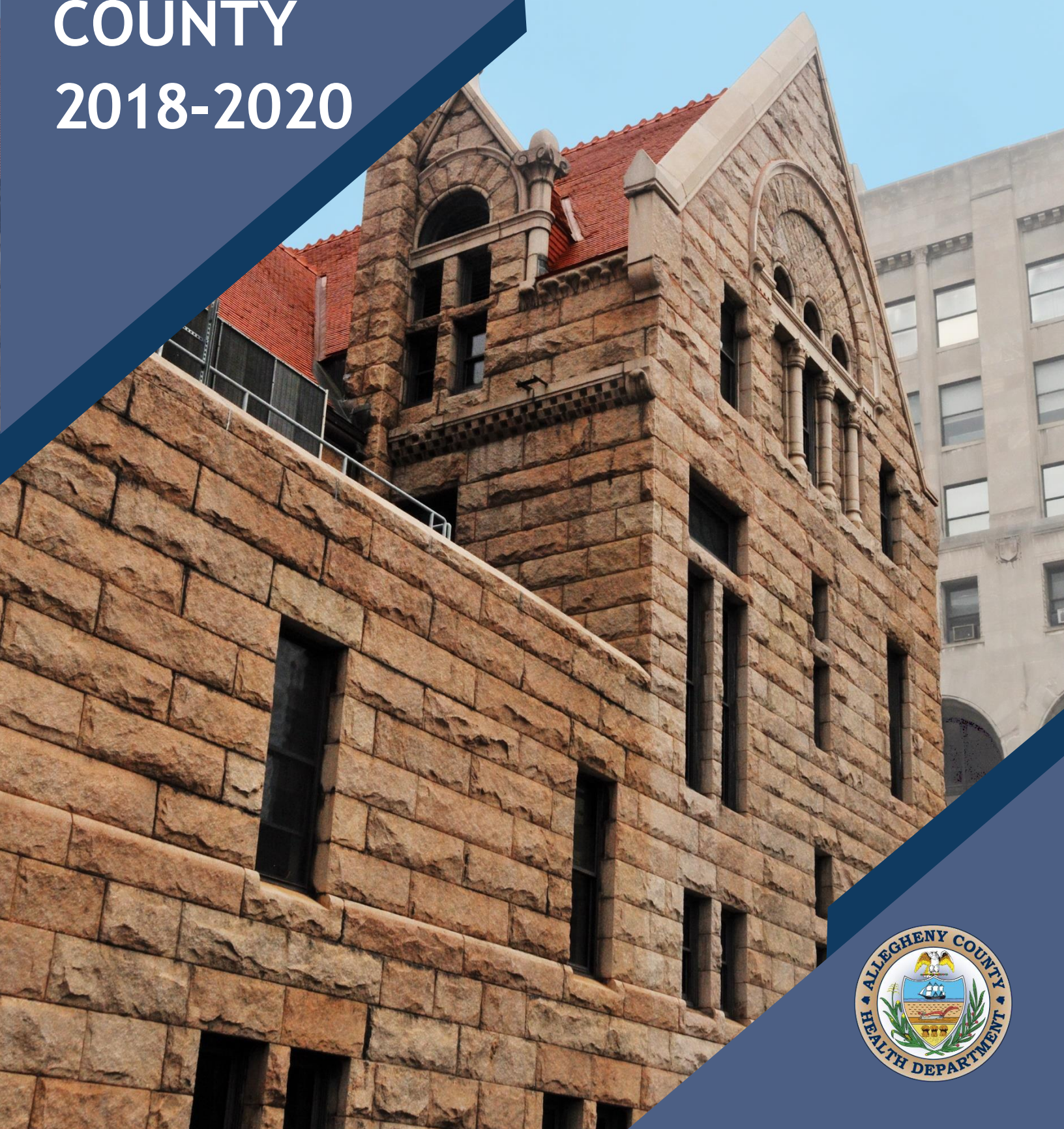


ALLEGHENY COUNTY
HEALTH DEPARTMENT

INVASIVE MRSA IN ALLEGHENY COUNTY

2018-2020



INVASIVE MRSA IN ALLEGHENY COUNTY, 2018-2020

Methicillin-resistant Staphylococcus aureus, also known as MRSA, is a bacterial infection with *Staphylococcus aureus* that is resistant to specific antibiotics. MRSA can cause skin and invasive infections. The bacteria, *Staphylococcus aureus*, is part of the normal bacteria found on the skin and in the nose; in other words, it is part of the normal microbiome. Nearly one in every three people have *Staphylococcus aureus* present in their nose, and nearly two out of every 100 people have MRSA in their nose without sign of illness.

Invasive MRSA occurs when MRSA 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 cause serious bloodstream infections, surgical site infections, or pneumonia, which 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 2018-2020.

How is MRSA transmitted?

MRSA can be contracted in hospital settings 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. contact with a contaminated wound or sharing personal items such as razors or towels that have been in contact with infected skin).

How is invasive MRSA tracked?

