

# AU Option Standardized Antimicrobial Administration Ratio (SAAR) Plot

## Description

A dot plot is a graphical display of data using dots plotted on a graph. NHSN provides a few Standardized Antimicrobial Administration Ratio (SAAR) dot plots.

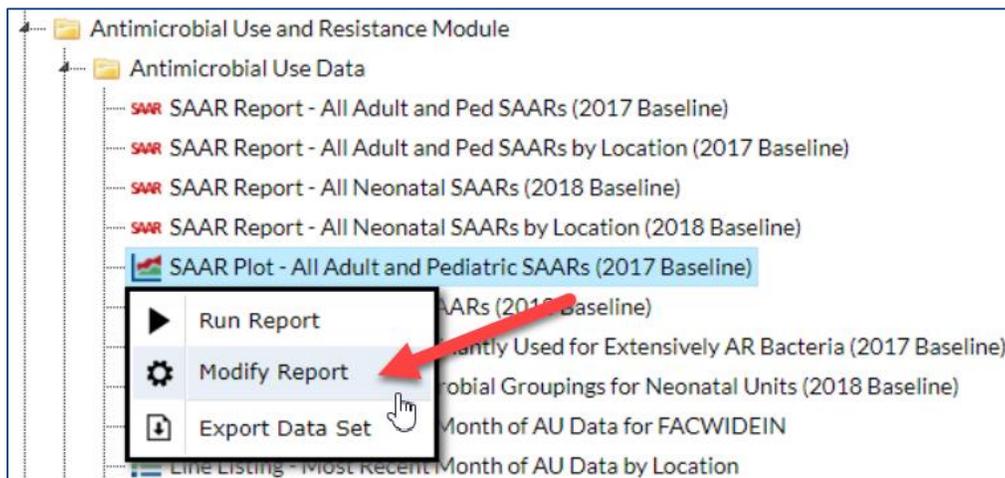
Dot plots can only be produced as HTML output; therefore, the results will appear in a pop-up window in your browser. This document explains how to visualize SAAR data for a specific antimicrobial agent category and location group over time.

## Example: SAAR Plot – All Adult and Pediatric SAARs (2017 Baseline)

You would like to create a dot plot to graphically display the SAAR for antibacterial agents predominantly used for resistant gram-positive infections (e.g., MRSA) used in adult intensive care units (ICUs) to see how usage in your facility's ICUs changed from April 2020 to December 2021 by quarter.

After generating datasets, click Analysis > Reports > Antimicrobial Use and Resistance Module > Antimicrobial Use Data. After selecting the dot plot you want, in this case "SAAR Plot – All Adult and Pediatric SAARs (2017 Baseline)," a pop-up box will appear with the options "Run Report," "Modify Report," and "Export Data Set." "Export Data Set" allows users to export the underlying SAAR data set used to populate the SAAR dot plots. Select "Modify Report" to customize your report.

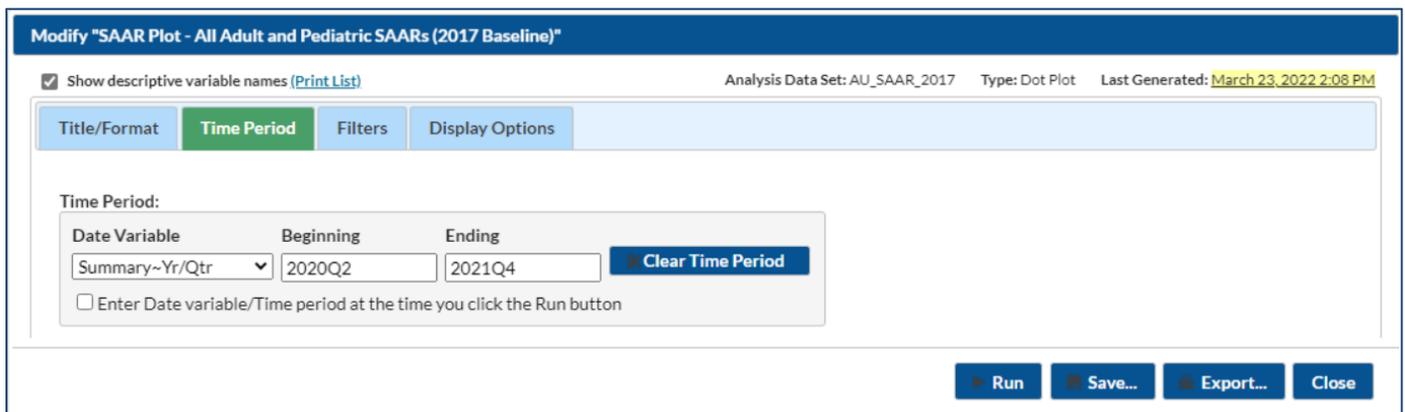
For a general step-by-step explanation of the NHSN report modification screen, refer to this document: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf>.



