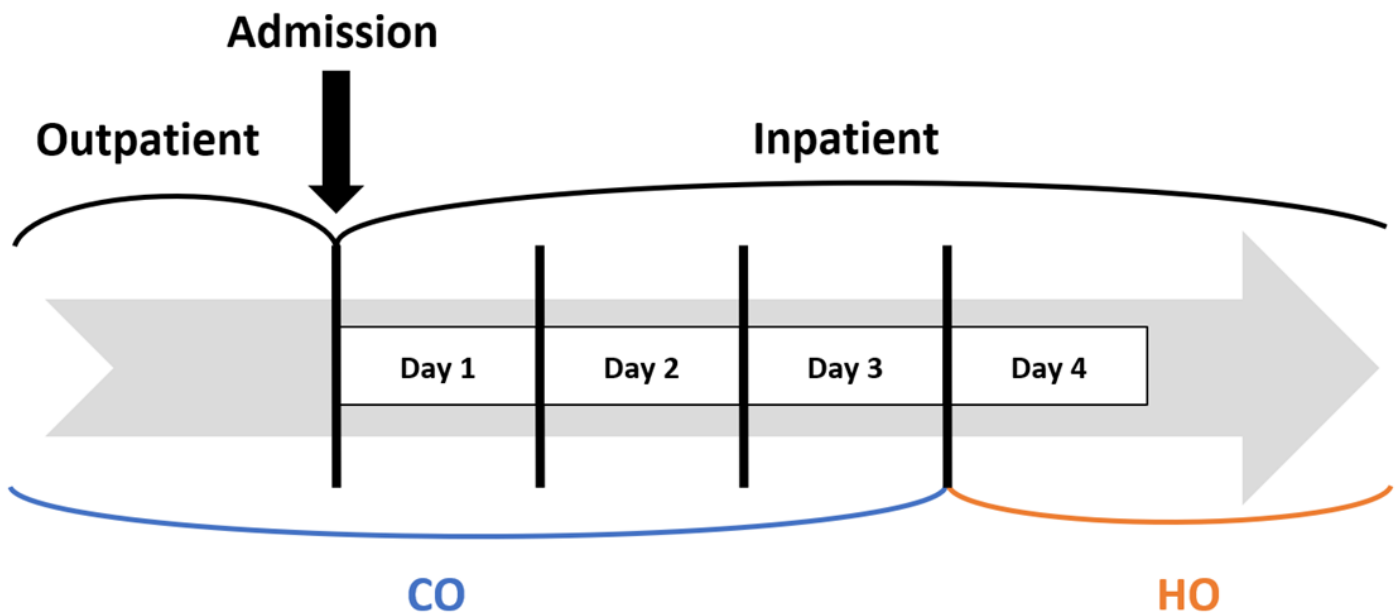# Outpatient Antimicrobial Resistance Prevalence Rate Table

Description

The Outpatient Antimicrobial Resistance Incidence Rate Table is one of six incidence and prevalence reports for the Antimicrobial Resistance (AR) Option. This report includes a set of tables that display the calculated prevalence rates for community-onset AR Events with susceptibility results reported from all outpatient locations to the AR Option that meet the definition for one of the 16 AR phenotypes. The AR phenotype definitions can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf. NHSN classifies AR Events as hospital-onset (HO) or community-onset (CO) based on the specimen collection date and date of admission (see screenshot below). Facility admission date is considered Day 1. If the specimen was collected in an outpatient location or in an inpatient location on Days 1, 2, or 3, the AR Event is classified as CO. If the specimen was collected in an inpatient location on Day 4 or after, the AR Event is classified as HO. The specific panel requirements for each organism are in Appendix F of the AUR Module Protocol: https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf.

NHSN calculates the prevalence rate per 10,000 encounters for each AR phenotype using the following formula:

$$\text{Outpatient Prevalence Rate} = \frac{\text{\# Community-onset AR Events from outpatient locations only}}{\text{\# Encounters}} \times 10{,}000$$

The default settings for the Outpatient Antimicrobial Resistance Prevalence Rate Table produce a report by quarter, but users can make modifications to display the data by half-year, year, or cumulative time periods. Users do not have the option to run the report by month. Additionally, NHSN includes rates by individual specimen source (blood, cerebrospinal fluid [CSF], lower respiratory specimen [LRS], and urine) and a combined rate for all specimen sources in the report by default, for a total of five rates per table. The default option will include 16 rate tables, one for each AR phenotype.

