

# NHSN AUR Webinar Series

## Session #1 Purpose and Benefits of Reporting, CMS PI Requirements, Getting Started Reporting

Jenna Preusker, PharmD  
Lacey Pavlovsky, RN, MSN, CIC, LTC-CIP  
Kelsey Drouhard, BSN, RN



1

### DISCLAIMER

All Kansas Healthcare Collaborative, Inc. (“KHC”) content and information in KHC’s publications, presentations, and on KHC’s website (“**KHC Content**”) are for informational and educational purposes only. KHC Content does not create any type of relationship with, or duty to, the reader, attendee, or user. KHC Content does not constitute legal, tax, business, professional, or personal advice. KHC disclaims any and all liabilities and warranties, express or implied, arising from users’ access and use of KHC Content.



2

2

## Today's Webinar Agenda

- Welcome – 5 mins
- Content Presentation 45 mins
  - Jenna Preusker and Lacey Pavlovsky – University of Nebraska
  - Kelsey Drouhard - Kingman Healthcare Center
- Q&A 5 Mins
- Closing Comments 2 mins

# AGENDA



3

## Registration Coming Soon!

**KHC Summit on Quality**  
**August 8<sup>th</sup>, 2024**  
**Wichita, KS**  
**Wichita State University**  
**Rhatigan Student Center**

[Learn More](#)



  
Kansas Healthcare  
COLLABORATIVE  
**Summit on Quality**  
August 8, 2024

Wichita State University  
Rhatigan Student Center

Audience  
Clinicians, Nurse Leaders, Hospital and Clinic Leaders,  
Infection Preventionists, Pharmacists and Quality Leaders

**SAVE *the* DATE**

4

## National Healthcare Safety Network Antibiotic Use and Resistance Module

Jenna Preusker, PharmD, BCPS, BCIDP  
Pharmacist, Healthcare Associated Infections and Antibiotic Resistance

Lacey Pavlovsky, RN, MSN, CIC, CIC-LTC  
Infection Preventionist, Healthcare Associated Infections and Antibiotic  
Resistance

5.21.2024



5

## Disclosures

The presenters today do not have any relevant disclosures to report related to this presentation.

Disclaimer – neither presenter works for the CDC or CMS!






We will only be discussing the CMS regulations in place for CY 2024, the proposed rule for CY 2025 is currently available for public comment and will be published August 2024.

6



6

## Objectives

-  Summarize benefits of reporting data to the NHSN AUR module
-  Understand the CMS requirements for AUR reporting beginning in CY 2024
-  Identify where to get started in the process of reporting data to the AUR module
-  Understand the various data output options for AU and AR data
-  Review hospital case examples of implementing antibiotic stewardship interventions based on NHSN AU data

7

7

## Summarize benefits of reporting data to the NHSN AUR module

8

8



## Benefits to AUR Reporting Insights and Data

- Benchmarking institutional antibiotic consumption to similar hospitals and national trends
- Evaluating stewardship quality initiatives
- Identify problem areas within a facility to target interventions
- Justifying antibiotic stewardship program positions
- Demonstrating the value of the program to local stakeholders
- Contributing to public health by providing antimicrobial resistance tracking on a more global scale

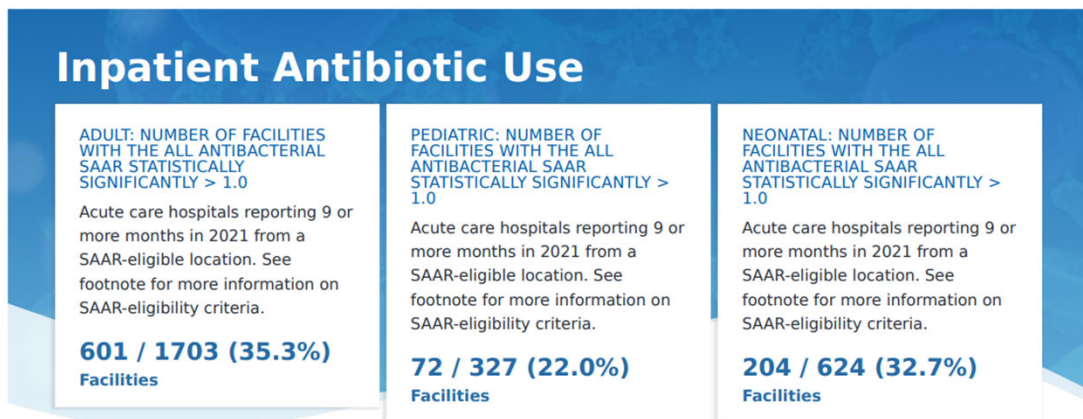
9

9

## Inpatient Antibiotic Use



Antibiotic Resistance &  
 Patient Safety Portal



10 [Inpatient Antibiotic Use | A.R. & Patient Safety Portal \(cdc.gov\)](https://www.cdc.gov/aarp/antibiotic-resistance/patient-safety-portal/inpatient-antibiotic-use)

10

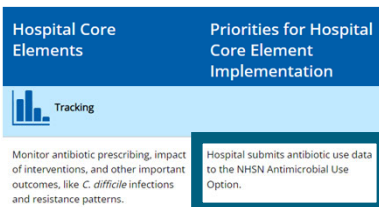
## Benefits of AUR Reporting

### Insights and Data Benefits

- Benchmarks for antimicrobial stewardship
- Benchmarks for antimicrobial quality improvement activities
- Compare with antimicrobial use trends across the nation (SAAR)
- Identify problem areas within a facility to target interventions

### Regulatory and Payment Benefits

- Meet the CMS Promoting Interoperability requirement added for CY 2024
- Satisfy the Joint Commission's antimicrobial stewardship standard for tracking and reporting
- Added to the CDC Priorities for Hospital Antibiotic Stewardship Core Element Implementation in 2022
  - [Priorities for Hospital Core Element Implementation | Antibiotic Use | CDC](#)



11

11

## CMS requirements for AUR reporting CY 2024

12

12

## CMS Requirement in CY 2024 AUR Module Data

- **CY 2024:** AUR Module data are required under the Public Health and Clinical Data Exchange Objective of the CMS Promoting Interoperability Program
- Measure includes submission of **both** AU and AR Option data

- Applies to eligible hospitals and critical access hospitals that participate in the CMS PI Program



### How do I know if my facility is participating in CMS PI?

- **Most facilities participate** in the CMS PI Program
- Reach out to the person(s) in charge of quality reporting
- Facilities not paid under the CMS Hospital Inpatient Prospective Payment System (IPPS) are **NOT** included in the CMS PI Program
  - Includes but is not limited to
    - Inpatient rehab hospitals
    - Inpatient psych hospitals
    - Long term acute care hospitals

13 [Promoting Interoperability Programs | CMS](#)

NEBRASKA DIVISION OF PUBLIC HEALTH  
Good Life. Great Mission.

13

## For CY 2024, facilities attest to either:



NEBRASKA DIVISION OF PUBLIC HEALTH  
Good Life. Great Mission.

