

Charting the Course: 2023 Dialysis BSI Rebaseline

Frequently Asked Questions Regarding the 2023 Dialysis BSI Rebaseline Project NHSN Dialysis Component

1. What is a baseline?

To promote external comparisons of bloodstream infections (BSI) or related outcomes, CDC uses national-level National Healthcare Safety Network (NHSN) rate data from a specific year (the “baseline” year) to calculate the predicted number of BSI. The predicted numbers are used as the denominators to calculate the standardized infection ratio (SIR). The SIR metric compares the number of observed BSI in a facility to the number of infections “predicted” to have occurred if the facility had a BSI rate equal to the national rate. The number of predicted infections is estimated using a regression model developed from the baseline year’s rate data. In 2014, a set of national rates (one for each access type) enabled the creation of an external benchmark for comparison purposes. This set of rates forms a baseline that promotes timely comparisons to measure change in an outcome. Until now, 2014 has been used as the national baseline year for all SIRs. Refer to [NHSN’s SIR Guide](#) for more information.

2. What is the 2023 BSI Rebaseline?

“Rebaseline” is a term that CDC’s NHSN staff use to describe the process of updating the national bloodstream infection (BSI) baseline and risk adjustment model. The 2023 BSI Rebaseline uses 2023 national aggregate data and a modeling approach for SIR calculation. During the Rebaseline process, national aggregate data reported to NHSN for calendar year 2023 were analyzed and used to create a new risk adjustment model that estimates the number of predicted BSIs in a given facility. When the updated risk adjustment model is finalized, the calculation of predicted cases for *all* existing SIRs will be updated in NHSN to utilize this new model.

3. What is Risk Adjustment?

Risk adjustment is a methodology used to account for differences in the risk of an outcome (in this case, BSI) or rate among a set of factors identified as having a statistically significant association with that outcome. In other words, any factors associated with risk of BSI occurrence may explain or account for differences in a way where the resulting measure needs to adjust for them. For instance, if an outcome risk or rate differs significantly between a hospital affiliated vs. freestanding clinic, then this factor should be used in risk adjustment. When outcome data are risk-adjusted, dialysis facility performance and comparisons are more accurate and fair.

4. Why does the current risk adjustment need to be updated?

CDC updates the baseline year to ensure that the data reflect current healthcare policy and practice, produce more accurate external benchmark comparisons, and drive progress in preventing BSIs. Specifically, there may have been significant facility operations since the existing (2014) baseline year. In addition, the Rebaseline will ensure that the risk adjustment model is better able to capture relevant changes in the risk of BSIs since 2014 and will allow facilities to compare their incidence of BSIs to recent national data.

5. Are the formulas and calculations changing for the SIR?

The SIR benchmark comparison metrics will still be calculated by the general formula:

$$\text{SIR} = \frac{\# \textit{observed} \text{ BSIs}}{\# \textit{predicted} \text{ BSIs}}$$

The updated risk adjustment model, created using 2023 national data, will be used to calculate revised denominators for SIRs. The parameter estimates from the updated risk adjustment model using 2023 national data will be used to calculate the number of predicted BSIs for a given facility, based on the facility characteristics.

6. Why was 2023 selected as the year for the new baseline?

The NHSN team remains committed to working with facilities to improve BSI prevention. COVID-19-related activities at CDC—and the national increase in BSIs associated with the pandemic—had previously delayed the team’s initial plans for a rebaseline several years ago. In 2024, the CDC team began planning a dialysis BSI rebaseline. The updated BSI rebaseline is a risk adjusted model using 2023 national data which will better reflect current policy, practice, and surveillance protocols. Measuring progress under an updated national standard is important to understanding BSI prevention efforts and standards in the current healthcare environment.

7. What factors will be included in the new risk adjustment models?

The NHSN team assessed all suitable factors (i.e., data elements, often called variables) reported to NHSN as potential risk factors. To be used for risk adjustment, any eligible risk factor must have a statistically significant relationship with the outcome and improve the statistical fit of the model. Suitable risk factors include facility-level characteristics reported on the NHSN Annual Facility Surveys as well as other applicable patient care locations being assessed.

8. What exclusion rules are applied to the new SIRs calculated under the 2023 baseline?

A set of general exclusion criteria was implemented on the 2023 baseline risk adjustment model.

9. When will the new 2023 baseline be available for use in NHSN?

The 2023 baseline SIR reports will be phased into NHSN in mid-2026 for facility and Group use.

