



# Standardized Antimicrobial Administration Ratio (SAAR) Part One

2019 Quick Learn Series

# Target Audience

- Facilities (or NHSN users) with access to data to the Antimicrobial Use (AU) Option in NHSN
- Any user interested in learning more about the Standardized Antimicrobial Administration Ratio (SAAR)

## Purpose

- Introduce updates to the SAAR, including new drug categories and locations
- Describe where to find a SAAR report in NHSN
- Compare the 2017 baseline SAAR to the original SAAR metric, which was calculated using 2014 baseline data

# SAAR Learner Objectives

- After viewing this Quick Learn, the learner will be able to:
  - Describe the components and utility of the SAAR metric
  - Summarize the differences between the 2014 baseline and 2017 baseline SAARs
  - Identify where to find the SAAR reports within the NHSN application

## Important Note

- Topics not covered in this Quick Learn:
  - How to run, interpret, and modify a SAAR report
    - See SAAR Part Two Quick Learn under training resources <https://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html>
  - SAAR methodology (see Antimicrobial Use and Resistance (AUR) Module Protocol: <https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>)
  - In-depth statistical explanation of the SAAR (see video presentation under training resources <https://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html>)

# What is a SAAR?

- SAAR Definition

- Standardized risk-adjusted metric of antibiotic use
- Available to facilities reporting to the AU Option in NHSN
- Compares observed to predicted days of antimicrobial use

$$\frac{\text{Observed}}{\text{Predicted}} = \frac{100 \text{ antimicrobial days observed}}{85 \text{ antimicrobial days predicted}} = 1.176$$

## SAAR Definition continued

1

$$\frac{\text{Observed}}{\text{Predicted}} = \frac{100 \text{ antimicrobial days observed}}{85 \text{ antimicrobial days predicted}} = 1.176$$

**Observed number of antimicrobial days**  
is how many days the facility administered  
antimicrobial agents to patients in a given location

## SAAR Definition continued

2

$$\frac{\textit{Observed}}{\textit{Predicted}} = \frac{100 \textit{ antimicrobial days observed}}{85 \textit{ antimicrobial days predicted}} = 1.176$$

**Predicted number of antimicrobial days** are calculated using statistical models based on nationally aggregated data

# Interpreting a SAAR value

A SAAR value:

- **<1.0** May indicate antimicrobial under use
- **=1.0** The same antimicrobial use as predicted
- **>1.0** May indicate antimicrobial over use

**Note:** A SAAR is not a definitive measure of appropriateness of antimicrobial use; any SAAR value may warrant additional investigation

# Value of SAAR Reports

Used for 

- Public health disease surveillance
- Quality improvement (internal to a specific organization)
- Quality improvement (external benchmarking involving multiple organizations)

Not used for 

- Public reporting
- Payment programs
- Regulatory and accreditation programs

## Using the SAAR to drive action:

- Identify which locations may require additional support or resources
- Measure progress of targeted interventions
- Understand how antimicrobial use compares to use in similar locations
- Set stewardship goals

## 2014 Baseline SAAR

- SAAR initially based on 2014 NHSN aggregate AU data
- Models estimate the number of predicted antimicrobial days
- Models available for:
  - Six location groupings
  - Five antibiotic groups
    - *Does not include antifungal or anti-influenza agents*

**To learn more visit:** <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/saar-2014-508.pdf>

# 2014 Baseline SAAR continued

- 6 Location Groupings
  - Adult Medical, Medical/Surgical, and Surgical ICUs
  - Adult Medical, Medical/Surgical, and Surgical Wards
  - Pediatric Medical, Medical/Surgical, and Surgical ICUs
  - Pediatric Medical, Medical/Surgical, and Surgical Wards
  - All Adult Medical, Medical/Surgical, and Surgical ICUs and Wards
  - All Pediatric Medical, Medical/Surgical, and Surgical ICUs and Wards

**Note:** AU data uploaded for other location types are not included in the 2014 SAARs but can be analyzed using other AU reports.

## Updating the SAAR

- Increased use of AUR Module has led to more diversity in size, acuity and types of patient care locations of submitting hospitals
- New models allow:
  - Assessment of AU risk in more settings
  - Updates to antimicrobial groupings
  - More precise predicted values

# 2017 Baseline SAAR – Antimicrobial Categories

- Models available for 15 antimicrobial categories
- New SAAR categories include:
  - Narrow spectrum beta-lactam agent category
  - Antifungal agent category
  - Azithromycin category for pediatric patient care locations
  - Antibiotics posing highest risk for *Clostridioides difficile* infection\*
- All 2014 SAAR categories updated

