Emerging Infections Program
Healthcare-Associated Infections Community Interface Report
Invasive *Staphylococcus aureus*, 2021

Last Updated: July 16, 2024

Surveillance Catchment Areas

Methicillin-resistant *Staphylococcus aureus* (MRSA): California (3 county San Francisco Bay area); Connecticut (Fairfield, Hartford, and New Haven Counties); Georgia (8 county Atlanta area); Maryland (Baltimore City and County); Minnesota (2 county Minneapolis–Saint Paul area); New York (1 Rochester county); Tennessee (1 Nashville county).

Methicillin-sensitive *Staphylococcus aureus* (MSSA): California (3 county San Francisco Bay area); Connecticut (New Haven County); Georgia (1 Atlanta county); Maryland (Baltimore City and County); Minnesota (2 county Minneapolis–Saint Paul area); New York (1 Rochester county); Tennessee (1 Nashville county).

Population

The MRSA surveillance areas represent 15,247,843 persons. The MSSA surveillance areas represent 10,249,804 persons.

Source: U.S. Census Bureau, Population Division, Vintage 2021 Special Tabulation

Case Definition

Invasive *Staphylococcus aureus* (SA) infection: isolation of SA from a normally sterile site in a resident of the surveillance area in 2021. Cases of infection are classified into one of three epidemiologic classifications.

A case is classified as

- hospital-onset (HO) if the SA culture was obtained on or after the third calendar day of hospitalization, where admission is hospital day 0[a];
- healthcare-associated community-onset (HACO) if the culture was obtained in an outpatient setting or before the third[a] 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 (CVC) within 2 days prior to SA culture;
- community-associated (CA) if none of the previously mentioned criteria are met.

Cases were classified as MRSA or MSSA based on results from local clinical microbiology laboratory testing.

[a] Compared to annual summaries from 2005–2017, this case definition represents an update in nomenclature from previous years but not a change to the case definition

Methods

Case finding was active, laboratory-based, and population-based. Emerging Infections Program (EIP) personnel routinely contacted microbiology laboratories serving healthcare facilities in their area to identify cases. Laboratories serving the surveillance catchment areas were routinely audited to ensure complete case ascertainment.

A standardized case report form was completed for each incident case through review of medical records. Medical records were reviewed for information on demographic characteristics, clinical syndrome, and outcome of illness.

Convenience samples of MSSA and MRSA isolates were collected and sent to CDC for routine testing, including antimicrobial susceptibility testing using reference broth microdilution and, beginning with 2017 isolates, whole genome sequencing (WGS) to perform staphylococcal cassette chromosome (SCC*mec)* typing, *spa* typing, multilocus sequence typing (MLST), clonal complex assignment, and inferred pulsed-field gel electrophoresis (PFGE) typing. Pulsed field type is inferred from WGS based on phylogenetic relatedness, MLST clonal complex, and molecular characteristics of the isolates[1]. Isolates belonging to clonal complex 8 are sub-typed using a single-nucleotide polymorphism (SNP) assay that has been modified for use with WGS data, allowing confirmation of isolates identified as USA300[2]. The use of PFGE for all isolates was discontinued in 2008; up until 2012, PFGE was inferred using a validated algorithm based on the following isolate microbiologic characteristics: SCC*mec* type, presence of Panton-Valentine leukocidin and toxic shock syndrome toxin genes, and antimicrobial susceptibility results[3]. From 2012–2016, *spa* typing was included in routine laboratory testing and MLST clonal complexes were inferred based on *spa* type, allowing for the identification of PFGE types based on MLST clonal complex and molecular characteristics of the isolates[1], with 2016 isolates identified as USA300 confirmed using a SNP assay[2]. In 2021, MRSA isolates were collected in five sites (California, Georgia, Minnesota, New York, and Tennessee) and MSSA isolates in four (California, Georgia, Minnesota, and New York). Characterization of 2021 isolates is in process as of the date of this report.

Rates of invasive SA infection among all patients were calculated using population estimates for 2021.

Rates of invasive SA infection among patients who were undergoing chronic dialysis treatment were calculated using December 31, 2020, point prevalence counts of patients on dialysis from the United States Renal Data System (USRDS) (https://www.niddk.nih.gov/about-niddk/strategic-plans-reports/usrds). The figures depicting the overall invasive SA incidence by epidemiologic class and incidence of invasive HACO SA among persons on dialysis, 2009–2021, are restricted to the continuous catchment area (California [3 county San Francisco Bay area]; Connecticut [Fairfield, Hartford, and New Haven Counties]; Georgia [8 county Atlanta area]; Minnesota [2 county Minneapolis–Saint Paul area]; New York [1 Rochester county]; and Tennessee [1 Nashville county]) for comparison of trends over time.

Invasive SA surveillance data undergo regular data cleaning to ensure accuracy and completeness. Patients with complete case report form data as of July 5, 2024, were included in this analysis. Because data can be updated as needed, analyses of datasets generated on a different date may yield slightly different results.

