Summer 2022 NHSN CDA Vendor Meeting

June 29, 2022
Agenda

- Future Initiatives
- General NHSN Release Updates
- COVID-19 Module Updates
- Patient Safety Component (PSC) – Release 10.1.3
- Long Term Care Facility (LTCF) Component – Release 10.1.5
- PSC – Release 11.1
- Vendor IDM Updates
- CDA HAI Vocabulary
- Gender Variable Update
- AUR Module Updates
- Late Onset Sepsis & Meningitis Module (LOS/MEN)
- NHSN Pre-Production Test Site (NPPT)
- Miscellaneous
- Q&A
Future Initiatives

Andrea Benin
Future Initiatives

- Medication Safety Component – Glycemic Control Hypoglycemia
  - Medication Safety Component – Glycemic Control Hyperglycemia
- Revised *C. difficile*
- Hospital Onset Bacteremia
- Respiratory Pathogens Surveillance
- Venous Thromboembolism (VTE1 and VTE2)
  - Venous Thromboembolism (Expanded VTE Portfolio)
- Sepsis
- Non-Ventilator Associated Pneumonia
General NHSN Release Updates

Joseph Esquibel
NHSN Release Schedule Overview

- Continuing one major release a year
  - Changes included:
    - Protocol changes
    - Transition to new CDA versions due to protocol changes
    - Effective January 1st of each year

- Non-major releases
  - Occurring on a six-week basis as needed
  - May include:
    - New Component
    - Minor change requests
    - Defect resolutions
    - Infrastructure maintenance and support
  - Users notified via message alert when logging into NHSN
Upcoming NHSN Releases

- **Release 10.1.4**
  - Scheduled for July 30, 2022
  - Defect fixes will be effective post deployment
  - Change Requests (CRs) will be effective July 31, 2022

- **Release 10.1.5**
  - Scheduled for September 8, 2022
  - Defect fixes will be effective post deployment
  - CRs will be effective September 9, 2022
Upcoming NHSN Releases (continued)

▪ Release 11.0
  – Scheduled for October 20, 2022
  – Defect fixes will be effective post deployment
  – CRs will be effective October 21, 2022

▪ Release 11.1
  – Scheduled for December 10, 2022
  – Defect fixes will be effective post deployment
  – CRs will be effective January 1, 2023
COVID-19 Module Updates

Sylvia Shuler
COVID-19 Module Updates – LTC, HPS & Dialysis

- Long-Term Care & Dialysis facilities are using NHSN to report COVID-19 data
- COVID-19 Vaccination data is being reported in the Long-Term Care Component, Healthcare Personnel Safety Component and Dialysis Component
COVID-19 Module: Long Term Care Facilities

- The following pathways are being reported into NHSN for LTCF:
  - Resident Impact and Facility Capacity
  - Staff and Personnel Impact
  - Therapeutics
  - Vaccinations
  - Point of Care (POC) Testing
COVID-19 Module: Dialysis

- Single data entry page with four sections:
  - Patient Impact
  - Staff and Personnel Impact
  - Supply and Personal Protective Equipment
  - Lab Testing

- COVID-19 Vaccination status for patients and staff
COVID-19 Module Data Submission

- Direct CSV Submission is now available for Long Term Care and Dialysis Pathways, POC Testing, and Vaccination uploads - for LTC, Dial, HPS Components

- The following are acceptable file formats:
  - CSV
  - HL7 2.5.1

- Instructions on how to sign up and use this method is available on the NHSN website: [https://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol](https://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol)

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Technical Guides

- [Technical User Guide for DIRECT CDA Automation](https://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol) [PDF - 300 KB]
  This is a quick reference guide for CDA vendors or facility’s IT technical staff.

- [Admin User Guide for DIRECT CDA Automation](https://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol) [PDF - 150 KB]
  This is a quick reference guide for NHSN Admins who want to sign-up a facility to have the capability to send data to NHSN without logging into the NHSN application.

- [COVID-19 CSV Guide for Long-term Care & Dialysis Facilities](https://www.cdc.gov/nhsn/cdaportal/importingdata.html#DIRECTProtocol) [PDF - 200 KB]
  This is a quick reference guide for LTC & Dialysis Facilities who want to submit their COVID-19 CSV File.
COVID-19 Module Training

- For both modules, training videos are available for each component.
- Please visit the NHSN website to find current CSV templates and other information for both LTCF and Dialysis components.
  - [https://www.cdc.gov/nhsn/covid19/index.html](https://www.cdc.gov/nhsn/covid19/index.html)
- Questions can be sent to: NHSN@CDC.GOV
Patient Safety – Release 10.1.3 Updates

- Defect 10205 – Correct the antibiogram for AntiB2B_PS/CEFEP; manual CDA & Direct impact – Resolved
  - The susceptibilities for AntiB2B_PS/CEFEP for Events in 2022 now show as S I/S-DD R N
Long Term Care Facility Component – Release 10.1.5

Sylvia Shuler
LTCF Change Request Planned for Release 10.1.5

- **Release 10.1.5 (September 2022)**
  - We will begin to build the ability to accept CDAs for LabID Events (CDI and MDROs) over the next several months
  - More details to come once this initiative gets underway
Patient Safety Component – Release 11.1

