



# NHSN Antimicrobial Use and Resistance (AUR) Module Reporting for the CMS Promoting Interoperability (PI) Program

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# Objectives

- Provide a brief overview of the NHSN AUR Module
- Describe the data reported & the mechanism for reporting
- Outline the steps for meeting the AUR Measure within the CMS Promoting Interoperability Program
- Summarize answers to common questions

**Questions you have but were afraid to ask...**

## Question 1

Are AUR Module data required for the CMS PI Program? If so, when does that start?

# AUR Module data are required in CY 2024

- Beginning in **CY 2024**, AUR Module data are required under the Public Health and Clinical Data Exchange Objective of the CMS PI Program
- Applies to eligible hospitals and critical access hospitals that participate in the CMS PI Program
- **Measure includes submission of both AU and AR Option data**
- For CY 2024 facilities attest to either:
  - Being in active engagement with NHSN to submit AUR data or,
  - Claim an applicable exclusion

## Question 2

What is AUR?

# NHSN AUR Module

## **Purpose**

The NHSN AUR Module provides a mechanism for facilities to report and to analyze antimicrobial use and/or resistance data to inform benchmarking, reduce antimicrobial resistant infections through antimicrobial stewardship, and interrupt transmission of resistant pathogens at individual facilities or facility networks.<sup>6</sup>

- Antimicrobial Use (AU) Option
  - Numerator: antimicrobial days (aka days of therapy)
  - Denominators: days present & admissions
- Antimicrobial Resistance (AR) Option
  - Numerator: isolate level susceptibility results
  - Denominator: patient days, admissions & encounters

<https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>

<https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html>

## Question 3

Are patient level data collected/shared?

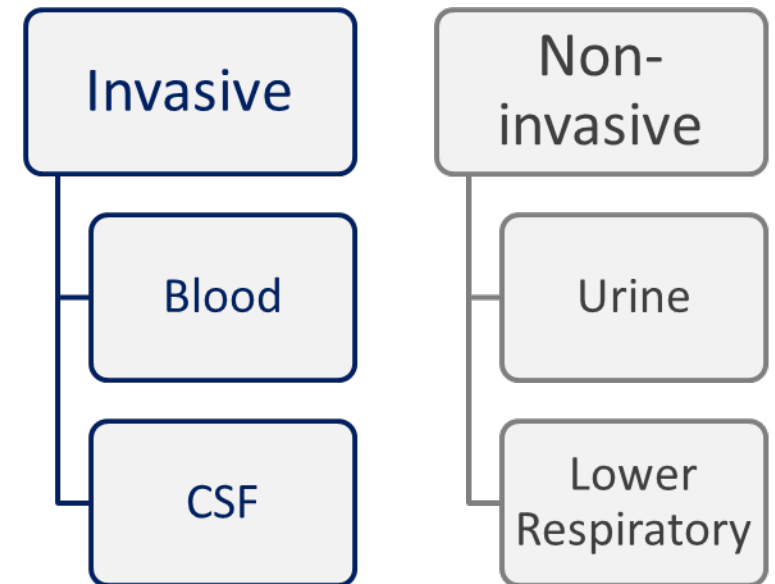


# No patient level AU data

- Data are aggregated to the month and location (aka unit) level and the Facility-wide inpatient level (aka FacWideIN)
  - **No patient level AU data are shared** (i.e., no dose, duration or indication)
- Antimicrobial days (Days of Therapy) – sum of days for which **any** amount of specific agent was administered to a patient
  - 95 antimicrobials – includes antibacterial, antifungal, and antiviral agents
    - Sub-stratified by route of administration:
      - Intravenous (IV)
      - Intramuscular (IM)
      - Digestive (oral → rectal)
      - Respiratory (inhaled)
  - **Only administration data (eMAR/BCMA)**

# Yes, patient level AR data

- Event data: Isolate-level susceptibility results for specific organisms
- Qualifying isolate criteria for an AR Event:
  1. Collected in an eligible location/unit
  2. Collected from one of four specimen types:
    - Blood
    - Cerebral spinal fluid (CSF)
    - Urine
    - Lower respiratory
  3. Eligible organism identified
  4. Antimicrobial susceptibility testing must be completed
    - Qualifies for submission regardless of susceptibility results



## Question 4

What denominator data are submitted?

