Preventing High Impact Data Quality Errors

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Learning Objectives

- Understanding NHSN Data Quality Check categories and procedures
- Identify common data quality concerns in NHSN data
- Understanding the impact of common data quality errors on CMS performance
- Utilize tools to evaluate data quality independently

Quarterly Data Quality Checks

Data Quality Checks

- To assist with ensuring high data quality, 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

- **Event Data**
  - Numerator data refers to any data entered using the NHSN Dialysis Event Form.
  - These checks are limited to only numerator forms for ESRD patients. Outreach is conducted on some identified errors, as well as potential errors.
- **CCN**
  - CMS uses CMS Certification Numbers (CCNs) to identify outpatient dialysis facilities and request NHSN data from those facilities for ESRD Quality Incentive Program (QIP).
  - Each NHSN dialysis orgID should have its own CCN.
- **Denominator Data**
  - Denominator data is any data collected from the Monthly Reporting Plan (MRP) and Summary Data Forms, separate from event data, which are submitted monthly by facilities as part of their participation in NHSN.
  - This form captures whether a facility is participating in surveillance, the number of patients at risk, and whether certain key reporting criteria are met.

Numerator Data

Definitions

- **21 DRV**: Identifies 21 Day Rule Violations. Subsequent events of the same type require 21 days between the first and second event for the two to be counted as separate events.
- **Other Access**: Identifies events with "Other vascular access type" that is likely misclassified (e.g., peritoneal catheters, femoral grafts, etc.)
- **Blood Culture Wound Check**: Identifies events with the word “wound” included in the comment section of the event.
- **Days Between ABX Start**: Identifies facilities with more than 7 days between ABX start and blood culture.

2024 Quarterly Event Issue Counts

	21 DRV	Other Access	Bld Cult Wound Check	Days Between ABX Start	Total
Q1	6 (16.7%)	3 (8.3%)	15 (41.7%)	12 (33.3%)	36
Q2	4 (9.3%)	2 (4.7%)	21 (48.8%)	16 (37.2%)	43
Q3	2 (3.7%)	1 (1.9%)	29 (53.7%)	22 (40.7%)	54
Q4	3 (9.7%)	0 (0.0%)	14 (45.2%)	14 (45.2%)	31
2024	15	6	79	64	164

Counts represent the number of unique organizations with specific issue alerted during data quality checks. Percentages represent their contribution to the quarterly total.

CCN Data

Definitions

- **2 Org IDs 1 CCN**: Identifies situations where multiple facilities have entered the same CCN. Usually, this is a case of duplicate enrollment but could also be the result of human error like mistyping.
- **Incorrect CCN:** CCNs are 6-digit numbers and do not contain letters or special characters except for rare situations. This check identifies CCNs that do not follow the standard 6-digit format.
- **No CCN Entered:** Identifies facilities that have not yet entered a CCN. Many of these are new enrollments who may not have been assigned a CCN by CMS yet.
- **Multiple ESRD Locations:** This check identifies facilities that have more than 1 ESRD location.

2024 Quarterly CCN Issue Counts

	2 Org IDs 1 CCN	Incorrect CCN	No CCN Entered	Multiple ESRD Locations	Total
Q1	16 (18.6%)	3 (3.5%)	58 (67.4%)	9 (10.5%)	86
Q2	14 (18.2%)	2 (2.6%)	61 (79.2%)	0 (0.0%)	77
Q3	14 (20.9%)	2 (3.0%)	51 (76.1%)	0 (0.0%)	67
Q4	14 (21.9%)	2 (3.1%)	48 (75.0%)	0 (0.0%)	64
2024	58	9	218	9	294

Counts represent the number of unique organizations with specific issue alerted during data quality checks. Percentages represent their contribution to the quarterly total.

Denominator Data

Definitions

- **No DE Plan:** Identifies facilities which have not selected the DE (Dialysis Event) Check Box on the MRP.
- **Missing RNE Box:** Identifies facilities which have at least 1 "Report No Event" box unchecked.
- **Not Participating:** Identifies facilities which selected the "Not Participating in NHSN this month" box.
- **All Zero Denominator:** Identifies non-AKI denominator forms that have all zeroes.