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 (<https://eapps.alleghenycounty.us/MRSA>). 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: when a positive MRSA culture is collected more than three calendar days after admission to a hospital,
- Healthcare-associated community onset: if a culture was obtained from an outpatient setting or during the first 3 days of hospitalization in a patient with one of several significant prior healthcare exposures (e.g. presence of a catheter upon hospital admission, previous stay in healthcare facility, or receipt of surgery or dialysis) (1), and
- Community-associated: all other invasive MRSA cases that do not meet these definitions.

How often does invasive MRSA occur?

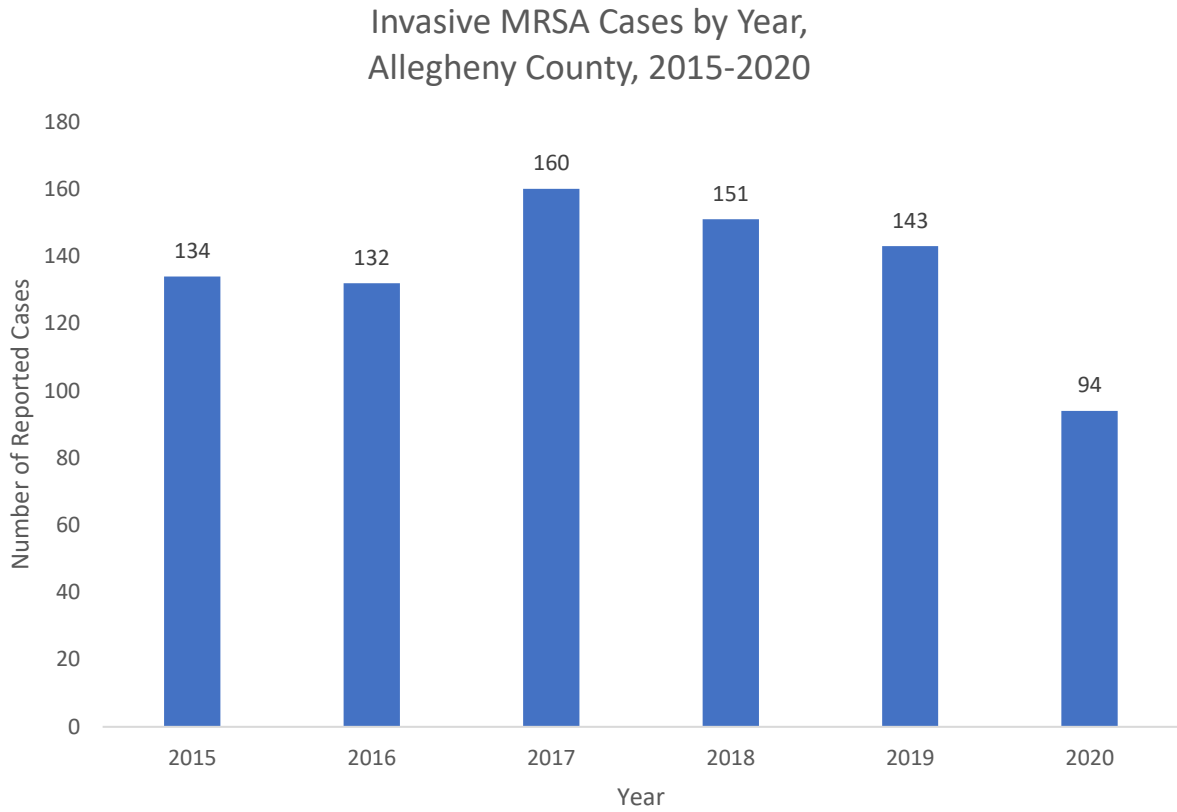
There is no national surveillance system to monitor invasive MRSA. The CDC's Emerging Infections Program (EIP) created an invasive *Staphylococcus aureus* infection surveillance program in 2004 as part of EIP Active Bacterial Core Surveillance. The program currently functions in 7 EIP sites across the United States, surveilling approximately 16 million people. A 2017 EIP Network Report on invasive *Staphylococcus aureus* found the incidence of invasive MRSA to be 20.7 cases per 100,000 people in the 7 jurisdictions (2).