\*includes antimicrobials found in other SAAR categories

Complete list of antimicrobial  
categories available in AUR  
Module protocol

# 2017 Baseline SAAR – Locations

- 13 location types modeled separately
  - 8 Adult
  - 5 Pediatric

## Adult Location

- Medical Critical Care
- Surgical Critical Care
- Medical-Surgical Critical Care
- Surgical Ward
- Medical Ward
- Medical-Surgical Ward
- Oncology General Hematology-Oncology Ward
- Adult Stepdown Unit

## Pediatric Locations

- Pediatric Medical Critical Care
- Pediatric Medical-Surgical Critical Care
- Pediatric Medical Ward
- Pediatric Surgical Ward
- Pediatric Medical-Surgical Ward

# Risk Adjustments\* 2014 baseline vs. 2017 baseline

Factor	Risk Adjustments 2017 Baseline	Risk Adjustments 2014 Baseline
Location Type	X	X
Facility Type	X	
Location Type with Facility Type	X	
Medical School Affiliation	X	X
Total Number of Hospital Beds	X	X
Total Number of Hospital ICU Beds	X	X
★ Percentage of Hospital Beds that are ICU Beds	X	
★ Average Hospital Length of Stay	X	
Interaction of Location type and ICU		X
Location Bed Size		X

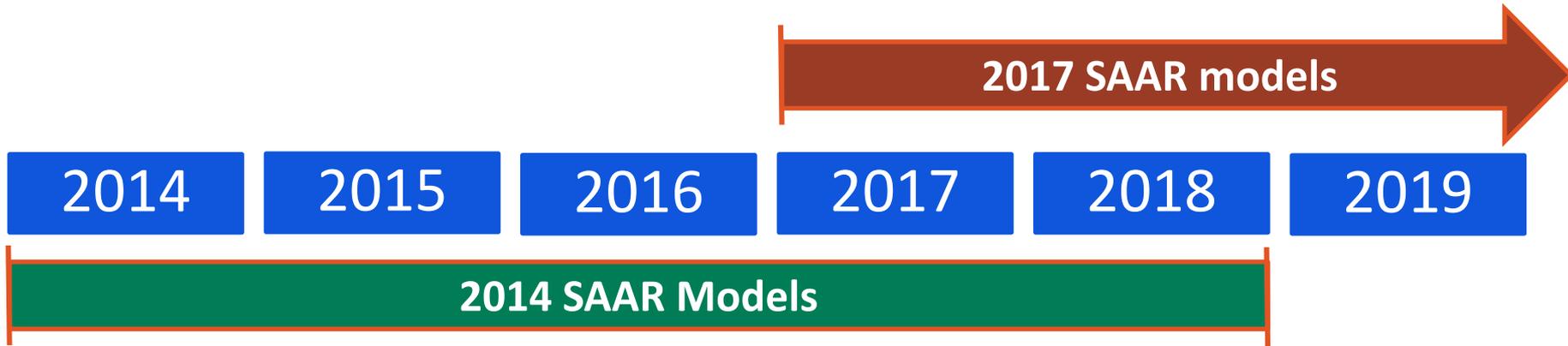
\*Within each baseline time period, risk adjustments vary within specific antimicrobial SAAR categories

Review resources at the end of this presentation for more information on the 2017 and 2014 baseline

# 2014 vs. 2017 Standardized Antimicrobial Administration Ratio (SAAR)

Characteristic	2014 SAAR	2017 SAAR
Referent Group (AKA baseline)	2014 aggregate data	2017 aggregate data
Number of antimicrobial categories	5 categories	★ 15 categories
Antimicrobials included	Antibiotics only	Antibiotics, antifungals
Number of locations	6 groupings	★ 13 locations

# For what years can SAARs be calculated?



**Note:** SAARs calculated under the 2014 baseline cannot be directly compared with 2017 baseline SAAR values.

**Finding SAAR Reports**

# Generate Data Sets

**NHSN Home**

- Alerts
- Dashboard ▶
- Reporting Plan ▶
- Patient ▶
- Event ▶
- Procedure ▶
- Summary Data ▶
- Import/Export
- Surveys ▶
- Analysis ▶**
- Users ▶
- Facility ▶
- Group ▶
- Tools ▶
- Logout

**Generate Data Sets (Patient Safety)**

**Reporting Data Sets**

Include data for the following time period:

Beginning: 01/2016 1 mm/yyyy 1 Ending: mm/yyyy 1

**Generate Reporting Data Sets**

**Clear Time Period**

**Last Generated:**  
October 28, 2019 3:54 PM  
to include data beginning 01/2019

**Generate Data Sets**

- Reports
- Statistics Calculator

# Where to find the 2017 baseline SAAR Reports:

The screenshot shows the NHSN Analysis Reports interface. On the left is a navigation menu with the following items: NHSN Home, Alerts, Dashboard, Reporting Plan, Patient, Event, Procedure, Summary Data, Import/Export, Surveys, Analysis, Users, Facility, Group, and Logout. The 'Analysis' menu item is highlighted with a red callout '1' and a mouse cursor. The main content area is titled 'Analysis Reports' and contains a search bar and two buttons: 'Expand All' and 'Collapse All'. Below these are several expandable folders. A red callout '2' points to the 'Reports' link in a sub-menu that appears when 'Generate Data Sets' is selected. A red callout '3' points to the 'Antimicrobial Use and Resistance Module' folder. A red callout '4' points to the 'Antimicrobial Use Data' folder, which is highlighted in blue. Underneath this folder, the 'Antimicrobial Use Data - 2014 Baseline SAARs' folder is visible.