[1] Inferred Identification of Pulsed Field Types based on MLST clonal complex (CC) (https://archive.cdc.gov/#/details?url=https://www.cdc.gov/hai/settings/lab/ccalgorithm.html)

[2] Improved Subtyping of *Staphylococcus aureus* Clonal Complex 8 Strains Based on Whole-Genome Phylogenetic Analysis [PDF - 15 pages] (https://msphere.asm.org/content/msph/3/3/e00464-17.full.pdf)

3 Use of an Inferred PFGE Algorithm, Emerging Infections Program/Active Bacterial Core (ABCs) Surveillance Invasive MRSA Project (https://archive.cdc.gov/#/details?url=https://www.cdc.gov/hai/settings/lab/inferred-pfge-algorithm.html)

Results

Table 1. MSSA (N=3669) and MRSA (N=2892) Cases by Race/Ethnicity, Emerging Infections Program, 2021

Race/Ethnicity[a]	MSSA Rate[b]	MRSA Rate[b]
Hispanic or Latino, any race	25.2	9.5
Not known to be Hispanic or Latino[c] - White	39.1	20.1
Not known to be Hispanic or Latino[c] - Black or African American	43.9	28.1
Not known to be Hispanic or Latino[c] - Asian	16.9	4.2
Not known to be Hispanic or Latino[c] - Another or multiple races[d]	17.6	12.2

[a] Cases with unknown race and either non-Hispanic or Latino or unknown ethnicity (168 MSSA and 111 MRSA cases) are excluded from rate calculations in this table

[b] Cases per 100,000 population for EIP areas (crude rates)

[c] For calculating rates, the numerator includes both cases with non-Hispanic or Latino ethnicity and unknown ethnicity

[d] Data for American Indian/Alaska Native and Native Hawaiian/Pacific Islander case-patients were included in the "Another or multiple races" category for privacy

Table 2. MSSA (N=3669) and MRSA (N=2892) Case and Death Rate[a] by Epidemiological Classification, Emerging Infections Program, 2021

Class	MSSA Cases No. (Rate[a])	MSSA Deaths No. (Rate[a])	MRSA Cases No. (Rate[a])	MRSA Deaths No. (Rate[a])
CA	1268 (12.4)	122 (1.2)	705 (4.6)	74 (0.5)
HCA[b]	2323 (22.7)	417 (4.0)	2174 (14.2)	414 (2.7)
HCA – HO	634 (6.2)	198 (1.9)	521 (3.4)	182 (1.2)
HCA – HACO	1689 (16.5)	219 (2.1)	1653 (10.8)	232 (1.5)
Unknown	78 (0.8)	5 (<0.1)	13 (<0.1)	1 (<0.1)

[a] Cases and deaths per 100,000 population for EIP areas (crude rates) calculated using 2021 U.S. Census Data

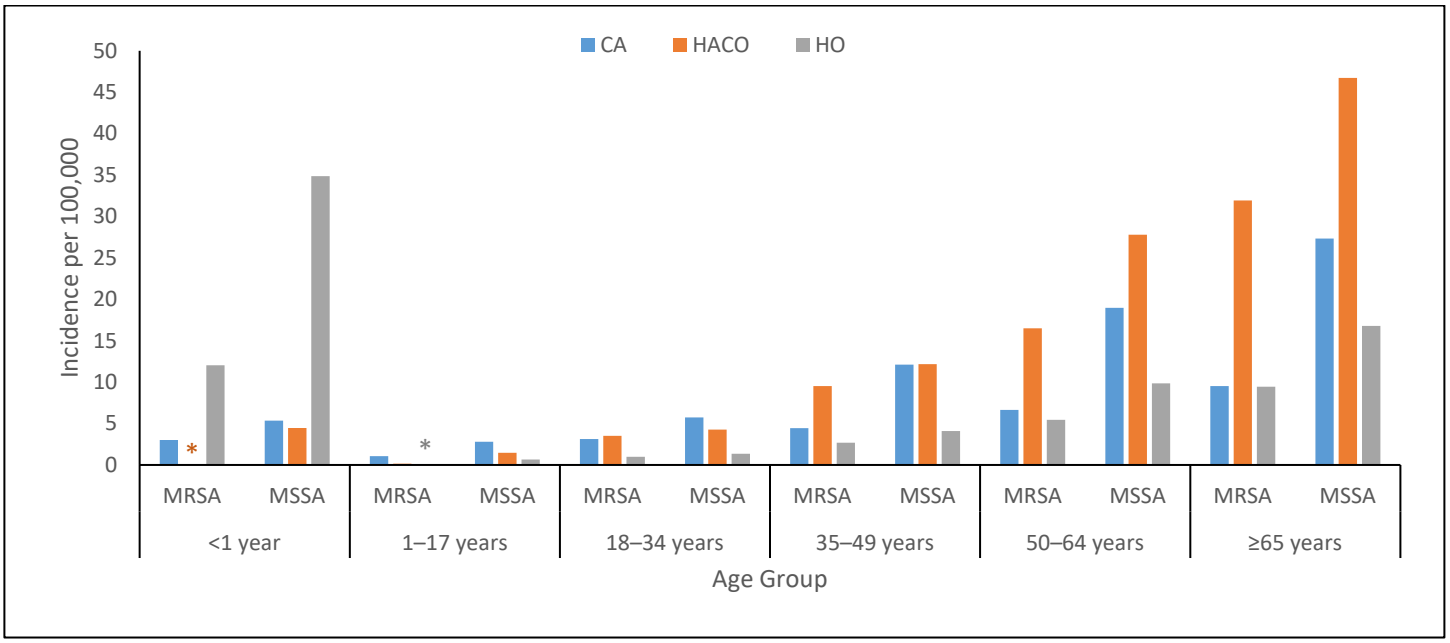
[b] HCA: Healthcare-associated invasive SA infection; sum of patients that are classified as either the HO or HACO classes

