# NHSN Antibiotic Use and Resistance (AUR) Module

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2016 NHSN/EID Workshops

## Objectives

- Review proposed **policies** and reporting requirements pertaining to Antibiotic Stewardship
- List the **CDC core elements** of Antibiotic Stewardship Programs
- Review **Meaningful Use** benefits of participation in the AUR Module
- Identify surveillance packages that have the capacity to submit information to the AUR Module via **CDA**
- Understand **surveillance methodologies** for the National Healthcare Safety Network's (NHSN) AUR Module

## CMS Proposed Rule: Potential Inclusion of NHSN Antimicrobial Use Measure (NQF #2720)

"In the future, we are considering proposing the **NHSN Antimicrobial Use** measure to advance national efforts to reduce the emergence of antibiotic resistance by enabling hospitals and CMS to assess national trends of antibiotic use to facilitate improved stewardship by comparing antibiotic use that hospitals report to antibiotic use that is predicted based on nationally aggregated data. The measure was included on a publicly available document entitled "List of Measures Under Consideration for December 1, 2015," (134) in compliance with section 1890A(a)(2) of the Act. The measure received conditional support, pending CDC recommendation that the measure is ready for use in public reporting as referenced in the MAP 2016 Final Recommendations..."

## CMS Proposed Rule: Infection Prevention and Control and Antibiotic Stewardship Programs (§ 482.42)

"We are proposing revisions to § 482.42 in an effort to further clarify existing requirements and update regulatory language to reflect state-of-the-art practices and terminology. We are also proposing revisions that would **require a hospital to develop and maintain an antibiotic stewardship program** as an effective means to improve hospital antibiotic-prescribing practices and curb patient risk for possibly deadly Clostridium difficile infections (CDIs), as well as other future, and potentially life-threatening, antibiotic-resistant infections. We would promote **better alignment of a hospital's infection control and antibiotic stewardship efforts** with nationally recognized guidelines and heighten the role and accountability of a hospital's governing body in program implementation and oversight."

## Summary of Core Elements of Hospital Antibiotic Stewardship Programs

- **Leadership Commitment**: Dedicating necessary human, financial and information technology resources
- **Accountability**: Appointing a single leader responsible for program outcomes. Experience with successful programs show that a physician leader is effective
- **Drug Expertise**: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
- **Action**: Implementing at least one recommended action, such as systemic evaluation of ongoing treatment need after a set period of initial treatment (i.e. "antibiotic time out" after 48 hours)
- **Tracking**: Monitoring antibiotic prescribing and resistance patterns
- **Reporting**: Regular reporting information on antibiotic use and resistance to doctors, nurses and relevant staff
- **Education**: Educating clinicians about resistance and optimal prescribing

## How Louisiana is Rated in the CDC Prevention Status Report for HAI

- As of July 31, 2015, Louisiana's HAI activities addressed all four prevention areas: HAI partnerships, outbreak response, training, and data validation.

| Rating | Number of HAI prevention areas addressed |
|---|---|
| Green | All four |
| Yellow | Three |
| Red | Two or fewer |

- As of December 2014, 29.5% of acute care hospitals in Louisiana reported having antibiotic stewardship programs that incorporated all 7 core elements deemed critical by CDC (9).

| Rating | Percentage of acute care hospitals with antibiotic stewardship programs |
|---|---|
| Green | ≥75.0% |
| Yellow | 50.0%–74.9% |
| Red | ≤49.9% |

## Antibiotic Use/Resistance (AUR) Vendors

The CDC's National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) Pharmacy Option provides a mechanism for facilities to report antimicrobial use and/or resistance data. The following vendors have expressed interest in providing services and software that will allow participating in the AUR Pharmacy Option through direct reporting.

NHSN AUR Module is listed as an option for public health registry reporting in MU 3 ($$$)!

