Staphylococcal Disease (MRSA)

Methicillin Resistant Staphylococcus aureus (MRSA) invasive disease is a reportable form of staphylococcal infection. This is a Class C Disease and must be reported to the state within five business days.

Staphylococcus aureus is a bacteria that causes a wide variety of localized and invasive infections as well as three toxin-mediated syndromes including food poisoning. In addition to the myriad of ways this bacteria manifests itself in disease, staphylococcus is extremely prevalent in the general population; about thirty percent of all healthy adults and children are colonized, usually in the nose. A colonized person is not infected with the bacteria but is carrying the bacteria. Methicillin-resistant strains of *S. aureus* (MRSA) are responsible for many hospital-acquired infections and community-associated infections. Every year, some staphylococcal infections result in death.

Due to the concern about antibiotic resistance in micro-organisms and the prevalence of staphylococcal infections, many requests for information about these organisms are addressed by the Office of Public Health (OPH) - Infectious Disease Epidemiology Section (IDES).

Colonization by MRSA

Surveys carried in different populations not connected with health care settings have shown prevalences of colonization ranging from one percent to six percent. A prevalence study was carried out by OPH in Louisiana in 2004. A sample of 400 individuals from offices workers, college students and parents at well-baby clinics was selected. These individuals had no connection with health care settings (no recent or chronic disease, no family members with frequent contacts with medical care). Among this sample only **one percent was found to be colonized with MRSA.**

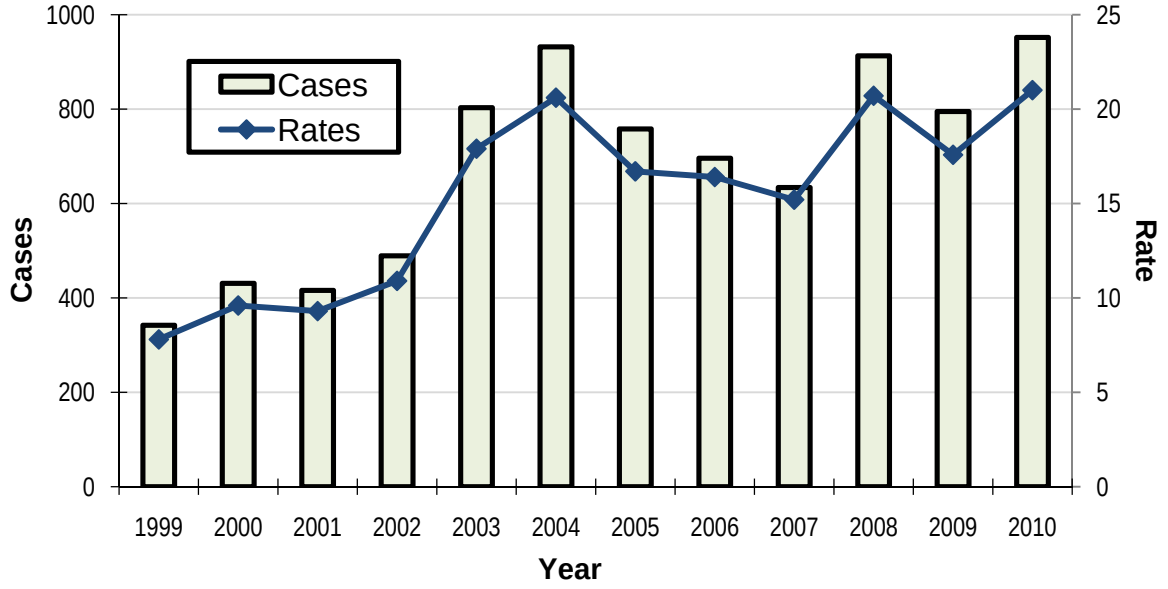
MRSA infections

The actual incidence of hospital or community-associated MRSA infections cannot be accurately determined.

In 1998, MRSA infections became reportable to the OPH. Cases were reported mostly from hospitals among in- and out-patients. The numbers increased from 860 in 1998 to almost 5,000 in 2001. At that time it became obvious that MRSA infections were so frequent that reporting had become widely inaccurate. Reporting was then limited to invasive MRSA infections (i.e. MRSA isolated from sterile sites, excluding MRSA skin infections and abscesses).

