



Active Bacterial Core Surveillance (ABCs) Report

Emerging Infections Program Network

Methicillin-Resistant *Staphylococcus aureus*, 2006

(Update)[†]



ABCs Areas

California (3 county San Francisco Bay area); **Colorado (1 Denver area county)**; Connecticut; Georgia (8 county Atlanta area); Maryland (1 Baltimore area county); Minnesota (1 metro Twin City county); New York (1 Rochester county); Oregon (3 county Portland area); Tennessee (1 Nashville county). Note, the population under surveillance changed from 2005 (Bold).

ABCs Population

The surveillance areas represent **14,954,451** persons

Source: National Center for Health Statistics bridged-race vintage 2006 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 2006. 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; 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. 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 2006. Cases with unknown race were assigned race based on distribution of known race and gender by EIP site. Methodology to make national estimates was modified in January 2012 to adjust for receipt of dialysis, as well as age, race, and gender. Previously reported national estimates were adjusted for age and race only. Confidence intervals for nationally estimated incidence rates of disease and mortality were calculated based on the gamma distribution (Stat Med, 1997 16:791-801).

ABCs Results

ABC Racial/Ethnic Profiles

Race	No. (Rate) ^a
White	3,136(29.9)
Black	2,128(70.5)
Other	202(12.0)

Unknown race (n=522) distributed amongst known

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

PFGE Type by Antibiotic Resistance

PFGE Type (%)	% PVL Pos.	Clinda-R ^a	T/S-R ^b	Levo-R ^c
USA100 (49.3)	0	98.4	0.2	99.6
USA300 (33.1)	98.6	7.8	0.3	54.5
USA500 (6.7)	0	51.3	94.6	94.6
USA800 (2.2)	0	23.1	3.9	46.2
IBERIAN (3.4)	4.6	59.1	68.2	81.8
OTHER (5.5)	22.5	27.5	0	30.0

^a % Clindamycin resistant

^b % Trimethoprim-sulfamethoxazole resistant

^c % Levofloxacin resistant

Distribution of cases, deaths and PFGE type by Epidemiological Classification

MRSA Class	No. (Rate) Cases ^b	No. (Rate) Death ^c	PFGE Type (n,%) ^d			
			Tot N	USA100	USA300	USA500/Iberian
CA	925(6.2)	85 (0.6)	237	52 (21.9)	152 (58.3)	14 (5.9)
HCA ^a	4,486 (30.0)	845 (5.7)	990	554 (56.0)	255 (25.8)	107 (10.8)
HO	1,353 (9.1)	354 (2.4)	272	154 (56.6)	64 (23.5)	29 (10.7)
HACO	3,133 (21.0)	491 (3.3)	718	400 (55.7)	191 (26.20)	78 (10.9)

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

^b n= 55 epidemiologic category unknown

^c n=10; epidemiologic category unknown

^d isolates were eligible for testing at CDC

Reported Clinical Syndrome by Epidemiological Class

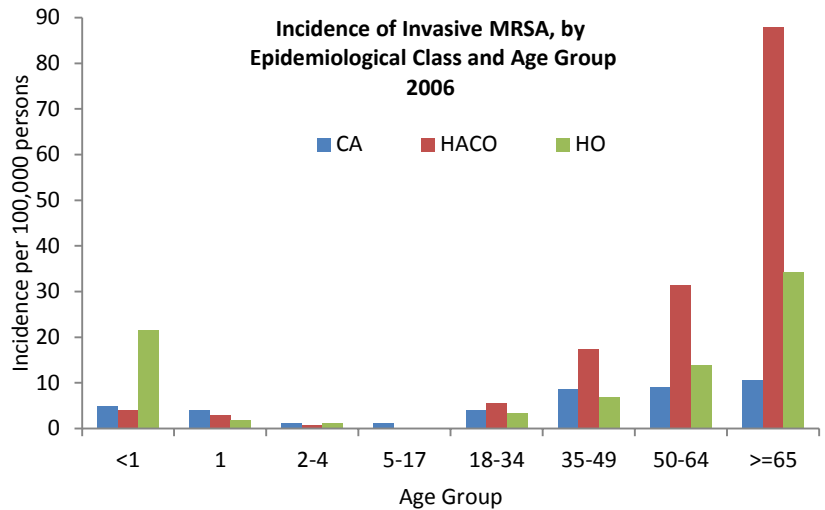
[†] Last Updated: January 30, 2012; See methods and discussion for update explanation.

Syndrome ^a	CA (n=925)	HACO (n=3,133)	HO (n=1,353)
Bloodstream infection			
with other syndrome	547	1414	402
with no other syndrome	241	1413	750
Pneumonia	118	276	175
Osteomyelitis	91	232	78
Endocarditis	86	156	35
Cellulitis	200	265	54
Wounds			
Surgical ^b	3	123	36
Decubitus/Pressure Ulcers	16	74	29
Other wounds/skin abscesses ^c	42	68	11
Traumatic	17	20	7

^a Some cases had more than one syndrome.

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

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



National Estimates and Adjusted Incidence Rates of Invasive MRSA Infections

Epidemiologic Class	Estimated No.	Incidence Rate (Confidence Interval) ^a
CA	17,473	5.84 (5.45-6.25)
HCA	89,514	29.93 (29.03-30.86)
HO	27,039	9.03 (8.54-9.55)
HACO	62,475	20.87 (20.12-21.65)
Overall ^b	108,345	36.11 (35.12-37.12)

^a National Estimates and Incidence (no. per 100,000 population per year) are adjusted for age, race, gender, and receipt of dialysis treatment using 2006 US Census Data.

^b 55 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	1,428	0.48 (0.37-0.61)
HCA	12,180	5.88 (5.48-6.31)
HO	2,010	0.67 (0.55-0.83)
HACO	10,170	3.40 (3.09-3.73)
Overall ^b	19,479	6.50 (6.08-6.95)

^a National Estimates and Mortality Rate (no. per 100,000 population per year) are adjusted for age, race, gender and receipt of dialysis in the previous year using 2006 US Census Data.

^b 10 cases could not be classified into an epidemiological category or category is unknown and therefore are counted in the overall estimate only.

ABCs Discussion

Surveillance data from 2006 represent the second full year of performing population-based surveillance for invasive MRSA infections through the Emerging Infections Program/Active Bacterial Core Surveillance Activity. National estimates and calculate incidence rates was modified in January 2012 to adjust for receipt of dialysis, as well as age, race, and gender. Previously reported national estimates were adjusted for age and race only.

Citation

1. Centers for Disease Control and Prevention. 2006. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Methicillin-Resistant *Staphylococcus aureus*, 2006.

Available via the Internet: <http://www.cdc.gov/abcs/reports-findings/survreports/mrsa06.pdf>

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

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