14

## What does **active engagement** mean?

Option 1

- Pre-production and validation
- Registration within NHSN
- Testing & validation of CDA files

Option 2

- Validated data production
- Submitting production AU & AR files to NHSN
- 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)

15

## For CY 2024, facilities attest to either:

Being in active engagement with NHSN to submit AUR data

Claim an applicable exclusion

16



## Reporting Exclusions

- 1) The hospital or CAH **does not have any patients in any patient care location** for which data are collected by NHSN during the EHR reporting period
- 2) The hospital or CAH does not **have electronic medication administration records/barcoded medication administration records** or an electronic admission discharge transfer (**ADT**) system during the EHR reporting period
- 3) The hospital or CAH does not have an **electronic laboratory information system** or electronic **ADT** system during the reporting period

Note: CMS is currently in its 2025 rule making cycle, so it is very likely that this will change for 2025!

17

[FY 2023 Hospital Inpatient Prospective Payment System \(IPPS\) and Long-Term Care Hospital Prospective Payment System \(LTCH PPS\) Final Rule — CMS-1771-F | CMS](#)

**NEBRASKA**  
Good Life. Great Mission. **DIVISION OF PUBLIC HEALTH**

17

## Getting started in the process of reporting data to the AUR module

18

**NEBRASKA**  
Good Life. Great Mission. **DIVISION OF PUBLIC HEALTH**

18

## CDC NHSN Reporting Structure



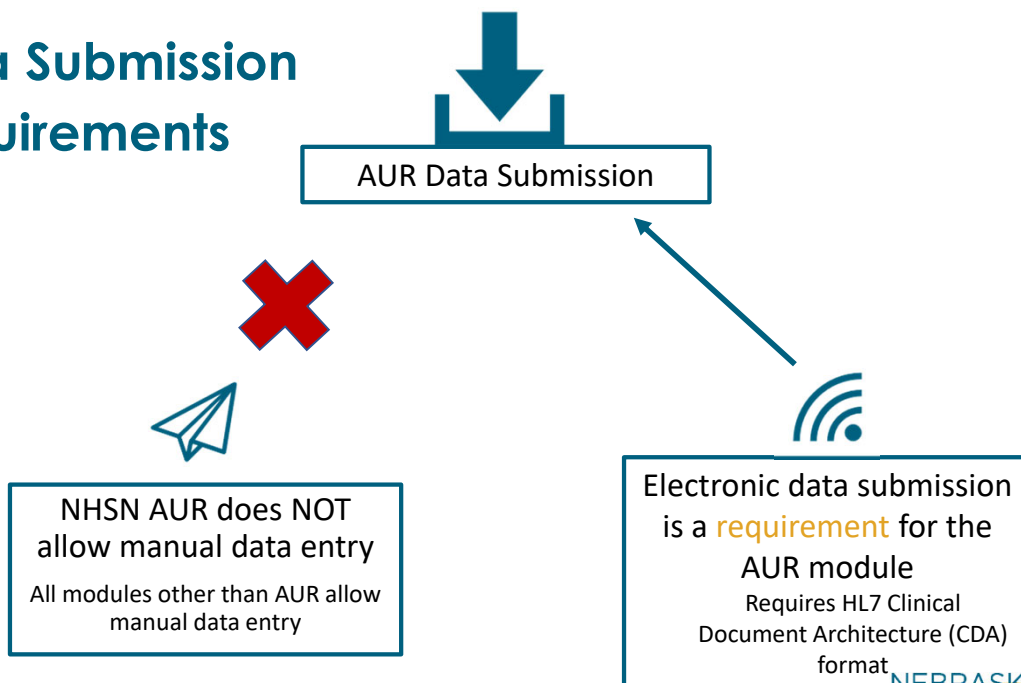
- Device-associated Module:
  - Bloodstream Infection (CLABSI – Central line-associated bloodstream infection)
  - Central line insertion practices (CLIP) adherence
  - Urinary Tract Infection (CAUTI – Catheter-associated urinary tract infection)
  - Ventilator-associated events (VAE) and Pediatric VAE (PedVAE)
  - Ventilator-associated Pneumonia (VAP)
- Procedure-associated Module:
  - Surgical Site Infection (SSI)
- Antimicrobial Use and Resistance Module (AUR)
- Multidrug-Resistant Organism and *Clostridioides difficile* Infection (MDRO/CDI) Module

19 [NHSN Overview \(cdc.gov\)](https://www.cdc.gov/nhsn/overview)

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

19

## Data Submission Requirements



20

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

20

# Data Submission Requirements

- Electronic Medication Administration Record (eMAR) or Bar-Coding Medication Administration (BCMA) system
  - Capturing antimicrobial administrations
- Electronic Laboratory Information System (LIS)
  - Capturing antimicrobial susceptibility results
- Electronic Admission, Discharge, Transfer (ADT)
  - Capturing patient movement within the facility



Ability to collect and package data using HL7 standardized format:

CDA (Clinical Document Architecture)

- Commercial software vendors
- Part of your current EHR
- “Homegrown” vendors (facility’s internal IT/informatics resources)

21 [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](https://www.cdc.gov/nhsn/aur/promoting-interoperability-guidance)

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

21

# How does AUR differ from other HAI uploads?

- Data must be electronically uploaded via CDA
  - **Too much data to enter by hand!**
  - **Every** dose administered, time, date, route, patient location for 91 antibiotics
  - **Every** susceptibility for included organisms
- Provides facilities with standardized way to package & upload data
- AU data is sent at an aggregated level – no patient specific information is sent
- **CDA ≠ CSV (Excel)**
  - CDA uses XML
- Downloading report from EHR and uploading to NHSN should be done every 30 days
  - Takes 15-30 minutes

```

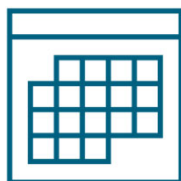
<!-- Number of Patient-present Days -->
<entryRelationship typeCode="COMP">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.5.6.69"/>
    <code codeSystem="2.16.840.1.113883.6.277"
          codeSystemName="cdcNHSN"
          code="2525-4"
          displayName="Number of Patient-present Days"/>
    <statusCode code="completed"/>
    <value xsi:type="PQ" unit="d" value="700"/>
  </observation>
</entryRelationship>
<!-- the Drug, aggregate data, no specified route of administration -->
<entryRelationship typeCode="COMP">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.5.6.69"/>
    <code codeSystem="2.16.840.1.113883.6.277"
          codeSystemName="cdcNHSN"
          code="2524-7"
          displayName="Number of Therapy Days"/>
    <statusCode code="completed"/>
    <value xsi:type="PQ" unit="d" value="3"/>
    <participant typeCode="CSM">
      <participantRole classCode="MANU" <!-- antimicrobial Drug -->
        <code codeSystem="2.16.840.1.113883.6.88"
              codeSystemName="RxNorm"
              code="620"
              displayName="Amantadine"/>
      </participantRole>
    </participant>
  </observation>
</entryRelationship>
    
```

22 [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](https://www.cdc.gov/nhsn/aur/promoting-interoperability-guidance)

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

22

## How often does data need to be uploaded to NHSN?



- **Monthly Data Submission**
  - Recommend upload within 30 days following the completion of the month
  - Per CMS PI Program guidance, facilities should report data on an ongoing basis during their EHR reporting period

