Rate Table: Antimicrobial Resistance Percentages

Description

There are several analysis output options 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 11 phenotypes of epidemiologic importance; the analysis output options will display data from these 11 phenotypes by default. Criteria and definitions for the pre-defined phenotypes can be found here: http://www.cdc.gov/nhsn/PDFs/analysis/Phenotype_Definitions.pdf.

Rate Table

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:

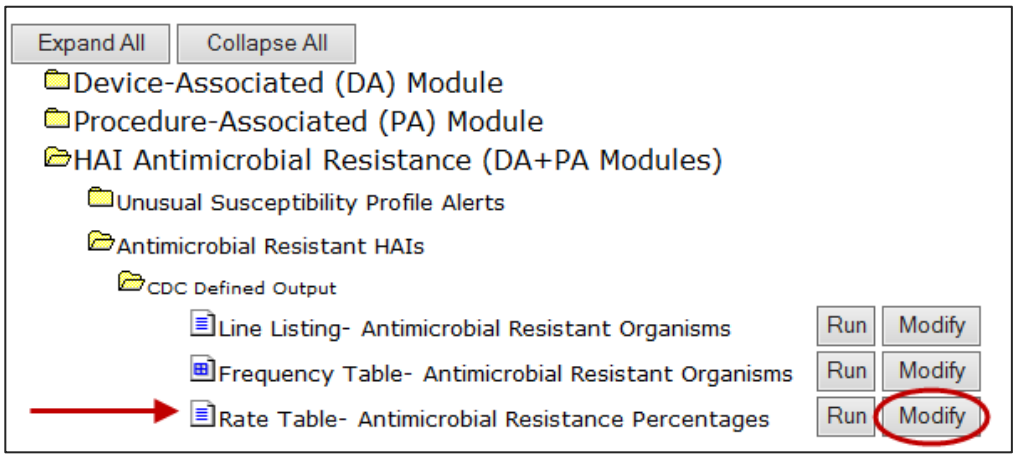
$$\frac{\text{\# of Enterobacteriaceae resistant to carbapenems}}{\text{\# of Enterobacteriaceae tested for susceptibility to carbapenems}} \times 100$$

The resistance percentage will only be calculated when the denominator contains at least 20 pathogens in order to ensure a minimum precision of the calculation.

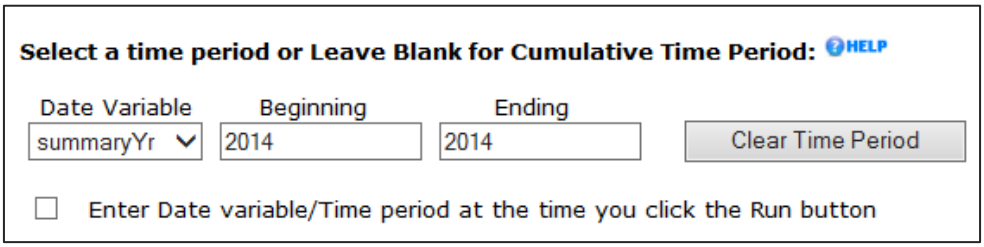
Example

In this example, you are asked to calculate your facility's resistance percentage of CRE for 2014.

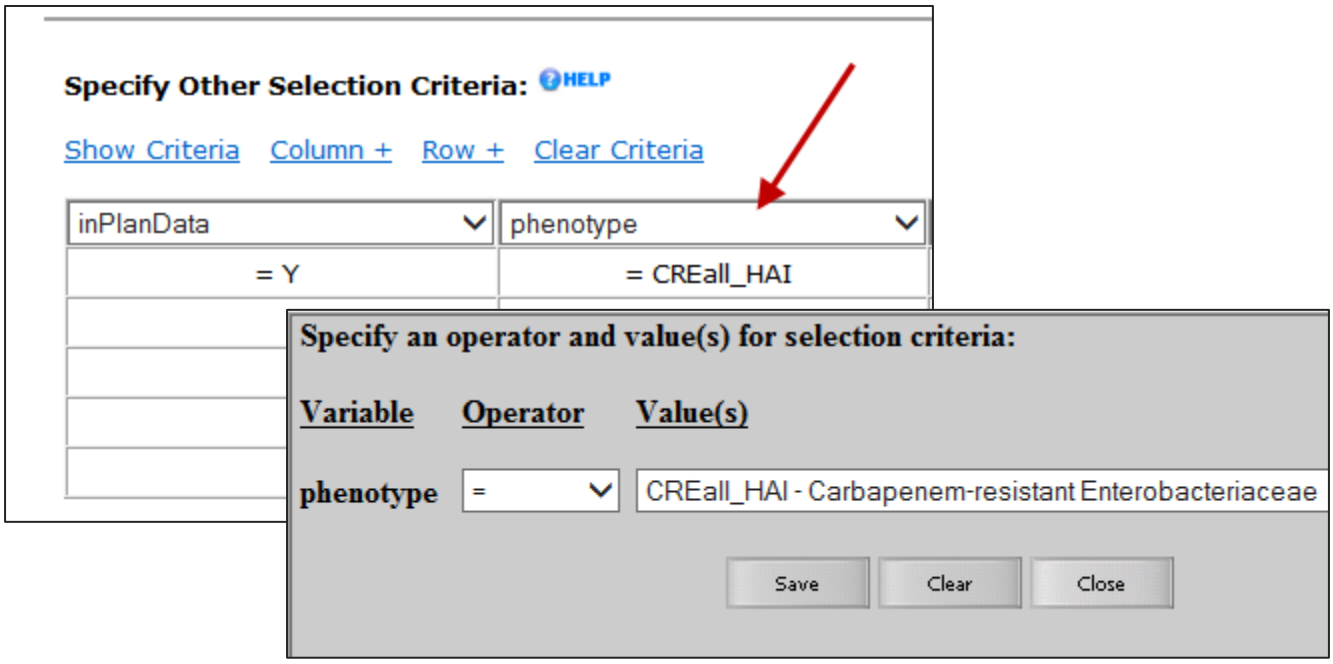
1. On the output options screen, navigate through the following folders: HAI Antimicrobial Resistance (DA + PA Modules) > Antimicrobial Resistant HAIs > CDC Defined Output > Rate Table- Antimicrobial Resistance Percentages. Click "Run" to view your facility's percent resistance for each of the 11 phenotypes in which you have reported data, or use the "Modify" option to make specifications to the output. In this example, we will use the "Modify" screen to specify a time period (2014) and phenotype (CRE).