## AU Option – Days present & admissions

- Days Present – number of days in which a patient spent any time in specific unit or facility
  - Reported for all individual locations & FacWideIN
  - Days present  $\neq$  Patient days
  - Used for AU data only
- Admissions – number of patients admitted to an inpatient location in the facility
  - Reported for FacWideIN only
  - Same definition used for AR Option

## AR Option – Patient days, admissions & encounters

- Patient days – Number of patients present in the facility at the same time on each day of the month (“daily census”)
  - Reported for FacWideIN only
  - Same definition used for HAI reporting
- Admissions – number of patients admitted to an inpatient location in the facility
  - Reported for FacWideIN only
  - Same definition used for AU Option
- Encounters – a visit to an eligible outpatient location
  - Reported for outpatient locations only

## Question 5

What systems should these data come from?

# AUR data from electronic sources only

- AU data from eMAR/BCMA & ADT
- AR data from LIS or EHR & ADT
- No manual data collection or entry into NHSN

eMAR: electronic medication administration record

BCMA: bar coding medication administration system

ADT: admission discharge transfer system

LIS: laboratory information system

EHR: electronic health record

## Question 6

How are these data submitted to NHSN?



# Clinical Document Architecture (CDA)

- Data must be uploaded via CDA
  - Too much data to enter by hand!
- Health Level 7 (HL7) standard
- Provides facilities with standardized way to package & upload data
  - AU, AR, & HAI
- CDA ≠ CSV (Excel)
  - CDA uses Extensible Markup Language (XML)

```
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<!-- Number of Patient-present Days -->
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  <observation classCode="OBS" moodCode="EVN">
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          code="2525-4"
          displayName="Number of Patient-present Days"/>
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  </observation>
</entryRelationship>
<!-- the Drug, aggregate data, no specified route of administration -->
<entryRelationship typeCode="COMP">
  <observation classCode="OBS" moodCode="EVN">
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          code="2524-7"
          displayName="Number of Therapy Days"/>
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      <participantRole classCode="MANU">
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              displayName="Amantadine"/>
      </participantRole>
    </participant>
  </observation>
</entryRelationship>
<!-- stratified data: Drug + route -->
```

# Using a vendor is most efficient

- Most facilities use commercial software vendor
  - EHR vendor or surveillance software vendor
  - Vendors that have met NHSN validation standards:
    - AU: <https://www.cdc.gov/nhsn/cdaportal/sds/au-vendor-list.html>
    - AR: <https://www.cdc.gov/nhsn/cdaportal/sds/ar-vendor-list.html>
  - CEHRT that has been updated to meet 2015 Edition Cures Update criteria
- Possible to use “homegrown” vendor solution but not recommended

CEHRT: certified electronic health record technology

<https://www.healthit.gov/topic/certification-ehrs/2015-edition-cures-update-test-method>

## Question 7

How often are data submitted to NHSN?

# Monthly data submission

- Recommend: Upload within 30 days following the completion of the month
- Files zipped; can be separate AU and AR or combined depending on zip file size
- Manual upload
  - User logs into NHSN to upload
- DIRECT upload
  - Facility has a vendor that supports submission via DIRECT
- How to upload CDA files into NHSN:  
<https://www.youtube.com/watch?v=T4DLtimpB5M>

## Question 8

Who needs access to NHSN?

# Pharmacist or physician champion

- Recommend two AUR-specific users within each NHSN facility
  - Generally, pharmacist or physician champion in charge of:
    - Uploading data
    - Reviewing/validating submitted data
    - Running reports/analyzing data
- If Infection Prevention will upload data, you may only need one additional AUR-specific user

## Question 9

How do I get access to NHSN?

# Talk with your Infection Prevention Team

- Your facility is already enrolled in NHSN and reporting HAI data
- Connect with Infection Prevention to gain access
- Steps for adding AUR Users:  
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-au-user-rights.pdf>



# SAMS credentials

- SAMS provides secure access to NHSN:  
<https://www.cdc.gov/nhsn/sams/about-sams.html>
- All users must have SAMS credentials
  - User specific and cannot be shared
  - Process completed once per person (regardless of how many NHSN facilities you'll have access to)
- Application process can take a few hours to a few weeks depending on the route you take

## Question 10

Has AUR always been a part of the CMS PI Program?

