Summary Report of NHSN External Data Validation
of Hemodialysis Facilities in Virginia
Dialysis Events, June 1, 2023 – December 31, 2023

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 the progress of prevention efforts, and ultimately eliminate HAIs. Hospitals and other healthcare facilities 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 Dialysis Events (DEs) reported by hemodialysis facilities in Virginia between June 1, 2023, and December 31, 2023.

2023 HAI Validation: Dialysis Events

VDH receives HAI and associated data from Virginia healthcare facilities through the NHSN. Dialysis facilities that are participating in NHSN monthly reporting are required to report data according to the Dialysis Event Surveillance Protocol, using the NHSN definitions and criteria described within it, to ensure data are uniformly reported across participating facilities. Outpatient hemodialysis facilities are required to report three types of dialysis events: IV antimicrobial start; positive blood culture; and pus, redness, or increased swelling at the vascular access site. The following measures are also generated from the reported data: bloodstream infection (BSI), local access site infection (LASI), access-related bloodstream infection (ARBSI), and vascular access infection (VAI).

Methodology

Project Timeline

Figure 1. Project Timeline

Selection of Dialysis Facilities

VDH HAI/AR Program invited hemodialysis facilities throughout the Commonwealth of Virginia to participate in external validation activities. A convenience sample of facilities (e.g., a sample of volunteer facilities) was utilized to make the most of available resources and project goals.

Validation Preparation and Case Selection

VDH "froze" NHSN data and generated reports in September 2024. In late September, VDH sent an email communication to the participating hemodialysis facilities with a link to a REDCap survey. The survey was conducted to assess understanding of the NHSN Dialysis Event Protocol and the facilities' data collection and reporting methods. Additionally, each participating hemodialysis facility was requested to submit the following line lists with their corresponding surveys:

1. All patients who had one or more in-center hemodialysis treatment(s) from June 1, 2023, to December 31, 2023.

2. All patients who received any intravenous antimicrobials in an outpatient setting from June 1, 2023, to December 31, 2023.

3. All patients who had any positive blood cultures from June 1, 2023, to December 31, 2023, including those during hospitalizations.

4. All patients who had any pus, redness, or swelling at the vascular access site from June 1, 2023, to December 31, 2023.

5. All patients who were hospitalized for any reason from June 1, 2023, to December 31, 2023.

From the submitted line lists, VDH randomly selected up to 40 patient charts from each facility to review.

Case Review

VDH external validation specialists reviewed the selected patient charts for the correct application of Dialysis Event Surveillance Protocol criteria and compared them to the data entered in NHSN. VDH coordinated patient chart reviews with the Facility Administrator/Nurse Manager at each dialysis facility.

Validation Summary Report

At the end of the validation process, VDH met with the Facility Administrator/Nurse Manager discussed findings and provided feedback. Each facility received an individualized written report with their facility-specific results.

Results

Currently, 192 dialysis facilities are enrolled in the NHSN monthly reporting plan in Virginia. Among them, 3 facilities from 3 local health districts and 2 health planning regions participated in the External Data Validation project, representing a participation rate of 1.56% of all facilities.

In total, 120 patient charts were selected and evaluated for accuracy in identification and reporting in NHSN for dialysis events out of 199 submitted patient charts from all facilities. Among 120 patient charts reviewed, 20 cases of reportable DEs were identified. Of those, 11 DEs were accurately reported with an overall accuracy rate of 56.0%. All the participating facilities (n=3, 100%) had discrepancies found by the NHSN external validation specialists.

Table 1. Summary Project Data

Summary Items	Number or Rate
Participating dialysis facilities	3
Represented local health districts	3
Represented health planning regions	2
Total patient charts reviewed	120
Overall accuracy rate (%)	56.0%

Table 2. Combined All DEs Validation Results

	Events Identified by VDH Team			
Events Identified by Facilities		Reportable DEs	Non-reportable DEs	Total
	Yes - DE Reported	11	2	13
	No – DE Not Reported	9	3	12
	Total	20	5	25
Overall Accuracy (%)[1] = 56.0%				

[1] Overall accuracy: number of correctly reported dialysis events / number of dialysis events reviewed

Of the 25 total dialysis events evaluated, there were 20 reportable dialysis events identified. Table 2 shows there were 11 discordant dialysis events identified, resulting in an overall accuracy rate of 56.0%.

9 dialysis events were not reported to NHSN by facilities, which should have been reported (under-reported), and 2 dialysis events were reported to NHSN, but did not meet the reporting criteria (over-reported).

Common reporting errors include missed opportunities to identify reportable DEs due to gaps in reporting caused by staffing shortages as well as lack of knowledge and misinterpretation of

NHSN reporting criteria. Additionally, the VDH validation team identified two cases of over-reported DEs that were misclassified due to miscalculation of the 21-day rule and misinterpretation of NHSN reporting criteria. It is also important to note that 3 of the 11 correctly reported events contained incorrect data elements, such as the wrong date of event which could impact the calculation of the 21-day rule.

In addition, the following tables are validation results by each Dialysis Events type.

Table 3. Intravenous Antimicrobial (IVAM) Event Validation

Event Determination	VDH Validation: Yes – IVAM	VDH Validation: No – Not IVAM	Total
Facility: Yes - IVAM reported	10	2	12
Facility: No – IVAM not reported	5	3	8
Total	15	5	20
Overall Accuracy (%)[1] = 65.0%			

[1]Overall accuracy = number of correctly reported IVAM events / number of IVAM reviewed

Out of 20 IVAM events reviewed, the VDH validation team identified 15 reportable IVAM events. Of those, 13 events were correctly reported by facilities, resulting in an overall accuracy rate of 65.0%.