## Modifying the Report

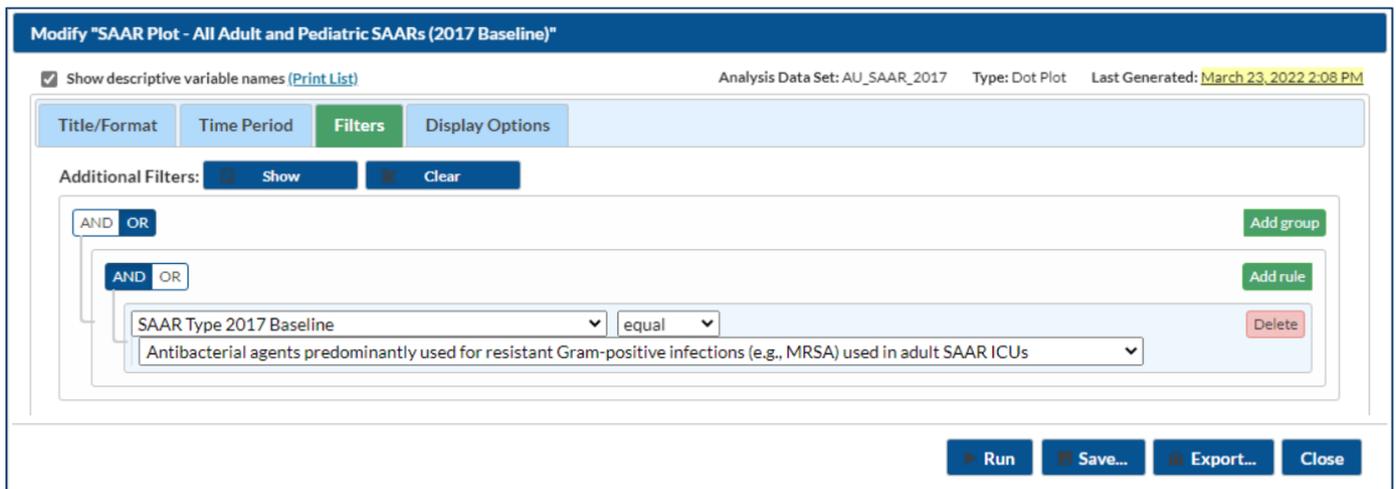
When you choose to modify the report, the modification screen appears showing multiple tabs containing available modification options for the given report. The “Title/Format” tab allows you to update the report title. To filter the data by time period, choose the “Time Period” tab at the top of the modification screen. In this example, we will select “Summary~Yr/Qtr” for the Data Variable and limit the report to 2020Q2 through 2021Q4.

**Tip:** For more descriptive variable labels on your report, check the box “Show descriptive variable names” that appears near the top of the modification window (recommended).



The screenshot shows the "Modify 'SAAR Plot - All Adult and Pediatric SAARs (2017 Baseline)'" interface. At the top, there is a header bar with the title and a checkbox for "Show descriptive variable names (Print List)". Below the header, there are four tabs: "Title/Format", "Time Period" (which is selected and highlighted in green), "Filters", and "Display Options". The "Time Period" section contains a "Date Variable" dropdown menu set to "Summary~Yr/Qtr", a "Beginning" text box with "2020Q2", and an "Ending" text box with "2021Q4". There is a "Clear Time Period" button to the right of the ending box. Below these fields is a checkbox labeled "Enter Date variable/Time period at the time you click the Run button". At the bottom right of the interface, there are four buttons: "Run", "Save...", "Export...", and "Close".