# AUR has been a part of the PI Program for 7 years

- AUR reporting has been an option to meet the Public Health Registry Reporting measure included in the CMS PI Program since 2017
  - Originally called the Meaningful Use (MU) Program
  - Facilities could chose to report other measures and still get full credit
- For CY 2023, AUR reporting is within the Public Health Registry Reporting
  - Facilities can receive 5 bonus points for being in active engagement with NHSN to submit AUR data
- For CY 2024, AUR reporting moves out of the Public Health Registry Reporting measure and becomes it's own required measure

## Question 11

What does “active engagement” mean?

# Two ways to be in active engagement with NHSN

- Option 1 – Pre-production and validation
  - Registration within NHSN
  - Testing & validation of the CDA files
- Option 2 – Production submission
  - Submitting production AU & AR files to NHSN
    - CY 2023 – 90 continuous days of AUR data submission
    - CY 2024 – 180 continuous days of AUR data submission
- **Note:** Beginning in CY 2024, facilities can only spend one calendar year in Option 1 (pre-production and validation)

## Question 12

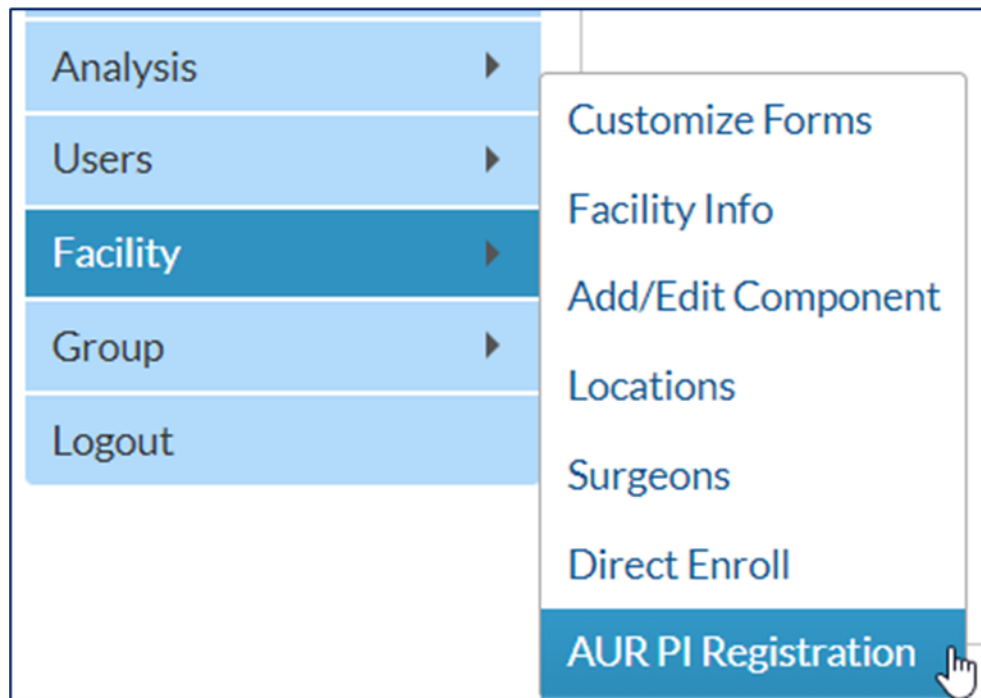
What do we need to do to meet the AUR reporting piece of the CMS PI Program?

# Prerequisites for submitting AUR data for the CMS PI Program

1. Figure out your vendor software situation
  - Certified by ONC and listed on the HealthIT webpage:  
<https://chpl.healthit.gov/#/search>
    - Refer to the bonus slides at the end of this slide deck
  - Validated by NHSN and listed on the NHSN SDS webpages:  
<https://www.cdc.gov/nhsn/cdaportal/sds/au-vendor-list.html> &  
<https://www.cdc.gov/nhsn/cdaportal/sds/ar-vendor-list.html>
2. Review Quick Reference Guide: <https://www.cdc.gov/nhsn/pdfs/cda/PHDI-Facility-Guidance-508.pdf>
3. Determine if your facility has done any of the following steps already
  - Over 600 facilities have already completed step 1 (registration of intent)

# Step 1 – Registration of intent to submit data

- Only the NHSN Facility Administrator can complete this step
- Can add up to two additional email addresses to receive the monthly AUR submission reports



**AUR Promoting Interoperability (PI) Program Registration**

NHSN Antimicrobial Use and Antimicrobial Resistance reporting has been identified as a measure for public health registry reporting under the CMS Promoting Interoperability (PI) Program (§ 170.315(f)(6)).