From 2005 through 2016, HO bloodstream infections declined by 17.1% annually, although the decline slowed during 2013-2016. During the same time span, HACO bloodstream infections declined by 7.8% per year, and CA bloodstream infections decreased by 2.5% per year (1).

In Allegheny County, there were 134 reported cases of invasive MRSA in 2015, 132 cases reported in 2016, and 160 cases reported in 2017. Between 2018-2020, ACHD received reports of 402 cases of invasive MRSA, including 102 recurrent infections.¹ There were 151 cases of invasive MRSA reported in 2018, 143 cases reported in 2019, 94 cases reported in 2020, and 14 cases without data on year of diagnoses (Figure 1). Most of the cases involved bloodstream infections (89%) (Table 1). Death was reported in about 6% of cases. Most persons with invasive MRSA were male (59%) and about half 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: 44 (11%) hospital-onset, 205 (51%) healthcare-associated community onset, 130 (32%) community-associated, and 23 (6%) could not be classified due to missing data (Figure 2).

¹ A recurrent infection involves a positive culture for a previously reported patient ≥ 30 days after initial report. Positive cultures for the same patient reported less than 30 days apart are considered the same event.

Figure 1. Reported invasive MRSA cases in Allegheny County, 2015-2020 (N = 814)*



*14 cases excluded due to missing data for year of diagnoses

Table 1. Specimen source of positive MRSA cultures collected from reported cases, Allegheny County, 2018-2020 (N = 402)*

Specimen Source	Positive Cultures N (%)
Blood	358 (89)
CSF	1 (< 1)
Joint/synovial Fluid	19 (5)
Muscle	1 (< 1)
Bone	13 (3)
Pleural Fluid	1 (< 1)
Peritoneal Fluid	1 (< 1)
Pericardial Fluid	0 (0)
Other	18 (4)

