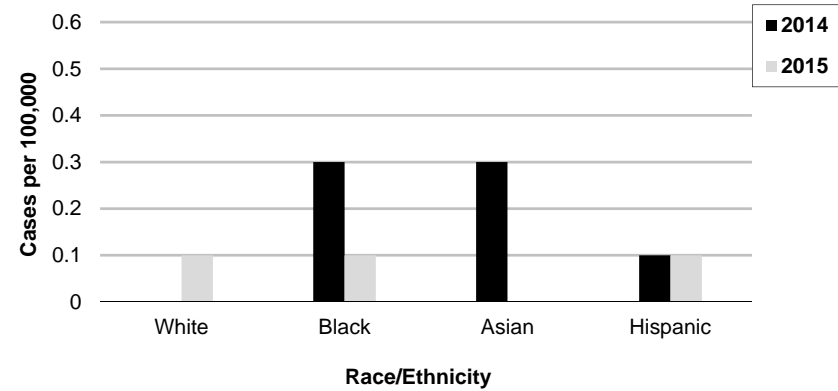


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2014-2015

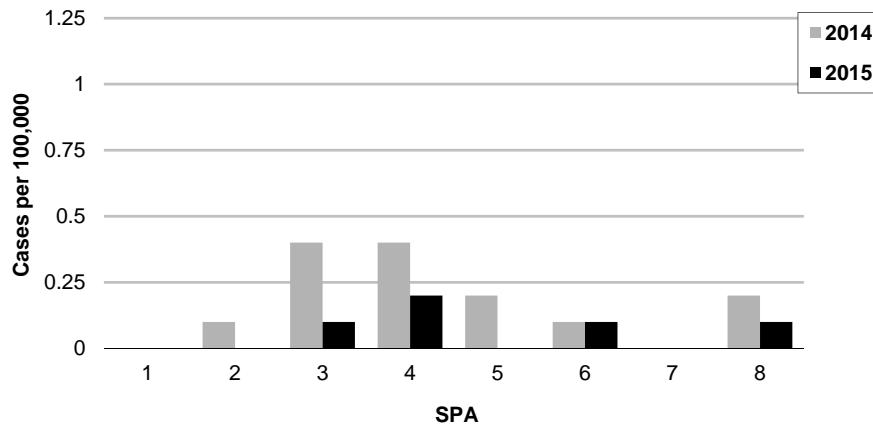
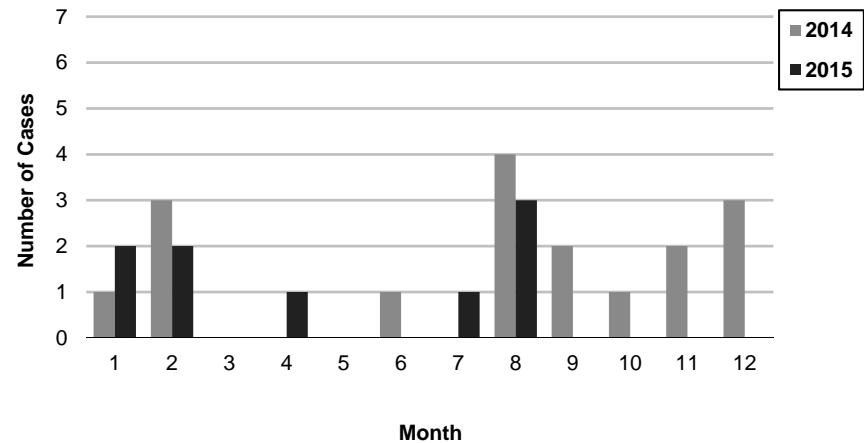


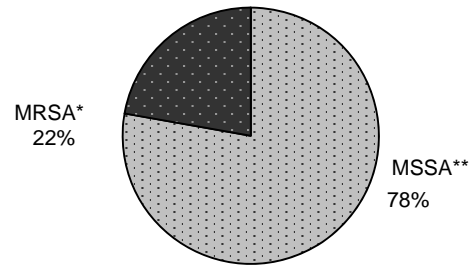
Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2014-2015



*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, 2015 (N=9)



*MRSA=Methicillin Resistance *Staphylococcus aureus*

**MSSA=Methicillin Sensitive *Staphylococcus aureus*

Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2015 (N=9)

Syndrome	Number	Percent*
Pneumonia	2	22.2
Bacteremia (without focus)	1	11.1
Septic Shock	2	22.2
Endocarditis	2	22.2
Septic emboli	2	22.2
Other	1	11.1
Meningitis	1	11.1

*Overlapping syndromes will total over 100%.

Table 1. Severe *S. aureus* Medical Conditions by Date of Onset, 2014-2015

	2014 N = 17		2015 N = 9	
	N	%*	N	%*
Alcohol Abuse	1	6	3	33
Diabetes	6	35	2	22
Obesity	0	0	2	22
IVDU	0	0	2	22
Chronic Dermatitis	1	6	1	11
Current Smoker	3	18	1	11
Emphysema	3	18	1	11
HIV/AIDS	2	12	1	11
None	2	12	1	11
Unknown	0	0	1	11
Chronic Renal	0	0	1	11
Malignancy-Hem	0	0	1	11
Other	5	29	0	0
Intravenous Drug Use	3	18	0	0
Malignancy-Solid	2	12	0	0
Liver Disease	0	0	0	0

*Overlapping risk factors will total over 100%.





STAPHYLOCOCCUS AUREUS, SEVERE INFECTIONS IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	17
Annual Incidence	
LA County ^a	0.18
California ^b	0.30
United States ^c	N/A
Age at Diagnosis	
Mean	55
Median	50
Range	23–97 years

^aCases per 100,000 population

^bSee Yearly Summary Reports of Selected General Communicable Diseases in California at: <http://www.cdph.ca.gov/data/statistics/Pages/CDdata.aspx> (2013 data)

^cNot notifiable.

DESCRIPTION

Staphylococcus aureus (*S. aureus*) is bacteria that can cause a number of infections and syndromes as a result of its ability to infect various tissues of the body and to produce toxins. *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, necrotizing pneumonia, and toxic shock syndrome.

Certain groups of people are at greater risk of getting *S. aureus* infections. This includes: injection drug users, those with skin injuries or disorders, those with intravenous catheters or surgical incisions, and those with a weakened immune system due either to disease or a result of immune suppressing medications. Risk also is increased among people with chronic conditions such as diabetes, cancer, vascular disease, and lung disease.

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.

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 a person who died and 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.

Because the large majority of *S. aureus* infections not result in an ICU admission or death, the data presented in this report substantially underestimates all disease caused by this organism in LAC.