By checking this box  **Mindy Durrance** registers facility **CDA-XYZ\_qa\_Test Facility (13860)** intent to satisfy a PI Program objective by submitting NHSN Antimicrobial Use and Antimicrobial Resistance (AUR) monthly data via an electronic interface.

For each year, data intended for inclusion in the annual PI Program status report generated by NHSN must be received no later than the end of January of the following year (i.e., AUR data for 2022 must be reported into NHSN by January 31, 2023).

The below recipients shall receive NHSN PI Program registration confirmation as well as monthly and annual status report emails. Please enter up to two optional additional email addresses that should receive this information regarding your facility's NHSN PI Program status.

NHSN Facility Administrator:

Optional facility PI Program contact:

Optional facility PI Program contact:

Date Registration of Intent Completed:

Request AUR PI Program Status Report by Year:

To complete registration, verify all information on this page and click the SAVE button.



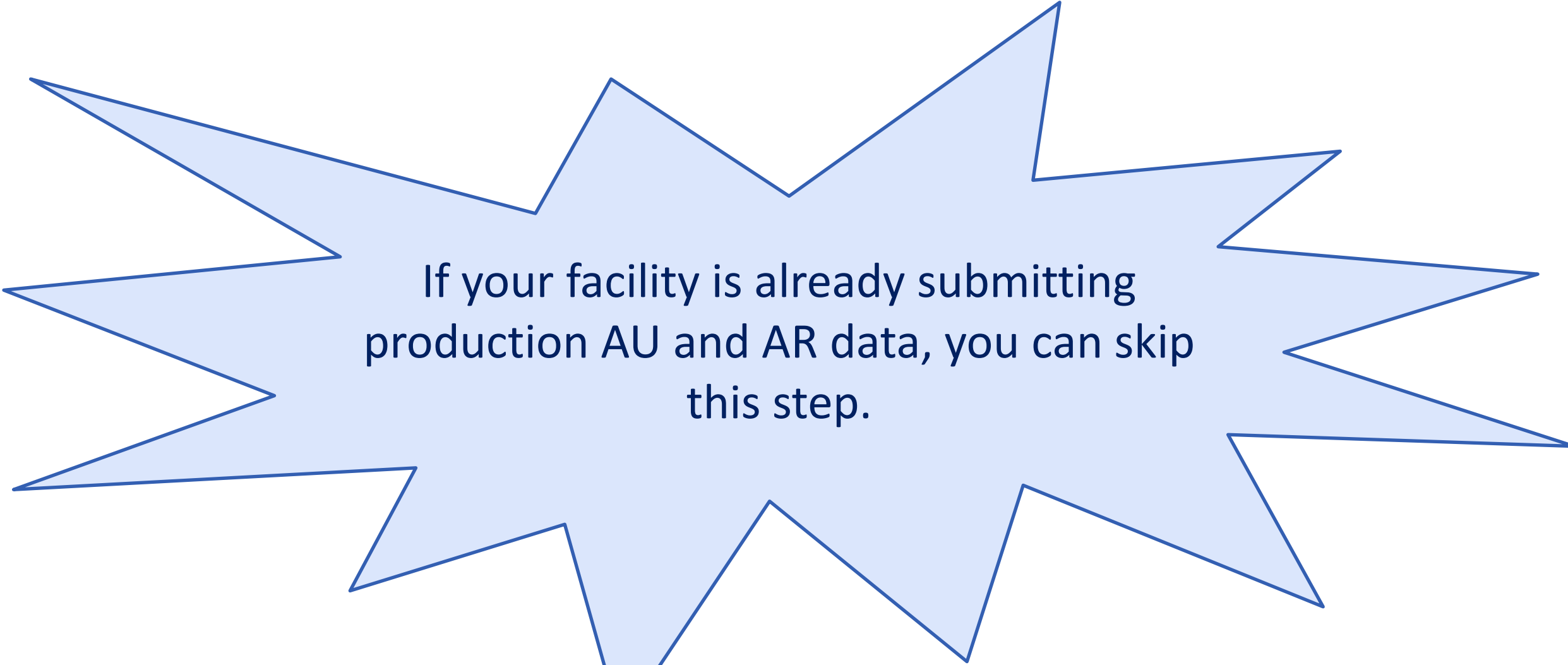
## Step 2 – Testing and validation of AUR CDA files

- 1 test file for each file type:
  - AU
  - AR Event (numerator)
  - AR Denominator
- Ask your vendor for these
- Send to [NHSNCDA@cdc.gov](mailto:NHSNCDA@cdc.gov)

NHSN invites your facility to begin the testing and validation stage. Please send the following test CDAs to the nhsncda@cdc.gov mailbox:

1. Antimicrobial Use Summary CDA
2. Antimicrobial Resistance - Numerator CDA (aka AR Event)
3. Antimicrobial Resistance - Denominator CDA (aka AR Summary)

## Step 2 – Testing and validation of AUR CDA files



If your facility is already submitting production AU and AR data, you can skip this step.

