Statewide Summary Report of NHSN External Data Validation

for Acute Care Hospitals in Virginia

Central Line-Associated Bloodstream Infection, CY2023

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. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure the progress of prevention efforts, and ultimately eliminate HAIs. Hospitals 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). 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 central line-associated bloodstream infection (CLABSI) events reported by acute care hospitals (ACH) in Virginia during calendar year 2023.

A CLABSI is a laboratory-confirmed bloodstream infection where an eligible pathogen is identified in the blood, and a central line is present on the day of the infection or the day before. A central line is an intravascular catheter that terminates at or close to the heart or great vessels and is used for administering medication, fluids, or collecting blood. Central lines can lead to serious infections. However, most CLABSIs can be prevented through adherence to aseptic techniques, rigorous surveillance, and comprehensive infection control measures.

2023 HAI Validation: CLABSI

VDH receives HAI and associated data from Virginia healthcare facilities through NHSN. ACHs, outpatient hemodialysis facilities, long-term acute care hospitals (LTACHs), and inpatient rehabilitation facilities (IRFs) are required to report the following HAI events to NHSN: CLABSIs, catheter-associated urinary tract infections (CAUTI), surgical site infections (SSIs) following colon and hysterectomy procedures, Methicillin-resistant *Staphylococcus aureus* (MRSA)

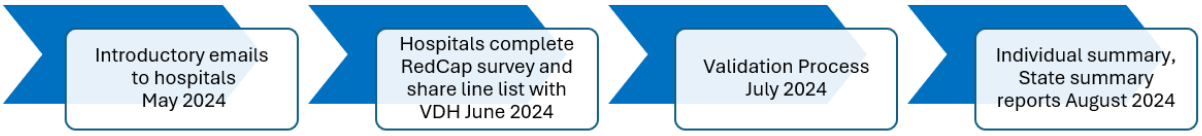
bacteremia laboratory-identified events, *Clostridioides difficile* (*C. difficile*) laboratory-identified events, and healthcare personnel influenza vaccination.

CMS requires facilities reporting CLABSI 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 CMS. For more information on CLABSI event reporting please see the Bloodstream Infection Event protocol. Other resources for ACHs can be found on the NHSN website.

Methodology

Project Timeline

Figure 1. Project Timeline.



Hospital Selection

VDH HAI/AR Program invited ACHs throughout the Commonwealth of Virginia to participate in external validation activities in accordance with the CDC 2023 CLABSI External Validation Toolkit.

Validation Preparation and Case Selection

VDH "froze" NHSN data and generated reports in May 2024 for the calendar year 2023. VDH sent introductory emails to participating ACHs with a link to a REDCap survey to assess surveillance methods, provide the most recent denominator validation data, and provide a laboratory-based list of all positive blood specimens for the calendar year 2023. From the submitted laboratory-based line lists, VDH randomly selected 40 positive blood cultures with a unique eligible episode of care from each hospital to review.

Case Review

VDH external validation specialists reviewed the selected cases for the correct application of NHSN CLABSI criteria and compared them to the 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 to discuss findings and provide feedback. Hospitals received an individualized written report with their facility-specific results.

Results

Of the 78 ACHs in Virginia, 8 participated from 8 local health districts (LHDs) out of 35 Virginia LHDs and 4 out of 5 Virginia health planning regions.

A total of 320 cases were selected and evaluated for accuracy in classification and reporting in NHSN for CLABSI events. The VDH external data validation team confirmed that all 320 cases were accurately classified with a statewide accuracy rate of 100%.

Table 1. Summary Project Data

Summary Items	Number or Rate
Participating hospitals	8
Represented local health districts	8
Represented health planning regions	4
Total cases reviewed	320
State-wide accuracy rate (%)	100%

Table 2. CLABSI Event Validation Results

	Events Identified by VDH Team			
Events Identified by Hospital		Reportable Event	Non-reportable Event	Total
	Reportable event	15	0	15
	Non-reportable event	0	305	305
	Total	15	305	320
Sensitivity (%)[1]				100.00%
Specificity (%)[2]				100.00%
Overall Accuracy (%)[3]				100.00%

[1] Sensitivity: correct identification of a positive blood culture meeting criteria for reporting
[2] Specificity: correct identification of a positive blood culture not meeting criteria for reporting
[3] Overall accuracy: number of correctly reported CLABSI events/number of positive blood cultures reviewed

Table 2 shows there were no discordant cases identified, resulting in an overall statewide accuracy rate of 100%. Of 320 cases evaluated, there were 15 reportable CLABSI events, all of which were correctly reported in NHSN. That represented a 100% overall sensitivity rate. The remaining 305 cases were correctly identified as non-reportable events, resulting in an overall specificity of 100%.

Through facility survey on denominator data collection and CLABSI surveillance practices, VDH identified a few areas requiring attention. These findings are further discussed in the conclusion section including VDH recommendations.

- Three facilities reported that they have no formal quality control processes ensuring accurate denominator data.

- Four facilities indicated using methods other than NHSN guidance for reporting missing patient day data or central line day data.

Conclusion

Through external data validation of CLABSI events reported to NHSN, the VDH HAI/AR program reviewed and evaluated the knowledge and reporting practices of 8 acute care hospitals in Virginia. We acknowledge that a statewide accuracy rate was high at 100%, and all participating hospitals (n=8) had no discrepancies.

However, participation among Virginia hospitals was low, which may be due to the volunteer nature of this project and the competing priorities of IPs who were invited to participate. This limited our ability to objectively determine the overall statewide accuracy of CLABSI events reporting in NHSN. To enhance facility participation in future external validation projects, a state legislation such as in Washington state[1], that supports the state health department to evaluate the quality and accuracy of HAI reporting, data collection, and analysis could be beneficial.

The following are additional recommendations based on the findings from denominator validation activities among participating facilities.

- *Conducting internal validation of denominator data*: It is important for facilities to implement internal validation processes for denominator data. Several facilities have reported a lack of formal quality control mechanisms. VDH recommends facilities conduct denominator validation in accordance with the NHSN internal validation toolkit to ensure accuracy. Periodic spot checks of electronic data are important even in facilities where denominators are collected electronically because electronic systems are subject to change and can result in disrupted or inaccurate data.

- *Handling of missing denominator data*: Facilities have indicated various methods to report missing patient day or central line day data. VDH recommends that facilities

review and follow NHSN issued guidance on imputing values for missing device-associated denominator data.

- *Education and training on denominator counting:* Education is important for new as well as more experienced infection prevention staff. NHSN recommends that all staff involved in denominator data collection receive formal training by NHSN or NHSN-trained IP due to technical aspects of definitions (e.g., types of central lines) and counting method (e.g., when or how to count lines) and to ensure that staff are aware of data collection procedures.

- *Clinical documentation of device use:* Complete and consistent documentation on the presence or absence of a central line is essential to determine CLABSI. Inadequate or missing documentation of central line status was observed in some cases during validation activities. VDH recommends facilities conduct quality checks to ensure adequate clinical documentation on central line use.

Acknowledgments

VDH would like to thank ACH IPs for volunteering for external validation activities, working with us on challenging cases, and ensuring a smooth collaboration. We also appreciate the medical records staff for accommodating our team and facilitating access to the records.

If you have any questions regarding this report, please email hai@vdh.virginia.gov.

References

1. 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 August 28, 2024. https://app.leg.wa.gov/RCW/default.aspx?cite=43.70.056