



NATIONAL HEALTHCARE SAFETY NETWORK
ANTIMICROBIAL USE OPTION

THE NHSN TARGETED ASSESSMENT FOR ANTIMICROBIAL STEWARDSHIP (TAS)

A Guide to the TAS

September 2022



**Centers for Disease Control
and Prevention**
National Center for Emerging and
Zoonotic Infectious Diseases

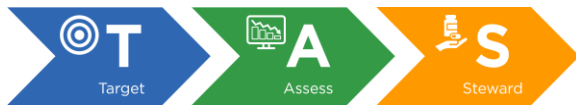
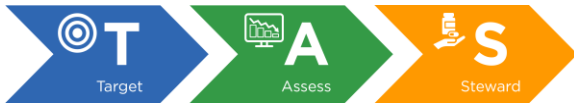


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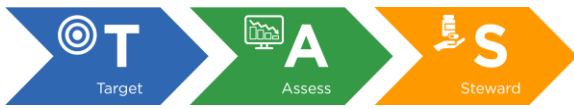
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Overview of the Targeted Assessment for Antimicrobial Stewardship (TAS)

What is the TAS framework?

The Targeted Assessment for Antimicrobial Stewardship (TAS) is a framework for quality improvement developed by the Centers for Disease Control and Prevention (CDC) to use National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Option data for action to optimize AU at facilities. TAS is available to hospitals participating in the NHSN AU Option. TAS can be used by antimicrobial stewards and others focused on optimizing AU within groups, such as health departments and health systems, as well as individual facilities.



The TAS framework consists of three components:

- 1) **Target** – Run TAS Reports in NHSN to identify facilities, location groups and locations for further assessment using the ranked AU cumulative attributable difference (AU-CAD).
- 2) **Assess** – Utilize assessment tools to identify gaps and opportunities to improve antibiotic use.
- 3) **Steward** – Implement antibiotic stewardship activities to address gaps and opportunities.

The TAS Reports use a metric called the AU-CAD. The AU-CAD represents the difference between the observed days and a selected Standardized Antimicrobial Administration Ratio (SAAR) target. The TAS Reports allow for ranking facilities within groups, or location groups and locations within individual facilities, by the AU-CAD, to identify where stewardship efforts may have the greatest impact. Since the SAAR is not a definitive measure of the appropriateness or judiciousness of AU, CDC cannot define SAAR targets for facilities or groups. Facilities and groups, however, can use their information on antibiotic use (for example, a medication use evaluation to assess appropriate courses of therapy) to establish improvement goals that can then be monitored with NHSN AU Option metrics (for example, the AU-CAD and SAAR).



The process by which facilities move through the TAS framework may be dynamic in that facilities set initial targets and assess the achievability of the targets before setting final appropriate targets. After implementing stewardship activities based on initial assessments, facilities may evaluate progress using the TAS reports and dashboards, and set new targets as needed.

Understanding and calculating the AU-CAD

The AU-CAD is the number of antimicrobial days needed to achieve a desired SAAR target. The higher the AU-CAD value, the greater the number of antimicrobial days that need to be reduced to meet the SAAR target. For example, if a facility has an AU-CAD of 75 when they run a TAS report with a SAAR target of 0.95, the interpretation would be “The facility would have needed 75 fewer antimicrobial days to reach their SAAR target of 0.95 during this time period.”

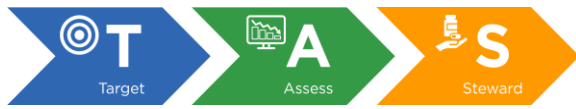
As part of the TAS Strategy, the AU-CAD can promote use of the AU data for action in a few ways:

- In combination with the SAAR, the AU-CAD can be used to identify and prioritize facilities and locations for targeting stewardship efforts.
- The AU-CAD translates a SAAR target into a numeric antimicrobial day reduction (or addition) goal, providing a concrete goal to drive action.
- The AU-CAD can identify facilities and locations with potential opportunities for improvement that might not be as apparent when only looking at the SAAR.

NHSN uses facility-specific SAAR data and the SAAR target to calculate the AU-CAD for each SAAR type, location group, and location within the facility or group. NHSN calculates the AU-CAD by multiplying a numerical SAAR target value by predicted antimicrobial days and then subtracting that from observed antimicrobial days, rounded to the nearest whole number.

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

- Observed antimicrobials days: Antimicrobial days reported to the AU Option by a facility for a SAAR antimicrobial agent category used in a specified patient care location, group of locations, or group of facilities.
- Predicted antimicrobials days: Antimicrobial days predicted for that same antimicrobial agent category used in the same location, group of locations or group of facilities. NHSN calculates predicted antimicrobial days using risk-adjusted SAAR predictive models.
- SAAR target: Users enter SAAR targets for TAS Reports by entering a value of their choice for each SAAR antimicrobial agent category (also known as SAAR type).



The AU-CAD can be greater than 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.

Like the SAAR, the AU-CAD is not a measure of the appropriateness or judiciousness of AU. Thus, facilities will need to assess the appropriateness of courses of therapy for select antibiotics or infections to inform the clinical relevance of AU-CAD reductions or additions. Please note that, because the AU-CAD is not adjusted by risk exposure size (for example, a location with many days present may have a higher AU-CAD than a location with fewer days present), it should not be used as a metric to compare performance of units or facilities. For example, a larger hospital with more patients and more days present will likely have a higher AU-CAD value than a smaller hospital with fewer patients.

Users can visualize AU-CADs over time using the [TAS Dashboard](#). Though visual comparisons of AU-CAD data over time can be useful as stewardship programs assess progress, NHSN does not recommend using statistical comparisons or trend analyses to determine whether there is a significant change or trend in AU-CADs. [NHSN's Guide to the SAAR](#) provides more information on assessing progress in antimicrobial stewardship or prescribing over time in the "Assessing AU data over time" section.

Comparing the SAAR and AU-CAD

While the SAAR and the AU-CAD value are both useful metrics for stewardship, they are used for different purposes. The SAAR is a risk-adjusted metric that accounts for differences in incidence (e.g., AU rate, frequency) among risk exposure categories (e.g., facility type, average length of stay). Facilities can use a SAAR value to tell them if antimicrobial use in a location or group of locations is greater than or less than the use predicted by national baselines. The AU-CAD value, on the other hand, translates the SAAR target into a tangible number of antimicrobial days to reduce or add to achieve a SAAR target. This value can then be communicated to antimicrobial stewardship committees, hospital leadership and prescribers. By using the AU-CAD, the TAS Strategy enables facilities to compare their antimicrobial use to a value other than 1.0 as displayed in the SAAR reports.

Selecting a "SAAR target"

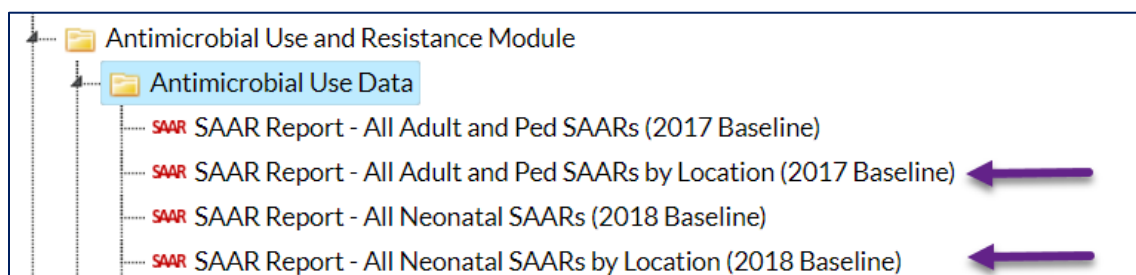
The TAS Reports enable facilities and groups to calculate an AU-CAD based upon a SAAR target. There are many factors to consider when defining target SAAR values. Unlike the Healthcare Association Infection (HAI) [Targeted Assessment for Prevention \(TAP\) Strategy](#) and Standardized Infection Ratios (SIRs), there are no national SAAR



goals. Higher SAARs might reflect opportunities to improve use, but these values might be justified in some instances. Additionally, a SAAR value of 1.000 does not necessarily mean AU is ideal. Clinical judgement and patient information should be considered when interpreting SAAR values and setting SAAR targets. Refer to [Livorsi and colleagues' publication](#) in Infection Control and Hospital Epidemiology as an example of a facility assessing SAAR values. The facility-identified SAAR target values may differ among facilities based on factors such as the original SAAR value for a given SAAR agent category, stewardship priorities, and clinical relevance. Additionally, SAAR target values may differ among SAAR agent categories and/or populations (adult, pediatric, neonatal) within a given facility. In many instances, stewards may go back and forth between setting a SAAR target and assessing the reasonableness of that target value before settling on an appropriate final SAAR target.

Antimicrobial stewardship programs can conduct medication use evaluations (MUEs) to assess courses of therapy for select antimicrobials or infections, which can help identify opportunities to improve use and inform target SAAR values. MUEs are considered the gold standard for assessing antimicrobial appropriateness. As outlined by [CDC and The PEW Charitable Trusts](#), more detailed reviews of antimicrobial use could focus on indications for prescribing, common infections and broad spectrum therapy. See the [Assess](#) section for resources.

National SAAR distributions can help further inform SAAR target decisions by allowing hospitals to see how their SAARs compare to others. Users can easily identify the percentile within which their location-specific SAARs fall within the NHSN SAAR Reports for a given location.



Broad spectrum antibacterial agents predominantly used for hospital-onset infections used in adult SAAR wards

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
10009	Adult_BSHO_Ward_2017	MEDSURG64	2022M01	IN:ACUTE:WARD:MS	45	36.819	320	1.222	0.1852	0.902, 1.621	64

The [NHSN AU Data Reports](#) provide summaries of SAAR distributions and percentages of use within SAAR antimicrobial agent categories in adult, pediatric, and neonatal locations. After identifying your current SAAR Percentile, you can use the SAAR distributions provided in the AU Data Report to determine your SAAR target. For example, using the 2020 AU National distributions, if the facility BSHO SAAR value is at the 64th percentile, the facility could use any percentile value from the corresponding SAAR distribution that is lower such as the 60th percentile value at 1.168, the 55th percentile value at 1.109, 50th percentile value at 1.052 (see below screenshot) or even lower if deemed clinically appropriate based upon local guidelines and practices.



SAAR and 95% confidence limits (CL)		Percentile distribution of location-specific SAARs																				
Adult SAAR location type	SAAR	Lower CL	Upper CL	5th	10th	15th	20th	25th	30th	35th	40th	45th	50th	55th	60th	65th	70th	75th	80th	85th	90th	95th
Medical-surgical wards	1.065	1.063	1.066	0.329	0.472	0.571	0.655	0.722	0.794	0.867	0.936	0.996	1.052	1.109	1.168	1.233	1.286	1.357	1.442	1.533	1.666	1.881

As another example, the facility’s BSHO SAAR value for adult medical wards is 0.95, and the target is to further reduce BSHO antimicrobial use to the national median BSHO SAAR value, which was 0.915 in 2020, then the facility may choose to set their BSHO SAAR target to 0.915 (the national median value as shown in the screenshot below), rather than the nominal 1.000 value.

