

Laboratory-identified Event Surveillance for Multidrug Resistant Organisms (MDROs) and *Clostridioides difficile* Infection (CDI) Events in Long-term Care Facilities (LTCFs)

Background

Multi-drug resistant bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant Enterococci (VRE), and multi-drug resistant Gram-negative bacilli (for example, *Carbapenem-resistant Enterobacterales*) have increased in prevalence in U.S. long-term care facilities (LTCF) over the past several decades.¹ For example, over 35% of nursing home residents are colonized with a multi-drug resistant organism (MDRO).¹ This has important public health implications as MDRO infections are associated with increased number of hospitalizations, hospital readmissions, higher healthcare costs, increased mortality due to more severe illnesses, and increased use of broad-spectrum antibiotics.¹

The Healthcare Infection Control Practices Advisory Committee (HICPAC) has approved guidelines for the control of MDROs.³ These guidelines are available at <https://www.cdc.gov/infectioncontrol/guidelines/MDRO/index.html>). The MDRO and *Clostridioides difficile* (*C. difficile*) module of NHSN can provide a tool to assist facilities in meeting some of the criteria outlined in the guidelines. In addition, many of the metrics used in this module are consistent with “Recommendations for Metrics for Multidrug-Resistant Organisms in Healthcare Settings: SHEA/HICPAC Position Paper.”⁶

Clostridioides difficile (*C. difficile*) infection (CDI) is one of the most common healthcare-associated infections in LTCFs and often a consequence of antibiotic overuse.⁷ The clinical presentation of CDI ranges from uncomplicated diarrhea to severe pseudomembranous colitis, toxic megacolon, and even death. CDI represents an important subset of gastrointestinal tract infections impacting residents in LTCFs in the current CDC definitions for HAIs. It is recommended that specific, standard definitions for CDI^{4,5} should be incorporated to obtain a more complete understanding of how *C. difficile* is being transmitted in LTCFs.

The use of standardized surveillance definitions to monitor MDROs and CDIs within a healthcare facility enables a more complete understanding of how these organisms manifest and are transmitted. The Laboratory-identified (LabID) Event Module within the NHSN LTCF Component is a less labor-intensive surveillance method in which laboratory testing data combined with limited admission, discharge, and transfer information are used without the clinical evaluation of the resident. Analysis of these data elements provide proxy infection measures of MDRO and *C. difficile* healthcare acquisition, exposure burden, and infection burden that will be useful in the implementation of recommended infection prevention and control strategies.¹⁻⁶

References:

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2. Smith et al. SHEA/APIC Guideline: Infection Prevention and Control in the Long-Term Care Facility. *Infection Control and Hospital Epidemiology*, vol.29, 2008, pp. 785-814.
3. Healthcare Infection Control Practice Advisory Committee (HICPAC) Approved Guidelines for the Control of Multidrug Resistant Organism (MDRO). Available at www.cdc.gov/hicpac/pdf/MDRO/MDROGuideline2006.pdf
4. McDonald, C., et al. Clinical Practice Guideline for *Clostridium difficile* Infection in Adults and Children: 2017 Update by Infectious Disease Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA). *Clinical Infectious Diseases*, vol. 44, no. 77, 2018, pp. e1-e48.
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6. Cohen, A. L., et al. Recommendations for Metrics for Multidrug-Resistant Organisms in Healthcare Settings: SHEA/HICPAC Position Paper. *Infection Control and Hospital Epidemiology*, vol. 29, no. 10, 2008, pp. 901-13.
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Section 1: MDRO LabID Event Reporting

The use of standardized surveillance definitions to monitor MDROs within a healthcare facility enables a more complete understanding of how these organisms manifest and are transmitted. The LabID Event Module within the NHSN LTCF Component is a less labor-intensive surveillance method in which laboratory tested data combined with limited admission, discharge, and transfer information are used without the clinical evaluation of the resident. This method provides proxy measures of MDRO infection burden and exposure that will be useful in the implementation of recommended MDRO infection prevention and control strategies.¹⁻⁶

Settings

The MDRO LabID Event Module is available for use by Nursing Homes/Skilled Nursing Facilities (LTC: SKILLNURS); Intermediate Care Facilities for Individuals with Intellectual Disabilities (LTC: ICF/IID); Psychiatric Residential Treatment Facility (LTC: PSYCH); and Skilled Nursing Facility for State Veteran's Homes (LTC: SVHSNF).

MDRO surveillance in the above settings requires surveillance to be performed in all resident care locations within the facility, which is referred to as facility-wide inpatient or FacWideIN.

Unit/location/pod specific MDRO surveillance is not an option in the LTCF MDRO LabID Event module.

Methods

Using the NHSN MDRO definitions listed below, LabID event surveillance methodology is used to monitor one or more of the following MDROs: *Staphylococcus aureus*, both methicillin-resistant (MRSA) and methicillin-susceptible (MSSA), vancomycin-resistant *Enterococcus* spp. (VRE), cephalosporin-resistant *Klebsiella* spp., Carbapenem-resistant *Enterobacterales* (CRE), and multidrug-resistant *Acinetobacter* spp.

NHSN data collection forms and form instructions are available for users to collect the required data prior to submitting the information to the NHSN application. Please note that one event form must be used for each LabID event. These forms are to be used for data collection only, and not to be sent to CDC NHSN.

MDRO LabID Event Definitions

- **MDRO Positive Isolate:** Any specimen, obtained for clinical decision making, testing positive for a MDRO (*as defined below*). Excludes positive isolates collected for active surveillance testing.
- **MDRO LabID Event:** (1) MDRO positive isolate from **any** specimen source collected while the resident is under the care of the reporting LTCF, which includes residents physically housed and cared for in the reporting LTCF, as well as residents being cared for during a brief outpatient visit (OP) in which the resident returns to the reporting LTCF on the day of the OP visit or the following calendar day.
- **Facility-wide Inpatient (FacWideIN):** All resident care locations in the facility.
- **LabID Event Date:** Specimen collection date.

MDROs included in this module are defined below:

Gram-stain positive organisms:

- **MRSA:** Includes *S. aureus* cultured from any specimen source that tests oxacillin-resistant, ceftazidime-resistant, or methicillin-resistant by standard susceptibility testing methods, or any laboratory finding of MRSA (includes but not limited to PCR or other molecular based detection methods).
- **MSSA:** Includes *S. aureus* cultured from any specimen source testing **susceptible** to oxacillin, ceftazidime, or methicillin by standard susceptibility testing methods. **Note:** MSSA is only an option when surveillance includes MRSA.
- **VRE: *Enterococcus faecalis, Enterococcus faecium, or Enterococcus species unspecified* (only those not identified to the species level)** that are resistant to vancomycin, by standard susceptibility testing methods or a laboratory finding of VRE (includes, but not limited, to PCR or other molecular based detection methods).

