Targeted Assessment for Stewardship (TAS) Report: Location Groups

Description

The Targeted Assessment for Stewardship (TAS) is a framework for quality improvement developed by the CDC to use NHSN AU Option data for action to optimize AU at facilities. The TAS Reports use a metric called the AU cumulative attributable difference (AU-CAD). The AU-CAD is the number of antimicrobial days needed to achieve a facility-identified Standardized Antimicrobial Administration Ratio (SAAR) target. This could be a reduction or addition of antimicrobial days depending on the facility-identified SAAR target. The TAS Reports allow users to rank location groups and locations within individual facilities or facilities within groups by the AU-CAD to prioritize stewardship efforts where they may have the greatest impact. The Facility TAS Reports use AU data reported by the facility and the facility-identified SAAR target to calculate the AU-CAD for each SAAR type and location using the following formula, rounded to the nearest whole number:

$$\text{AU-CAD} = \text{Observed antimicrobial days} - (\text{Predicted antimicrobial days} \times \text{SAAR target})$$

The AU-CAD can be greater or less than zero. A positive AU-CAD value means the SAAR target was less than the current SAAR value for that category. A positive AU-CAD value represents the number of antimicrobial days to reduce per time period to decrease the SAAR value and reach your SAAR target. A negative AU-CAD value means the SAAR target was greater than the current SAAR value for that category. A negative AU-CAD value represents the number of antimicrobial days to add per time period to increase the SAAR value and reach your SAAR target.

Note: SAAR and AU-CAD values are not definitive measures of appropriateness or judiciousness of antimicrobial use and any SAAR or AU-CAD value may warrant additional investigation. Facilities should assess the appropriateness of courses of therapy for select antimicrobials or infections to inform the clinical relevance of AU-CAD reductions or additions.

This Quick Reference Guide describes how a facility can run and interpret a location group-level TAS Report within NHSN. All TAS Reports with titles ending in "– Location Groups" will produce "location group-level" SAARs and AU-CAD values (specifically, ICUs, Wards, Stepdown, and Oncology). Keep in mind these reports only include those location types that can generate SAARs (see Table 5 in the AUR Module Protocol for a list of SAAR-eligible location types).
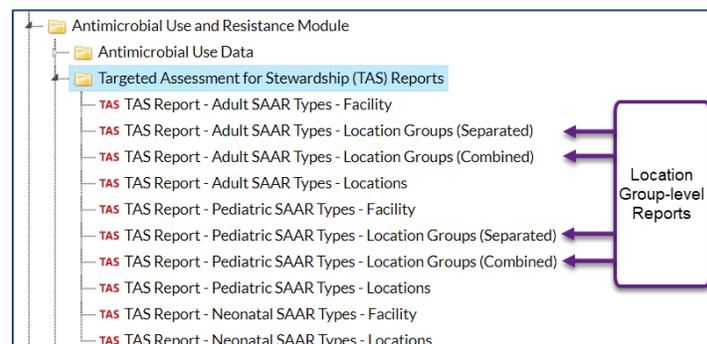
These reports are available for the adult and pediatric populations. The two reports within a given population display the same data, just organized differently. The Location Groups (Separated) report will display the SAAR Types ranked by AU-CAD

value within each location group. Whereas the Location Groups (Combined) report will display the location group and SAAR type ranked by AU-CAD. See the examples below for an illustration of the difference.

For guidance on running the other types of TAS Reports or the TAS Dashboard, please see the guides here: Analysis Quick Reference Guides. Prior to generating a TAS Report, we recommend reviewing the TAS Guide to learn how to set your facility-identified SAAR targets.

Example

You've already reviewed the facility-level TAS reports and set your SAAR targets. To inform further discussions, your antimicrobial stewardship team would like to investigate whether stewardship resources would have the largest impact in the facility's pediatric wards or the pediatric ICUs. If there is a difference, is there a particular SAAR type that could be targeted for assessment and intervention? These data can be displayed in two ways within NHSN as outlined below.

After generating data sets, first click "TAS Report – Pediatric SAAR Types – Location Groups (Separated)" then click "Modify Report." This report will rank the location group SAAR Type AU-CAD values *within* the location group.

Entering SAAR Targets

On the modification screen, click the Display Options tab. You're able to enter your SAAR targets on this tab. If you've set SAAR targets before via the TAS Dashboard or other TAS Reports, they will appear here. You'll notice the default GroupBy value at the top of this tab shows "Cumulative". This means the report will generate for the most recent 12 months of AU data combined. If you wanted to run the TAS reports using more granular time periods (for example, Quarter), you'd change the GroupBy selection. However, the reports will still only contain data for the most recent 12 months.

