



Understanding SIR Scoring

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Objectives

- Define a Standardized Infection Ratio (SIR)
- Know the three (3) primary factors of an SIR
- Apply the SIR formula
- Run analysis reports

SIR OVERVIEW

A detailed breakdown of the ESRD BSI SIR

What is SIR?

- **The End-Stage Renal Disease Quality Incentive Program (ESRD QIP) scores facilities on their performance according to the measures established for the relevant payment year.**
 - For reporting measures, CMS assigns points based on whether a facility provided the required data.
- The standardized infection ratio (SIR) is a ratio of the number of infections that are **observed at a facility versus the number of infections that are predicted for that facility.**
 - The predicted values are based on national aggregate data.
- SIR scores have a lower limit of zero but are not bound by any upper limit.
 - A score < 1 is considered low, > 1 high, and $= 1$ expected number of infections.

What is SIR?

- **The SIR score is calculated by dividing the number of observed infections by the number of predicted healthcare associated infections (HAIs).**
 - Facilities following the NHSN Dialysis Event Protocol are required to report all bloodstream infections (BSIs) for their hemodialysis outpatients, including those specimens collected as an outpatient or collected on the day of or the day after a hospital admission.
 - Although other dialysis event types are reported to NHSN and calculated from the data, the BSI measure only assesses the number of positive blood cultures reported by a facility using a standardized infection ratio (SIR).

Why an SIR score instead of an overall BSI rate?

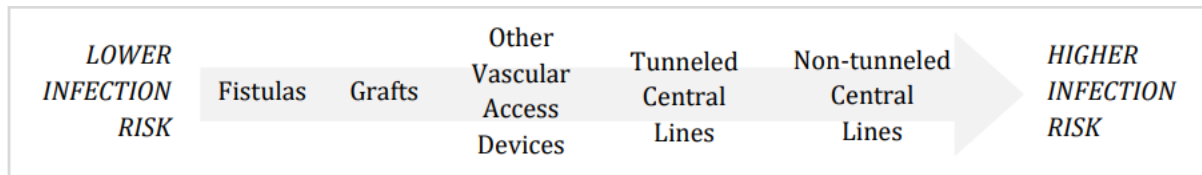
- **The SIR and corresponding rates serve different purposes.**
- **The SIR compares the number of BSIs that a facility reported compared to the number of infections predicted** for that facility based on national aggregate data, across **several** vascular access type strata.
 - Those data are summarized into a single number, which makes the SIR easier to use for evaluation purposes.
 - In contrast, vascular access-specific BSI rates provide more detailed information about BSI occurrence in the different strata and can be meaningful in infection prevention efforts.

Scoring Criteria

A detailed breakdown of the ESRD BSI SIR

SIR Components

- The SIR uses three (3) primary factors:
 - **Blood Stream Infections (BSI):** defined as “any positive blood culture,” regardless of the suspected source of the culture.
 - **Patient Total (Patient-Months):** the total number of qualifying patients the facility had for the year.
 - **Patient Access Type:** the access type(s) the served patients have.
- These factors ensure facilities receive a SIR reflective of their patient population. The number of patients served, and the access types of the patients served both impact risk for blood stream infections amongst patients.



The SIR Formula

SIR = Observed (O) HAIs / Predicted (P) HAIs

NHSN Bloodstream Infection Calculations:

- Number of Observed BSIs: the total number of positive blood cultures that were reported by the facility to NHSN during a certain timeframe (e.g., calendar year 2023).
- Number of Predicted BSIs: a number calculated by multiplying the national aggregate BSI rates stratified by vascular access type from NHSN Dialysis Event Data 2014*. The total number of patients at a facility and the number of patients in different vascular access categories factor into the calculation.
 - For example, a facility with many patients will tend to have more predicted BSIs than a facility with few patients depending on demographic.

Facilities must meet criteria to be scored

- **Facility Exclusions**

- Facilities that do not offer in-center hemodialysis.
- Facilities that treat fewer than 11 in-center hemodialysis patients during the performance period.
- Facilities with approved Extraordinary Circumstances Exception (ECE).

- **Patient Exclusions**

- Patients receiving only inpatient hemodialysis during the reporting month.
- Patients receiving only home hemodialysis or peritoneal dialysis during the reporting month.

Minimum Data Requirements

12 consecutive months of data reported to NHSN. Facilities that do not submit 12 months of data in accordance with the Dialysis Event Protocol receive zero points for the measure.