## Antibiotic Use/Resistance (AUR) Vendors

| Vendor Name | Vendor Contact | Contact E-mail | Actively Reporting Microbial |
|---|---|---|---|
| Asolva, Inc. | Chun Wong | cwong@asolva.com | Yes |
| Atlas Development Corporation | Mark Marostica | mmarostica@atlasph.com | |
| MedMinded™ services from BD | Vikas Gupta | Vikas.gupta@carefusion.com | Yes |
| Cerner | Kelly Luden | Kelly.luden@cerner.com | |
| Epic Systems Corporation | Jim Russell | jrussell@epic.com | Yes |
| Baxter Healthcare/ICNet | Eric Sato | Eric_sato@baxter.com | Yes |
| Intelligent Medical Systems | Darryl Vine MD | Darryl@intelms.com | Yes |
| RL Solutions | Len Georgiou | Jgeorgiou@rlsolutions.com | Yes |
| SafetySurveillor® by Premier | Steve Pennock | Steve_pennock@premierinc.com | |
| Sentri7 by Wolters Kluwer | Sentri7 NHSN | CS-P1S-DL-NHSNInformation@wolterskluwer.com | |
| TheraDoc – Premier | TheraDoc NHSN Team | NHSN@Premierinc.com | Yes |
| Truven Health Analytics | Vicki Faas | Vicki.faas@truvenhealth.com | |
| QC Pathfinder – Vecna Technologies | Jennifer L. Cook | jcook@vecna.com | |
| VigiLanz Corporation | Craig Leischner | CLeischner@vigilanzgcorp.com | Yes |
| WHONET | John Stelling | jstelling@whonet.org | |

# 3402: NHSN Antimicrobial Use & Resistance Module

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**Public Health Analyst**
Contractor for the Division of Healthcare Quality Promotion, CDC

APIC 2016 Annual Conference
Monday, June 13: 1:30 - 2:30pm

*Nothing to disclose*

Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases

## Objectives

- Outline the purpose, features, and benefits of the NHSN AUR Module
- Discuss the requirements for NHSN AUR Module data submission
- Describe the analysis reports currently available within the NHSN AUR Module

## Outline

- Overview of NHSN
- Antimicrobial Use 'AU' Option
  - Standardized Antimicrobial Administration Ratio (SAAR)
- Antimicrobial Resistance 'AR' Option
- Additional Resources

## OVERVIEW OF NHSN

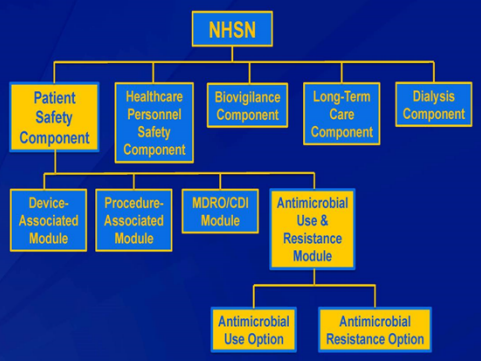
## National Healthcare Safety Network (NHSN)

- A secure, Internet-based surveillance system managed by the CDC
- Collects mandated and voluntarily reported data on:
  - Healthcare-associated infections (HAIs)
  - Antimicrobial use and resistance
  - Healthcare personnel influenza vaccination
  - Blood safety
- Provide facilities with data that can be used for:
  - Recognition of trends
  - Inter-facility comparisons
  - Local quality improvement activities

## NHSN Participation

- Over 18,000 healthcare facilities enrolled in NHSN
  - Acute care hospitals
  - Long term acute care hospitals
  - Inpatient rehabilitation facilities
  - Inpatient psychiatric facilities
  - Outpatient dialysis facilities
  - Ambulatory surgery centers
  - Long term care facilities

## NHSN Structure




## ANTIMICROBIAL USE (AU) OPTION

## NHSN Antimicrobial Use (AU) Option

- Released in 2011
- Purpose:
  - Provide a mechanism for facilities to report and analyze antimicrobial usage as part of antimicrobial stewardship efforts at their facility
  - Allow for risk-adjusted comparison of antimicrobial use to a national aggregate
- Voluntary reporting

## CMS IQR Program Proposed Rule

- CMS Hospital Inpatient Quality Reporting (IQR) Program Proposed Rule
  - Includes request for comment re: NHSN AU Option
  - Comment period closes June 17

**Proposed CMS rule includes antibiotic prescribing measure, open for public comment**

The Centers for Medicare and Medicaid Services (CMS) is inviting the public to comment on proposed rule changes related to hospital payment and quality reporting. One proposed rule is to include hospitals' antibiotic prescribing data to the CMS Hospital Inpatient Quality Reporting (IQR) Program. Hospitals would send their information to CMS through CDC's National Healthcare Safety Network (NHSN) Antimicrobial Use module. They can then compare their antibiotic prescribing to national benchmarks and evaluate and improve antimicrobial prescribing as needed.

