

Vancomycin Resistant Enterococcus (VRE)

Vancomycin resistant Enterococcus is a Class C Disease and must be reported to the Office of Public Health within five business days.

Enterococci are common bacteria found in human intestines and the female genital tract and in the environment. There are many species and they rarely cause illness in healthy people. Vancomycin is an antibiotic that is often used to treat infections caused by enterococci. In some instances, enterococci have become resistant to this drug and thus are called vancomycin resistant enterococci (VRE).

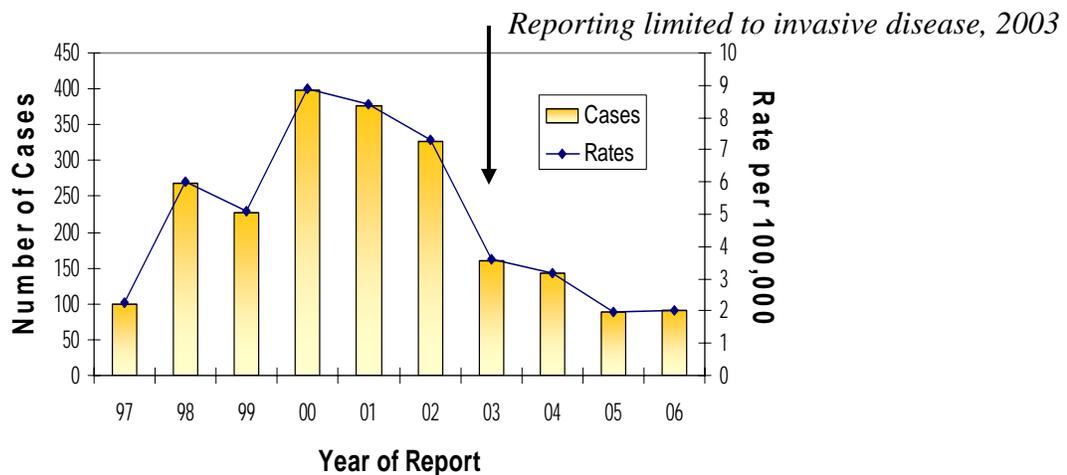
Most VRE infections occur in hospitals and involve infection of the urinary tract, blood stream or wounds. Those at higher risk of becoming infected with VRE include:

- Persons who have previously been treated with vancomycin and combinations of other antibiotics like penicillin and gentamicin
- Persons who are hospitalized, especially when they receive antibiotic treatment for long periods of time
- Persons with weakened immune systems such as patients in Intensive Care Units, in cancer or transplant wards, or who are infected with HIV
- Persons who have undergone surgical procedures such as abdominal or chest surgery
- Persons with medical devices that stay in for some time - such as urinary catheters or central intravenous catheters.

VRE became a reportable disease in Louisiana in 1998. Data from the Centers for Disease Control and Prevention (CDC) showed that VRE caused about one out of every three infections in hospital ICUs in 2004.

After 2002, reporting requirements were changed to include only invasive VRE infections, causing a drop in cases reported to the Office of Public Health (OPH) in Louisiana. This decrease is a surveillance artifact and does not mean that actual numbers of infections are decreasing. (Figure 1)

Figure 1. Reported cases and incidence of VRE – Louisiana, 1997- 2006



VRE primarily affects older adults. Adults over the age of sixty-five years are more likely to have characteristics that put them at higher risk of contracting VRE and so have higher incidence rates than other age groups. This trend holds for all races and both sexes. Males and females show similar incidence of VRE. Over the age of sixty-five years, females and Whites show slightly higher rates than males and African-Americans. (Figures 2 and 3)

Figure 2. Average VRE incidence rates by sex and age group – Louisiana, 1997- 2006