2024 Quarterly Denominator Issue Counts

	No DE Plan	Missing RNE Box	Not Participating	Had Zero for Denominator	Reporting Plan Missing Month	Total
Q1	26 (1.3%)	1742 (87.2%)	18 (0.9%)	11 (0.6%)	201 (10.1%)	1998
Q2	16 (2.2%)	378 (51.2%)	19 (2.6%)	13 (1.8%)	312 (42.3%)	738
Q3	24 (0.9%)	2459 (88.7%)	14 (0.5%)	30 (1.1%)	245 (8.8%)	2772
Q4	25 (1.3%)	1656 (85.3%)	8 (0.4%)	29 (1.5%)	224 (11.5%)	1942
2024	91	6235	59	83	982	7450

Counts represent the number of unique organizations with specific issue alerted during data quality checks. Percentages represent their contribution to the quarterly total.

Summary

- **Overall, 2024 saw an overall increase in organizations with error alerts driven by denominator data issues versus 2023.**
  - **Numerator**: Alerts remained relatively steady with a 6% increase.
  - **CCN**: There was a 14% decrease in alerts that was driven primarily by fewer facilities with no CCN entered.
  - **Denominator**: There was a significant 174% increase in alerts that was driven primarily by an uptick in facilities with a missing RNE box.

Addressing High Impact Data Errors

Ensuring data quality in NHSN

High Impact Data

12 consecutive months of data reported to NHSN. Facilities that do not submit 12 months of data in accordance with the Dialysis Event Surveillance Protocol receive zero points for the End Stage Renal Disease Quality Incentive Program (ESRD QIP) measure.

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

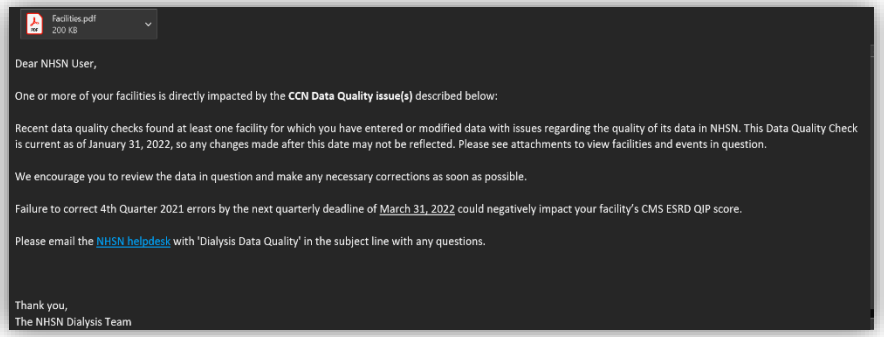
1. Select a location AND the 'DE' box on the Monthly Reporting Plan.
2. Complete Summary Data Form.
3. Report at least 1 event of each of the three Dialysis Event types (IV antimicrobial start, positive blood culture, pus/redness/increased swelling) *OR* select the appropriate 'Report No Events' box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

Centers for Medicare and Medicaid Services (CMS)
Quality Incentive Program (QIP)
NHSN Calendar Year 2025/2026 Deadlines

Quarter	Months Reported	Deadline
1	January-March 2025	June 30, 2025
2	April-June 2025	September 30, 2025
3	July-September 2025	December 31, 2025
4	October-December 2025	March 31, 2026

Data Quality Essentials: Data Quality Checks

- **Data quality emails are sent for 4 individual categories:** CCN, numerator, denominator, and AKI. Emails include a description of when data was captured, the upcoming quarterly CMS deadline, and a PDF attachment.
  - PDFs identify the specific data quality errors, facility information, and instructions on how to fix the data quality errors identified. **It is important to read it fully.**
- If a facility is identified as having a data quality error, the **facility administrator (FA)** will be alerted. It is **essential** FA contact information is up to date in NHSN. If out of date, updates and reassignments can made in NHSN by the original FA.