SAAR and 95% confidence limits (CL)		Percentile distribution of location-specific SAARs																				
Adult SAAR location type	SAAR	Lower CL	Upper CL	5th	10th	15th	20th	25th	30th	35th	40th	45th	50th	55th	60th	65th	70th	75th	80th	85th	90th	95th
Medical wards	0.955	0.953	0.956	0.314	0.446	0.546	0.604	0.654	0.723	0.778	0.817	0.866	0.915	0.985	1.017	1.085	1.142	1.209	1.285	1.372	1.483	1.685

Of note, the 95% confidence interval is the range of values within which there is a high degree of confidence that a facility’s true SAAR value lies, and the SAAR is the preferred estimate to summarize use. It is not necessary to pick a SAAR target value lower than the lower bound of the confidence interval or higher than the upper bound because doing so doesn’t guarantee a statistically significant change in the SAAR value. It’s important to remember that any reduction in antimicrobial days could be meaningful, regardless of the statistical significance.

As antimicrobial stewardship programs set SAAR targets and reduce antimicrobial use, it is important to monitor for potential unintended consequences by assessing outcomes like treatment failures and infection-related readmissions.

[NHSN Group Users](#) may use several approaches to set SAAR targets due to the variation of SAAR values among the facilities within their group. For example, different SAAR targets may be used for the highest quartile compared to the other quartiles of facilities within the group. State health departments may use the state-specific SAAR values found in the [Antibiotic Resistance and Patient Safety Portal](#) to inform their SAAR targets.

Example calculation of AU-CAD based upon SAAR target value

As an example, let’s calculate the AU-CAD for antifungal agents predominantly used for invasive candidiasis for a pediatric medical-surgical ICU in a fictional hospital. Based on the most recent 12 months of data reported, the antifungal SAAR for the pediatric medical-surgical ICU is 1.587. This SAAR value is in the 70th percentile of



antifungal SAARs reported from pediatric medical-surgical ICUs nationwide in 2020. We worked with our antimicrobial stewardship team to determine that it is appropriate to reduce use of antifungals in our pediatric medical-surgical ICU to the 65th percentile, a SAAR value of 1.358. To calculate the AU-CAD manually, we will need three pieces of information:

- SAAR target
- Observed antimicrobial days
- Predicted antimicrobial days

For this example, let's use:

- SAAR target: 1.36*
- Observed antimicrobial days: 2,087
- Predicted antimicrobial days: 1,314.714

**The NHSN TAS Reports and TAS Dashboard will automatically round the SAAR target value to two decimal places. Entering a value of 1.358 will produce a SAAR target of 1.36.*

To calculate the AU-CAD for pediatric antifungal agents predominantly used for invasive candidiasis in our medical-surgical ICU, we can plug the SAAR target, antimicrobial days, and predicted antimicrobial days into the AU-CAD formula and round to the nearest whole number.

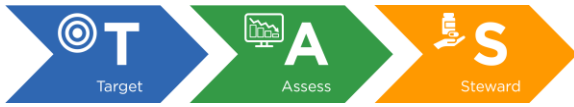
$$\begin{aligned}\text{AU-CAD} &= \text{Observed antimicrobial days} - (\text{Predicted antimicrobial days} \times \text{SAAR target}) \\ &= 2087 - (1314.714 \times 1.36) \\ &\approx 299 \text{ antimicrobial days}\end{aligned}$$

The AU-CAD for antifungal agents predominantly used for invasive candidiasis in our pediatric medical-surgical ICU over the most recent complete 12 calendar months is 299 antimicrobial days. This means that to reduce our pediatric medical-surgical ICU's antifungal SAAR of 1.587 to our SAAR target of 1.36 for the most recent complete 12 calendar months, we would have needed to reduce our use of antifungal agents predominantly used for invasive candidiasis in our pediatric medical-surgical ICU by approximately 299 antimicrobial days.

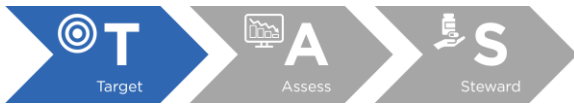
Circumstances under which NHSN cannot calculate AU-CAD values

The AU-CAD formula uses predicted antimicrobial days, which are calculated using the SAAR models. NHSN can only calculate an AU-CAD for SAAR-eligible locations. At present, SAARs and AU-CADs are available for 17 eligible adult, pediatric, and neonatal location types included in Table 5 of the [AUR Protocol](#). In the future, as more facilities submit AU data, the NHSN Team plans to develop SAARs for additional location types.

To provide the highest possible quality of data to its users, NHSN does not calculate AU-CADs under certain circumstances. These circumstances align with the "Circumstances under which NHSN cannot generate SAAR reports or SAAR values" in the "Interpreting the SAAR" section of [NHSN's Guide to the SAAR](#) with the exception



that NHSN *can* calculate AU-CADs for locations with less than one predicted antimicrobial day, provided the location has at least one observed antimicrobial day. Predicted antimicrobial days are calculated based on the number of days present and estimates from the SAAR models, which use data from healthcare facilities nationwide reporting to the NHSN AU Option. Locations with less than one predicted antimicrobial day do not receive SAARs because they do not meet NHSN’s minimum precision criteria. However, these locations may still report antimicrobial days and NHSN wants to provide antimicrobial stewards the opportunity to target locations for stewardship interventions regardless of how other, similar locations performed nationally.

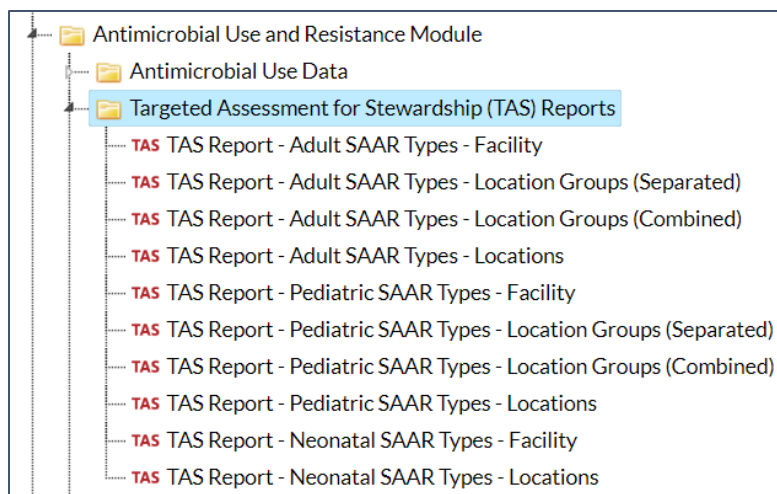


Target: Run TAS Reports in NHSN to identify facilities, location groups and locations for further assessment by ranked AU-CADs

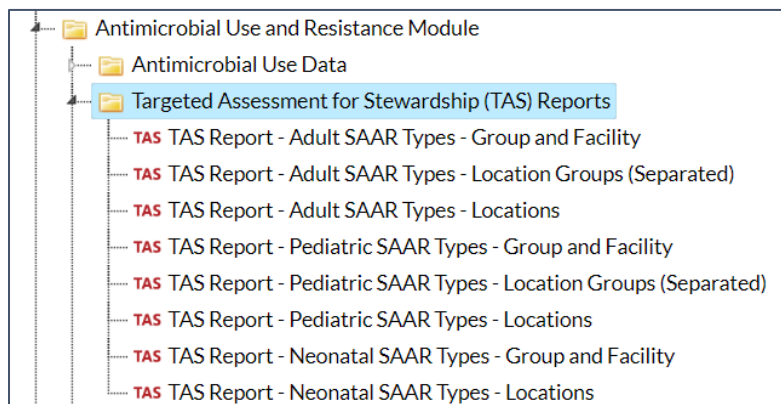
Running TAS reports

Report overview

TAS Reports are located within the Analysis section of NHSN. First, generate new data sets. On the Generate Data Sets screen, we recommend leaving the beginning and ending dates blank to ensure you're not limiting the AU data included in the TAS Reports. After data set generation is complete, navigate to the Analysis Reports page by clicking Analysis, then Reports on the left-hand navigation bar. You'll notice the TAS Reports have their own subfolder within the Antimicrobial Use and Resistance Module folder. Below is a screenshot of the TAS reports available within a facility:



NHSN Groups will see a slightly different set of reports:



You'll notice the TAS reports are separated by population (adult, pediatric, or neonatal) and by level of aggregation (group, facility, location group, and location). TAS reports include only those location types that can generate SAARs; in other words, the same locations in your SAAR reports will also be included in the TAS reports.

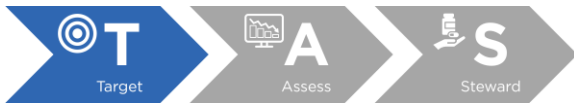
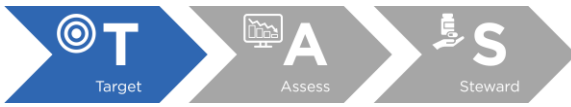


Table 1: Location types able to generate SAARs and included in TAS reports

Location Group in TAS Reports	CDC Location Type	CDC Location Code	NHSN Healthcare Service Location (HL7) Code
Adult Locations			
ICU	Medical Critical Care	IN:ACUTE:CC:M	1027-2
ICU	Surgical Critical Care	IN:ACUTE:CC:S	1030-6
ICU	Medical-Surgical Critical Care	IN:ACUTE:CC:MS	1029-8
Stepdown	Adult Step Down Unit	IN:ACUTE:STEP	1099-1
Ward	Medical Ward	IN:ACUTE:WARD:M	1060-3
Ward	Surgical Ward	IN:ACUTE:WARD:S	1072-8
Ward	Medical-Surgical Ward	IN:ACUTE:WARD:MS	1061-1
Oncology	ONC General Hematology-Oncology Ward	IN:ACUTE:WARD:ONC_HONC	1232-8
Pediatric Locations			
ICU	Pediatric Medical Critical Care	IN:ACUTE:CC:M:PED	1044-7
ICU	Pediatric Medical-Surgical Critical Care	IN:ACUTE:CC:MS_PED	1045-4
Ward	Pediatric Medical Ward	IN:ACUTE:WARD:M_PED	1076-9
Ward	Pediatric Surgical Ward	IN:ACUTE:WARD:S_PED	1086-8
Ward	Pediatric Medical-Surgical Ward	IN:ACUTE:WARD:MS_PED	1081-9
Neonatal Locations			
N/A	Step down Neonatal Nursery	IN:ACUTE:STEP:NURS	1041-3
N/A	Neonatal Critical Care (Level II/III)	IN:ACUTE:CC_STEP:NURS	1039-7
N/A	Neonatal Critical Care (Level III)	IN:ACUTE:CC:NURS	1040-5
N/A	Neonatal Critical Care (Level IV)	IN:ACUTE:CC:NURS_IV	1269-0

The TAS reports are available at different levels of aggregation:

- Group
 - Available only when running the TAS reports within an NHSN Group.
 - One table displays metrics pooled at the group level. All other tables in the Group reports display metrics at the facility level for each member facility in the group by SAAR type.
- Facility
 - Available only when running the TAS reports within an individual facility.
 - The reports display metrics pooled at the facility level for an individual facility.
- Location Group
 - The reports display metrics for a group of patient care locations based on how the locations are mapped in NHSN (see Table 1).
 - Adult location groups: ICUs, Wards, Stepdown, Oncology
 - Pediatric location groups: ICUs, Wards
 - Location groups are not available for neonatal TAS reports.
 - Two types of location group reports are available depending on your preferred sort:



- Location groups (Separated): Rank is based on location group SAAR Type AU-CAD values *within the location group*. In other words, the SAAR Types are ranked based on location group AU-CAD value within that specific location group.
 - Location groups (Combined): Rank is based on location group SAAR Type AU-CAD values among all SAAR Types and location groups. In other words, SAAR Types and location groups are ranked according to the AU-CAD value alone.
- Locations
 - AU-CAD values are provided for each individual location able to generate SAARs (see Table 1).