The “Filters” tab allows you to further filter the data displayed in the report. For our example, we want to filter the report to show the SAAR for antibacterial agents predominantly used for resistant gram-positive infections (e.g., MRSA) used in adult ICUs. Select the variable “SAAR Type 2017 Baseline” from the drop-down menu, set the operator to “equal”, then select “Antibacterial agents predominantly used for resistant Gram-positive infections (e.g., MRSA) used in adult SAAR ICUs” from the drop-down menu that appears.



The screenshot shows the "Modify 'SAAR Plot - All Adult and Pediatric SAARs (2017 Baseline)'" interface with the "Filters" tab selected. At the top, there is a header bar with the title and a checkbox for "Show descriptive variable names (Print List)". Below the header, there are four tabs: "Title/Format", "Time Period", "Filters" (which is selected and highlighted in green), and "Display Options". The "Filters" section contains an "Additional Filters:" label with "Show" and "Clear" buttons. Below this, there is a filter rule editor. It starts with "AND OR" buttons. A rule is defined with a dropdown menu set to "SAAR Type 2017 Baseline", an "equal" operator, and another dropdown menu set to "Antibacterial agents predominantly used for resistant Gram-positive infections (e.g., MRSA) used in adult SAAR ICUs". There are "Add group", "Add rule", and "Delete" buttons. At the bottom right of the interface, there are four buttons: "Run", "Save...", "Export...", and "Close".

The “Display Options” tab allows you to modify how the plot is displayed such as viewing SAARs by month, quarter, half-year, or year for the time period selected.

Modify "SAAR Plot - All Adult and Pediatric SAARs (2017 Baseline)"

Show descriptive variable names ([Print List](#)) Analysis Data Set: AU\_SAAR\_2017 Type: Dot Plot Last Generated: [March 23, 2022 2:08 PM](#)

Title/Format Time Period Filters **Display Options**

Dot Plot Options:

1 Chart Variable  
Location SAAR

2 Group by  
Summary~Yr/Qtr

3  Display Confidence Interval  
 Display Charted Value  
 Reference Line with value = 1.0

Run Save... Export... Close

1) The "Chart Variable" is the variable being graphed on the dot plot and is represented by the dots; in this case, the variable is Location SAAR. Although you have the option to change the Chart Variable, you must use "Location SAAR" in order to view the SAARs.

2) In this example, we will use Summary Year/Quarter to show quarterly SAARs for drugs predominantly used for resistant gram-positive infections. Under Group by, select "Summary~Yr/Qtr". Please note that if the Time Period is not specified on the "Time Period" tab of the modification screen, the default SAAR dot plot will display the most recent 12 time periods (if available) corresponding to the Group by value (e.g., months, quarters, half-years, or years).

3) You can adjust how the plots display. By default, the SAAR 95% confidence interval will display around the dot for the SAAR (which is called the charted value), and the reference line is set to 1.0. The 95% confidence interval is a range of values in which we have a high degree of confidence that the true SAAR lies, though the SAAR is the most likely value. You can change the reference line value by typing in a number other than 1.0 in the text box beside "Reference Line with value". Deselect the "Display Confidence Interval" checkbox if you do not want the confidence interval to be displayed around the SAAR, deselect the "Display Charted Value" if you do not want the SAAR to be displayed, and/or deselect "Reference Line with value" if you do not want a reference line displayed.

