Targeted Assessment for Stewardship (TAS) Report: Locations
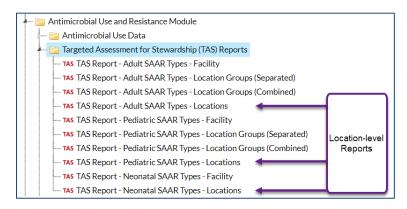
Description

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-level TAS Report within NHSN. All TAS Reports with titles ending in "– Locations" will produce "location-level" SAARs and AU-CAD values. Keep in mind that 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).

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. After reviewing the data, you know the neonatal Broad spectrum antibacterial agents predominantly used for hospital-onset infections (BSHO) SAAR is the highest among your NICU SAARs. To inform further discussions, your neonatal stewardship team would like to know if and how the use in the various neonatal units differs. Assuming use differs, is there one unit where the stewardship resources would have the largest impact in reaching the facility's Neonatal BSHO SAAR target?

After generating data sets, click "TAS Report – Neonatal SAAR Types – Locations" then click "Modify Report."

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 Neonatal SAAR Types TAS Report, you'll see the population defaults to Neonatal and all Neonatal 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 - Neonatal SAAR Types - Locations"

☑ Show descriptive variable names (Print List)   Type: TAS   Last Generated: July 25, 2022 1:15 PM

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

TAS Options:

Group by: Cumulative ▾

Population: Neonatal ▾

All Antibacterials | 1.8
BSHO | 1.25
Vancomycin | 0.14
3rd gen Cephalosporins | 1
Ampicillin | 0.22
Aminoglyscosides | 0.14
Fluconazole | 0.46

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

TAS Report - Neonatal SAAR Types - Locations
Neonatal SAAR Ranked by Location AU-CAD (1)
Facility Identified SAAR Target: BSHO = (1.25); VANC = (0.14); CEPH = (1); AMP = (0.22); AMINO = (0.14); FLUCO = (0.46)
As of: August 4, 2022 at 2:04 PM
Date Range: All AU_TAS
if (((population = "NEONATAL")))

Facility Org ID	Facility Name	SAARTypeCat	Facility AU-CAD (Rounded)	Location	CDC Location	Location Rank	Location 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	BSHO	34	NICUSTEP	IN:ACUTE:STEP:NURS	1	54	PIPERWT(31); MERO(27); IMIPWC(20);	75	16.452	7469	4.559	3.611, 5.682
				NICU III	IN:ACUTE:CC:NURS	2	5	IMIPWC(23); MERO(23); ERTA(22);	82	61.596	7055	1.331	1.066, 1.644
				NICU IV	IN:ACUTE:CC:NURS_IV	3	-4	ERTA(26); IMIPWC(24); PIPERWT(22);	74	62.093	7112	1.192	0.943, 1.488
				NICU	IN:ACUTE:CC_STEP:NURS	4	-21	PIPERWT(31); CEFEP(19); IMIPWC(19);	64	67.891	7776	0.943	0.732, 1.196
		CEPH	30	NICU III	IN:ACUTE:CC:NURS	1	16	CEFTAZ(42); CEFOT(32); CEFTRX(26);	57	40.833	7055	1.396	1.067, 1.796
				NICU	IN:ACUTE:CC_STEP:NURS	2	7	CEFOT(37); CEFTRX(37); CEFTAZ(27);	52	45.006	7776	1.155	0.872, 1.503
				NICUSTEP	IN:ACUTE:STEP:NURS		7	CEFOT(36); CEFTRX(34); CEFTAZ(30);	50	43.229	7469	1.157	0.868, 1.513
				NICU IV	IN:ACUTE:CC:NURS_IV	3	0	CEFOT(44); CEFTAZ(32); CEFTRX(24);	41	41.163	7112	0.996	0.724, 1.338
		FLUCO	27	NICU III	IN:ACUTE:CC:NURS	1	16	FLUCO(100);	55	85.063	7055	0.647	0.492, 0.835
				NICU	IN:ACUTE:CC_STEP:NURS	2	9	FLUCO(100);	52	93.757	7776	0.555	0.418, 0.722
				NICU IV	IN:ACUTE:CC:NURS_IV	3	2	FLUCO(100);	41	85.750	7112	0.478	0.348, 0.642
		VANC	17	NICUSTEP	IN:ACUTE:STEP:NURS	1	15	VANC(100);	18	23.879	7469	0.754	0.461, 1.168
				NICU IV	IN:ACUTE:CC:NURS_IV	2	6	VANC(100);	18	87.842	7112	0.205	0.125, 0.318
				NICU	IN:ACUTE:CC_STEP:NURS	3	-2	VANC(100);	11	96.043	7776	0.115	0.060, 0.199
				NICU III	IN:ACUTE:CC:NURS		-2	VANC(100);	10	87.137	7055	0.115	0.058, 0.205
		AMINO	16	NICU III	IN:ACUTE:CC:NURS	1	21	AMK(52); TOBRA(30); GENTA(18);	83	443.808	7055	0.187	0.150, 0.231
				NICU IV	IN:ACUTE:CC:NURS_IV	2	9	AMK(46); TOBRA(31); GENTA(24);	72	447.393	7112	0.161	0.127, 0.201
				NICUSTEP	IN:ACUTE:STEP:NURS	3	-2	AMK(48); TOBRA(34); GENTA(17);	64	469.851	7469	0.136	0.106, 0.173
				NICU	IN:ACUTE:CC_STEP:NURS	4	-12	AMK(43); GENTA(32); TOBRA(25);	56	489.164	7776	0.114	0.087, 0.148
		AMP	-474	NICU III	IN:ACUTE:CC:NURS	1	-112	AMP(100);	14	574.553	7055	0.024	0.014, 0.040
				NICU IV	IN:ACUTE:CC:NURS_IV	2	-114	AMP(100);	13	579.195	7112	0.022	0.012, 0.037
				NICUSTEP	IN:ACUTE:STEP:NURS	3	-119	AMP(100);	15	608.269	7469	0.025	0.014, 0.040
				NICU	IN:ACUTE:CC_STEP:NURS	4	-129	AMP(100);	10	633.270	7776	0.016	0.008, 0.028

