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 <u>not</u> 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

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

SAAR Definition continued

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

(1)

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

SAAR Definition continued

$$\boxed{2} \quad \frac{Observed}{\boxed{Predicted}} = \frac{100\ antimicrobial\ days\ observed}{85\ antimicrobial\ days\ predicted} = 1.176$$

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 **<u>under</u>** use

- **=1.0** The **<u>same</u>** antimicrobial use as predicted

- **>1.0** May indicate antimicrobial **<u>over</u>** 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 <u>not</u> 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?

2017 SAAR models

| 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |

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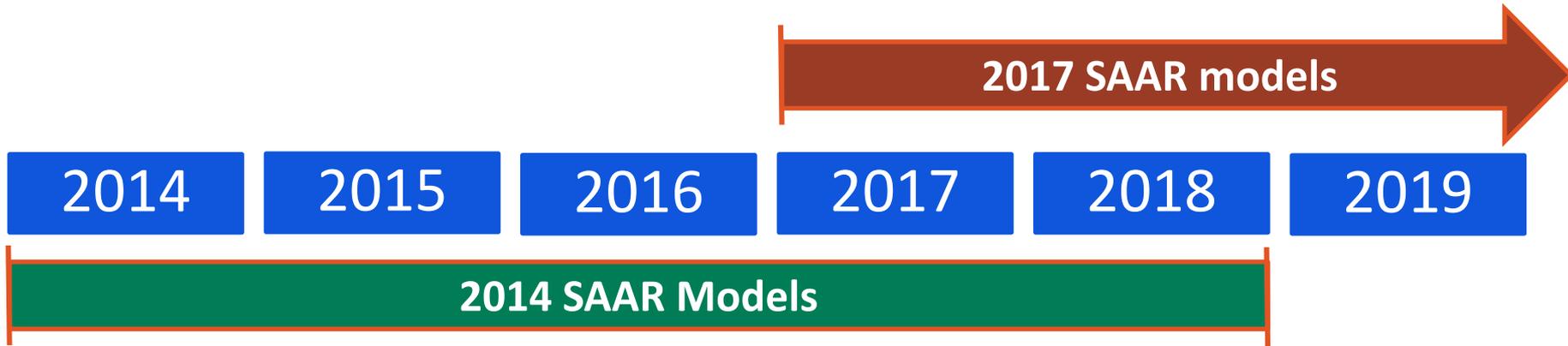
Note: SAARs calculated under the 2014 baseline cannot be directly compared with 2017 baseline SAAR values.

Finding SAAR Reports

Generate Data Sets

Where to find the 2017 baseline SAAR Reports:

2017 Available reports:

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

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

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