Hamna Baig
PS Change Requests Planned for Release 11.1

- **Release 11.1 (December 2022)**
  - **CR 3680** - PedVAE - updates to antimicrobial list within NHSN application
  - **CR 3700** - Update to antimicrobial list within the VAE calculator
  - **CR 3702** - Specific Event-Criteria BRST '3' removed as a selection for SSI-BRST entry
  - **CR 3713** - 2023 Pathogen Codes Update (All Components)
  - **CR 3712** - Remove CLIP from Patient Safety Component Monthly Reporting Plan
  - **CR 2725** - Gender Identity and Sex at Birth (All Components)
Vendor IDM Updates

Joseph Esquibel
Vendor IDM

- The vendor IDM for Release 10.1 has been posted to the Toolkits Webpage as a version 1
- Remove “other signs and symptoms” as an option for Conjunctivitis (CONJ) Specific Criteria – update to the vendor IDM is forthcoming
- Remove Specific Event-Criteria BRST '3'(CR3702) for SSI-BRST- Release 11.x
- We will notify vendors when the final version has been posted
CDA HAI Vocabulary

- There will be Pathogen Code updates for the January 2023 11.1 release
- Reminder: Value sets specified in CDA Implementation Guides that have been distributed in the spreadsheet hai_voc.xlsx are now available in VSAC (Value Set Authority Center) [https://vsac.nlm.nih.gov/](https://vsac.nlm.nih.gov/)
Gender Variable Update

Henrietta Smith & Joseph Esquibel
New variable fields added

- Birth Sex
- Gender Identity

Value sets in use in the CDA IG (the templates used are C-CDA templates).
# IG Timeline

<table>
<thead>
<tr>
<th>Month/Period</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>Balloting complete, and updates made to the IG</td>
</tr>
<tr>
<td>June 20 – 24</td>
<td>Anticipate HL7 Structured Documents Work Group approval for publication</td>
</tr>
<tr>
<td>June 27 – July 1</td>
<td>Anticipate CDA Management Group approval</td>
</tr>
<tr>
<td>July 2 – 15</td>
<td>Anticipate HL7 Technical Steering Committee approval</td>
</tr>
<tr>
<td>Mid to end July</td>
<td>IG fully published</td>
</tr>
</tbody>
</table>

Provided courtesy of Sarah Gaunt, Lantana Consulting Group
Birth Sex — Captures sex assigned at birth

- Must select from:
  - Male
  - Female
  - Unknown
Birth Sex

- VSAC link to value set: https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1/expansion
  - Note that UNK is also allowed but not included in that value set as it’s just the one nullFlavor value):

```plaintext
6. SHALL contain exactly one [1..1] value with @xsi:type="CD", where the code SHALL be selected from ValueSet ONC Administrative Sex urn:oid:2.16.840.1.113762.1.4.1 STATIC 2016-06-01 (CONF:3250-32947).
   a. If value/@code not from value set ONC Administrative Sex urn:oid:2.16.840.1.113762.1.4.1 STATIC 2016-06-01, then value/@nullFlavor SHALL be “UNK” (CONF:3250-32948).
```

**Table 173: ONC Administrative Sex**

<table>
<thead>
<tr>
<th>Code</th>
<th>Code System</th>
<th>Code System OID</th>
<th>Print Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Administrative Gender</td>
<td>urn:oid:2.16.840.1.113883.5.1</td>
<td>Female</td>
</tr>
<tr>
<td>M</td>
<td>Administrative Gender</td>
<td>urn:oid:2.16.840.1.113883.5.1</td>
<td>Male</td>
</tr>
</tbody>
</table>

Provided courtesy of Sarah Gaunt, Lantana Consulting Group
Gender Identity – Captures patient reported gender

- Select:
  - Male
  - Female
  - Female-to-male transgender
  - Male-to-female transgender
  - Identifies as non-conforming
  - Other
  - Asked but unknown
Gender Identity

- VSAC link to value sets:
  (in this case they have created a separate value set for the two allowed nullFlavor codes)

8. **SHALL** contain exactly one [1..1] value with @xsi:type="CD", where the code **SHALL** be selected from ValueSet **Gender Identity USCDI core**

To represent additional Gender Identities, set nullFlavor="OTH". To represent "choose not to disclose", set nullFlavor="ASKU".

a. This value **MAY** contain zero or one [0..1] @nullFlavor, which **SHOULD** be selected from ValueSet **Asked but Unknown and Other**

Provided courtesy of Sarah Gaunt, Lantana Consulting Group
# Gender Identity – Value set

<table>
<thead>
<tr>
<th>Code</th>
<th>Code System</th>
<th>Code System OID</th>
<th>Print Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>407376001</td>
<td>SNOMED CT</td>
<td>urn:oid:2.16.840.1.113762.1.4.1021.101</td>
<td>Male-to-female transsexual (finding)</td>
</tr>
<tr>
<td>407377005</td>
<td>SNOMED CT</td>
<td>urn:oid:2.16.840.1.113762.1.4.1021.101</td>
<td>Female-to-male transsexual (finding)</td>
</tr>
<tr>
<td>44613100012</td>
<td>SNOMED CT</td>
<td>urn:oid:2.16.840.1.113762.1.4.1021.101</td>
<td>Identifies as non-conforming gender (finding)</td>
</tr>
<tr>
<td>4102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44614100012</td>
<td>SNOMED CT</td>
<td>urn:oid:2.16.840.1.113762.1.4.1021.101</td>
<td>Identifies as female gender (finding)</td>
</tr>
<tr>
<td>4107</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44615100012</td>
<td>SNOMED CT</td>
<td>urn:oid:2.16.840.1.113762.1.4.1021.101</td>
<td>Identifies as male gender (finding)</td>
</tr>
<tr>
<td>4109</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Gender Identity – Value set (continued)