**1** Analysis

**2** Reports

**3** Antimicrobial Use and Resistance Module

**4** Antimicrobial Use Data

Antimicrobial Use Data - 2014 Baseline SAARs

## 2017 Available reports:

The screenshot shows a navigation menu with the following items:

- Expand All
- Collapse All
- Search
- Device-Associated (DA) Module
- Procedure-Associated (PA) Module
- HAI Antimicrobial Resistance (DA+PA Modules)
- Antimicrobial Use and Resistance Module
  - Antimicrobial Use Data**
    - SAAR SAAR Report - All SAARs (2017 Baseline)
    - SAAR SAAR Report - All SAARs by Location (2017 Baseline)
    - Rate Table - Drugs predominantly used for extensively AR bacteria (2017 Baseline)
    - 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
    - Rate Table - Most Recent Month of AU Data - Antimicrobial Utilization Rates for FACWIDEIN
    - Rate Table - All Submitted AU Data - Antimicrobial Utilization Rates for FACWIDEIN
    - Rate Table - Most Recent Month of AU Data - Antimicrobial Utilization Rates by Location

# Where to find the original (2014 baseline) SAAR reports:

The screenshot displays the NHSN Analysis Reports interface. On the left is a navigation menu with the following items: NHSN Home, Alerts, Dashboard, Reporting Plan, Patient, Event, Procedure, Summary Data, Import/Export, Surveys, Analysis, Users, Facility, Group, and Logout. The 'Analysis' item is highlighted with a red callout '1'. A dropdown menu is open for 'Analysis', containing 'Generate Data Sets', 'Reports', and 'Statistics Calculator'. The 'Reports' item is highlighted with a red callout '2'. The main content area is titled 'Analysis Reports' and features 'Expand All', 'Collapse All', and a search box. A tree view shows the following structure: Device-Associated (DA) Module, Procedure-Associated (PA) Module, HAI Antimicrobial Resistance (DA+PA Modules), Antimicrobial Use and Resistance Module (highlighted with a red callout '3'), Antimicrobial Use Data, Antimicrobial Use Data - 2014 Baseline SAARs (highlighted with a red callout '4' and a red box), Antimicrobial Resistance Data, O/CDI Module - LABID Event Reporting, O/CDI Module - Infection Surveillance, O/CDI Module - Process Measures, O/CDI Module - Outcome Measures, CMS Reports, TAP Reports, Baseline Set 1, Advanced, and My Custom Reports. Under the 'Antimicrobial Use Data - 2014 Baseline SAARs' folder, two reports are listed: 'SAAR SAAR Report - All SAARs (2014 Baseline)' and 'SAAR SAAR Report - All SAARs by Location (2014 Baseline)'. The 'SAAR' icon next to each report name is highlighted with a red callout '4'.

## Which baseline should I use?

- 2014 baseline reports are available for 2014-2018
- 2017 baseline reports are available for 2017 moving forward
- As a rule, use 2017 baseline reports when available
- Use 2014 baseline reports if:
  - Analysis includes time period prior to 2017 baseline SAARs

**Note:** Reports will always have the referent population (baseline year) in the title

**Listen to The Standardized Antimicrobial Administration Ratio (SAAR) Part Two to learn how to run, interpret, and modify a SAAR report:**

**<https://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html>**

# NHSN Resources

- NHSN Antimicrobial Use & Resistance Module webpage:  
<http://www.cdc.gov/nhsn/acute-care-hospital/aur/>
  - AUR Module Protocol
  - SAAR Quick Reference Guides (QRGs)
  - Standardized Antimicrobial Administration Ratio – 2019
- Strategies to Assess Antibiotic Use to Drive Improvements in Hospitals:  
<https://www.cdc.gov/antibiotic-use/healthcare/pdfs/Strategies-to-assess-antibiotic-use-in-hospitals-508.pdf>

## NHSN Resources Continued

- SAAR methodology (see Antimicrobial Use and Resistance (AUR) Module Protocol):  
<https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>
- In-depth statistical explanation of the SAAR (see video presentation under training resources): <https://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html>
- 2014 SAAR Baseline Details: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/saar-2014-508.pdf>

**Thank you!**

**For any questions or concerns, contact  
the NHSN Helpdesk at:**

**[nhsn@cdc.gov](mailto:nhsn@cdc.gov)**

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.