23

23

## Software Vendors

- As a facility, begin evaluating software vendors
  - Cost considerations
  - Using hospital's EHR vs. third party
  - Additional features (prospective audit and review capabilities)
  - Implementation timeline
  - IT involvement
  - Demonstrations
  - C-suite/IT services approval
- Always use a vendor that has passed SDS validation



[AU SDS Vendors | NHSN | CDC](#)



[AR SDS Vendors | NHSN | CDC](#)

24

24

## What can our facility get started on today?

25

25

## Getting started with NHSN AUR

- Fulfill the basic requirements for submission of data into NHSN
  - Hospital is enrolled in NHSN
  - Hospital has mapped NHSN locations
  - Hospital has an NHSN Facility OID
- Get your pharmacist involved!
- Complete online AUR Module training
  - Antimicrobial Use Option
    - Reporting and Analysis (50 minutes)
    - Beginner Analysis (30 minutes)
    - Advanced Analysis (36 minutes)
    - Standardized Antimicrobial Administration Ratio (24 minutes)
    - NHSN Targeted Assessment for Antimicrobial Stewardship (60 minutes)
  - Antimicrobial Resistance Option
    - Reporting and Analysis (1 hour 12 minutes)
    - Facility-Wide Antibigram Report (23 minutes)

26

26

## Add New NHSN Users

- NHSN Administrator – Enroll new users (i.e., pharmacists)
  - Grid Card or Mobile Soft Token
- Assign user rights – Minimum rights for AUR included below

Customize Rights

	View	Add,Edit,Delete	All Rights
<b>Denominator Data: Procedure/Summary</b>			
AUR - Antimicrobial Use and Resistance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PROC - Procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROC - Custom Procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICU - Device Associated - Intensive Care Unit / Other Locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NICU - Device Associated - Neonatal Intensive Care Unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCA - Device Associated - SCA/ONC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MDRO - MDRO and CDI Prevention Process and Outcome Measures Monthly Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Plan</b>	<b>View</b>	<b>Add,Edit</b>	<b>All Rights</b>
Patient Safety Monthly Reporting Plan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Annual Survey</b>	<b>View</b>	<b>Add,Edit</b>	<b>All Rights</b>
Patient Safety Annual Facility Survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Analysis</b>			
Patient Safety Data Analysis	<input checked="" type="checkbox"/>		
Antimicrobial Use and Resistance Analysis	<input checked="" type="checkbox"/>		

27 [Resources for Users New to NHSN | CDC](#)

27

## Next steps

28

28

## Registration of Intent to Submit Data

- The eligible hospital must first register the facility's intent to submit AU and AR data into NHSN.
- Facilities should **NOT** register intent to submit data until they have verified that the vendor being used is ready (or almost ready) to submit testing data. There is a 60-day response clause.
  - Failure to respond twice within an EHR reporting period would result in the facility not meeting the measure
- Note: Only the NHSN Facility Administrator can view and complete this task.

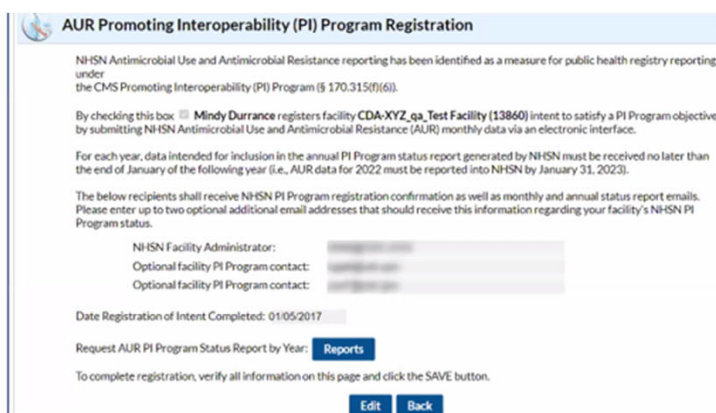
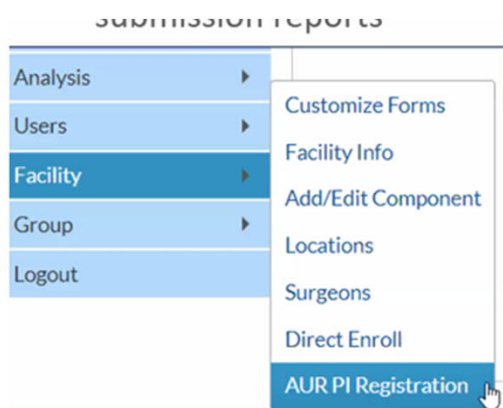


29 [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](#)

NEBRASKA DIVISION OF PUBLIC HEALTH  
Good Life. Great Mission.

29

## Registration of Intent to Submit Data



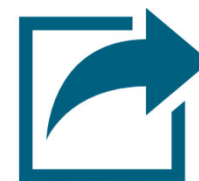
30 [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](#)

NEBRASKA DIVISION OF PUBLIC HEALTH  
Good Life. Great Mission.

30

## Validation of the AUR CDA Files

- NHSN will send the facility an invitation letter to begin testing and validation
- Three test CDA files are to be emailed to the NHSN CDA Helpdesk ([NHSNCDA@cdc.gov](mailto:NHSNCDA@cdc.gov)) following the specifications outlined in the invitation – **ask your software vendor for these!**
  - Antimicrobial Use Summary CDA
  - Antimicrobial Resistance - Numerator CDA
  - Antimicrobial Resistance - Denominator CDA
- As the NHSN CDA Helpdesk receives and validates the test files, details will be returned to the facility via email describing any errors that were identified during the validation process
- The facility will **work with their vendor** to correct the errors and resend the updated test CDA file(s)



<sup>31</sup> [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](https://www.cdc.gov/nhsn/aur/promoting-interoperability-guidance)

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

31

## Submission of Production AUR Data into NHSN

- Once the testing and validation steps are complete, the facility will be invited to submit AU and AR data into the NHSN production environment.
- Prior to uploading AU and AR CDA files, **enter AUR on your monthly reporting plans** within NHSN
  - Locations for monthly recording plan must be specified prior to upload
  - Same monthly reporting plan used for HAI reporting

Antimicrobial Use and Resistance Module

Locations	Antimicrobial Use	Antimicrobial Resistance
FACWIDEIN - Facility-wide Inpatient (FacWIDEIn)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MEDWARD - MEDICAL WARD - AU	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MICU - MEDICAL ICU - AU	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PEDMED - PED MED WARD-AU	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SURGWARD - SURGICAL WARD - AU	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Add Row Clear All Rows Copy from Previous Month

<sup>32</sup> [NHSN AUR Promoting Interoperability Guidance \(cdc.gov\)](https://www.cdc.gov/nhsn/aur/promoting-interoperability-guidance)

NEBRASKA DIVISION OF PUBLIC HEALTH  
 Good Life. Great Mission.

