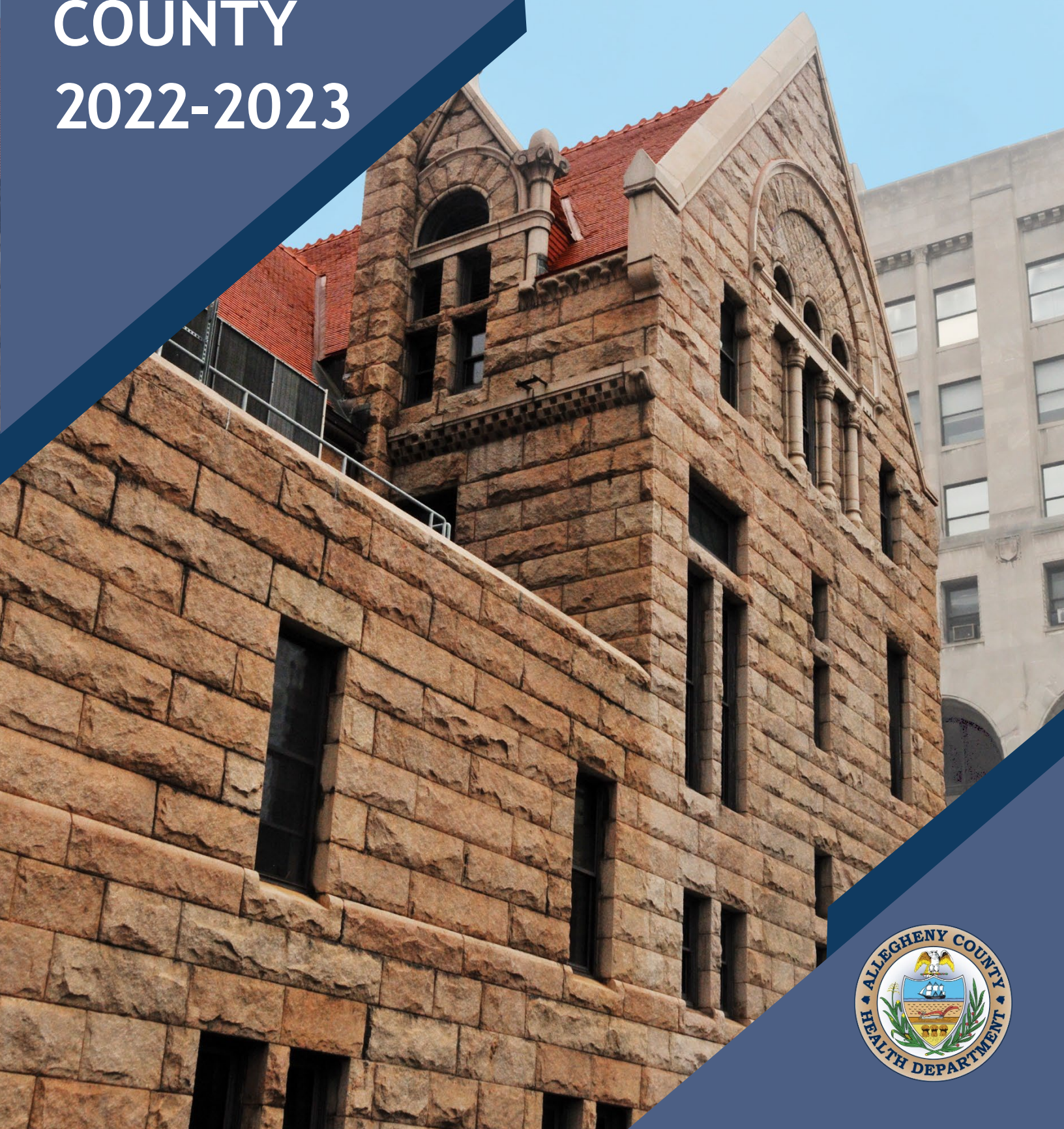


ALLEGHENY COUNTY
HEALTH DEPARTMENT

INVASIVE MRSA IN ALLEGHENY COUNTY

2022-2023



INVASIVE MRSA IN ALLEGHENY COUNTY, 2022-2023

Methicillin-resistant *Staphylococcus aureus*, also known as MRSA, is a *Staphylococcus aureus* bacterium that is resistant to specific antibiotics. MRSA can cause skin and invasive infections. *Staphylococcus aureus* is part of the normal bacteria found on the skin and in the nose. Nearly 33 percent of people have *Staphylococcus aureus* present in their nose, with almost 2 percent of people having MRSA in their nose without signs of illness.