Table 3. MSSA (N=3669) and MRSA (N=2892) Cases by Race and Ethnicity, Emerging Infections Program, 2021

Race/Ethnicity	MSSA No. (%)	MRSA No. (%)
Hispanic or Latino, any race	360 (9.8)	214 (7.4)
Not known to be Hispanic or Latino[a] - White[b]	1929 (52.6)	1430 (49.5)
Not known to be Hispanic or Latino[a] - Black or African American[c]	896 (24.4)	1001 (34.6)
Not known to be Hispanic or Latino[a] - Asian[d]	251 (6.8)	77 (2.7)
Not known to be Hispanic or Latino[a] - American Indian/Alaskan Native[e]	25 (0.7)	35 (1.2)
Not known to be Hispanic or Latino[a] - Native Hawaiian/Pacific Islander[f]	27 (0.7)	11 (0.4)
Not known to be Hispanic or Latino[a] - Multiple races[g]	13 (0.4)	13 (0.4)
Not known to be Hispanic or Latino[a,h] - Unknown race	168 (4.6)	111 (3.8)

[a] Records either indicated ethnicity was non-Hispanic or Latino, or ethnicity was not known
[b] 97 MSSA cases and 47 MRSA cases with unknown ethnicity
[c] 55 MSSA cases and 41 MRSA cases with unknown ethnicity
[d] 25 MSSA cases and 5 MRSA cases with unknown ethnicity
[e] 4 MSSA cases and 2 MRSA cases with unknown ethnicity
[f] 1 MSSA case with unknown ethnicity
[g] 2 MSSA cases with unknown ethnicity
[h] Of cases with unknown race, 109 MSSA and 67 MRSA cases had unknown ethnicity

Figure 1. Incidence[a,b] of Invasive *Staphylococcus aureus*, by Epidemiologic Class, Age Group, and Methicillin-Resistance Status, Emerging Infections Program, 2021



[a] Incidence (no. per 100,000 population per year) calculated using 2021 U.S. Census Data

[b] An asterisk represents a case count of <5; rates for these groups have been suppressed

Table 4. Location of Invasive MSSA (N=3669) and MRSA (N=2892) Cases Before Incident Specimen Collection, Emerging Infections Program, 2021

Location of patient before incident specimen collection[a]	MSSA No. (%)	MRSA No. (%)
Private residence	2650 (72.2)	1790 (61.9)
Long-term care facility	219 (6.0)	407 (14.1)
Acute-care hospital (inpatient)	547 (14.9)	472 (16.3)
Long-term acute care hospital	4 (0.1)	20 (0.7)
Homeless	165 (4.5)	168 (5.8)
Other	10 (0.3)	17 (0.6)
Unknown	74 (2.0)	18 (0.6)

[a] Represents location of the patient three days before incident specimen collection, where date of initial culture is day 0

Table 5. Location of Invasive MSSA (N=3669) and MRSA (N=2892) Cases at Time of Incident Specimen Collection, Emerging Infections Program, 2021

Location of incident specimen collection	MSSA No. (%)	MRSA No. (%)
Outpatient setting or emergency department	2410 (65.7)	1954 (67.6)
Acute care hospital	1152 (31.4)	895 (31.0)
Long-term care facility	7 (0.2)	9 (0.3)
Long-term acute care hospital	3 (0.1)	15 (0.5)
Other	34 (0.9)	9 (0.3)
Unknown	63 (1.7)	10 (0.3)

Table 6. Selected Clinical Characteristics of Invasive MSSA (N=3591[a]) and MRSA (N=2879[a]) Cases by Epidemiological Class, Emerging Infections Program, 2021