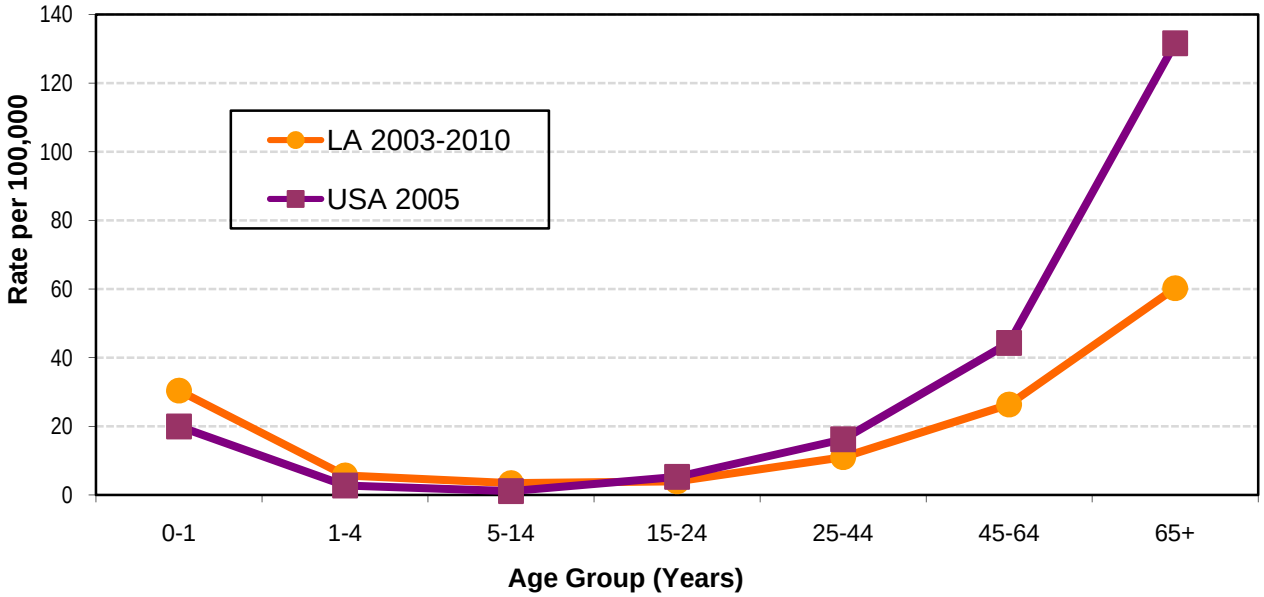
Blood and CSF are the most common sites for invasive MRSA infections. The number of invasive cases increased in 2003; this was the year the reporting criteria changed. Before 2003, approximately 400 cases of invasive MRSA were reported. After 2003, the numbers increased and have remained between 600, to over 800 cases. This sudden increase is most certainly an artifact. Hospitals that had many cases of MRSA (invasive and non-invasive) had stopped reporting. Restricting the reporting to invasive disease convinced these hospitals to start reporting again (Figure 1).

Figure 1: Number of MRSA invasive diseases – Louisiana, 1999-2010



The age group distribution shows two peaks of incidence: one in the infants younger than one year of age, then a progressive increase with age to reach a peak among the elderly over sixty-five years of age. Comparison between the rates observed in Louisiana for the period 2003-2008 and the U.S. estimates based on the Active Bacterial Core (ABC) program (*Klevens RM 2007. Invasive MRSA infections in the USA. JAMA 298 (15): 1763*) is presented in Figure 2.

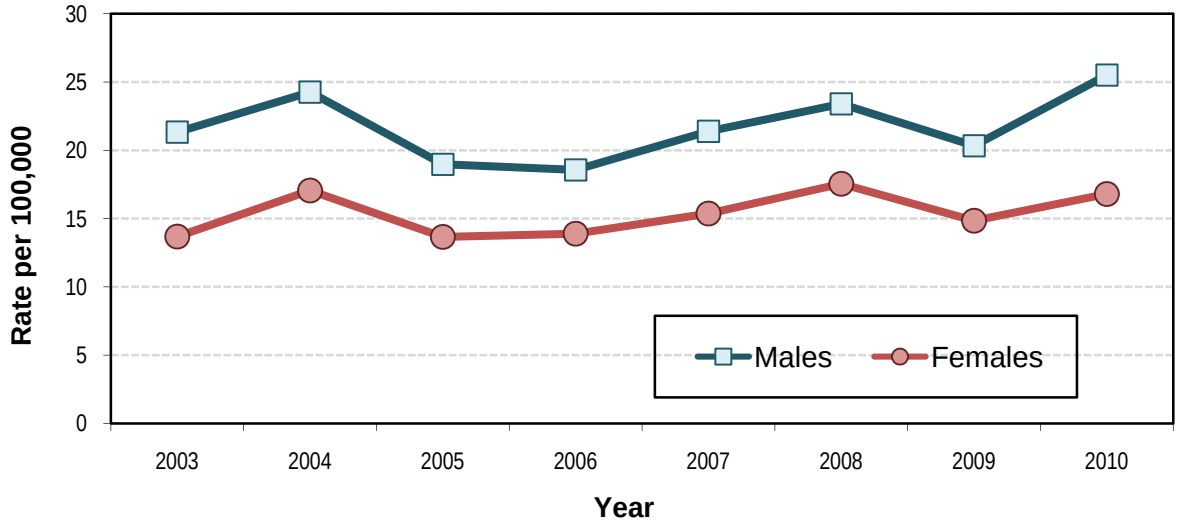
Figure 2: Age group distribution of cases – Louisiana and United States, 2003-2010



The distribution pattern is similar. The overall incidence for Louisiana is 17.6 per 100,000 population per year and about 32 per 100,000 in the USA. The passive surveillance used in Louisiana is much less labor intensive than the one used in the ABC program.