2014 TRENDS AND HIGHLIGHTS

- Because of the low number of reported cases each year, interpreting trends and associations is difficult as rates may be significantly affected by the occurrence of a small number of cases. For example, whereas in 2014 there were no cases among infants, in 2010, 2012 and 2013, a single infant case resulted in the incidence rate among those <1 year old being higher than for any other age group. In 2014, cases aged 65 years and older had the highest rate (0.4 per 100,000) and each year, after infancy rates have increased with age (Figure 1).
- Blacks and Asians had the highest rate (0.6 per 100,000) (Figure 2).
- The male to female ratio in 2014 was 1:0.6.
- The incidence rate was highest in SPAs 3 and 4 (0.4 per 100,000) (Figure 3).
- Cases were distributed throughout the year with the peak months being December, February and August (Figure 4).
- Four (24%) of the reported *S. aureus* infections were resistant to methicillin (Figure 5).
- The most frequently reported risk factors were diabetes and being a current smoker (Table 1). Intravenous drug use was present



- for about 20% of cases in each of 2013 and 2014.
- Reported severe *S. aureus* cases presented most often with pneumonia, bacteremia, and/or the toxic shock syndrome (Table 2).
 - Thirty percent of cases were reported from the LAC coroner and >50% of cases came from two reporting sources. 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, 2010-2014**

Age Group	2010 (N=28)		2011 (N=44)		2012 (N=24)		2013 (N=26)		2014 (N=17)		
	No.	Rate/ 100,000 (%)	No.	Rate/ 100,000 (%)	No.	Rate/ 100,000 (%)	No.	Rate/ 100,000 (%)	No.	Rate/ 100,000 (%)	
<1	1	4.0	0	-	1	4.2	0.8	1	3.8	0	0.8
1-4	0	-	0	-	0	-	-	0	-	0	-
5-14	3	10.7	2	4.5	1	4.2	0.1	0	-	0	-
15-34	6	21.4	6	13.6	3	12.5	0.1	7	26.9	3	17.6
35-44	3	10.7	6	13.6	2	8.3	0.2	2	7.7	3	17.6
45-54	7	25.0	9	20.4	3	12.5	0.2	6	23.0	3	17.6
55-64	3	10.7	8	18.2	5	20.8	0.5	5	19.2	3	17.6
65+	5	17.9	13	29.5	9	37.5	0.8	5	19.2	5	29.4
Unknown	0	-	0	-	0	-	-	0	-	0	-
Race/Ethnicity											
Asian	4	14.2	7	15.9	4	16.7	0.3	3	11.5	4	23.5
Black	4	14.2	3	6.8	4	16.7	0.5	5	19.2	2	11.8
Hispanic	7	25.0	17	38.6	4	16.7	0.1	10	38.5	3	17.6
White	13	46.4	15	34.1	10	41.7	0.4	8	30.8	0	0.3
Other	0	-	1	2.3	1	4.2	-	0	-	1	5.9
Unknown	0	-	1	2.3	1	4.2	-	1	4.2	7	41.2
SPA											
1	1	4.0	0	-	2	8.3	0.5	1	7.7	0	0.3
2	6	21.4	12	27.3	1	4.2	0.0	6	23.0	2	11.8
3	6	21.4	7	15.9	8	33.3	0.5	1	3.8	6	35.3
4	4	14.2	2	4.5	2	8.3	0.2	4	15.4	5	29.4
5	2	7.1	5	11.4	1	4.2	0.2	2	7.7	1	5.9
6	2	7.1	11	25.0	5	20.8	0.5	5	19.2	1	5.9
7	4	14.2	5	11.4	4	16.7	0.3	3	11.5	0	0.2
8	2	7.1	1	2.3	0	-	-	2	7.7	2	11.8
Unknown	1	4.0	1	2.3	1	4.2	-	2	7.7	0	0.2

*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, 2012-2014

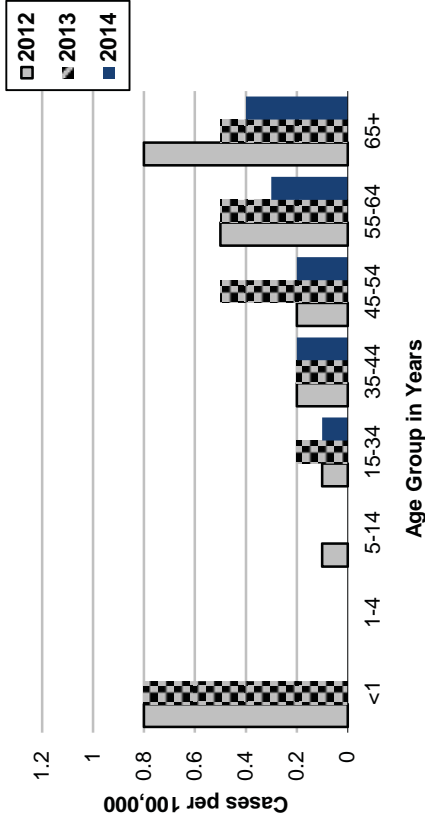
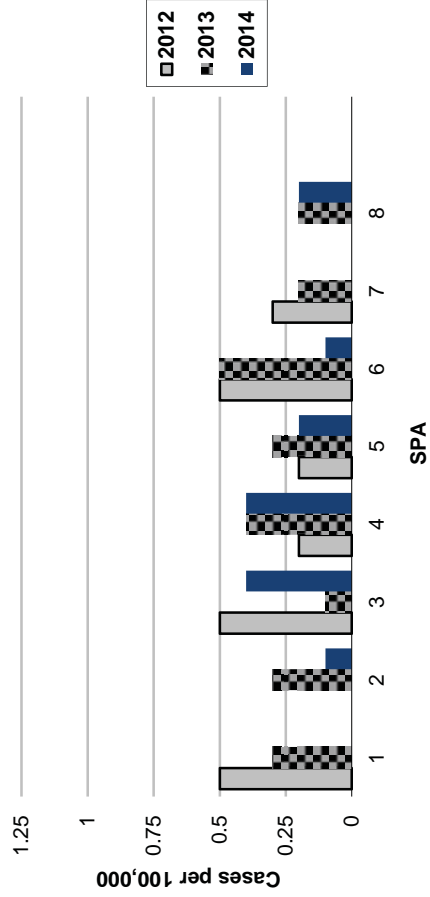