Table 243: Asked but Unknown and Other

<table>
<thead>
<tr>
<th>Code</th>
<th>Code System</th>
<th>Code System OID</th>
<th>Print Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASKU</td>
<td>HL7NullFlavor</td>
<td>urn:oid:2.16.840.1.113762.1.4.1114.17</td>
<td>asked but unknown</td>
</tr>
<tr>
<td>OTH</td>
<td>HL7NullFlavor</td>
<td>urn:oid:2.16.840.1.113762.1.4.1114.17</td>
<td>other</td>
</tr>
</tbody>
</table>

This value set was imported on 3/16/2022 with a version of Latest.
Value Set Source: https://vsac.nlm.nih.gov/valueset/2.16.840.1.113762.1.4.1114.17/expansion

Provided courtesy of Sarah Gaunt, Lantana Consulting Group
Timeline for implementation within the application

**Jan 1, 2023**
- Optional reporting
- Reporting only via manual entry and .csv import

**Jan 1, 2024**
- Required reporting
- CDA upload available for reporting
Questions?

Please send questions and feedback to us: nhsn@cdc.gov.
AUR Module Updates:
Previous Application Updates

Malissa Mojica
AUR Updates already in NHSN

- AR Summary files are required for Outpatient Locations (ED, pedED, 24hr obs)
- 2022 AU data requires use of RxNorm codes only
- Two new COVID drugs are required for AU Reporting beginning in March 2022
- AUR data can be reported from Overflow location types
AR Summary Files for Outpatient Locations

- Beginning with January 2021, facilities should report **AR Option summary records** for their outpatient locations (ED, pediatric ED, and 24-hour observation area) as applicable.
  - Total number of patient encounters for each location/month
  - Initially released summer of 2021 and backdated to apply for January 2021 forward
- Lots of facility confusion over where to find these files within their vendor system
AR Summary Files for Outpatient Locations (cont.)

- We would greatly appreciate you sharing the following information with your client facilities:
  1. Does your software currently generate 2022 AR Option Summary files for ED, pediatric ED, and 24-hour observation locations? If yes, where are they located?
  2. Is your software able to retrospectively generate 2021 AR Option Summary files for ED, pediatric ED, and 24-hour observation locations? If yes, where are they located?
  3. If your software is not currently able to generate AR Option Summary files, is this planned for a future update of your software? If so, when can your client facilities expect to see these new files?

- If these files are not available within your vendor system, please instruct your client facilities to edit their Monthly Reporting Plans to remove the check box in the AR Option column on the rows for the outpatient locations.
Beginning with January 2022 AU data, all drugs must be reported using RxNorm codes.

Eight drugs previously used NHSN local codes and were updated to use RxNorm codes.

As a reminder!
- NHSN uses the ingredient (IN) level RxNorm codes for AU Option submission.
- Please review your facilities’ data feeds to ensure use reported with a more granular RxNorm code term type (e.g., SCDC, SCD/GPCK, etc.) is rolled up and reported to NHSN using the ingredient level code.
2022 AU Data Requires Use of RxNorm Codes Only (cont.)

- The List of Antimicrobial Agents Eligible for AUR Module – April 2022 displays the RxNorm codes in column B of the spreadsheet:

![Antimicrobial Agents Table](https://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx)

- [Link to the spreadsheet](https://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx)
AU COVID Drugs

- Two COVID antiviral agents, *molnupiravir* and *nirmatrelvir*, added to the AU Option in March 2022.
  - Required in the AU Option files beginning in March 2022; files will fail to upload into NHSN if they do not include these two drugs.
  - Facilities can optionally include the two drugs in AU files for January and February 2022
  - Drug variables included in the Eligible Agents spreadsheet and/or IDM
# Overflow Location Types

- Facilities can now report data for Overflow Location types (including AUR)
  - Reminder: facilities reporting data from these locations should also include them in the FacWideIN counts

<table>
<thead>
<tr>
<th>CDC Location Label</th>
<th>NHSN Healthcare Service Location code</th>
<th>CDC Location Code</th>
<th>Location Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onsite Overflow Ward</td>
<td>1271-6</td>
<td>IN:ACUTE:WARD:OF_ONSITE</td>
<td>Area previously used for non-patient care which has been repurposed to care for non-critically ill or injured patients</td>
</tr>
<tr>
<td>Onsite Overflow Critical Care</td>
<td>1272-4</td>
<td>IN:ACUTE:CC:OF_ONSITE</td>
<td>Area previously used for non-patient care which has been repurposed to care for critically ill or injured patients</td>
</tr>
</tbody>
</table>

[https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf](https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf)
AUR Module Updates:
Fall Releases