Example

Suppose you want to review the prevalence rates for community-onset extended-spectrum cephalosporin-resistant *E. coli* for 2020-2022 by year for your facility's outpatient locations.

After generating data sets, to run the report, click Analysis > Reports > Antimicrobial Use and Resistance Module > Antimicrobial Resistance Data. After selecting the report, "Rate Table – Outpatient Antimicrobial Resistance Prevalence" in this case, a pop-up box will appear that will allow you to "Run Report," "Modify Report," or "Export Data Set." Select "Modify Report" to customize your report.
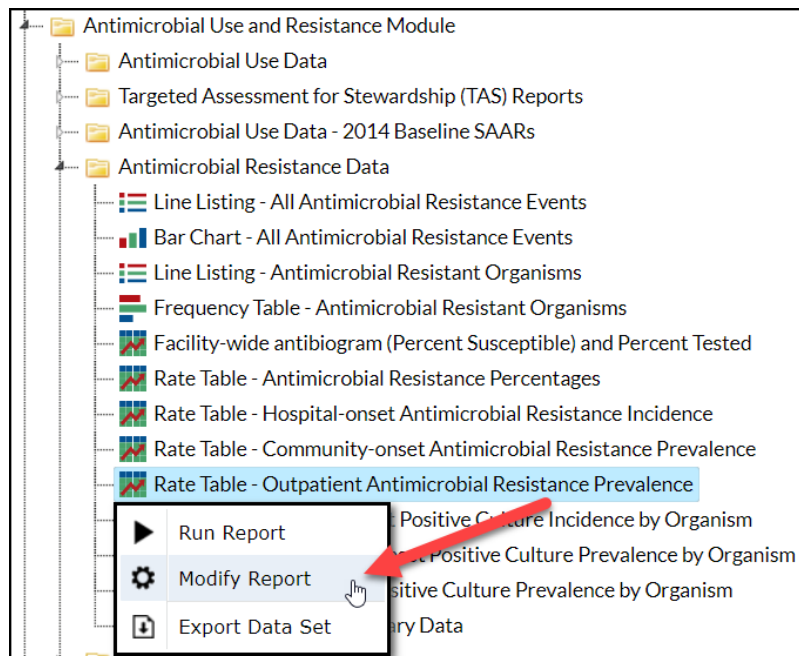
Modifying the Report

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

When you choose to modify the report, the modification screen appears showing multiple tabs containing available modifications for the given report. The "Title/Format" tab allows you to update the report title and select the format in which you want the report displayed, such as HTML or PDF. To filter the data by time period, choose the "Time Period" tab at the top of the page. To display data for 2020-2022, select Summary~Yr with a beginning date of 2020 and an ending date of 2022.

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

The "Display Options" tab allows you to pick how you'd like the tables displayed in your final report. For this example, we'd like the tables to display by year, so select Summary~Yr as the Group by value.

Final Report

The example rate table shown below is the result of the modifications shown in this document. The report will display 16 rate tables; scroll down to the extended-spectrum cephalosporin-resistant *E. coli* table.

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

National Healthcare Safety Network
Rate Table for Prevalence of Outpatient Antimicrobial Resistance by Phenotype (per 10,000 encounters) ①
As of: June 7, 2023 at 5:51 PM
Date Range: ANTIBIOGRAMRATES_OP_PHEN summaryYr 2020 to 2022

② Facility Org ID=13860 Phenotype Description=Extended-spectrum cephalosporin-resistant E.coli

Phenotype_AR	Summary Yr ③	Encounters ④	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count ⑤	All Specimen Type Prevalence Rate ⑥
ESCecoli_AR	2020	.	2	.	2	.	0	.	0	.	4	.
ESCecoli_AR	2021	1679	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ESCecoli_AR	2022	4055	2	4.93	0	0.00	0	0.00	0	0.00	2	4.93

⑦ 1. This phenotype includes any Escherichia coli that has tested Resistant (R) or Intermediate (I) to at least one of the following: cefepime, ceftriaxone, cefotaxime, ceftazidime, ceftazidime-avibactam, or ceftolozane-tazobactam.
2. Prevalence: number of community-onset AR Events (events from outpatient locations only) / encounters * 10,000.