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2012-2014



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

Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity LAC, 2012-2014

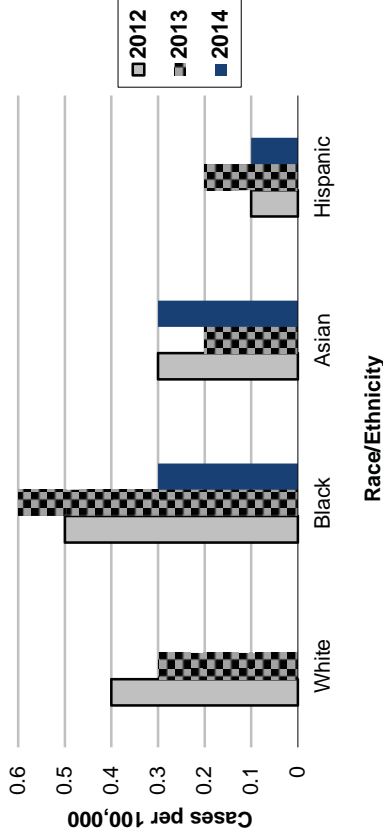


Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2012-2014

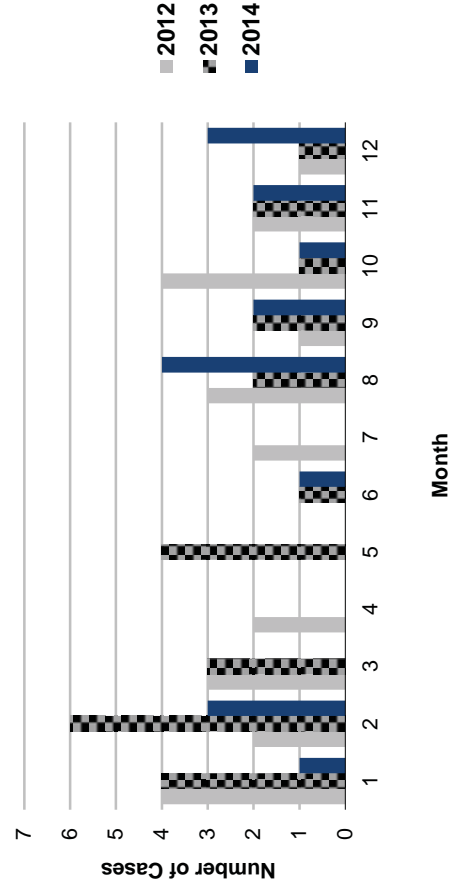
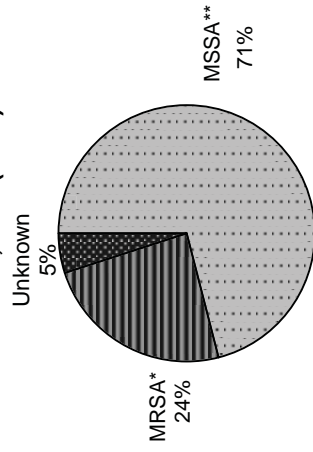




Figure 5. Percent Cases of Severe *S. aureus* Infection by Methicillin-Resistance Type LAC, 2014 (N=17)



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

Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2014

Syndrome	Number	Percent*
Pneumonia	7	41
Bacteremia (without focus)	5	29
Toxic Shock Syndrome	5	29
Endocarditis	3	18
Septic emboli	3	18
Skin Infection	2	12
Other	1	6
Meningitis	0	0
Septic arthritis	0	0

*Overlapping syndromes will total over 100%.

Table 1. Severe *S. aureus* Medical Conditions by Year of Onset, 2013-2014

	2013 N=26		2014 N=17	
	N	(%)	N	(%)
Diabetes	7	(27)	6	(35)
Other	8	(31)	5	(29)
Current Smoker	6	(23)	3	(18)
Intravenous Drug Use	5	(19)	3	(18)
Emphysema	2	(8)	3	(18)
HIV/AIDS	2	(8)	2	(12)
Malignancy-Solid	1	(4)	2	(12)
None	7	(27)	2	(12)
Alcohol Abuse	3	(12)	1	(6)
Chronic Dermatitis	0	0	1	(6)
Liver Disease	8	(31)	0	0
Heart Failure/CHF	3	(12)	0	0
Chronic Renal Insufficiency	2	(8)	0	0
Malignancy-Hem	1	(4)	0	0
Asthma	0	0	0	0
Eczema	0	0	0	0

*Overlapping risk factors will total over 100%.



SEVERE *STAPHYLOCOCCUS AUREUS* INFECTION IN PREVIOUSLY HEALTHY PERSONS

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

^aCases per 100,000 population

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

^cNot 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	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	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		
Race/Ethnicity															
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		
SPA															
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	