Amy Webb
CR 3604 – Update message displayed after manual CDA upload

- After manually uploading CDA files, NHSN generates a message.
- Message is the same regardless of how many files were successfully uploaded:

![Results](image)

- Plan to update the message to make it clearer when not all files passed.
AR Option Benchmark Metrics

- Will use 2019 as the baseline year

- Standardized Resistant Infection Ratio (SRIR) for prioritized resistant phenotypes:
  
  \[
  \frac{\text{# Observed Resistant isolates}}{\text{# Predicted Resistant isolates}}
  \]

- Pathogen-specific Standardized Infection Ratio (pSIR) for culture-positive infections:
  
  \[
  \frac{\text{# Observed isolates of specific pathogen}}{\text{# Predicted isolates of specific pathogen}}
  \]
Target drug-resistant phenotypes to generate SRIR

- Methicillin-resistant *S. aureus* (MRSA)*
- Multidrug resistant (MDR) *Pseudomonas aeruginosa**
- Vancomycin-resistant Enterococci (VRE)**
- Carbapenem-resistant *E. coli, Klebsiella, and Enterobacter* (CRE)*
- Fluoroquinolone-resistant *Pseudomonas aeruginosa***
- Fluoroquinolone-resistant *E. coli, Klebsiella, and Enterobacter*
- Extended-spectrum cephalosporin-resistant *E. coli, Klebsiella, and Enterobacter*

*Definitions are here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf
**Any Enterococci that has tested Resistant (R) to vancomycin
****Pseudomonas aeruginosa* that has tested Resistant (R) to ciprofloxacin or levofloxacin
Pathogens to generate pathogen specific-SIR

- *S. aureus*
- *Pseudomonas aeruginosa*
- *Enterococcus*
- Enterobacterales (*E. coli, Klebsiella, and Enterobacter*)
AUR Module Updates: December Release – 11.1

Laura Blum & Amy Webb
CR 3219 – Update AR Option specimen codes

- Revise list of accepted AR Option specimen source codes to bring them up to date with current standards (Specimen Source tab in IDM)
  - 60+ additions, mostly to LRT
  - 20 removals, mostly from urine and blood
  - <5 display name discrepancies between IDM and Value Set Authority Center (VSAC)
    - Human-readable changes only – will not affect what’s accepted by NHSN
CR 3519 – 2023 AR Option pathogen updates

- Updates to AR Option Pathogen Roll-up workbook in AR CDA Toolkit
  - Additions for new, more specific codes
  - Removal of inactive/irrelevant codes
  - Revise descriptors to align with SNOMED description
- No changes to what's accepted by NHSN
CR 3714 – Update the AR Drug Susceptibility Test value set display name for imipenem

- Update display name for code IMIPWC (LOINC code: 18932-4) from “Imipenem with Cilastatin” to “Imipenem”
  - Human-readable change only – will not affect what’s accepted by NHSN
- Change reflects true susceptibility test completed by labs and aligns with LOINC description
  - Cilastatin is not an antimicrobial; it enhances the effects of imipenem when administered together in certain situations
  - Cilastatin is not included in susceptibility tests for imipenem
CR 3626 – AU Option Drug Validation Updates

- As of 6/29 – no drug additions or removals
- Plan to update NHSN’s validation of drugs included in the file
  - No longer accept a range of drugs
  - All drugs in the IDM (Antimicrobial Ingredients tab) will be required to be included for calendar year 2023 and forward
CR 2725 – Gender Identity & Sex at Birth

- See Henrietta’s slides for additional details
- Will be added to AR Events in January 2024
  - No way to optionally report these fields on AR Events in CY 2023
  - Must wait until IG has been updated
CR 3550 – Update language to PI Program

- Meaningful Use >> Promoting Interoperability
- Will be updating language throughout the app

https://www.cdc.gov/nhsn/cdaportal/datainteroperability.html
CR 3163 – Verify Vendor has Passed AR SDS

- Like AU, NHSN will require vendors validate the software used for submitting AR Option data
- Beginning with January 2023, files will fail if they don’t include the vendor OID and SDS Validation ID
AUR Module Updates: AR Synthetic Data Set

Amy Webb
AR Synthetic Data Set

- R1 now available: [https://www.cdc.gov/nhsn/cdaportal/sds/index.html](https://www.cdc.gov/nhsn/cdaportal/sds/index.html)
  - Zip file
  - FAQs
  - Passing vendor list
AR Synthetic Data Set (2)

- R1 now available: https://www.cdc.gov/nhsn/cdaportal/sds/index.html
  - Zip file
  - FAQs
  - Passing vendor list

Late breaking update!
We’ll be updating the numerator and denominator answer keys to include three new 2022-specific variables:
Encounters, Admission Date, and Admission Status
AR Synthetic Data Set continued

- Zip file contents:
  - Instructions & Quick Reference Card
  - Data model diagram
  - Data files in csv and mysql formats
  - Answer key templates
AR SDS Validation Process