NHSN is already used by hospitals, CDC, and CMS to gather and report progress on a number of other quality and safety measures. CMS is proposing the NHSN Antimicrobial Use measure to further advance national efforts combating antibiotic resistance. Evidence shows that programs dedicated to optimizing inpatient antibiotic prescribing, known as antimicrobial stewardship programs (ASPs), can slow the emergence of antibiotic resistance and improve both appropriateness of antimicrobial use and patient outcomes.

By commenting on proposed rules, members of the public play an important role in the rulemaking process. Comments must be received no later than 5 p.m. EDT on June 17, 2016.

- Proposed CMS rules open for public comment: https://federalregister.gov/a/2016-09120
- NHSN Antimicrobial Use Measure summary (NQF #2720): http://www.qualityforum.org/Measures_Reports_Tools.aspx
- CDC's NHSN Antimicrobial Use and Resistance (AUR) Module: http://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html
- CMS's Hospital IQR Program: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalIRHQDAPU.html

## Meaningful Use (MU) Stage 3

- NHSN AUR Module listed as option for public health registry reporting in MU 3
- Monthly data for both AU and AR Option required
- Timeline
  - Summer 2016: NHSN declaration of readiness
  - January 2017: MU 3 Option Year 1
  - January 2017: NHSN facilities can register intent & begin submitting data
  - January 2018: Submission required for MU 3 participants
- Important note: AUR Module is only part of NHSN that qualifies for MU 3

MU 3 Final Rule:
https://www.federalregister.gov/articles/2015/10/16/2015-25595/medicare-and-medicaid-programs-electronic-health-record-incentive-program-stage-3-and-modifications

## Requirements for AU Data Submission Who Can Participate?

- Hospitals* that have:
  - Electronic Medication Administration Record (eMAR), or
  - Bar Coding Medication Administration (BCMA) systems

  AND
  - Ability to collect and package data using HL7 standardized format: Clinical Document Architecture
    - Participating 3rd party vendors: http://www.sidp.org/aurvendors
    - "Homegrown" vendors

*General acute care hospitals, long-term acute care hospitals (LTAC), inpatient rehabilitation facilities (IRF), oncology hospitals, critical access hospitals enrolled in NHSN

## AU Data Elements
## What Data Are Collected?

- **Monthly aggregate, summary-level data**
  - All inpatient locations individually & combined (FacWideIN)
  - 3 outpatient locations (ED, pediatric ED, 24 hour observation)
- **Numerator: Antimicrobial days (Days of Therapy)**
  - 89 antimicrobials – includes antibacterial, antifungal, and anti-influenza agents
    - Sub-stratified by route of administration:
      - Intravenous (IV)
      - Intramuscular (IM)
      - Digestive (oral)
      - Respiratory (inhaled)
- **Denominators:**
  - Days Present - number of days spent in specific unit or facility
    - Days present ≠ Patient days
  - Admissions - number of patients admitted to the facility

## What is Clinical Document Architecture (CDA)?

- **Standard that specifies:**
  - Structure and semantics of a clinical document
  - For information exchange between systems
- **HL7 (Health Level 7) provides an Implementation Guide**
  - "How to…"
- **Used for importing Antimicrobial Use, Antimicrobial Resistance, and Healthcare Associated Infection data into NHSN**

## AU Data from eMAR/BCMA to CDA

1. **eMAR/BCMA captures drug administration**
2. **Vendor or 'homegrown' system extracts and aggregates data elements**
   a) eMAR/BCMA administration data
   b) ADT (admission, discharge, transfer data)
3. **"Package" AU data into CDA files using an XML format**

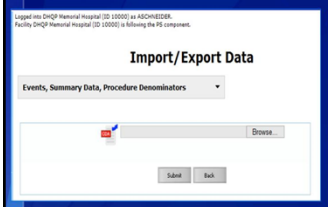

```
    <!-- stratified data: Drug + route -->
- <entryRelationship typeCode="COMP">
  - <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.5.6.69"/>
      <code code="2524-7" displayName="Number of Therapy Days" codeSystemName="cdcNHSN" codeSystem="2.16.840.1.113883.6.277"/>
      <statusCode code="completed"/>
      <value value="0" unit="d" xsi:type="PQ"/>
      <methodCode code="2523-9 " displayName="Respiratory tract route" codeSystemName="cdcNHSN" codeSystem="2.16.840.1.113883.6.277"/>
        <!-- how actually administered -->
    - <participant typeCode="CSM">
          <!-- antimicrobial Drug -->
      - <participantRole classCode="MANU">
          <code code="641" displayName="Amikacin" codeSystemName="RxNorm" codeSystem="2.16.840.1.113883.6.88"/>
        </participantRole>
      </participant>
    </observation>
  </entryRelationship>
```