* 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, 2011-2013

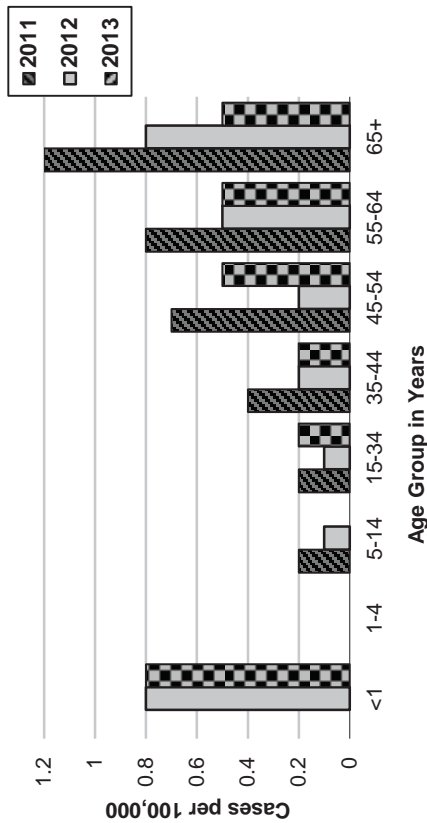


Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity LAC, 2011-2013

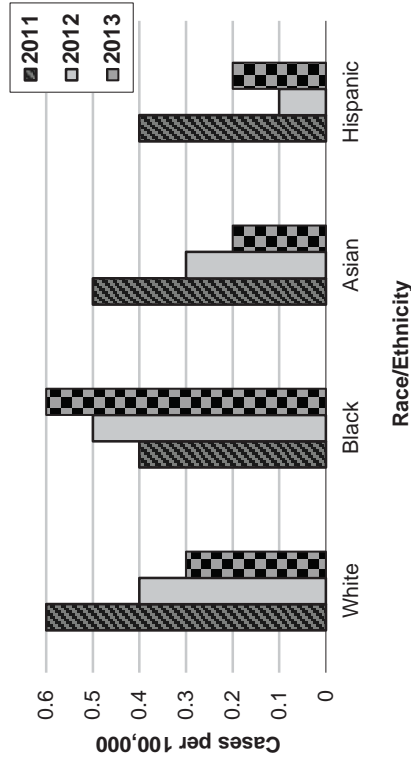


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2011-2013

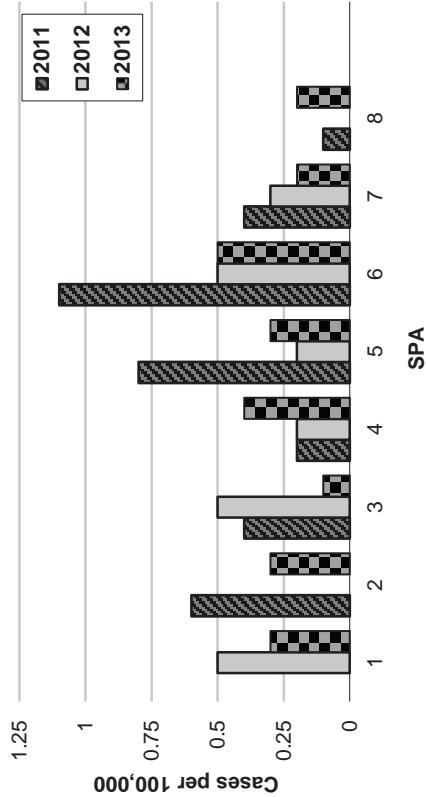
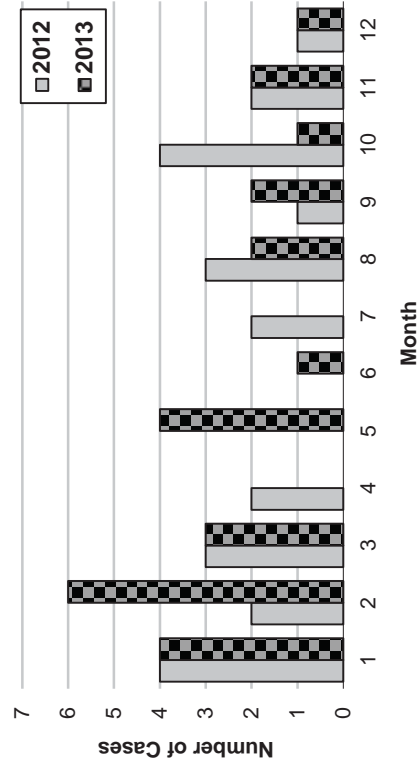


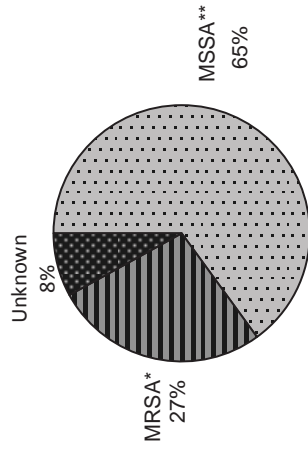
Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2012-2013



*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, 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%.



SEVERE STAPHYLOCOCCUS AUREUS INFECTION IN PREVIOUSLY HEALTHY PERSONS

CRUDE DATA	
Number of Cases	24
Annual Incidence	
LA County ^a	0.26
California ^b	--
United States ^c	N/A
Age at Diagnosis	
Mean	56
Median	58
Range	0-98 years

^aCases per 100,000 population

^bSee Yearly Summary Reports of Selected General Communicable Diseases in California at:
<http://www.cdph.ca.gov/data/statistics/Pages/CD-YearlyTables.aspx>

^cNot 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.

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.

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).

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.



**Reported Severe Staphylococcus Aureus Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
Los Angeles County, 2008-2012**

Age Group	2008 (N=25)			2009 (N=27)			2010 (N=28)			2011 (N=44)			2012 (N=24)		
	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000
<1	1	4.0	0.7	0	0.0	0.0	1	4.0	0.7	0	0.0	0.0	1	4.2	0.8
1-4	0	0.0	0.0	1	3.7	0.2	0	0.0	0	0	0.0	0.0	0	0	0
5-14	2	8.0	0.1	2	7.4	0.1	3	10.7	0.2	2	4.5	0.2	1	4.2	0.1
15-34	1	4.0	0.0	5	18.5	0.2	6	21.4	0.2	6	13.6	0.2	3	12.5	0.1
35-44	2	8.0	0.1	3	11.1	0.1	3	10.7	0.2	6	13.6	0.5	2	8.3	0.2
45-54	7	28.0	0.5	6	22.2	0.4	7	25.0	0.5	9	20.4	0.7	3	12.5	0.2
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		
Race/Ethnicity															
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	
Unknown	0	0.0		0	0.0		0	0.0		1	2.3		1	4.2	
SPA															
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

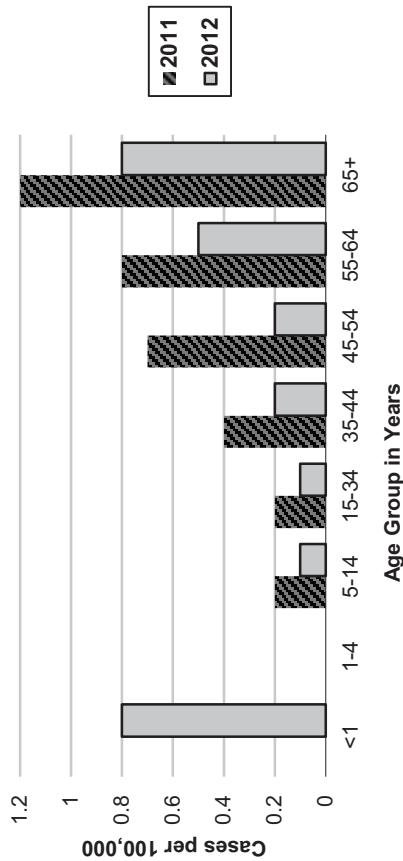


Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity LAC, 2011-2012

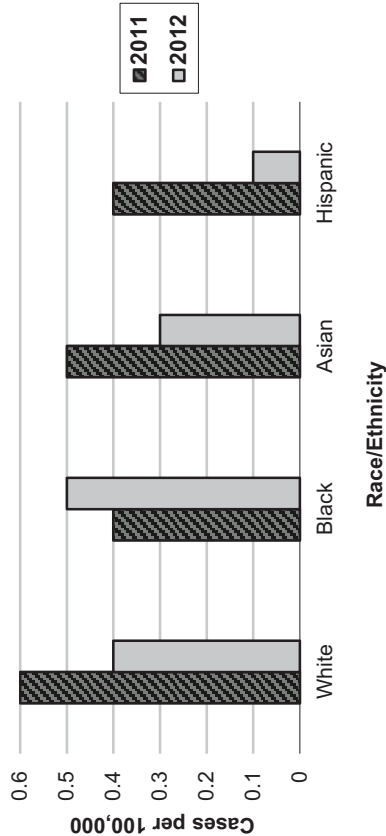


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2011-2012

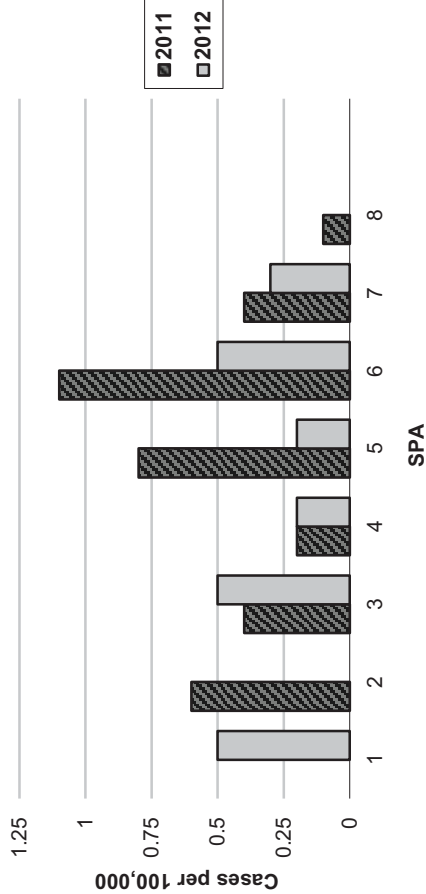
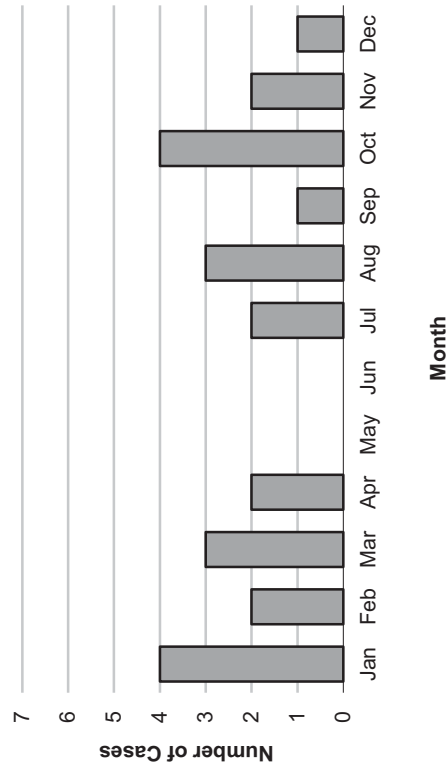


