

## **Staphylococcus aureus Infection, Invasive, Methicillin-Resistant (MRSA)**

**Agent:** *Staphylococcus aureus* (bacteria) that has developed resistance to the class of beta-lactam antibiotics, including penicillin, cloxacillin, oxacillin, nafcillin, and methicillin, as well as cephalosporins and carbapenems.

**Mode of Transmission:** Person-to-person transmission via direct contact with colonized skin or skin lesions of an infected person, or by indirect contact with contaminated personal items or surfaces. Invasive infections occur when the bacteria penetrate normally sterile sites.

**Signs/Symptoms:** Invasive infections may affect the blood, bone, lung, and lining of the brain and spinal cord and may cause fever, difficulty breathing, chills, pain and other syndrome-specific signs and symptoms. Non-invasive skin and soft tissue infections commonly cause swelling, tenderness, and redness and can manifest as abscesses, boils, or pustules.

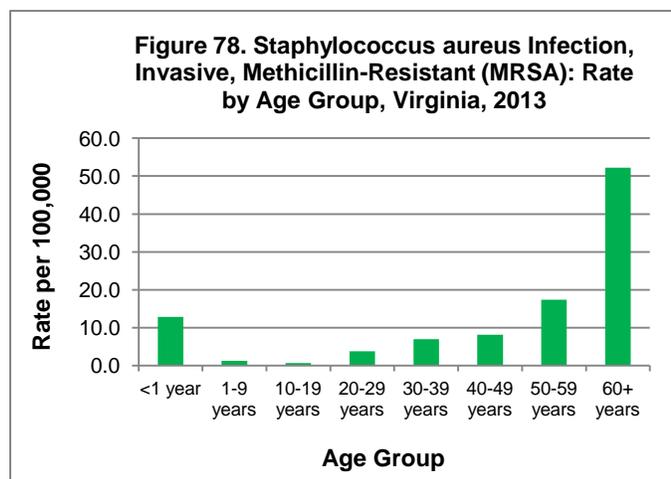
**Prevention:** In the community, preventive measures include practicing proper hygiene and wound care and cleaning hands regularly and thoroughly with soap and water or alcohol-based hand sanitizer. In healthcare settings, control measures include adhering to appropriate infection prevention practices, including management of catheters or other medical equipment, and practicing prudent use of antibiotics.

**Other Important Information:** Only invasive MRSA infections are required to be reported in Virginia and only laboratories are required to report these infections. Asymptomatic colonization and infections from non-sterile sites (e.g., skin and soft tissue) are not reportable. Reporting of this condition became effective on October 26, 2007.

<b>Staphylococcus aureus Infection, Invasive, Methicillin-Resistant (MRSA): 2013 Data Summary</b>	
Number of Cases:	1,247
5-Year Average Number of Cases:	1,289.4
% Change from 5-Year Average:	-3%
Incidence Rate per 100,000:	15.2

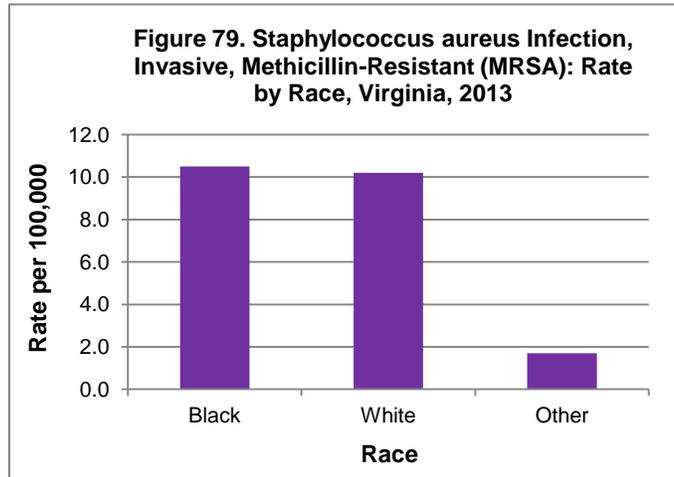
The 1,247 cases of invasive MRSA infection reported in 2013 is similar to the 1,294 cases reported in 2012, but represents an 18% decrease from the 1,524 cases reported in 2008, the first full reporting year for invasive MRSA infection in Virginia.

In general, with the exception of the less than one year age group and 1-9 year age group, both the number of cases and the incidence rate increased with age in 2013. As in previous years, the 60 year and older age group experienced both the highest number of cases and highest incidence rate (796 cases, 52.2 per 100,000), followed by the 50-59 year age group (200 cases, 17.4 per 100,000) (Figure 78). The less than one year age



group had the third highest incidence rate (13 cases, 12.9 per 100,000), which was a decrease from 2012 (16.8 per 100,000). The 10-19 year age group had the lowest number of cases and lowest incidence rate of all age groups in 2013 (7 cases, 0.7 per 100,000).

Thirty-six percent of cases were missing race data. Among cases with race information, incidence in the black population (10.5 per 100,000) was similar to the incidence in the white population (10.2 per 100,000) (Figure 79). This is



the first time incidence among the black population has not been significantly higher than the white population since Virginia started collecting invasive MRSA surveillance data in 2008. Racial disparities have been noted nationally, with the black population having twice the incidence rate of the white population. It is unclear why Virginia saw little difference in incidence between these two populations in 2013. Possibly, the larger proportion of cases with unknown race data in 2013 could have had an effect on these results. In Virginia, incidence was higher in males than in females (17.4 and 12.8 per 100,000, respectively).

By region, the southwest region had the highest incidence rate (26.9 per 100,000) and the northern region experienced the lowest rate (7.7 per 100,000). Overall, incidence tends to be higher in the western half of the state. Incidence by locality can be viewed in the map below. In general, invasive MRSA infections occurred throughout the year with little seasonal variation.

There were four MRSA outbreaks in 2013, only one of which was due to invasive MRSA. That outbreak occurred in a medical facility in the northern region and involved 11 infants. One of the infants was identified with invasive MRSA infection, and surveillance cultures submitted in response to that finding identified 10 additional colonized infants. The hospital instituted numerous measures to halt the spread of the organism.

Among those with invasive MRSA infections reported in 2013, 3% (35 cases) were reported to have died from these infections. The average age of those who died from their invasive MRSA infection was 69 years, with a range of 32 to 92 years. Among the deaths in 2013, 71% occurred in adults aged 60 years and older. Case-fatality was slightly higher in males than females (3% and 2%, respectively).

*Staphylococcus aureus* Infection, Invasive (MRSA)  
Incidence Rate by Locality, Virginia, 2013