Gram-stain negative organisms:

- **CephR-Klebsiella:** *Klebsiella oxytoca* or *Klebsiella pneumoniae* testing non-susceptible (specifically, either resistant or intermediate) to ceftazidime, ceftazidime/avibactam, or ceftolozane/tazobactam.
- **CRE:** Any *Escherichia coli, Klebsiella oxytoca, Klebsiella pneumoniae, Klebsiella aerogenes* or *Enterobacter spp.* testing **resistant** to imipenem, meropenem, doripenem, ertapenem, meropenem/vaborbactam, or imipenem/relebactam by standard susceptibility testing methods (specifically, minimum inhibitory concentrations of ≥ 4 mcg/mL for doripenem, imipenem, meropenem, meropenem/vaborbactam, and imipenem/relebactam or ≥ 2 mcg/mL for ertapenem) OR by production of a carbapenemase (specifically, KPC, NDM, VIM, IMP, OXA-48) demonstrated using a recognized test (examples: polymerase chain reaction, metallo- β -lactamase test, modified-Hodge test, Carba-NP). **Note:** CRE surveillance requires facilities perform surveillance for all three organisms CRE-*E.coli*, CRE-*Enterobacter*, **and** CRE-*Klebsiella* (*Klebsiella oxytoca, Klebsiella aerogenes* and *Klebsiella pneumoniae*).
- **MDR-Acinetobacter:** Any *Acinetobacter* species testing non-susceptible (specifically, either resistant or intermediate) to at least one agent in at least 3 antimicrobial classes of the following 6 antimicrobial classes:

Antimicrobial Class	Antimicrobial Agents
Aminoglycosides:	Amikacin, Gentamicin, Tobramycin
β-lactam/β-lactam β-lactamase inhibitor combination	Piperacillin and tazobactam
Carbapenems:	Imipenem, Meropenem, Doripenem
Cephalosporins:	Cefepime, Ceftazidime, Ceftazidime/avibactam, Ceftriaxone
Fluoroquinolones:	Ciprofloxacin, Levofloxacin
Sulbactam:	Ampicillin/sulbactam



Requirements for MDRO LabID Event Reporting

1. A **NHSN Monthly Reporting Plan** for the LTCF must be completed for each calendar month in which a facility plans to submit data to NHSN. A user will not be able to save entered event data in the NHSN application without a corresponding monthly reporting plan.
 - For MDRO surveillance, one or more MDROs must be selected from the *Specific Organism Type* drop-down menu under the LabID Event Module section. As a reminder, the *Location* box will auto-populate Facility-wide Inpatient (FacWideIN), which means surveillance must occur for all resident care locations in the facility. The *LabID Event All Specimens* box will auto check, indicating MDRO surveillance must include all specimen sources. Click “Add Row” to select more than one specific organism type. Facilities may opt to include *C. difficile* infection in the monthly LabID Event surveillance plan.

The screenshot shows the 'LabID Event Module' interface. It features a table with three main columns: 'Locations', 'Specific Organism Type', and 'Lab ID Event All Specimens'. The 'Locations' column contains three rows, each with a trash icon and a dropdown menu set to 'Facility-wide Inpatient (FacWideIN)'. The 'Specific Organism Type' column has three rows: 'CDIF - C. difficile', 'ACINE - MDR-Acinetobacter', and an empty dropdown menu. The 'Lab ID Event All Specimens' column has three rows with checkboxes, the first two of which are checked. Below the table are buttons for 'Add Row', 'Clear All Rows', and 'Copy from Previ'. A dropdown menu is open for the third row of the 'Specific Organism Type' column, listing options: 'CEPHRKLEB - CephR-Klebsiella', 'CRE - CRE (CRE-Ecoli, CRE-Enterobacter, CRE-Klebsiella)', 'MRSA/MSSA - MRSA with MSSA', 'MRSA - MRSA', and 'VRE - VRE'. A purple callout bubble with white text says 'Click to add additional organisms'.

2. Submit **ALL MDRO LabID events for all specimen sources** to NHSN. Exceptions are **not** made for duplicate isolates, location, or admission/transfer dates, as all events must be submitted for accurate categorization and analyses. In return, NHSN will categorize the submitted MDRO LabID events based on the MDRO categories described in this protocol.
3. Perform surveillance for all resident care locations in the facility, referred to as FacWideIN. Surveillance includes positive isolates collected during an OP visit, such as an emergency department (ED) or clinic/office visit, when the resident returns to the LTCF on the day of the visit or the following calendar day (specifically, these residents remain under the care of the LTCF, and the *current* admission date does not change due to the OP visit).
 - **NOTES ABOUT SPECIMEN COLLECTION AND SURVEILLANCE**
 - When submitting a LabID event for a specimen collected in an OP setting, the *Resident Care Location* and *Primary Resident Service Type* should reflect the resident’s primary LTCF location and service type on the day of the outpatient visit.
 - Specimens collected prior to admission to the LTCF or during an admission in another facility are NOT included in data submission for the reporting LTCF.
 - *Results from positive isolates collected as part of active surveillance are excluded.*
 - There is not an option to perform surveillance on select or individual units/pods within the facility. However, users will be able to review resident and location level data and trends in line lists, analysis reports, including the LTCF Data Dashboard.

4. Submit **complete event and monthly summary data** (specifically, numerators and denominators) for each calendar month in which the facility has a monthly reporting plan. Incomplete data will result in errors in data analysis, including the LTCF Data Dashboard (see Numerator and Denominator Data section).
5. Facilities are encouraged to perform surveillance and reporting for at least 6 consecutive months to provide meaningful measures for analysis, but there is not a minimum reporting requirement.

Case Scenarios:

1. Mr. G is a resident in your LTCF. On March 1st, he was transferred to the local emergency department (ED) for evaluation of a foot ulcer. While in the ED, the wound was cultured and tested positive for MRSA. Antibiotics were ordered and Mr. G was transferred back to the LTCF on the same calendar day. Since the MRSA positive wound culture was collected in an outpatient setting and Mr. T returned to the LTCF on the same calendar day of the visit (or the next calendar day), the LTCF submitted a MRSA LabID event.
2. Mr. G is a resident in your LTCF. On March 1st, he was transferred to the local ED for evaluation of a foot ulcer. While in the ED, the wound was cultured and tested positive for MRSA. He was admitted to the hospital for IV antibiotics. Since Mr. G was admitted to the hospital and did not return to the LTCF within 2 calendar days of the OP visit, the LTCF did not submit a MRSA LabID event.