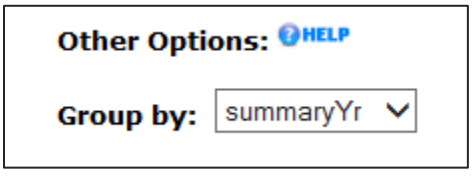
2. On the Modify screen, navigate to the time period selection fields. Notice that you can only calculate resistance percentages by quarter (summaryYQ), half-year (summaryYH), or year (summaryYr). Due to the precision required for this calculation, you will not be able to calculate resistance percentages by month. For this example, select summaryYr as the time variable, and set this equal to 2014 – 2014.



3. You will see a specification already made in the selection grid as part of the Default output, which limits the output to data that were reported in your monthly reporting plans (in-plan data). To view resistance percentages for each of the 11 phenotypes, no other modifications to the selection grid are needed. In our example, as we are only interested in CRE, we will use the second column of the selection grid to set the variable "phenotype" equal to 'CREall_HAI'.



4. You can use the "Group by" option, found at the bottom of the screen, to view your percentages by quarter, half-year, or year. For example, if you want to calculate a single resistance percentage for the entire year, select 'summaryYr' as the "Group by" variable.



5. For this example, no further modifications are needed. When you are ready to generate the output, click "Run". You may also choose to "Export Output Dataset" if you wish to obtain this output in another format (e.g., xls).

Output

The default output 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.

National Healthcare Safety Network
Rate Table- Antimicrobial Resistance Percentages
CREall_HAI - Carbapenem-resistant Enterobacteriaceae
As of: December 12, 2014 at 4:18 PM
Date Range: ANTIBIOGRAM_RATESHAI summaryYr 2014 to 2014

orgID=10401

orgID	summaryYr	phenotype	NumIsolated	NumTested	NumNonSuscep	PctNonSuscep	PctNonSuscep_CI
10401	2014	CREall_HAI	25	21	3	14.3	3.8,34.1

CRE includes the appropriate pathogens that tested Resistant ('R') to imipenem, meropenem, doripenem, or ertapenem.
Criteria used to define each phenotype can be found on the Patient Safety Analysis Resources webpage.
Percent Non-Susceptible 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 non-susceptible.
This rate table only displays data when at least 1 applicable organism has been entered in NHSN (i.e., number isolated is at least 1).
Source of aggregate data: Not available

Interpretation

This table shows a single row of data for the entire year of 2014. 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 number of Enterobacteriaceae pathogens that were tested by the laboratory for susceptibility to carbapenems (see the phenotype definition list, and the first footnote beneath this rate table). "**NumNonSuscep"** represents the number of pathogens that tested non-susceptible, or in this case, resistant, to at least one carbapenem.

This facility reported 25 Enterobacteriaceae pathogens (*NumIsolated)*, 21 of which were tested by the laboratory for susceptibility to carbapenems (*NumTested)*, and 3 pathogens were found to be resistant to at least one carbapenem (*NumNonSuscep*). The percent non-susceptible is 14.3% (*NumIsolated / NumTested x 100)* which can be interpreted as 14.3% of tested Enterobacteriaceae were resistant to carbapenems. The 95% confidence interval (3.8, 34.1) is an indication of precision (*PctNonSuscep_CI).*

Reminder: The percent non-susceptible 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:
Definitions of pre-defined phenotypes for HAI Antimicrobial Resistance NHSN Analysis Output:
http://www.cdc.gov/nhsn/PDFs/analysis/Phenotype_Definitions.pdf

How to run and modify a Rate table in NHSN:
http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/RateTables.pdf