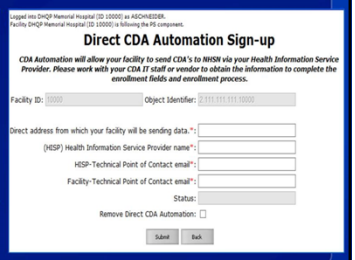

## Monthly AU Data Submission

- **Recommend: Upload within 30 days following the completion of the month**
- **1 CDA file per location & 1 CDA file for FacWideIN**
  - Example for a facility with 5 locations
    - 1 CDA for Adult Medical/Surgical ICU
    - 1 CDA for Adult Medical/Surgical Ward
    - 1 CDA for Pediatric Medical/Surgical Ward
    - 1 CDA for Labor & Delivery Ward
    - 1 CDA for Emergency Department
    - 1 CDA for FacWideIN (combination of all 4 inpatient locations above)
  - Each single CDA file contains numerator and denominator(s) for the given location
  - All CDA files are uploaded within 1 Zip file

## Importing CDA Files into NHSN

- Manual upload
- Automatic upload from vendor/IT solution using DIRECT CDA Automation




## Flow of AU Data: From Bedside to NHSN

eMAR/BCMA & ADT

→

Vendor/Homegrown System
- Monthly summary
- Location specific & FacWideIN
  - 89 antimicrobials
  - Days present & admissions

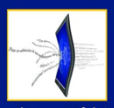
→

Report in standard format

↓

NHSN Servers

←

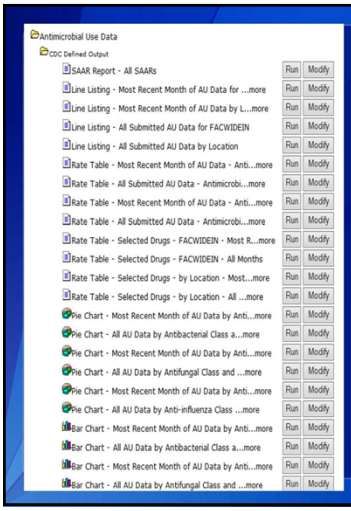


Local access of data: NHSN web interface – analysis, visualization and data sharing

←

Pharmacists & Physicians compare and target education/ interventions

New: Risk adjusted comparisons for specific locations, groupings of antimicrobials




## AU Option – NHSN Analysis Output Options

- Basic analysis output options available
  - Line lists
  - Rate tables
  - Pie charts
  - Bar charts
  - SAAR (Standardized Antimicrobial Administration Ratio)

## AU Option – Line List by Location

National Healthcare Safety Network
Line Listing - Most Recent Month of AU Data by Location
As of: February 20, 2015 at 5:01 PM
Date Range: All SUMMARYAU1MONTH

Location=MICU

| Facility Org ID | Summary Year/Month | Antimicrobial Agent Decription | Location | Days Present | Antimicrobial Days | Route: IM | Route: IV | Route: Digestive | Route: Respiratory |
|---|---|---|---|---|---|---|---|---|---|
| 13860 | 2015M01 | AMAN - Amantadine | MICU | 421 | 0 | 0 | 0 | 0 | 0 |
| 13860 | 2015M01 | AMK - Amikacin | MICU | 421 | 2 | 0 | 2 | 0 | 1 |
| 13860 | 2015M01 | AMOX - Amoxicillin | MICU | 421 | 0 | 0 | 0 | 0 | 0 |
| 13860 | 2015M01 | AMOXWC - Amoxicillin with Clavulanate | MICU | 421 | 0 | 0 | 0 | 0 | 0 |
| 13860 | 2015M01 | AMP - Ampicillin | MICU | 421 | 4 | 0 | 4 | 0 | 0 |

- Sample line list of the most recent month of AU data by location
  - Generates a list of each antimicrobial separated by location
  - Shows total antimicrobial days, days present and sub-stratification of routes of administration for each antimicrobial

