

# NHSN Antimicrobial Use Option – Advanced Analysis

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# Objectives

- Modify, run, and interpret Standardized Antimicrobial Administration Ratio (SAAR) reports, including the new SAAR percentile variable
- Aggregate and compare SAAR values
- Modify, run, and interpret the Rate Table – Drugs Predominantly Used for Extensively Antimicrobial Resistant (AR) Bacteria report
- Create, save, and publish custom reports

# SAAR Recap

# SAAR Background

- SAAR provides a standardized metric of antimicrobial use
- SAAR is a ratio comparing observed, or reported, antimicrobial use to antimicrobial use predicted by a referent, or baseline, population

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

- Compares antimicrobial use within and across facilities to guide antimicrobial stewardship efforts

# SAAR Baselines

- “Baseline” refers to the calendar year of NHSN data used to develop SAAR Models
- SAAR referent population is AU data aggregated from select patient care locations reporting to the AU Option during the baseline year
- NHSN develops new models every few years (“re-baselining”)
  - Allows for assessment of AU risk in more settings
  - Updates antimicrobial groupings
  - Generates precise predicted values

## Table of SAAR Baselines

SAAR Baseline	Locations	Antimicrobial Categories
2014 baseline adult and pediatric SAARs*	6 adult and pediatric ICUs and wards	5 antimicrobial categories
2017 baseline adult and pediatric SAARs	13 adult and pediatric ICUs, wards step down units, and oncology units	15 antimicrobial categories
2018 baseline neonatal SAARs	4 neonatal units	7 antimicrobial categories

\*You cannot directly compare SAARs calculated under the 2014 baseline with SAARs calculated under the 2017 baseline

# 2014 Baseline SAAR – Locations

- 6 location groupings:
  - Adult Medical, Medical/Surgical, and Surgical Intensive Care Units (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

# 2014 Baseline SAAR – Antimicrobials

- 5 antimicrobial categories:
  - Broad spectrum antibacterial agents predominantly used for hospital-onset/multi-drug resistant infections
  - Broad spectrum antibacterial agents predominantly used for community-acquired infections (BSCA)
  - Anti-MRSA antibacterial agents
  - Antibacterial agents predominantly used for surgical site infection prophylaxis

Full list of antimicrobials in 2014 Baseline SAAR Details: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/saar-2014-508.pdf>



# 2017 Baseline SAAR – Locations

8 adult locations:

- 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

5 pediatric locations:

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

# 2017 Baseline SAAR – Antimicrobials

7 adult antimicrobial categories:

- All antibacterial agents
- Broad spectrum antibacterial agents predominantly used for hospital-onset infections (BSHO)
- BSCA
- Antibacterial agents predominantly used for resistant Gram-positive infections
- Narrow spectrum beta-lactam agents (NSBL)
- Antibacterial agents posing the highest risk for *Clostridioides difficile* infection (CDI)
- Antifungal agents predominantly used for invasive candidiasis

8 pediatric antimicrobial categories:

- All antibacterial agents
- BSHO
- BSCA
- Antibacterial agents predominantly used for resistant Gram-positive infections
- NSBL
- Azithromycin
- Antibacterial agents posing the highest risk for CDI

Full list of antimicrobials in AUR Module Protocol: <https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>

# 2018 Baseline Neonatal SAAR - Locations

4 neonatal units:

- Step down Neonatal Nursery
- Neonatal Critical Care (Level II/III)
- Neonatal Critical Care (Level III)
- Neonatal Critical Care (Level IV)

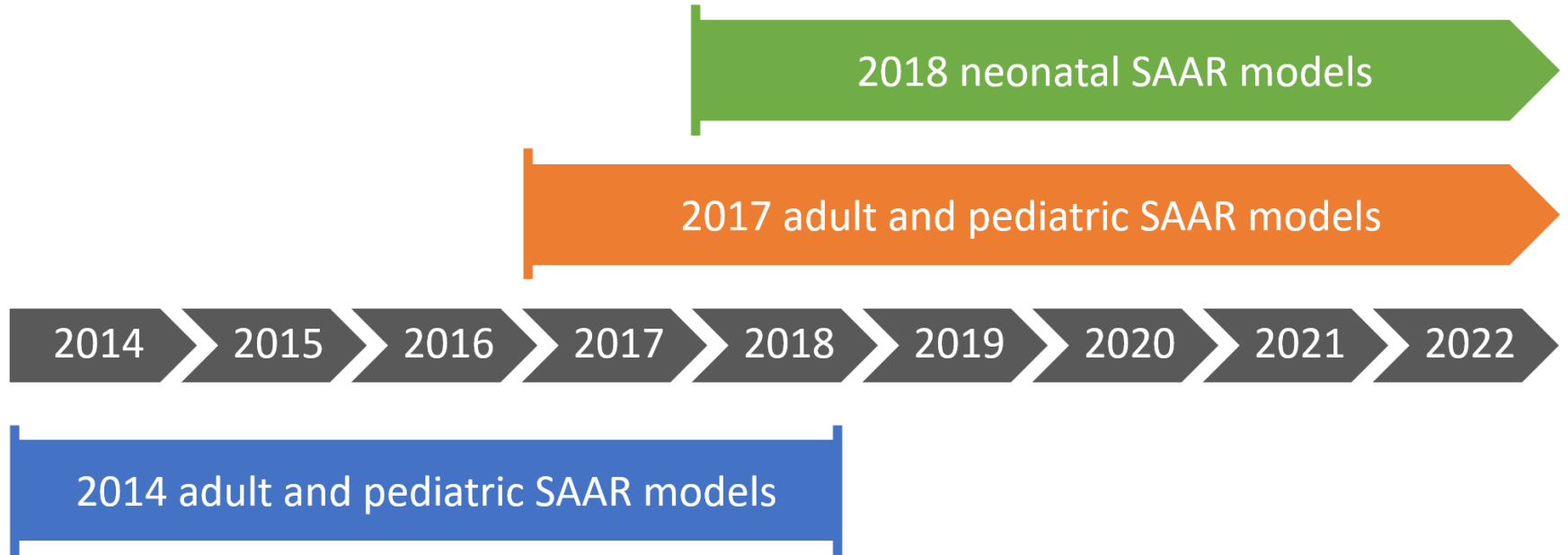
# 2018 Baseline Neonatal SAAR - Antimicrobials