Key Points for MDRO LabID Event Reporting

- All MDRO LabID events for selected MDRO(s) must be submitted to NHSN. Exceptions are **not** made for duplicate specimens, collection date, admission, etc. since these submitted events are required for accurate categorization and analyses.
- LabID events must be monitored at the overall facility-wide level for inpatient areas (FacWideIN).
- Location specific surveillance is not available for LabID Event reporting. Although, facilities are able to organize and view location specific LabID events submitted to NHSN.
- Laboratory results obtained before a resident's admission to the LTCF or during an admission in another facility are excluded from LabID event reporting.
- LabID event rules apply to specimens collected while the resident is under the care of the reporting LTCF, which NHSN defines as being physically housed/bedded in the reporting LTCF or during a brief outpatient visit in which the resident returns to the reporting LTCF on the day of the OP visit or the following calendar day. **Note:** When submitting a LabID event for positive isolates collected in an OP setting, the selected *Resident Care Location* and *Primary Resident Service Type* should reflect the resident's primary LTCF location and service type on the day of the OP visit.
- Surveillance must occur for all specimen sources for each of the selected MDROs in the *Monthly Reporting Plan*.
- The date of specimen collection is considered the event date.
- Incomplete event or denominator data will be excluded from analysis, including the LTCF Data Dashboard.

Case Scenarios:

1. Mr. T is a long-term resident in your facility. On December 2nd, he developed a fever and complained of pain during urination. A urine culture was collected on 12/2 and subsequently returned positive for MRSA. A MRSA LabID event was submitted to NHSN for 12/2 (date of specimen collection). Over

the next week, Mr. T seemed to improve, and the pain resolved. On December 25th, he had purulent discharge around his penis. A urine culture was collected on the same day and subsequently tested positive for MRSA. The second MRSA was also entered in NHSN as a MRSA LabID event for 12/25. *Hint: All MDRO LabID events for selected MDRO(s) must be submitted to NHSN. Exceptions are not made for duplicate specimens.*

2. Ms. Smith was admitted to your LTCF today, on May 1. According to her chart, she was recently treated for VRE in a surgical wound but continues to have episodes of pain and copious discharge. The attending physician ordered a culture of the wound, and the specimen was collected on the following day, on May 2. The results were positive for VRE. The LTCF submitted a VRE LabID Event to NHSN for Ms. Smith. *Hint: All MDRO LabID events for selected MDRO(s) must be submitted to NHSN. Exceptions are not made based on when the resident was transferred or admitted to the LTCF.*

2a. Over the next several days, Ms. Smith's condition seemed to worsen, and she developed a fever that would not respond to medication. A blood, urine, and wound culture were ordered. The specimens were collected on May 10th and came back with the following results: Blood +VRE; Wound +VRE and +MRSA; Urine +VRE. The LTCF submitted a separate LabID event for each positive MDRO: (1) VRE-blood; (2) VRE-wound; (3) MRSA-wound; and (4) VRE-urine. *Hint: All MDRO LabID events for selected MDRO(s) must be submitted to NHSN. Exceptions are not made for duplicate results or specimens. A new LabID event must be submitted for each positive MDRO isolate.*

3. Mrs. A was transferred from an acute care facility to your skilled nursing facility (SNF) for rehab following a motor vehicle accident. According to her chart, immediately prior to transfer to your SNF, the acute care facility collected a wound culture, which returned as positive for multidrug resistant *Acinetobacter*. She transferred to your facility on antibiotics for a wound infection. Your LTCF does NOT submit this positive MDRO isolate as an MDR-*Acinetobacter* LabID event since Mrs. A was tested prior to admission to your SNF. *Hint: if she is tested again, after admission to your SNF, a positive MDR-*Acinetobacter* would be submitted as an MDR-*Acinetobacter* LabID event.*

3a. While reviewing her chart, you also notice that a nasal swab was collected as part of the SNF's MRSA active surveillance program. The culture was positive. Since the positive MRSA was collected as part of your active surveillance program, A MRSA LabID event is not submitted for Mrs. A. *Hint: NHSN defines a MDRO Positive Isolate as any specimen, obtained for clinical decision making, testing positive for a MDRO. Results from positive isolates collected as part of active surveillance are excluded.*

Numerator and Denominator Data

NHSN provides users with data collection forms and accompanying form instructions (referred to as Table of Instructions) that can be used to collect the required LabID event data (numerator data), as well as the required monthly summary data (denominator data). While manual data collection using the forms is optional, users should be familiar with the required data elements that must be submitted in the NHSN application in order for the data to be considered as complete. Facilities may also choose to customize these forms to better accommodate individual surveillance programs.

Numerator

The *Laboratory identified MDRO or CDI Event for LTCF* form ([CDC 57.138](#)) is used to collect required data for each NHSN defined MDRO LabID event. A separate data collection form is to be used for each LabID

event. NHSN also provides users with detailed form instructions in the [Table of Instructions for Completion of the LTCF Laboratory- identified \(LabID\) MDRO or CDI Event form](#).

Denominator

Referred to by NHSN as *Monthly Summary Data*. After selecting the month and year for which monthly summary data will be submitted, the NHSN application will auto-populate the form with the required data elements based on the selections made in the NHSN Monthly Reporting Plan for the corresponding month. For MDROs only, the monthly summary requires users to enter **monthly totals** for resident admissions and resident days, as well as confirm if no LabID events were submitted for the selected organisms during the month.

The following example represents the Monthly Summary Data requirements for a facility with a Monthly Reporting Plan indicating that MRSA LabID event surveillance will be the only NHSN surveillance completed for the month of August 2023. In this example, the *Report No Events* box is active with two red asterisks, under MRSA (Specific Organism Type), indicating that no MRSA LabID events were submitted to NHSN during the month of August 2023. If this is correct, the facility must put a check mark in the box to confirm that no MRSA isolates were identified during this month. If, after saving the Monthly Summary Data form, a MRSA positive isolate is submitted as a MRSA LabID event, the form will auto-update without additional action from the user.

Location Code	Resident Admissions	Resident Days	LabID Event (All specimens)	Report No Events	Specific Organism Type									
					MRSA	MSSA	VRE	CapHiR-Klebsiella	CRE-EcoII	CRE-Enterobacter	CRE-Klebsiella	C.difficile	MDR-Adinetobacter	
Facility-wide Inpatient (FacWIDEIn)	9	3200	<input type="checkbox"/>	<input checked="" type="checkbox"/> **	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NHSN provides two form options for collecting monthly summary data for LabID events. One form should be used for the entire calendar month.