32



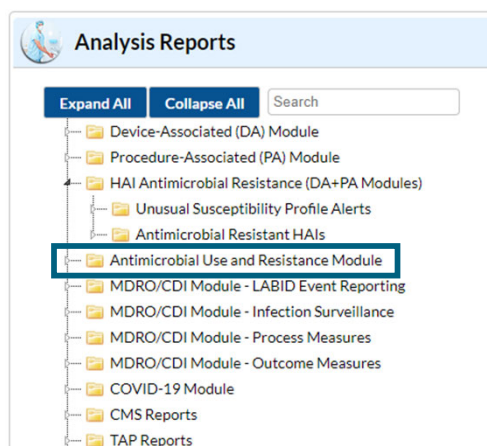
## Understand the various data output options for AU and AR data

33

33

## NHSN Data Output Options





- AU line list
  - Review your own facility's data
- SAAR line list
  - Facility comparison data
- TAS (Target, Assess, Steward)
- Data quality line list
  - Validation



34

34

# NHSN AU Reports – DOT/1,000 Days Present

-  Line Listing - Most Recent Month of AU Data for FACWIDEIN
-  Line Listing - Most Recent Month of AU Data by Location
-  Line Listing - All Submitted AU Data for FACWIDEIN
-  Line Listing - All Submitted AU Data by Location

- Antimicrobial days:
  - 1 antimicrobial day = any amount of specific antibiotic administered in a calendar day to a particular patient
- Days present: total number of patients in a location or facility anytime each day during a calendar month

$$\frac{\text{Drug specific antimicrobial days per patient care location per month}}{\text{Days present per patient care location per month}} \times 1000$$

35

35

## AU Line Listing

### National Healthcare Safety Network Line Listing - All Submitted AU Data by Location

As of: December 3, 2018 at 3:09 PM  
 Date Range: SUMMARYAU summaryYQ 2017Q3 to 2017Q3  
 if ((location = 4MICU ))

Location=4MICU

Summary Year/Month	Antimicrobial Agent Description	Antimicrobial Days	Days Present	Admissions	Route: IM	Route: IV	Route: Digestive	Route: Respiratory	Location
2017M07	AMAN - Amantadine	0	500	.	0	0	0	0	4MICU
2017M08	AMAN - Amantadine	0	482	.	0	0	0	0	4MICU
2017M07	AMK - Amikacin	0	500	.	0	0	0	0	4MICU
2017M08	AMK - Amikacin	0	482	.	0	0	0	0	4MICU
2017M07	AMOX - Amoxicillin	0	500	.	0	0	0	0	4MICU
1 2017M08	AMOX - Amoxicillin	2	482	.	0	0	2	0	4MICU
2017M07	AMOXWC - Amoxicillin with Clavulanate	2	500	.	0	0	2	0	4MICU
2017M08	AMOXWC - Amoxicillin with Clavulanate	2	482	.	0	0	2	0	4MICU
2017M07	AMP - Ampicillin	0	500	.	0	0	0	0	4MICU
2 2017M08	AMP - Ampicillin	6	482	.	0	6	0	0	4MICU
2017M07	AMPH - Amphotericin B	0	500	.	0	0	0	0	4MICU
2017M08	AMPH - Amphotericin B	0	482	.	0	0	0	0	4MICU
2017M07	AMPHOT- Amphotericin B Liposomal	0	500	.	0	0	0	0	4MICU

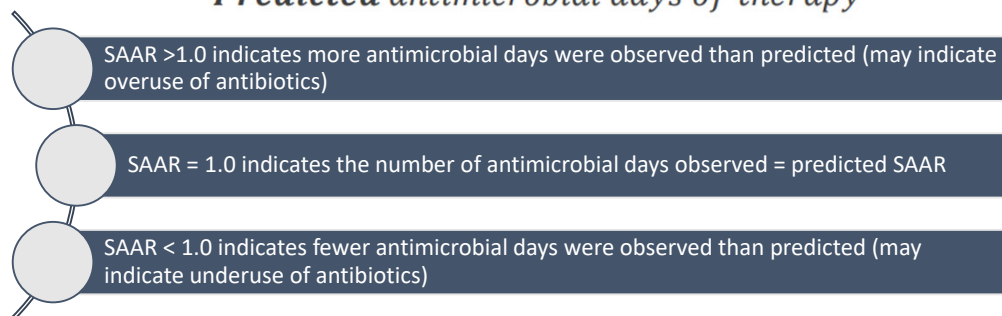
36 Fictitious data for illustrative purposes only

36

## Standardized Antimicrobial Administration Ratio (SAAR)

- NHSN calculates predicted antimicrobial days by risk-adjusting for location- and facility-level factors found to be statistically significantly associated with differences in AU rates among the SAAR referent population
- **NOT a measure of appropriateness or judicious antimicrobial use**

$$SAAR = \frac{\textit{Observed antimicrobial days of therapy}}{\textit{Predicted antimicrobial days of therapy}}$$



37

37

## SAAR Types

- SAARs can be generated for 22 antimicrobial agent categories (7 adult, 8 pediatric, and 7 neonatal)
  - All antibacterial agents
  - Broad spectrum antibacterial agents predominantly used for hospital-onset infections
  - Broad spectrum antibacterial agents predominantly used for community-acquired infections
  - Antibacterial agents predominantly used for resistant Gram-positive infections (e.g., MRSA)
  - Narrow spectrum beta-lactam agents
  - Antibacterial agents posing the highest risk for CDI
  - Antifungal agents predominantly used for invasive candidiasis
  - Azithromycin (Pediatric Locations ONLY)
- Analyzed for specific location types for which sufficient data is available to predict AU
  - NHSN uses negative binomial regression for AU risk-adjustment
  - The model uses a set of fixed parameters (adjustment variables) for each SAAR type to predict risk of AU in a set of SAAR-locations

38 [NHSN Antimicrobial Use and Resistance \(AUR\) Module Protocol \(cdc.gov\)](https://www.cdc.gov/nhsn/antimicrobial-use-and-resistance-aur-module-protocol)

38

## SARR Antimicrobial Groupings

Broad spectrum antibacterial agents predominantly used for hospital-onset infections (BHSO ICU/Ward_2017)			
Amikacin	Ceftazidime/Avibactam	Doripenem	Meropenem
Aztreonam	Ceftolozane/tazobactam	Gentamicin	Piperacillin/tazobactam
Cefepime	Colistimethate	Imipenem/Cilastatin	Tobramycin
Ceftazidime			
Broad spectrum antibacterial agents predominantly used for community-acquired infections (BSCA ICU/Ward_2017)			
Cefaclor	Cefpodoxime	Cefuroxime	Gemifloxacin
Cefdinir	Cefprozil	Ciprofloxacin	Levofloxacin
Cefixime	Ceftriaxone	Ertapenem	Moxifloxacin
Cefotaxime			
Antibacterial agents predominantly used for resistant Gram-positive infections (e.g. MRSA- GramPos ICU/Ward_2017)			
Ceftaroline	Linezolid	Quinupristin/Dalfopristin	Televancin
Dalbavancin	Oritavancin	Tedizolid	Vancomycin
Daptomycin			
Narrow spectrum beta-lactam agents (NSBL ICU/Ward_2017)			
Amoxicillin	Cefadroxil	Cephalexin	Penicillin G
Amoxicillin/Clavulanate	Cefazolin	Dicloxacillin	Penicillin V
Ampicillin	Cefotetan	Nafcillin	
Ampicillin/Sulbactam	Cefoxitin	Oxacillin	
Antibacterial agents posing the highest risk for CDI (CDI ICU/Ward_2017)			
Cefdinir	Cefotaxime	Ceftriaxone	Gemifloxacin
Cefepime	Cefpodoxime	Ciprofloxacin	Levofloxacin
Cefixime	Ceftazidime	Clindamycin	Moxifloxacin
Antifungal agents predominantly used for invasive candidiasis (Antifungal ICU/Ward_2017)			
Anidulafungin	Caspofungin	Fluconazole	Micafungin