## Step 3 – Submission of production data

Subject: NHSN AUR Promoting Interoperability (PI) Program Testing and Validation Completed - Ready to Send AUR CDAs to Production

Your facility's Antimicrobial Use Summary, Antimicrobial Resistance – numerator, and Antimicrobial Resistance - denominator (AUR) test CDAs have passed validation.

**You may now send all AUR CDAs to the NHSN production environment.**

Monthly AUR submission status reports will be automatically generated and emailed to the facility administrator and optional emails listed on the PI Registration page within your NHSN facility.

- Send production AUR data to NHSN on a monthly basis
- NHSN will automatically email the NHSN Facility Administrator and optional email contacts a monthly report outlining data submission status

Month/Year	Antimicrobial Use Summary	Antimicrobial Resistance Events	Antimicrobial Resistance Summary
01/2022	Yes	Yes	Yes
02/2022	Yes	Yes	Yes

## Question 13

Can I start now?

# Yes! Start now!

- Facilities can begin these steps now
- Being in active engagement with NHSN AUR reporting in CY 2023 provides 5 bonus points in the CMS PI Program Public Health and Clinical Data Exchange Objective
  - Option 1 – Pre-production and validation
  - Option 2 – Production submission

## Question 14

What if my facility is already reporting AU and/or AR data but we didn't complete steps 1 & 2?

# Must complete registration within NHSN

- Follow the steps to complete registration of intent to submit AUR data within NHSN: <https://www.cdc.gov/nhsn/pdfs/cda/PHDI-Facility-Guidance-508.pdf>
  - Required in order to receive the emailed monthly status reports
- If already sending production AU and AR data, you do not need to complete the Testing & Validation step
  - Facilities attest to the most advanced stage (registration/testing & validation or production data)
  - Attest to submitting production data

## Question 15

Does CDC/NHSN provide my data to CMS?



## No – AUR Measure is attestation based

- CDC/NHSN does not provide any data to CMS for this reporting measure
- **NHSN provides documentation to facilities to use as proof**
- Facilities must attest to CMS that they are in active engagement with NHSN
  - Attest within the CMS Hospital Quality Reporting (HQR) system:  
<https://hqr.cms.gov/hqrng/login>

## Question 16

But I have so many more questions!

# AUR Module Resources

- NHSN Helpdesk: [NHSN@cdc.gov](mailto:NHSN@cdc.gov)
- AUR Module website: <https://www.cdc.gov/nhsn/psc/aur/index.html>
- AUR Trainings: <https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html>

CMS-related questions:

- QualityNet help desk: [QnetSupport@cms.hhs.gov](mailto:QnetSupport@cms.hhs.gov) or 1-866-288-8912

# Thank you!

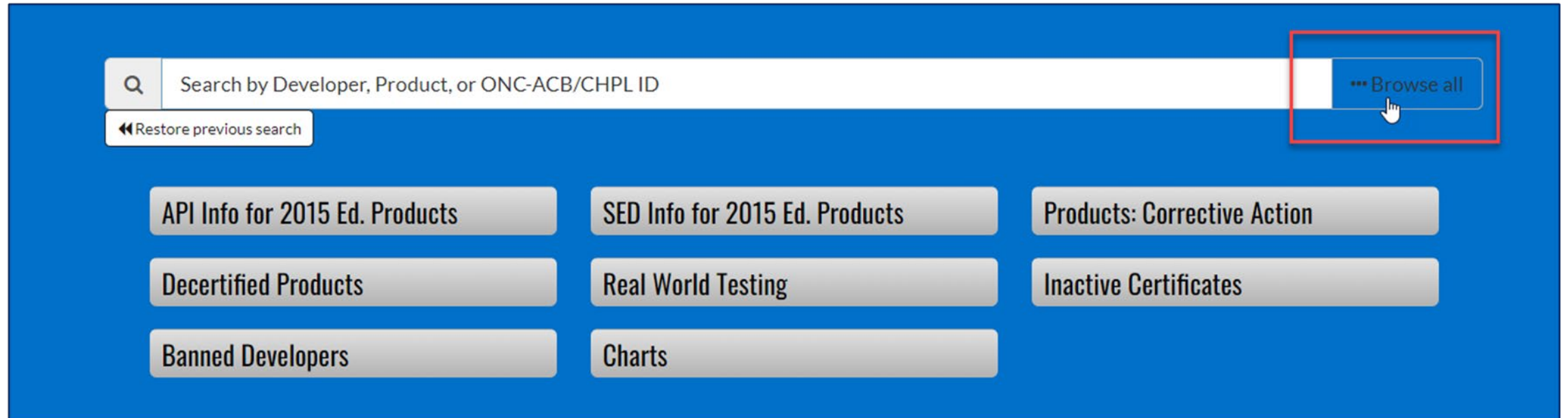
For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