- Download the AR SDS and Instructions: [https://www.cdc.gov/nhsn/cdaportal/sds/index.html](https://www.cdc.gov/nhsn/cdaportal/sds/index.html)
  - Review AR SDS FAQs: [https://www.cdc.gov/nhsn/cdaportal/sds/ar-sds-faq.html](https://www.cdc.gov/nhsn/cdaportal/sds/ar-sds-faq.html)
- Process AR SDS through vendor software system
- Compile & aggregate the data following the AR Option Protocol
- Output the data to AR Numerator and AR Denominator Excel files
- Upload AR Excel files to the NHSN SDS Validation Web Service:
  - [https://nhsnpilot.ng.philab.cdc.gov/ARValidation-Denominator/home.html](https://nhsnpilot.ng.philab.cdc.gov/ARValidation-Denominator/home.html)
  - [https://nhsnpilot.ng.philab.cdc.gov/ARValidation-Numerator/home.html](https://nhsnpilot.ng.philab.cdc.gov/ARValidation-Numerator/home.html)
Once files pass webservice validation with no errors, email NHSNCDA@cdc.gov the AR Numerator & Denominator Excel files containing the AR data and include the below required vendor info:

- Vendor (Application) OID
- Vendor Name
- Vendor Software Name
- Vendor Software Version/Release
- Technical Point of Contact (one primary person but you may cc others on file submission emails)
- Vendor Website (optional)
NHSN Testing of AR Numerator & Denominator Excel Files

- Files Pass
  - NHSN Team emails vendor SDS Validation ID
  - Vendor includes SDS Validation ID on production AR CDAs
  - Vendor information published on NHSN website

- Files Fail
  - NHSN Team emails vendor that file(s) failed and list of errors
  - Vendor to resume internal testing
  - Resubmit file once ready
AR SDS Validation Frequency

- Completed once per vendor per software version

- Initial Validation – Starting in 2023 for all AR CDA Vendors (no “grandfathering”)

- Thereafter:
  - Major AR Option Protocol changes
  - Major Vendor Software changes affecting AR data compilation & aggregation
AUR Module Updates: Miscellaneous Updates

Amy Webb, Virgie Fields, & Malissa Mojica
NHSN Report Available for ONC Real World Testing

- New report available for vendors detailing the number of successful & failed AU submissions by month
  - Uses required vendor information in AU files
- Includes AU submissions from March 2022 forward
- Generated for vendors upon request (NHSNCDA@cdc.gov)
  - Available formats: .csv, .xlsx, .pdf

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>OrgID</th>
<th>Record Type</th>
<th>Year</th>
<th>Total # of records successfully imported</th>
<th>Total # of records failed to import</th>
<th>Total # successful and failed records</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHQP MEMORIAL HOSPITAL</td>
<td>10000</td>
<td>PSSummaryAU</td>
<td>2022</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
</tbody>
</table>
Plans for Reviewing 2021 AU Data

- The NHSN AUR Team is in the process of reviewing 2021 AU data
  - Determine discrepancies in submitted AU data
    - Repeating counts for multiple drugs
    - Incompatible drug with route (e.g., reporting a drug that can only be administered via an IV as being administered via another route)
    - Reporting of drugs that have been removed from NHSN
  - Plan to perform outreach to specific facilities and vendors
CMS Proposed Rule Requiring Reporting of AUR Data

- CMS proposed the following change to the Medicare Promoting Interoperability Program for eligible hospitals:
  - Add a new AUR Surveillance measure and require its reporting through NHSN under the Public Health and Clinical Data Exchange Objective, beginning with the CY 2023 EHR reporting period
  - Eligible hospitals must use certified technology
- Comment Period ended on June 17, 2022

AUR Module Updates:
Updated AUR Documents

Malissa Mojica
List of Antimicrobial Agents Eligible for AUR Module

- The List of Antimicrobial Agents Eligible for AUR Module has been updated and posted in the NHSN AUR page, in the Supporting Materials section

Eligible Agents for AUR Module: AU Option

- Includes all drugs ever reported to AU
  - Dates First reported & Last reported (if applicable)
  - Color coded
- RxNorm codes
- New COVID antivirals

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimicrobial Agent</td>
<td>Value</td>
<td>NHSN Drug Code</td>
<td>Antimicrobial Category</td>
<td>Antimicrobial Class b</td>
<td>Antimicrobial Subclass b</td>
<td>First Reported</td>
<td>Last Reported</td>
<td>Notes</td>
<td>Color Key</td>
<td></td>
</tr>
<tr>
<td>AMANTADINE</td>
<td>620</td>
<td>AMAN</td>
<td>Anti-influenza</td>
<td>M2 ion channel inhibitors</td>
<td></td>
<td>Jan-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMIKACIN</td>
<td>641</td>
<td>AMK</td>
<td>Antibacterial</td>
<td>Aminoglycosides</td>
<td></td>
<td>Jan-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMIKACIN LIPOSOMAL</td>
<td>2059180</td>
<td>AMIKLIP</td>
<td>Antibacterial</td>
<td>Aminoglycosides</td>
<td></td>
<td>Oct-18</td>
<td></td>
<td>First reported date is the date of FDA Approval</td>
<td></td>
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<tr>
<td>AMOXICILLIN</td>
<td>723</td>
<td>AMOX</td>
<td>Antibacterial</td>
<td>Penicillins</td>
<td>Aminopenicilllin</td>
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<td></td>
</tr>
<tr>
<td>AMOXICILLIN/CLAUVANATE</td>
<td>19711</td>
<td>AMOXWC</td>
<td>Antibacterial</td>
<td>B-lactam/ B-lactamase inhibitor combination</td>
<td>Jan-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMPHOTERICIN B</td>
<td>732</td>
<td>AMPH</td>
<td>Antifungal</td>
<td>Polynenes</td>
<td></td>
<td>Jan-10</td>
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<td>AMPHOTERICIN B LIPID COMPLEX</td>
<td>2001759</td>
<td>AMPLUC</td>
<td>Antifungal</td>
<td>Polynenes</td>
<td></td>
<td>Jan-20</td>
<td></td>
<td>Not a new drug but added due to change in RxNorm coding</td>
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<tr>
<td>AMPHOTERICIN B LIPOSOMAL</td>
<td>236594</td>
<td>AMPHOT</td>
<td>Antifungal</td>
<td>Polynenes</td>
<td></td>
<td>Jan-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Eligible Agents for AUR Module: AR Option