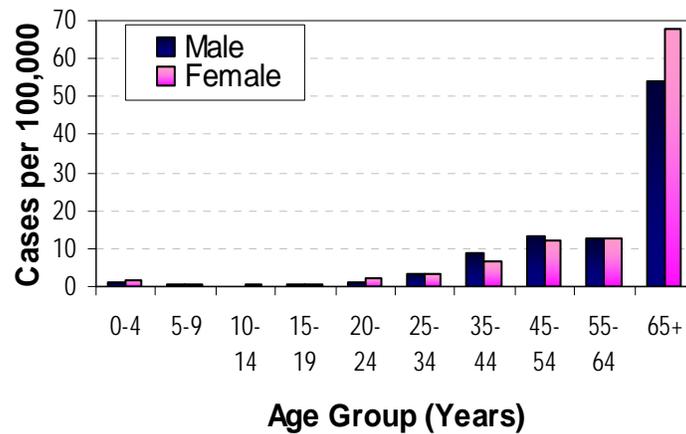
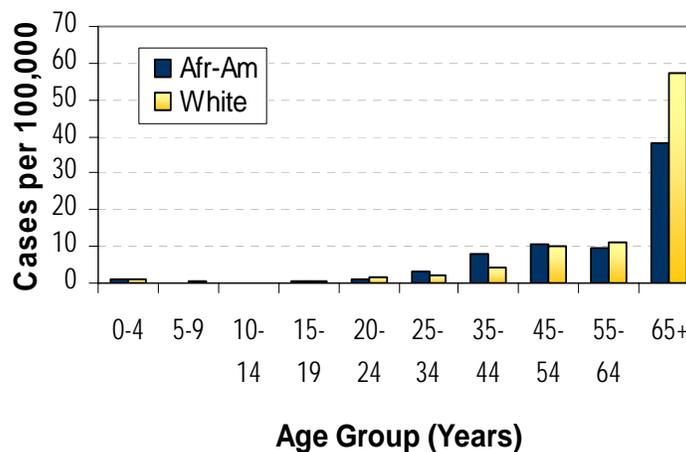


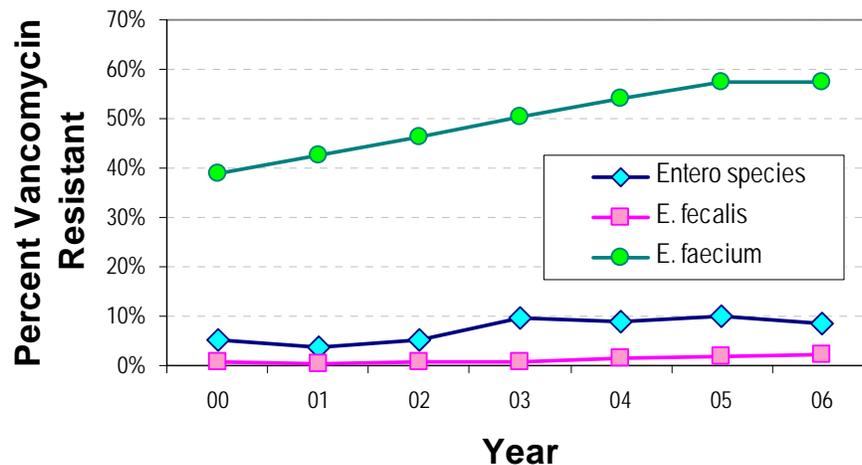
Figure 3. Average VRE incidence rates by race and age group – Louisiana, 1997- 2006.



Because reporting requirements for VRE changed in 2002, reported cases cannot be used to determine if there has been an increase in VRE cases over time. To study this issue, other sources of data are used.

The Louisiana OPH conducts active laboratory surveillance with the participation of Louisiana hospitals. This program, called EASE, monitors trends in antibiotic resistance of a number of bacteria, including Enterococcus species, *Enterococcus faecium* and *Enterococcus fecalis*. *E. fecalis* accounts for eighty percent to ninety percent of enterococci isolated in laboratories; *E. faecium* accounts for five percent to ten percent of isolates. Vancomycin resistance is increasing in all species of *Enterococcus*. (Figure 4)

Figure 4. Percentage of Enterococcus isolates with vancomycin resistance Louisiana, 2000 - 2006.