Characteristics	MSSA CA (n=1268) No. (%)	MRSA CA (n=705) No. (%)	MSSA HACO (n=1689) No. (%)	MRSA HACO (n=1653) No. (%)	MSSA HO (n=634) No. (%)	MRSA HO (n=521) No. (%)
Charlson comorbidity index[b] - 0	412 (32.6)	239 (34.1)	218 (13.0)	168 (10.2)	163 (25.7)	106 (20.4)
Charlson comorbidity index[b] - 1	387 (30.6)	190 (27.1)	250 (14.9)	266 (16.2)	125 (19.7)	102 (19.6)
Charlson comorbidity index[b] - ≥2	464 (36.7)	273 (38.9)	1207 (72.1)	1210 (73.6)	346 (54.6)	312 (60.0)
Underlying conditions[b] – Burn/surgical wound	6 (0.5)	4 (0.6)	40 (2.4)	30 (1.8)	5 (0.8)	14 (2.7)
Underlying conditions[b] - Chronic pulmonary disease	214 (16.9)	134 (19.1)	380 (22.7)	405 (24.6)	149 (23.5)	126 (18.9)
Underlying conditions[b] - Chronic kidney disease	156 (12.4)	89 (9.9)	702 (41.9)	666 (40.5)	178 (28.1)	146 (16.2)
Underlying conditions[b] - Decubitus/pressure ulcer	37 (2.9)	28 (9.2)	88 (5.3)	228 (13.9)	28 (4.4)	50 (9.6)
Underlying conditions[b] - Diabetes mellitus	403 (31.9)	202 (28.8)	716 (42.8)	774 (47.1)	238 (37.5)	203 (39.0)
Underlying conditions[b] - Hemiplegia	2 (0.2)	3 (0.4)	18 (1.1)	22 (1.3)	2 (0.3)	5 (1.0)
Underlying conditions[b] - Injection drug use	203 (16.1)	183 (26.1)	89 (5.3)	170 (10.3)	12 (1.9)	23 (4.4)
Underlying conditions[b] - Obesity or morbid obesity	208 (16.5)	93 (13.3)	352 (21.0)	322 (19.6)	155 (24.5)	118 (22.7)

Characteristics	MSSA CA (n=1268) No. (%)	MRSA CA (n=705) No. (%)	MSSA HACO (n=1689) No. (%)	MRSA HACO (n=1653) No. (%)	MSSA HO (n=634) No. (%)	MRSA HO (n=521) No. (%)
Underlying conditions[b] - Other chronic ulcer or chronic wound	153 (12.1)	91 (13.0)	231 (13.8)	330 (20.1)	34 (5.4)	57 (11.0)
Underlying conditions[b] - Paraplegia	9 (0.7)	7 (1.0)	14 (0.8)	55 (3.4)	5 (0.8)	7 (1.4)
Underlying conditions[b] - Pregnancy	8 (0.6)	6 (0.9)	3 (0.2)	2 (0.1)	2 (0.3)	1 (0.2)
Syndrome[c] - Bloodstream infection with other syndrome	764 (60.3)	443 (62.8)	916 (54.2)	995 (57.8)	274 (43.2)	263 (50.5)
Syndrome[c] - Bloodstream infection with no other syndrome	292 (23.0)	169 (24.0)	555 (32.9)	512 (31.0)	299 (47.2)	182 (34.9)
Syndrome[c] - Pneumonia	107 (8.4)	82 (11.6)	141 (8.4)	164 (9.9)	127 (20.0)	130 (25.0)
Syndrome[c] - Osteomyelitis	218 (17.2)	102 (14.5)	220 (13.0)	254 (15.4)	40 (6.3)	43 (8.3)
Syndrome[c] - Endocarditis	149 (11.8)	97 (13.8)	136 (8.1)	151 (9.1)	25 (3.9)	26 (5.0)
Syndrome[c] - Cellulitis	213 (16.8)	146 (20.7)	190 (11.3)	209 (12.6)	28 (4.4)	40 (7.7)

Characteristics	MSSA CA (n=1268) No. (%)	MRSA CA (n=705) No. (%)	MSSA HACO (n=1689) No. (%)	MRSA HACO (n=1653) No. (%)	MSSA HO (n=634) No. (%)	MRSA HO (n=521) No. (%)
Syndrome[c] - Surgical wound[d]	11 (0.9)	7 (1.0)	105 (6.2)	65 (3.9)	7 (1.1)	12 (2.3)
Syndrome[c] - Decubitus/pressure ulcer	27 (2.1)	11 (1.6)	33 (2.0)	79 (4.8)	10 (1.6)	14 (2.7)
Syndrome[c] - Skin abscess[e]	71 (5.6)	50 (7.1)	65 (3.9)	70 (4.2)	11 (1.7)	11 (2.1)
Syndrome[c] - Other wound[f]	60 (4.7)	36 (5.1)	88 (5.2)	108 (6.5)	8 (1.3)	15 (2.9)
Syndrome[c] - Traumatic wound	26 (2.1)	13 (1.8)	12 (0.7)	9 (0.5)	10 (1.6)	13 (2.5)

