

## Statewide Summary Report of NHSN External Data Validation for Acute Care Hospitals in Virginia

### *Methicillin-Resistant Staphylococcus aureus* Bacteremia LabID Events, CY2022

#### Introduction

The Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN) is the nation's most widely used healthcare-associated infection (HAI) tracking system, and provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate HAIs. Hospitals are to comply with state and federal public reporting mandates by reporting certain HAIs to NHSN per the NHSN surveillance definitions and criteria.

External validation is a survey and data validation process conducted by an agency outside the reporting facility such as the state health department or the Centers for Medicare and Medicaid Services (CMS). The data validation is conducted by one or more trained validators to review and evaluate the facility's surveillance practices and methods, data completeness, and reporting accuracy in a non-regulatory, confidential manner. External data validation can help assure adherence to NHSN's specifications for HAI reporting by identifying and correcting shortcomings that would be difficult to address through internal validation alone.

The Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Program at the Virginia Department of Health (VDH) conducted external validation of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia laboratory-identified (LabID) Events reported by acute care hospitals in Virginia during calendar year 2022.

The bacteria, *Staphylococcus aureus*, is commonly found on the skin and in the nose of healthy people and does not cause disease unless it enters an opening in the skin. Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of *S. aureus* that is resistant to several antibiotics, making it difficult to treat. MRSA most often spreads by direct person-to-person contact with an infected wound, contaminated hands, objects, or environmental surfaces (e.g., towels, razors, bandages, sauna benches, athletic equipment, etc.). Invasive cases of MRSA are often healthcare-associated and can cause severe problems including blood stream infections, pneumonia, surgical site infections, sepsis, and death among high-risk individuals. MRSA infection can also spread outside of healthcare settings.

#### 2022 HAI Validation: MRSA Bacteremia

VDH receives HAI and associated data from Virginia healthcare facilities through the NHSN. Acute care hospitals, outpatient hemodialysis facilities, long-term acute care hospitals (LTACHs), and inpatient rehabilitation facilities (IRFs) are required to report the following HAI events to NHSN: central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), surgical site infections (SSIs) following colon and hysterectomy procedures, Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia laboratory-identified events, *Clostridioides difficile* (*C. difficile*) laboratory-identified events, and healthcare personnel influenza vaccination.

CMS requires facilities reporting MRSA bacteremia LabID event data to adhere to the definitions and reporting requirements as specified in the NHSN protocol. In Virginia, the state HAI reporting requirements align with those of the

CMS. For more information on MRSA bacteremia LabID event reporting please see [MDRO & CDI Protocol](#). Other resources for acute care hospitals can be found on the NHSN website.

## Methodology

### *Project Timeline*

**Figure 1.** Project Timeline.



### *Hospital Selection*

There are five health planning regions, 35 health districts, and 78 acute care hospitals (ACH) in Virginia. The VDH HAI/AR Program selected 30 ACHs from across the state for external validation in accordance with the [CDC 2022 External Validation Guidance and Toolkit](#) and [Acute Care Hospital Method 3 Supplement for Validation](#). Of those, 16 ACHs from 16 local health districts (LHDs) participated in the external validation project.

### *Validation Preparation and Case Selection*

VDH “froze” NHSN data and generated reports in mid-September 2022. In late-September, VDH sent an email communication to the participating hospitals with a link to a REDCap survey that hospitals used to complete surveillance methods assessment, provide the most recent denominator validation data, and provide a laboratory-based list of all positive blood specimens of MRSA for calendar year 2022. From the submitted laboratory-based line lists, VDH randomly selected 40 positive blood cultures of MRSA for each hospital to review. The total number of submitted cases from all facilities came up to 438. For example, some facilities may have had fewer than 40 cases, in that case, all cases have been validated.

### *Case Review*

VDH external validation specialists reviewed the selected cases for correct application of NHSN MRSA BSI LabID criteria and compared to entered NHSN data. VDH coordinated case reviews with the Infection Preventionist (IP) at each hospital.

### *Validation Summary Report*

At the end of the validation process, VDH met with the hospital IP staff and discussed findings and provided feedback. Hospitals are to receive an individualized written report with their facility-specific results.

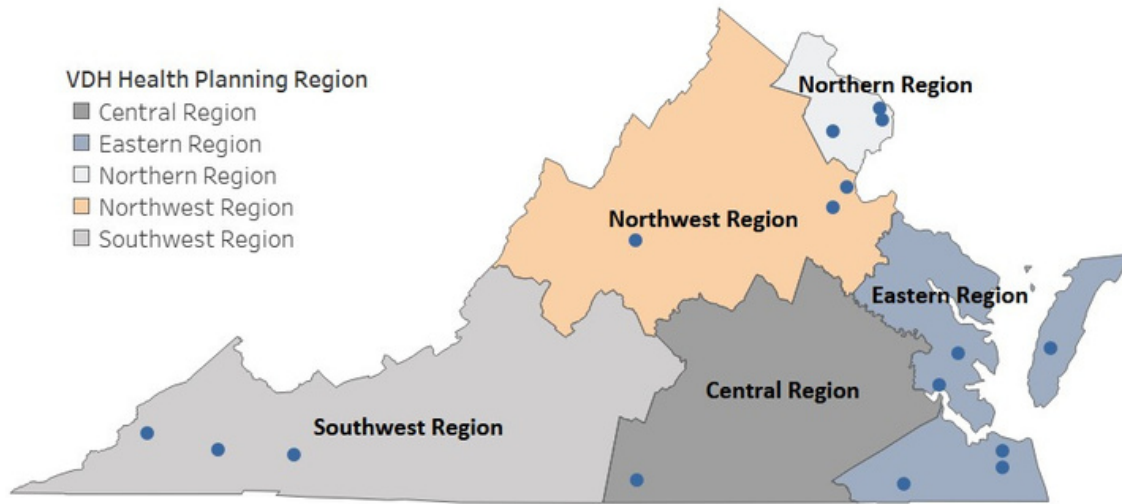
## Results

The 16 participating hospitals represented 16 local health districts (LHDs) out of 35 Virginia LHDs and all 5 Virginia health planning regions.