Since you selected the Pediatric SAAR Types TAS Report, you'll see the population defaults to Pediatric and all Pediatric SAAR types are listed. You've already entered your SAAR targets. After clicking Save, you'll see a message that confirms you've successfully saved your SAAR targets.

Click Run to generate the report.

Modify "TAS Report - Pediatric SAAR Types - Location Groups (Separated)"

☑ Show descriptive variable names (Print List)   Last Generated: September 6, 2022 11:36 AM

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

TAS Options:

Group by: Cumulative ⌄

Population: Pediatric ⌄

All Antibacterials 0.8
BSHO 0.8
BSCA 0.6
GramPos 0.6
NSBL 0.9
Azithromycin 0.5
CDI 0.4
Antifungal 1

Reset   Save ← Click Save here to save the SAAR Targets

► Run   🖫 Save...   ⬇ Export...   Close

Interpretating the Report

Note: This example uses fictitious data for illustrative purposes only

National Healthcare Safety Network
TAS Report - Pediatric SAAR Types - Location Groups (Separated)
Pediatric SAAR Types Location Groups Ranked by AU-CAD ①
Facility Identified SAAR Target: BSHO = (0.8); BSCA = (0.6); GramPos = (0.6); NSBL = (0.9); Azithromycin = (0.5); CDI = (0.4); Antifungal = (1)
As of: September 9, 2022 at 1:35 PM
Date Range: All AU_TAS
if (((population = "PEDIATRIC")))

FACILITY		②	③		④	⑤	⑥ LOCATION GROUP		⑦		⑧	⑨	⑩
Facility Org ID	Facility Name	Facility AU-CAD (Rounded)	LocationGroup	SAARTypeCat	Location Group Rank	Location Group AU-CAD (Rounded)	Three highest use drugs within SAAR Type (Percentage)		Antimicrobial Days	Predicted Antimicrobial Days	Days Present	Location SAAR	95% Confidence Interval
13860	CDA-XYZ_QA_TEST FACILITY	-520	ICUS	GRAMPOS	1	-20	CLIND(14); TELAV(13); QUINWD(12);		542	935.994	7575	0.579	0.532, 0.629
				AZITH	2	-55	AZITH(100);		59	228.860	7575	0.258	0.198, 0.330
				ANTIFGL	3	-62	FLUCO(30); CASPO(28); MICA(24);		170	231.970	7575	0.733	0.629, 0.849
				BSHO	4	-72	CIPRO(10); GEMIF(10); LEVO(10);		599	838.723	7575	0.714	0.659, 0.773
				CDI	5	-103	CLIND(11); CEFPO(10); CEFDIN(10);		703	2015.270	7575	0.349	0.324, 0.375
				NSBL	6	-120	CEFOX(11); DICLOX(9); OX(9);		671	878.670	7575	0.764	0.707, 0.823
				BSCA	7	-315	CEFUR(12); CEFAC(12); CEFPO(12);		603	1529.519	7575	0.394	0.364, 0.427
			WARDS	BSHO	1	261	CEFEP(10); CIPRO(10); ERTA(10);		945	855.414	10775	1.105	1.036, 1.177
				GRAMPOS		261	CEFTAR(13); TELAV(12); LNZ(11);		765	839.817	10775	0.911	0.848, 0.977
				ANTIFGL	2	198	ANID(27); CASPO(26); FLUCO(25);		304	105.941	10775	2.870	2.560, 3.206
				CDI	3	156	CEFPO(10); CEFDIN(9); CEFEP(9);		1030	2185.901	10775	0.471	0.443, 0.501
				AZITH	4	0	AZITH(100);		84	168.954	10775	0.497	0.399, 0.612
				BSCA	5	-157	CEFPO(12); CEFAC(11); CEFDIN(11);		847	1672.682	10775	0.506	0.473, 0.541
				NSBL	6	-492	CEFAZ(10); DICLOX(9); CEFAD(9);		925	1574.927	10775	0.587	0.550, 0.626

1. **Report header:** At the top of the report, you'll see the report title along with the SAAR target values you entered on the modification screen and any other modifications you made to the report. In this example, we ran a pediatric report, so it displays as population = PEDIATRIC and shows the targets specifically for each pediatric SAAR type (see above screenshot).