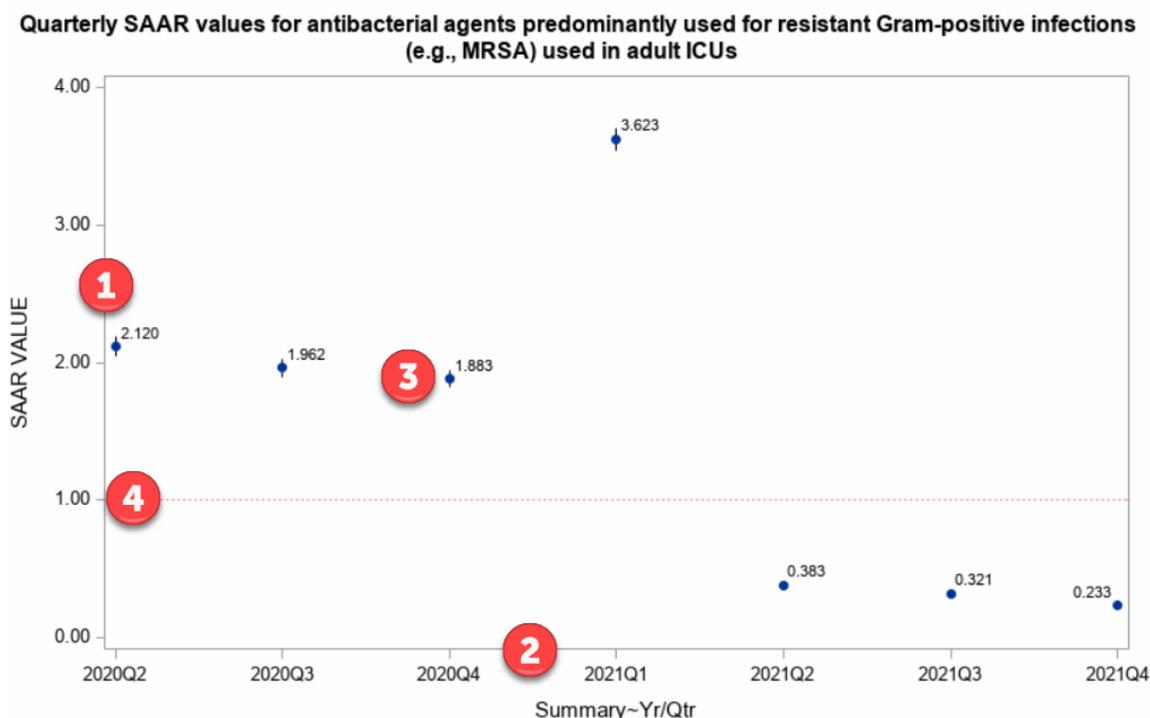
## Final Report

The example dot plot below is the result of the modifications shown in this document. This example displays the SAARs for antibacterial agents predominantly used for resistant gram-positive organisms used in adult ICUs from 2020Q2 to 2021Q4.

Note: Tracking antimicrobial use over time using SAARs should be limited to comparing two SAAR values across two points in time. NHSN does not recommend using SAARs for trend analyses, where SAAR values are simultaneously compared across many points in time to determine whether there is a statistically significant change in antimicrobial use, as this is not statistically appropriate. Please refer to the [NHSN's Guide to the SAAR](#) for more information.

1. The y-axis is the SAAR value. One dot is displayed for each SAAR value. Because we asked NHSN to display the “Charted Value” in the Display Options tab, the SAAR value (rounded to 3 decimal places) is displayed beside the dot. In the example, the SAAR for antibacterial agents predominantly used for resistant gram-positive organisms used in adult ICUs in 2020Q2 was 2.120.
2. The x-axis is the designated Group by variable and in this example it’s Summary Year/Quarter. The SAARs are displayed for each quarter beginning with 2020Q2 through 2021Q4. In the first four quarters of our selected time period, the SAAR value was above 1.0 meaning more antimicrobial use was reported than predicted, while for the last three quarters, the SAAR value was below 1.0 meaning less antimicrobial use was reported than predicted.
3. The SAAR 95% confidence interval is displayed as vertical lines around the SAAR value. The bigger the range of the confidence interval, the longer the lines will display on the plot. For example, the SAAR value for 2020Q4 was 1.883. The SAAR 95% confidence interval (1.820, 1.949) is very narrow, in other words, the lines extending above and below the charted SAAR value are short. If a SAAR 95% confidence interval includes 1.0, this indicates that reported antimicrobial use is not statistically significantly different from predicted antimicrobial use.
4. The reference line (1.0) is displayed as a red dashed horizontal line.

*Note: This example uses fictitious data for illustrative purposes only.*



*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.*

*If a SAAR 95% confidence interval (vertical line) includes 1.0 (dashed horizontal line), this indicates that reported antimicrobial use is not statistically significantly different from predicted antimicrobial use.*

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

## Additional Resources

Surveillance for Antimicrobial Use Option: <https://www.cdc.gov/nhsn/psc/aur/index.html>

NHSN AUR Module Protocol: <http://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf>

NHSN AUR Module 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>

How to Export Data from NHSN: <http://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/exportdata.pdf>