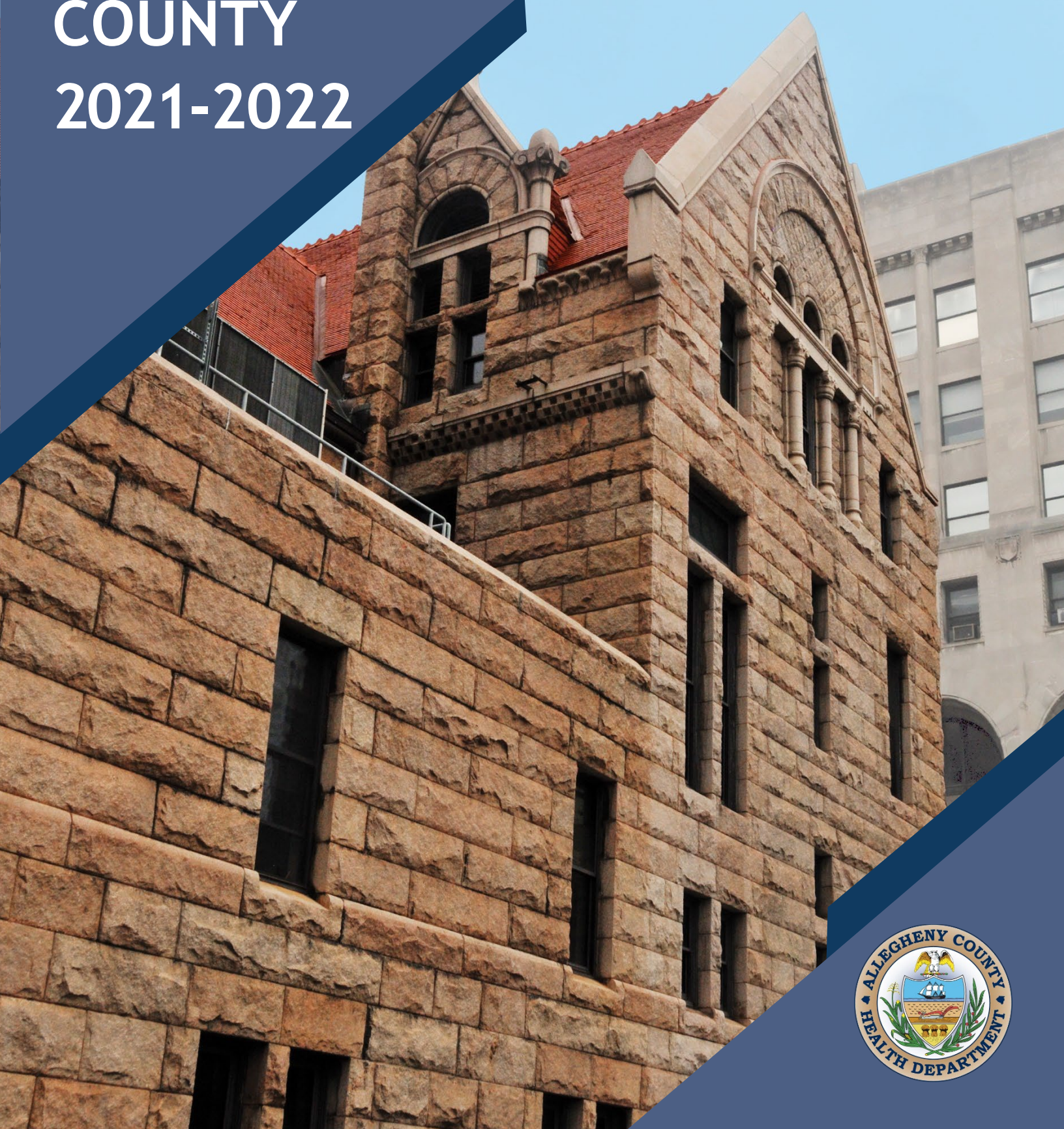


ALLEGHENY COUNTY
HEALTH DEPARTMENT

INVASIVE MRSA IN ALLEGHENY COUNTY

2021-2022



INVASIVE MRSA IN ALLEGHENY COUNTY, 2021-2022

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 gets 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 2021 through 2022.

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 as part of EIP Active Bacterial Core Surveillance. The program currently functions in seven EIP catchment areas across the United States, representing approximately 16 million people (1). A 2019 EIP 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).

According to the CDC, there have been some successes in decreasing invasive MRSA incidence, as rates of bloodstream infections decreased from 2005 through 2016 (2). Since 2012, however, the rate of decrease slowed, and invasive MRSA was still responsible for high morbidity and mortality rates in the U.S. in the same time span (2).