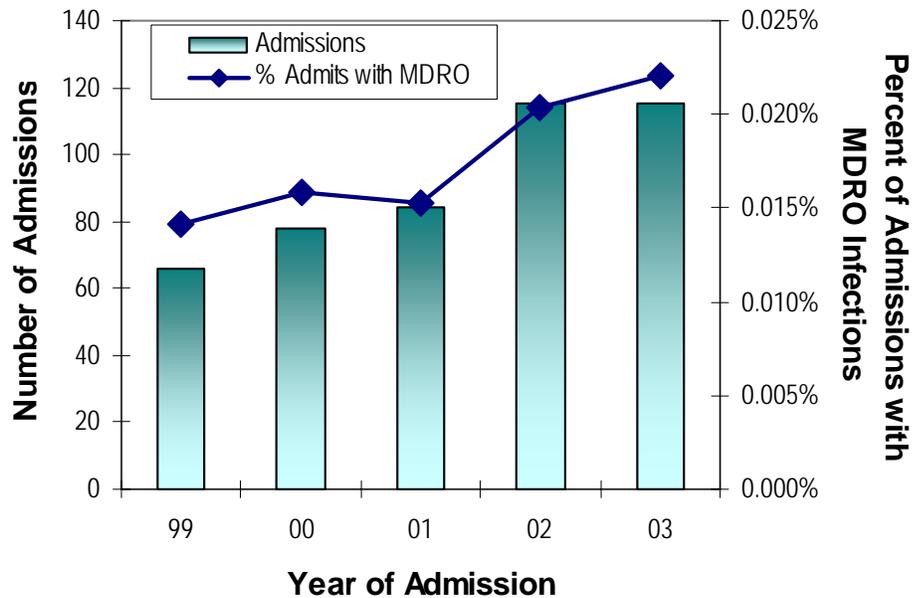


In 1997, the Louisiana Legislature mandated the reporting of all hospital inpatient records to the OPH. These records contain demographic and diagnosis information for every patient admitted to a Louisiana hospital and are compiled into yearly datasets. These datasets are a tremendous resource for epidemiologists to study trends in disease.

The datasets were examined for trends in VRE diagnoses and infections. Diagnoses are categorized by the International Classification of Diseases, 9th Revision (ICD9). Because there is no ICD9 code that exclusively covers VRE, ICD9 codes that include diagnoses of infection with microorganisms resistant to specified drugs (MDRO, or multi-drug resistant organisms) including vancomycin intermediate and resistant *Staphylococcus aureus* and vancomycin resistant enterococcus, were examined. While these numbers are not exact for VRE, they provide a proxy measure of VRE prevalence.

The number of people admitted to Louisiana hospitals that develop MDRO infections has increased over time (Figure 5).

Figure 5. Hospital inpatients diagnosed with VRE – Louisiana, 1999-2003



Similar to trends seen in cases reported to the OPH, VRE primarily strikes adult hospital inpatients over the age of sixty-five years. This is most likely due to the fact that older adults are more likely to be admitted to hospitals than younger people. This trend holds true for all races and both sexes (Figures 6 and 7).

Figure 6. Average number of hospital inpatients diagnosed with VRE by sex and age group Louisiana, 1999-2003