39 [NHSN Antimicrobial Use and Resistance \(AUR\) Module Protocol \(cdc.gov\)](#)

39

## Standardized Antimicrobial Administration Ratio (SAAR) Reports

- Standardized Antibiotic Administration Ratio (SAAR) reports can be produced by month, quarter, half year, year or cumulative time periods

National Healthcare Safety Network  
**SAARs Table - All Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets**

As of: November 17, 2015 at 3:10 PM  
 Date Range: All AU\_SAAAR

All antimicrobials used in adult ICUs and wards

Facility Org ID	Summary Yr/Qtr	SAAR Type	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval
13860	2014Q1	IND-Adult-1	4416	4421.364	6326	0.999	0.9437	0.970, 1.029
13860	2014Q2	IND-Adult-1	3998	3856.677	5668	1.037	0.0240	1.005, 1.069
13860	2014Q3	IND-Adult-1	3568	3952.912	5765	0.903	0.0000	0.873, 0.933
13860	2014Q4	IND-Adult-1	6835	5731.061	9247	1.193	0.0000	1.165, 1.221
13860	2015Q1	IND-Adult-1	4060	3113.877	5358	1.304	0.0000	1.264, 1.344

Observed Use ↑ Predicted Use ↑ Calculated SAAR Values ↑

Includes data for January 2014 and forward.  
 Data restricted to medical, medical/surgical and surgical locations.  
 Source of aggregate data: 2014 NHSN AU Data  
 Data contained in this report were last generated on November 11, 2015 at 5:57 PM.

40

40

## Standardized Antimicrobial Administration Ratio (SAAR) Reports

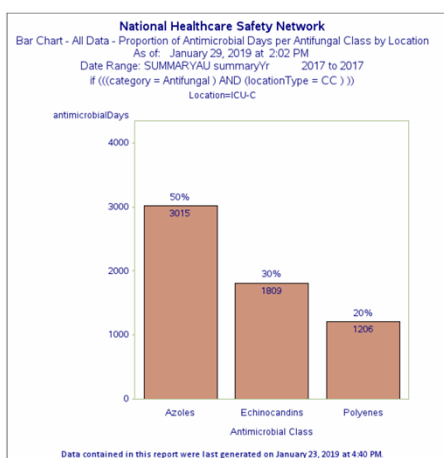
- NOT a measure of appropriateness or judicious antimicrobial use
- SAAR metrics cannot provide clinical context of the prescribing culture at an institution
- SAAR highlights areas of variance/deviation from the expected
- SAAR needs to be combined with onsite clinical context to effectively design interventions

41

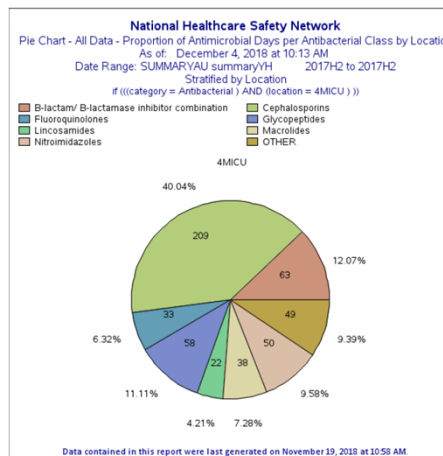
41

## NHSN AU Data Output – Graphical Options

### Bar Charts



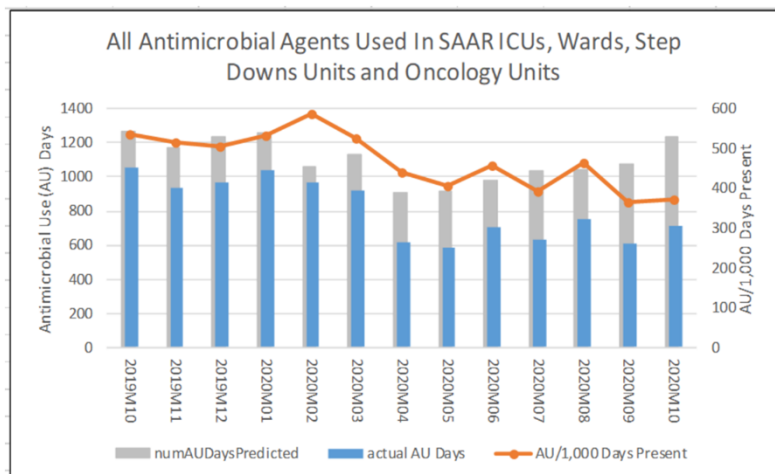
### Pie Charts



42 Fictitious data for illustrative purposes only

42

## AU data can be exported to Excel for chart creation



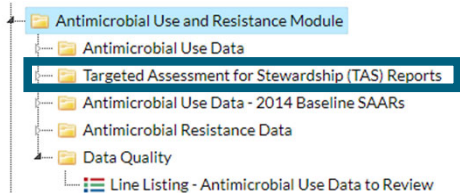
43 Fictitious data for illustrative purposes only

43

## TAS (Target, Assess, Steward) Reports



- Target: Run TAS Reports in NHSN to identify locations for further assessment using the ranked AU cumulative attributable difference (AU-CAD).
- Assess: Utilize assessment tools to identify gaps and opportunities to improve antibiotic use.
- Steward: Implement antibiotic stewardship activities to address gaps and opportunities.
- Note: TAS reports are only available for locations that can generate SAAR values

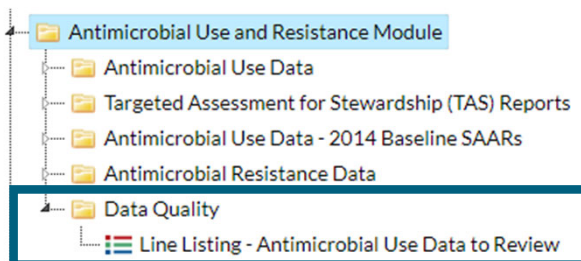


44 [NHSN AU TAS Webinar \(cdc.gov\)](https://www.cdc.gov/nhsn/au-tas-webinar)

44

## Data Quality Line List

- In addition to the Implementation Data Validation Protocol and Annual Data Validation Protocol, NHSN has a report built to help facilities find potential data errors
- Facilities should run this report periodically and follow-up with your vendor to address data quality concerns.
  - Zero or Missing Antimicrobial Days
  - Antimicrobial Days Reported when Patients were Not Present
  - Antimicrobial Days  $\geq$  Days Present
  - Sum of Routes < Total Antimicrobial Days



45 [AU Data Quality Line List \(cdc.gov\)](https://www.cdc.gov/au/data-quality-line-list)

45

## Antibiotic Resistance Option Output

- Line listing
  - Can create a list of AR events by pathogen
  - Can be modified to show additional variables
- Facility-wide antibiogram
  - Limitations
    - Eligible specimen source groups include only blood, CSF, urine, and lower respiratory
    - If antibiotic susceptibilities are suppressed in your facility report, that information may be missing in NHSN