Facilities.pdf
200 KB

Dear NHSN User,

One or more of your facilities is directly impacted by the **CCN Data Quality issue(s)** described below:

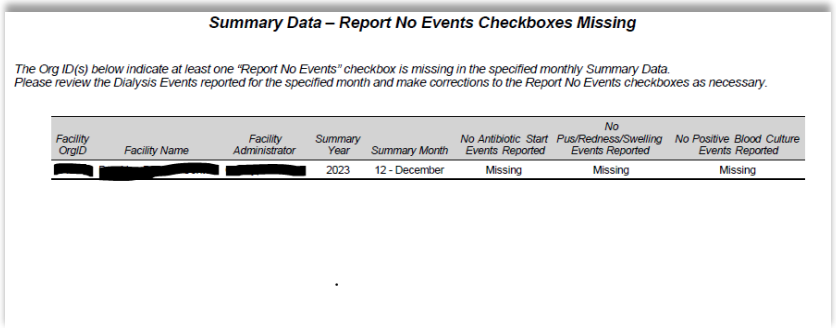
Recent data quality checks found at least one facility for which you have entered or modified data with issues regarding the quality of its data in NHSN. This Data Quality Check is current as of January 31, 2022, so any changes made after this date may not be reflected. Please see attachments to view facilities and events in question.

We encourage you to review the data in question and make any necessary corrections as soon as possible.

Failure to correct 4th Quarter 2021 errors by the next quarterly deadline of March 31, 2022 could negatively impact your facility's CMS ESRD QIP score.

Please email the NHSN helpdesk with 'Dialysis Data Quality' in the subject line with any questions.

Thank you,
The NHSN Dialysis Team


Summary Data – Report No Events Checkboxes Missing

The Org ID(s) below indicate at least one "Report No Events" checkbox is missing in the specified monthly Summary Data.
Please review the Dialysis Events reported for the specified month and make corrections to the Report No Events checkboxes as necessary.

Facility OrgID	Facility Name	Facility Administrator	Summary Year	Summary Month	No Antibiotic Start Events Reported	No Pus/Redness/Swelling Events Reported	No Positive Blood Culture Events Reported
[redacted]	[redacted]	[redacted]	2023	12 - December	Missing	Missing	Missing

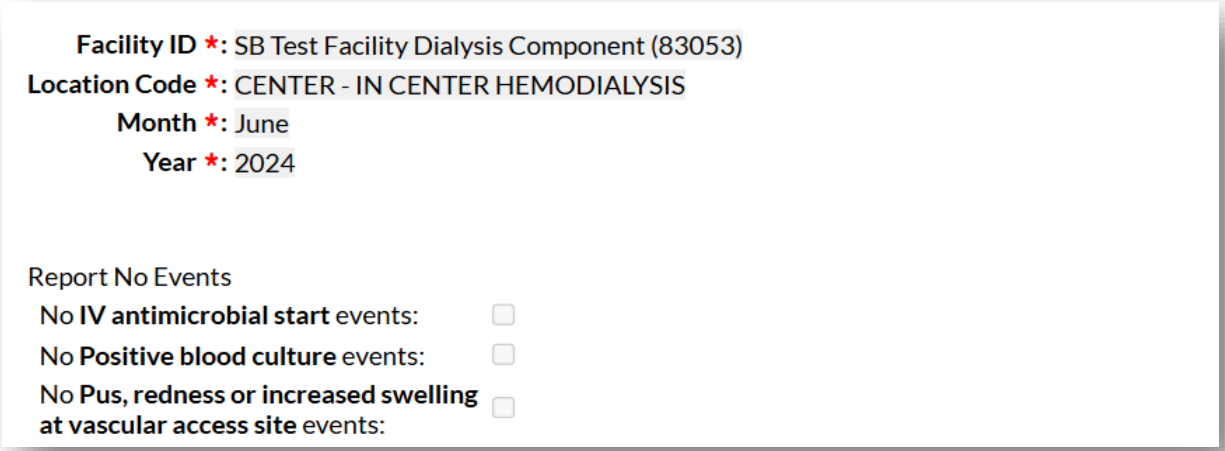
Data Quality Essentials: Data Quality Checks – Facility Administrator Reassignment

- If the current facility administrator is **not available** to make the reassignment in the facility, an **FA Reassignment Form** will need to be submitted to NHSN. When received the User Support team will process the FA Reassignment form on behalf of the submitter within **5 business days**.
  - Please complete the FA reassignment form.
- If you need to reassign a facility administrator to more than 20 facilities, please submit a request to NHSN via email or Service Now @ attention Rebecca Jones. Please provide the following information on the spreadsheet: Facility names, Org ID or CCNs, address if possible and name and email of the new FA. Please do not fill out over 20 FA reassignment forms for this issue.