1. The *MDRO and CDI LabID Event Reporting Monthly Summary Data for LTCF form* ([CDC. 57.139](#)) may be used to document total required denominator counts for the calendar month. Detailed instructions for completing this form are available in the [Table of Instructions for Completion of the MDRO and CDI Monthly Monitoring for Long-term Care Facility](#).
2. A second form option includes the *Denominators for LTCF form* ([CDC 57.142](#)), which may be used to document daily denominator counts, keeping in mind that only the monthly totals are submitted to NHSN. This optional form provides users with the option to document daily counts for MDRO and/or CDI LabID events, as well as for urinary tract infections (UTI). Detailed form instructions are available in the [Table of Instructions for Completion of the LTCF Component Denominators for LTCF](#) document.

Definitions and Key Points for MDRO LabID Event Denominator Data

- *Resident Admissions* refers to total number of residents admitted to the facility including both new and re-admissions (specifically, a resident who was out of the facility for more than two (2) calendar days and then returned). The total number of new and re-admissions is added for the complete calendar month and submitted to NHSN as Resident Admissions.
- *Resident-Days* are calculated using the daily census of residents in the facility each calendar day of the month. The daily total is added at the end of the calendar month and the total number is then submitted to NHSN as Resident Days.

MDRO Data Analyses

All event (numerator) and monthly summary (denominator) data submitted to NHSN can be analyzed. Prior to calculating MDRO LabID event metrics, NHSN categorizes submitted MDRO LabID events. The below sections will first describe how MDRO LabID Events are categorized, followed by the calculated metrics that are incorporated into the analytics output.

Categorizations of Submitted MDRO LabID Events

Based on the surveillance and reporting options selected in the NHSN Monthly Reporting Plan, **ALL** selected positive MDRO isolates collected while the resident is under the care of the reporting LTCF are to be submitted as a MDRO LabID event, including those collected in an OP setting when the resident returns to the LTCF on the day of the OP visit or the following calendar day. In return, NHSN removes duplicate MDRO LabID events and categorizes remaining non-duplicate events based on event date (specifically specimen collection date), specimen source (specifically blood sources), current admission date, and date of last transfer from an acute care facility to the reporting LTCF. Calendar days are used for all categorizations.

NHSN removes duplicate events prior to categorizing and analyzing submitted MDRO LabID events. Duplicate MDRO LabID events are defined as: (1) the same organism subsequently collected from any non-blood source in the same calendar month; and (2) the same organism collected from a second blood source in the subsequent 14 calendar days. While these events are not further analyzed by NHSN, a facility user may opt to review a NHSN line list to view all submitted MDRO LabID events, including duplicate and non-duplicate events.

Categorization applied by NHSN to MDRO LabID events are defined below:

After removing duplicate MDRO LabID events, NHSN categorizes nonduplicate events as one of the following: 1). Community-onset (CO); 2). Long-term Care Facility-onset (LO); or 3). Acute Care Transfer-Long-term Care Facility-onset (ACT-LO)

1. **Community-onset (CO) LabID Event:** LabID event date (specifically, specimen collection date) occurs in 3 calendar days or less after date of current admission to the facility. For example, days 1 (current admission date), 2, or 3 are considered as CO LabID events.
2. **Long-term Care Facility-onset (LO) LabID Event:** LabID event date (specifically, specimen collection date) is more than 3 calendar days after the date of current admission to the facility. For example, day 4 or after.

2a. **Acute Care Transfer-Long-term Care Facility-onset (ACT-LO):** A LTCF-onset (LO) LabID event with date specimen collected 4 weeks or less following the date of last transfer from

an acute care facility (specifically, a hospital, long-term acute care hospital, or acute inpatient rehabilitation facility only) to the LTCF.

Case Scenarios to Demonstrate How NHSN Classifies Submitted LabID Events:

Example: NHSN Classification of Lab ID Events as Community-onset or LTCF-onset				
Admission date June 4th	June 5th	June 6th	June 7th	June 8th
day 1	day 2	day 3	day 4	day 5
Community-onset (CO)			Long-term Care Facility-onset (LO)	

For the following case scenarios, the LTCF submitted an NHSN Monthly Reporting Plan indicating that all NHSN MDROs would be included in LabID Event surveillance for the year.

1. Ms. T was first admitted to the LTCF on June 4th. On June 5th, a CNA documented a foot ulcer with purulent drainage and redness around the borders. On June 7th, the foot ulcer tested positive for MRSA. A MRSA LabID event was submitted to NHSN for June 7th (date of specimen collection). NHSN categorized the LabID event as **Long-term Care Facility onset (LO)** since the specimen was collected after the 3rd calendar day of the current admission to the facility. Later, Ms. T had a urine culture collected on June 29 that also tested positive for MRSA. The positive isolate was submitted to NHSN as a MRSA LabID event. NHSN identified the specimen as a duplicate MRSA LabID event and excluded the event from additional analysis. After reviewing the lab reports and NHSN line listing for all submitted LabID events, the infection preventionist (IP) realized a positive MRSA blood culture collected from Ms. T on June 12 was not submitted to NHSN, so a MRSA blood specimen was submitted to NHSN as a MRSA LabID event for June 12. Since no other blood source MRSA LabID events were entered in NHSN for the previous 14 calendar days, the MRSA blood specimen was considered as a non-duplicate MRSA LabID event. NHSN recategorized the previously submitted non-blood MRSA LabID events submitted for June as duplicate events and excluded those events from further NHSN analyses.
 - a. NHSN identified the first submitted MRSA LabID event for the month as a non-duplicate. NHSN then categorized the nonduplicate MRSA LabID event as **Long-term Care Facility onset (LO)** since the specimen was collected more than 3 calendar days after the current admission date. *Hint: LabID event methodology is a less labor-intensive surveillance method for providing proxy measures of infection burden and exposure. This methodology does not incorporate clinical criteria and is instead based on laboratory testing data and admission, discharge, and transfer information. This means the onset of signs and symptoms documented on June 5 were not considered when categorizing the LabID event. This scenario represents a trade-off between reduced surveillance burden associated with LabID event methodology and decreased specificity.*
 - b. A blood specimen LabID event with the same organism will always triumph submitted non-blood LabID events for the same month.

2. Ms. Smith was transferred to your SNF from an acute care facility on July 1st. A urine culture was collected on July 10th that tested positive for VRE. The SNF submitted a VRE LabID event to NHSN for July 10th.
 - a. First, NHSN identified the submitted event as a non-duplicate since the application did not detect a prior VRE LabID event submitted for Ms. Smith in the month of July.