7 antimicrobial categories:

- All antibacterial agents
- Vancomycin predominantly used for treatment of late onset sepsis
- BSHO
- Third generation cephalosporins
- Ampicillin predominantly used for treatment of early-onset sepsis
- Aminoglycosides predominantly used for treatment of early-onset and late-onset sepsis
- Fluconazole predominantly used for candidiasis

Full list of antimicrobials in AUR Module Protocol: <https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>

# SAAR Baselines Timeline



# Modifying the SAAR Report

# Modifying the SAAR by Location Report

The screenshot displays the 'Analysis Reports' interface. At the top, there is a header bar with a globe icon and the text 'Analysis Reports'. Below this, there are three buttons: 'Expand All', 'Collapse All', and a 'Search' input field. A tree view on the left shows the following structure:

- 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 Adult and Ped SAARs (2017 Baseline)
    - SAAR SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)
    - SAAR SAAR Report - All Adult and Ped SAARs (2018 Baseline)
    - SAAR SAAR Report - All Adult and Ped SAARs by Location (2018 Baseline)
    - SAAR SAAR Report - Most Frequently Used for Extensively AR Bacteria (2017 Baseline)
    - SAAR SAAR Report - Microbial Groupings for Neonatal Units (2018 Baseline)

A context menu is open over the 'SAAR SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)' item, showing three options:

- Run Report
- Modify Report
- Export Data Set

Below the tree view, there are two line listing items:

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

# SAAR by Location Report — Time Period Tab

**Modify "SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)"**

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AU\_SAAR\_2017    Type: SAAR    Last Generated: February 11, 2022 7:49 PM

Title/Format

**Time Period**

Filters

Display Options

Time Period:

Date Variable	Beginning	Ending
Summary~Yr ▼	2021	2021

Clear Time Period

☐ Enter Date variable/Time period at the time you click the Run button

▶ Run

💾 Save...

📄 Export...

Close



# SAAR by Location Report — Filters Tab

Modify "SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AU\_SAAR\_2017

Type: SAAR

Last Generated: February 11, 2022 7:49 PM

Title/FormatTime PeriodFiltersDisplay Options

Additional Filters: 

Show

Clear

AND OR

Add group

AND OR

Add rule

Location

equal

Delete

MEDWARD - MEDICAL WARD\_AU

Run

Save...

Export...

Close

# SAAR by Location Report — Display Options Tab

**Modify "SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)"**

☒ Show descriptive variable names ([Print List](#))Analysis Data Set: AU\_SAAR\_2017    Type: SAAR    Last Generated: February 11, 2022 7:49 PM

Title/FormatTime PeriodFilters**Display Options**

SAAR Options:

Group by: Summary Year/Month ▾

▶ Run

💾 Save...

📄 Export...

Close

# SAAR Report Output

# SAAR by Location Report — Output

## National Healthcare Safety Network

### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: February 11, 2022 at 8:37 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ) )

#### All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M03	IN:ACUTE:WARD:M	495	557.219	916	0.888	0.0079	0.813, 0.969	35
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M04	IN:ACUTE:WARD:M	569	577.902	950	0.985	0.7313	0.906, 1.068	48
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M05	IN:ACUTE:WARD:M	579	480.570	790	1.205	0.0000	1.110, 1.306	82
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M06	IN:ACUTE:WARD:M	553	671.581	1104	0.823	0.0000	0.757, 0.894	25
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M07	IN:ACUTE:WARD:M	675	820.619	1349	0.823	0.0000	0.762, 0.886	25
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M08	IN:ACUTE:WARD:M	521	526.802	866	0.989	0.8227	0.907, 1.077	49
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M09	IN:ACUTE:WARD:M	670	564.519	928	1.187	0.0000	1.099, 1.279	80
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M10	IN:ACUTE:WARD:M	537	934.984	1537	0.574	0.0000	0.527, 0.624	9
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M11	IN:ACUTE:WARD:M	671	1068.814	1757	0.628	0.0000	0.582, 0.677	11
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M12	IN:ACUTE:WARD:M	671	889.969	1463	0.754	0.0000	0.699, 0.813	18

Any reported use of Colistin will be combined with and reported as Colistimethate. Any reported use of Amikacin Liposomal will be combined with and reported as Amikacin.

Includes data for January 2017 and forward.

The SAAR is only calculated if the number of predicted antimicrobial days (numAUDaysPredicted) is >=1.

If antimicrobial days exceed days present for any SAAR categories except the All Antibacterial SAAR, a SAAR will not be calculated and data should be validated for accuracy.

Data restricted to medical, medical-surgical, surgical, step down and oncology locations.

The SAAR percentile is not shown if the SAAR is not shown, nor is it shown for pediatric medical ICUs or pediatric surgical wards where the aggregate sample size was too small for analysis (<20).