[a] Excludes 78 MSSA and 13 MRSA cases with unknown epidemiological class

[b] Some case patients had more than one underlying condition. Excludes 5 CA MSSA, 3 CA MRSA, 14 HACO MSSA, 9 HACO MRSA, 0 HO MSSA, and 1 HO MRSA cases with unknown underlying conditions

[c] Some case patients had more than one syndrome

[d] Combines deep tissue/organ infection and infection of a surgical wound, post-operatively

[e] Category includes skin abscess, necrotizing fasciitis, gangrene

[f] Category includes non-traumatic and other chronic wound infections

Table 7. Selected Healthcare Exposures and Risk Factors for Invasive MSSA (N=3669) and MRSA (N=2892), Emerging Infections Program, 2021

Exposures	MSSA No. (%)	MRSA No. (%)
Healthcare facility stay in the year before incident specimen collection – Any[a]	1654 (45.1)	1818 (62.9)
Healthcare facility stay in the year before incident specimen collection – Acute care hospitalization	1580 (43.1)	1695 (58.6)
Healthcare facility stay in the year before incident specimen collection – Long-term care facility residence	393 (10.7)	705 (24.4)
Healthcare facility stay in the year before incident specimen collection – Long-term acute care hospitalization	7 (0.2)	36 (1.2)
Surgery in the year before the date of incident specimen collection	678 (18.5)	763 (26.4)
Chronic dialysis – Any modality	499 (13.6)	456 (15.8)
Chronic dialysis – Modality - Peritoneal[b]	36 (7.2)	21 (4.6)
Chronic dialysis – Modality - Hemodialysis[c]	464 (93.0)	436 (95.6)
Chronic dialysis – Modality - Hemodialysis - AV Fistula/Graft	200 (43.1)	185 (42.4)
Chronic dialysis – Modality - Hemodialysis - CVC	260 (56.0)	258 (59.1)
Central vascular catheter in place at any time in the 2 calendar days before incident specimen collection	639 (17.4)	582 (20.1)
Unknown	80 (2.2)	12 (0.4)

[a] Some case patients had stays in more than one type of healthcare facility in the year before incident specimen collection

[b] 1 MSSA and 1 MRSA case were reported to receive both peritoneal dialysis and hemodialysis

[c] 2 MSSA and 10 MRSA cases had both AV Fistula/Graft and CVC

Table 8. Number and Incidence Rates of Invasive MSSA (N=3669) and MRSA (N=2892) Infections by Dialysis Status and Epidemiologic Class, Emerging Infections Program, 2021

Epidemiologic Class	MSSA Dialysis Patients No. (Rate[a])	MRSA Dialysis Patients No. (Rate[a])	MSSA Non-Dialysis Patients No. (Rate[b])	MRSA Non-Dialysis Patients No. (Rate[b])	MSSA Total[c] No. (Rate[b])	MRSA Total[c] No. (Rate[b])
CA	NA	NA	1268 (12.4)	705 (4.6)	1268 (12.4)	705 (4.6)
HCA[d]	499 (2636.9)	456 (1605.6)	1809 (17.7)	1709 (11.2)	2323 (22.7)	2,174 (14.3)
HCA – HO	65 (343.5)	73 (257.0)	567 (5.5)	448 (2.9)	634 (6.2)	521 (3.4)
HCA – HACO	434 (2293.4)	383 (1348.5)	1242 (12.1)	1261 (8.3)	1689 (16.5)	1653 (10.8)
Overall[e]	499 (2636.9)	456 (1605.6)	3077 (30.1)	2414 (15.9)	3669 (35.8)	2892 (19.0)

[a] Incidence (no. per 100,000 dialysis patients per year) for dialysis patients calculated using 2020 USRDS point prevalence data

[b] Incidence (no. per 100,000 population per year) calculated using 2021 U.S. Census Data

[c] The total counts and rates include 2 HO MSSA, 13 HACO MSSA, and 9 HACO MRSA cases with unknown dialysis status

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

[e] The overall counts and rates include 78 MSSA and 13 MRSA cases with unknown epidemiological class

NA: By definition, CA cases cannot have dialysis in the past year

Figure 2. Incidence of Invasive MRSA by Epidemiologic Class, Emerging Infections Program, 2009–2021[a]

