

# AR OPTION FACILITY-WIDE ANTIBIOGRAM

## Description

The Antimicrobial Resistance (AR) Option facility-wide antibiogram is a table displaying the calculated percent non-susceptible (%NS) for each organism-antimicrobial combination reported from an inpatient location to the AR Option. Each organism reported to the AR Option has a specific antimicrobial panel for which antimicrobial susceptibility testing values are required to be reported. 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>.

The %NS is calculated for each organism-antimicrobial pairing using the following formula\*:

$$\frac{\text{Total isolates that tested resistant, intermediate, and nonsusceptible for a pathogen}}{\text{Total \# of isolates tested for that organism}} \times 100$$

\*Exceptions for *Staphylococcus aureus*, *Enterococcus faecalis*, *Enterococcus faecium*, *Enterococcus* spp., *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, and *Enterobacter* spp. are in the AUR Module protocol.

The default settings for the AR facility-wide antibiogram produce a report by month, but modifications can be made to display the data by quarter, half-year, year, or cumulative time periods. Additionally, all specimen types (blood, cerebrospinal fluid, urine, and lower respiratory) are included in the report by default but modifications can be made to show the susceptibility patterns for specific specimen types if desired.

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>.

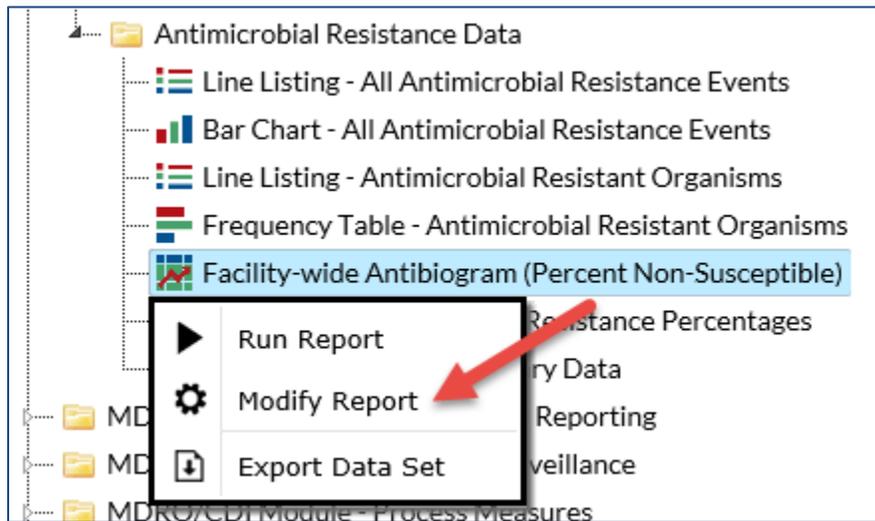
## Example

Suppose you want to review the resistance patterns of common Enterobacteriaceae: *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, and *Enterobacter* spp. You want this report to include isolates of all specimen types submitted to the AR Option for the entire calendar year of 2018.

After generating data sets, to run an AR Option Facility-wide Antibiogram report, click Analysis > Reports > Antimicrobial Use and Resistance Module > Antimicrobial Resistance Data. After selecting the report, in this case, "Facility-wide Antibiogram (Percent Non-Susceptible)," 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.



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## Modifying the Report

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. In order to display data for 2018 only, select Specimen Date~Year with beginning and ending dates of 2018.

**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 screenshot shows the 'Modify "Facility-wide Antibigram (Percent Non-Susceptible)"' window. At the top, there is a header bar with the title. Below it, there are several status indicators: a checked box for 'Show descriptive variable names (Print List)', 'Analysis Data Set: AUR\_Summary', 'Type: Rate Table', and 'Data Set Generated On: 01/09/2019 15:03:00'. Below these are four tabs: 'Title/Format', 'Time Period' (which is active and highlighted in green), 'Filters', and 'Display Options'. The 'Time Period' section contains a 'Time Period:' label, a table with columns 'Date Variable', 'Beginning', and 'Ending', and a 'Clear Time Period' button. The 'Date Variable' is set to 'Specimen Date~Year', 'Beginning' is '2018', and 'Ending' is '2018'. There is also a checkbox for 'Enter Date variable/Time period at the time you click the Run button'. At the bottom of the window are four buttons: 'Run', 'Save...', 'Export...', and 'Close'.