Source of aggregate data: 2017 NHSN AU Data

Source of Facility Data: 2017 NHSN AU Data

**Note:** Data are fictitious and for example only

# SAAR Components

- **Antimicrobial days:** Any amount of a specific antimicrobial agent administered in a calendar day to a patient as reported in electronic medication administration record (eMAR) or bar coding medication administration (BCMA) system
- **Predicted antimicrobial days:** Calculated using predictive models developed by CDC
- **Days present:** Aggregate number of patients housed in a patient care location or facility anytime throughout the day during a calendar month
  - Used in SAAR models to calculate predicted antimicrobial days

## Interpreting a SAAR value

- Ratio comparing observed antimicrobial use to predicted antimicrobial use
  - $SAAR < 1.0$  indicates antimicrobial use was less than predicted
  - $SAAR = 1.0$  indicates antimicrobial use was equivalent to predicted use
  - $SAAR > 1.0$  indicates antimicrobial use was greater than predicted
- Not a definitive measure of appropriateness or judiciousness of antimicrobial use, and any SAAR value may warrant additional investigation
- Can only generate SAAR when the number of predicted antimicrobial days are  $\geq 1$  and total antimicrobial days do not exceed days present

## SAAR *p*-value

- Statistical measure that indicates if observed antimicrobial use is statistically different from predicted antimicrobial use
  - If  $p\text{-value} \leq 0.05$ , then observed antimicrobial days are significantly different from predicted antimicrobial days
  - If  $p\text{-value} > 0.05$ , then observed antimicrobial days are not significantly different from predicted antimicrobial days
- Due to large number of antimicrobial days recorded and included in predictive models, most SAAR *p*-values are statistically significant and should be interpreted with caution

## 95% Confidence Interval (CI)

- Range of values in which true SAAR value is likely to lie (however SAAR is the most likely value)
  - If the 95% CI does not include 1, the SAAR is statistically significantly different than 1
  - If the 95% CI includes 1, the SAAR is not statistically significantly different than 1
- SAAR p-value and 95% CI will always indicate the same statistical significance and can be interpreted interchangeably



# SAAR Percentile

- Percentile a SAAR falls into based on the distribution of location-specific SAARs found in the NHSN AU Option Report Data Tables
  - More recent data than used for SAAR baseline
  - Currently 2019 data, future release will update to 2020
- SAARs were calculated for each SAAR location reporting nine or more months of data and percentiles are based on those location-year-level distributions
- Interpretation example: SAAR percentile of 90 indicates 89% of SAAR values reported from similar locations are less than that SAAR and 10% of SAAR values are greater than it
  - The 50<sup>th</sup> percentile is the median location-specific SAAR value

# SAAR Report Interpretation

## Example Interpretation – SAAR Type

Interpret first row of modified report as an example: SAAR data for all antibacterial agents used in medical ward in January 2021

### National Healthcare Safety Network

#### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: March 6, 2022 at 6:54 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD") 1.))

#### All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

# Example Interpretation – Location

Report displays SAARs for Medical Ward (MEDWARD) location

National Healthcare Safety Network											
SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)											
As of: March 6, 2022 at 6:54 PM											
Date Range: AU_SAAR_2017 summaryYr 2021 to 2021											
if (((location = "MEDWARD" ) ))											
All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units											
Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

## Example Interpretation – Time Period

Each row in report represents one month/location combination

National Healthcare Safety Network											
SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)											
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33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10



# Example Interpretation – Antimicrobial Days & Days Present

632 antimicrobial days reported for patients contributing 2009 days present in the medical ward

**National Healthcare Safety Network**  
**SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)**  
As of: March 6, 2022 at 6:54 PM  
Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021  
if (((location = "MEDWARD" ) ))

**All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units**

Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

# Example Interpretation – Predicted Antimicrobial Days

SAAR model predicted 1222.111 antimicrobial days for medical ward using 2017 baseline data from similar locations

## National Healthcare Safety Network

### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: March 6, 2022 at 6:54 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ))

All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

# Example Interpretation – SAAR

SAAR (ratio of observed to predicted antimicrobial use) was 0.517

National Healthcare Safety Network											
SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)											
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Date Range: AU_SAAR_2017 summaryYr 2021 to 2021											
if (((location = "MEDWARD" ) ))											
All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units											
Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10



## Example Interpretation – SAAR $p$ -value

Observed antimicrobial use was significantly different from predicted use (or SAAR was significantly different from 1)

National Healthcare Safety Network												
SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)												
As of: March 6, 2022 at 6:54 PM												
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if (((location = "MEDWARD" ) ))												
All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR $p$ -value	95% Confidence Interval	SAAR Percentile	
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7	
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10	

## Example Interpretation – 95% CI

High degree of confidence true SAAR between 0.478 and 0.559; 0.517 is most likely SAAR value

### National Healthcare Safety Network

#### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: March 6, 2022 at 6:54 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ))

#### All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

Facility Org ID	SAAR Type 2017 Baseline	Location	Summary Year/Month	CDC Location	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	SAAR p-value	95% Confidence Interval	SAAR Percentile
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN:ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

## Example Interpretation – SAAR Percentile

SAAR was in the 7<sup>th</sup> percentile of SAARs reported from similar locations;  
6% of SAAR values were less than and 93% were greater than 0.517

### National Healthcare Safety Network

#### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: March 6, 2022 at 6:54 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ))

#### All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

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33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN:ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

# Comparing SAARs

# SAAR Benchmarks

- By default, SAAR p-value and 95% CI compare SAAR value to 1
- Values other than 1 may be helpful benchmarks depending on past performance, stewardship goals, or patient population
  - Our SAAR value was 0.517 – 1 may not be a good benchmark so let's aim for 0.5 instead
- Many methods to develop benchmarks – more information in the SAAR Guide under “Defining your benchmark” starting on page 16:  
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/au-saar-guide-508.pdf>

# Advanced SAAR Comparisons

- Can compare SAARs to value other than 1 or compare two SAAR values to each other
  - Cannot directly compare SAAR values calculated under different baselines
- NHSN Statistics Calculator, a tool within NHSN application, conducts statistical tests and determines statistical differences
- More information in the SAAR Guide under “Comparing two SAAR values” starting on page 17: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/au-saar-guide-508.pdf>

# Example: Statistics Calculator – Navigation


The screenshot displays the NHSN Patient Safety Component Home Page. At the top, a dark blue header bar contains the text "NHSN - National Healthcare Safety Network" on the left and a user profile on the right with the name "XGA6" and the role "\_CDA-XYZ Test Facility (Prod)".