Entering SAAR targets

Before running the TAS Reports you will first need to enter your SAAR target values for each SAAR Type and population. If you run the reports without setting your own SAAR targets, the application will default to a SAAR target of 0 for all populations and SAAR Types, which is not an appropriate target value. Please review the section above for guidance on [selecting SAAR target values](#).

To enter your SAAR target values within the TAS Reports, select any TAS report and click Modify Report.

1. On the Modification Screen, click the Display Options tab (see below screenshot)
2. Note the population (adult, pediatric, or neonatal)
3. Enter each SAAR target value
4. After entering your SAAR target values click Save

A screenshot of a web application interface titled "Modify 'TAS Report - Adult SAAR Types - Facility'". At the top, there is a checkbox labeled "Show descriptive variable names (Print List)" which is checked. Below this are four tabs: "Title/Format", "Time Period", "Filters", and "Display Options". The "Display Options" tab is highlighted in green and has a purple circle with the number "1" next to it. Under the "TAS Options:" section, there are two dropdown menus: "Group by:" set to "Cumulative" and "Population:" set to "Adult", with a purple circle with the number "2" next to the "Population:" dropdown. Below these are several input fields for SAAR target values, each with a "1" next to it: "All Antibacterials", "BSHO", "BSCA", "GramPos", "NSBL", "CDI", and "Antifungal". A purple box highlights these input fields, with a purple circle with the number "3" next to it. At the bottom of the form are two buttons: "Reset" and "Save", with a purple circle with the number "4" next to the "Save" button.

From that same screen, change the population and enter additional SAAR target values. Please be sure to enter a SAAR target for each SAAR Type. Click Save after entering the SAAR target values for each population. These



SAAR target values will be saved and used each time you run TAS reports and the TAS Dashboard. Specifically, the TAS reports and TAS Dashboard will continue to use these SAAR target values until you manually update the values. You can update your SAAR target values at any time by following these same steps. The SAAR target values are unique to your NHSN user profile; in other words, each NHSN user will set their own SAAR target values prior to running the TAS reports or TAS Dashboard.

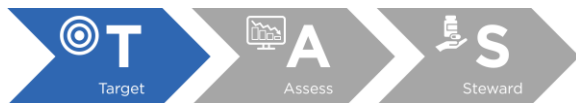
Default TAS reports

After saving the SAAR target values, you can run the default TAS reports by selecting the TAS report you'd like to run and clicking Run Report. Each report is set up similarly.

By default, TAS reports use data reported from the most recent 12 months. Specifically, a TAS report run on July 15, 2022, will automatically include all reported AU data from July 2021 through June 2022. You can modify the output to display tables according to calendar year, half-year, quarter, or month within that 12-month span. For example, a TAS report run on July 15, 2022, using the modification to "group by summaryYQ" would produce 4 tables for the quarters in the 12-month span between July 2021-June 2022 (Quarter 3, 2021, Quarter 4, 2021, Quarter 1, 2022, and Quarter 2, 2022).

Below is an overview of the variables included in the TAS reports:

- SAARTypeCAT: The SAAR type variable indicates the abbreviated name of the SAAR type (Table 2).
- Rank: The AU-CAD values are compared to assign a rank. The highest AU-CAD value will be ranked first (rank = 1).
- Facility AU-CAD/Location Group AU-CAD/Location AU-CAD: The number of antimicrobial days to reduce or add to get your SAAR to your identified SAAR target.
- Three highest use drugs within SAAR Type (Percentage): The three highest use drugs within that SAAR Type and population. The percentage represents the number of antimicrobial days for a given drug divided by the total number of antimicrobial days for that specific SAAR Type. The full drug names can be found here: [AUR Module Eligible Agents Spreadsheet](#).
- Antimicrobial Days: Antimicrobial days include any amount of a specific antimicrobial agent administered in a calendar day to a particular patient as reported in the electronic medication administration record (eMAR) or bar-coding medication administration record (BCMA). Antimicrobial days are the SAAR numerator and are used in the AU-CAD calculation.
- Predicted Antimicrobial Days: Predicted antimicrobial days are the days of therapy predicted for each SAAR agent category and location, or group of locations, through predictive modeling applied to nationally aggregated AU data. In addition to estimates from predictive models, predicted antimicrobial



days are calculated using the number of days present for the time period of interest and the location or group of locations. Predicted antimicrobial days are the SAAR denominator and are used in the AU-CAD calculation.

- Days Present: Days present include the aggregate number of patients housed in a patient care location or group of locations anytime throughout the day during a calendar month. Users should verify the accuracy of their days present counts because NHSN uses days present to calculate predicted antimicrobial day values.
- Location SAAR: The SAAR is a ratio comparing observed antimicrobial days to antimicrobial days predicted by a referent, or baseline, population (specifically, predicted antimicrobial days).
- 95% Confidence Interval: The 95% confidence interval is the range of values in which NHSN has a high degree of confidence that the true SAAR value lies. However, the SAAR is the most likely value.

Table 2: SAAR Types used in the TAS Reports^a

Abbreviation	SAAR Type Description	Applicable Population(s)
ALL	All antibacterial agents	Adult, Pediatric, Neonatal
BSHO	Broad spectrum antibacterial agents predominantly used for hospital-onset infections	Adult, Pediatric, Neonatal
BSCA	Broad spectrum antibacterial agents predominantly used for community-acquired infections	Adult, Pediatric
GRAMPOS	Antibacterial agents predominantly used for resistant Gram-positive infections (e.g., Methicillin-resistant <i>Staphylococcus aureus</i> [MRSA])	Adult, Pediatric
NSBL	Narrow spectrum beta-lactam agents	Adult, Pediatric
CDI	Antibacterial agents posing the highest risk for <i>Clostridioides difficile</i> infection (CDI)	Adult, Pediatric
ANTIFGL	Antifungal agents predominantly used for invasive candidiasis	Adult, Pediatric
AZITH	Azithromycin	Pediatric
VANC	Vancomycin predominantly used for treatment of late-onset sepsis	Neonatal
CEPH	Third generation cephalosporins	Neonatal
AMP	Ampicillin predominantly used for treatment of early-onset sepsis	Neonatal
AMINO	Aminoglycosides predominantly used for treatment of early-onset and late-onset sepsis	Neonatal
FLUCO	Fluconazole predominantly used for candidiasis	Neonatal

^aDrugs within each SAAR type may differ by population. See the [AUR Module Protocol](#) for the list of drugs included in each SAAR.



Interpreting TAS reports

The TAS reports are a tool to help stewards identify where stewardship efforts may have the greatest impact.

Facility-level report

Here's an example interpretation for the TAS Report for adult locations at the Facility-level.

**National Healthcare Safety Network
TAS Report - Adult SAAR Types - Facility
Adult SAAR Types Ranked by AU-CAD**

Facility Identified SAAR Targets: All antibacterials = (0.67); BSHO = (0.2); BSCA = (0.5); GramPos = (0.5); NSBL = (1.5); CDI = (0.4); Antifungal = (0.7)

As of: July 28, 2022 at 3:34 PM
Date Range: All AU_TAS
if (((population = "ADULT")))

Facility Org ID	Facility Name	SAARTypeCat	AU-CAD Rank	Facility 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	BSCA	1	1207	ERTA(8); GEMIF(8); MOXI(8);	5371	8328.744	52759	0.645	0.628, 0.662
		ALL	2	922	AMOX(2); CEFTAZ(2); MINO(2);	25893	37269.485	52759	0.695	0.686, 0.703
		CDI	3	875	CEFTAZ(9); GEMIF(9); MOXI(9);	5037	10404.835	52759	0.484	0.471, 0.498
		BSHO	4	613	CEFTAZ(17); CEFEP(16); IMIPWC(16);	2757	10720.680	52759	0.257	0.248, 0.267
		ANTIFGL	5	340	CASPO(26); ANID(26); FLUCO(25);	1665	1893.515	52759	0.879	0.838, 0.922
		GRAMPOS	6	199	QUINWD(13); CEFTAR(12); TELAV(12);	3385	6372.250	52759	0.531	0.514, 0.549
		NSBL	7	-987	AMOX(8); CEFOX(8); AMOXWC(7);	5706	4462.067	52759	1.279	1.246, 1.312

Note: Data are fictitious and for example only.

After selecting the SAAR target values for each Adult SAAR Type, the fictional facility generated the TAS Report – Adult SAAR Types – Facility. The facility-identified SAAR targets are listed above each table (A).

The SAAR Types are ranked based on the Facility AU-CAD value with the highest Facility AU-CAD ranked as 1 and the lowest Facility AU-CAD ranked as 7. In this case, the BSCA SAAR Type in the adult locations was ranked #1 (B) with a Facility AU-CAD value of 1,207. This SAAR type has the largest Facility AU-CAD value, meaning it has the most antimicrobial days to reduce in order to meet the facility's SAAR target for this SAAR (Facility-identified BSCA SAAR target = 0.5). The Facility AU-CAD value of 1,207 means the facility would need to reduce 1,207 antimicrobial days among the drugs in the BSCA SAAR category to move from the current SAAR of 0.645 (C) to the facility-identified SAAR target of 0.5.



The three highest use drugs column (D) shows that within the BSCA SAAR category, ertapenem, gemifloxacin, and moxifloxacin had the highest number of antimicrobial days, each accounting for 8% of all use within the BSCA SAAR category. Of note, when drug percentages are tied, the drugs are listed alphabetically.

Location group-level report

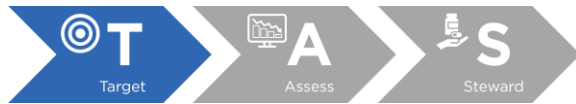
As referenced above, the Location group-level reports allow for two different methods of sorting the displayed data. In the “Separated” reports, the SAAR Types are ranked based on the AU-CAD value within a specific location group. In the “Combined” reports, the SAAR Types and location groups are displayed according to the AU-CAD value alone.

Here’s an example interpretation for the TAS Report for adult location groups (combined).