*Some cases involved multiple positive sources

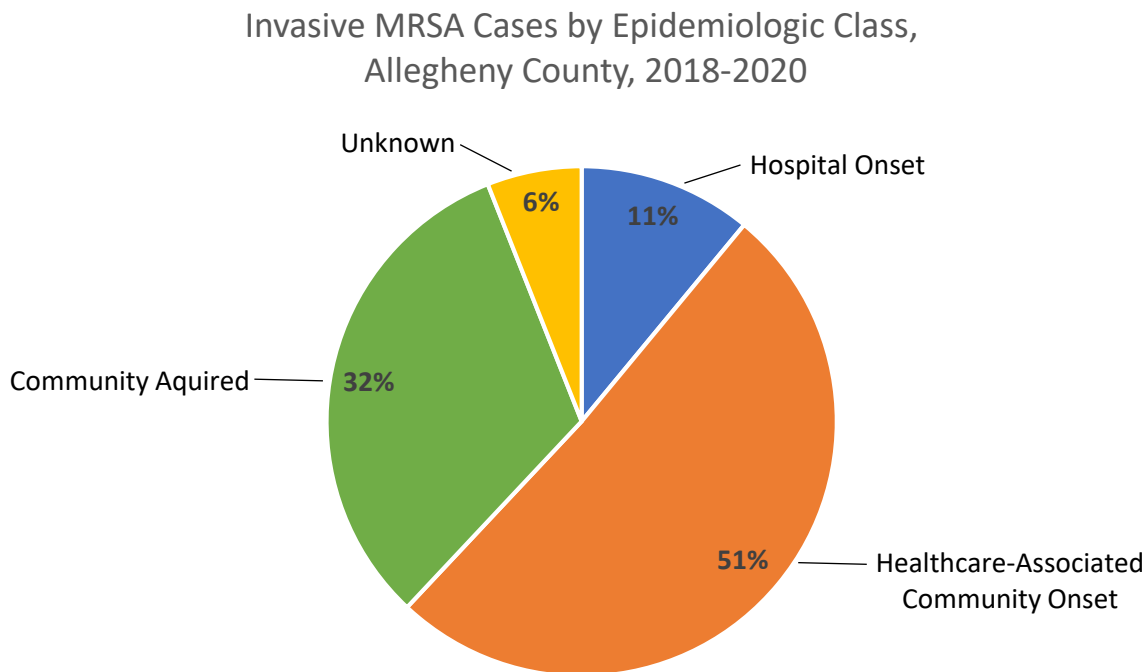
Table 2. Reported invasive MRSA cases by patient characteristics, Allegheny County, 2018-2020 (N = 402)

Characteristics	N (%)
Sex	
Male	238 (59)
Female	148 (37)
Unknown	16 (4)
Age (Years)	
≤ 19	16 (4)
20-44	60 (15)
45-64	106 (26)
≥ 65	196 (49)
Unknown	25 (6)
Race	
White	246 (61)
Black	35 (9)
Hawaiian/Native Pacific Islander	0 (0)
Asian	0 (0)
American Indian/Alaskan Native	0 (0)
Unknown	121 (30)

Table 3. Reported invasive MRSA cases by risk factors, Allegheny County, 2018-2020 (N = 402)

Risk Factor	N (%)
Previous MRSA infection or colonization	
Yes	135 (34)
No	116 (28)
Unknown	151 (38)
Stayed overnight in an acute or long-term care facility within 1 year of invasive MRSA diagnosis	
Yes	206 (51)
No	56 (14)
Unknown	140 (35)
Received dialysis or had surgery within 1 year of invasive MRSA test	
Yes	88 (22)
No	146 (36)
Unknown	168 (42)
Vascular catheter in place within the 2 calendar days before invasive MRSA test	
Yes	46 (11)
No	268 (67)
Unknown	88 (22)

Figure 2. Epidemiologic classification of invasive MRSA cases reported in Allegheny County, 2018-2020 (N = 402)



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 healthcare 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. 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 factsheets about MRSA in healthcare settings, cleaning and disinfection, laboratory testing, and what the CDC is doing can be found here: [MRSA | CDC](#).

References:

1. 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>.
2. Centers for Disease Control and Prevention. 2020. Healthcare-Associated Infections – Community Interface Surveillance Report, Emerging Infections Program Network, Methicillin-Resistant Staphylococcus aureus, 2017. Available at: <https://www.cdc.gov/hai/eip/pdf/2017-MRSA-Report508.pdf>