10. What can dialysis facilities expect to happen to their SIRs after the 2023 Rebaseline?

The data included in the 2023 baseline will serve as a new “reference point” for measuring progress in BSI prevention. CDC understands that facility SIRs calculated using their 2023 data may shift closer to 1.0 since the baseline uses 2023 national data; however, each dialysis facility will need to track their SIRs to better understand the impact of this Rebaseline. The number of predicted infections may increase or decrease for a particular facility depending on multiple factors including access type, location, and number of stations in a facility.

11. Will NHSN Groups have access to SIRs calculated under the 2023 baseline?

Yes. Groups have access to the SIR reports based on their membership rights.

12. Will all current SIRs calculated under the 2014 national baseline remain available in the NHSN application for use?

Yes, all current SIRs calculated using the 2023 baseline and previous SIRs calculated using the 2014 baselines will continue to be active in NHSN. NHSN will organize SIR reports by baseline year into subfolders in the NHSN Analysis Report tree-view.

13. Will there be an assessment of changes in facility level SIRs using the 2014 baseline compared to SIRs using the 2023 baseline?

Facilities should expect their SIRs to differ based on the model baseline year used. This is due to differences in the overall event rate for each of the baseline years (2014 vs. 2023). However, these differences do not necessarily mean that a particular dialysis facility is better or worse depending on the baseline year used. NHSN conducted analyses investigating the impact of facility level SIRs calculated on the same year with both baseline models. That analysis showed only marginal changes in the dialysis facility distribution. Please refer to the presentation linked here: [Add link once BSI SIR presentation is posted.](#)

14. Will a facility be able to select which baseline is used in running an SIR report?

Yes. The new 2023 baseline BSI SIR report appears in its own subfolder in the NHSN Analysis tree-view under the BSI Risk Adjusted Measure Reports (SIRs) main folder.

15. How should providers interpret a high SIR, such as one exceeding 2.0, when the corresponding p-value is greater than 0.05 and the confidence intervals encompass 1.0?

A high SIR (for example, one that is above 2.0), with a p-value greater than 0.05 and confidence intervals that include 1.0, suggests that the number of observed infections is not statistically different from the predicted number of infections. Despite this, the number of observed infections reported by the facility, in this example, is higher (double) than what was predicted, and providers may want to consider the practical significance of this finding and consider additional factors in taking further action.

16. How should we interpret and compare SIRs from 2014 and 2023, given that the baselines are not directly comparable?

It's important to note that NHSN has established a national BSI baseline twice, first using 2014 national BSI data (the 2014 "Rebaseline") and later with 2023 national BSI data (the 2023 "Rebaseline"). These updates involved changes in risk adjustment models and the inclusion of different factors, leading to variations in how SIRs are calculated. Consequently, SIRs derived from these different baselines are not directly comparable. When interpreting and comparing SIRs from multiple time periods, it's essential to ensure that both SIRs are calculated using the same baseline. For example, comparing a 2025 SIR based on the 2014 baseline with a 2025 SIR based on the 2023 baseline would be inappropriate due to differences in risk adjustment models. For detailed guidance on interpreting SIRs and understanding the implications of different baselines, refer to NHSN's official resources, such as the "NHSN Guide to the SIR" and the "2023 BSI Rebaseline Talking Points" documents. More information about proper comparisons across different baselines can also be found in this webinar: [Add link to How Will My SIR Change presentation once posted.](#)

17. How do facility risk factors, such as facility location and number of stations, impact the calculation of the number of predicted infections?

The new BSI SIR model uses data collected in the annual survey for SIR denominator risk adjustment. Factors like facility location and number of stations were found to be significant predictors of BSI. More specifically, facilities based at hospitals (as opposed to free-standing clinics) may treat sicker patients with more complex medical conditions, which can influence BSI rates. To account for these variations, NHSN will now incorporate facility location and number of stations into the risk adjustment model. This risk adjustment ensures that comparisons of BSI across facilities are fair and account for inherent differences associated with the risk factors. It is important that facilities update their annual surveys each year to receive the correct risk adjustment for their facility SIRs. Missing or incorrect annual survey data impacts all the data included in the SIR calculation.

Rebaseline Resources

- Rebaseline Fact Sheet: What is the Rebaseline and Why it is Important? [\(add link once posted\)](#)
- How Will My SIR Change; Understanding the Impact of the 2023 Dialysis BSI Rebaseline: [\(add link once posted\)](#)
- 2023 NHSN Dialysis BSI Rebaseline webpage and resources: [\(add link once posted\)](#)
- 2023 Dialysis BSI Rebaseline Talking Points: [\(add link once posted\)](#)