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



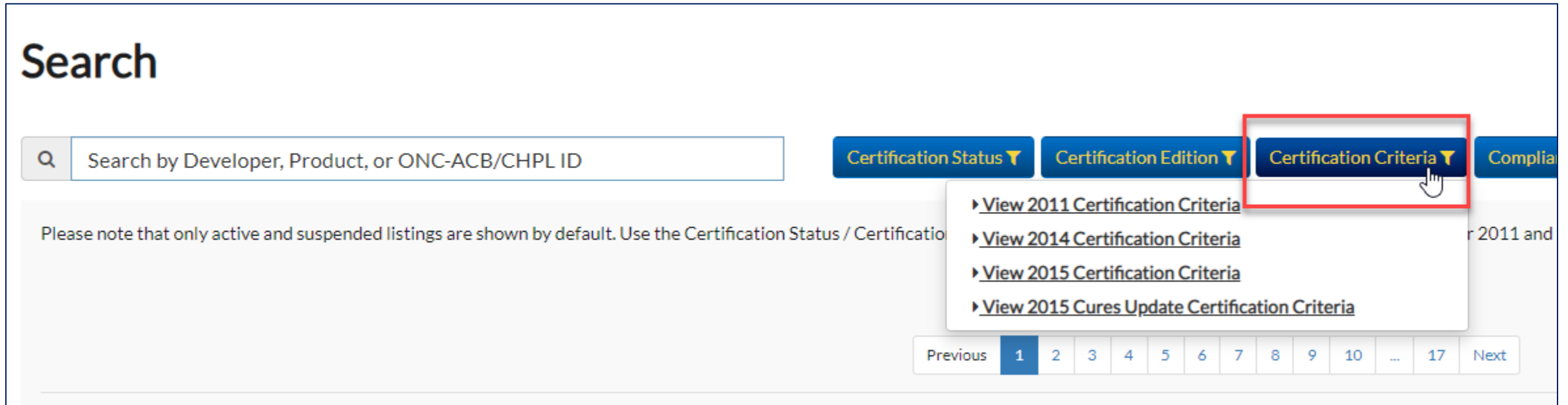
# Looking up your vendor on the ONC list\_1