2. **Facility AU-CAD:** The Facility AU-CAD value is the sum of the location group AU-CAD values listed in the table. If an individual location group does not receive a SAAR or a location AU-CAD value, it will not be included in the Facility AU-CAD displayed on this report. In this example, the Facility AU-CAD is -520. This means that overall, for each of these SAAR Types and location types combined, the facility would need have needed to add 520 antimicrobial days over the last 12 months to meet the facility's pediatric SAAR targets.

$$\text{Facility AU-CAD} = \text{Sum of location group AU-CADs}$$
$$= -20 - 55 - 62 - 72 - 103 - 120 - 315 + 261 + 261 + 198 + 156 + 0 - 157 - 492$$
$$= -520$$

3. **LocationGroup & SAARTypeCat:** By default, the location group report type generates two tables showing the SAAR Type AU-CAD values, and their rankings based on those values, within each location group. The first table (not pictured) displays the AU-CAD values for the All Antibacterial SAAR. The second table (see above screenshot) displays the AU-CAD values for all other SAAR types according to the population (specifically, adult, pediatric and neonatal). The "Location Groups (Separated)" tables will show the location groups consisting of data from individual locations that can generate SAARs. The "Separated" report type will always

order the location groups the same way. For pediatric reports ICUS will be listed first followed by WARDS. For adult reports (not pictured), the report will be ordered by ICUS, STEPDOWN, WARDS, and ONCOLOGY.

4. **Location Group Rank:** Within each location group, the SAAR Types are displayed according to their rank with the highest SAAR Type AU-CAD value within the location group being ranked #1. In this example, within the ICUS group the GRAMPOS SAAR is ranked #1 while within the WARDS group the BSHO and GRAMPOS SAARs are tied and both ranked #1. If the AU-CAD values are tied, the ranks will also be tied as shown in the above screenshot for the BSHO and GRAMPOS SAARs within the WARDS location group with a location group AU-CAD value of 261.

5. **Location Group AU-CAD:** The location group AU-CAD is calculated for each SAAR type using the observed antimicrobial days, predicted antimicrobial days and facility-identified SAAR target. The value is rounded to the nearest whole number. In this example, the GRAMPOS SAAR within the ICUS location group has a location group AU-CAD value of -20.

$$\text{AU-CAD} = \text{Observed antimicrobial days} - (\text{Predicted antimicrobial days} \times \text{SAAR target})$$
$$= 542 - (935.994 \times 0.6)$$
$$\approx -20$$

This facility needed to increase the antimicrobial days in the GRAMPOS SAAR category by 20 antimicrobial days in the pediatric ICU locations over the course of those twelve months if they wanted to move the GRAMPOS SAAR value from the current value of 0.579 to the SAAR target value of 0.6. A negative AU-CAD value means the SAAR target is greater than the current SAAR value and to move closer to the SAAR target, antimicrobial days would need to increase among that group of drugs.

A positive AU-CAD value means the SAAR target is lower than the current SAAR value and to move closer to the SAAR target, antimicrobial days would need to be decreased. In this example, for the BSHO SAAR category among the WARDs, the facility needed to decrease by 261 antimicrobial days over the last 12 months to move the current WARDs BSHO SAAR value of 1.105 to the SAAR target of 0.8. Of note, if a SAAR cannot be calculated due to data quality issues, the location AU-CAD value will also be suppressed.

In this report, we can see that the SAAR Types within the WARDS location group have the higher location group AU-CAD values whereas within the ICUS location group, all SAAR Types have a SAAR value that's already below the SAAR target value.

6. **Three highest use drugs within SAAR Type (Percentage):** This column shows the three highest use drugs and their percentage of use within each location group by SAAR type. For the pediatric ICUs location group within the GRAMPOS SAAR, CLIND (clindamycin), TELAV (telavancin) and QUINWD (quinupristin/dalfopristin) were the three highest use drugs over the course of the last twelve months making up 14%, 13%, and 12% of GRAMPOS use, respectively. The drugs are abbreviated using the NHSN drug codes to save space. Refer to the List of Antimicrobial Agents Eligible for AUR Module for the full drug name.

7. **Antimicrobial Days & Predicted Antimicrobial Days:** These columns indicate the observed (or reported) antimicrobial days and predicted antimicrobial days, respectively, for antimicrobials included in the selected SAAR type. These values are used to calculate the AU-CAD for each location. For the GRAMPOS SAAR, the ICU location group reported a combined 542 antimicrobial days and 935.994 antimicrobial days were predicted based on the national benchmark.

8. **Days Present:** These are the total days present for each location group included in the TAS Report. As a reminder, for the report "TAS Report – Pediatric SAAR Types – Location Groups (Separated)", this would include all pediatric locations that can generate SAARs. In this example, the total days present for the pediatric ICU location group over the last twelve months was 7575.

9. **Location SAAR:** The SAAR value displayed on this report uses the antimicrobial days and predicted antimicrobial days from each location group. For the GRAMPOS SAAR type, the ICU location group SAAR value was 0.579.