On the left side, there is a vertical navigation menu with the following items: "NHSN Home", "Alerts", "Dashboard", "Reporting Plan", "Patient", "Event", "Procedure", "Summary Data", "COVID-19", "Import/Export", "Surveys", "Analysis", "Users", and "Facility". The "Analysis" item is currently selected and highlighted in a darker blue.

The main content area is titled "NHSN Patient Safety Component Home Page" and features a light blue header with a small icon. Below this, there are three main sections: "TAP Strategy Dashboard", "TAS Dashboard", and "Action Items". The "Action Items" section is expanded, showing a list of tasks under the heading "COMPLETE THESE ITEMS".

One of the tasks listed is "Mini-IRF Survey Required" with a red progress bar. Below this, there is a sub-menu for "Generate Data Sets" which includes the following options: "Reports" and "Statistics Calculator". The "Statistics Calculator" option is highlighted with a red circle and a mouse cursor icon, indicating it is the target of the navigation.

# Example: Statistics Calculator – Compare to Nominal Value

 Statistics Calculator




- Compare Two Proportions
- Compare Two Incidence Density Rates
- Compare Single Proportion to a Benchmark

The options below can be applied to the following standardized ratios: standardized infection ratios (SIRs), standardized utilization ratios (SURs), and standardized antimicrobial administration ratios (SAARs).

- Compare Single Standardized Ratio (for example, SIR) to Nominal Value
- Compare Single Standardized Ratio (for example, SIR) to 1
- Compare Two Standardized Ratios (for example, SIRs)



# Example: Statistics Calculator – SAAR



## Compare Single Standardized Ratio (for example, SIR) to Nominal Value

When comparing a standardized ratio to a nominal value, the hypothesis is that the ratio is not different from the nominal value. To perform a hypothesis test and calculate a p-value, first select the type of ratio you wish to analyze. Then, enter the values for the appropriate number observed and number predicted. The standardized ratio will be displayed automatically. Enter the nominal value you wish to use for the comparison, and click Calculate.

Type of ratio:

SAAR - standardized antimicrobial administration ratio ▾

Data Source

Number Observed Antimicrobial Days of Therapy:

Number Predicted Antimicrobial Days of Therapy:

Standardized Antimicrobial Administration Ratio: 0.517

Nominal Value:

Title:

Calculate

Back

# Example: Statistics Calculator – Input Data

## National Healthcare Safety Network

### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: February 23, 2022 at 1:42 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ))

All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

orgID	SAARType_2017	location	summaryYM	locCDC	antimicrobialDays	numAUDaysPredicted	numDaysPresent	SAAR	SAAR_pval	SAAR95CI	SAAR_pctl
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN-ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN-ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10

#### Data Source

Number Observed Antimicrobial Days of Therapy: 632

Number Predicted Antimicrobial Days of Therapy: 1222.111

Standardized Antimicrobial Administration Ratio: 0.517


Nominal Value:

Title:

Calculate

Back

# Example: Statistics Calculator – Benchmark and Title



## Compare Single Standardized Ratio (for example, SIR) to Nominal Value

When comparing a standardized ratio to a nominal value, the hypothesis is that the ratio is not different from the nominal value. To perform a hypothesis test and calculate a p-value, first select the type of ratio you wish to analyze. Then, enter the values for the appropriate number observed and number predicted. The standardized ratio will be displayed automatically. Enter the nominal value you wish to use for the comparison, and click Calculate.

Type of ratio:

SAAR - standardized antimicrobial administration ratio ▾

Data Source

Number Observed Antimicrobial Days of Therapy:

632

Number Predicted Antimicrobial Days of Therapy:

1222.111

Standardized Antimicrobial Administration Ratio:

0.517

Nominal Value:

0.5

Title:

Compare SAAR value to 0.5

Calculate

Back

# Example: Statistics Calculator – Output

## National Healthcare Safety Network

### Compare SAAR value to 0.5

As of: February 11, 2022 at 9:29 PM


Number Observed Antimicrobial Days of Therapy	Number Predicted Antimicrobial Days of Therapy	SAAR	p-value as Compared to 0.5
632	1222.111	0.517	0.4070

- The  $p$ -value is 0.4070, which is  $> 0.05$
- Our SAAR value of 0.517 is not statistically significantly different from 0.5


# SAARs Over Time

- Tracking AU over time using SAARs should be limited to comparing two SAAR values across two points in time
- Do not use SAARs for trend analyses
  - Work with statistician to use crude rates and risk-adjust for factors included in the SAAR models that fit your analysis question instead
- More information in the SAAR Guide under “Assessing AU data over time” starting on page 20: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/au-saar-guide-508.pdf>

# Example: SAARs Over Time – Compare Two Ratios



## Statistics Calculator




- Compare Two Proportions
- Compare Two Incidence Density Rates
- Compare Single Proportion to a Benchmark

The options below can be applied to the following standardized ratios: standardized infection ratios (SIRs), standardized utilization ratios (SURs), and standardized antimicrobial administration ratios (SAARs).

