



NAVY AND MARINE CORPS PUBLIC HEALTH CENTER EPIDATA CENTER DEPARTMENT

Report: Methicillin-Resistant *Staphylococcus aureus* (MRSA) in the DOD, Quarter 4 2011

Clinical Epidemiology Division

CY 2011

REPORT SUMMARY:

- MRSA incidence in the DOD has not increased in the past 6 years (Appendix B).
- In quarter 4 (Oct-Dec) 2011, the majority of MRSA infections were skin and soft tissue infections (63.8%) and community-associated infections (85.8%) (no change from previous quarter).
 - This trend was also observed for active duty service members (73.0% skin and soft tissue infections; 94.3% community associated infections) during quarter 4.
- MRSA remains highly susceptible to linezolid, trimethoprim/sulfamethoxazole and vancomycin (no change from previous quarter).
- Trimethoprim/sulfamethoxazole, vancomycin, and clindamycin were antibiotics most frequently prescribed for MRSA infection (no change from previous quarter).

Figure 1. MRSA infection incidence rates by month, per 100,000 DOD beneficiaries, 2011

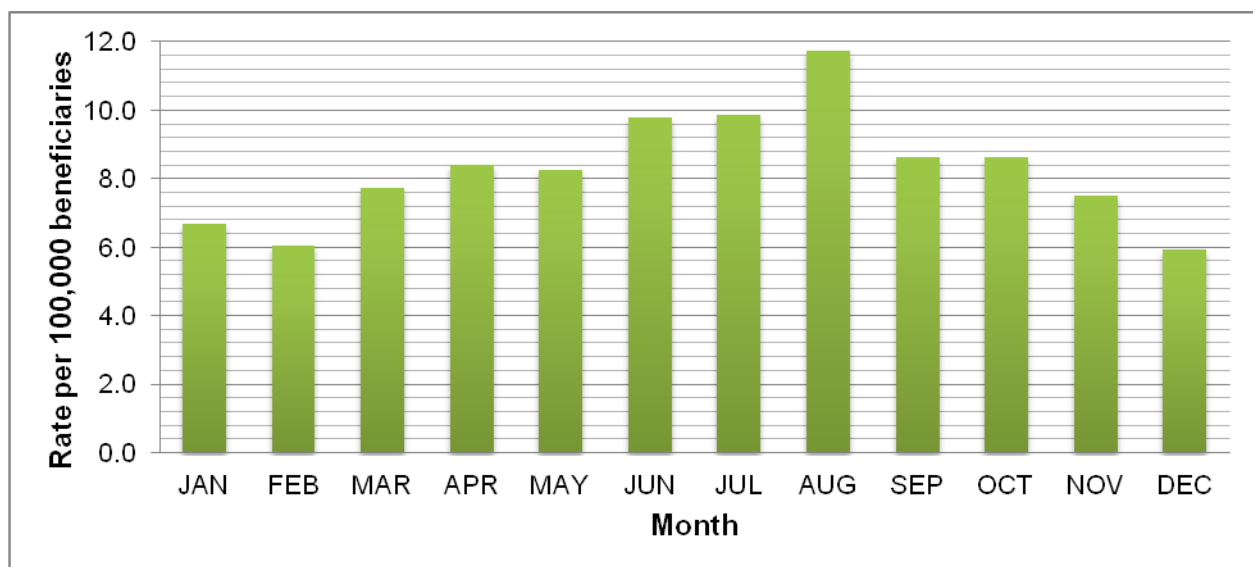


Table 1. Description of MRSA infections among DOD beneficiaries, N=2138, quarter 4 2011

	Count	Percent		Count	Percent
<i>Gender</i>			<i>TRICARE Region</i>		
Female	803	37.6%	Alaska	30	1.4%
Male	1335	62.4%	North	490	22.9%
<i>Age Group</i>			OCONUS	140	6.5%
0-4 years	228	10.7%	South	618	28.9%
5-17 years	177	8.3%	West	702	32.8%
18-24 years	696	32.6%	Unknown	127	5.9%
25-64 years	871	40.7%	<i>Encounter Type</i>		
65+ years	166	7.8%	Inpatient	177	8.3%
<i>Sponsor Service</i>			Outpatient	1922	89.9%
Air Force	335	15.7%	Other	39	1.8%
Army	1033	48.3%	<i>Healthcare/Community Associated</i>		
Marine Corps	280	13.1%	Hospital onset	5	0.2%
Navy	391	18.3%	Healthcare associated	300	14.0%
Other	99	4.6%	Community associated	1835	85.8%
<i>Beneficiary Type</i>			<i>Specimen Type</i>		
Active duty	749	35.0%	Skin/soft tissue	1365	63.8%
Dependent	841	39.3%	Invasive	41	1.9%
Retired	198	9.3%	Other non-invasive	675	31.6%
Other	211	9.9%	Unknown	57	2.7%

Table 2. Description of MRSA infections among active duty service members, N=749, quarter 4 2011

	Count	Percent		Count	Percent
<i>Gender</i>			<i>Service</i>		
Female	154	20.6%	Air Force	109	14.6%
Male	595	79.4%	Army	357	47.7%
<i>Encounter Type</i>			Marine Corps	130	17.4%
Inpatient	26	3.5%	Navy	145	19.4%
Outpatient	701	93.6%	Other	8	1.0%
Other	22	2.9%	<i>Specimen Type</i>		
<i>Healthcare/Community Associated</i>			Skin/soft tissue	547	73.0%
Hospital onset	0	0.0%	Invasive	6	0.8%
Healthcare associated	43	5.7%	Other non-invasive	184	24.6%
Community associated	706	94.3%	Unknown	12	1.6%