Invasive MRSA occurs when the bacteria get inside the body into a normally sterile site, such as blood, cerebrospinal fluid (CSF), pleural fluid, peritoneal fluid, pericardial fluid, bone, joint/synovial fluid, or an internal body site (e.g., lymph node, brain). Invasive MRSA that is not treated properly can result in sepsis and death. Below are frequently asked questions regarding invasive MRSA, along with a summary of cases reported to the Allegheny County Health Department (ACHD) from 2022 through 2023.

How is MRSA transmitted?

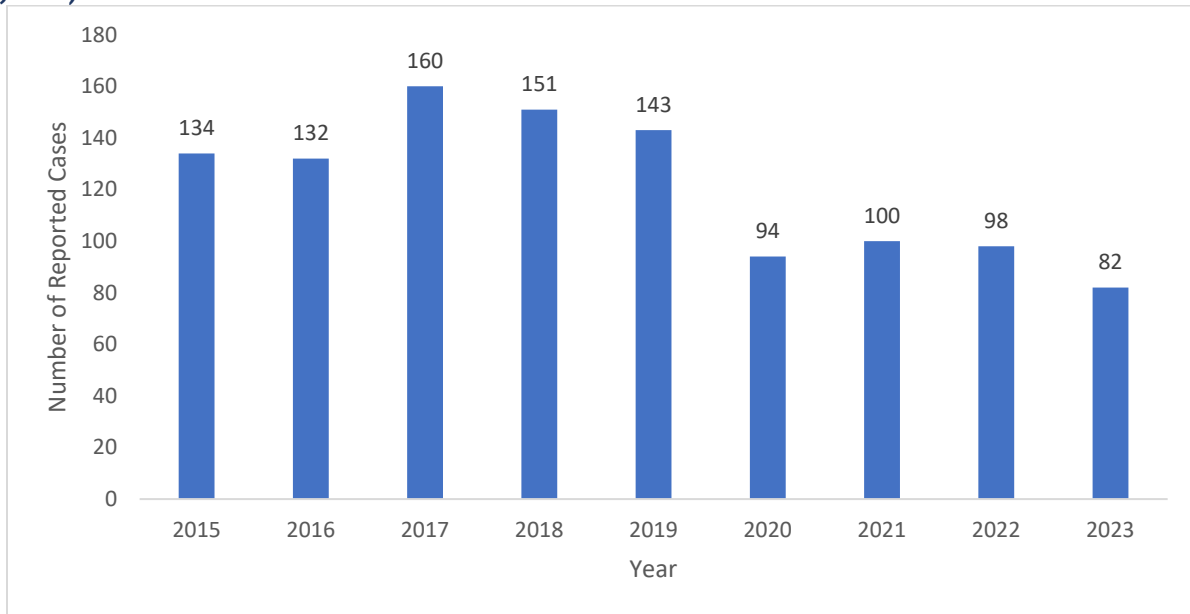
MRSA can be contracted in hospitals and in long-term care settings through improper infection control (e.g. poor hand hygiene; contaminated linens, bedrails and medical equipment). MRSA can also be contracted in the community through contact with infected people, or objects, that carry bacteria (e.g. touching a contaminated wound or sharing personal items such as razors or towels that have been in contact with infected skin).

How often does invasive MRSA occur?

There is no national surveillance system to monitor invasive MRSA. The CDC's Emerging Infections Program (EIP) created an invasive *Staphylococcus aureus* infection surveillance program in 2004. The program currently functions in seven catchment areas across the United States, representing approximately 16 million people (1). A 2019 report on invasive *Staphylococcus aureus* stated that the incidence of invasive MRSA is 21.3 cases per 100,000 people in the 7 jurisdictions (1).