- Compare Single Standardized Ratio (for example, SIR) to Nominal Value
- Compare Single Standardized Ratio (for example, SIR) to 1
- Compare Two Standardized Ratios (for example, SIRs)

# Example: SAARs Over Time – SAAR



## Compare Two Standardized Ratios (for example, SIRs)

When comparing two standardized ratios, the hypothesis is that the two ratios are not different from each other. To perform a hypothesis test and calculate a p-value, first select the type of ratio you wish to analyze. Then, enter the values for the appropriate number observed and number predicted. The standardized ratios for each data source will be displayed automatically. Click Calculate

Type of ratio:

SAAR - standardized antimicrobial administration ratio ▾

	Data Source #1	Data Source #2
Group Labels:	<input type="text"/>	<input type="text"/>
Number Observed Antimicrobial Days of Therapy:	<input type="text"/>	<input type="text"/>
Number Predicted Antimicrobial Days of Therapy:	<input type="text"/>	<input type="text"/>
Standardized Antimicrobial Administration Ratio:		
Title:	<input type="text"/>	

Calculate

Back

# Example: SAARs Over Time – Input Data

## National Healthcare Safety Network

### SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets by Location (2017 Baseline)

As of: March 6, 2022 at 9:49 PM

Date Range: AU\_SAAR\_2017 summaryYr 2021 to 2021

if (((location = "MEDWARD" ) ) )

#### All Antibacterial Agents used in adult SAAR ICUs, wards, step down units and oncology units

orgID	SAARType_2017	location	summaryYM	locCDC	antimicrobialDays	numAUDaysPredicted	numDaysPresent	SAAR	SAAR_pval	SAAR95CI	SAAR_pctl
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M01	IN-ACUTE:WARD:M	632	1222.111	2009	0.517	0.0000	0.478, 0.559	7
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M02	IN-ACUTE:WARD:M	704	1181.961	1943	0.596	0.0000	0.553, 0.641	10
33617	Adult_All-Antibacterial_2017	MEDWARD	2021M03	IN-ACUTE:WARD:M	485	557.219	916	0.889	0.0079	0.813, 0.969	25

Data Source #1

Group Labels:

Number Observed Antimicrobial Days of Therapy:

Number Predicted Antimicrobial Days of Therapy:

Standardized Antimicrobial Administration Ratio:

Data Source #2

Group Labels:

Number Observed Antimicrobial Days of Therapy:

Number Predicted Antimicrobial Days of Therapy:

Standardized Antimicrobial Administration Ratio:


Title:

Calculate

Back



## Example: SAARs Over Time – Title



### Compare Two Standardized Ratios (for example, SIRs)

When comparing two standardized ratios, the hypothesis is that the two ratios are not different from each other. To perform a hypothesis test and calculate a p-value, first select the type of ratio you wish to analyze. Then, enter the values for the appropriate number observed and number predicted. The standardized ratios for each data source will be displayed automatically. Click Calculate

Type of ratio:	SAAR - standardized antimicrobial administration ratio ▾	
	Data Source #1	Data Source #2
Group Labels:	2021M01	2021M02
Number Observed Antimicrobial Days of Therapy:	632	704
Number Predicted Antimicrobial Days of Therapy:	1222.111	1181.961
Standardized Antimicrobial Administration Ratio:	0.517	0.596
Title:	Compare 2021M01 SAAR value to 2021M02 SAAR value	
<div>CalculateBack</div>		

## Example: SAARs Over Time – Output

- The  $p$ -value is 0.0099, which is  $< 0.05$
- Our Jan. 2021 and Feb. 2021 SAAR values are significantly different

### National Healthcare Safety Network

#### Compare 2021M01 SAAR value to 2021M02 SAAR value

As of: March 6, 2022 at 10:10 PM

	2021M01	2021M02
Observed Antimicrobial Administration	632	704
Predicted Antimicrobial Administration	1222.111	1181.961
SAAR	0.517	0.596

Relative ratio of SAARs (data column 2 / data column 1):  $0.596/0.517 = 1.153$  (115.3%)

Two-tailed  $p$ -value: 0.0099

95% Conf. Interval: 1.034, 1.282

# Drugs Predominantly Used for Extensively AR Bacteria

# Background

- NHSN understands importance of monitoring usage of drugs predominantly used for extensively AR bacteria
- Utilization of these drugs was too low include in SAAR models:
  - Ceftazidime/avibactam
  - Ceftolozane/tazobactam
  - Colistimethate (IV only)
  - Polymyxin B (IV only)
  - Tigecycline
- List can also be found in AUR Protocol:  
<https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>

# Rate Table Report

- Utilization was too low for an adjusted metric (e.g., SAAR), but NHSN can provide unadjusted rates
- Drugs Predominantly Used for Extensively AR Bacteria Rate Table generates unadjusted rates for antimicrobial agents predominantly used for extensively AR bacteria
- Special rate table that displays calculated rate of antimicrobial use using SAAR antimicrobial groupings and referent data
  - Uses 2017 SAAR baseline and facilities can generate it for January 2017 – present

# Modifying the Rate Table Report

# Modifying the Rate Table

The screenshot displays the 'Analysis Reports' interface. At the top, there is a header bar with a user icon and the title 'Analysis Reports'. Below the header, there are three buttons: 'Expand All', 'Collapse All', and a 'Search' input field. A tree view on the left lists various report categories and specific reports. The 'Antimicrobial Use Data' category is expanded, showing several reports. The 'Rate Table - Drugs Predominantly Used for Extensively AR Bacteria (2017 Baseline)' report is selected and highlighted in blue. A context menu is open over this report, showing three options: 'Run Report' (with a play button icon), 'Modify Report' (with a gear icon and a hand cursor pointing to it), and 'Export Data Set' (with a download icon). Other reports visible in the tree include 'SAAR Report - All Adult and Ped SAARs (2017 Baseline)', 'SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)', 'SAAR Report - All Neonatal SAARs (2018 Baseline)', 'SAAR Report - All Neonatal SAARs by Location (2018 Baseline)', 'Antimicrobial Groupings for Neonatal Units (2018 Baseline)', 'Month of AU Data for FACWIDEIN', 'Month of AU Data by Location', 'AU Data for FACWIDEIN', and 'Line Listing - All Submitted AU Data by Location'.