National Healthcare Safety Network
TAS Report - Adult SAAR Types - Location Groups (Combined)
Adult SAAR Types Combined Location Groups Ranked by AU-CAD **A**
Facility Identified SAAR Target: BSHO = (0.2); BSCA = (0.5); GramPos = (0.5); NSBL = (1.5); CDI = (0.4); Antifungal = (0.7)
 As of: September 15, 2022 at 11:55 AM
 Date Range: All AU_TAS
 if (population = "ADULT")

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	2771	WARDS	BSHO	1	752	CEFTAZ(17); CEFEP(17); IMIPWC(16);	1652	4500.768	34168	0.367	0.350, 0.385
			WARDS	CDI	2	623	CEFTAZ(9); CEFEP(9); MOXI(9);	3022	5997.117	34168	0.504	0.486, 0.522
			WARDS	ANTIFGL	3	596	ANID(29); CASPO(24); MICA(24);	1031	622.127	34168	1.657	1.558, 1.761
			WARDS	BSCA	4	588	MOXI(8); GEMIF(8); CEFPRO(8);	3252	5327.053	34168	0.610	0.590, 0.632
			WARDS	GRAMPOS	5	544	QUINWD(15); LNZ(13); ORITAV(13);	2060	3031.315	34168	0.680	0.651, 0.709
			ICUS	BSCA	6	531	ERTA(9); CEFUR(9); GEMIF(8);	2764	4465.649	28864	0.619	0.596, 0.642
			ONCOLOGY	NSBL	7	316	AMOXWC(9); NAF(8); AMPIWS(8);	1081	509.736	10866	2.121	1.997, 2.250
			STEPDOWN	BSCA	8	207	MOXI(9); CEFIX(9); CIPRO(9);	1090	1766.051	11538	0.617	0.581, 0.655
			STEPDOWN	BSHO	9	205	IMIPWC(17); MERO(16); CEFTAZ(15);	574	1844.385	11538	0.311	0.287, 0.337
			ONCOLOGY	BSCA	10	187	CEFPO(9); ERTA(9); GEMIF(9);	1155	1935.253	10866	0.597	0.563, 0.632
			STEPDOWN	CDI	11	161	MOXI(10); CEFIX(10); CIPRO(9);	1020	2147.159	11538	0.475	0.447, 0.505
			STEPDOWN	ANTIFGL	12	151	FLUCO(27); ANID(25); CASPO(25);	324	247.400	11538	1.310	1.173, 1.458
			ONCOLOGY	GRAMPOS	13	127	QUINWD(16); CEFTAR(14); ORITAV(13);	632	1010.493	10866	0.625	0.578, 0.676
			ICUS	CDI	14	124	CEFEP(10); CLIND(9); GEMIF(9);	2613	6223.497	28864	0.420	0.404, 0.436
			STEPDOWN	GRAMPOS	15	107	TEDIZ(14); TELAV(14); DAPTO(13);	643	1072.986	11538	0.599	0.554, 0.647
			STEPDOWN	NSBL	16	107	NAF(8); CEFAD(8); DICLOX(8);	1187	720.252	11538	1.648	1.556, 1.744
			ONCOLOGY	BSHO	17	88	PIPERWT(18); IMIPWC(16); MERO(16);	496	2037.939	10866	0.243	0.223, 0.266
			ONCOLOGY	CDI	18	22	CEFPO(11); GEMIF(10); MOXI(9);	1033	2528.532	10866	0.409	0.384, 0.434
			ONCOLOGY	ANTIFGL	19	-161	CASPO(27); ANID(26); FLUCO(25);	329	700.570	10866	0.470	0.421, 0.522
			ICUS	ANTIFGL	20	-163	FLUCO(28); CASPO(28); MICA(22);	887	1500.429	28864	0.591	0.553, 0.631
			ICUS	BSHO	21	-390	CEFEP(17); IMIPWC(16); MERO(15);	1475	9326.757	28864	0.158	0.150, 0.166
			ICUS	GRAMPOS	22	-821	QUINWD(13); DALBA(13); TELAV(13);	1865	5372.512	28864	0.347	0.332, 0.363
			ICUS	NSBL	23	-1130	AMOX(8); DICLOX(8); CTET(7);	3034	2775.785	28864	1.093	1.055, 1.132
			WARDS	NSBL	-	-	AMOX(94); CEFIX(1); CEFAZ(0);	53471	-	34168	-	-

Note: Data are fictitious and for example only.



The TAS Report – Adult SAAR Types – Location Group (Combined) shows the facility-identified SAAR target values listed above each table (A).

This report shows the All Antibacterials SAAR in a separate table. Below that table, and shown in the screenshot above, all other SAAR Types are shown in the order of the Location Group AU-CAD. The Location Group SAAR Type with the highest Location Group AU-CAD value is at the top of the table and the lowest Location Group AU-CAD value is at the bottom of the table (B). The Facility AU-CAD is the sum of all the Location Group AU-CAD values in the table. The TAS Report – Adult SAAR Types – Location Group (Separated) report run with the same parameters would display the same data organized differently.

All Location Group AU-CADs for a given SAAR Type are calculated using the same facility-identified SAAR target. In this example, the BSHO SAAR within the Ward location group has the largest Location Group AU-CAD (752) (C) and is ranked #1. This means the facility needs to reduce the antimicrobial days in the BSHO SAAR category within the Ward location group by 752 to lower this location group’s current SAAR value from 0.367 (D) to the facility-identified BSCA SAAR target value of 0.2. In this example, the ward location group had higher location group AU-CAD values than the other location groups (specifically ICUS, Stepdown and Oncology).

Location-level report

Here’s an example interpretation for the TAS Report for adult locations at the Location-level.

National Healthcare Safety Network
TAS Report - Adult SAAR Types - Locations
Adult SAAR Ranked by Location AU-CAD A
Facility Identified SAAR Target: BSHO = (0.2); BSCA = (0.5); GramPos = (0.5); NSBL = (1.5); CDI = (0.4); Antifungal = (0.7)
As of: July 28, 2022 at 3:35 PM
 Date Range: All AU_TAS
 if ((population = "ADULT"))

FACILITY				LOCATION									
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	BSCA	1206	SURGWARD	IN:ACUTE:WARD.S	C 1	285	CEFPRO(10); ERTA(9); CEFDIN(8);	719	868.733	6990	D 0.828	0.769, 0.890
				SICU	IN:ACUTE:CC.S	2	272	CEFOT(9); CEFPO(9); CEFUR(9);	694	844.125	6792	0.822	0.763, 0.885
				AD_STP_DN	IN:ACUTE:STEP	3	162	MOXI(10); CEFIX(10); CIPRO(9);	711	1097.315	7169	0.648	0.602, 0.697
				MICU	IN:ACUTE:CC.M	4	157	GEMIF(10); ERTA(10); MOXI(9);	567	819.090	4599	0.692	0.637, 0.751
				MSICU	IN:ACUTE:CC.MS	5	134	LEVO(10); ERTA(9); CEFUR(9);	575	881.316	5286	0.652	0.601, 0.707
				ONCGEN	IN:ACUTE:WARD:ONC_HONC	6	95	CEFPO(9); ERTA(9); GEMIF(9);	736	1282.154	7199	0.574	0.534, 0.617
				MEDWARD	IN:ACUTE:WARD.M	7	55	CEFPO(9); GEMIF(9); CEFAC(8);	690	1270.222	7132	0.543	0.504, 0.585
				MEDSURG64	IN:ACUTE:WARD:MS	8	46	GEMIF(10); MOXI(10); CEFPRO(8);	679	1265.789	7592	0.536	0.497, 0.578
				CDI	874	SURGWARD	IN:ACUTE:WARD.S	1	267	CEFEP(10); CEFTAZ(10); CEFDIN(9);	665	994.297	6990
		SICU	IN:ACUTE:CC.S	2	162	CEFEP(10); CEFOT(10); CEFPO(10);	668	1263.954	6792	0.529	0.490, 0.570		



Note: Data are fictitious and for example only.

The TAS Report – Adult SAAR Types – Locations shows the facility-identified SAAR target values listed above each table (A).

This report shows the All Antibacterials SAAR in a separate table. Below that table, and shown in the screenshot above, all other SAAR Types are shown in the order of the Facility AU-CAD with the SAAR Type with the highest Facility AU-CAD value at the top of the table and the lowest Facility AU-CAD value at the bottom of the table (B). The Facility AU-CAD is the sum of all the location AU-CAD values for that SAAR Type. In this report, the BSCA SAAR type has the largest Facility AU-CAD and is listed first in the table.

Within each SAAR Type, you'll see the individual locations with AU data ranked by the Location AU-CAD value. All Location AU-CADs for a given SAAR Type are calculated using the same facility-identified SAAR target. In this example, the surgical ward "SURGWARD" has the largest Location AU-CAD (285) (C) and is ranked #1 within this SAAR Type. This means the facility needs to reduce the antimicrobial days in the BSCA SAAR category by 285 to lower this location's current SAAR value from 0.828 (D) to the facility-identified BSCA SAAR target value of 0.5.

Group report

The Group TAS report available to NHSN groups functions similarly to the Facility-level TAS report with a few key differences. Here's an example highlighting the differences and interpretation for the TAS Report for NHSN Groups.

**National Healthcare Safety Network
TAS Report for Adult SAAR Types for Acute Care Hospitals
Total for all Facilities in Group**

Group Identified SAAR Target: All antibacterials = (1); BSHO = (1); BSCA = (1); GramPos = (1); NSBL = (1); CDI = (1); Antifungal = (1)

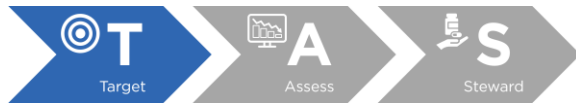
As of: September 15, 2022 at 1:11 PM
Date Range: All AU_TAS
if (((population = "ADULT")))

Number of Facilities	Number of Beds	Number of SAAR Locations	SAARTypeCat	Facility AU-CAD (Rounded)	Three highest use drugs within SAAR Type (Percentage)	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	95% Confidence Interval
2	285	16	NSBL	51620	AMOX(82); AMOXWC(1); CEFOX(1);	61814	10194.491	114	6.063	6.016, 6.111
2	285	16	ALL	22017	AMOX(49); QUINWD(1); MINO(1);	103124	81106.732	114327	1.271	1.264, 1.279
2	285	16	ANTIFGL	-758	CASPO(26); ANID(26); FLUCO(24);	3439	4197.067	114327	0.819	0.792, 0.847
2	285	16	BSCA	-5765	ERTA(8); GEMIF(8); MOXI(8);	10991	16756.490	114327	0.656	0.644, 0.668
2	285	16	GRAMPOS	-7162	QUINWD(14); TEDIZ(12); TELAV(12);	6980	14142.200	114327	0.494	0.482, 0.505
2	285	16	CDI	-12379	CLIND(9); CEFTAZ(9); GEMIF(9);	10269	22648.327	114327	0.453	0.445, 0.462
2	285	16	BSHO	-18290	IMIPWC(16); CEFTAZ(16); CEFEP(16);	5584	23874.435	114327	0.234	0.228, 0.240

Note: Data are fictitious and for example only.

The TAS Report – Adult SAAR Types – Group and Facility shows the group-identified SAAR target values listed above each table (A).

The first table in this report shows the data summarized at the Group level and includes data from all facilities in the NHSN group that have reported AU data from locations that can generate SAARs. This table lists the SAAR Types ranked by the value in the Facility AU-CAD (B). This is the group-level AU-CAD value. In this example, the NSBL SAAR Type has the highest AU-CAD value and is listed at the top of the table (C). This means, across the group, facilities would need to reduce antimicrobial days in the NSBL SAAR category by 51,620 to lower the group’s current NSBL SAAR value from 6.063 (D) to the group-identified SAAR target value of 1.