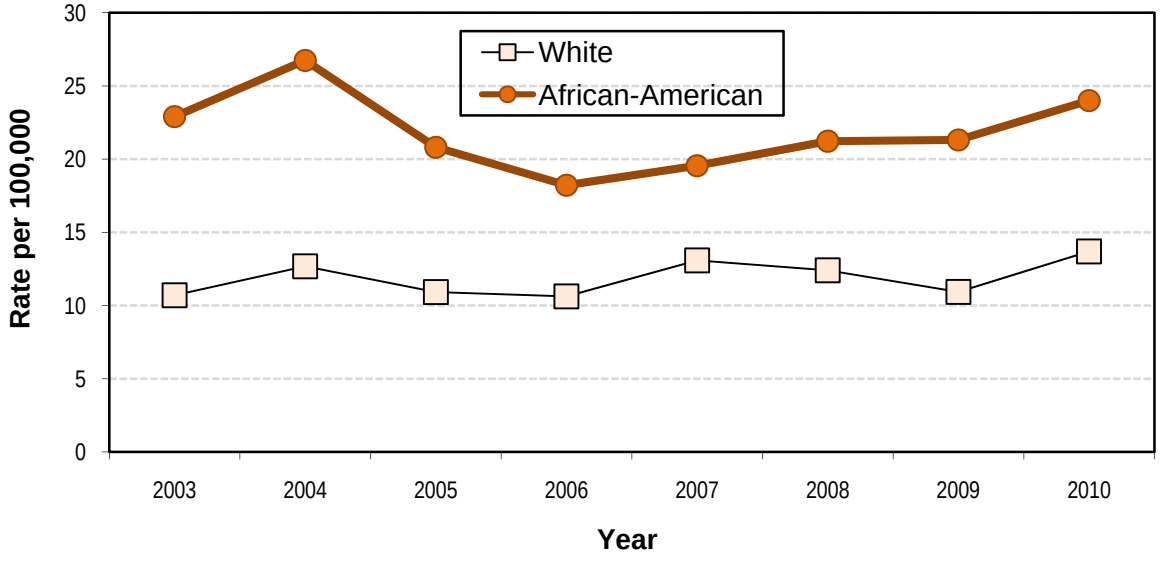
Gender distribution shows that both genders follow the same trend from year to year, but males have a higher overall rate (Figure 3).

Figure 3: Gender distribution – Louisiana, 2003-2010



Race distribution shows African-Americans with higher rates of MRSA for all years. Both races follow the same general trend over the years, with the highest peak in African-Americans in 2004 (26.97), (Figure 4).

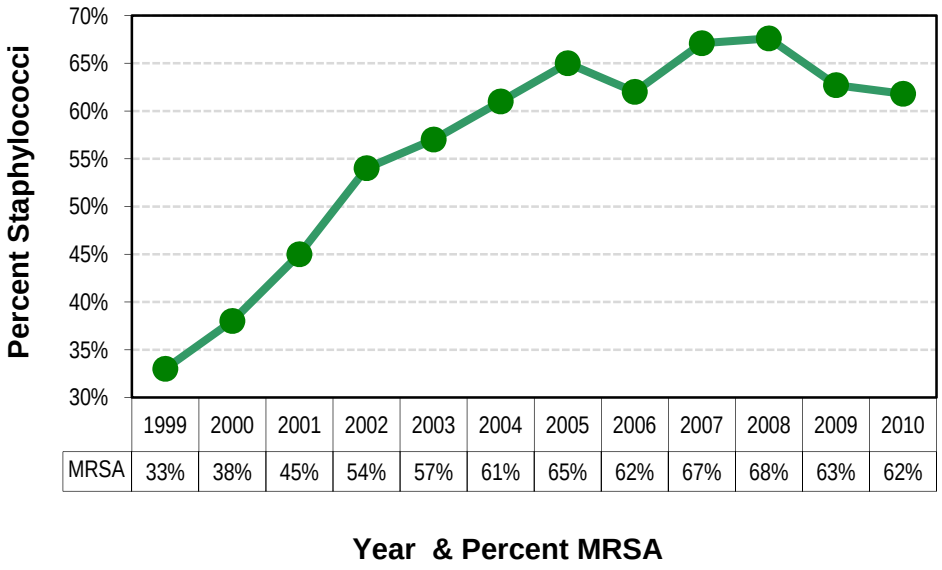
Figure 4: Race distribution of MRSA in Louisiana, 2003-2010



MRSA Infections in Healthcare

In the past thirty years, MRSA has progressively become more and more common in health care facilities. Nowadays MRSA is the predominant strain of *Staphylococcus aureus* isolated among hospital patients and among staphylococcal hospital acquired infections.(Figure 3).

Figure 3: Proportion of MRSA among Staphylococci isolated in hospitals- Louisiana, 1999-2010



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
MRSA	33%	38%	45%	54%	57%	61%	65%	62%	67%	68%	63%	62%

Risk factors for infection with MRSA in health-care settings include prolonged hospital stay, exposure to multiple or prolonged broad-spectrum antimicrobial therapy, stay in an intensive care or burn unit, proximity to patients colonized or infected with MRSA, use of invasive devices, surgical procedures, underlying illnesses and MRSA nasal carriage.