



Active Bacterial Core Surveillance (ABCs) Report

Emerging Infections Program Network

Methicillin-Resistant *Staphylococcus aureus*, 2005

(Update)[†]



ABCs Areas

California (3 county San Francisco Bay area); Colorado (5 county Denver area); 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).

ABCs Population

The surveillance areas represent **16,489,254** persons
Source: National Center for Health Statistics bridged-race vintage 2005 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 2005. 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 or 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 ascertainment. Rates of invasive MRSA disease among all patients were calculated using population estimates for 2005. 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	3,578(29.9)
Black	2,364(78.3)
Other	192(12.9)

Unknown race (n=691) distributed amongst known.
^aCases 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 (68.2)	0	99.3	1.8	99.9
USA300 (18.7)	98.6	9.2	1.3	50.8
USA500 (4.6)	0	55.9	94.1	97.1
USA800 (1.9)	0	12.0	4.0	52.0
IBERIAN (1.8)	4.6	51.8	63.0	85.2
OTHER (4.1)	22.5	65.1	3.0	57.6

^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	Tot N	PFGE Type (n,%) ^d		
				USA100	USA300	USA500/Iberian
CA	966(5.9)	105 (0.6)	222	56 (23.2)	145 (65.3)	12 (5.4)
HCA ^a	5,064 (30.7)	977 (5.9)	1,248	844 (67.6)	232 (18.9)	83 (6.7)
HO	1,601 (9.7)	418 (2.5)	417	309 (74.1)	69 (13.4)	25 (6.0)
HACO	3,463 (21.0)	559 (3.4)	831	535 (64.4)	176 (21.2)	58 (7.0)

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

^b n= 104; epidemiologic category unknown.

^c n=16; epidemiologic category unknown.

^d isolates were eligible for testing at CDC.

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

Reported Clinical Syndrome by Epidemiologic Class

Syndrome ^a	CA (n=966)	HACO (n=3,463)	HO (n=1,601)
Bloodstream Infection			
with other syndrome	585	1676	547
with no other syndrome	207	1427	831
Pneumonia	137	410	260
Osteomyelitis	84	265	92
Endocarditis	120	212	38
Cellulitis	205	299	83
Wounds			
Surgical ^b	4	167	52
Decubitus/Pressure Ulcers	17	87	36
Other Skin wounds/abscesses ^c	61	79	26
Traumatic Wounds	14	18	5

^a Some case patients 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	16,624	5.61 (5.25-5.99)
HCA	93,006	31.38 (30.50-32.29)
HO	29,311	9.89 (9.4-10.4)
HACO	63,695	21.49 (20.76-22.24)
Overall ^b	111,345	37.56 (36.61-38.55)

^a National Estimates and Incidence (no. per 100,000 population per year) are adjusted for age, race, gender, and receipt of dialysis treatment using 2005 US Census Data.

^b 104 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 2005 represent the first full year of performing population-based surveillance for invasive MRSA infections through the Emerging Infections Program/Active Bacterial Core Surveillance Activity. In January 2012, tables/figures were added to (1) display age-specific incidence rates by epidemiologic category; and (2) to report national estimates and incidence rates of disease and mortality by epidemiological class. Previous published estimates of 2005 data differ from those in this updated report. Current estimates use slightly different definitions for HACO status (previous documented MRSA colonization or infection is not a determinant in classifying patients) and estimates include initial and subsequent infections in the same patient. Also, HO cases are now defined based on reported calendar dates which also differs from previously published estimates (JAMA, 2007 Oct 17: 298 (15): 1765-71).

Citation

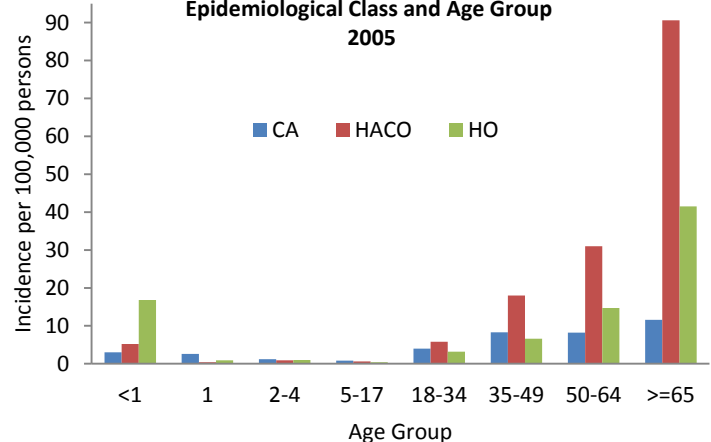
1. Centers for Disease Control and Prevention. 2005. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Methicillin-Resistant *Staphylococcus aureus*, 2005.

Available via the Internet: <http://www.cdc.gov/abcs/reports-findings/survreports/mrsa05.html>

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

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Incidence of Invasive MRSA by Epidemiological Class and Age Group 2005



National Estimates and Adjusted Incidence Rates for Mortality among Cases

Epidemiologic Class	Estimated No.	Mortality Rate (Confidence Interval) ^a
CA	703	0.24 (0.17-0.33)
HCA	18,907	6.39 (5.99-6.82)
HO	7,984	2.69 (2.44-2.98)
HACO	10,923	3.68 (3.38-4.02)
Overall ^b	21,210	7.12 (6.70-7.57)

^a National Estimates and Mortality Rate (no. per 100,000 population per year) are adjusted for age, race, gender and receipt of dialysis treatment in the using 2005 US Census Data

^b 16 cases epidemiological category or category is unknown and therefore are counted in the overall estimate only.