**National Healthcare Safety Network
TAS Report - Adult SAAR Types - Group and Facility
Facilities within the Group Ranked by AU-CAD
Group Identified SAAR Target: NSBL = (1) **A****

As of: September 15, 2022 at 1:11 PM
Date Range: All AU_TAS
if (((population = "ADULT")))

Facility Rank	Facility Org ID	Facility Name	State	Medical School Affiliation	Number of Beds	SAARTypeCat	Facility AU-CAD (Rounded)	Three highest use drugs within SAAR Type (Percentage)	Antimicrobial Days	Predicted Antimicrobial Days	Days Present	SAAR	95% Confidence Interval
B 1	13860	CDA-XYZ_QA_TEST FACILITY	GA	M	200	NSBL	51547	AMOX(86); AMOXWC(1); CEFIX(1);	58773	7226.063	85436	8.133	8.068, 8.200
2	10656	CDA TEST FACILITY	AL		85	NSBL	73	DICLOX(8); AMOXWC(8); CEFAD(8);	3041	2968.428	28891	1.024	0.989, 1.061

The tables following the first table list each SAAR Type ranking each facility in the group by Facility AU-CAD value as shown in the screenshot above. The group-identified SAAR target is listed above the table (A). In this table showing the NSBL SAAR Type, facility ID 13860 has the largest Facility AU-CAD and is listed first in the table (B). The data in these tables for antimicrobial days, predicted antimicrobial days, days present, SAAR and 95% Confidence Interval will match the Facility-Level TAS reports that the facilities individually generate. However, the SAAR target values are separate, and the Group and Facility TAS report uses the SAAR targets set at the group level rather than the SAAR targets set by individual facilities in the group. Changing the SAAR target at the group level does not affect individual facilities' AU Option data in any way.

Interpreting negative AU-CAD values

A negative AU-CAD value means the SAAR target was greater than the current SAAR value for that category. To increase your SAAR value, the negative AU-CAD value represents the number of antimicrobial days to add per time period to reach your SAAR target. If your facility would like to increase use of the drugs in the NSBL SAAR category, selecting an NSBL SAAR target value greater than your current NSBL SAAR will provide the number of antimicrobial days to add to the drugs in this category to reach that SAAR target.

You may also see negative AU-CAD values on the location-group or location-level reports if a given group/location has a current SAAR value that is already below the facility-identified SAAR target. The example screenshot below shows four locations with positive Location AU-CAD values (A) meaning those locations must reduce antimicrobial days in the ANTIFGL SAAR category to get to a facility-identified SAAR target of 0.7. At the same time, four locations have negative Location AU-CAD values (B) meaning those locations already have an ANTIFGL SAAR less than 0.7.



National Healthcare Safety Network
 TAS Report - Adult SAAR Types - Locations
 Adult SAAR Ranked by Location AU-CAD

Facility Identified SAAR Target: BSHO = (0.2); BSCA = (0.5); GramPos = (0.5); NSBL = (1.5); CDI = (0.4); Antifungal = (0.7)

As of: September 21, 2022 at 4:01 PM
 Date Range: All AU_TAS
 if ((population = "ADULT"))

FACILITY				LOCATION										
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_OA_TEST FACILITY	BSCA	307	SURGUARD	IN-ACUTE:WARD:S	1	125	CEFAC(10); MOXI(10); CEFUR(9);	417	584.996	4707	0.713	0.647, 0.784	
		ANTIFGL	82	MICU	IN-ACUTE:CC:M	3	-155	CEFJT(12); CLFIX(10); CcFUH(10);	237	784.183	4403	0.502	0.266, 0.345	
				MEDWARD	IN-ACUTE:WARD:M	1	73	ANID(33); CASPO(29); FLUCO(25);	124	73.123	4016	1.696	1.416, 2.015	
				MEDSURG64	IN-ACUTE:WARD:MS	2	71	ANID(32); FLUCO(29); MICA(24);	119	67.933	3731	1.752	1.458, 2.088	
				SURGUARD	IN-ACUTE:WARD:S	3	65	MICA(30); FLUCO(26); ANID(25);	125	85.704	4707	1.459	1.219, 1.732	
				AD_STP_DN	IN-ACUTE:STEP	4	53	ANID(29); CASPO(24); FLUCO(24);	119	93.681	4369	1.270	1.057, 1.514	
				MSICU	IN-ACUTE:CC:MS	5	-13	CASPO(33); FLUCO(33); MICA(21);	112	178.743	3994	0.627	0.518, 0.751	
				ONCGEN	IN-ACUTE:WARD:ONC_HONC	6	-51	CASPO(30); ANID(28); MICA(25);	114	236.425	3667	0.482	0.400, 0.577	
				MICU	IN-ACUTE:CC:M	7	-55	FLUCO(40); CASPO(24); MICA(22);	83	197.047	4403	0.421	0.338, 0.520	
				SICU	IN-ACUTE:CC:S	8	-61	CASPO(28); FLUCO(27); ANID(24);	110	244.355	3790	0.450	0.372, 0.540	

Note: Data are fictitious and for example only.

TAS report footnotes

Just like other NHSN reports, the footnotes in the TAS reports contain helpful information for interpreting the output.

- Tables include the most recent 12 months of reported data from locations for which SAARs are generated. If SAAR Type-level AU-CADs are the same, their ranks are tied.
 - This footnote explains what data are included in the TAS Reports. TAS reports use reported data from the most recent 12 months. Specifically, a TAS report run on July 15, 2022, will include all reported AU data from July 2021-June 2022.
 - If the AU-CAD value is tied with another SAAR Type, location group or location then the ranks will also be tied.
- Location AU-CAD = Observed Antimicrobial Days - (Predicted Antimicrobial Days * Facility-Identified SAAR target); Facility AU-CAD = Sum of Location AU-CADs
 - This footnote displays the formulas for calculating the AU-CAD values.
- When selecting a SAAR target, consider the lower bound of the SAAR Confidence Interval. See the TAS User Guide for further details.
 - The 95% confidence interval is the range of values within which there is a high degree of confidence that a facility's true SAAR value lies, and the SAAR is the preferred estimate to summarize use. It is not necessary to pick a SAAR target value lower than the lower bound of



the confidence interval or higher than the upper bound because doing so doesn't guarantee a statistically significant change in the SAAR value. It's important to remember that any reduction in antimicrobial days could be meaningful, regardless of the statistical significance.

4. A negative AU-CAD value means the SAAR target was greater than the current SAAR value for that category. To increase your SAAR value, the negative AU-CAD value represents the number of antimicrobial days to add per time period to reach your SAAR target.
 - a. See previous section for more details on negative AU-CAD values.
5. The drug code and full drug name can be found here: <http://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx>.
 - a. The Three highest use drugs within SAAR Type (Percentage) shows the abbreviated drug names for the drugs within the given SAAR category that contributed the largest number of antimicrobial days.
 - b. The percentage is calculated by taking the total antimicrobial days for that drug divided by the total antimicrobial days summed across all drugs in that SAAR category.
6. If the observed antimicrobial days exceed days present for a specific SAAR category, neither the SAAR nor the AU-CAD will be calculated, and data should be validated for accuracy.
 - a. Additionally, the rank and predicted antimicrobial days will be suppressed.

TAS Dashboard

The Targeted Assessment for Stewardship (TAS) Dashboard allows NHSN facilities to visualize locations with the greatest need for antimicrobial stewardship. The TAS Dashboard displays AU-CADs over time, by quarter, for the most recent complete four calendar quarters at the group, facility, and location level. Unlike the TAS Reports, the time period and level of aggregation displayed by the TAS Dashboard cannot be changed.

The TAS Dashboard is located on the NHSN Patient Safety Component Home Page and can also be accessed by navigating to Dashboard and then TAS Dashboard from the left-hand menu in NHSN. The TAS Dashboard will display "No SAAR targets set" if you have not set SAAR targets via the TAS Dashboard or TAS Reports. You will have to enter and save SAAR targets to view the TAS Dashboard. These targets are also used for the TAS Reports and are unique to your NHSN user account. If you've already entered SAAR targets on the TAS Reports, those same targets are automatically applied to the TAS Dashboard.

Facility TAS Dashboard

The Facility TAS Dashboard displays AU-CADs over time, by quarter, for the most recent complete four calendar quarters at the facility and location level. Below is an overview of the components in the Facility TAS Dashboard and example interpretation of the AU-CAD values.

High-level facility TAS Dashboard

1 Population:

2 All Antibacterials

BSHO

BSCA

GramPos

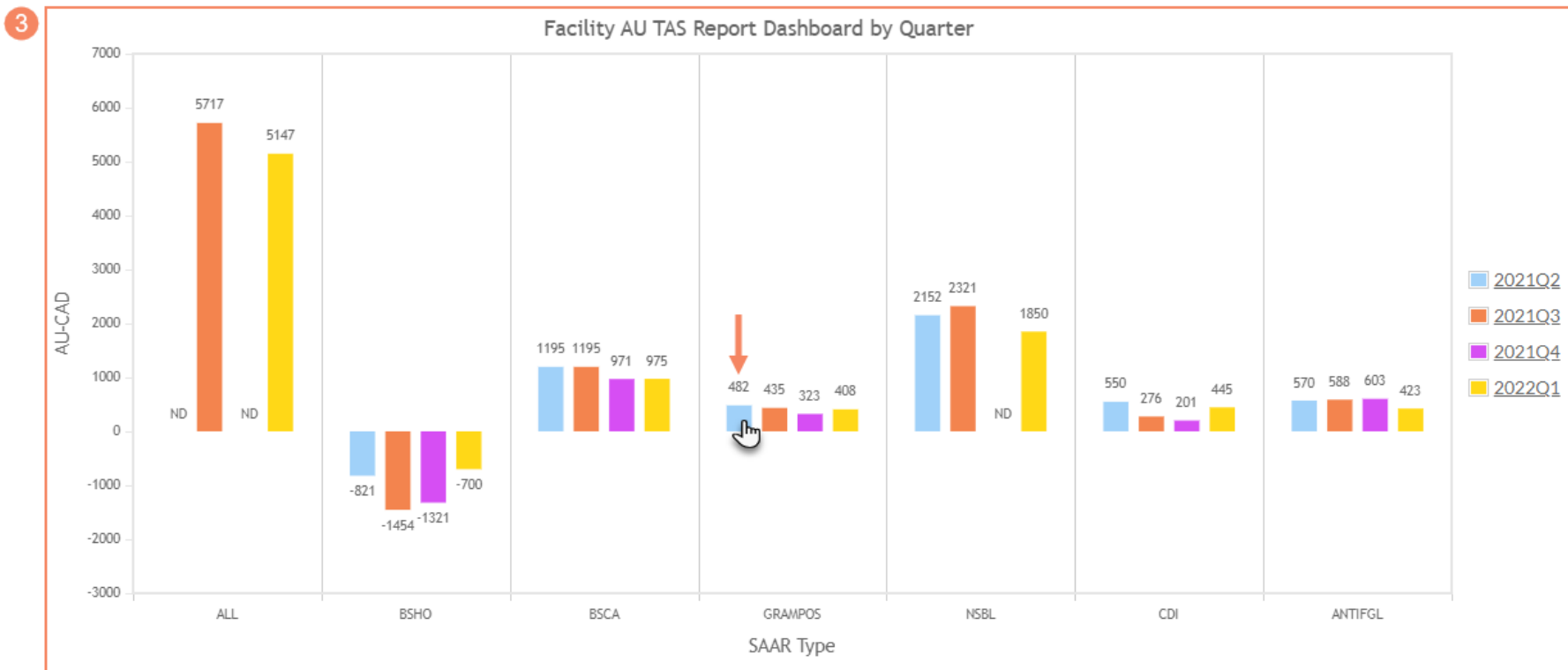
NSBL

CDI

Antifungal

[Export PDF](#) [Generate New](#) Last Generated: June 20, 2022 12:33 PM

[Refresh](#) [Reset](#) [Save](#)