The Most Common Data Quality Errors – Missing RNE Box

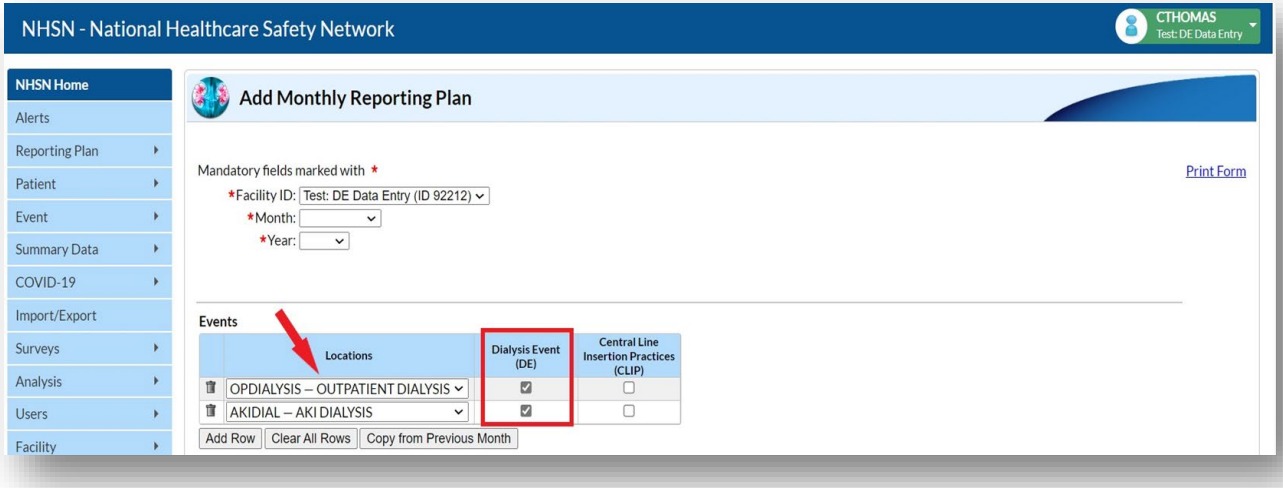
1. Missing RNE Checkbox

- **How to prevent it:**
  - Select the appropriate ‘Report No Events’ box on the summary form if an event of the specific type **did not occur in the reporting month.**
  - Ensure event data is entered and corrected in a **timely manner** to avoid potential missed errors.



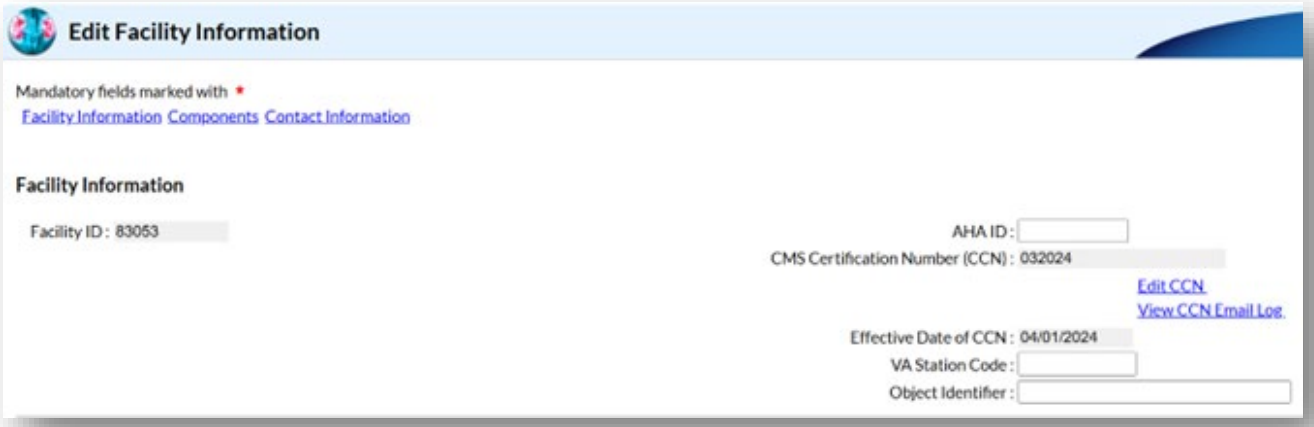
The Most Common Data Quality Errors – Missing Monthly Reporting Plan