10. **95% Confidence Interval:** The 95% Confidence Interval (CI) is a range of values in which we have a high degree of confidence that the true SAAR lies; however, the SAAR reported under the SAAR column is the most likely value. If the confidence interval includes the value of 1, then the SAAR is not statistically significant (the observed usage is not statistically significantly different from predicted usage). In this example, the GRAMPOS SAAR 95% CI within the ICUS location group is 0.532, 0.629 and does not include 1.0 which means this SAAR is statistically different than a value of 1.0.

National Healthcare Safety Network
TAS Report - Pediatric SAAR Types - Location Groups (Combined)
Pediatric SAAR Types Combined Location Groups Ranked by AU-CAD
Facility Identified SAAR Target: BSHO = (0.8); BSCA = (0.6); GramPos = (0.6); Antifungal = (1); NSBL = (0.9); AZITH = (0.5); CDI = (0.4)
As of: September 9, 2022 at 1:42 PM
Date Range: All AU_TAS
if (((population = "PEDIATRIC")))

FACILITY			LOCATION GROUP									
Facility Org ID	Facility Name	Facility AU-CAD (Rounded)	LocationGroup	SAARTypeCat	Location Group Rank	Location Group AU-CAD (Rounded)	Three highest use drugs within SAAR Type (Percentage)	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	Location SAAR	95% Confidence Interval
13860	CDA-XYZ_QA_TEST FACILITY	-520	WARDS	BSHO	1	261	CEFEP(10); CIPRO(10); ERTA(10);	945	855.414	10775	1.105	1.036, 1.177
			WARDS	GRAMPOS		261	CEFTAR(13); TELAV(12); LNZ(11);	765	839.817	10775	0.911	0.848, 0.977
			WARDS	ANTIFGL	2	198	ANID(27); CASPO(26); FLUCO(25);	304	105.941	10775	2.870	2.560, 3.206
			WARDS	CDI	3	156	CEFPO(10); CEFDIN(9); CEFEP(9);	1030	2185.901	10775	0.471	0.443, 0.501
			WARDS	AZITH	4	0	AZITH(100);	84	168.954	10775	0.497	0.399, 0.612
			ICUS	GRAMPOS	5	-20	CLIND(14); TELAV(13); QUINWD(12);	542	935.994	7575	0.579	0.532, 0.629
			ICUS	AZITH	6	-55	AZITH(100);	59	228.860	7575	0.258	0.198, 0.330
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			ICUS	NSBL	10	-120	CEFOX(11); DICLOX(9); OX(9);	671	878.670	7575	0.764	0.707, 0.823
			WARDS	BSCA	11	-157	CEFPO(12); CEFAC(11); CEFDIN(11);	847	1672.682	10775	0.506	0.473, 0.541
			ICUS	BSCA	12	-315	CEFUR(12); CEFAC(12); CEFPO(12);	603	1529.519	7575	0.394	0.364, 0.427
			WARDS	NSBL	13	-492	CEFAZ(10); DICLOX(9); CEFAD(9);	925	1574.927	10775	0.587	0.550, 0.626

Another way to view these same data would be to run the "TAS Report – Pediatric SAAR Types – Location Groups (Combined)" report (example output shown above). You'll see the exact same column structure and data, but notice the sorting is different compared to the "Separated" report. The "Combined" report type will show the location group SAAR Types combined into one ranking based on the AU-CAD value. To provide additional evidence for our original goal of assessing which location group

and SAAR Types may benefit from further assessment and intervention, we can see the top four location group AU-CAD values are all for the WARD locations. These also happen to be the only location group SAAR types that need to decrease excess antimicrobial days to meet the facility-identified SAAR goals (specifically, the only location group SAAR types with positive AU-CAD values).

The TAS report(s) provides a starting point for the antimicrobial stewardship team. Just like the SAARs, the AU-CAD values are not a measure of appropriate use so a location with a high AU-CAD value may not have any room for improvement. It's up to stewards to assess use within their facility and determine which locations may benefit from further assessment and intervention. Using this information from the "Target" portion of the TAS Strategy, they can move onto the "Assess" portion as outlined in the TAS Guide. Or they can run the TAS Report by Locations to see if a specific location is contributing a greater excess of antimicrobial days or run an AU Rate Table or Line List if they wanted to gather more information about the use of these drugs over the last 12 or more months.

Additional Resources

Antimicrobial Use and Resistance (AUR) Module Eligible Antimicrobial Agents: http://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx

AUR Module website: https://www.cdc.gov/nhsn/psc/aur/index.html

National Healthcare Safety Network (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

NHSN's Guide to TAS: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/tas-guide-508.pdf

TAS Report – Facility level QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/facility-level-508.pdf

TAS Report – Location level QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/location-level-508.pdf

Facility TAS Dashboard QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/facility-508.pdf

Group TAS Report QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/group-level-508.pdf

Group TAS Dashboard QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/group-508.pdf