- <https://chpl.healthit.gov/#/search>
- Click Browse All



# Looking up your vendor on the ONC list\_2

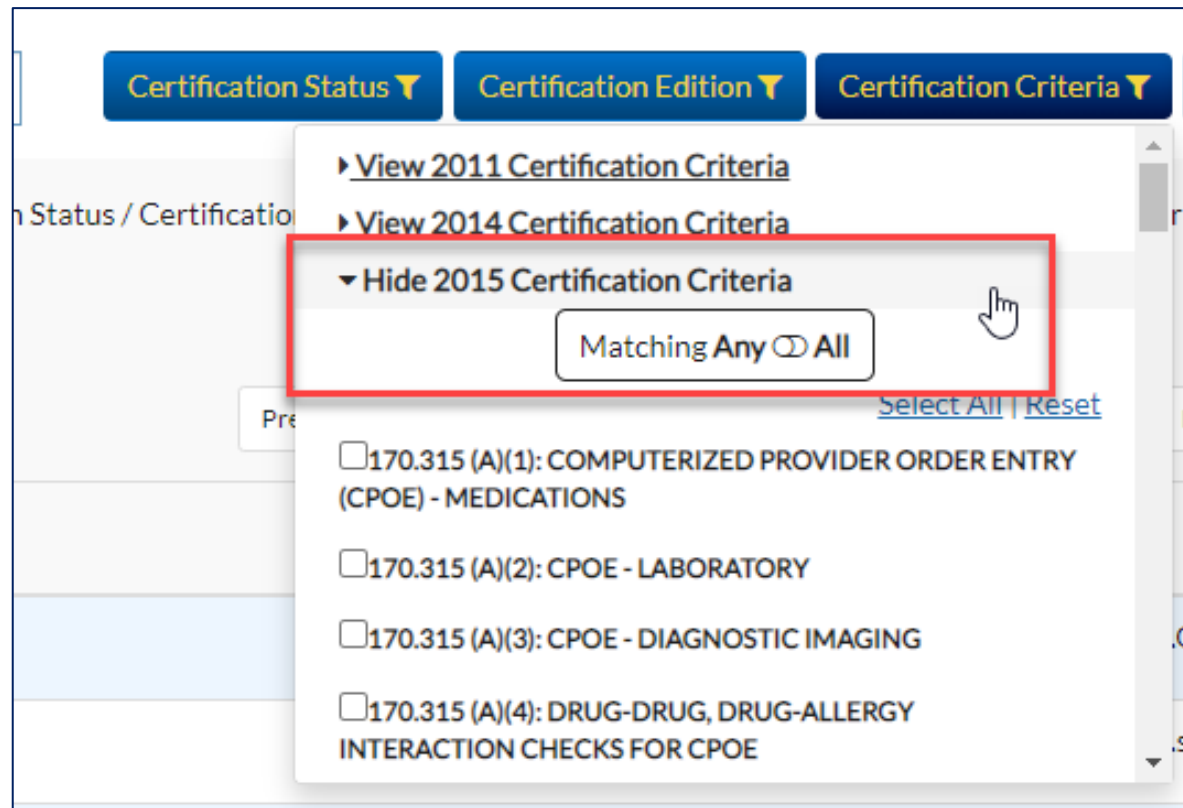
- Click Certification Criteria



The screenshot shows a search interface for the ONC list. On the left, there is a search bar with the placeholder text "Search by Developer, Product, or ONC-ACB/CHPL ID". To the right of the search bar are several filter buttons: "Certification Status", "Certification Edition", "Certification Criteria", and "Compliance". The "Certification Criteria" button is highlighted with a red box, and a mouse cursor is pointing at it. A dropdown menu is open below this button, listing four options: "View 2011 Certification Criteria", "View 2014 Certification Criteria", "View 2015 Certification Criteria", and "View 2015 Cures Update Certification Criteria". Below the dropdown menu is a pagination bar with buttons for "Previous", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "...", "17", and "Next".

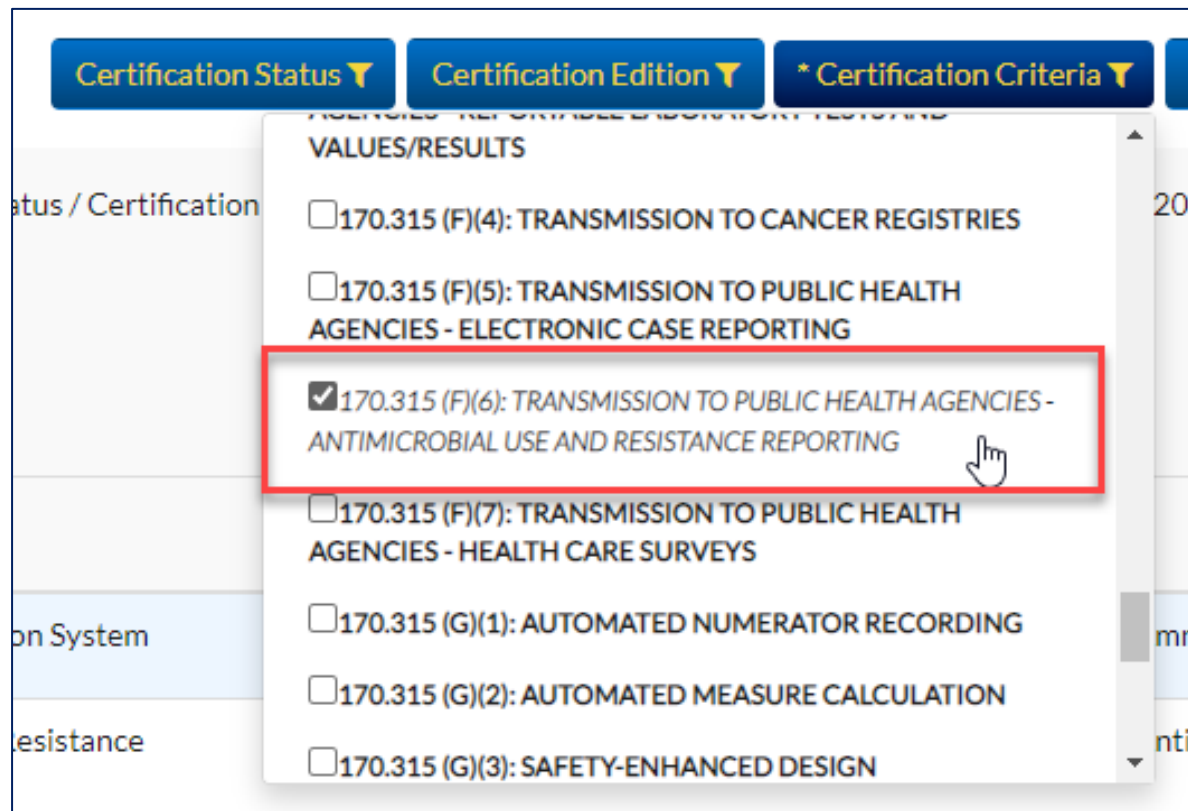
# Looking up your vendor on the ONC list\_3