- Includes all panels from the beginning of AR Option reporting
  - Includes effective and removed as of dates
  - Color coded
- Lists LOINC codes

<table>
<thead>
<tr>
<th>Organism</th>
<th>Antimicrobial Agents</th>
<th>Value (LOINC Code)</th>
<th>NIBSN Drug Code</th>
<th>Effective Beginning</th>
<th>Removed as of</th>
<th>Returned to reporting</th>
<th>Notes</th>
<th>Color Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacterzw</td>
<td>Amikacin</td>
<td>18880-7</td>
<td>AMK</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td>Removed</td>
<td>Added as of 1/1/2019</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin-sulbactam</td>
<td>18885-6</td>
<td>AMPBS</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td>Added as of 1/1/2022</td>
</tr>
<tr>
<td></td>
<td>Cefepime</td>
<td>18879-7</td>
<td>CEFEP</td>
<td>1/1/2014</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Cefotaxime</td>
<td>18886-2</td>
<td>CEFOT</td>
<td>1/1/2014</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ceftazidime</td>
<td>18893-8</td>
<td>CEFTAZ</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>Ceftiraxone</td>
<td>18895-3</td>
<td>CEFTRX</td>
<td>1/1/2014</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Ciprofloxacin</td>
<td>18906-8</td>
<td>CIPRO</td>
<td>1/1/2014</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Ciprofloxacin</td>
<td>18912-6</td>
<td>COL</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Doripenem</td>
<td>60353-2</td>
<td>DIORI</td>
<td>1/1/2014</td>
<td></td>
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<tr>
<td></td>
<td>Doxycycline</td>
<td>18917-5</td>
<td>DOXY</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gentamicin</td>
<td>18928-2</td>
<td>BENTA</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Imipenem with Cilastatin</td>
<td>18923-4</td>
<td>MIPCW</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levofoxacin</td>
<td>20632-2</td>
<td>LEVO</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meropenem</td>
<td>18943-1</td>
<td>MERO</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Minocycline</td>
<td>18946-0</td>
<td>MINO</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Piperacillin</td>
<td>41529</td>
<td>PIPER</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td>12/28/2018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Piperacillin-tazobactam</td>
<td>15570-4</td>
<td>PIPERAT</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polymyxin B</td>
<td>18972-0</td>
<td>PBS</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ticarcillin-sulbactam</td>
<td>113931</td>
<td>TICARBS</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td>12/31/2018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tobramycin</td>
<td>18956-9</td>
<td>TOBRA</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trimethoprim-sulfamethoxazole</td>
<td>18955-5</td>
<td>SULFAST</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acinetobacterzw</td>
<td>Tetracycline</td>
<td>18991-6</td>
<td>TETRA</td>
<td>1/1/2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Additional Agents for Urine*

- Tetracycline was reported for all specimen sources from January 2014 - December 2018. Beginning January 2019, Tetracycline is reported only for urine specimens.
CDA Toolkits

- The team updated the AU and AR Sample Files:
  - AU includes the new AU COVID drugs and RxNorm Codes
  - AR Option Events for specimens collected January 1, 2022, and forward must use the R3 (aka R3-N1) IG.
    - The old R1 IG will continue to be accepted for specimens collected December 31, 2021.
- CDA Toolkit page: https://www.cdc.gov/nhsn/cdaportal/toolkits.html
The team has updated the AU and AR FAQ pages to include more items based on questions received in the iSupport AUR inbox

- AU FAQ page: https://www.cdc.gov/nhsn/faqs/faq-au.html
Late Onset Sepsis & Meningitis Module (LOS/MEN)

LaTasha Boswell & Shuai Zheng
About the LOS/MEN Module

- Target Population: 401 – 1500 grams; Day of Life 4 – 120
- Eligible Locations: Level II/III, III, and IV nurseries
- Created in partnership with the Vermont Oxford Network (VON) and other stakeholders
- Events and denominator eligible infants determined by the LOS/MEN calculator created by Dr. Shuai Zheng
- All events and denominator data uploaded via CDA. No manual entry of data.
Late Onset Sepsis Events