1. The title of the report specifies which rates are being displayed. Here, we are looking at the prevalence of outpatient antimicrobial resistance by phenotype (per 10,000 encounters).
2. NHSN prints out the Facility Organization ID and a description of the AR phenotype being displayed in each table. In this example, we are looking at the rates for community-onset extended-spectrum cephalosporin-resistant *E. coli*. The first column in the table (Phenotype_AR) displays the abbreviation for the AR phenotype.
3. The second column in the table specifies the time period. In the modifications screen, we filtered the time period to only include data from 2020 through 2022, and we specified the report to group the data by year. Each row in the table represents one year starting with 2020 and ending with 2022.
4. The third column in the table specifies the denominator of the rates. For the AR outpatient prevalence rates, the denominator is encounters. In this example, no encounters were reported for any outpatient location in 2020, so there is a '.' that indicates encounters were missing for the year. There were 1,679 encounters in the facility's outpatient locations in 2021 and 4,055 encounters in 2022.
5. Each table will include the number of community-onset AR Events that meet the AR phenotype definition isolated from each of the four specimen sources (blood, CSF, LRS, and urine) as well as a combined count for all specimen sources. In 2020, there were 2 extended-spectrum cephalosporin-resistant *E. coli* isolated from blood and 2 isolated from CSF for a total of 4 extended-spectrum cephalosporin-resistant *E. coli* reported to the AR Option. There were no extended-spectrum cephalosporin-resistant *E. coli* reported in 2021. In 2022, there were 2 extended-spectrum cephalosporin-resistant *E. coli* isolated from blood reported to the AR Option.
6. Each table will include rates for each of the four specimen sources (blood, CSF, LRS, and urine) as well as a combined rate for all specimen sources. All of the rates for 2020 are suppressed because no denominator data (encounters) were reported for the year. All of the rates for 2021 were 0.00 because encounters were reported for the year, but no extended-spectrum cephalosporin-resistant *E. coli* events were reported. In 2022, the rate of community-onset extended-spectrum cephalosporin-resistant *E. coli* isolated from blood was 4.93 events per 10,000 encounters. The rates for CSF, lower respiratory, and urine were 0.00 since no events were isolated from CSF, lower respiratory, or urine. The overall prevalence rate of community-onset extended-spectrum cephalosporin-resistant *E. coli* from all specimen sources in 2022 was 4.93 events per 10,000 encounters.
7. In the footnotes, you will find the definition of each AR phenotype and the formula for calculating prevalence. This example's phenotype includes any *Escherichia coli* that has tested Resistant (R) or Intermediate (I) to at least one of the following: cefepime, ceftriaxone, cefotaxime, ceftazidime, ceftazidime-avibactam, or ceftolozane-tazobactam. Prevalence = number of community-onset AR Events from outpatient locations only / encounters x 10,000.

Note: If denominator data (*i.e.*, patient days, admissions, encounters) are not reported for a month, but AR Events were reported for that month, then the AR Events for that month will be excluded from the counts and rates for the rollup (*e.g.*, quarter, half-year, year, cumulative). If denominator data (*i.e.*, patient days, admissions, encounters) are not reported for all three months in a quarter, all six months in a half-year, all 12 months in a year, or at all (cumulative), but AR Events were reported for that time period, then the AR Events will be included in the counts, but both the denominator and rates will be suppressed/appear missing ('.').

Additional Resources

AR Option Incidence and Prevalence Reports Session from the 2023 NHSN Annual Training:

Video recording: https://www.youtube.com/watch?v=1seKabgmCIA

Slides: https://www.cdc.gov/nhsn/pdfs/training/2023/AR-Option-Incidence-Prevalence.pdf

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

AUR Module Protocol: https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf

AUR Training: https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html

NHSN Analysis Quick Reference Guides: http://www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html