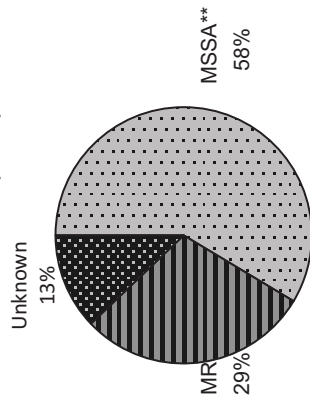
Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2012 (N=24)



*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, 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	44
Annual Incidence	
LA County ^a	0.45
California ^b	--
United States ^c	N/A
Age at Diagnosis	
Mean	53
Median	51
Range	12-96 years

^aCases per 100,000 population

^bSee Yearly Summary Reports of Selected General Communicable Diseases in California at:
<http://www.cdph.ca.gov/data/statistics/Pages/CD-YearlyTables.aspx>

^cNot 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) as a result of their infection with *S. aureus*. 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).

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).

2011 TRENDS AND HIGHLIGHTS

- Cases in the 65+ age group had the highest rate (1.2 per 100,000) followed by cases aged 55-64 years (0.8 per 100,000), there were no cases in the <1 and 1-4 year age groups for 2011 (Figure 1).
- The incidence rate of Hispanics in 2011 (0.4 per 100,000) increased four-fold compared to last year (0.1 per 100,000) (Figure 2).
- For 2011, incidence rates increased in five of eight SPAs compared with 2010, the highest incidence rate was in SPA 6 (1.0 per 100,000). (Figure 3).
- The percentage of *S. aureus* infections resistant to methicillin was 36% (Figure 5).
- Diabetes and being a current smoker were reported more than any other risk factors (Table 1).
- Severe *S. aureus* cases presented most often with bacteremia and pneumonia (Table 2).
- Thirty-two percent of cases were reported by just one hospital 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, 2008-2011**

Age Group	2007		2008 (N=25)		2009 (N=27)		2010 (N=28)		2011 (N=44)	
	No.	(%) Rate/ 100,000	No.	(%) Rate/ 100,000	No.	(%) Rate/ 100,000	No.	(%) Rate/ 100,000	No.	(%) Rate/ 100,000
<1	N/A	N/A	1	4.0	0	0.0	1	4.0	0	0.0
1-4	N/A	N/A	0	0.0	1	3.7	0	0.0	0	0.0
5-14	N/A	N/A	2	8.0	2	7.4	3	10.7	2	4.5
15-34	N/A	N/A	1	4.0	5	18.5	6	21.4	6	13.6
35-44	N/A	N/A	2	8.0	3	11.1	3	10.7	6	13.6
45-54	N/A	N/A	7	28.0	6	22.2	7	25.0	9	20.4
55-64	N/A	N/A	4	16.0	4	14.8	3	10.7	8	18.2
65+	N/A	N/A	8	32.0	6	22.2	5	17.9	13	29.5
Unknown	N/A	N/A	0	0.0	0	0.0	0	0.0	0	0.0
Race/Ethnicity										
Asian	N/A	N/A	3	12.0	1	3.7	4	14.2	7	15.9
Black	N/A	N/A	4	16.0	3	11.1	4	14.2	3	6.8
Hispanic	N/A	N/A	5	20.0	12	44.4	7	25.0	17	38.6
White	N/A	N/A	13	52.0	11	40.7	13	46.4	15	34.1
Other	N/A	N/A	0	0.0	0	0.0	0	0.0	1	2.3
Unknown	N/A	N/A	0	0.0	0	0.0	0	0.0	1	2.3
SPA										
1	N/A	N/A	2	8.0	3	11.1	1	4.0	0	0.0
2	N/A	N/A	5	20.0	2	7.4	6	21.4	12	27.3
3	N/A	N/A	8	32.0	4	14.8	6	21.4	7	15.9
4	N/A	N/A	1	4.0	3	11.1	4	14.2	2	4.5
5	N/A	N/A	3	12.0	1	3.7	2	7.1	5	11.4
6	N/A	N/A	2	8.0	9	33.3	2	7.1	11	25.0
7	N/A	N/A	1	4.0	2	7.4	4	14.2	5	11.4
8	N/A	N/A	3	12.0	2	7.4	2	7.1	1	2.3
Unknown	N/A	N/A	0	0.0	1	3.7	1	3.7	1	2.3