The “Filters” tab allows you to filter the data that will be displayed in the report. For our example, we want to filter the report to show only data for four pathogens: *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, and *Enterobacter* spp. Select Pathogen as the variable and use the “in” operator to specify more than one value.

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Use the drop down menu to select the first and second pathogens. Use the small plus symbol to add additional values until your list is complete.

**Tip:** To include just one item in a filter such as a single pathogen, the “equal” operator can be used instead of the “in” operator.

Modify "Facility-wide AntibioGram (Percent Non-Susceptible)"

Show descriptive variable names (Print List)    Analysis Data Set: AUR\_Summary    Type: Rate Table    Data Set Generated On: 01/09/2019 15:03:00

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

Additional Filters:

AND OR

AND OR

Pathogen in

- Escherichia coli - EC
- Klebsiella oxytoca - KO
- Klebsiella pneumoniae - KP
- Enterobacter - ESP

**Tip:** Not sure of the meaning of the variables in the list? Click “Print List” in the upper left corner of the modification window or use the variable reference list here: [https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/VarLabelXref-PS\\_current.pdf](https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/VarLabelXref-PS_current.pdf).

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 one table for the entire 2018 calendar year. To do this, select Specimen Date~Year as the Group by value.

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## Final Report

The example antibiogram shown below is the result of the modifications shown in this document.

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

**National Healthcare Safety Network**  
**Facility-wide Antibiogram (Percent Non-Susceptible)**  
**Rate per 100 Isolates**  
 As of: January 17, 2019 at 5:41 PM  
 Date Range: AUR\_SUMMARY SpecimenDateYr 2018 to 2018 if (((Pathogen IN (EC, KO, KP, ESP ))) )  
 orgID=13860 CCN=999999 SpecimenDateYr=2018

Drug	Pathogen			
	Enterobacter - ESP	Escherichia coli - EC	Klebsiella oxytoca - KO	Klebsiella pneumoniae - KP
AMK	41.0	0	.	.
AMOXWC	5.0	0	.	.
AMP	100	100	.	.
AMPIWS	100	100	.	.
AZT	0	0	.	.
CEFAZ	0	0	.	.
CEFEP	35.0	20.0	.	.
CEFOT	0	16.0	.	.
CEFOX	0	0	.	.
PERV	0	0	.	.
SULFAET	14.0	0	.	.
SULFI	.	.	.	.
TETRA	22.0	0	.	.
TICARWC	.	.	.	.
TMP	.	.	.	.
TOBRA	.	.	.	.

- The report shows all drugs required to be included in the CDA file for the organisms in the report. Full drug names are here: <https://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx>.
- For 2018 there were more than 30 isolates reported for both *Enterobacter spp.* and *Escherichia coli*. All, or 100%, of *Enterobacter spp.* and *Escherichia coli* isolates tested were non-susceptible to both ampicillin (AMP) and ampicillin/sulbactam (AMPIWS).
  - To see the total number of isolates tested, from the Modify screen, click Export. Then select "Export Analysis Data Set using Modifications."
- All *Enterobacter spp.* isolates were susceptible to cefotaxime (CEFOT) (0% NS) while only 84% of *Escherichia coli* isolates were susceptible (16.0% NS).



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4. A “.” will be displayed if there were less than 30 isolates tested for that pathogen-drug combination. The pathogen column only displays if there was one or more isolates reported with that pathogen.
5. Grey cells represent non-valid drugs for the pathogen and specimen types submitted.

## Additional Resources

NHSN Analysis Training: <https://www.cdc.gov/nhsn/training/analysis/index.html>

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>

Surveillance for AU and AR Options: <https://www.cdc.gov/nhsn/acute-care-hospital/aur/>