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 MRSA reporting form](#). Case reports submitted to ACHD are used to track cases and

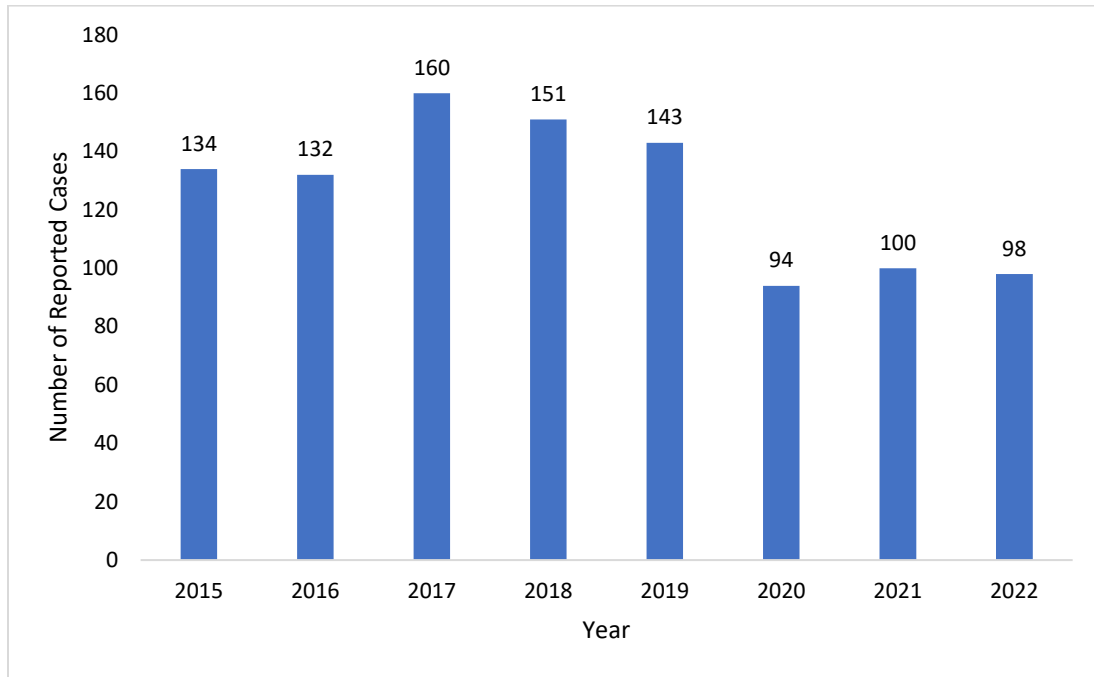
clusters of disease in time and location. Specifically, the data are used to assess the incidence of the following three specific categories of invasive MRSA infections:

- 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).

What do the local data show?

In Allegheny County, an average of 144 cases of invasive MRSA were reported each year from 2015 through 2019, while there were only 94 cases reported in 2020. In 2021 and 2022, 100 and 98 cases, respectively, were reported. In 2021-2022, most (88 percent) of the reported cases involved bloodstream infections (Table 1). Death was reported in 13 cases, approximately 7 percent of the total cases. Most (57 percent) persons with invasive MRSA were male and 59 percent were ≥ 65 years of age (Table 2). Among those with available risk factor data, more than half had a history of a previous MRSA infection, and most had stayed overnight in an acute or long-term care facility within one year of an invasive MRSA diagnosis (Table 3). The epidemiologic classification of reported invasive MRSA cases is as follows: 22 (12 percent) HO, 26 (13 percent) HACO, 108 (52 percent) CA, and 47 (23 percent) could not be classified due to missing data (Figure 2). Of 198 reported cases, 13 (7 percent) had a history of injection drug use.

Figure 1. Reported invasive MRSA cases in Allegheny County, 2015-2022 (N = 1,012)*



*19 cases excluded for missing data on year of diagnosis

Table 1. Specimen source of positive MRSA cultures collected from reported cases, Allegheny County, 2021-2022 (N=198)

Specimen Source*	Positive Cultures n (%)
Blood	180 (87)
Joint/Synovial Fluid	12 (6)
Other	8 (4)
Bone	6 (3)
CSF	0 (0)
Muscle	0 (0)
Pleural Fluid	0 (0)
Peritoneal Fluid	0 (0)
Pericardial Fluid	0 (0)

*Some cases involved multiple positive sources, percentages out of total cultures