- Click View 2015 Certification Criteria



# Looking up your vendor on the ONC list\_4

- Click the checkbox for criteria: 170.315 (F)(6)



The screenshot shows a web application interface with a dropdown menu for 'Certification Criteria'. The menu is open, displaying a list of criteria with checkboxes. The checkbox for '170.315 (F)(6): TRANSMISSION TO PUBLIC HEALTH AGENCIES - ANTIMICROBIAL USE AND RESISTANCE REPORTING' is checked and highlighted with a red box. A mouse cursor is pointing at the checked checkbox.

VALUES/RESULTS

- 170.315 (F)(4): TRANSMISSION TO CANCER REGISTRIES
- 170.315 (F)(5): TRANSMISSION TO PUBLIC HEALTH AGENCIES - ELECTRONIC CASE REPORTING
- 170.315 (F)(6): TRANSMISSION TO PUBLIC HEALTH AGENCIES - ANTIMICROBIAL USE AND RESISTANCE REPORTING
- 170.315 (F)(7): TRANSMISSION TO PUBLIC HEALTH AGENCIES - HEALTH CARE SURVEYS
- 170.315 (G)(1): AUTOMATED NUMERATOR RECORDING
- 170.315 (G)(2): AUTOMATED MEASURE CALCULATION
- 170.315 (G)(3): SAFETY-ENHANCED DESIGN



# Looking up your vendor on the ONC list\_5

- 42 vendor products are listed

1 - 42 of 42 Results

Previous 1 Next

Edition	Developer	Product	Version	Certification Date	CHPL ID	Status	
2015 Cures Update	<a href="#">Altera Digital Health Inc.</a>	Sunrise Acute Care	22.1	May 24, 2022	15.04.04.3123.Sunr.22.06.1.220524	✓	<a href="#">Details</a> <a href="#">Compare</a> <a href="#">Cert ID</a>
2015 Cures Update	<a href="#">Altera Digital Health Inc.</a>	Sunrise Acute Care for Hospital-based Providers	22.1	May 24, 2022	15.04.04.3123.Sunr.AH.08.1.220524	✓	<a href="#">Details</a> <a href="#">Compare</a> <a href="#">Cert ID</a>
2015 Cures Update	<a href="#">Amrita Ventures, LLC</a>	Amrita Hospital Information System	AHIS 7.2	Dec 28, 2022	15.04.04.2678.Amri.AH.01.1.221228	✓	<a href="#">Details</a> <a href="#">Compare</a> <a href="#">Cert ID</a>
2015 Cures Update	<a href="#">Becton Dickinson and Company</a>	AUR Reporting Module	1	Jan 25, 2022	15.02.05.3024.BEDC.01.01.0.220125	✓	<a href="#">Details</a> <a href="#">Compare</a> <a href="#">Cert ID</a>
2015 Cures Update	<a href="#">Beth Israel Deaconess Medical Center</a>	Online Medical Record	2013	Jan 30, 2023	15.07.05.1147.BIDM.01.00.1.230130	✓	<a href="#">Details</a> <a href="#">Compare</a> <a href="#">Cert ID</a>