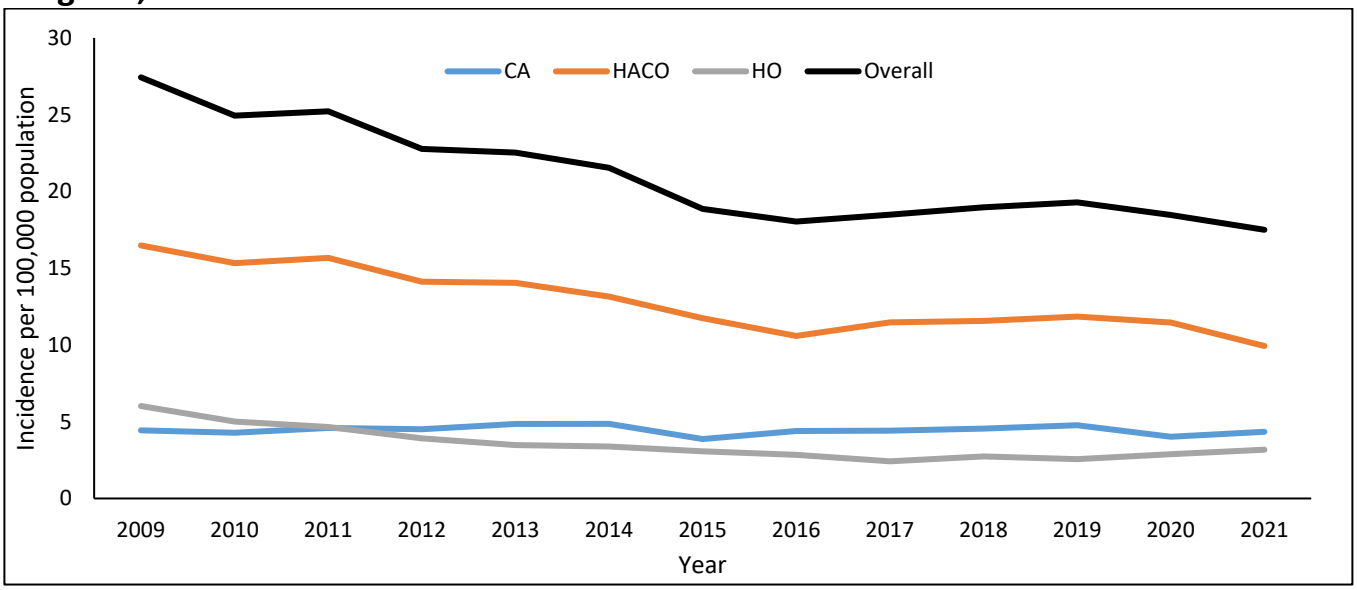
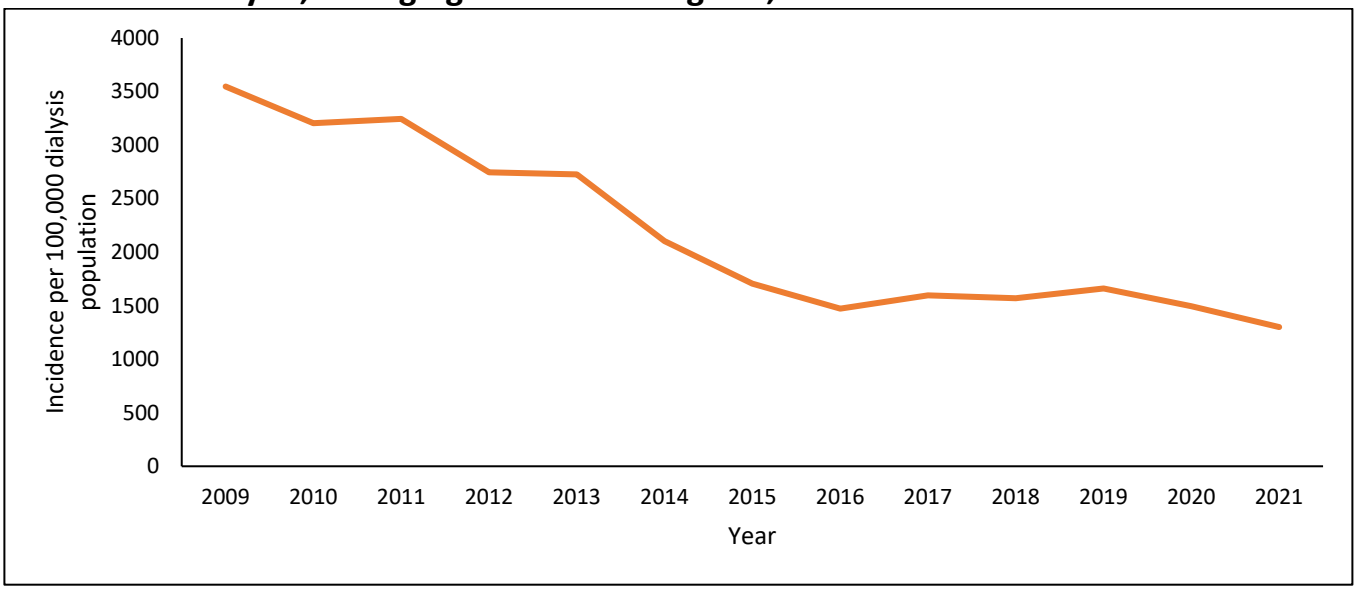


Figure 3. Incidence of Invasive Healthcare-Associated Community-Onset MRSA among Persons on Dialysis, Emerging Infections Program, 2009–2021[a]



[a] Restricted to the continuous catchment area (California [3 county San Francisco Bay area]; Connecticut [Fairfield, Hartford, and New Haven Counties]; Georgia [8 county Atlanta area]; Minnesota [2 county Minneapolis-Saint Paul area]; New York [1 Rochester county]; and Tennessee [1 Nashville county]) for comparison of trends over time.