1. **Missing RNE Checkbox**
2. **Missing Monthly Reporting Plan**
    - **How to prevent it:** Select a location **AND** the ‘DE’ box on the Monthly Reporting Plan for each individual month of the reporting year. Either box left blank will result in a loss of credit for the month. **This can be done in advance for ALL months of the year after completion of the current year's annual survey.**



The Most Common Data Quality Errors – All CCN Errors

1. **Missing RNE Checkbox**
2. **Missing Monthly Reporting Plan**
3. **All CCN Errors**
    - **How to prevent it:** ensure on the Facility Information page your CMS provided **6-digit** CCN is entered correctly **with no spaces, dashes, or letters** (unless informed by CMS). **Incorrect CCNs can result in reported data not being sent to CMS.**

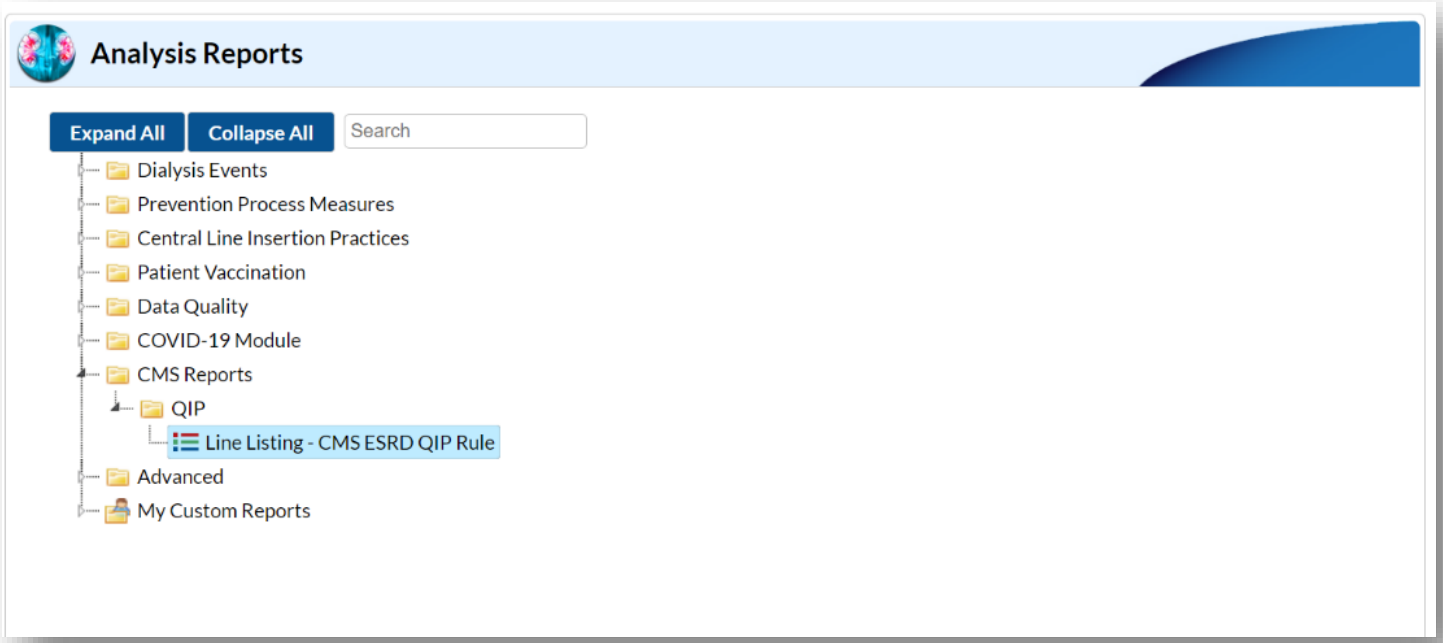


Data Quality Essentials: Self-Review Data Regularly

- **Quality check data is captured 8 weeks before the CMS deadlines**.
  - Therefore, only a limited amount of data is included in these checks. It is essential for facilities to conduct their own personal data quality checks in addition to the checks provided by CDC.
- **Monthly**
  - Ensure all data has been reported.
  - Ensure the accuracy of reported data.
- **Quarterly**
  - Investigate potential data quality errors.
  - Ensure all months are within Dialysis Surveillance Reporting Protocol.
  - Ensure all summary data (denominator data) is in alignment with dialysis event data (numerator data), especially in the case of late added events and/or edited events.

