

# Rate Table

## Antimicrobial Resistance Percentages

Updated 2021

This document provides instructions for the antimicrobial-resistant percentage rate table that is available in the NHSN analytic reports located in the following analysis folder within NHSN: **HAI Antimicrobial Resistance (DA + PA Modules) > Antimicrobial Resistant HAIs**.

### Overview

There are several analysis reports available in NHSN that will allow you to analyze HAI events from your facility (or group) in which a specific antimicrobial resistant organism (or “phenotype”) was identified. CDC has defined 13 phenotypes of epidemiologic importance; the analysis reports will display data from these 13 phenotypes by default. Criteria and definitions for the pre-defined phenotypes can be found here: [https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype\\_definitions.pdf](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype_definitions.pdf)

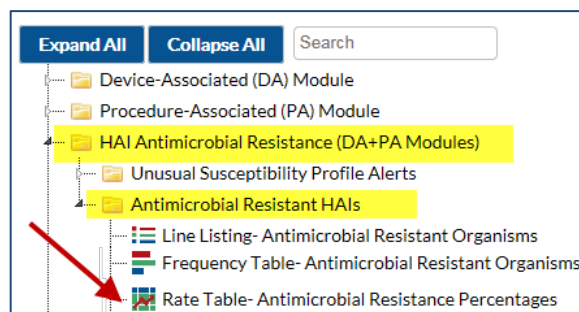
The rate table will display the percent of pathogens that tested non-susceptible or resistant to certain antimicrobials for each defined phenotype. For example, the resistant percentage for CRE (carbapenem-resistant Enterobacteriaceae) is calculated as:

$$\frac{\text{\# of Enterobacteriaceae resistant to carbapenems}}{\text{\# of Enterobacteriaceae tested for susceptibility to carbapenems}} \times 100$$

### Example

In this example, you are asked to calculate your facility’s resistance percentage of CRE for 2020 Q1.

1. On the Reports screen, navigate through the following folders: *HAI Antimicrobial Resistance (DA + PA Modules) > Antimicrobial Resistant HAIs > Rate Table- Antimicrobial Resistance Percentages*. Click on the report title to view options for running or modifying the report. On the pop-up menu, click “Run” to view all events and pathogens from each of the 13 phenotypes, or click “Modify” to specify a time period and/or phenotype of interest. In this example, we will use the “Modify” screen to specify a time period (2020 Q1) and phenotype (CRE).



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- On the Modify screen, navigate to the tab called “Time Period”. Notice that you can only calculate resistance percentages by quarter (summaryYQ), half-year (summaryYH), or year (summaryYr). Due to the precision required for this calculation, you will not be able to calculate resistance percentages by month. For this example, select summaryYQ as the time variable, and set this equal to 2020 Q1 – 2020 Q1.

The screenshot shows the 'Time Period' configuration screen. At the top, there are four tabs: 'Title/Format', 'Time Period' (highlighted in green), 'Filters', and 'Display Options'. A red arrow points to the 'Time Period' tab. Below the tabs, the 'Time Period:' section contains a 'Date Variable' dropdown set to 'summaryYQ', 'Beginning' and 'Ending' text boxes both containing '2020Q1', and a 'Clear Time Period' button. At the bottom of this section is a checkbox labeled 'Enter Date variable/Time period at the time you click the Run button'.

- To view resistance percentages for each of the 13 phenotypes, no other modifications to the report are needed. In our example, as we are only interested in CRE, we will use the third tab on the Modify screen called “Filters” to set the variable “phenotype” equal to ‘CREall\_HAI’.

The screenshot shows the 'Filters' configuration screen. At the top, there are four tabs: 'Title/Format', 'Time Period', 'Filters' (highlighted in green), and 'Display Options'. A red arrow points to the 'Filters' tab. Below the tabs, the 'Additional Filters:' section has 'Show' and 'Clear' buttons. A filter rule is defined with 'AND OR' logic. The rule consists of a sub-rule with 'AND OR' logic, where 'phenotype' is set to 'equal' to 'CREall\_HAI - Carbapenem-resistant Enterobacteriaceae'.

- You can use the “Group by” option, found on the “Display Options” tab, to view your percentages by quarter, half-year, year, or cumulative time period. For example, if you want to calculate a single resistance percentage for the entire year, select ‘summaryYr’ as the “Group by” variable.
- For this example, no further modifications are needed. When you are ready to generate the report, click “Run” at the bottom of the screen. You may also choose “Export” if you wish to obtain this output in another format (e.g., xls).



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## Report

The default report will contain one rate table for each phenotype. In this example, because we specified a single phenotype of interest (CRE), we will only see one table. Note that fictitious data are presented below.

**National Healthcare Safety Network**  
**Rate Table- Antimicrobial Resistance Percentages**  
As of: December 9, 2020 at 4:22 PM  
Date Range: ANTIBIOGRAM\_RATE SHA1 summaryYQ 2020Q1 to 2020Q1

orgID=10401 phenotypeDesc=CREall\_HAI - Carbapenem-resistant Enterobacteriaceae

orgID	phenotype	summaryYQ	numIsolated	numTested	numResistant	pctResistant	pctResistant_CI
10401	CREall_HAI	2020Q1	23	20	5	25.0	9.8,47.0

Criteria used to define each phenotype can be found on the Patient Safety Analysis Resources webpage at: [https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype\\_definitions.pdf](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype_definitions.pdf)  
Percent resistant is only calculated when at least 20 isolates have been tested.  
If the percent of isolates tested is less than 70%, caution should be used when interpreting the percent resistant.  
The data in this table include all applicable pathogens entered for an HAI, and are not limited to the first pathogen.

## Interpretation

This table shows a single row of data for the first quarter of 2020. The column “**numIsolated**” represents the total number of Enterobacteriaceae pathogens that were isolated in the facility and reported to NHSN (from all HAI types). “**NumTested**” is a count of the Enterobacteriaceae pathogens that were tested by the laboratory for susceptibility to carbapenems (see the phenotype definition list). “**NumResistant**” represents the number of pathogens that tested resistant to at least one carbapenem.

This facility reported 23 Enterobacteriaceae pathogens (*numIsolated*), 20 of which were tested by the laboratory for susceptibility to carbapenems (*numTested*), and 5 pathogens were found to be resistant to at least one carbapenem (*numResistant*). The percent resistant is 25.0 % ( $numResistant / numTested \times 100$ ), which can be interpreted as 25.0 % of tested Enterobacteriaceae were resistant to carbapenems. The 95% confidence interval (9.8, 47.0) is an indication of precision (*pctResistant\_CI*).

Reminder: The percent resistant and the 95% confidence intervals will only be calculated when the number of tested pathogens (*numTested*) is at least 20. To include more data in the calculation, you could select a wider time period or choose a different “group by” option on the Modification screen.

## Additional Resources

Antimicrobial Resistance Definitions:

[https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype\\_definitions.pdf](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/phenotype_definitions.pdf)

How to run and modify a Rate table in NHSN:

<http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/RateTables.pdf>



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