

## **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.

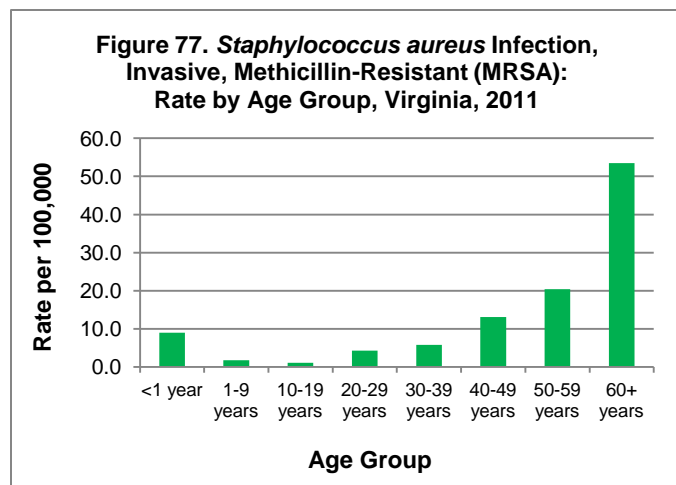
**Signs/Symptoms:** Invasive infections may affect the blood, bone, lung, and lining of the brain and spinal cord and may cause fever, difficulty breathing, chills, pain and other syndrome-specific signs and symptoms. Non-invasive skin and soft tissue infections commonly cause swelling, tenderness, and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

The 1,304 cases of invasive MRSA infection reported in 2011 represent a 9% increase over the number reported in 2010, but a 14% 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 <1 year age group, both the number of cases and the incidence rate increased with age. As in previous years, the 60 year and older age group experienced both the highest number of cases and highest incidence rate in 2011 (759 cases, 53.5 per 100,000), followed by the 50-59 year age group (225 cases, 20.4 per 100,000) (Figure 77). Twenty-three percent of cases were missing race data; however, among cases with race information, incidence in the black population (19.9 per 100,000) was 1.6 times the rate in the white population (12.4 per 100,000), and more than seventeen times the rate in the “other” race population (1.1 per 100,000) (Figure 78). Although the cause is unknown, this racial disparity in invasive MRSA infections has also been observed nationally. In Virginia, incidence was higher in males than in females (18.1 and 13.7 per 100,000, respectively). By region, the southwest region had the highest incidence rate (22.2 per 100,000), followed by the central region (20.0 per 100,000). The lowest rate (7.8 per 100,000) was seen in the northern region. Onset of invasive MRSA infections occurred throughout the year.



One MRSA outbreak was reported in 2011 and involved 21 athletes on a sports team (K-12). Among those with invasive MRSA infections reported in 2011, slightly more than 2% (33 cases) were reported to have died from these infections. This is similar to the case-fatality rate from the previous year when 2% of those reported with invasive MRSA infections died from the infection. Of the reported deaths in 2011, 70% occurred in adults aged 60 years and older. This is a decrease from 2010, when 88% of the reported deaths occurred in adults aged 60 years and older. Equal numbers of deaths were observed in each sex but the case-fatality rate was slightly higher in females (3%) than in males (2%).