4 Facility AU-CAD

SAAR Type	2021Q2	2021Q3	2021Q4	2022Q1
ALL	ND	5717	ND	5147
BSHO	-821	-1454	-1321	-700
BSCA	1195	1195	971	975
GRAMPOS	482	435	323	408
NSBL	2152	2321	ND	1850
CDI	550	276	201	445
ANTIFGL	570	588	603	423

Footnotes

1. **Population:** This drop-down menu can be used to display the TAS Dashboard for each of the available populations. The TAS Dashboard can be generated for different patient populations (i.e., “Adult”, “Pediatric”, or “Neonatal”) by selecting from the drop-down menu. Only one population can be displayed at a time, and the adult population is selected by default. In the screenshot above, the TAS Dashboard displays AU-CAD data for the 2017 baseline adult SAAR types.
2. **SAAR targets:** These are the desired SAAR values your facility would like to work towards for each SAAR category. The SAAR targets can be different for each combination of population and SAAR type. They can be changed at any time by editing the targets and clicking the Save button. These targets are also used for the TAS Reports and are unique to your NHSN user account. They do not affect the rest of your AU data or SAAR reports in any way. Once you enter SAAR targets and click Save, the TAS Dashboard displays AU-CAD data based on the SAAR targets you entered. In this example, we have entered a SAAR target of 0.40 for every SAAR type.
3. **High-level Facility TAS Dashboard display:** The high-level Facility TAS Dashboard displays a graphical interpretation of the AU-CADs for each SAAR type over time by quarter for the most recent complete four calendar quarters at the facility-level. AU-CAD values will only appear if you've entered a SAAR target and have uploaded AU data for locations that can generate SAARs. “ND” in place of an AU-CAD value indicates no data are available for that SAAR type/quarter combination and “NT” indicates no SAAR target was entered for that SAAR type. “ND” is also displayed when an AU-CAD for the specific SAAR type/quarter cannot be generated.
4. **High-level Facility AU-CAD table:** The high-level Facility AU-CAD table repeats the information in the high-level Facility TAS Dashboard display in tabular format.



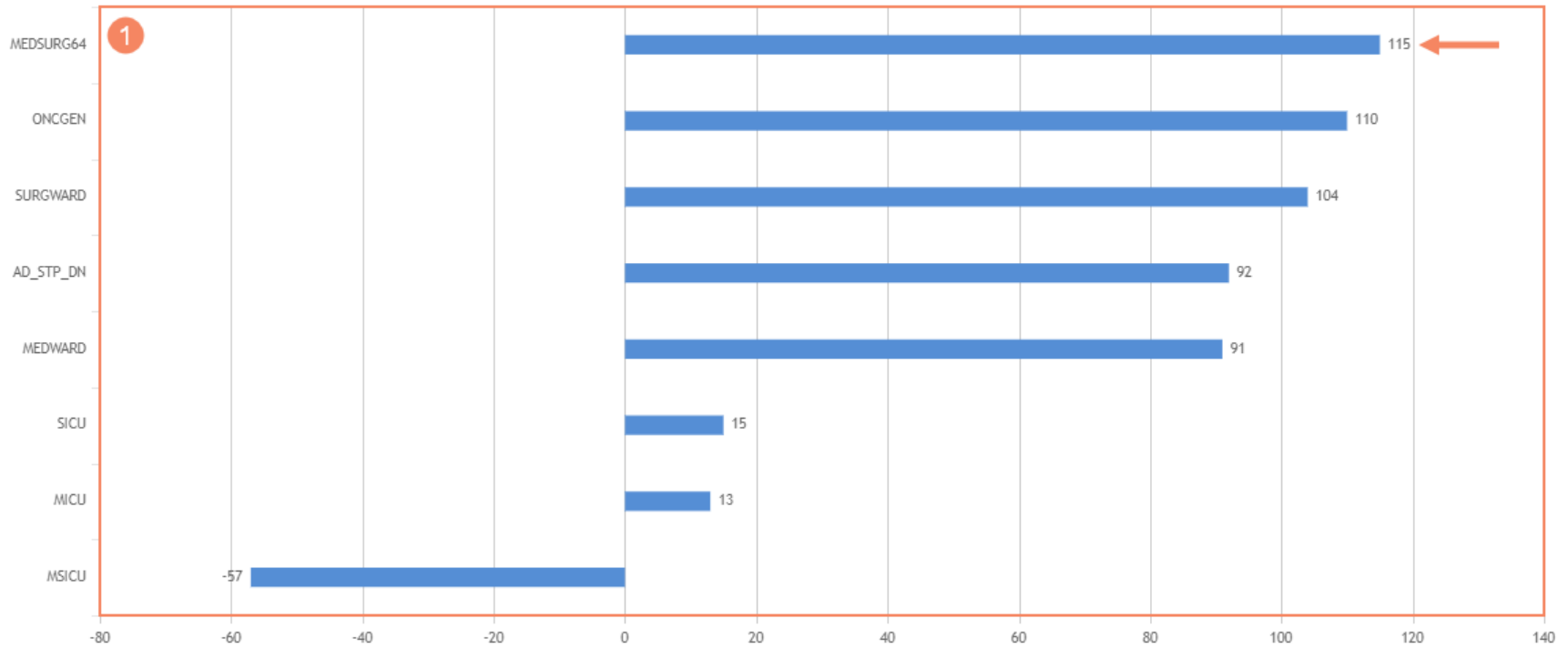
As an example, let's interpret the AU-CAD for adult antibacterial agents predominantly used for resistant Gram-positive infections (GRAMPOS) during the second quarter of 2021 (2021Q2). The adult GRAMPOS AU-CAD value at our facility in 2021Q2 was 482, as shown by the arrows on the chart and table. To reduce our 2021Q2 adult GRAMPOS SAAR to meet our SAAR target of 0.40, we would have needed to reduce use of adult antibacterial agents predominantly used for resistant Gram-positive infections at our facility by at least 482 antimicrobial days during that quarter.

To continue the example, let's explore how to reduce our 2021Q2 adult GRAMPOS SAAR. Clicking on either the colored bar (as shown in the screenshot above) or the number above/below the bar takes you to the Facility TAS Dashboard drilldown for each SAAR type and quarter combination. Let's click on the bar on the chart that corresponds with GRAMPOS 2021Q2.

Facility TAS Dashboard drilldown

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GRAMPOS SAAR Number of Antimicrobial Days to Reduce to Reach Facility Specific SAAR



SAAR Type	Summary Year/Quarter	Location Rank	Location	Location Code	AU Days Predicted	Observed Antimicrobial Days	Location AU-CAD	Three highest use drugs within SAAR Type
GRAMPOS	2021Q2	1	MEDSURG64	IN:ACUTE:WARD:MS	325.114	245	115	CEFTAR(14); DALBA(14); ORITAV(14);
		2	ONCGEN	IN:ACUTE:WARD:ONC_HONC	321.301	239	110	CEFTAR(16); DALBA(16); ORITAV(14);
		3	SURGWARD	IN:ACUTE:WARD:S	281.105	216	104	DAPTO(17); DALBA(15); TEDIZ(15);
		4	AD_STP_DN	IN:ACUTE:STEP	361.01	236	92	ORITAV(15); LNZ(14); TELAV(13);
		5	MEDWARD	IN:ACUTE:WARD:M	282.987	204	91	TEDIZ(16); CEFTAR(14); ORITAV(14);
		6	SICU	IN:ACUTE:CC:S	466.633	202	15	DAPTO(15); LNZ(15); CEFTAR(14);
		7	MICU	IN:ACUTE:CC:M	575.707	243	13	CEFTAR(17); LNZ(15); TEDIZ(13);
		8	MSICU	IN:ACUTE:CC:MS	647.553	202	-57	QUINWD(16); LNZ(15); ORITAV(14);

Footnotes

- Facility TAS Dashboard drilldown display:** The Facility TAS Dashboard drilldown displays a graphical interpretation of the AU-CADs for each eligible location for the selected SAAR type and quarter, ordered by location rank.
- Location Rank column:** This column lists the rank order of locations by AU-CAD value, from largest to smallest. If AU-CADs are the same for two or more locations within the same SAAR type, their ranks are tied. Locations where NHSN cannot calculate an AU-CAD are not assigned ranks.
- Location and Location Code columns:** These columns indicate the “Your Code” and “CDC Code” value, respectively, for each location included in the table.
- AU Days Predicted and Observed Antimicrobial Days columns:** These columns indicate the predicted antimicrobial days and observed (or reported) antimicrobial days, respectively, for antimicrobials included in the selected SAAR antimicrobial category for the selected quarter for each location included in the table. These values are used to calculate the AU-CAD for each location.
- Location AU-CAD column:** This column indicates the SAAR type- and quarter-specific AU-CAD for each location, calculated using the AU-CAD formula.
- Three highest use drugs within SAAR Type column:** This column displays the top three antimicrobials that contributed to the selected SAAR antimicrobial category for the selected quarter for each location included in the table and, in parenthesis, the percent of observed antimicrobial days each antimicrobial contributed rounded to the nearest whole number. If two or more antimicrobials contributed the same number of



observed antimicrobial days, they are listed in alphabetical order by drug code. Full drug names can be found in the AU tab here: [AUR Module Eligible Antimicrobial Agents](#).

Let's interpret the AU-CAD and data in the table for our medical-surgical ward (MEDSURG64), as shown by the arrows on the chart and table. The medical-surgical ward was ranked #1, which means it had the highest AU-CAD value among the locations that contributed to our facility's 2021Q2 adult GRAMPOS SAAR. The medical-surgical ward reported 245 antimicrobial days in the adult GRAMPOS SAAR antimicrobial category in 2021Q2. NHSN predicted this location would report approximately 325.114 antimicrobial days based on the adult GRAMPOS SAAR model. We can plug these values along with our SAAR target of 0.40 into the AU-CAD formula to see what our AU-CAD value should be.

$$\text{AU-CAD} = \text{Observed Antimicrobial Days} - (\text{Predicted Antimicrobial Days} \times \text{Facility-Identified SAAR target}) = 245 - (325.114 \times 0.40) \approx 115$$

As expected, based on our calculation, the AU-CAD value for adult antibacterial agents predominantly used for resistant Gram-positive infections administered in our medical-surgical ward in 2021Q2 was 115, as shown by the arrow on the chart. To reduce our medical-surgical ward's 2021Q2 adult GRAMPOS SAAR to our SAAR target of 0.40, we would need to reduce use of adult antibacterial agents predominantly used for resistant Gram-positive infections in our medical-surgical ward by approximately 115 antimicrobial days in a quarter. Ceftaroline (CEFTAR), dalbavancin (DALBA), and oritavancin (ORITAV) were tied as the most frequently administered antimicrobials in the adult GRAMPOS antimicrobial category for our medical-surgical ward in 2021Q2 so they are listed in alphabetical order by drug code. Ceftaroline, dalbavancin, and oritavancin each contributed 14% of the observed 245 antimicrobial days.