Self Review: 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 Listing – CMS ESRD QIP Rule (CMS Reports > QIP)

- **DE on Reporting Plan = Y:** if “DE” is checked on the Monthly Reporting Plan, indicating Dialysis Event data will be collected according the Dialysis Event Protocol.
- **Dialysis Event Numerator Reported = Y:** if (for each dialysis event type) at least 1 dialysis event was reported that month *or* the corresponding “Report No Events” checkbox was selected on the Denominators for Outpatient Dialysis form to confirm there were zero events of that type for the month.
- **Dialysis Event Denominator Reported = Y:** if the Denominators for Outpatient Dialysis census form was completed for the month.

National Healthcare Safety Network
Line Listing for CMS ESRD QIP Rule
As of: September 18, 2024 at 3:23 PM UTC
Date Range: All DE_CMSQIP

Run the "Rate Table - Bloodstream Infection Data" to view BSI rates

Facility Org ID	CMS Certification Number	Facility Name	Location	CDC Location Description	Summary Year/Month	DE on Reporting Plan	Dialysis Event Numerator Reported	Dialysis Event Denominator Reported	Criteria Met this Month
44166	99999	TEST DIALYSIS CLINIC A	CLINIC	Outpatient Hemodialysis Clinic	2021M01	N	N	N	N
44166	99999	TEST DIALYSIS CLINIC A	CLINIC	Outpatient Hemodialysis Clinic	2021M02	N	N	N	N

Line Listing – Dialysis Events (Dialysis Events > Numerator)

- Check all dialysis events are correctly reported. Review the “Data Validity Check PBC ABX Description” column and check if IV antimicrobial starts or positive blood cultures were missed.

A

Org ID	Event ID	Patient ID	Transient	Event Date	IV Anti-microbial Start	IV Vanco-mycin Start	Positive Blood Culture	Pus Redness Swelling Event	Data Validity Check PBC ABX Description
10856	32403	0322	Y	01/20/2014	Y	Y	N	N	Is This Antimicrobial Start w/o PBC Valid?
10856	30936	1234	N	02/01/2014	N	N	Y	N	Is This PBC w/o Antimicrobial Start Valid?

Line Listing – All DE Denominators (Dialysis Events > Denominator)

- Review denominator data across months. For each vascular access type, verify minimum and maximum values are reasonable and the numbers of patient-months are consistent with the facility’s census.

B

Org ID	Location	Summary Year/Month	No Dialysis Events	Number of Patients: AV Fistula	Number of Buttonhole Patients	Number of Patients: AV Graft	Number of Patients: Tunneled Central Line	Number of Patients: Nontunneled Central Line	Number of Patients: Other Access Device	Patient-months	Number of Fistulas and Grafts	Number of All Central Lines
10856	DIALYSIS	2014M01	Y	38	0	32	12	2	0	84	70	14
10856	DIALYSIS	2014M02	N	38	0	33	12	1	0	84	71	13

Data Quality and Validation

- **CDC has developed recommended approaches to investigate and enhance the accuracy and completeness of NHSN Dialysis Event data. Users should visit the NHSN Data Validation webpage for appropriate year's data validation guide and toolkit.** This webpage was developed to assist nurses, infection preventionists, or quality professionals at outpatient dialysis facilities that report to NHSN, state health department, or end stage renal disease (ESRD) Network personnel who work with facilities to enhance NHSN data quality for surveillance, reimbursement, quality improvement, research or public reporting purposes.
- **CDC has developed an External Validation Toolkit and Appendices document which include the templates and forms necessary to implement a data quality evaluation project.** Resources can be found on the NHSN Data Validation website.

Questions?

Reach out to nhsn@cdc.gov or submit questions to the ServiceNow portal.

A more detailed breakdown of analysis reports in the dialysis component and unique report capabilities can be found in the Dialysis Surveillance Component Manual.

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

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.