



Active Bacterial Core Surveillance (ABCs) Report

Emerging Infections Program Network

Methicillin-Resistant *Staphylococcus aureus*, 2011



ABCs Areas

California (3 county San Francisco Bay area); Colorado (5 county Denver area); Connecticut; Georgia (8 county Atlanta area); Maryland (Baltimore City and County); Minnesota (2 metro Twin City counties); New York (1 Rochester county); Oregon (3 county Portland area); Tennessee (1 Nashville county).

ABCs Population

The surveillance areas represent **19,393,677** persons

Source: National Center for Health Statistics bridged-race vintage 2011 postcensal file.

ABCs Case Definition

Invasive methicillin-resistant *Staphylococcus aureus* (MRSA) disease: isolation of MRSA from a normally sterile site in a resident of the surveillance area in 2011. Cases of disease are classified into one of three epidemiologic classifications. A case is classified as hospital-onset (HO) if the MRSA culture was obtained on or after the fourth calendar day of hospitalization, where admission is hospital day 1; as healthcare-associated community-onset (HACO) if the culture was obtained in an outpatient setting or before the fourth calendar day of hospitalization and had one of more of the following: 1) a history of hospitalization, surgery, dialysis, or residence in a long term care facility in the previous year, or 2) the presence of a central vascular catheter (CVC) within 2 days prior to MRSA culture; and as community-associated (CA) if none of the previously mentioned criteria are met.

ABCs Methodology

ABCs personnel routinely contacted all microbiology laboratories serving acute care hospitals in their area to identify cases. Standardized case report forms that include information on demographic characteristics, clinical syndrome, and outcome of illness were completed for each identified case. Convenience samples of isolates were collected and sent to CDC for routine testing, including: antimicrobial susceptibility testing, toxin testing and *SCCmec* typing. Pulsed field gel electrophoresis (PFGE) of all isolates was discontinued in 2008; an inferred PFGE algorithm was developed based on microbiologic and molecular characteristics of isolates. The algorithm has been validated for use with isolates collected through this surveillance only (<http://www.cdc.gov/HAI/settings/lab/inferred-PFGE-algorithm.html>). Regular laboratory audits were performed to ensure completeness of case detection.

Rates of invasive MRSA disease among all patients were calculated using population estimates for 2011. Cases with unknown race were assigned race based on distribution of known race and gender by EIP site. Confidence intervals for nationally estimated incidence rates of disease and mortality were calculated based on the gamma distribution (Stat Med, 1997 16:791-801).

Rates of invasive MRSA disease among patients who were undergoing chronic dialysis treatment were calculated using the December 31, 2010 point prevalent counts of patients on dialysis from the United States Renal Data System (USRDS) (<http://www.usrds.org/adr.htm>).

ABCs Results

Reported Race among 4872 Cases

Race	No. (Rate) ^a
White	2743 (20.1)
Black	1542 (41.5)
Other	126 (6.2)

Unknown race (n=461) distributed amongst known

^a Cases per 100,000 population for ABCs areas (crude rates)

Reported Cases on Chronic Dialysis (n=960)

Dialysis and Access Type	No. (%)
Type of dialysis	
Peritoneal	30 (3.1)
Hemodialysis	929 (96.9)
AV Fistula/Graft	348 (37.5)
CVC	511 (55.0)
Unknown	70 (7.5)
Unknown	1

Distribution of cases, deaths and PFGE type by Epidemiological Classification

MRSA Class	No. (Rate) Cases ^b	No. (Rate) Deaths ^c	Inferred PFGE Type (n,%) ^d			
			Tot N	USA100	USA300	USA500/Iberian
CA	1010 (5.2)	100 (0.5)	306	81 (26.5)	192 (62.8)	9 (2.9)
HCA ^a	3780 (19.5)	532 (2.7)	986	478 (48.5)	312 (31.6)	88 (8.9)
HO	868 (4.5)	182 (0.9)	220	122 (55.5)	56 (25.5)	17 (7.7)
HACO	2912 (15.0)	350 (1.8)	766	356 (46.5)	256 (33.4)	71 (9.3)

^a HCA: Healthcare-associated invasive MRSA infection; sum of patients that are classified as either the HO or HACO classes

^b n= 82 epidemiologic category unknown

^c n=18; epidemiologic category unknown

^d isolates were eligible for testing at CDC

Reported Clinical Syndrome by Epidemiological Class

Syndrome ^a	CA	HACO	HO
	(n=1010) No. (%)	(n=2912) No. (%)	(n=868) No. (%)
Bloodstream Infection ^b			
with other syndrome	528 (52.3)	1503 (51.6)	313 (36.1)
with no other syndrome	246 (24.4)	949 (32.6)	306 (35.3)
Pneumonia	161 (15.9)	441 (15.1)	146 (16.8)
Lower Respiratory Infection ^c	52 (5.2)	127 (4.4)	58 (6.7)
Osteomyelitis	130 (12.9)	316 (10.9)	113 (13.0)
Endocarditis	74 (7.3)	150 (5.2)	48 (5.5)
Cellulitis	189 (18.7)	222 (7.6)	71 (8.2)
Wounds			
Surgical ^d	15 (1.5)	185 (6.4)	34 (3.9)
Decubitus/Pressure Ulcers	16 (1.6)	84 (2.9)	21 (2.4)
Other Wounds/Skin Abscesses ^e	7 (0.5)	23 (0.8)	6 (0.7)
Traumatic	13 (1.3)	16 (0.6)	8 (0.9)