Group TAS Dashboard

The Group TAS Dashboard displays AU-CADs over time, by quarter, for the most recent complete four calendar quarters at the group and facility level. Below is an overview of the components in the Group TAS Dashboard and example interpretation of the AU-CAD values.

High-level group TAS Dashboard

1 Population:

2 All Antibacterials

BSHO

BSCA

GramPos

NSBL

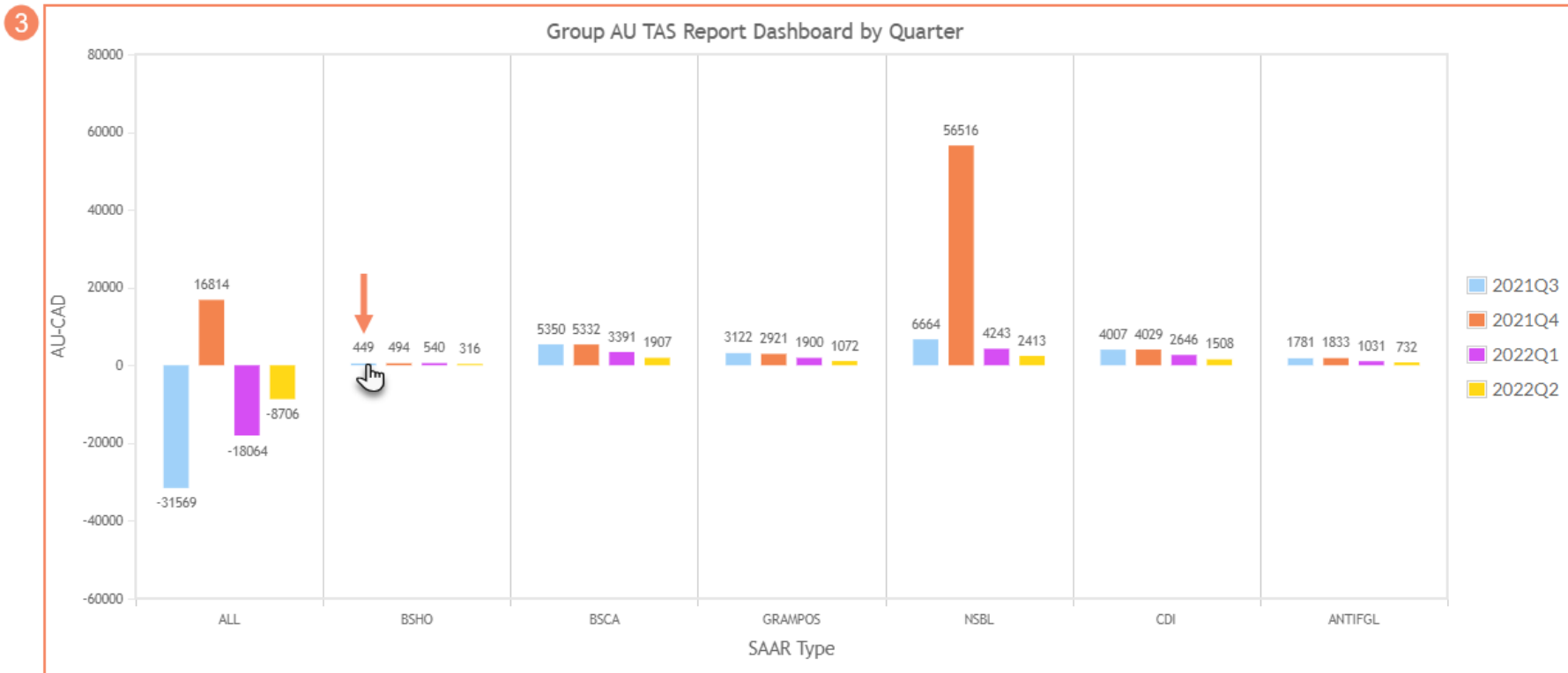
CDI

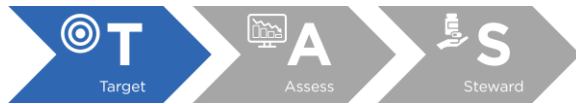
Antifungal

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[Refresh](#) [Reset](#) [Save](#)





4

Group AU-CAD				
SAAR Type	2021Q3	2021Q4	2022Q1	2022Q2
ALL	-31569	16814	-18064	-8706
BSHO	449	494	540	316
BSCA	5350	5332	3391	1907
GRAMPOS	3122	2921	1900	1072
NSBL	6664	56516	4243	2413
CDI	4007	4029	2646	1508
ANTIFGL	1781	1833	1031	732

Footnotes

- Population:** This drop-down menu can be used to display the TAS Dashboard for each of the available populations. The TAS Dashboard can be generated for different patient populations (i.e., “Adult”, “Pediatric”, or “Neonatal”) by selecting from the drop-down menu. Only one population can be displayed at a time, and the adult population is selected by default. In the screenshot above, the TAS Dashboard displays AU-CAD data for the 2017 baseline adult SAAR types.
- SAAR targets:** These are the desired SAAR values your group would like member facilities to work towards for each SAAR category. Groups cannot set different SAAR targets for each member facility, but the SAAR targets can be different for each combination of population and SAAR type. SAAR targets can be changed at any time by editing the targets and clicking the Save button. These targets are also used for the Group TAS Reports and are unique to your NHSN user account. They do not affect the rest of your AU data or SAAR reports in any way, nor do they affect member facilities’ data. In this example, we entered SAAR targets of 1.20 for the All Antibacterial SAAR and 0.20 for all the other SAAR types.
- High-level Group TAS Dashboard display:** The high-level Group TAS Dashboard displays a graphical interpretation of the AU-CADs pooled at the group level for each SAAR type over time by quarter for the most recent complete four calendar quarters. NHSN does not provide SAARs pooled at the group level, so the pooled AU-CAD is the sum of AU-CADs for all member facilities. AU-CAD values will only appear if you've entered a SAAR target and facilities have uploaded AU data for locations that can generate SAARs. “ND” in place of an AU-CAD value indicates no data are available for that SAAR type/quarter combination and “NT” indicates no SAAR target was entered for that SAAR type. “ND” is also displayed when an AU-CAD for the specific SAAR type/quarter cannot be generated.
- High-level Group AU-CAD table:** The high-level Group AU-CAD table repeats the information in the high-level Group TAS Dashboard display in tabular format.



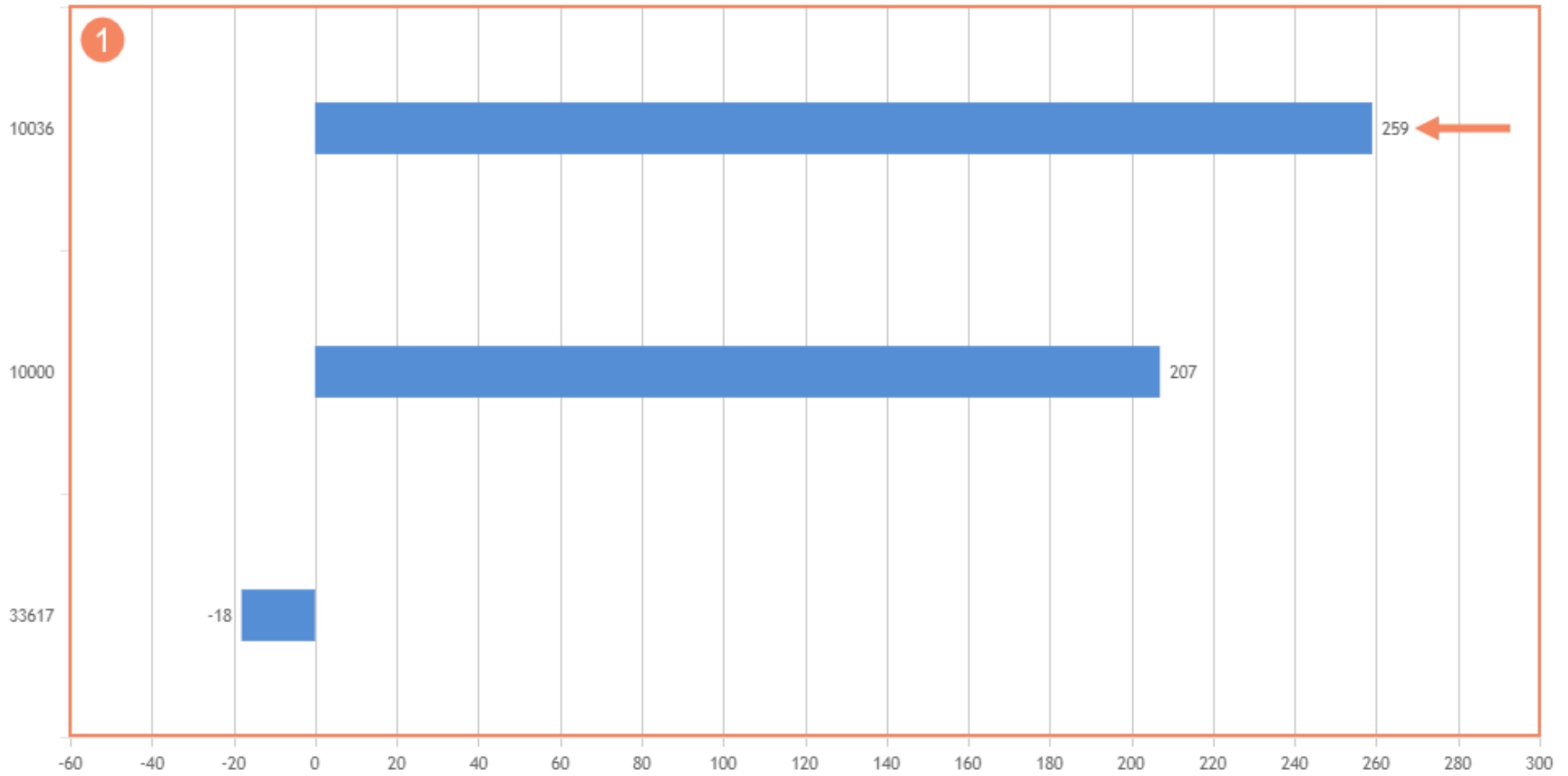
As an example, let's interpret the AU-CAD for adult broad spectrum antibacterial agents predominantly used for hospital-onset infections (BSHO) during the third quarter of 2021 (2021Q3). The AU-CAD value for adult BSHO agents administered at our member facilities in 2021Q3 was 449, as shown by the arrows on the chart and table. For our member facilities to reduce their 2021Q3 adult BSHO SAARs to meet our SAAR target of 0.20, they would have needed to reduce use of adult BSHO agents by at least 449 antimicrobial days during that quarter. However, it'll be important to review the Group TAS Dashboard drilldown to see the contributions of each member facility.

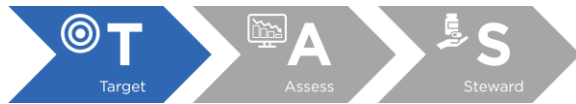
To continue the example, let's explore how to identify which member facility had the highest adult BSHO AU-CAD values in 2021Q3 and may benefit most from antimicrobial stewardship intervention. Clicking on either the colored bar (as shown in the screenshot above) or the number above/below the bar takes you to the Group TAS Dashboard drilldown for each SAAR type and quarter combination. Click on the bar on the chart that corresponds with BSHO 2021Q3.