# Rate Table — Time Period Tab

## Modify "Rate Table - Drugs Predominantly Used for Extensively AR Bacteria (2017 Baseline)"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AU\_SAARRates\_2017

Type: Rate Table

Last Generated: February 11, 2022 7:49 PM

Title/Format

Time Period

Filters

Display Options

Time Period:

Date Variable

Beginning

Ending

Summary~Yr



2021

2021

Clear Time Period

☐ Enter Date variable/Time period at the time you click the Run button

Run

Save...

Export...

Close



# Rate Table — Filters Tab

## Modify "Rate Table - Drugs Predominantly Used for Extensively AR Bacteria (2017 Baseline)"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AU\_SAARRates\_2017

Type: Rate Table

Last Generated: February 11, 2022 7:49 PM

Title/Format

Time Period

Filters

Display Options

Additional Filters:

Show

Clear

AND OR

Add group

AND OR

Add rule

SAAR Rate Type 2017 Baseline equal

Delete

Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units

Run

Save...

Export...

Close

# Rate Table — Display Options Tab

**Modify "Rate Table - Drugs Predominantly Used for Extensively AR Bacteria (2017 Baseline)"**

☒ Show descriptive variable names [\(Print List\)](#) Analysis Data Set: AU\_SAARRates\_2017 Type: Rate Table Last Generated: February 11, 2022 7:49 PM

Title/FormatTime PeriodFiltersDisplay Options

Rate Table Options:

Group by: Summary Year/Month ▾

▶ Run

💾 Save...

📄 Export...

Close

# Rate Table Output and Interpretation

# Rate Table — Output

## National Healthcare Safety Network

### Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)

As of: February 11, 2022 at 9:50 PM

Date Range: AU\_SAARRATES\_2017 summaryYr 2021 to 2021

if (((SAARRateType\_2017 = "Adult\_EARB\_2017" ) ) )

Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units

Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	31.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M03	Adult_EARB_2017	2149	9550	225.03	215.667, 234.694	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M04	Adult_EARB_2017	367	9439	38.88	35.054, 43.015	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M05	Adult_EARB_2017	356	7741	45.99	41.395, 50.957	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M06	Adult_EARB_2017	387	9068	42.68	38.582, 47.093	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M07	Adult_EARB_2017	439	12767	34.39	31.281, 37.719	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M08	Adult_EARB_2017	357	8609	41.47	37.330, 45.942	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M09	Adult_EARB_2017	445	11790	37.74	34.358, 41.376	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M10	Adult_EARB_2017	378	10782	35.06	31.656, 38.730	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M11	Adult_EARB_2017	519	12247	42.38	38.848, 46.144	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M12	Adult_EARB_2017	446	10696	41.70	37.962, 45.704	1.21	0.0000	0.00	0.39	1.12	2.22

Any reported use of Colistin will be combined with and reported as Colistimethate. Any reported use of Amikacin Liposomal will be combined with and reported as Amikacin.

Includes data for January 2017 and forward.

Data restricted to adult medical, medical-surgical, surgical, step down and general hematology-oncology locations.

Source of aggregate data: 2017 NHSN AU Data

**Note:** Data are fictitious and for example only

# Rate Table Components

- **Rate per 1,000 days present:** Antimicrobial days for drugs predominantly used for extensively AR bacteria per 1,000 days present
- **Rate days present 95% CI:** Range of values in which the true rate is likely to lie (rate per 1,000 days present is the most likely value)
- **Pooled mean AU rate:** National pooled mean rate per 1,000 days present using the 2017 baseline SAAR referent population
- **SAAR *p*-value:** Statistical measure that indicates if rate was significantly different from pooled mean rate of the referent population
- **25<sup>th</sup> – 90<sup>th</sup> percentile:** Pooled rate distribution from referent population

# Rate Table Interpretation – Rate Type

Let's interpret the first row of our modified report as an example: rate for antibacterial agents predominantly used for extensively AR bacteria used in adult SAAR ICUs, wards, step down units, and oncology units in January 2021

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

# Rate Table Interpretation – Time Period

Each row in report represents one month

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

# Rate Table Interpretation – Antimicrobial Days & Days Present

58 antimicrobial days reported for patients contributing 2009 days present

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22



# Rate Table Interpretation – Rate per 1000 Days Present

Rate of adult antibacterial agents predominantly used for extensively AR bacteria was 28.87 antimicrobial days per 1000 days present

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ) )												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	31.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

# Rate Table Interpretation – 95% CI

High degree of confidence the true rate is between 22.124 and 37.058 antimicrobial days per 1000 days present; most likely value is 28.87 antimicrobial days per 1000 days present

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

# Rate Table Interpretation – Pooled Mean Rate

National pooled mean rate of adult antibacterial agents predominantly used for extensively AR bacteria using the 2017 baseline referent population was 1.21 antimicrobial days per 1000 days present

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

**Note:** Data are fictitious and for example only

# Rate Table Interpretation – *p*-value

Rate of 28.87 antimicrobial days per 1000 days present was significantly different from national pooled mean rate

National Healthcare Safety Network												
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)												
As of: March 6, 2022 at 8:54 PM												
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021												
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))												
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units												
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22

# Rate Table Interpretation – Percentiles

Pooled rate distribution from 2017 baseline referent population was 0.00 (25<sup>th</sup> percentile) – 2.22 (90<sup>th</sup> percentile); median was 0.39 (50<sup>th</sup> percentile)

