

MRSA and VRE BSIs

Jon Rosenberg

- This is the first report of MRSA and VRE BSI incidence rates among California acute care facilities using NHSN data.
- For this report the use of the NHSN laboratory reporting method provided for the use of standard definitions for BSIs and allows comparisons according to types of hospitals and, with caution, between hospitals with these types.

Data sources

- Beginning April 1, 2010, all California licensed general acute care hospitals were required to report MRSA and VRE BSIs using the NHSN MDRO LabID module facility-wide
- On October 5, 2011, we accessed from NHSN MRSA and VRE BSI data reported for the period April 1, 2010 through March 31, 2011

Quality assurance and control

- We distributed quality assurance and control reports, which identified missing, incomplete, or potentially aberrant data to hospitals in March and May 2011.
- We strongly encouraged hospitals to investigate and resolve these data issues, as appropriate.
- Additionally, in October 2011 we sent an email to all facilities with missing data (both numerator and denominator) notifying them that there was missing data in NHSN and indicated the number of months for which we had no data. We encouraged facilities to do a final review to make corrections and enter missing data before the final data download on October 24, 2011.
- All corrections were made by the facility in NHSN.

Definitions

- **Unique Blood Source:** MRSA or VRE isolate from blood in a patient with no prior positive blood culture in ≤ 2 weeks
- **Healthcare Facility (Hospital)-Onset (HO):** LabID Event specimen collected > 3 days after admission to the facility (i.e., on or after day 4).

- **Major teaching hospital:** Hospital that is an important part of the teaching program of a medical school and the majority of medical students rotate through multiple clinical services. Before extracting the data for this report we asked each California hospital enrolled in NHSN self-identified as teaching to review their classification in regard to the NHSN definitions and to change their classification if appropriate. Each classification was reviewed and confirmed as appropriate according to NHSN definitions by HAI Program staff. As a result of this process approximately half of those previously identified as major teaching were reclassified as other, and approximately half of those previously identified as other were reclassified as major teaching.
- **Long-term Acute Care (LTAC)** facilities are defined by the Centers for Medicare & Medicaid Services (CMS) as a licensed general acute care hospital providing care for patients with medically complex conditions requiring an average length of stay for all patients of greater than 25 days. California LTAC hospitals were identified through CMS and assessments by HAI Program staff.

Data presentation and organization

- Numbers of MRSA and VRE BSI, patient days, unadjusted MRSA and VRE BSI incidence rates, and 95% confidence intervals, stratified by hospital type, are the primary measures reported. We stratified hospitals according to status as a major teaching, LTAC, or pediatric hospital, after examination of pooled mean incidence rates using this stratification. We included the four pediatric facilities that are also major teaching hospitals in pediatric facilities only, as their incidence rates were consistent with that category.

Statistical Analyses

Incidence Density Rate for hospital onset MRSA
and VRE BSIs =

Number of Unique Blood Source HO LabID Events
Total inpatient days

x 10,000

- For each rate we calculated exact 95 percent confidence intervals using the Poisson distribution.
- We calculated the pooled mean for each rate by dividing the sum of all BSI cases by the sum of all inpatient days or admits, as appropriate
- The pooled mean was calculated for each BSI by dividing the sum of all Unique Blood Source HO LabID Events by the sum of the number of all patient days x 10,000.
- For a measure of the severity of illness in hospital patient populations, we also utilized campus-specific case mix indices (CMI) published by the California Office of Statewide Health Planning and Development (OSHPD) for fiscal year 2008/2009, if available

Table 1. Incidence rates of hospital-onset methicillin-resistant *Staphylococcus aureus* bloodstream infections reported by California acute care facilities, restricted to facilities that reported at least 10 of 12 months, April 1, 2010 through March 31, 2011

Facility Category	Number of Facilities	Cases	Patient Days	Pooled Mean Rate	Mean Case Mix Index*
Major Teaching	19				
Long-term Acute Care	21				
Pediatric	10				
Other**	310				
All	360				

Table 5. Incidence rates of hospital-onset methicillin-resistant *Staphylococcus aureus* bloodstream infections reported by California pediatric acute care facilities, restricted to facilities that reported at least 10 of 12 months, April 1, 2010 - March 31, 2011

Hospital licensee and/or campus name	Cases	Patient Days	Incidence Rate	95% Confidence Intervals**	Case Mix Index
STATE OF CALIFORNIA POOLED DATA					
CHILDRENS HOSP AND RESEARCH CTR OAKLAND					
CHILDREN'S HOSP AT MISSION, MISSION VIEJO					
CHILDREN'S HOSP CENTRAL CALIFORNIA, MADERA					
CHILDREN'S HOSP OF ORANGE COUNTY, ORANGE					
CHILDRENS HOSP OF LOS ANGELES					
EARL & LORAIN MILLER CHILDREN'S HOSP, LONG BEACH					
HEALTHBRIDGE CHILDREN'S HOSP, ORANGE					
LUCILE SALTER PACKARD CHILDREN'S HOSP STANFORD					
RADY CHILDREN'S HOSP, SAN DIEGO					
SHRINERS HOSPS FOR CHILDREN NORTH CA, SACRAMENTO					

*All hospitals reported 12 months of data.

** Mean of all pediatric hospitals case mix indices

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Notes: No hospital had incidence rates significantly higher or lower than the State pooled mean. Rate per 10,000 patient days; 95% confidence interval calculated based on exact Poisson distribution; case mix index was available and listed for most but not all acute care campuses

Source: Methicillin-Resistant *Staphylococcus Aureus* and Vancomycin-Resistant *Enterococcus* Bloodstream Infections In California General Acute Care Hospitals, April 2010 Through March 2011

Table 11. Months reported and cases of hospital-onset methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococci* bloodstream infections reported by California acute care facilities, reporting less than 10 of 12 months, April 1, 2010 - March 31, 2011.

Facility Name (Category)	Months Reported	MRSA Cases	VRE Cases	Patient Days

Limitations

- No national benchmarks, risk adjustment
- Stratification by hospital type may not account for all differences in patient populations within strata
 - Particularly for other than major teaching, LTAC, and pediatric – very wide range of rates
- Not all blood culture results may be entered properly