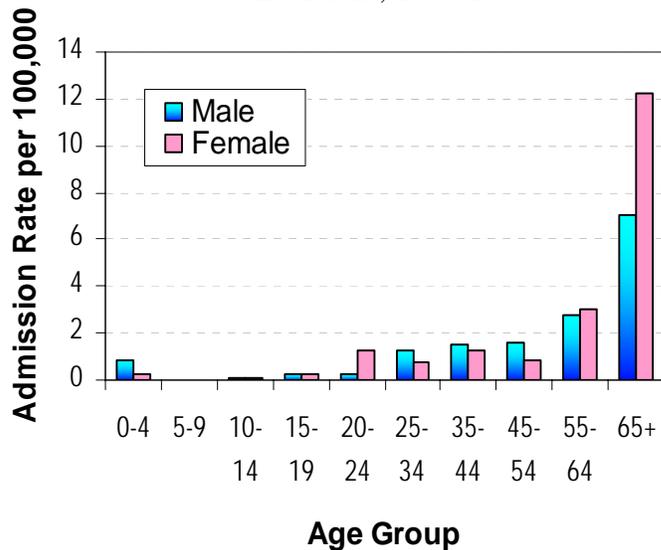
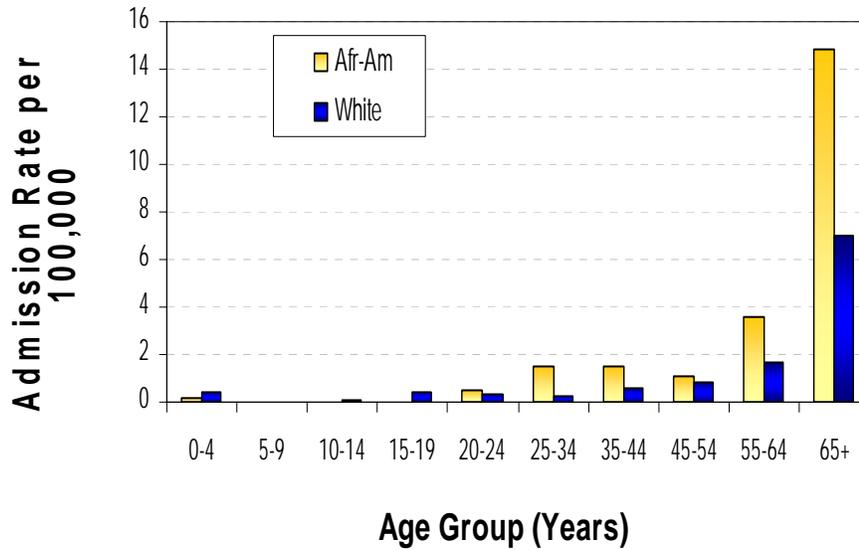
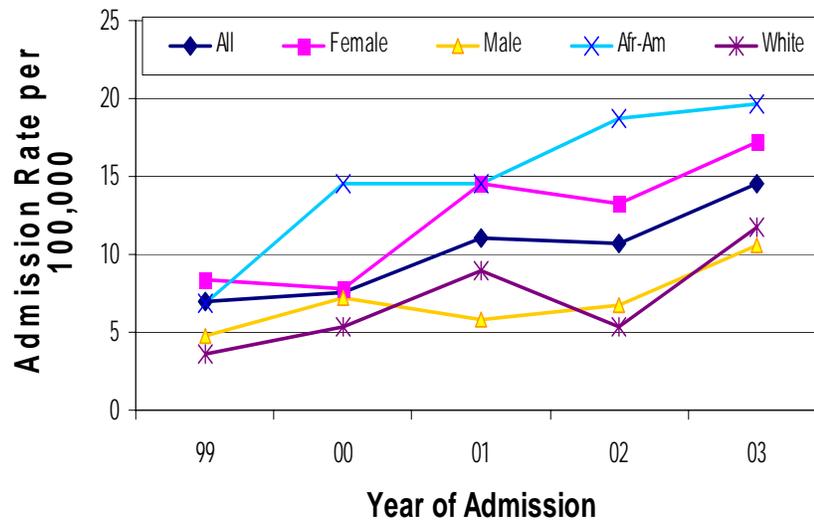


Figure 7. Average number of hospital inpatients diagnosed with VRE by race and age group Louisiana, 1999-2003



The rates of VRE among hospitalized persons increased from 1999 to 2003 in Louisiana. This trend held true for all races and both sexes. (Figure 8)

Figure 8. VRE infection rates among hospital inpatients by race and sex Louisiana, 1999-2003



Older adults are more likely to be at higher risk of developing VRE infections. The largest increase in incidence rates of VRE occurred among persons over the age of sixty-five years. (Figure 9)

Figure 9. VRE infection rates among hospital inpatients by age group (years)
Louisiana, 1999-2003