46 [NHSN Antimicrobial Use and Resistance \(AUR\) Module Protocol \(cdc.gov\)](https://www.cdc.gov/nhsn/antimicrobial-use-and-resistance-aur-module-protocol)

46

## Case examples of implementing antibiotic stewardship interventions based on NHSN AU data

47

47

### Case #1 – Potential Antibiotic Overuse identified by high SAAR Values

- You are the antimicrobial stewardship pharmacist for a 100- bed community hospital
- Your facility has started to participate in NHSN AU module, and you now have access to a year’s worth of DOT and SAAR data
- You are looking to utilize the NHSN AU data to decide on the next targeted intervention your antimicrobial stewardship program will implement

48

48



## Case #1

SAAR Metric	Q1 2022	Q2 2022	Q3 2022	Q4 2022
All Antibacterial Agents (FACWIDEIN)	1.13	1.15	1.16	1.13
Antifungal (ICU)	0.92	0.98	1.01	1.34
Antifungal (Ward)	1.21	0.82	0.67	0.73
Broad-Spectrum Hospital Onset (ICU)	1.15	1.24	1.07	1.04
Broad-Spectrum Hospital Onset (Ward)	1.17	1.09	1.08	1.13
Resistant Gram positives (ICU)	1.22	1.36	1.31	1.41
Resistant Gram positives (Ward)	1.47	1.36	1.21	1.56
Narrow Spectrum beta-lactams (ICU)	0.89	0.91	0.90	1.01
Narrow Spectrum beta-lactams (Ward)	1.08	0.97	0.99	1.22

49 Fictitious data for illustrative purposes only

49

## Case #1

Based on the available SAAR data, what would be a reasonable initiative for your antibiotic stewardship team to implement?

- A. Carbapenem restriction criteria
- B. Mandatory ID consult for Staphylococcus aureus bacteremia
- C. Pharmacy-driven MRSA nares PCR screening for patients on empiric anti-MRSA therapy
- D. Prospective audit and feedback targeting fluconazole

50

50

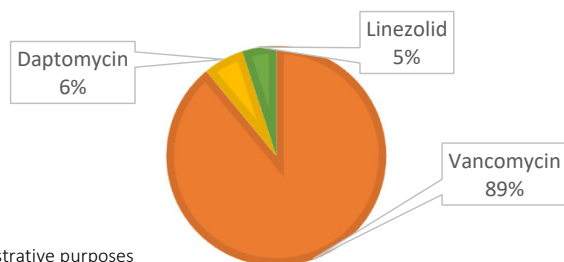
## Case #1

- DOT / 1000 Patient Days can be useful to determine which antimicrobial is driving the elevation in SAAR

Antimicrobial	Days of Therapy per 1,000 Patient Days			
	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Vancomycin	109	104	115	101
Daptomycin	10	9	9	10
Linezolid	5	3	2	5

Based on the available DOT data, which anti-MRSA agent would you focus prospective audit and feedback efforts on?

- A. Vancomycin
- B. Daptomycin
- C. Linezolid



51 Fictitious data for illustrative purposes only

51

## Case #2 – SIR data + SAAR data

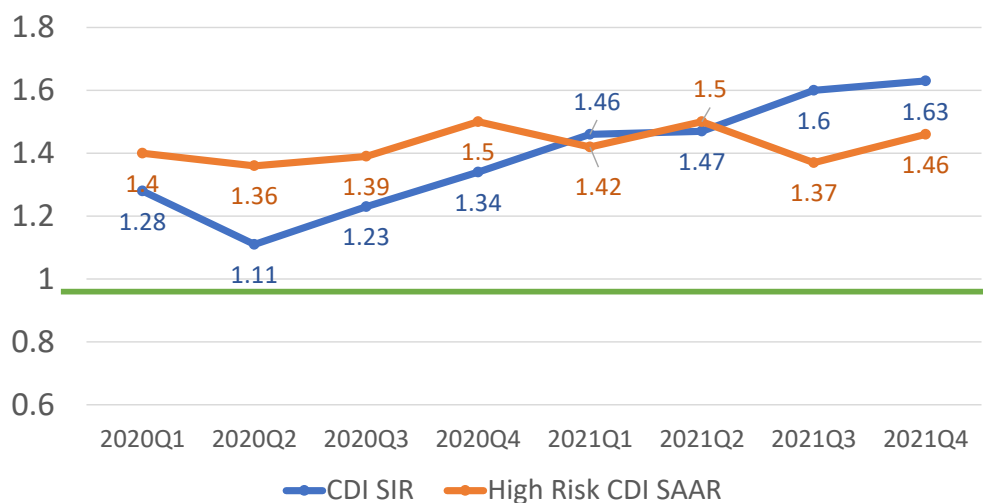
- The hospital’s infection preventionist has shared at the antibiotic stewardship committee meeting that the hospital’s *C diff* SIR has been trending upward over the last 6 months.
- In addition to other hospital-wide efforts (including changes in environmental cleaning, hand hygiene, and *C diff* testing strategies), are there potential ASP initiatives related to antibiotic use that can be identified by the hospital’s NHSN AUR data?

52

52

## Case #2

Hospital A CDI SIR and High Risk CDI SAAR Trends



53 Fictitious data for illustrative purposes only

53

## Case #2

DOT / 1000 Patient Days can be useful to determine which antimicrobial is driving the elevation in SAAR

Antimicrobial	Days of Therapy per 1,000 Patient Days			
	Q1 2021	Q2 2021	Q3 2021	Q4 2021
Ceftriaxone	103	89	96	101
Cefepime	19	22	24	26
Levofloxacin	44	39	40	47

Based on the available DOT data, which high-risk CDI agent(s) would you focus prospective audit and feedback efforts on?

- A. Ceftriaxone
- B. Cefepime
- C. Levofloxacin
- D. Ceftriaxone and Levofloxacin**

54 Fictitious data for illustrative purposes only

54

## Case #2 - Interventions

- Indication is required to be documented on each antibiotic order at your institution
- On review of documented indications for antibiotic orders, it was found that ceftriaxone and levofloxacin were predominantly being used in your facility to treat community-acquired pneumonia and urinary tract infections
- **Community-acquired pneumonia** was chosen as the target for interventions
  - Order sets
    - Long durations of therapy pre-populated (10 days of therapy for community-acquired pneumonia) for both ceftriaxone and levofloxacin
      - Order set durations were adjusted
      - Education was sent to providers recommending shorter courses of 5 days per IDSA guidelines
    - Alternative, lower CDI-risk antibiotics (such as ampicillin-sulbactam) were added to the order set
      - Education given to providers on higher CDI-risk antibiotic choices

55

55

## Case #2 – Goal Setting

- The Antibiotic Stewardship Committee at your institution hopes that these interventions would result in a 20% reduction in the High-Risk CDI SAAR in the 12 months following implementation
- The TAS (Target, Assess, Steward) report within NHSN can help the committee determine how much change is needed in prescribing numbers to achieve their 20% SAAR reduction goal
- To get a SAAR of 1.2 (~20% reduction) your facility would have needed to reduce the use of antimicrobials in the High-Risk CDI antibiotics category by 355 antimicrobial days over the last 12 months