Among 438 total cases reviewed, 421 cases were accurately reported with statewide accuracy rate of 96.12%. Among the 16 participating hospitals, 44% (n=7) of the hospitals had zero discrepancies. One facility did not have any positive MRSA Bacteremia LabID Events during the review period.

The most common type of reporting error was missed opportunities of case finding, which resulted in under-reporting of reportable MRSA bacteremia events. There were 2 cases of over-reporting MRSA bacteremia events.

**Figure 2.** Map of ACHs Participating in NHSN External Data Validation MRSA Bacteremia LabID Events, CY2022



**Table 1.** Summary Project Data

16	Participating Hospitals
16	Represented Local Health Districts
5	Represented Health Planning Regions
438	Total Cases Reviewed
96.12%	Statewide Accuracy

**Table 2.** MRSA LabID Event Validation Results

The Virginia Department of Health External Data Validation Specialists				
Hospital Infection Prevention Teams		Reportable Event	Non-Reportable Event	Total
	Reportable Event	323	2	325
	Non-Reportable Event	15	98	113
	Total	338	100	438
Sensitivity (%) <sup>1</sup>				95.56%
Specificity (%) <sup>2</sup>				98.00%
Overall Accuracy (%) <sup>3</sup>				96.12%

<sup>1</sup> Sensitivity: correct identification of a positive MRSA blood culture meeting criteria for reporting

<sup>2</sup> Specificity: correct identification of a positive MRSA blood culture not meeting criteria for reporting

<sup>3</sup> Overall accuracy: number of correctly reported MRSA blood culture events / number of positive MRSA blood cultures reviewed

Table 2 depicts discordant cases between the VDH validators and hospital IP team. Out of 438 cases reviewed, the validators identified 338 reportable events. Of those, we noted 15 reportable MRSA bacteremia events were not reported in NHSN. Those 15 cases were missed opportunity of identifying reportable MRSA bacteremia events by the facility IPs. That represented 95.6% overall sensitivity rate. Out of 438 cases reviewed, 100 cases were non-reportable events. We found that 2 of those non-reportable events (cases not meeting NHSN reporting criteria) were reported in NHSN, which makes the overall specificity of 98%. With that said, the overall accuracy rate was 96.12%.

## Conclusion

Through external data validation of MRSA bacteremia LabID event reported to NHSN, the VDH HAI/AR Program reviewed and evaluated the knowledge and reporting practices of 16 acute care hospitals in Virginia. Even though a statewide accuracy rate of 96.12% is quite high, only 44% (n=7) of participating facilities had no discrepancies. Around 56% of participating hospitals (n=9) had more than one discrepancy. This indicates that Virginia has an opportunity for improvement in reporting accuracy in HAI reporting in NHSN.

After a thorough literature review in the effort to compare the results of VA external validation project to other states, only Washington state had published a similar project, where 20 acute care hospitals participated in MRSA external validation<sup>1</sup>. Washington state reviewed 744 total cases from 2021, identifying 16 discrepancies, all of which involved underreporting. Their overall accuracy rate was at 98%.

Virginia could improve the participation rate to better reflect the level of overall accuracy. All 5 Virginia health planning regions were represented, but only one facility from Central Region participated, while Eastern Region was the most represented by 6 facilities. Additionally, out of 35 Virginia health districts, hospitals from only 16 districts volunteered to participate. To enhance facility participation in the future external validation project, a state legislation such as in Washington state<sup>2</sup>, that support the state health department to evaluate the quality and accuracy of healthcare-associated infection reporting, data collection, and analysis could be beneficial.

Another recommendation would be for facilities to conduct the denominator validation to improve their own reporting accuracy, given that almost all facilities chose to not complete this section of the REDCap survey.

The results of the external validation can be used to increase knowledge of NHSN definitions, data requirements, and increase reporting accuracy.

In the next phase of the external data validation project, VDH will evaluate the surveillance and reporting practices of central line-associated bloodstream infections (CLABSI) events reported to NHSN for calendar year 2022.

If you have any questions regarding this report, please email [hai@vdh.virginia.gov](mailto:hai@vdh.virginia.gov).

## References

1. Washington State Healthcare-Associated Infection Validation for Acute Care Hospitals, Methicillin-Resistant Staphylococcus Aureus Bacteremia LabID Events, 2021. Accessed March 12, 2024. <https://doh.wa.gov/sites/default/files/2022-12/420-455-HAIValidationReport.pdf>
2. Health care-associated infections—Data collection and reporting—Advisory committee—Rules. RCW 43.70.056: Health care-associated infections-data collection and reporting-advisory committee-rules. Accessed March 12, 2024. <https://app.leg.wa.gov/RCW/default.aspx?cite=43.70.056>