Figure 4. Incidence of Invasive MSSA by Epidemiologic Class, Emerging Infections Program, 2017–2021[a]

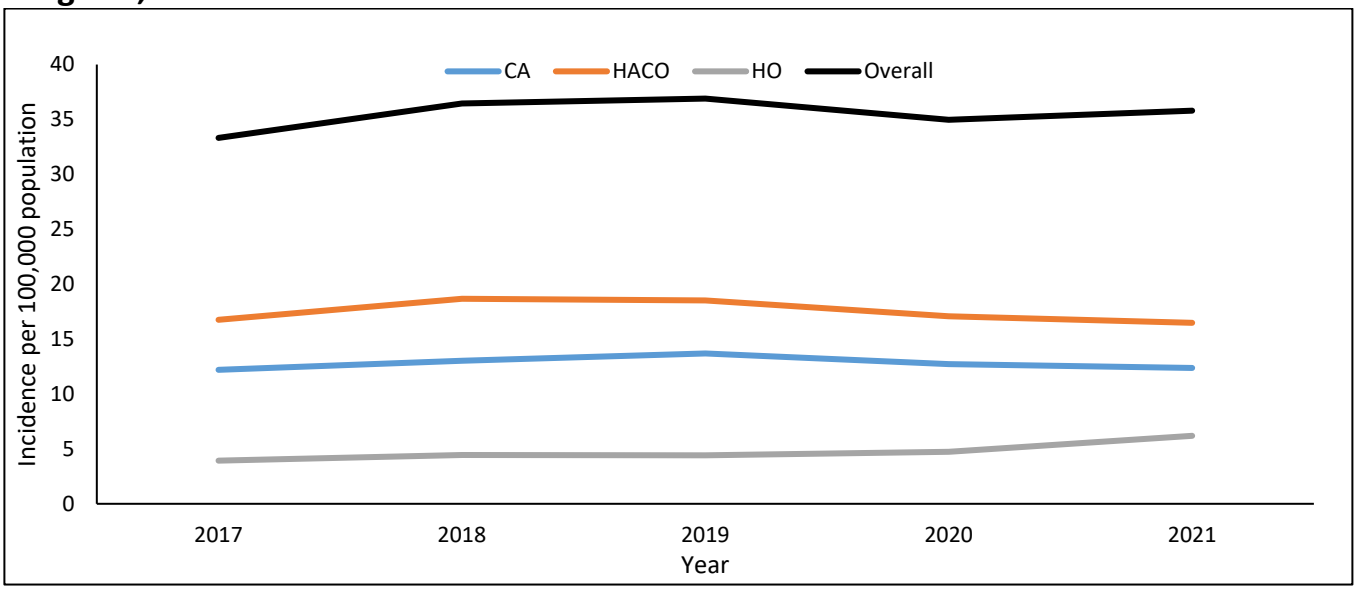
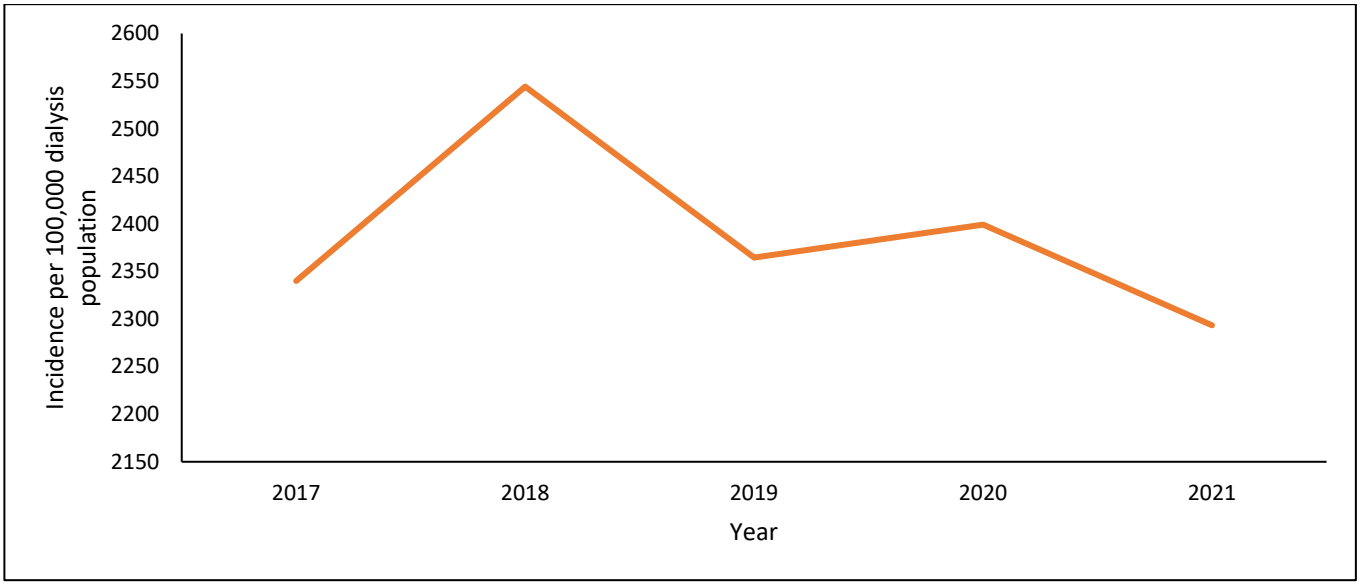