To have a complete data, a facility must (for every month):

1. Select the 'DE' box on the Monthly Reporting Plan
2. Complete Summary Data Form
3. Report at least 1 event of each of the three Dialysis Event types (IV antimicrobial start, positive blood culture, pus/redness/increased swelling)
OR Select the appropriate 'Report No Events' box on their summary form if they truly did not have any events to report

BSI SIR File Structure

Data Element	Definition
Year	Year of data.
CCN	CMS Certification Number
OrgID	NHSN Facility Organization ID
Facility Name	Selfreported facility name in NHSN
State	State
Enrollment Date	Date that the facility enrolled in NHSN (NHSN enrollment date)
Monthly Complete Reporting	Each data element in this section represents a month (Jan-Dec) and indicates whether the facility had complete reporting for that month.
BSIs	Number of bloodstream infections (BSI) that the facility had for the year. Note that each positive blood culture counts as a BSI.
Predicted	Number of BSIs the facility is predicted to have for the year
Patient-Months	Total number of patient-months the facility had for the year
SIR	The facility's Standardized Infection Ratio (SIR)
SIR 95% CI	The lower limit and upper limits to the 95% Confidence Interval for the SIR.

Data Quality and SIR

Ensuring an accurate score

Data Quality Measures

As previously mentioned, all facilities that do not submit 12 consecutive months of data in accordance with the **Dialysis Event Protocol** receive zero points for the measure. To assist with this, the NHSN Dialysis team completes regular data quality checks.

Data quality checks are performed to identify potential reporting errors in data reported by facilities in the NHSN application such as:

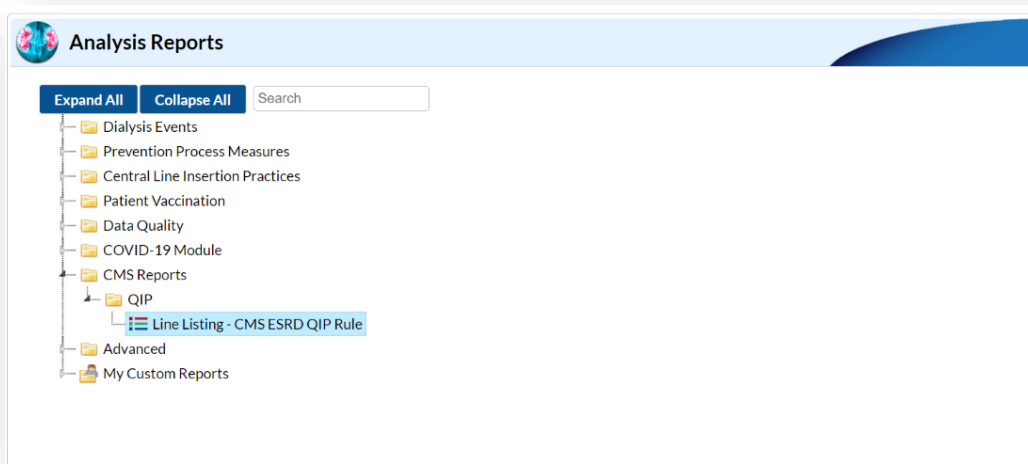
- Data that violate NHSN business rules
- Data that violate reporting guidelines set by the Dialysis Event Protocol
- Incomplete or missing data which may result in score reductions for CMS QIP
- Inconsistent or improbable values on numerator or denominator records

Data Quality Measures

- If a facility is identified as having a data quality error, the **facility administrator** as listed on the facility's NHSN profile will be emailed with a PDF document detailing the identified error and how to correct it.
- **Although these checks are done on a quarterly basis, please note:**
 - Data quality emails are sent a month before the deadline; however, data is captured for checks two months before the deadline. **Thus, all errors in that two-month span cannot be accounted for.**
 - The specific date of data capture is also shared in all data quality check emails
 - These checks only account for a specific set of **common data quality errors** and may not capture all potential data quality errors. Engaging in regular self-checks is highly suggested.

Locate and Generate Reports in NHSN

- To run analysis reports in NHSN, users must first generate analysis data sets (**Analysis > Generate Data Sets**). After generating datasets, users can generate reports (**Analysis > Reports**).
- Line listings can be found in the analysis folder titled “**CMS Reports**”. These reports are available to ensure data quality for data submitted to the Centers for Medicare & Medicaid Services (CMS) Quality Reporting Programs.



Centers for Medicare and Medicaid Services (CMS) Quality Incentive Program (QIP) NHSN Calendar Year 2024/2025 Deadlines

Dialysis Component



Quarter	Months Reported	Deadline
1	January-March 2024	July 1, 2024
2	April-June 2024	September 30, 2024
3	July-September 2024	January 2, 2025
4	October-December 2024	March 31, 2025

Questions?

Additional questions? Reach out to nhsn@cdc.gov or submit questions to the <https://servicedesk.cdc.gov/nhsncsp>

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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