*Data for example only

## AU Option – Rate Table by Facility-Wide Inpatient

National Healthcare Safety Network
Rate Table - Most Recent Month of AU Data - Antimicrobial Utilization Rates for FACWIDEIN
Rate per 1,000 Days Present
As of: February 23, 2015 at 1:44 PM
Date Range: All AU_RATE51MONTHFACWIDEIN

Facility Org ID=13860

| Summary Year/Month | Antimicrobial Category | Antimicrobial Class | Antimicrobial Days | Days Present | Rate per 1000 Days Present |
|---|---|---|---|---|---|
| 2015M01 | Antibacterial | -- All -- | 1626 | 2177 | 746.899 |
| 2015M01 | Antibacterial | Aminoglycosides | 22 | 2177 | 10.106 |
| 2015M01 | Antibacterial | Carbapenems | 101 | 2177 | 46.394 |
| 2015M01 | Antibacterial | Cephalosporins | 337 | 2177 | 154.8 |
| 2015M01 | Antibacterial | Fluoroquinolones | 244 | 2177 | 112.081 |
| 2015M01 | Antibacterial | Folate pathway inhibitors | 32 | 2177 | 14.699 |

- **Sample rate table for all submitted AU data by FacWideIN (all inpatient locations reporting AU data)**
  - Generates a rate of utilization per 1,000 days present for each antimicrobial class for all inpatient locations combined

*Data for example only

## AU Option – Rate Table by Location by Selected Antimicrobial

National Healthcare Safety Network
Rate Table - Selected Drugs from Most Recent Month of AU Data - Antimicrobial Utilization Rates by Location
Rate per 1,000 Days Present
As of: July 22, 2015 at 2:00 PM
Date Range: All AU_DRUGRATE51MONLOCATION
# (@drugIngredientDesc = "LNZ" ) ) )

orgID=13860 locCDC=IN:ACUTE:CC:M location=MICU

| summaryYM | antimicrobialDays | numDaysPresent | RateDaysPresent |
|---|---|---|---|
| 2015M01 | 8 | 421 | 19.00 |

National Healthcare Safety Network
Rate Table - Selected Drugs from Most Recent Month of AU Data - Antimicrobial Utilization Rates by Location
Rate per 1,000 Days Present
As of: July 22, 2015 at 2:00 PM
Date Range: All AU_DRUGRATE51MONLOCATION
# (@drugIngredientDesc = "LNZ" ) ) )

orgID=13860 locCDC=IN:ACUTE:CC:MS location=MSICU

| summaryYM | antimicrobialDays | numDaysPresent | RateDaysPresent |
|---|---|---|---|
| 2015M01 | 2 | 279 | 7.17 |

- **Sample rate table for selected antimicrobial(s) by location**
  - Generates a rate of utilization per 1,000 days present for each antimicrobial selected on the modification screen separated by location for the most recent month of data imported
  - Report can be generated to include any number of antimicrobials from multiple antimicrobial classes

*Data for example only

# STANDARDIZED ANTIMICROBIAL ADMINISTRATION RATIO (SAAR)

## Standardized Antimicrobial Administration Ratio (SAAR)

SAAR is an Observed-to-Expected (O-to-E) ratio

- **Observed antibacterial use –** Days of therapy reported by a healthcare facility for a specified category of antimicrobial agents in a specified patient care location or group of locations
- **Predicted antibacterial use –** Days of therapy predicted on the basis of nationally aggregated AU data for a healthcare facility's use of a specified category of antimicrobial agents in a specified patient care location or group of locations

Detailed information on the SAAR can be found in the NHSN AUR Module Protocol: http://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf.

## Interpreting the SAAR

**The SAAR is a ratio with values greater than or equal to 0.**

- A high SAAR (above 1.0) that achieves statistical significance (i.e., different from 1.0) indicates more antimicrobial use than expected (predicted)
- A low SAAR (below 1.0) that achieves statistical significance indicates antimicrobial use is less than expected (predicted)
- A SAAR that is not statistically different from 1.0 indicates antibacterial use is equivalent to the referent population's antibacterial use

**Note**: A SAAR alone is not a definitive measure of the appropriateness or judiciousness of antibacterial use, and any SAAR may warrant further investigation. For example, a SAAR that is not statistically significant may still indicate under or over use. Likewise, investigation into a statically significant SAAR may not yield actionable results.