Figure 5. Incidence of Invasive Healthcare-Associated Community-Onset MSSA among Persons on Dialysis, Emerging Infections Program, 2017–2021[a]



[a] Restricted to the continuous catchment area (California [3 county San Francisco Bay area]; Connecticut [New Haven County]; Georgia [1 Atlanta area county]; Minnesota [2 county Minneapolis–Saint Paul area]; New York [1 Rochester county]; and Tennessee [1 Nashville county]) for comparison of trends over time.

Table 9. Outcomes of Invasive MSSA (N=3291[a]) and MRSA (N=2879[a]) Cases by Epidemiologic Class, Emerging Infections Program, 2021

Outcomes[b]	MSSA CA (n=1268) No. (%)	MRSA CA (n=705) No. (%)	MSSA HACO (n=1689) No. (%)	MRSA HACO (n=1653) No. (%)	MSSA HO (n=634) No. (%)	MRSA HO (n=521) No. (%)
Died	122 (9.6)	74 (10.5)	219 (13.0)	232 (14.0)	197 (31.1)	182 (34.9)
Survived	1140 (89.9)	629 (89.2)	1456 (86.2)	1410 (85.3)	432 (68.1)	339 (65.1)
Acute care hospitalization – survived	1031 (81.3)	582 (82.6)	1394 (82.5)	1358 (82.1)	432 (68.1)	339 (65.1)
Acute care hospitalization – survived - Discharged to long-term care facility	318 (30.8)	170 (29.2)	451 (32.4)	616 (45.4)	166 (38.4)	142 (41.9)
Acute care hospitalization – survived - Discharged to long-term acute care hospital	17 (1.7)	10 (1.7)	15 (1.0)	27 (2.0)	25 (5.8)	22 (6.5)
Acute care hospitalization – survived - Discharged to other[c]	681 (66.0)	375 (64.4)	920 (66.0)	684 (50.3)	238 (55.1)	171 (50.4)
Acute care hospitalization – survived - Discharged to Unknown	15 (1.5)	27 (4.6)	8 (0.6)	31 (2.3)	3 (0.7)	4 (1.2)
Unknown	6 (0.5)	2 (0.3)	14 (0.8)	11 (0.7)	5 (0.8)	0 (0.0)

[a] Excludes 78 MSSA and 13 MRSA cases with unknown epidemiological class

[b] For patients admitted to a hospital, outcome was assessed at the time of discharge. For patients in a long-term care facility, long-term acute care facility, or in an outpatient dialysis center, outcome was assessed 30 days after the date of incident culture. For all other patients, outcome was ascertained from the healthcare facility encounter associated with the incident culture.

[c] Examples include private residence, correctional facility, homeless shelter, and drug rehabilitation program

Summary

Surveillance data from 2021 represent the seventeenth full year of population-based surveillance for invasive MRSA infections through the Emerging Infections Program, and the sixth for MSSA.

This is the first surveillance report that includes rates stratified by Hispanic or Latino ethnicity. Rates of invasive MRSA and MSSA among patients of Hispanic ethnicity were less than what was found for non-Hispanic White or non-Hispanic Black patients.

Incidence of HO MRSA increased in 2021 compared to 2017-2020. Conversely, incidence of HACO MRSA, including among dialysis patients, decreased in 2020 and 2021, interrupting the previous increases that had been noted since 2017. HACO and CA MSSA incidence decreased compared to 2018-2020, but HO MSSA incidence increased and is the highest observed since 2017.

Citation

Centers for Disease Control and Prevention. 2024. Emerging Infections Program, Healthcare-Associated Infections – Community Interface Surveillance Report, Invasive *Staphylococcus aureus*, 2021. Available at: https://www.cdc.gov/healthcare-associated-infections/media/pdfs/2021-MRSA-Report-508.pdf.

For more information, visit our web sites:

- Invasive *Staphylococcus aureus* (MRSA/MSSA) Infection Tracking (https://www.cdc.gov/healthcare-associated-infections/php/haic-eip/invasive-staphylococcus.html)
- Methicillin-resistant *Staphylococcus aureus* (MRSA) (http://www.cdc.gov/mrsa/about/index.html)