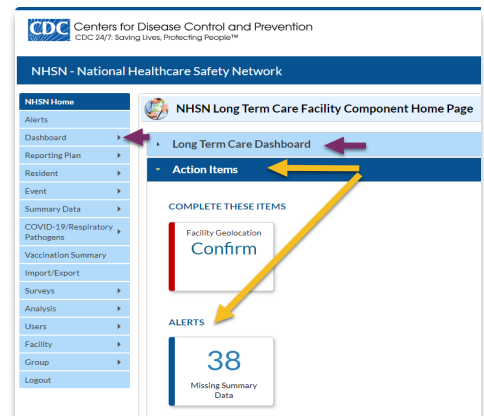
- b. Next, NHSN categorized the nonduplicate VRE LabID event as **Acute Care Transfer-Long-term Care Facility-onset (ACT-LO)** since the specimen was collected more than 3 calendar days after her current admission and the submitted event indicated a transfer from an acute care facility to your SNF in the previous 4 weeks.
- 3. Mr. Tom was transferred to your LTCF from home on August 5th. He was on treatment for a MRSA urinary tract infection at the time of admission. The LTCF does not submit a MRSA LabID event since the positive MRSA isolate was collected prior to admission to the LTCF. Later, on August 10th, the on-call doctor ordered a urine culture and the results returned positive for MRSA and VRE. The LTCF must submit two separate MDRO LabID events for 8/10, one MRSA LabID event and a VRE LabID event.
 - a. First, NHSN identified each the submitted LabID event as a non-duplicate since the application did not detect a prior MRSA or VRE LabID event submitted for Mr. Tom in the month of July.
 - b. Next, NHSN categorized each event as **Long-term Care Facility-onset (LO)** since the specimen were collected more than 3 days after the current admission date. If no other positive MDRO isolates were identified during July, the LTCF NHSN line list would show LO MRSA LabID event and a LO VRE LabID event for July.

Calculated MDRO LabID Event Metrics

After a user generates analysis datasets in the application, all data entered for the facility up until that time are immediately available for users to visualize and analyze. For example, line listing reports provide detailed, line by line listing of events submitted to NHSN, including how submitted MDRO events are categorized (refer to the “Onset” variable in the NHSN Line List). Additionally, rate tables provide users with summarized monthly data using NHSN calculated rates and denominator data. Examples include calculated incidence and prevalence rates, as well as rate tables for submitted MDROs. Users can also generate frequency tables, bar charts, and pie charts.

Additionally, the LTCF Dashboard, located on the NHSN Home Page, allows users to quickly visualize data found in the rate tables and line listings in the form of interactive bar charts and line graphs. For additional information about the LTCF Dashboard, please review the [CDC Guidance Document – Dashboard](#). As a reminder, only NHSN identified non-duplicate LabID events are included in calculated metrics.

Important: Incomplete events and/or summary data will trigger an “Alert” on the facility’s NHSN homepage. All records identified by an “Alert” will be excluded from the rate tables and the LTCF Dashboard until the Alert is resolved by a facility user.



The following table describes the various NHSN calculated metrics for MDRO LabID event surveillance.

Calculated Metrics	Calculations	Comments
Total MDRO Rate per 1,000 resident days	$\frac{\text{Number of MDRO LabID Events}}{\text{Total resident – days}} \times 1,000$	Includes CO and LO LabID events per month
<ul style="list-style-type: none"> Percent of MDRO CO LabID events 	$\frac{\text{Number of CO MDRO LabID Events}}{\text{Total number of MDRO LabID Events}} \times 100$	
<ul style="list-style-type: none"> Percent of MDRO LO LabID events 	$\frac{\text{Number of LO MDRO LabID Events}}{\text{Total number of MDRO LabID Events}} \times 100$	
<ul style="list-style-type: none"> Percent of LO MDRO LabID events that are ACT-LO LabID events 	$\frac{\text{Number of ACT – LO MDRO LabID Events}}{\text{Total number of LO MDRO LabID Events}} \times 100$	
MDRO LO Rate per 1,000 resident days	$\frac{\text{Number of LO MDRO LabID Events}}{\text{Total resident – days}} \times 1,000$	

Section 2: CDI LabID Event Reporting

The use of standardized surveillance definitions to monitor *C. difficile* infection (CDI) within a healthcare facility enables a more complete understanding of the burden and transmission of this spore-forming, Gram-positive anaerobic bacterium. The LabID Event Module within the NHSN LTCF Component is a less labor-intensive surveillance method in which laboratory testing data combined with limited admission, discharge, and transfer information are used without the clinical evaluation of the resident for signs and symptoms. This method provides proxy measures of CDI and healthcare exposure that can be useful in the implementation of recommended CDI prevention and control strategies.¹⁻⁶

Settings

The CDI LabID Event Module is available for use by certified skilled nursing facilities and nursing homes (LTC: SKILLNURS) and intermediate/chronic care facilities for the developmentally disabled (LTC: DEVDIS), which may also be referred to by the Centers for Medicare and Medicaid Services (CMS) as Intermediate Care Facilities for Individuals with Intellectual Disabilities (IDF/IIDs).

CDI surveillance in the above settings requires surveillance to be performed in all resident care locations within the facility, which is referred to as facility-wide inpatient or FacWideIN. Unit/location/pod specific CDI surveillance is not an option in the LTCF MDRO & CDI LabID Event module.

Methods

Using LabID event surveillance methodology, LTCFs have the option to monitor CDI alone or in conjunction with one or more of the MDROs available in the reporting module. NHSN data collection forms and form instructions are available for users to collect the required data elements prior to submitting the information to the NHSN application. Keeping in mind that one form should be used per LabID event and forms must not be sent to CDC-NHSN.

CDI LabID Event Definitions

- C. difficile positive laboratory assay: (1) An unformed/loose stool that tests positive for *C. difficile* toxin A and/or B. This includes molecular assays (PCR) and/or toxin assays; or (2) A toxin-producing *C. difficile* organism detected in an unformed/loose stool sample by culture or other laboratory means.
- CDI Laboratory-identified (LabID) Event: (1) *C. difficile* positive laboratory assay collected while resident is under the care of the reporting LTCF, which includes residents physically housed and cared for in the reporting LTCF, as well as residents being cared for during a brief outpatient visit (OP) in which the resident returns to the reporting LTCF on the day of the OP visit or the following calendar day.
- Facility-wide Inpatient (FacWideIN): All resident care locations in the facility.
- LabID Event Date: Specimen collection date.