## Patient Care Locations Used for the SAARs

SAARs are generated for antimicrobial use in six specified groupings of adult and pediatric patient care locations:

1. Adult medical, surgical, and medical/surgical intensive care units
2. Adult medical, surgical, and medical/surgical wards
3. Pediatric medical, surgical, and medical/surgical intensive care units
4. Pediatric medical, surgical, and medical/surgical wards
5. All adult medical, medical/surgical, and surgical intensive care units and wards
6. All pediatric medical, medical/surgical, and surgical intensive care units and wards

## Five Antibacterial Agent Categories Used for the SAARs*

**High value targets for antimicrobial stewardship programs:**

1. **Broad spectrum agents predominantly used for hospital-onset/multi-drug resistant bacteria** – aminoglycosides, carbapenems (except ertapenem), 4th and 5th gen. cephalosporins, penicillin B-lactam/b-lactamase inhibitor combinations, and other agents
2. **Broad spectrum agents predominantly used for community-acquired infection** – Ertapenem, some cephalosporins, and some fluroquinolones
3. **Anti-MRSA agents** – Ceftaroline, Dalbavancin, Daptomycin, Linezolid, Oritavancin, Quinupristin/Dalfopristin, Tedizolid, Telavancin, and Vancomycin
4. **Agents predominantly used for surgical site infection prophylaxis** – Cefazolin, Cefotetan, Cefoxitin, Cefuroxime, and Cephalexin

**High level indicators for antimicrobial stewardship programs:**

5. **All antibacterial agents** – All antibacterial agents included in NHSN AUR protocol

*A complete list of all antimicrobials used in each SAAR can be found here: http://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf

## SAARs for High Value Targets

**SAARs for broad spectrum antibacterial agents predominantly used for hospital-onset/multidrug resistant infections:**

1. Adult medical, medical/surgical, and surgical ICUs
2. Adult medical, medical/surgical, and surgical wards
3. Pediatric medical, medical/surgical, and surgical ICUs
4. Pediatric medical, medical/surgical, and surgical wards

**SAARs for broad spectrum antibacterial agents predominantly used for community-acquired infections:**

5. Adult medical, medical/surgical, and surgical ICUs
6. Adult medical, medical/surgical, and surgical wards
7. Pediatric medical, medical/surgical, and surgical ICUs
8. Pediatric medical, medical/surgical, and surgical wards

## SAARs for High Value Targets (continued)

**SAARs for anti-MRSA antibacterial agents:**

9. Adult medical, medical/surgical, and surgical ICUs
10. Adult medical, medical/surgical, and surgical wards
11. Pediatric medical, medical/surgical, and surgical ICUs
12. Pediatric medical, medical/surgical, and surgical wards

**SAARs for antibacterial agents predominantly used for surgical site infection prophylaxis:**

13. Adult ICUs and wards (medical, medical/surgical, and surgical)
14. Pediatric ICUs and wards (medical, medical/surgical, and surgical)

## High Level Indicator SAARs

**SAARs for all antibacterial agents:**

15. Adult ICUs and wards (medical, medical/surgical, and surgical)
16. Pediatric ICUs and wards (medical, medical/surgical, and surgical)

## SAAR Output in NHSN

**National Healthcare Safety Network**

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

As of: April 18, 2016 at 4:14 PM
Date Range: All AU_SAAR

SAAR Title

**Antimicrobials used for hospital-onset/multi-drug resistant infections in adult wards**

| orgID | summaryYQ | SAARType | antimicrobialDays | numAUDaysPredicted | numDaysPresent | SAAR | SAAR_pval | SAAR95CI |
|---|---|---|---|---|---|---|---|---|
| 13860 | 2014Q1 | TAR-Adult-2 | 151 | 391.046 | 3526 | 0.396 | 0.0000 | 0.337, 0.463 |
| 13860 | 2014Q2 | TAR-Adult-2 | 175 | 373.157 | 3453 | 0.469 | 0.0000 | 0.403, 0.542 |
| 13860 | 2014Q3 | TAR-Adult-2 | 131 | 370.239 | 3426 | 0.354 | 0.0000 | 0.297, 0.418 |
| 13860 | 2014Q4 | TAR-Adult-2 | 580 | 518.920 | 4751 | 1.118 | 0.0089 | 1.029, 1.212 |
| 13860 | 2015Q1 | TAR-Adult-2 | 789 | 512.183 | 4658 | 1.540 | 0.0000 | 1.436, 1.651 |
| 13860 | 2015Q2 | TAR-Adult-2 | 60 | 122.332 | 1132 | 0.490 | 0.0000 | 0.378, 0.627 |

Observed Use
Predicted Use (SAAR Denominator)
Rate
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 March 15, 2016 at 10:33 AM.