In Allegheny County, an average of 144 MRSA cases (11.8 MRSA cases per 100,000 people) were reported each year from 2015 through 2019, while there were only 94 cases (7.7 per 100,000) reported in 2020 and 100 (7.9 per 100,000) reported in 2021. In 2022 and 2023, 98 (8.0 per 100,000) and 82 (6.7 per 100,000) cases, respectively, were reported (Figure 1).

Figure 1. Reported invasive MRSA cases in Allegheny County, 2015-2023 (N = 1,094)*



*20 cases excluded for missing data on year of diagnosis

In 2022-2023, most (91 percent) of the reported cases involved bloodstream infections (Table 1). Death was reported in 4 cases, approximately 2 percent of the total cases.

Table 1. Specimen source of positive MRSA cultures collected from reported cases, Allegheny County, 2022-2023 (N=188*)

Specimen Source	Positive Cultures n (%)
Blood	164 (91)
Other	13 (7)
Joint/Synovial Fluid	6 (3)
Bone	5 (3)
CSF	0 (0)
Muscle	0 (0)
Pleural Fluid	0 (0)
Peritoneal Fluid	0 (0)
Pericardial Fluid	0 (0)

*Some cases had multiple positive sources

Most (63 percent) persons with invasive MRSA were male and 53 percent were ≥ 65 years of age (Table 2).

Table 2. Reported invasive MRSA cases by patient characteristics, Allegheny County, 2022-2023 (N=180)

Characteristics	n (%)
Sex	
Male	114 (63)
Female	66 (37)
Unknown	0 (0)
Age (Years)	
≤19	1 (<1)
20-44	31 (17)
45-64	51 (28)
≥65	96 (53)
Unknown	1 (<1)
Race	
White	104 (58)
Black	27 (15)
Asian	0 (0)
American Indian/Alaskan Native	0 (0)
Other/Unknown	49 (27)

Of 180 reported cases, 41 (23 percent) had a known history of previous MRSA infection, 76 (42 percent) reported an overnight stay in a healthcare facility within 1 year of invasive MRSA diagnosis, 33 (18 percent) reported dialysis or surgery within 2 years of diagnosis, and 12 (7 percent) reported a vascular catheter in place within 2 days prior to their invasive MRSA test (Table 3).

Table 3. Reported invasive MRSA cases by risk factors, Allegheny County, 2022-2023 (N=180)

Risk Factor	n (%)
Previous MRSA infection or colonization	
Yes	41 (23)
No	59 (33)
Unknown	80 (44)
Stayed overnight in an acute or long-term care facility withing 1 year of invasive MRSA diagnosis	
Yes	76 (42)
No	37 (21)
Unknown	67 (37)

Received dialysis or had surgery within 2 years of invasive MRSA test	
Yes	33 (18)
No	71 (39)
Unknown	76 (43)
Vascular catheter in place within the 2 calendar days before invasive MRSA test	
Yes	12 (7)
No	117 (65)
Unknown	51 (28)