National Healthcare Safety Network													
Rate Table – Antibacterial agents predominantly used for extensively antibiotic resistant bacteria (2017 Baseline)													
As of: March 6, 2022 at 8:54 PM													
Date Range: AU_SAARRATES_2017 summaryYr 2021 to 2021													
if (((SAARRateType_2017 = "Adult_EARB_2017" ) ))													
Antibacterial agents predominantly used for extensively antibiotic resistant bacteria used in adult SAAR ICUs, wards, step down units and oncology units													
Facility Org ID	Summary Year/Month	SAAR Rate Type 2017 Baseline	Antimicrobial Days	Days Present	Rate per 1000 Days Present	RateDaysPresent95CI	Pooled Mean AU Rate	SAAR p-value	25th Percentile	50th Percentile	75th Percentile	90th Percentile	
33617	2021M01	Adult_EARB_2017	58	2009	28.87	22.124, 37.058	1.21	0.0000	0.00	0.39	1.12	2.22	
33617	2021M02	Adult_EARB_2017	61	1943	21.39	24.224, 40.056	1.21	0.0000	0.00	0.39	1.12	2.22	

# Custom Reports

# Custom Reports – Modify Screen

Can save any modified analysis report as a Custom Report

**Modify "SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)"**

☒ Show descriptive variable names [\(Print List\)](#) Analysis Data Set: AU\_SAAR\_2017 Type: SAAR Last Generated: February 11, 2022 7:49 PM

Title/FormatTime PeriodFiltersDisplay Options

Title:

SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and H

Format:

htmlpdfxlsrtf

RunSave...Export...Close


# Custom Reports – Saving

Modify "SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)"

☒ Show descriptive variable names ([Print List](#)) Analysis Data Set: AU\_SAAR\_2017 Type: SAAR Last Generated: February 11, 2022 7:49 PM

Title/Format Time Period Filters Display Options

Title:  
SAARs Table - All Adult and Pediatric Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and I


Format:  


Specify a name for your Analysis Report:

Analysis Report Name: XGA6 - SAAR Report - 2021 MEDWARD All Adult and Ped SAARs by Location (2017 Baseline)

☐ Overwrite existing Custom Analysis Report (Save)

☒ Create a new Custom Analysis Report based on this one (Save as)





 Save Cancel





Run Save... Export... Close




## Custom Reports – Location

### Antimicrobial Use Data

-  SAAR Report - All Adult and Ped SAARs (2017 Baseline)
-  SAAR Report - All Adult and Ped SAARs by Location (2017 Baseline)
-  SAAR Report - All Neonatal SAARs (2018 Baseline)
-  SAAR Report - All Neonatal SAARs by Location (2018 Baseline)

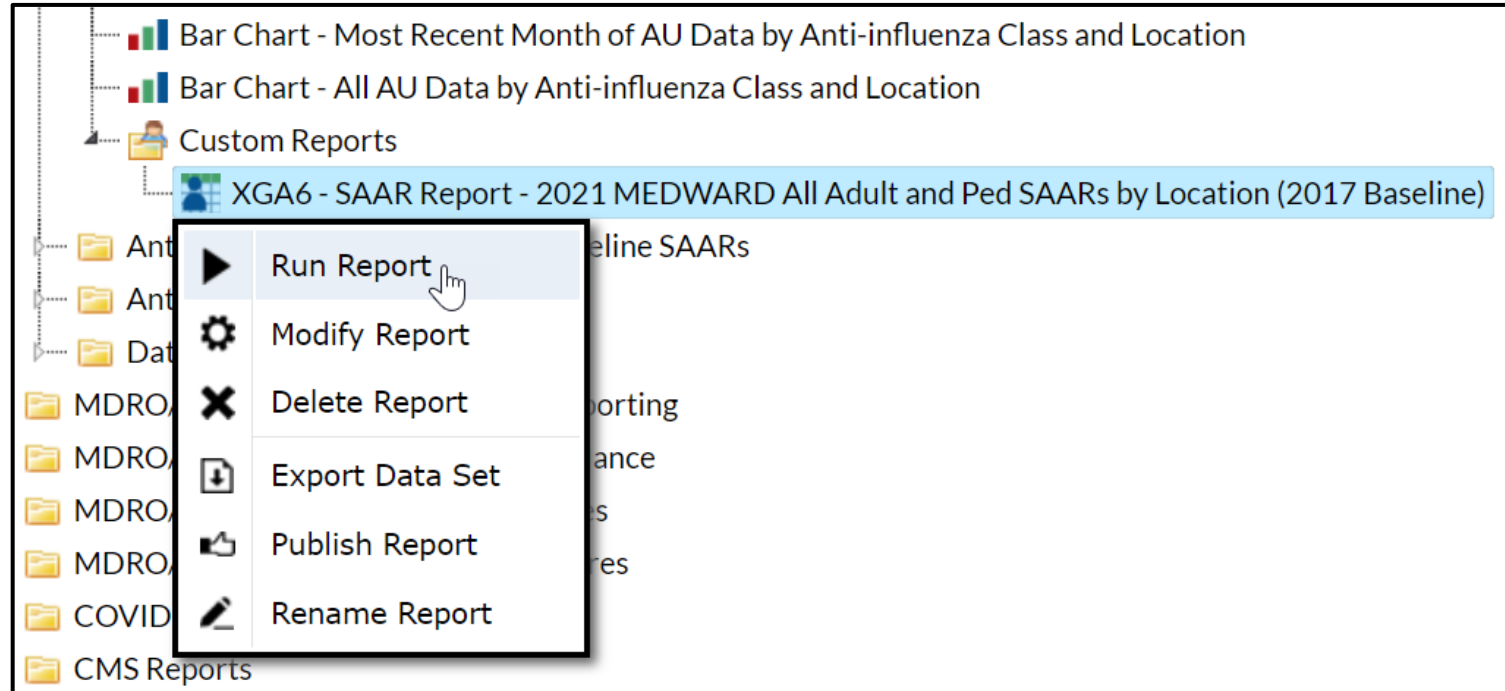
-  Bar Chart - Most Recent Month of AU Data by Antifungal Class and Location
-  Bar Chart - All AU Data by Antifungal Class and Location
-  Bar Chart - Most Recent Month of AU Data by Anti-influenza Class and Location
-  Bar Chart - All AU Data by Anti-influenza Class and Location