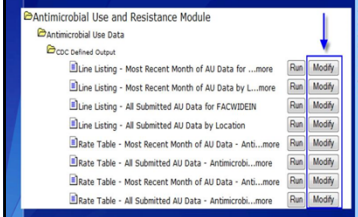
Denominator

- Sample SAAR table for HO/MDRO antimicrobials used in adult medical, surgical, and medical/surgical ward locations submitting AU data from the facility
  - SAARs are generated per quarter
  - Includes to total observed antimicrobial days and the predicted antimicrobial days that are used to calculate the SAAR values

*Data for example only

## AU Option – Additional Analysis Options

- Modify NHSN reports
- Export data from NHSN
  - Excel, CSV, Access, SAS, TXT, and DBF

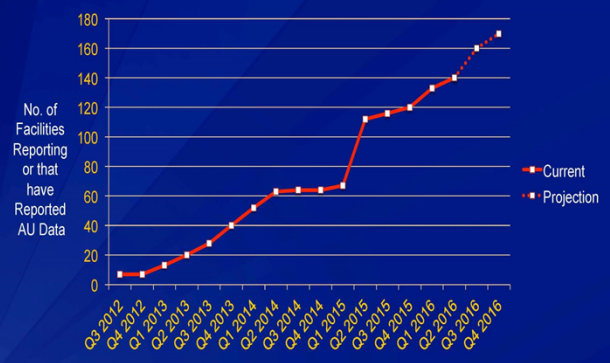


## AU Option Submission Metrics

- **138 facilities submitted at least 1 month of data**
  - From 30 states: AZ, CA, CO, CT, FL, IA, ID, IL, IN, KS, KY, MA, MI, MN, MO, NC, ND, NE, NM, NY, OH, OK, OR, RI, SD, TN, TX, UT, VA, WI
  - Bed size:
    - Average = 228
    - Median = 209
    - Min/Max = 11, 919
  - 60% teaching hospitals
    - 58% major teaching
  - 92% facility submission part of health system submission or large academic medical center
  - Using 6 vendors and 'homegrown' systems
- **Working with additional groups to continue to grow submission during 2016 and 2017**

*As of May 2016

## Quarterly Submission to NHSN AU Option*




*As of May 2016

## Steps for Facility Participation in NHSN AU Option

- **Must have eMAR/BCMA**
- **Identify facility lead(s) for AU Option**
- **Gain support!**
- **Obtain/develop system for collecting/packaging eMAR/BCMA data into CDA**
  - Vendor or 'Homegrown' approach
- **Validation**
  - Review internal EHR data & compare to vendor data
  - Collaborate with vendor
- **Monthly submission**

## AU Option Implementation Lessons Learned

- **Nothing is one size fits all**
  - Time to connect eMAR/BCMA to vendor systems
  - Different types of connections for different vendor/facility pairs
  - Ability for eMAR/BCMA system to capture data
- **Importance of validation**
  - Discrepancies in denominator data from different systems
  - Even more important since data is electronic submission only
- **Importance of facility buy in & working together**
  - Support needed from various different departments of the facility

## AU Option Implementation Lessons Learned (continued)

- **Patience**
  - New type of (non-mandated) reporting into NHSN
  - Takes time to work out the bugs
- **Ask around**
  - Knowledge gained from other facilities
  - Collaboration with experienced NHSN users within the facility
- **Speak up!**
  - Ask your vendor about product availability
  - Express the need for participation to facility leadership
  - Don't settle for bad data

## ANTIMICROBIAL RESISTANCE (AR) OPTION

## Antimicrobial Resistance Data in NHSN

| | AR Option | MDRO Module | Device & Procedure-Associated Modules |
|---|---|---|---|
| **Events reported** | AR Events from blood, CSF, urine, & lower respiratory specimens | Laboratory Identified (LabID) & Infection Surveillance Events | CLABSI, CAUTI, pedVAP, VAE, SSI Events |
| **Type of susceptibility data** | 19 specific organisms; detailed lab test results & final interpretation | Positive specimens (i.e., MRSA, CDI, CRE) defined by NHSN criteria | Susceptibility results for specific antibiotics |
| **Benefits** | Wide-spread, 'whole-house' coverage; no manual entry | Simplified reporting; LabID MRSA & CDI national benchmarks | Infection control software; data can be manually entered; national AR data published (%resistance) |
| **Drawbacks** | Requires set-up by vendor/ homegrown system | Small number of organisms followed | Only get susceptibility info for events that meet NHSN definitions |