Requirements for CDI LabID Event Reporting

1. A **NHSN Monthly Reporting Plan** for the LTCF must be completed for each calendar month in which a facility plans to submit data to NHSN. A user will not be able to save entered event data in the NHSN application without a corresponding monthly reporting plan.
 - For CDI surveillance, *C. difficile* must be selected as the *Specific Organism Type* from the drop-down menu under the LabID Event Module section. As a reminder, the *Location* box will auto-populate Facility-wide Inpatient (FacWideIN), which means surveillance must occur for all resident care locations in the facility. The *LabID Event All Specimens* box will auto check, although CDI surveillance is specific to *loose stool specimens* only. Click “Add Row” to select additional organism types, such as specific MDROs (optional).

LabID Event Module		
Locations	Specific Organism Type	Lab ID Event All Specimens
Facility-wide Inpatient (FacWideIN)	CDIF - C. difficile	<input checked="" type="checkbox"/>
Facility-wide Inpatient (FacWideIN)	MRSA - MRSA	<input checked="" type="checkbox"/>

Click to add additional organisms

2. Perform surveillance for all resident care locations in the facility, referred to as FacWideIN. Surveillance includes *C. difficile* positive laboratory assays collected during an OP visit, such as an emergency department (ED) or clinic/office visit, when the resident returns to the LTCF on the day of

the visit or the following calendar day (specifically, these residents remain under the care of the LTCF, and the *current* admission date does not change due to the OP visit).

➤ **NOTES ABOUT SPECIMEN COLLECTION AND SURVEILLANCE**

- When submitting a LabID event for a specimen collected in an OP setting, the *Resident Care Location* and *Primary Resident Service Type* should reflect the resident's primary LTCF location and service type on the day of the outpatient visit.
 - Specimens collected prior to admission to the LTCF or during an admission in another facility are NOT included in data submission for the reporting LTCF.
 - There is not an option to perform surveillance on select or individual units/pods within the facility. However, users will be able to review resident and location level data and trends in line lists and analysis reports, including the LTCF Data Dashboard.
3. Submit **ALL CDI LabID Events** to NHSN. Exceptions are **not** made for duplicate *C. difficile positive laboratory assays*, location, or admission/transfer dates, as all events must be submitted for accurate categorization and analyses. In return, NHSN will categorize the submitted CDI LabID events based on the CDI categories described in this protocol.
 4. Submit **complete Event and Monthly Summary Data** (specifically, numerators and denominators) for each calendar month in which the facility has a monthly reporting plan. Incomplete data will result in errors in data analysis, including the LTCF Data Dashboard (see Numerator and Denominator Data section).
 5. Facilities are encouraged to perform surveillance and reporting for at least 6 consecutive months to provide meaningful measures for analysis, but there is not a minimum reporting requirement.

Case Scenarios:

1. Mrs. A was admitted to your skilled nursing facility (SNF) for rehab following a motor vehicle accident. According to her chart, she had a *C. difficile* PCR positive test result during her admission in the acute care facility. She is admitted to your facility on treatment. Your SNF does NOT submit the *C. difficile* positive laboratory assay to NHSN as a CDI LabID event since the specimen was collected during an admission in another facility. *Hint: if she is tested again, after admission to your SNF, a C. difficile positive laboratory assay would be submitted as a CDI LabID event.*
2. Mr. G is a resident in your LTCF. On March 1st, he was transferred to the local emergency department (ED) for evaluation of copious diarrhea for 3 days. While in the ED, he tested positive for *C. difficile*. After receiving IV fluids and a prescription for medication, Mr. G was transferred back to the LTCF the next calendar day, on March 2. Since the *C. difficile positive laboratory assay* was collected in an outpatient setting and the resident returned to the LTCF within 2 calendar days (day of OP visit or next calendar day), the LTCF submitted a CDI LabID event.

Key Points for CDI LabID Event Reporting

- All CDI LabID events must be submitted to NHSN. Exceptions are **not** made for duplicate specimens, collection date, admission, etc. since these submitted events are required for categorization and analyses.
- LabID events must be monitored at the overall facility-wide level for inpatient areas (FacWideIN).
- Location specific surveillance is not available for LabID event reporting. Although, facilities are able to organize and view location specific LabID events submitted to NHSN.

- Laboratory results obtained before a resident’s admission to the LTCF or during an admission in another facility are excluded from LabID event reporting.
- LabID event rules apply to specimens collected while the resident is under the care of the reporting LTCF, which NHSN defines as being physically housed/bedded in the reporting LTCF or during a brief outpatient visit in which the resident returns to the reporting LTCF on the day of the OP visit or the following calendar day. **Note:** When submitting a LabID event for positive isolates collected in OP setting, the selected *Resident Care Location* and *Primary Resident Service Type* should reflect the resident’s primary LTCF location and service type on the day of the OP visit.
- Surveillance must occur for loose stool specimen sources.
- The date of specimen collection is considered the event date.
- Incomplete event or denominator data will be excluded from analysis, including the LTCF Data Dashboard.

Case Scenarios:

1. Mr. T is a long-term resident in your facility. On December 10th, he had 4 episodes of copious diarrhea and a fever that continued through the next day. A loose stool specimen was collected on 12/11, and subsequently returned positive for *C. difficile* toxin. A CDI LabID event was submitted to NHSN for 12/11 (date of specimen collection). Over the next week, Mr. T seemed to improve, and the diarrhea and fever resolved with treatment. On December 20th, the diarrhea returned and after several episodes of diarrhea, a loose specimen was collected on the same day and tested positive for *C. difficile* toxin. A second CDI LabID event was submitted to NHSN for 12/20. *Hint: All CDI LabID events must be submitted to NHSN. Exceptions are not made for duplicate specimens.*
2. Ms. Smith was admitted to your LTCF today, on May 1st. According to her chart, she was recently treated for CDI while in the acute care facility but continues to have episodes of diarrhea and abdominal pain. The attending physician ordered a *C. difficile* assay, and a loose stool specimen was collected on the following day, May 2nd. The results were positive for *C. difficile* toxin A. The LTCF submitted a CDI LabID event to NHSN for Ms. Smith. *Hint: All CDI LabID events submitted to NHSN. Exceptions are not made for based on when the resident was admitted or readmitted to the LTCF.*
3. Mrs. A was transferred from an acute care facility to your skilled nursing facility (SNF) for rehab following a motor vehicle accident. According to her chart, immediately before transfer to your SNF, she tested positive for CDI and was ordered to start medication. Your LTCF does NOT submit a CDI LabID event since Mrs. A was tested prior to admission to your SNF. *Hint: if she is tested again, after admission to your SNF, a positive *C. difficile* toxin result would be submitted as a CDI LabID event.*

Numerator and Denominator Data

NHSN provides users with data collection forms and accompanying form instructions (referred to as Table of Instructions) that can be used to collect the required LabID event data (numerator data), as well as the required monthly summary data (denominator data). While manual data collection using the forms is optional, users should be familiar with the required data elements that must be submitted in the NHSN application for the data to be considered as complete. Facilities may also choose to customize these forms to better accommodate individual surveillance programs.