- Neonatal laboratory confirmed bloodstream infection (NLCBI) Event: In an eligible infant, a recognized pathogen or common commensal is identified from one or more blood specimens by a culture or nonculture-based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment. Under this major type of infection, there are two specific types of infection (see below).
  - **NLCBI 1**: One or more positive blood specimens with a recognized pathogen (specifically a bacterial or fungal organism which is NOT on the NHSN Common Commensal list).
  - **NLCBI 2**: One or more positive blood specimens with a common commensal (specifically, a bacterial organism which is on the NHSN Common Commensal list). In addition, a new intravenous antimicrobial agent from Table 6 must be initiated during the LOS/MEN window period on or after DOL 4 AND continued for at least 5 calendar days.
Meningitis Events

- Neonatal laboratory-confirmed meningitis (NLCM) Event: In an eligible infant, a recognized pathogen or common commensal identified from a CSF specimen by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment. Under this major type of infection, there are two specific types of infection.
  - **NLCM 1**: A positive CSF specimen with a recognized pathogen (specifically, a bacterial or fungal organism which is not on the NHSN Common Commensal list).
  - **NLCM 2**: A positive CSF specimen with a common commensal (specifically, a bacterial organism which is on the NHSN Common Commensal list). In addition, a new intravenous antimicrobial agent from Table 6 must be initiated during the LOS/MEN window period on or after DOL 4 AND continued for at least 5 calendar days.
Overview of the Electronic Data Flow

Facility’s Electronic Medical Record (EMR) → Data extracted electronically → Vendor’s OR Facility’s reporting system → Data sent to LOS/MEN Calculator to determine the event → Calculator labels denominator eligible infants and numerator events NLCBI 1, NLCBI 2, NLCM 1, NCM 2 → CDA upload to NHSN
Event Calculator – Java Library (1)

Data Aggregation (from EHR) → Event Determination → Event Reporting (CDA)

Denominator Determination

Numerator Determination

XML/Java Object Input

<table>
<thead>
<tr>
<th>ID</th>
<th>Denominator Days</th>
<th>NLCB1</th>
<th>NLCM1</th>
<th>NLCB2</th>
<th>NLCM2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[4, 40]</td>
<td>TRUE</td>
<td>FALSE</td>
<td>FALSE</td>
<td>FALSE</td>
</tr>
<tr>
<td>2</td>
<td>[21, 50]</td>
<td>FALSE</td>
<td>FALSE</td>
<td>TRUE</td>
<td>FALSE</td>
</tr>
<tr>
<td>3</td>
<td>[17, 59]</td>
<td>FALSE</td>
<td>FALSE</td>
<td>FALSE</td>
<td>FALSE</td>
</tr>
</tbody>
</table>
Event Calculator – Java Library (2)
Validation and Synthetic Dataset (1)

- Surveillance Protocol (Algorithmic Procedures)
- IT Implementation (Programming Implementation)

Implementation Validation

- Synthetic Dataset/Test Plan
- Message Validation/Testing Server
Validation and Synthetic Dataset (2)

Data Collection, Aggregation & Calculation → CDA Generation → CDA Submission → NHSN

Lantana’s CDA Validation Website → Testing Server

Import Synthetic Dataset → EHR → Generate Output → Compare with Answer Key

Validation (Offline)
Validation and Synthetic Dataset (3)

Synthetic Dataset

Test Cases & Answer Key

Contact Us: LaTasha R. Boswell (nw17@cdc.gov), Shuai Zheng (lgu3@cdc.gov)
NHSN Pre-Production Test Site

- Copy of the NHSN development environment
- Includes Analysis and Reporting (A&R) functionality
- Does not include DIRECT CDA Automation or Groups
- No SAMS credentials required
- To enroll – complete form found at https://www.cdc.gov/nhsn/cdaportal/datavalidation/toolsandtestsites.html
- Send completed form to the nhsncda@cdc.gov mailbox
NHSN Pre-Production Test Site (NPPT) cont.

- v10.1.3.3 is current environment
  - Reminder: Read “Important Message” at login
- Blast email will be sent out when NPPT is upgraded to new version
- Report any issues you find to the nhsncda@cdc.gov mailbox
Miscellaneous

Sylvia Shuler
CDA Import Data Comparison:

Percentage of data per specific event or summary that is imported via CDA and CSV for the following date ranges:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Stream Infection</td>
<td>44%</td>
<td>47%</td>
<td>49%</td>
<td>51%</td>
<td>56%</td>
<td>53%</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>46%</td>
<td>47%</td>
<td>47%</td>
<td>48%</td>
<td>45%</td>
<td>49%</td>
<td>50%</td>
<td>51%</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>45%</td>
<td>47%</td>
<td>49%</td>
<td>51%</td>
<td>42%</td>
<td>53%</td>
<td>54%</td>
<td>57%</td>
</tr>
<tr>
<td>Laboratory Identified Event</td>
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<td>68%</td>
<td>69%</td>
<td>70%</td>
<td>64%</td>
<td>72%</td>
<td>73%</td>
<td>75%</td>
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<td>Dialysis Event</td>
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<td>77%</td>
<td>76%</td>
<td>74%</td>
<td>74%</td>
<td>74%</td>
<td>73%</td>
</tr>
<tr>
<td>Central Line Insertion Practices (CLIP)</td>
<td>25%</td>
<td>26%</td>
<td>28%</td>
<td>30%</td>
<td>23%</td>
<td>32%</td>
<td>34%</td>
<td>38%</td>
</tr>
<tr>
<td>Dialysis Central Line Insertion Practices (CLIP)</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Ventilator-Associated Events (VAE)</td>
<td>8%</td>
<td>12%</td>
<td>16%</td>
<td>22%</td>
<td>0%</td>
<td>37%</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>Antimicrobial Resistance Event</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Antimicrobial Use</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Antimicrobial Resistance Summary</td>
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<td>100%</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>ICU /Other Summary</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>27%</td>
<td>32%</td>
<td>34%</td>
<td>39%</td>
</tr>
<tr>
<td>SCA/ONC Summary</td>
<td>37%</td>
<td>38%</td>
<td>38%</td>
<td>39%</td>
<td>33%</td>
<td>41%</td>
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<td>32%</td>
<td>32%</td>
<td>32%</td>
<td>28%</td>
<td>35%</td>
<td>36%</td>
<td>43%</td>
</tr>
<tr>
<td>Surgical Procedure - via CDA</td>
<td>42%</td>
<td>45%</td>
<td>47%</td>
<td>50%</td>
<td>34%</td>
<td>54%</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>MDRO Summary</td>
<td>9%</td>
<td>10%</td>
<td>10%</td>
<td>11%</td>
<td>8%</td>
<td>12%</td>
<td>13%</td>
<td>18%</td>
</tr>
<tr>
<td>Dialysis Summary</td>
<td>62%</td>
<td>62%</td>
<td>63%</td>
<td>66%</td>
<td>58%</td>
<td>66%</td>
<td>68%</td>
<td>67%</td>
</tr>
<tr>
<td>Hemovigilance Summary</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Surgical Procedure - via CSV</td>
<td>50%</td>
<td>47%</td>
<td>46%</td>
<td>43%</td>
<td>56%</td>
<td>40%</td>
<td>39%</td>
<td>35%</td>
</tr>
</tbody>
</table>
DIRECT CDA Automation Updates

- ~59 direct addresses and > 8,600 facilities sending via DIRECT
- DIRECT
  - Batch submission process
  - No immediate reply
  - Turn around time based on volume of messages in the queue
- New to implement DIRECT?
  - DIRECT toolkit on the NHSN website
  - Contact NHSNCDA@cdc.gov for any questions or to set up an onboarding discussion
## CDA Version Support

- **CDA support:**

- **Toolkits:**
  [https://www.cdc.gov/nhsn/cdaportal/toolkits.html](https://www.cdc.gov/nhsn/cdaportal/toolkits.html)

- **Guide to CDA versions:**
  [https://www.cdc.gov/nhsn/cdaportal/toolkits/guidetocdaversions.html](https://www.cdc.gov/nhsn/cdaportal/toolkits/guidetocdaversions.html)

### Guide to CDA Versions

For creating CDA files, please see the specific Implementation Guide (IG) and its associated reference materials. The table below describes the specific Implementation Guide (IG) to be used for each component based on the event, insertion, procedure, specimen collection date (as applicable) for each year.

Download the corresponding CDA Toolkits for the corresponding year.

<table>
<thead>
<tr>
<th>Events or Denominators</th>
<th>2022</th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDA Toolkit Release</td>
<td>10.1</td>
<td>9.5 &amp; 10.0</td>
<td>9.4</td>
<td>9.2 &amp; 9.3</td>
</tr>
<tr>
<td><strong>DIALYSIS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dialysis Event</td>
<td>R3-D4</td>
<td>R3-D4</td>
<td>R3-D1.1</td>
<td>R3-D1.1</td>
</tr>
<tr>
<td>Dialysis Denominator</td>
<td>R3-D3</td>
<td>R3-D3</td>
<td>R3-D3</td>
<td>R3-D1 or R3-D3</td>
</tr>
<tr>
<td><strong>EVENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Bloodstream Infection (BSI)</td>
<td>R4-D1</td>
<td>R3-D3</td>
<td>R3-D3</td>
<td>R3-D2</td>
</tr>
</tbody>
</table>
CDA Version Support (continued)

- Implementers can also use the HL7 GitHub website for latest IG Guides
- HL7 GitHub site ([https://github.com/HL7/cda-hai](https://github.com/HL7/cda-hai)) also includes:
  - XML
  - Related files
  - Schematron
  - CDA Schema
  - Samples
  - Stylesheet
Helpful NHSN Resources

- NHSN Newsletter: https://www.cdc.gov/nhsn/newsletters/index.html
- Release Notes and Communication Updates: https://www.cdc.gov/nhsn/commup/index.html
- CDA Webinars: https://www.cdc.gov/nhsn/cdaportal/webinars.html
Troubleshooting CDA DIRECT

- I haven’t received a DIRECT response for my DIRECT messages, what are my next steps?
  - Please provide the information listed in the table below, send an email to nhsncda@cdc.gov, and the DIRECT database administrator will research the issue.

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>NHSN Facility ID#</th>
<th>Submitted Date/Time</th>
<th>Zip file Name</th>
<th>Message ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Hospital Ever</td>
<td>12345</td>
<td>11/27/2018 13:15</td>
<td>AU123_NOV_2018</td>
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NHSN Reminders

- Welcome feedback
- Offer individual vendor conference calls
- Make sure you are on the NHSNCDA email distribution list
Thank you!
Questions?
NHSNCD@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)

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.