## Antimicrobial Resistance (AR) Option

- **Released in July 2014**
- **Purpose:**
  - Facilitate evaluation of antimicrobial resistance data using standardized approach
  - Provide facilities with improved awareness of a variety of AR issues to aid in clinical decision making and prioritize transmission preventions efforts
- **Voluntary reporting**

## Requirements for AR Data Submission Who Can Participate?

- **Hospitals* that have:**
  - Electronic Laboratory Information System (LIS) and
  - Admission Discharge Transfer (ADT) System
  - *Or electronic access to required data elements*

  AND

  - Ability to collect and package data using HL7 standardized format: Clinical Document Architecture
    - 3rd party vendor or "Homegrown" solution

*General acute care hospitals, long-term acute care hospitals, inpatient rehabilitation facilities, oncology hospitals, critical access hospitals enrolled in NHSN

## AR Data Elements What Data Are Collected?

- **Numerator: Patient-level susceptibility results for 19 specific organisms**
  - DOB, gender, date admitted to facility, location
  - Specimen collection date, specimen source
    - Blood, cerebral spinal fluid (CSF), urine, lower respiratory
  - Organism & antimicrobial susceptibility data for each antimicrobial required for the isolated organism/specimen type
    - Values for E-test, MIC, or Zone
    - Final lab interpretation
      - S, S-DD, I, R, NS, N
- **Denominator: Patient days & admissions (facility-wide only)**

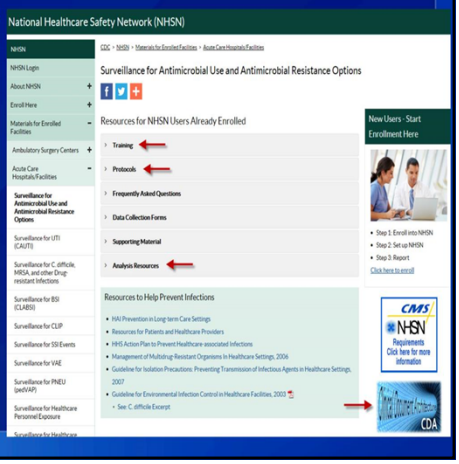
## AR Option Implementation Lessons Learned

- **Nothing is one size fits all**
  - Labs have different testing practices
- **Access to data**
  - Vendors pulling susceptibility data from EHR
  - Suppression of results
- **Importance of facility buy in & working together**
  - Support needed from various different departments of the facility
- **Speak up!**
  - Ask your vendor about product availability
  - Express the need for participation to facility leadership
  - Don't settle for bad data

## ADDITIONAL RESOURCES

## NHSN AUR Module Resources

- NHSN AUR Module webpage: http://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html




## NHSN AUR Module Resources (continued)

- NHSN AUR Protocol:
  - http://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf
- Intro to NHSN AUR Module Training Slides:
  - http://www.cdc.gov/nhsn/PDFs/training/AUR-training.pdf
- NHSN AU Option Analysis Quick Reference Guides:
  - http://www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html
- NHSN CDA Submission Support Portal:
  - http://www.cdc.gov/nhsn/cdaportal/index.html
- NHSN Helpdesk:
  - NHSN@cdc.gov
- NHSN CDA Helpdesk (technical questions):
  - NHSNCDA@cdc.gov

## Confer Rights to Infectious Disease Epidemiology's NHSN Group for Technical Support

- NHSN Group #15156 is maintained by Infectious Disease Epidemiology for user support of NHSN-reporting facilities
- To confer rights:
  - NHSN Facility Administrator accesses Groups > Confer Rights in the AUR Module
  - Group #15156
  - Joining password: maladies

| Benefits |
| --- |
| Generating reports for AUR-reporting facilities |
| Support of the Louisiana Antibiogram |
| Infectious disease surveillance support |
| Shared patient safety goals |
| Confidential with no hospital-level reporting |

## Contact

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