Table 3. Antibiotic susceptibilities for MRSA infections among DOD beneficiaries, quarter 4 2011

	Number Tested	Susceptible	
		Count	Percent
Amoxicillin/clavulanate	307	1	0.3%
Cefazolin	346	5	1.4%
Cefoxitin	0	0	N/A
Cefotaxime	4	0	0.0%
Ceftriaxone	171	0	0.0%
Clindamycin	1989	1688	84.9%
Doxycycline	89	88	98.9%
Gentamicin	1059	1050	99.2%
Imipenem	3	2	66.7%
Linezolid	676	674	99.7%
Penicillin	1581	3	0.2%
Rifampin	1130	1120	99.1%
Tetracycline	1959	1863	95.1%
Trimethoprim/sulfamethoxazole	2111	2076	98.3%
Vancomycin	2102	2094	99.6%

Note: Susceptibility results only clinically significant when number tested is ≥ 30 .

Table 4. Antibiotic prescriptions associated with MRSA infections, quarter 4 2011

	Oral - outpatient (N=1056)		Oral - inpatient (N=46)		Intravenous - all (N=133)	
	Count	Percent	Count	Percent	Count	Percent
Clindamycin	281	26.6%	11	23.9%	29	21.8%
Daptomycin	0	0.0%	0	0.0%	1	0.8%
Doxycycline	93	8.8%	5	10.9%	4	3.0%
Gentamicin	1	0.1%	0	0.0%	3	2.3%
Linezolid	2	0.2%	1	2.2%	5	3.8%
Minocycline	7	0.7%	0	0.0%	0	0.0%
Rifampin	34	3.2%	3	6.5%	2	1.5%
Tetracycline	0	0.0%	0	0.0%	0	0.0%
Trimeth/sulfa *	752	71.2%	11	23.9%	1	0.8%
Vancomycin	2	0.2%	19	41.3%	104	78.2%

N=Number of people with at least one antibiotic of that type

*Trimeth/sulfa=trimethoprim/sulfamethoxazole

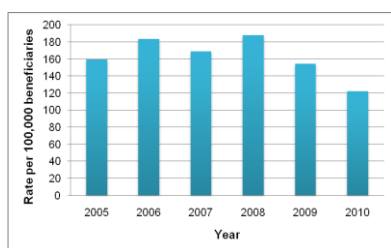
APPENDIX A: METHODS

MRSA isolates were identified using HL7 restructured microbiology data with specimen collection dates occurring within the quarter of interest. BacLink and WHONET software were used to identify MRSA isolates from these data. BacLink and WHONET are programs developed by the World Health organization to aid in the identification and analysis of multidrug-resistant organisms. MRSA was defined as an *S. aureus* isolate resistant to oxacillin. Isolates susceptible or intermediately susceptible to oxacillin were excluded, as were isolates without oxacillin susceptibility results. Additionally, isolates taken for surveillance purposes (nares or groin) were excluded, as these do not represent true infection. From the remaining isolates, the first MRSA isolate per person per 30 days was selected to represent unique infections. Demographics were described for each individual, while specimen types and antibiotic susceptibilities were described for each isolate (Definitions in Appendix B). Antibiotic prescriptions were evaluated using HL7 pharmacy data, consisting of Outpatient, Unit Dose, and Intravenous databases. Antibiotics selected for inclusion in the antibiogram and the analysis of antibiotic prescriptions were selected based on antibiotics recommended by the 2011 Clinical Practice Guidelines issued by the Infectious Diseases Society of America (IDSA)¹ as well as recommendations from clinical experts.

APPENDIX B: HISTORICAL TRENDS

A previous analysis conducted by NMCPHC concluded that there was no significant trend in MRSA incidence rates from 2005-2010 (Figure 2).

Figure 2. MRSA infection incidence rates, per 100,000 DOD beneficiaries, 2005-2010



APPENDIX C: DEFINITIONS

Demographics

Age group: Age at date of MRSA specimen collection

Sponsor service: Service indicated in Patient Category (PATCAT) code

Beneficiary type: Beneficiary status indicated in PATCAT code

TRICARE region: Requesting DMIS ID

Encounters

Encounter type: First letter of MEPRS code: A=Inpatient, B=outpatient, All other=Other

Hospital onset: Specimen collected ≥ 4 days after inpatient admission

Healthcare associated: Previous hospitalization within 12 months of specimen collection

Community associated: All others not meeting hospital onset or healthcare associated criteria

Infection type

Skin/soft tissue infection: Wound, abscess, skin, lesion, pustule, cellulitis, boil, pus, or carbuncle specimen sources

Invasive infection: Blood, cerebrospinal fluid, pleural fluid, pericardial fluid, peritoneal fluid, synovial fluid, bone specimen sources

Other non-invasive infection: All other specimen sources

Unknown: Specimen source not specified

Associated antibiotic prescriptions

Outpatient (oral – outpatient) database: Antibiotics prescribed 0-14 days following specimen collection

Unit Dose (oral – inpatient) database: Antibiotics prescribed 0-7 days following specimen collection

Intravenous database: Antibiotics prescribed 0-7 days following specimen collection

¹ Liu C, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant *Staphylococcus aureus* infections in adults and children. *Clin Infect Dis* 2011; 52: 1-38.