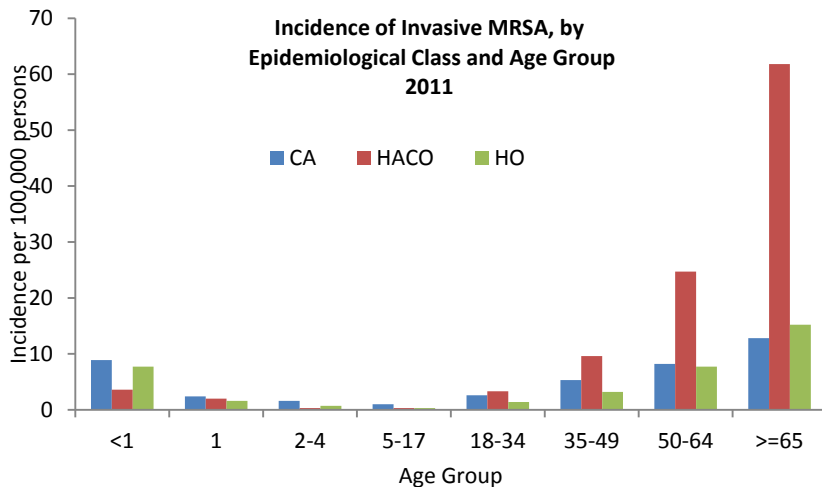
^a Some case patients had more than one syndrome.

^b Sepsis or catheter site infection or AV fistula infection only are included in BSI with other syndrome.

^c Lower Respiratory Infection is defined as: a patient with pneumonia documented in their discharge summary, who has a positive MRSA non-sterile respiratory specimen with accompanying chest radiology results documenting any of the following: bronchopneumonia/pneumonia, air space density/opacity, new or changed infiltrates.

^d Combines deep tissue/organ infection and infection of a surgical wound, post operatively.

^e Category includes skin abscess, necrotizing fasciitis, gangrene, non-traumatic wounds.



National Estimates and Adjusted Incidence Rates of Invasive MRSA Infections

Epidemiologic Category	Estimated Cases of Infection					
	Non-Dialysis Patients		Dialysis Patients		Total	
	Estimated No.	Incidence Rate (Confidence Interval) ^a	Estimated No.	Incidence Rate (Confidence Interval) ^b	Estimated No.	Incidence Rate (Confidence Interval)
CA	16,560	5.32 (4.11-7.00)	NA	NA	16,560	5.31 (4.11-7.00)
HCA	47,340	15.21 (13.27-17.62)	15,169	3654.19 (2820.46-4739.00)	62,509	20.06 (17.01-23.91)
HO	12,464	4.01 (3.02-5.44)	1,692	407.71 (174.70-850.84)	14,156	4.54 (3.24-6.56)
HACO	34,876	11.21 (9.62-13.18)	13,477	3247.45 (2472.51-4246.00)	48,353	15.52 (12.90-18.82)
Overall ^c	65,296	20.98 (18.58-23.86)	15,169	3654.19 (2820.46-4739.00)	80,461	25.82 (22.31-30.14)

^a National Estimates and Incidence (no. per 100,000 population per year) are adjusted for age, race, gender and receipt of chronic dialysis using 2011 US Census Data.

^b National Estimates and Incidence (no. per 100,000 dialysis patients per year) for dialysis patients are adjusted for age, race and gender using 2010 USRDS point prevalence data.

^c 82 cases could not be classified into an epidemiological category or category is unknown and therefore are counted in the overall estimate **only**.

National Estimates and Adjusted Incidence Rates for Mortality among Cases

Epidemiologic Class	Estimated No.	Mortality Rate (Confidence Interval) ^a
CA	1,764	0.57 (0.30-1.04)
HCA	9,197	2.95 (2.02-4.54)
HO	3,126	1.00 (0.51-2.06)
HACO	6,071	1.95 (1.26-3.12)
Overall ^b	11,285	3.62 (2.58-5.31)

^a National Estimates and Mortality Rate (no. per 100,000 population per year) are adjusted for age, race, gender and receipt of chronic dialysis using 2011 US Census Data

^b 82 cases could not be classified into an epidemiological category or category is unknown and therefore are counted in the overall estimate **only**.

National Metric for Healthy People 2020 and the Department of Health and Human Services Action Plan to Prevent Healthcare-Associated Infections

	Disease Rate			Estimate of Cases in United States. ^a		
	Baseline (07-08)	2011	% Change	Baseline (07-08)	2011	Difference
HCA	27.08	20.06	-25.92	82,000	62,500	19,500

^a Disease Rate (no. per 100,000 population per year) and National Estimates are adjusted for age, race, gender and receipt of chronic dialysis using 2011 US Census Data

ABCs Discussion

Surveillance data from 2011 represent the seventh full year of performing population-based surveillance for invasive MRSA infections through the Emerging Infections Program/Active Bacterial Core Surveillance Activity.

Overall, compared to the baseline incidence (2007-2008 calendar years) identified in the HHS Action Plan, there was a decrease of 25.92%.

Citation

1. Centers for Disease Control and Prevention. 2011. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Methicillin-Resistant *Staphylococcus aureus*, 2011.

Available via the Internet: <http://www.cdc.gov/abcs/reports-findings/survreports/mrsa11.pdf>

2. Centers for Disease Control and Prevention. 2007. Invasive Methicillin-Resistant *Staphylococcus aureus* Infections Among Dialysis Patients --- United States, 2005. *MMWR Morb Mortal Wkly Rep.* 2007; 56(09):197.

For more information, visit our web sites: <http://www.cdc.gov/abcs>, <http://www.cdc.gov/mrsa>