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Bulletin No. 7 January 26, 2009

## Hospitalizations Associated with *Staphylococcus aureus* Infection — Alaska, 2001–2006

### Background

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections among hospitalized patients have been increasing nationally and are associated with higher morbidity and costs than methicillin-sensitive (MSSA) infections.<sup>1,2</sup> MRSA infections are not reportable to Alaska public health authorities; therefore, the Alaska Hospital Discharge Data Set (HDDS) was used to examine hospitalizations associated with these infections. HDDS is a voluntary system that began in 2001 and includes 17 facilities, accounting for ~85% of Alaska hospitalizations.<sup>3</sup>

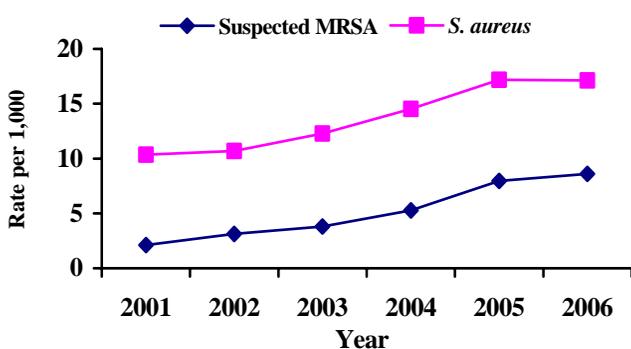
### Methods

ICD-9 codes 038.11 (*S. aureus* septicemia), 041.11 (*S. aureus* not otherwise specified), and 482.41 (*S. aureus* pneumonia) were used to identify hospitalizations with discharge diagnoses of *S. aureus* infections from 2001–2006. Persons discharged with more than one of the above codes during a single hospitalization were only counted once. Those records were then searched for secondary code V09.0, indicating resistance to penicillins. Consistent with other similar studies, V09.0 was used here as an indicator of suspected MRSA infection.<sup>1,4</sup>

### Results

From 2001–2006, 4,517 (13.8/1,000) discharged persons were coded as having had a *S. aureus* infection; of these, 1,717 (5.2/1,000) were coded V09.0 (i.e., suspected MRSA). Proportions of suspected MRSA infections increased over the 6-year period (Table). Rates of all *S. aureus* and suspected MRSA only infections increased from 10.4 to 17.1, and 2.1 to 8.6 per 1,000 discharges, respectively (Chi<sup>2</sup> for linearity p<0.03 and p<0.01, respectively) (Figure).

Figure. Infection Rates with *S. aureus* and Suspected MRSA per 1,000 Hospitalizations — Alaska, 2001–2006



The median age of patients with *S. aureus* infection was 48 (range: 0–101) years; 58.9% (2,660/4,516) were male. Median age and sex distribution did not differ substantially by MSSA/MRSA status (46.4 versus 45.9 years and 60.1% versus 57.0% male, respectively). For records where race was recorded, 67.7% (2,869/4,235) of patients with *S. aureus* infection were non-Natives and 32.3% (1,366/4,235) were Alaska Natives; for suspected MRSA infections, these values were 58.8% (958/1,630) and 41.2% (672/1,630), respectively.

### Discussion

During the study period, Alaska experienced statistically significant increases in rates of hospitalizations associated with both *S. aureus* infection and suspected MRSA infection. Additionally, the proportion of hospitalizations associated with *S. aureus* infections that were suspected to be MRSA increased by nearly 30% (from 20.5% to 50.3%). Similar trends have been seen elsewhere in the United States.<sup>1,2</sup> This study also found that Alaska Natives were at increased risk for MRSA infections, a finding that has been documented in previous studies.<sup>4,5</sup>

We do not know how reliably providers use ICD-9 code V09.0, whether this use has changed over time, or whether any non-MRSA infections may have been misclassified in this analysis. Increased awareness of MRSA may have caused health care providers to increase their testing or coding for MRSA which, in turn, could lead to inaccurate conclusions. Additional limitations to HDDS data included incomplete ascertainment of discharges and missing data for several fields.

### Recommendations

1. Health care providers should ensure that patients with MRSA infection and their caretakers receive education about how to decrease the risk of transmission to others.
2. Hospitalized patients with MRSA infections should be placed on contact precautions to reduce the risk of transmission to vulnerable hospitalized patients.<sup>6</sup>
3. For more information about MRSA, including a treatment algorithm, refer to the following CDC website: [http://www.cdc.gov/mrsa/mrsa\\_initiative/skin\\_infection/mrsa\\_hcp.html](http://www.cdc.gov/mrsa/mrsa_initiative/skin_infection/mrsa_hcp.html)

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### Acknowledgments

Data selected from the HDDS (obtained annually per agreement with ASHNHA) were provided by Alice Rarig, MA, MPH, PhD, HDDS Manager, Health Planning and Systems Development, Health Care Services, with assistance from Charles Utermohle, PhD, Chronic Disease Prevention and Health Promotion, Division of Public Health, DHSS.

Table. *Staphylococcus aureus* Hospitalizations by ICD-9 Code and Percent with Suspected Methicillin Resistance, Alaska, 2001–2006

	2001	2002	2003	2004	2005	2006
All discharges	51,350	52,448	54,093	54,923	55,597	58,838
<i>S. aureus</i> infection <sup>1</sup>	532	561	665	797	955	1,007
% (#) suspected MRSA <sup>2</sup>	20.5 (109)	29.2 (164)	30.8 (205)	36.4 (290)	46.3 (442)	50.3 (507)
<i>S. aureus</i> septicemia						
% (#) suspected MRSA	12.1 (11)	22.1 (23)	16.2 (18)	25.0 (29)	33.5 (52)	38.7 (55)
<i>S. aureus</i> pneumonia						
% (#) suspected MRSA	18 (9)	25.7 (19)	32.1 (26)	31.3 (25)	36.5 (27)	38.2 (34)
<i>S. aureus</i> NOS <sup>3</sup>						
% (#) suspected MRSA	22.8 (89)	31.9 (122)	34.0 (161)	39.3 (236)	50.0 (363)	53.9 (418)

1. Any hospitalization with ICD-9 codes 038.11 (*S. aureus* septicemia), 482.41 (*S. aureus* pneumonia), or 041.11 (*S. aureus* not otherwise specified).

2. Any *S. aureus* hospitalization as defined above that also had ICD-9 code V09.0.

3. NOS=not otherwise specified.