Numerator

The *Laboratory identified MDRO or CDI Event for LTCF* form ([CDC 57.138](#)) is used to collect required data for each NHSN defined CDI LabID event. A separate data collection form is to be used for each LabID event. NHSN also provides users with detailed form instructions in the [Table of Instructions for Completion of the LTCF Laboratory-identified \(LabID\) MDRO or CDI Event Form](#)

Denominator

Referred to by NHSN as *Monthly Summary Data*. After selecting the month and year for which monthly summary data will be submitted, the NHSN application will auto-populate the denominator form with the required data elements based on the selections made in the NHSN Monthly Reporting Plan for the corresponding month. For CDI, the monthly summary requires **monthly totals** for resident admissions, resident days, number of admissions on *C. difficile* infection treatment, and number of residents on antibiotics (or other CDI treatment) for *C. difficile* infection.

The following example represents the Monthly Summary Data requirements for a facility with a Monthly Reporting Plan indicating that MRSA LabID and *C. difficile* LabID event surveillance will be the only two NHSN surveillance options completed for the month of August 2023. In this example, the *Report No Events* box is active with two red asterisks for MRSA, but not for *C. difficile*, indicating that no MRSA LabID events were submitted to NHSN during the month of August 2023, but at least one CDI LabID event was submitted. If correct, the facility must put a check mark in the box to confirm that no MRSA isolates were identified during this month. If, after saving the Monthly Summary Data form, a MRSA positive isolate is submitted as a MRSA LabID event, the form will auto-update without additional action from the user.

Facility ID *: Pike Nursing Home ()
Month *: August
Year *: 2023

Denominators for Long Term Care Locations
- No long term care locations selected on monthly reporting plan

MDRO & CDI LabID Event Reporting

Location Code	Resident Admissions: 25 Resident Days: 3300	Specific Organism Type										Custom Fields	
		MRSA	MESA	VRE	CapR- Klebsiella	CRE- E.coli	CRE- Enterobacter	CRE- Klebsiella	C. difficile	MDR- Acinetobacter			
Facility-wide Inpatient (FacWIDEIn)	Number of Admissions on C. diff Treatment: 4 Number of residents started on antibiotic treatment for C.diff: 1	LabID Event (All specimens) Report No Events									25		

Prevention Process Measures
- No long term care locations selected on monthly reporting plan

NHSN provides two form options for collecting monthly summary data for LabID events. One form should be used for the entire calendar month.

3. The *MDRO and CDI LabID Event Reporting Monthly Summary Data for LTCF* form ([CDC. 57.139](#)) may be used to document total required denominator counts for the calendar month, specifically for MDRO and CDI LabID events. Detailed instructions for completing this form are available in the [Table of Instructions for Completion of the MDRO and CDI Monthly Monitoring for Long-term Care Facility](#).
4. A second form option includes the *Denominators for LTCF* form ([CDC 57.142](#)), which may be used to document daily denominator counts, keeping in mind that only the monthly totals are

submitted to NHSN. This optional form provides users with the option to document daily counts for MDRO and/or CDI LabID events, as well as for urinary tract infections (UTI). Detailed form instructions are available in the [Table of Instructions for Completion of the LTCF Component Denominators for LTCF](#) document.

Definitions and Key Points for CDI LabID Event Denominator Data

- *Resident Admissions* refer to total number of residents admitted to the facility including both new and re-admissions (specifically, a resident that was out of the facility for more than two (2) calendar days and then returned). The total number of new and re-admissions is added for the complete calendar month and submitted to NHSN as Resident Admissions.
- *Resident-Days* are calculated using the daily census of residents in the facility each calendar day of the month. The daily total is added at the end of the calendar month and the total number is then submitted to NHSN as Resident Days.
- *Number of Admissions on C. difficile Treatment* is calculated by counting the number of residents who were receiving antibiotic therapy for *C. difficile* infection at the time of admission to your facility during the current calendar month.
- *Number of Residents Started on Antibiotic Treatment for C. difficile* is the total count of new prescriptions for an antibiotic/medication given to residents suspected or diagnosed with having a *C. difficile* infection in the facility for the calendar month and includes treatment with or without a positive laboratory test.

CDI Data Analyses

All event (numerator) and monthly summary (denominator) data submitted to NHSN can be analyzed. Prior to calculating CDI LabID event metrics, NHSN categorizes submitted CDI LabID events. The below sections will first describe how CDI LabID events are categorized, followed by the calculated metrics that are incorporated into the analytics output.

Categorizations of Submitted CDI LabID Events

Based on the surveillance and reporting options selected in the NHSN Monthly Reporting Plan, **ALL C. difficile** positive laboratory assays collected while the resident is under the care of the reporting LTCF must be submitted as a CDI LabID event, including those collected from the resident in an OP setting when the resident returns to the LTCF on the day of the OP visit or the following calendar day. Otherwise, data categorization and analysis will not be accurate. Based on submitted data, NHSN categorizes CDI LabID events to populate different measures. Because of the variability in documenting “time,” calendar days are used to categorize LabID events.

Categorization applied by NHSN to CDI LabID events are defined below:

- CDI LabID events are initially categorized by NHSN as *Duplicate*, *Incident*, or *Recurrent* based on the specimen collection date of the most recent CDI LabID event submitted for an individual resident in the reporting LTCF. **Note:** The date of specimen collection is considered as day 1. The following definitions are applied in the initial categorization of CDI LabID events.

- a. **Duplicate CDI LabID Event:** Any CDI LabID event submitted by the reporting LTCF for the same resident in the facility following a previous CDI LabID Event within the past two weeks (<15 days). Important: Duplicate CDI LabID events will be excluded from rate calculations.
- b. **Incident CDI LabID Event:** Either the first CDI LabID event ever submitted by the reporting LTCF for an individual resident in the facility, or a subsequent CDI LabID event submitted more than 56 days (8 weeks) after the most recent CDI LabID event reported by the LTCF for the individual resident.
- c. **Recurrent CDI LabID Event:** Any CDI LabID event submitted by the reporting LTCF more than 14 days (2 weeks) and less than 57 days (8 weeks) after the most recent CDI LabID event submitted by the reporting LTCF for an individual resident.