(Column group markers across the header: FACILITY | (2) | (3) | (4) | (5) | (6) LOCATION | (7) | (8) | (9) | (10))

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 neonatal report, so it displays as population = NEONATAL and shows the targets specifically for each neonatal SAAR type (see above screenshot).

2. **SAARTypeCat & Facility AU-CAD:** By default, this report generates two tables showing the individual location AU-CAD values, and their rankings based on those values, within each SAAR type. The first table (not pictured) displays the AU-CAD values for the All Antibacterial SAAR. The second table (see above screenshot) displays the Facility AU-CAD values for all other SAAR types according to the population (specifically, adult, pediatric and neonatal). The Facility AU-CAD value is the sum of the location AU-CAD values for that specific SAAR type. If an individual location 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 BSHO SAAR type had the highest Facility AU-CAD value (34) and is therefore listed at the top of the table followed by CEPH (Third generation Cephalosporins) and FLUCO (Fluconazole predominantly used for candidiasis).

$$\text{BSHO Facility AU-CAD} = \text{Sum of BSHO location AU-CADs}$$
$$= 54 + 5 - 4 - 21$$
$$= 34$$

A Facility AU-CAD value of 34 for the BSHO SAAR means the facility needed to reduce 34 antimicrobial days among the drugs in the neonatal BSHO SAAR group across these four neonatal locations over the last 12 months to decrease the facility-level BSHO SAAR to a value of 1.25. (Note: you can find the Facility-level SAAR values on the [Facility-level TAS Reports](#))

3. **Location & CDC Location:** These columns indicate the "Your Code" and "CDC Code" value, respectively, for each location included in the table. This report displays all locations within the population (neonatal in this example) that can generate SAARs. As a reminder, step down neonatal nursery locations are unable to get a FLUCO SAAR and are therefore excluded from the TAS reports specifically for the FLUCO SAAR type.

4. **Location Rank:** Within each SAAR type, the locations are displayed according to their rank with the highest location AU-CAD value being ranked #1. In this example, within the BSHO SAAR, the NICUSTEP location is ranked #1. Of note, if the AU-CAD values are tied, the ranks will also be tied as shown in the above screenshot for the Third generation Cephalosporins (CEPH) SAAR for the locations NICU and NICUSTEP with a location AU-CAD value of 7.