* 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, 2010-2011

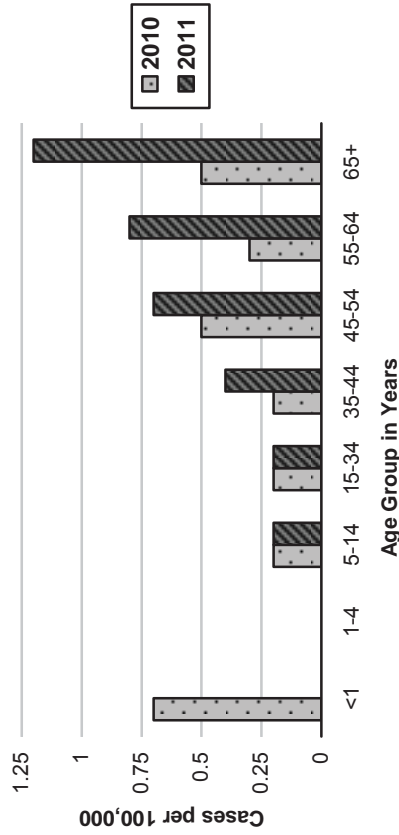


Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity LAC, 2010 -2011

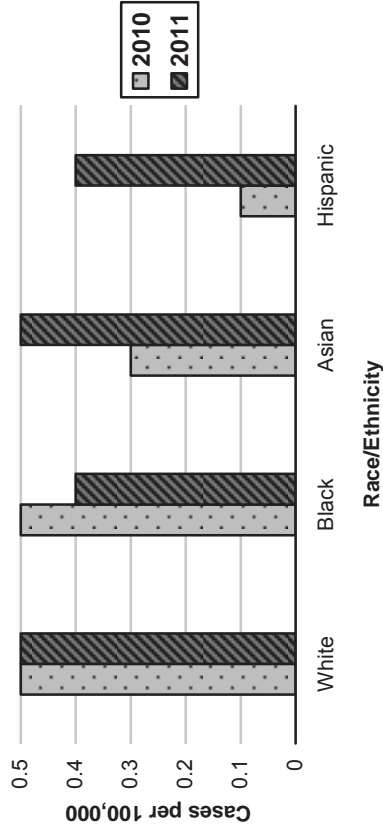


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2010-2011

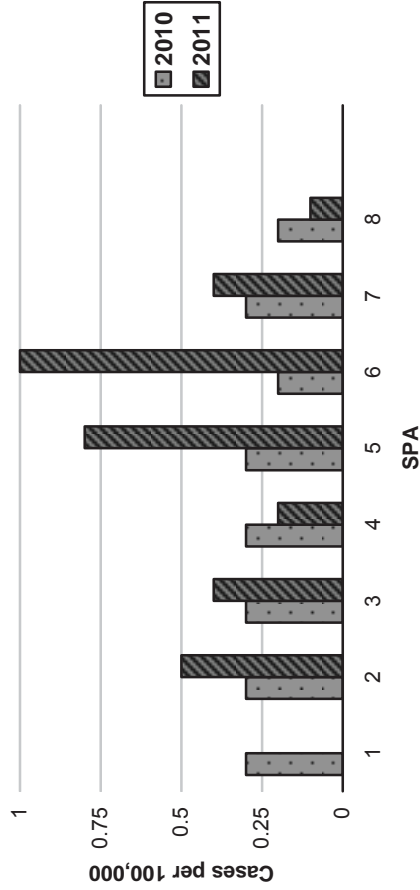
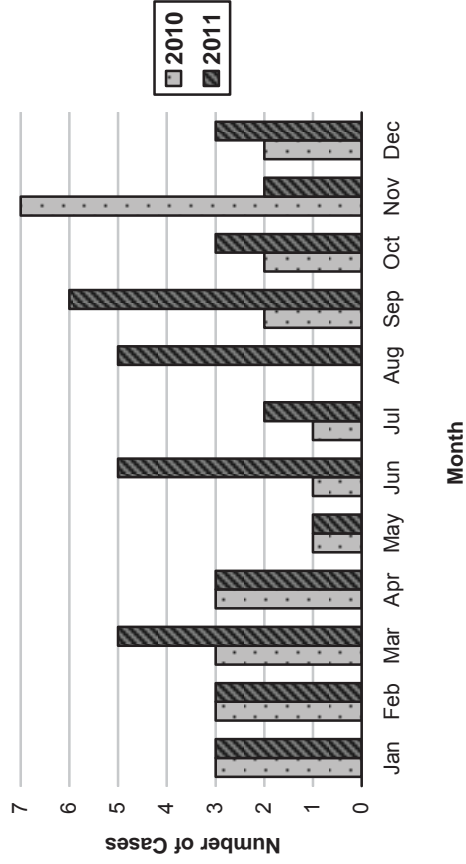


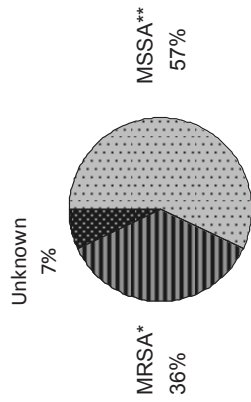
Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2010-2011



*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, 2011 (N=44)



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

Table 2. Frequency and Percentage of Severe *S. aureus* Clinical Syndromes, LAC, 2011

Syndrome	Number	Percent*
Bacteremia (without focus)	26	59
Pneumonia	19	43
Septic emboli	5	11
Wound Infection	4	9
Skin Infection	3	7
Endocarditis	2	5
Osteomyelitis	1	2
Meningitis	1	2
Other	7	16

*Overlapping syndromes will total over 100%.

Table 1. Severe *S. aureus* Risk Factors by Date of Onset, 2010-2011

	2010		2011	
	N = 28	%*	N = 44	%*
Diabetes		32		32
Current Smoker		4		16
Intravenous Drug Use		4		11
Heart Failure/CHF		0		9
Liver Disease		14		9
Alcohol Abuse		4		9
Asthma		4		9
Emphysema		0		7
Malignancy		0		5
HIV/AIDS		4		2
Chronic Renal Insufficiency		0		2
Other Skin Condition		4		0
Other		29		39
None		39		18

*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 ^a	0.29
California ^b	N/A
United States ^b	N/A
Age at Diagnosis	
Mean	42
Median	46
Range	0-88 years

^aCases per 100,000 population.

^bNot 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**

Age Group	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	
<1	N/A	N/A	N/A	N/A	1	4.0	0	0.0	1	4.0	0.7
1-4	N/A	N/A	N/A	N/A	0	0.0	1	3.7	0	0.0	0
5-14	N/A	N/A	N/A	N/A	2	8.0	2	7.4	3	10.7	0.2
15-34	N/A	N/A	N/A	N/A	1	4.0	5	18.5	6	21.4	0.2
35-44	N/A	N/A	N/A	N/A	2	8.0	3	11.1	3	10.7	0.2
45-54	N/A	N/A	N/A	N/A	7	28.0	6	22.2	7	25.0	0.5
55-64	N/A	N/A	N/A	N/A	4	16.0	4	14.8	3	10.7	0.3
65+	N/A	N/A	N/A	N/A	8	32.0	6	22.2	5	17.9	0.5
Unknown	N/A	N/A	N/A	N/A	0	0.0	0	0.0	0	0.0	
Race/Ethnicity											
Asian	N/A	N/A	N/A	N/A	3	12.0	1	3.7	4	14.2	0.3
Black	N/A	N/A	N/A	N/A	4	16.0	3	11.1	4	14.2	0.5
Hispanic	N/A	N/A	N/A	N/A	5	20.0	12	44.4	7	25.0	0.1
White	N/A	N/A	N/A	N/A	13	52.0	11	40.7	13	46.4	0.5
Other	N/A	N/A	N/A	N/A	0	0.0	0	0.0	0	0.0	0.0
Unknown	N/A	N/A	N/A	N/A	0	0.0	0	0.0	0	0.0	
SPA											
1	N/A	N/A	N/A	N/A	2	8.0	3	11.1	1	4.0	0.3
2	N/A	N/A	N/A	N/A	5	20.0	2	7.4	6	21.4	0.3
3	N/A	N/A	N/A	N/A	8	32.0	4	14.8	6	21.4	0.3
4	N/A	N/A	N/A	N/A	1	4.0	3	11.1	4	14.2	0.3
5	N/A	N/A	N/A	N/A	3	12.0	1	3.7	2	7.1	0.3
6	N/A	N/A	N/A	N/A	2	8.0	9	33.3	2	7.1	0.2
7	N/A	N/A	N/A	N/A	1	4.0	2	7.4	4	14.2	0.3
8	N/A	N/A	N/A	N/A	3	12.0	2	7.4	2	7.1	0.2
Unknown	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)