5 IVAM events were under-reported by dialysis facilities and the common reasons were missed opportunities to identify reportable IVAM events and misinterpretation of antibiotic administration or reporting criteria. The validation team also identified 2 cases of over-reported IVAM events, which were misclassified due to errors in applying the 21-day rule and misinterpretation of NHSN reporting criteria.

Table 4. Positive Blood Culture (PBC) Event Validation

Event Determination	VDH Validation: Yes – PBC event	VDH Validation: No – Not PBC event	Total
Facility: Yes – PBC event reported	1	0	1
Facility: No – PBC event not reported	2	0	2
Total	3	0	3
Overall Accuracy (%)[1] = 33.33%			

[1]Overall accuracy = number of correctly reported PBC events / number of PBC reviewed

The validation team identified 3 reportable PBC events during the validation period. Only 1 PBC event was reported to NHSN with an overall accuracy rate of 33.33% for PBC events.

The misclassification reason identified was a misinterpretation of PBC reporting criteria. Specifically, facilities failed to report a PBC when the source of infection was reported as contamination and when the PBC was obtained within the first day after hospital admission.

Table 5. Pus/Redness/Swelling (PRS) Event Validation

Event Determination	VDH Validation: Yes – PRS event	VDH Validation: No – Not PRS event	Total
Facility: Yes - PRS reported	0	0	0
Facility: No – PRS not reported	2	0	2
Total	2	0	2
Overall Accuracy (%)[1] = 0.0%			

[1]Overall accuracy = number of correctly reported PRS events / number of PRS reviewed

The validation team identified 2 reportable PRS events during the validation period. None of these events were reported to NHSN by facilities, which resulted in an overall accuracy of 0.0% for PRS events.

The reporting errors were due to a lack of effective processes to track PRS events and inconsistent adherence to the facility's standard procedure of documenting potential PRS events, such as completing PRS tracking forms in the electronic health record (EHR) system.

Review and Evaluation of DE Surveillance Practices

The facility manager or administrator was asked to complete a survey that was intended to understand how dialysis event surveillance is conducted at in-center dialysis facilities and assess knowledge of denominator data collection, vascular access assessment, and how to identify and report DEs. Through this survey and data validation activities via patient chart review, VDH identified opportunities for improvement. These findings are further discussed in the conclusion section including VDH recommendations.

- Lack of knowledge of vascular access types in general.
- Inconsistencies in PRS identification, documentation, and reporting among staff and across facilities.
- Inconsistency in counting denominator data. For example, excluding transient patients, counting hospitalized patients, or patients who missed their scheduled treatment.
- Some facilities stated that they have no standardized process to follow up on requested records from hospital admission.

- No standardized process to identify and report PBCs collected during the first day of a dialysis patient's hospital admission or inconsistent adherence to the facility's standard process.

Conclusion

Through external data validation of DE events reported to NHSN, the VDH HAI/AR program reviewed and evaluated the knowledge and reporting practices of 3 dialysis facilities in Virginia. The overall accuracy rate was 56.0%, and all participating facilities (n=3, 100%) had discrepancies.

The statewide participation rate among dialysis facilities was only 1.56%, which limited our ability to objectively assess the overall accuracy of DE reporting to NHSN. Low participation highlights the need for further external validation to obtain objective and representative data on DE surveillance and reporting practices across dialysis facilities in the state. Among the facilities that declined to participate, the most common reason cited was staffing shortages. It is also important to note that 12 facilities initially volunteered to participate but ultimately 9 facilities withdrew from the external validation activities before the project's completion. Reasons for not participating included competing clinical and administrative priorities, low staffing, lack of corporate support for granting external validators access to EHR systems, and the time required to provide requested line lists, due to reliance on paper records.

The low participation rate may also be partly due to the voluntary nature of this project. To improve facility participation in future validation projects, state legislation like that in Washington[1], supporting the health department's role in evaluating the quality and accuracy of HAI reporting, data collection, and analysis could be helpful.

VDH HAI/AR program also recommends the following based on the findings from the patient chart review and denominator validation activities among participating facilities.

- *Implementing data quality checks and evaluations*: The validation team found that facilities lack formal quality control mechanisms. VDH recommends facilities periodically conduct internal reviews of NHSN dialysis event surveillance data. This includes verifying that monthly DE reporting requirements are met, ensuring submitted data are accurate and complete, and assessing facility performance as outlined in the NHSN 2024 New Steps to Review NHSN Dialysis Event Surveillance Data.

- *Education and training on NHSN reporting criteria:* The validation findings indicate that the overall accuracy rate among participating facilities was primarily impacted by a lack of understanding and misinterpretation of NHSN reporting criteria. To ensure high-quality surveillance and compliance with NHSN protocols and methods, VDH recommends that all staff responsible for reporting remain up to date with NHSN definitions and procedures through ongoing training and education.

- *Tracking and reporting of Dialysis Events:* Although only 2 PRS events were identified during validation, none were reported to NHSN. VDH validators faced challenges identifying these events due to insufficient documentation and tracking, which led to extensive time spent reviewing patient charts. VDH recommends implementing a standardized process for tracking all PRS events and ensuring that all staff adhere to facility procedures for identifying, documenting, and reporting potential PRS events. VDH also recommends developing a coverage plan for DE surveillance and reporting during staffing vacancies to prevent potential gaps in NHSN reporting.

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Please email hai@vdh.virginia.gov for questions related to NHSN and/or external validation activities.

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 January 10, 2025. https://app.leg.wa.gov/RCW/default.aspx?cite=43.70.056