Case Scenarios to Demonstrate How NHSN Classifies CDI LabID Events:

Example: NHSN Classification of CDI Lab ID Events as Incident or Recurrent			
Resident ID	Current Admit Date	CDI Event Date (Specimen collection date)	NHSN Categorization
1111	09/01/2023	09/02/2023	Incident
1111	09/01/2023	09/10/2023	Duplicate -no further categorization
1111	09/01/2023	09/25/2023	Recurrent
1111	09/01/2023	11/28/2023	Incident

B. Incident and recurrent CDI LabID events are further categorized by NHSN based on the following: (1) date of *current admission to the facility*; (2) *date specimen was collected (event date)*; and (3) *date of last transfer from an acute care facility directly to the reporting LTCF*. Note: duplicate CDI LabID events are excluded from additional categorization and analyses.

- 1. **Community-onset (CO) LabID Event:** Date specimen collected ≤ 3 calendar days after the date of current admission to the facility (specifically, days 1, 2, or 3 of current admission).
- 2. **Long-term Care Facility-onset (LO) LabID Event:** Date specimen collected > 3 calendar days after current admission date (specifically, on or after day 4).

2a. **Acute Care Transfer-Long-term Care Facility-onset (ACT-LO):** LTCF-onset (LO) LabID event with date specimen collected 4 weeks or less following the date of last transfer from an acute care facility (specifically, a hospital, long-term acute care hospital, or acute inpatient rehabilitation facility) to the LTCF.

Scenarios to Demonstrate How NHSN Classifies CDI LabID Events:

Example: NHSN Classification of Lab ID Events as Community-onset or LTCF-onset				
Admission date June 4 th	June 5 th	June 6 th	June 7 th	June 8 th
day 1	day 2	day 3	day 4	day 5
Community-onset (CO)			Long-term Care Facility-onset (LO)	



For the following case scenarios, the LTCF submitted an NHSN Monthly Reporting Plan indicating that CDI would be included in LabID Event surveillance for the year.

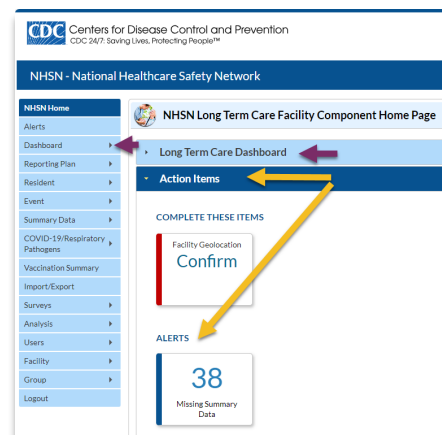
1. Ms. T was first admitted to the LTCF on June 4th. On June 5th she developed diarrhea, and on June 6th a loose stool specimen was collected and tested positive for *C. difficile* toxin. A CDI LabID event was entered for June 6th (date of specimen collection). This event was considered a non-duplicate event and categorized as **Community-onset (CO)** since the specimen was collected within the first 3 days of her current admission into the facility. If the specimen had been initially collected four or more days (June 7th or later) after her current admission date, the NHSN application would have categorized the LabID event as **Long-term Care Facility-onset (LO)**.
2. Ms. Smith was transferred to your facility from an acute care facility on July 1st and had a loose stool collected on July 10th that tested positive for *C. difficile* toxin. A CDI LabID event was submitted to NHSN and subsequently categorized as incident, **Acute Care Transfer-Long-term Care Facility-onset (ACT-LO)** since the specimen was collected more than 3 days after her current admission and she was transferred to your facility from an acute care facility in the previous 4 weeks.
3. Mr. T was transferred to your facility from home on August 5th. He was on treatment for a *C. difficile* infection at the time of admission but seemed to be doing well. On August 10th, the on-call doctor ordered a *C. diff* stool test that subsequently returned positive for *C. difficile* toxin. You submit a CDI LabID event for Mr. T and NHSN categorized the event as **Incident, Long-term Care Facility Onset CDI LabID** event. This scenario represents a trade-off between reduced surveillance burden associated with LabID Event reporting and decreased specificity.

Calculated CDI LabID Event Metrics

After a user generates analysis datasets in the application, all data entered for the facility up until that time are immediately available for users to visualize and analyze. For example, line listing reports provide detailed line by line listing of events reported and rate table reports provide summarized monthly data with calculated rates and denominator data. Users can also generate frequency tables, bar charts, and pie charts.

Additionally, the LTCF Dashboard, located on the NHSN Home Page, allows users to quickly visualize data found in the rate tables and line listings in the form of interactive bar charts and line graphs. For additional information about the LTCF Dashboard, please review the [CDC Guidance Document – Dashboard](#). As a reminder, only NHSN identified non-duplicate LabID events are included in calculated metrics.

Important: Incomplete events and/or summary data will trigger an “Alert” on the facility’s NHSN homepage. All records identified by an “Alert” will be excluded from the rate tables and the LTCF Dashboard until the Alert is resolved by a facility user.



The following table describes the various NHSN calculated metrics for CDI LabID event surveillance.

Calculated Metrics	Calculations	Comments
Total CDI Rate per 1,000 resident days	$\frac{\text{Number of CDI LabID Events}}{\text{Total resident – days}} \times 1,000$	Includes CO and LO LabID events
<ul style="list-style-type: none"> • <i>Percent of CO CDI LabID Events</i> 	$\frac{\text{Number of CO CDI LabID Events}}{\text{Total number of CDI LabID Events}} \times 100$	
<ul style="list-style-type: none"> • <i>Percent of LO CDI LabID Events</i> 	$\frac{\text{Number of LO CDI LabID Events}}{\text{Total number of CDI LabID Events}} \times 100$	Includes incident and recurrent CDI LabID events
<ul style="list-style-type: none"> ○ <i>Percent of ACT-LO CDI LabID Events</i> 	$\frac{\text{Number of ACT – LO CDI LabID Events}}{\text{Total number of LO CDI LabID Events}} \times 100$	
CDI LO Incidence Rate per 1,000 resident-days	$\frac{\text{Number Incident LO CDI LabID Events}}{\text{Total resident – days}} \times 1,000$	Excludes recurrent CDI LabID events
CDI Treatment Prevalence on Admission	$\frac{\text{Number of residents on CDI treatment on admission to facility}}{\text{Total number of admissions}}$	
CDI Treatment Ratio	$\frac{\text{Number of CDI medication treatment starts for CDI}}{\text{Total number of CDI LabID Events}}$	<p>When the CDI treatment ratio is less than 1, there are fewer reported medication starts for CDI than CDI events submitted to NHSN;</p> <p>When the CDI treatment ratio equals 1, there are the same number of new medication starts for CDI events submitted.</p> <p>When the CDI treatment ratio is greater than 1, there are more reported medication starts for CDI than CDI events submitted to NHSN.</p>