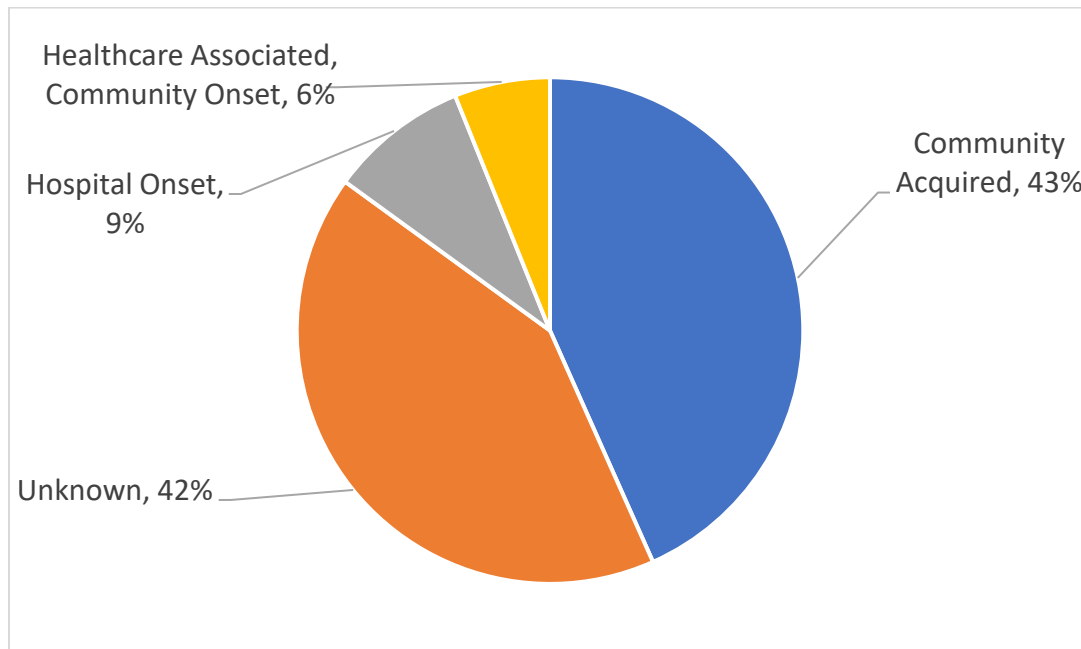
How is invasive MRSA tracked in Allegheny County?

In Allegheny County, invasive MRSA is a reportable condition. Hospitals are required to report any positive MRSA culture collected from a normally sterile site in the body. Positive MRSA cultures are reported via [ACHD's reporting form](#). Case reports submitted to ACHD are used to track cases and clusters of disease in time and location. Specifically, the data are used to assess the incidence of the following three specific categories of invasive MRSA infections:

- Hospital-onset (HO): when a positive MRSA culture is collected more than three calendar days after admission to a hospital,
- Health care-associated community onset (HACO): cultures collected in outpatient settings or prior to the third day of hospital admission in a patient with one of several significant prior health care exposures (e.g. presence of a catheter upon hospital admission, previous stay in health care facility, or receipt of surgery or dialysis), and
- Community-associated (CA): all other invasive MRSA cases that do not meet the HO and HACO definitions (1).

The epidemiologic classification of reported invasive MRSA cases in 2022-2023 is as follows: 16 (9 percent) HO, 11 (6 percent) HACO, 78 (43 percent) CA, and 75 (43 percent) could not be classified due to missing data (Figure 2).

Figure 2. Likely setting of transmission of invasive MRSA cases reported in Allegheny County, 2022-2023 (N=180)



How is invasive MRSA prevented?

Invasive MRSA can be prevented in the community by practicing good [hand and body hygiene](#), covering wounds with clean, dry bandages until healed, refraining from sharing personal items (e.g. towels, washcloths, razors, and clothing), washing clothes before being worn by others, and washing hands after handling dirty laundry. Invasive MRSA in health care settings can be prevented through proper hand hygiene, adequate sanitation of hospital rooms and medical equipment, testing infected patients for the presence of MRSA on the skin, and patient decolonization (2). Additionally, using Contact Precautions when treating MRSA-positive patients can reduce the transmission of MRSA. Contact Precautions include use of gloves and gowns when treating MRSA patients and removing the gloves and gown when done, followed by handwashing. It is also recommended that MRSA-positive patients have either a single room or share a room with another MRSA-positive patient.

General information and fact sheets about MRSA in health care settings, cleaning and disinfection, laboratory testing, and what the CDC is doing can be found on the [CDC's website](#).

References:

1. Centers for Disease Control and Prevention. 2022. Healthcare-Associated Infections – Community Interface Surveillance Report, Emerging Infections Program Network, Methicillin-Resistant *Staphylococcus aureus*, 2019. Available at: <https://www.cdc.gov/hai/eip/pdf/2019-MRSA-Report-508.pdf>

2. Climo MW, Sepkowitz KA, Zuccotti G, et al. The effect of daily bathing with chlorhexidine on the acquisition of methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant Enterococcus, and healthcare-associated bloodstream infections: results of a quasi-experimental multicenter trial. *Crit Care Med*. 2009; 37: 1858–1865.