SAARTypeCat	AU-CAD Rank	Facility AU-CAD (Rounded)
ALL	1	1668
NSBL	2	798
GRAMPOS	3	517
BSCA	4	374
CDI	5	355
ANTIFGL	6	150
BSHO	7	77



56 [NHSN AU TAS Webinar \(cdc.gov\)](https://www.cdc.gov/nhsn/au-tas-webinar)

Fictitious data for illustrative purposes only

56

## Case #3

### SAAR ≠ Antimicrobial Appropriateness

- Your antimicrobial stewardship committee is completing their annual review of SAAR data to meet the CDC Core Elements of Tracking and Reporting
- You notice that your facility's usage in the category of narrow spectrum beta-lactam agents was on average 60% higher than your predicted usage in 2022
- You remember that the SAAR is not a measure of appropriateness and decide to investigate

SAAR Metric	Q1 2022	Q2 2022	Q3 2022	Q4 2022
All Antibacterial Agents (FACWIDEIN)	1.13	1.15	1.16	1.13
Narrow Spectrum beta-lactams (ICU)	1.23	1.33	1.26	1.29
Narrow Spectrum beta-lactams (Ward)	1.68	1.55	1.63	1.72

57

Fictitious data for illustrative purposes only

57

## Case #3

### SAAR ≠ Antimicrobial Appropriateness

- Questions to consider
  1. Does our hospital's antibiogram indicate that we should be using narrow-spectrum agents for all patients empirically based on resistance patterns?
  2. Are our antibiotic stewardship team members and hospital providers appropriately de-escalating therapy early to narrow-spectrum agents?
  3. Are we using antibiotics for surgical prophylaxis appropriately?

58

58

## Case #3

# SAAR ≠ Antimicrobial Appropriateness

Question 1:

Does our hospital's antibiogram indicate that we should be empirically using narrow-spectrum agents based on resistance patterns?

NO – 173/613 isolates (28%) of *S. aureus* in 2022 were MRSA.

If patients have specific risk factors for MRSA, anti-MRSA agents should be used empirically. (MRSA rate is >20%)

**Gram Positive Antibiogram**  
 Nebraska Medical Center  
 Jan 1 - Dec 31, 2022  
 Admitted patients only,  
 first isolate per patient

isolates	Ampicillin	Amp/Subactam	Cefazolin (1st Gen)	Cefuroxime-PO (2nd)	Ceftazoxime (3rd)	Cefepime (4th)	Clindamycin	Daptomycin	Erythromycin	Levofloxacin	Linezolid	Meropenem	Mincycline	Nitrofurantoin <sup>o</sup>	Oxacillin <sup>†</sup>	Penicillin	Rifampin <sup>‡</sup>	Sulfa/Trim	Tetracycline	Vancomycin
<b>Staphylococcus aureus</b>	613	0	72	72	73	100	54	76	100					72	21	99	99	93	100	
•Methicillin-resistant <i>S. aureus</i>	173	R	R	R	R	R	61	100	19	32	100	R			R	R	98	97	87	100
Staphylococcus, Coagulase-negat	261	0	44	44	55	100	39	61	100					44	20	98	61	85	100	
•Staphylococcus epidermidis	204	0	33	31	48	100	28	55	100					33	13	98	51	84	100	
Enterococcus faecalis	293	99	99	R	R	R	R	99	32	88	98		100		99		R	30	100	
Enterococcus faecium	116	21	21	R	R	R	R	91	21	22	98		80		19		R	31	48	
•Vancomycin-resistant <i>E. faecium</i>	64	0	0	R	R	R	R	86	27	1	98		80		0		R	20	R	
Viridans Group Streptococci	89	76			95	92	88		47	81	100	100			76			69	100	
Streptococcus pneumoniae <sup>†</sup>	69			76	100	96	90		55	97	78				88		62	79	100	
Streptococcus (Group B) agalactiae <sup>*</sup>	*																			

\*Subset of group above      \* Use caution interpreting results with < 30 isolates      R = Intrinsicly Resistant  
**Bold are drugs of choice empirically**      Blanks indicate not routinely      <sup>o</sup>Rifampin not for monotherapy      <sup>o</sup> NTF tested on Urine isolates only  
<sup>†</sup> 100% for mecA(-) -> oxacillin-susc (MSSA)      <sup>†</sup>Using non-meningitis breakpoints      <sup>‡</sup> GBS tested only in penicillin-allergic OB patients  
 Green background = most likely susceptible, Yellow = possibly susceptible, Red = unlikely to be susceptible (avoid empirically)  
 For more info, including *Candida* results, go to: [www.unmc.edu/asp](http://www.unmc.edu/asp) & select "Antibiograms"

Note: Nebraska Medical Center Antibiogram used for illustrative purposes only for case example

59

59

## Case #3

# SAAR ≠ Antimicrobial Appropriateness

Question 2:

Are our antibiotic stewardship team members and hospital providers appropriately de-escalating therapy early to narrow-spectrum agents?

Yes –

Approximately 20% of ASP interventions are documented as "Streamline Therapy"

This could potentially be contributing to increased use of narrow-spectrum beta-lactam agents.

Intervention	2021	2022
Streamline therapy	134	146
Recommend discontinue antibiotics	66	73
Restricted antimicrobial review	84	96
Recommend ID consult	30	42
Recommend cultures	23	33
Antibiotic dose adjustment	212	263
<b>Total Interventions</b>	<b>549</b>	<b>653</b>

60

Fictitious data for illustrative purposes only

60

## Case #3

### SAAR ≠ Antimicrobial Appropriateness

Question 3:

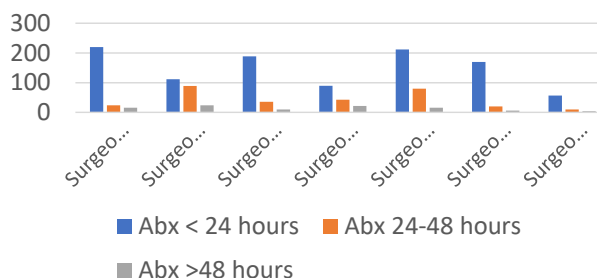
Are we using antibiotics for surgical prophylaxis appropriately?

No!

An EHR usage report shows that post-op antibiotics are commonly prescribed for > 24 hours.

- 400/1,450 patients (28%) received durations of cefazolin >24 hours postop. This likely contributed up to 1,200 excess cefazolin doses in 2022
- Some surgeons have a higher rate of >24-hour post-op prescribing than others
  - (Surgeon 1: 15% vs Surgeon 2: 50%)

Duration of Post-Op Cefazolin Therapy by Surgeon



61

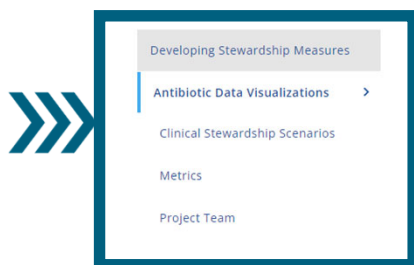
Fictitious data for illustrative purposes only

61



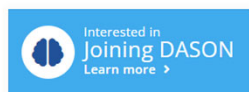
Log In Search

About Member Services Infection Prevention The Center Training eDASON Research & Publications  
 Research & Publications Antibiotic Data Visualizations



### Leveraging National Health Safety Network Antibiotic Use Data to Inform, Implement and Assess Antibiotic Stewardship Activities

Tracking and Reporting antibiotic use are Core Elements of successful hospital stewardship programs. In the 2019 update Hospital Core Elements by the US Center for Disease Control & Prevention, particular emphasis was given to hospitals electronically submitting antibiotic use data to the National Healthcare Safety Network (NHSN) [Antimicrobial Use \(AU\) option](#). Beginning in 2024, this reporting, along with reporting data to the Antimicrobial Resistance (AR) option will become required for hospitals participating in the Centers for Medicare and Medicaid (CMS) [Promoting Interoperability Program](#).