### Custom Reports

-  XGA6 - SAAR Report - 2021 MEDWARD All Adult and Ped SAARs by Location (2017 Baseline)

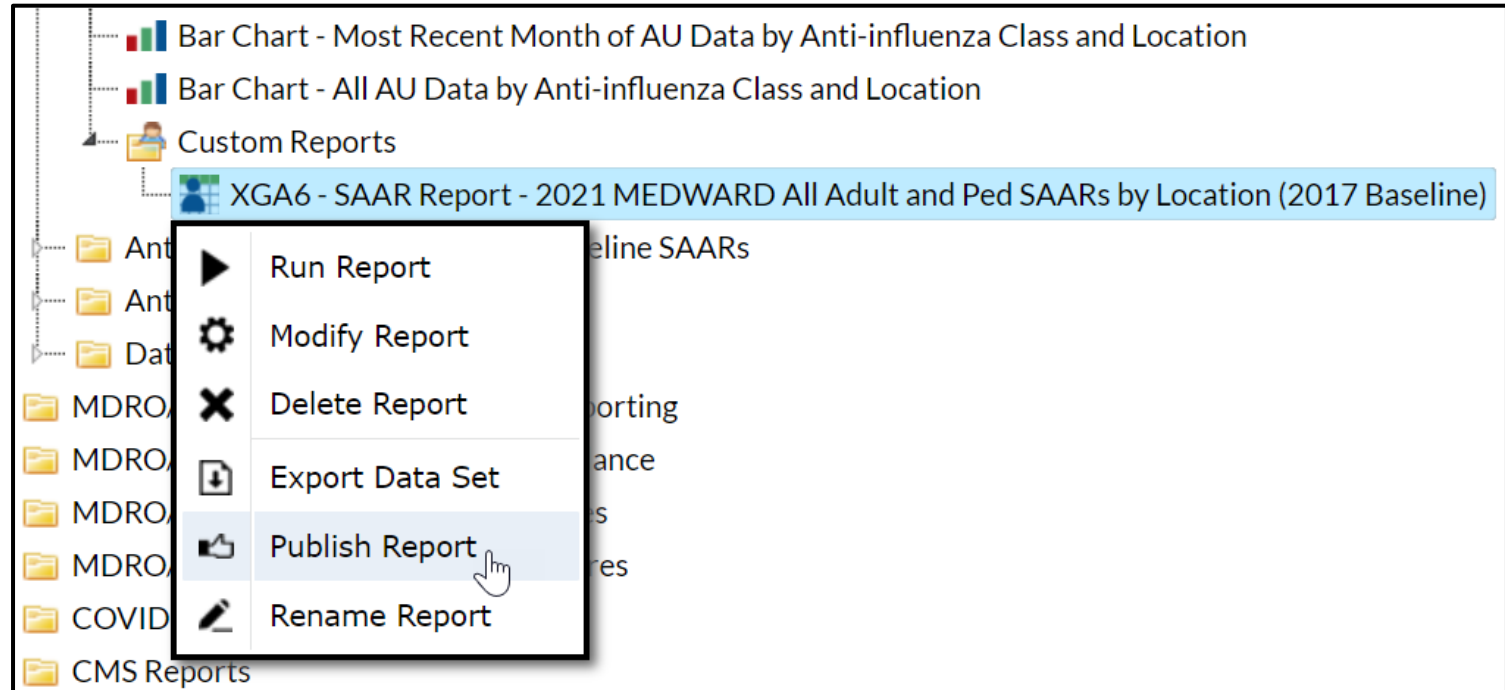
# Custom Reports – Re-running

Can re-run or edit Custom Reports whenever you want



# Custom Reports – Publishing

Publish Custom Report to make it visible to other users



## Custom Reports – Publishing (cont.)

Now all users at facility can use Custom Report we created

The screenshot displays a software interface with a left-hand navigation pane containing a tree structure of folders and reports. The folders include 'Antimicrobial Use Data - 2', 'Antimicrobial Resistance D', 'Data Quality', 'MDRO/CDI Module - LABID E', 'MDRO/CDI Module - Infection Surveillance', 'MDRO/CDI Module - Process Measures', 'MDRO/CDI Module - Outcome Measures', 'COVID-19 Module', and 'CMS Reports'. The 'Custom Reports' folder is expanded, showing 'XGA6 - SAAR Report'. The main content area on the right shows a bar chart titled 'Bar Chart - Most Recent Month of AU Data by Anti-influenza Class and Location'. An 'Alert' dialog box is overlaid in the center, displaying the message 'Successfully published report.' with an 'OK' button.

# Advanced AU Option Analysis Resources

# Resources

- AU Option Quick Reference Guides: <https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html#accordion-1-collapse-5>
- AUR Training: <https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html>
- Keys to Success with the SAAR: <https://www.cdc.gov/nhsn/ps-analysis-resources/keys-to-success-saar.html>
- NHSN's Guide to the SAAR: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/au-saar-guide-508.pdf>
- AUR Module Reports: <https://www.cdc.gov/nhsn/datastat/aur-reports.html>
- NHSN Statistical Tool SAS Macros: <https://www.cdc.gov/nhsn/ps-analysis-resources/index.html>

# Thank you!

**Q&A Session: 1:00-1:15pm ET on March 24, 2022**

**NHSN Help Desk: [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)



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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.