5. **Location AU-CAD:** The location 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 NICUSTEP has a BSHO location AU-CAD value of 54.

$$\text{AU-CAD} = \text{Observed antimicrobial days} - (\text{Predicted antimicrobial days} \times \text{SAAR target})$$
$$= 75 - (16.452 \times 1.25)$$
$$\approx 54$$

This facility needed to decrease the antimicrobial days among the drugs in the BSHO type by 54 in the NICUSTEP unit over the course of the last twelve months if they wanted to decrease the NICUSTEP BSHO SAAR value from the current value of 4.559 to the target value of 1.25.

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. In this case, to move the NICU unit's BSHO SAAR from the current value of 0.943 to the target value of 1.25, the facility would have needed to <u>add</u> 21 antimicrobial days over the last 12 months. Of note, if a SAAR cannot be calculated due to data quality issues, the location AU-CAD value will also be suppressed.

6. **Three highest use drugs within SAAR Type (Percentage):** This column shows the three highest use drugs and their percentage of use within each SAAR type by location. For the NICUSTEP location within the neonatal BSHO SAAR, PIPERWT (piperacillin/tazobactam), MERO (meropenem) and IMIPWC (imipenem/cilastatin) were the three highest use drugs over the course of the last twelve months making up 31%, 27%, and 20% of BSHO use within the NICUSTEP unit, 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 BSHO SAAR, the NICUSTEP location reported a combined 75 antimicrobial days and 16.452 antimicrobial days were predicted based on the SAAR model.

8. **Days Present:** These are the total days present for each location included in the TAS Report. As a reminder, for the report "TAS Report – Neonatal SAAR Types – Locations", this would be all neonatal locations that can generate SAARs. In this example, the total days present for the NICUSTEP location over the last twelve months was 7,469.

9. **Location SAAR:** The SAAR value displayed on this report uses the antimicrobial days and predicted antimicrobial days from each location. For the BSHO SAAR type, the NICUSTEP SAAR value was 4.559.

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 BSHO SAAR 95% CI is 3.611, 5.628 and does not include 1.0 which means this SAAR is statistically different than a value of 1.0.

FACILITY				LOCATION (E)		(F) LOCATION	(A)	(C)	(B)	(D)	
Facility Org ID	Facility Name	SAAR TypeCat	Facility AU-CAD (Rounded)	Location	CDC Location	Location Rank	Location 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	BSHO	34	NICUSTEP	IN:ACUTE:STEP:NURS	1	54	PIPERWT(31); MERO(27); IMIPWC(20);	75	16.452	7469	4.559	3.611, 5.682
				NICU III	IN:ACUTE:CC:NURS	2	5	IMIPWC(23); MERO(23); ERTA(22);	82	61.596	7055	1.331	1.066, 1.644
				NICU IV	IN:ACUTE:CC:NURS_IV	3	-4	ERTA(26); IMIPWC(24); PIPERWT(22);	74	62.093	7112	1.192	0.943, 1.488
				NICU	IN:ACUTE:CC_STEP:NURS	4	-21	PIPERWT(31); CEFEP(19); IMIPWC(19);	64	67.891	7776	0.943	0.732, 1.196

To answer the original question of if and how the use of drugs in the BSHO SAAR type in the various neonatal units differs, we can look at the antimicrobial days, SAAR values, and the Location AU-CAD. Looking at the antimicrobial days (A) for the neonatal BSHO SAAR type, the units seem to use a similar amount of these drugs ranging from 64 antimicrobial days in the NICU location to 82 antimicrobial days in the NICU III location. However, based on the varying denominators (B) (specifically, days present) and the risk adjustment applied to each location, the predicted antimicrobial days (C) and SAAR values (D) vary greatly from 0.943 for the NICU location to 4.559 for the NICUSTEP location. The varying predicted antimicrobial use leads to the large difference in Location AU-CAD values (E) with the NICUSTEP location needing to decrease use of drugs in the BSHO SAAR type by 54 antimicrobial days to get that location's SAAR to the neonatal BSHO SAAR target of 1.25. The three highest use drugs column (F) may also provide actionable insight into the use of BSHO drugs in the NICUSTEP location.

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 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 – Facility location group level QRG: https://www.cdc.gov/nhsn/ps-analysis-resources/tas/location-group-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