Group TAS Dashboard drilldown

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BSHO SAAR Number of Antimicrobial Days to Reduce to Reach Group Specific SAAR





SAAR Type	Summary Year/Quarter	2 Facility Rank	3 Facility ID	4 AU Days Predicted	5 Observed Antimicrobial Days	5 Facility AU-CAD
BSHO	2021Q3	1	10036	4418.617	1143	259
		2	10000	4943.391	1196	207
		3	33617	7179.819	1418	-18

Footnotes

- Group TAS Dashboard drilldown display:** The Group TAS Dashboard drilldown displays a graphical interpretation of the AU-CADs for each member facility for the selected SAAR type and quarter, ordered by facility rank.
- Facility Rank column:** This column lists the rank order of member facilities by AU-CAD value, from largest to smallest. If AU-CADs are the same for two or more member facilities within the same SAAR type, their ranks are tied. Member facilities for which NHSN cannot calculate an AU-CAD are not assigned ranks.
- Facility ID column:** This column indicates the orgID for each member facility included in the table. In this example, NHSN calculated an AU-CAD value for the adult BSHO SAAR type for three member facilities in 2021Q3.
- AU Days Predicted and Observed Antimicrobial Days columns:** These columns indicate the predicted antimicrobial days and observed (or reported) antimicrobial days, respectively, for antimicrobials included in the selected SAAR antimicrobial category for the selected quarter for SAAR-eligible locations within each member facility included in the table. These values are used to calculate the AU-CAD for each member facility.
- Facility AU-CAD column:** This column indicates the pooled SAAR type- and quarter-specific AU-CAD for SAAR-eligible locations within each member facility, calculated using the AU-CAD formula.

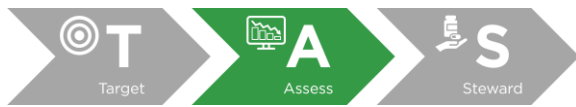
Let’s interpret the AU-CAD and data in the table for orgID 10036, as shown by the arrows on the chart and table. OrgID 10036 was ranked #1, which means it had the highest adult BSHO AU-CAD value among the included member facilities in 2021Q3. OrgID 10036 reported 1,143 antimicrobial days in



the adult BSHO SAAR antimicrobial category in 2021Q3. NHSN predicted this facility would report approximately 4,418.617 antimicrobial days based on the adult BSHO SAAR model. We can plug these values, along with our SAAR target of 0.20, into the AU-CAD formula to see what the facility's AU-CAD value should be.

$$\text{AU-CAD} = \text{Observed antimicrobial days} - (\text{Predicted antimicrobial days} \times \text{SAAR target}) = 1143 - (4418.617 \times 0.20) \approx 259$$

As expected, based on our calculation, the AU-CAD value for adult broad spectrum antibacterial agents predominantly used for hospital-onset infections administered at orgID 10036 in 2021Q3 was 259, as shown by the arrow on the chart. To reduce their 2021Q3 adult BSHO SAAR to our SAAR target of 0.20, the facility would need to reduce use of adult broad spectrum antibacterial agents predominantly used for hospital-onset infections by approximately 259 antimicrobial days in a quarter.



Assess: Utilize assessment tools to identify gaps and opportunities to improve antimicrobial use

Several approaches for assessment can be used by antimicrobial stewardship programs to identify potential gaps and opportunities. Some of the assessment tools listed below evaluate the comprehensiveness of an antimicrobial stewardship program while other assessments focus on identifying opportunities where antimicrobial use may be improved. Antimicrobial stewardship programs can select the assessment approach that best aligns with their facility priorities and stewardship efforts based on the AU-CAD values produced in the TAS Reports. The assessment approach may focus on the entire inpatient facility or specific patient care locations, such as intensive care units. However, the “target” within the TAS framework is only available for SAAR-eligible patient care locations. Once the assessments have been completed, the findings can be summarized and presented to the antimicrobial stewardship committee and/or other hospital committees, such as Pharmacy and Therapeutics, to identify gaps and opportunities to improve antimicrobial use. Of note, the assessment may determine that use is appropriate based upon local guidelines and practices. Findings can also be presented to leadership, hospital committees, and prescribers.

Comprehensiveness of Antimicrobial Stewardship Program

NHSN Annual Hospital Survey

CDC identified seven Core Elements of a successful hospital Antibiotic Stewardship Program. Adherence to each of these elements can be assessed by a hospital or Group in NHSN based on responses to NHSN’s Patient Safety Component Annual Hospital Survey. More information is available at this link: [How to Run the Core Elements Line List within NHSN \(cdc.gov\)](#). CDC has also identified [priorities for implementation](#) for six of the seven Core Elements.

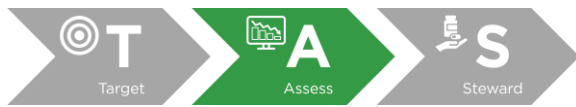
Core Elements of Hospital Antibiotic Stewardship Program Assessment Tool

The [Antibiotic Stewardship Program Assessment Tool](#) is a companion to the *Core Elements of Hospital Antibiotic Stewardship Programs*. This tool provides examples of ways to implement the Hospital Core Elements. The assessment tool can be used to document current program infrastructure and activities and to help identify items that could improve the effectiveness of the stewardship program.

Identification of opportunities to improve antimicrobial use

Strategies to assess antibiotic use

The suggestions outlined in [Strategies to Assess Antibiotic Use to Drive Improvements in Hospitals](#) are intended to help antimicrobial stewardship programs in hospitals assess antimicrobial use to see if there are opportunities for improvement. This document can be used in conjunction with the SAAR to target assessments in areas where use is unexpectedly high.



Appropriate use assessment such as medication use evaluations

Consider conducting patient-level review to assess courses of therapy for select antimicrobials or infections.

Opportunities for improvement in diagnosis, empiric, or tailored therapy, including post-discharge prescription, may be identified as outlined in the Hospital Core Elements. Standardized tools or antibiotic audit forms can assist in these reviews. Examples resources include:

- [CDC's Assessment of Appropriateness of Antibiotics for UTI, CAP, inpatient antibiotics, and Resistant Gram-Positive Infections](#)
- [Department of Veterans Affairs Medication Use Evaluation Resources](#)

NHSN AUR Module analysis and reporting resources for assessment

In addition to the SAAR and TAS reports, the NHSN AUR Module offers reports that can be used to assess antimicrobial use. Below is a short description of reports that may be useful for evaluating antimicrobial use, identifying gaps, and discovering opportunities to improve antibiotic use. The [Patient Safety Analysis Quick Reference Guides](#) provide more detailed information about how to run, modify, and interpret each report.

AU Line List

The AU Line List is an organized, detailed list of each record submitted to the NHSN AU Option. This report can be used by both facilities and groups to assess overall antimicrobial use or modified to display data by a specific time period, location, and a variety of other factors.

AU charts

The AU Option provides two chart types that can be useful for visualizing antimicrobial use: the AU Bar Chart and AU Pie Chart. The AU Bar Chart is a graphical representation of data where the length or height of the bars represents counts of records meeting the criteria. Bar chart report options include display by antimicrobial category (antibacterial, antifungal, and anti-influenza) and by location. The AU Pie Chart is a graphical representation of data where the different slices of the pie represent different values of a variable, with the relative size of the slice representing the amount of data included in the slice.

AU Rate Tables

The AU Rate Tables display facilities' calculated rate of antimicrobial use when run within an individual facility or an NHSN Group. Report options include rates of use for facility-wide inpatient (FACWIDEIN) or by location. Rates can be calculated by drug category and class, for specific drugs within separate classes (modified Selected Drugs option), or for individual drugs (modified Selected Drugs option). The rate tables include displays of antimicrobial use data by month and selected agent distribution by location.



AR Facility-wide Antibiogram

For facilities and groups not able to produce an antibiogram (cumulative antibiotic susceptibility report) via internal methods, the AR Option facility-wide antibiogram provides a table displaying the calculated percent tested (%T) and susceptible (%S) for each organism-antimicrobial combination reported from all locations (inpatient and outpatient) to the AR Option.

AR Event Line List

The AR event line list is an organized, detailed list of each AR event submitted to the NHSN AR Option. The AR event line list can be used by both facilities and groups to assess the burden of culture-positive events that may warrant the use of certain antimicrobials in the same patient care locations and time period that the antimicrobial stewards are assessing AU. The default settings of the AR line list are likely to produce a report that is too lengthy to be useful, so modifying the report to include only time periods or organisms of interest is recommended.



Steward: Implement antimicrobial stewardship activities to address gaps and opportunities

Once the findings have been summarized and presented as part of the assessment, the antimicrobial stewardship program can embark on planning and implementing antimicrobial stewardship activities addressing the identified gaps and opportunities. Stewards can refer to CDC stewardship resources highlighted below for potential opportunities to expand components of their antimicrobial stewardship program.

Core Elements of Hospital Antibiotic Stewardship Program

The [Core Elements](#) outline structural and procedural components that are associated with successful stewardship programs. The Core Elements are intended to be an adaptable framework that hospitals can use to guide efforts to improve antibiotic prescribing. In 2019, CDC updated the hospital Core Elements to reflect both lessons learned from five years of experience as well as new evidence from the field of antibiotic stewardship.

Priorities for Hospital Core Element Implementation

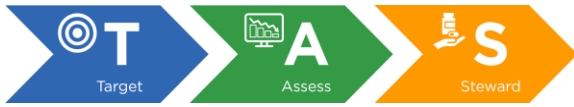
CDC released the [Priorities for Hospital Core Element Implementation](#) to highlight a subset of implementation approaches that are highly effective and/or were prioritized by stewardship experts. The *Priorities for Hospital Core Element Implementation* are derived from the 2019 Hospital Core Elements and were identified for six of the seven Hospital Core Elements. The goal of the *Priorities* is to enhance the quality and impact of antibiotic stewardship programs.

Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals

The [Implementation of Core Elements at Small and Critical Access Hospitals](#) provides guidance on practical strategies to implement antibiotic stewardship programs. The suggestions provided are based on discussions with staff in small and critical access hospitals.

Implementation resources for hospitals

This [link](#) provides CDC and external implementation resources for hospital antibiotic stewardship programs.



Additional Resources

General AU Option materials:

1. AUR Module Protocol:
<https://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf>
2. FAQs for the Antimicrobial Use Option:
<https://www.cdc.gov/nhsn/faqs/faq-au.html>
3. NHSN AUR Module Training Presentations:
<https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html>

SAAR specific materials:

1. SAAR Quick Reference Guide - AU SAAR Table:
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/AU-QRG-SAARTables.pdf>
2. SAAR Quick Reference Guide - AU SAAR Table by Location:
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/AU-QRG-SAARTables-Location.pdf>
3. SAAR Quick Reference Guide - AU SAAR Bar Chart by Location:
<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/au-grg-saar-bartable-location-508.pdf>
4. SAAR Quick Learn Series:
 - Part One: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/saar-p1-508.pdf>
 - Part Two: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/saar-p2-508.pdf>

General NHSN materials:

1. NHSN Annual Hospital Survey:
https://www.cdc.gov/nhsn/forms/57.103_pshospurv_blank.pdf
2. Instructions for NHSN Annual Hospital Survey:
https://www.cdc.gov/nhsn/forms/instr/57_103-toi.pdf