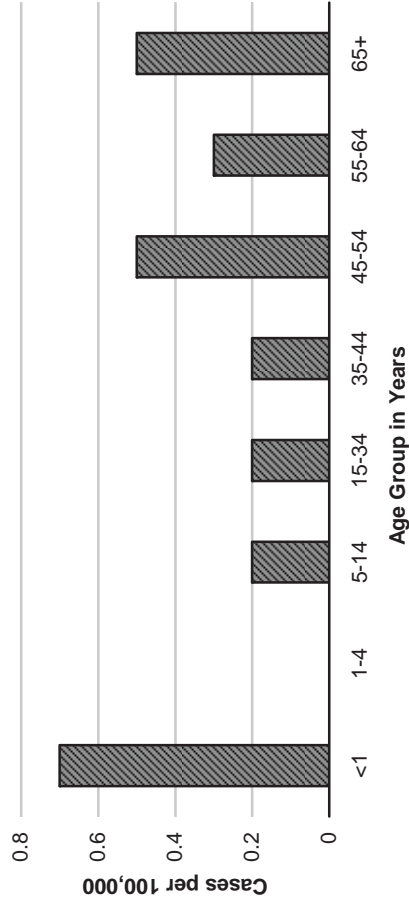


Figure 2. Severe *S. aureus* Infection Incidence Rates* by Race/Ethnicity LAC, 2010 (N=28)

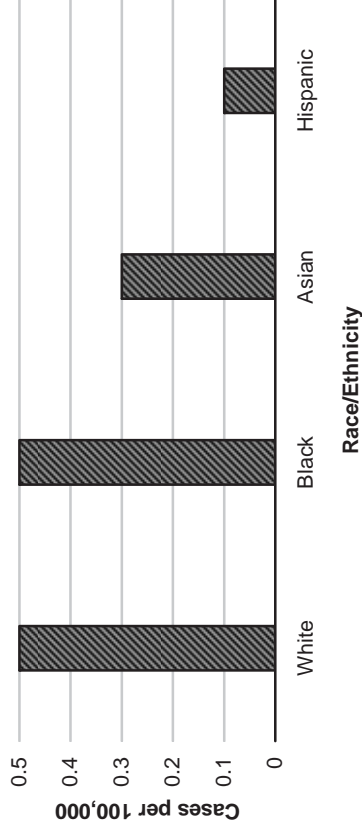


Figure 3. Incidence Rates* of Severe *S. aureus* Infection by SPA LAC, 2010 (N=28)

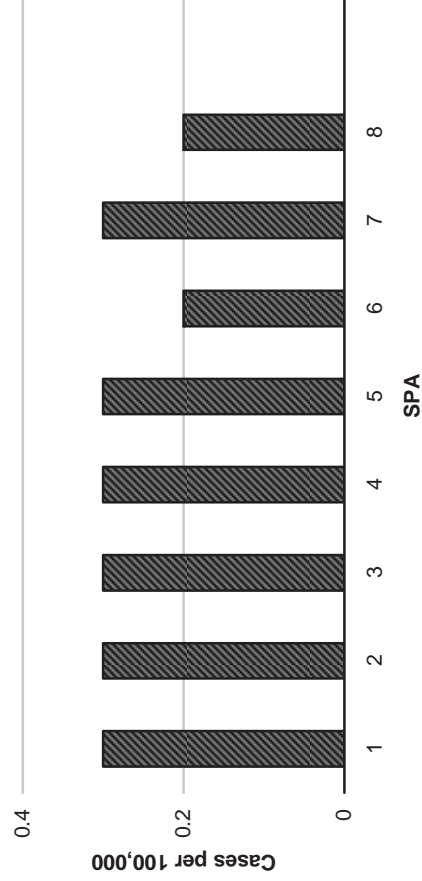
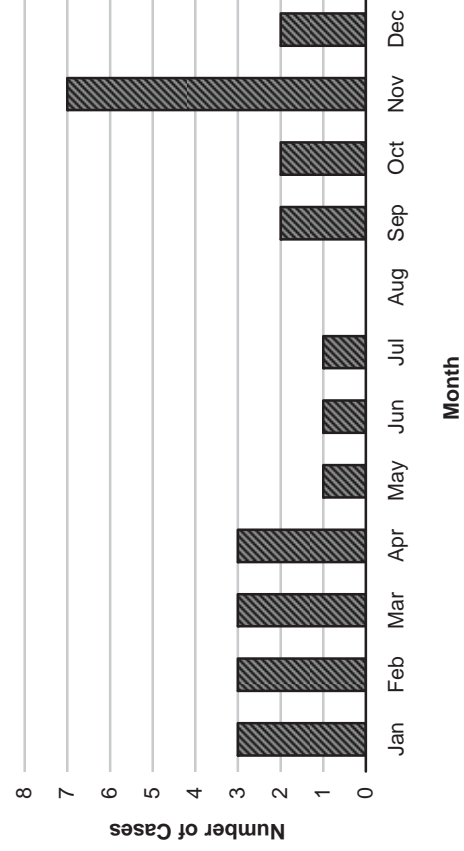


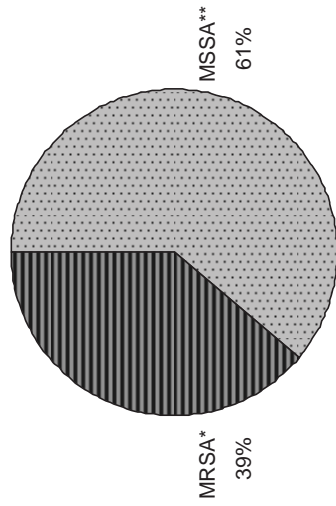
Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2010 (N=28)



*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		2010	
	N = 27	%*	N = 28	%*
Diabetes	15	56	32	114
Current Smoker	7	26	4	14
Emphysema	0	0	0	0
Alcohol Abuse	0	0	4	14
Asthma	4	15	4	14
Intravenous Drug Use	15	56	4	14
HIV/AIDS	4	15	4	14
Malignancy	4	15	0	0
Liver Disease	0	0	14	50
Other Skin Condition	0	0	4	14
Other	41	152	29	104
None	22	81	39	139

*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 ^a	0.28
California	N/A
United States	N/A
Age at Diagnosis	
Mean	46
Median	48
Range	1 - 90 years