[Leveraging National Health Safety Network Antibiotic Use Data to Inform, Implement and Assess Antibiotic Stewardship Activities | Duke Antimicrobial Stewardship Outreach Network \(DASON\)](#)

62

## What if we still have 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>
  - FAQ: [FAQs: AUR Reporting for the CMS Promoting Interoperability Program | NHSN | CDC](#)
- CMS-related Questions
  - QualityNet help desk: [QnetSupport@cms.hhs.gov](mailto:QnetSupport@cms.hhs.gov) or 1-866-288-8912

63

## Onboarding to the NHSN AUR Module in a Critical Access Hospital



Kelsey Drouhard BSN, RN  
Clinical Informatics

64



## Exclusions

As outlined in the...

- CMS Medicare Program;
- Hospital Inpatient Prospective Payment Systems (IPPS) for Acute Care Hospitals and the Long-Term Care Hospital Prospective Payment System and Policy Changes and Fiscal Year 2023 Rates;
- Quality Programs and Medicare Promoting Interoperability Program Requirements for Eligible Hospitals and Critical Access Hospitals;
- Costs Incurred for Qualified and Non-Qualified Deferred Compensation Plans; and
- Changes to Hospital and Critical Access Hospital Conditions of Participation (IPPS) FY 2023 final rule...

65

## Exclusions

Any eligible hospital or CAH meeting one or more of the following criteria may be excluded from the AUR Surveillance measure if the eligible hospital or CAH:

1. Does not have any patients in any patient care location for which data are collected by NHSN during the EHR reporting period; or
2. Does not have electronic medication administration records (eMAR)/bar coding medication administration (BCMA) records or an electronic admission discharge transfer (ADT) system during the EHR reporting period; or
3. Does not have an electronic laboratory information system (LIS) or electronic ADT system during the EHR reporting period.

Many CAHs are using #3 as their qualifying exception.

At Kingman Healthcare Center, we do have a lab interface with our reference lab (AMS). It does require some additional modification to meet AUR needs but the capability is there so we needed to move forward.

66

## Scoping Validated Vendors

- I spoke to about 5 validated vendors at the time.
  - CDC AU Validated Vendors list: [cdc.gov/nhsn/cdaportal/sds/au-vendor-list.html](https://cdc.gov/nhsn/cdaportal/sds/au-vendor-list.html)
  - CDC AR Validated Vendors list: [cdc.gov/nhsn/cdaportal/sds/ar-vendor-list.html](https://cdc.gov/nhsn/cdaportal/sds/ar-vendor-list.html)
- One particular vendor was working with our hospital EHR already (TruBridge, formerly CPSI).
- We signed with Wolters Kluwer for their Senti7 solution.
  - They offer multiple solutions. The one we picked was a modified, more budget friendly version that meets all the needs of AUR without having to pay for the full suite of offerings.

67

## What Next?

- After signing, my IP nurse logged on to NHSN and submitted our ROI.
- NHSN emails us every so often asking for a status. Even though we are not in production yet, that is okay. We just have to reply with a “status update” to let them know where we are at.

68

## My AUR Implementation Team

- I invite our IT Director, Infection Prevention Nurse and Pharmacy nurse to all of the calls/emails regarding this project. They don't always attend, but it keeps them in the loop.
- We also added in our lab director to our group to help with some modifications required to some of the micro items. (If I had it to do over I would add in lab from the beginning!)
- I maintain responsibility for project implementation.
- Once implementation is complete, our Infection Prevention nurse will be responsible for continued submission of this information.

69

## Barriers

- Project delay due to waiting on development of new functionality in the EHR to meet needs.
- IT testing SFTP files/working out connections
- Changes in project management (vendor side)

70

## My Personal Recommendations

- Don't assume. Ask around! Reach out to the experts until you find an answer or explanation to your questions.
- ALWAYS check with CMS if you plan to use an exclusion.
- Put a team together to approach the project and help gather information.
- If you have not already, start the conversation with your admin team and other decision makers. Make sure they know about the work you are doing for PI requirements and what AUR is.
- Have a plan...but be flexible.
- Check in for updates to try to maintain momentum.
- Don't be afraid to get started! Slow progress is still progress.

71

## Contact Info

Email: [kelsey@kingmanhc.com](mailto:kelsey@kingmanhc.com)

Kelsey Drouhard BSN, RN  
Clinical Informatics



72

## Questions?



## Upcoming Education and Important Dates

- [5/22 KHC Office Hours - Applying High Reliability Concepts in CAHs](#)
- [6/4 KHC KDHE NHSN AUR Webinar Session #2](#)
- [6/18 KHC KDHE NHSN AUR Webinar Session #3](#)
- [6/4 Navigating Rural Health Resources - Navigating the PHQ-9 When a Patient is Experiencing Crisis](#)
- [6/26 KHC Office Hours - Advanced Directives are for the Living - Improving Workflows in Your Organization](#)
- [6/19 IHC Annual Forum - Altoona, IA](#)
- [6/21 Resilience Learning Action Series](#)
- [7/11 Navigating Rural Health Resources - Statewide Farmwork Health Program](#)
- [7/31 Save the Date - KFMC KHA Healthy Equity Webinar - Transportation - Registration Coming Soon](#)
- [8/8 KHC Summit on Quality](#)
- [9/5-9/6 KHA Convention and Trade Show - Overland Park, KS](#)
- [10/30 Kansas Health Equity Summit](#)



Connect with us on:

-  [KHCqi](#)
-  [@KHCqi](#)
-  [Kansas Healthcare Collaborative](#)

→ Find contact info and more at:  
[www.KHOnline.org/staff](http://www.KHOnline.org/staff)

 <b>Malea Hartvickson</b> Executive Director	 <b>Mandy Johnson</b> Senior Director, Programs	 <b>Treva Borchert</b> Director of Operations	 <b>Eric Cook-Wiens</b> Data & Measurement Director
 <b>Liz Warman</b> Quality Improvement Advisor	 <b>Jill Daughhelee</b> Director of Education and Communications	 <b>Azucena Gonzalez</b> Health Care Quality Data Analyst	 <b>Erin McGuire</b> Quality Improvement Advisor
 <b>Jenni Peters</b> Quality Improvement Advisor	 <b>Julia Pyle</b> Quality Improvement Advisor	 <b>Patty Thomsen</b> Quality Improvement Advisor	 <b>Rebecca Wagner</b> Grants Coordinator



75



76