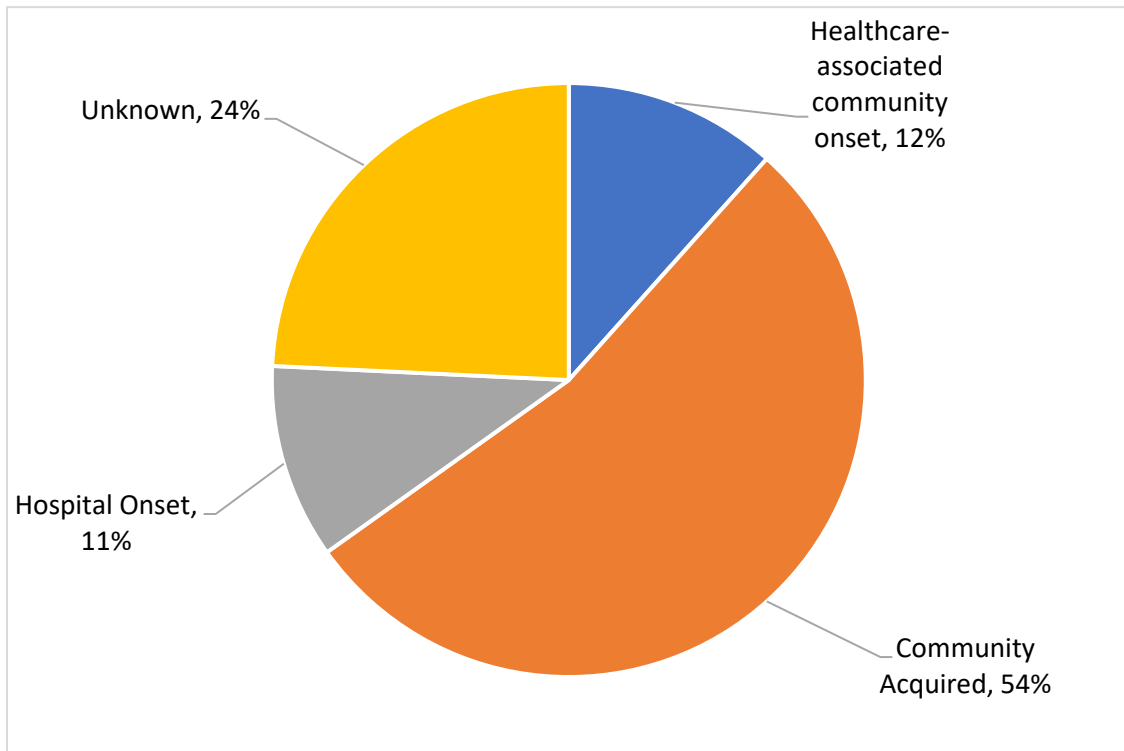
Table 2. Reported invasive MRSA cases by patient characteristics, Allegheny County, 2021-2022 (N=198)

Characteristics	n (%)
Sex	
Male	114 (58)
Female	80 (40)
Unknown	4 (2)
Age (Years)	
≤19	1 (<1)
20-44	28 (14)
45-64	45 (23)
≥65	122 (62)
Unknown	2 (1)
Race	
White	123 (62)
Black	22 (11)
Hawaiian/Native Pacific Islander	1 (<1)
Asian	0 (0)
American Indian/Alaskan Native	0 (0)
Unknown	52 (26)

Table 3. Reported invasive MRSA cases by risk factors, Allegheny County, 2021-2022 (N=198)

Risk Factor	n (%)
Previous MRSA infection or colonization	
Yes	56 (28)
No	63 (33)
Unknown	79 (39)
Stayed overnight in an acute or long-term care facility within 1 year of invasive MRSA diagnosis	
Yes	81 (42)
No	39 (20)
Unknown	78 (38)
Received dialysis or had surgery within 2 years of invasive MRSA test	
Yes	38 (20)
No	74 (37)
Unknown	86 (43)
Vascular catheter in place within the 2 calendar days before invasive MRSA test	
Yes	21 (11)
No	133 (69)
Unknown	44 (20)

Figure 2. Epidemiologic classification of invasive MRSA cases reported in Allegheny County, 2021-2022 (N=198)



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 (3). 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. Kourtis, AP, Hatfield K, Baggs J, et al. *Vital Signs*: Epidemiology and Recent Trends in Methicillin-Resistant and in Methicillin-Susceptible *Staphylococcus aureus* Bloodstream Infections – United States. MMWR Morb Mortal Wkly Rep 2019;68:214-219. DOI: <http://dx.doi.org/10.15585/mmwr.mm6809e1>.
3. 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.