^aCases 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**

Age Group	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
<1	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	0	0.0
1-4	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	1	3.7
5-14	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	2	7.4
15-34	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	5	18.5
35-44	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	3	11.1
45-54	N/A	N/A	N/A	N/A	N/A	N/A	7	28.0	6	22.2
55-64	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	4	14.8
65+	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	6	22.2
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	0	0.0
Race/Ethnicity										
Asian	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	1	3.7
Black	N/A	N/A	N/A	N/A	N/A	N/A	4	16.0	3	11.1
Hispanic	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	12	44.4
White	N/A	N/A	N/A	N/A	N/A	N/A	13	52.0	11	40.7
Other	N/A	N/A	N/A	N/A	N/A	N/A	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
SPA										
1	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	3	11.1
2	N/A	N/A	N/A	N/A	N/A	N/A	5	20.0	2	7.4
3	N/A	N/A	N/A	N/A	N/A	N/A	8	32.0	4	14.8
4	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	3	11.1
5	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	1	3.7
6	N/A	N/A	N/A	N/A	N/A	N/A	2	8.0	9	33.3
7	N/A	N/A	N/A	N/A	N/A	N/A	1	4.0	2	7.4
8	N/A	N/A	N/A	N/A	N/A	N/A	3	12.0	2	7.4
Unknown	N/A	N/A	N/A	N/A	N/A	N/A	0	0.0	1	0.0

* 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)

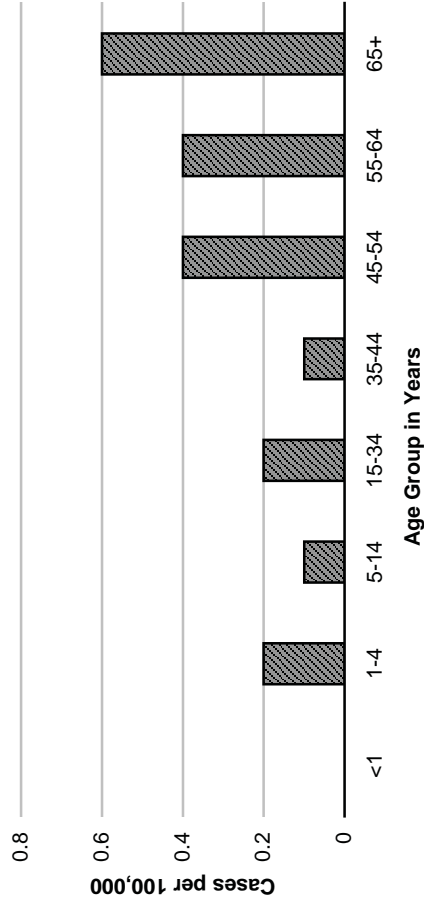


Figure 2. Severe *S. aureus* Infection Incidence Rates by Race/Ethnicity LAC, 2009 (N=27)

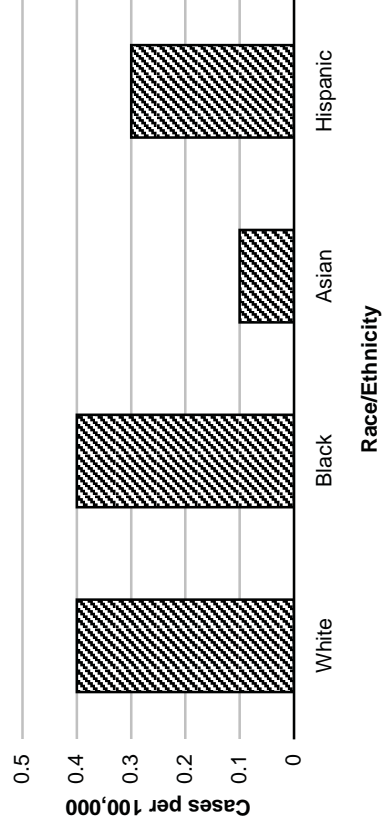


Figure 3. Incidence Rates of Severe *S. aureus* Infection by SPA LAC, 2009 (N=27)

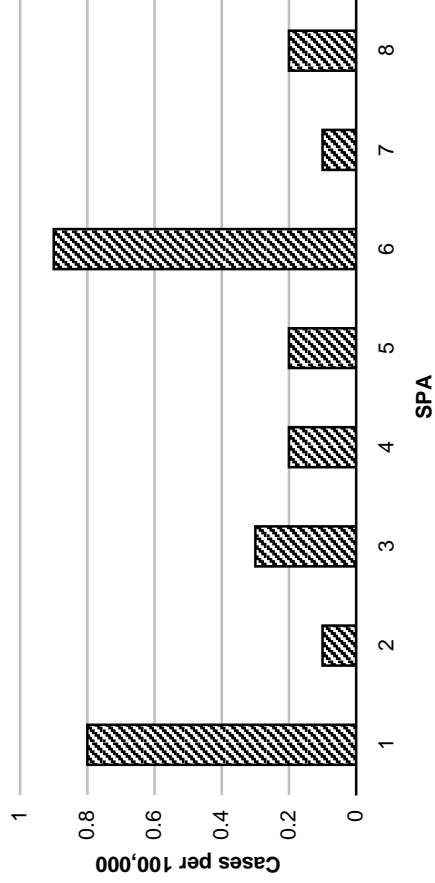


Figure 4. Reported Severe *S. aureus* Cases by Month of Onset LAC, 2009 (N=27)

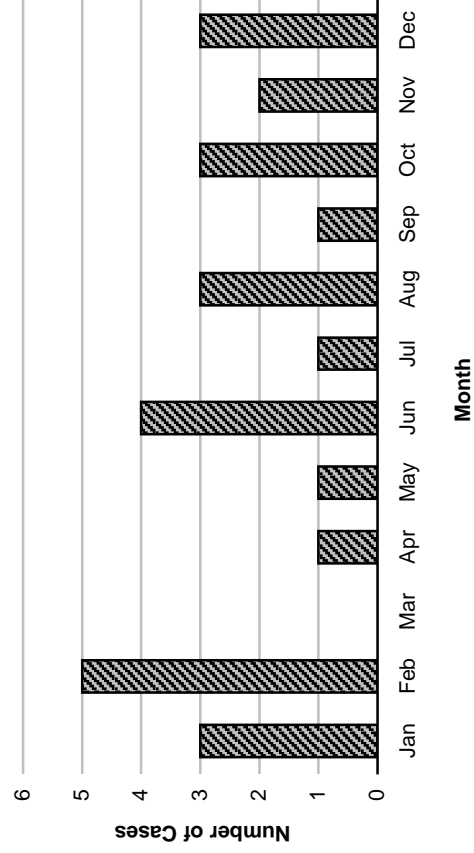
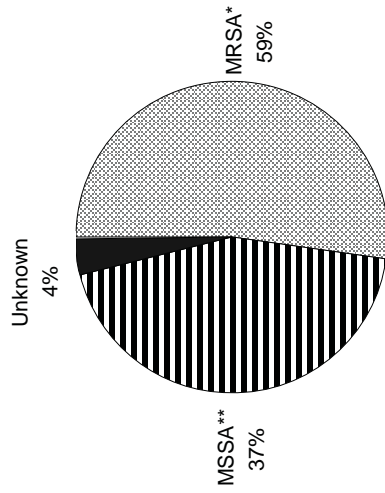




Figure 5. Percent Cases of Severe *S. aureus* Infection by Type LAC, 2009 (N=27)



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

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

	2008 N = 25 %**	2009 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%.

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%.