

NHSN Antimicrobial Resistance (AR) Option: Analysis

Annual NHSN Training – March 24, 2022

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Healthcare Quality Promotion, CDC

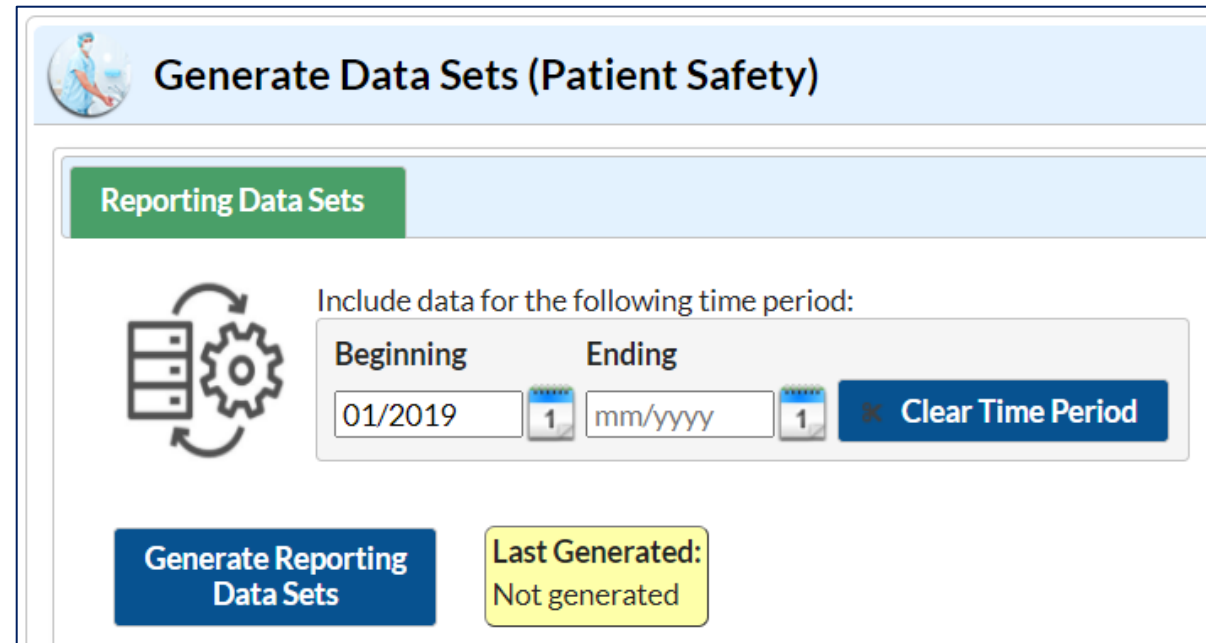
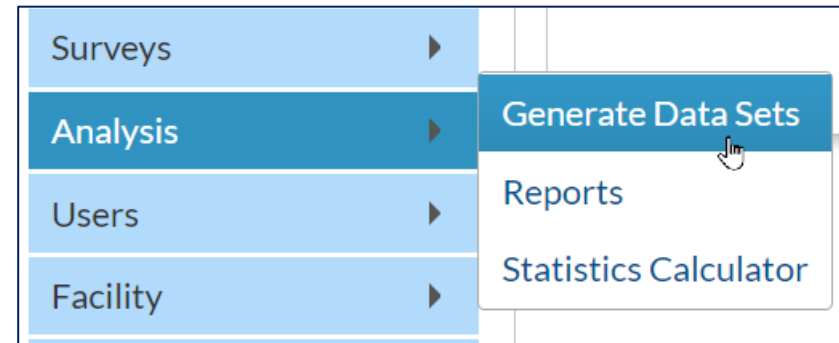
Objectives

- Describe the analysis reports currently available within the NHSN AR Option
- Explain the utility of each report
- Interpret the output produced in each report

AR Option Analysis

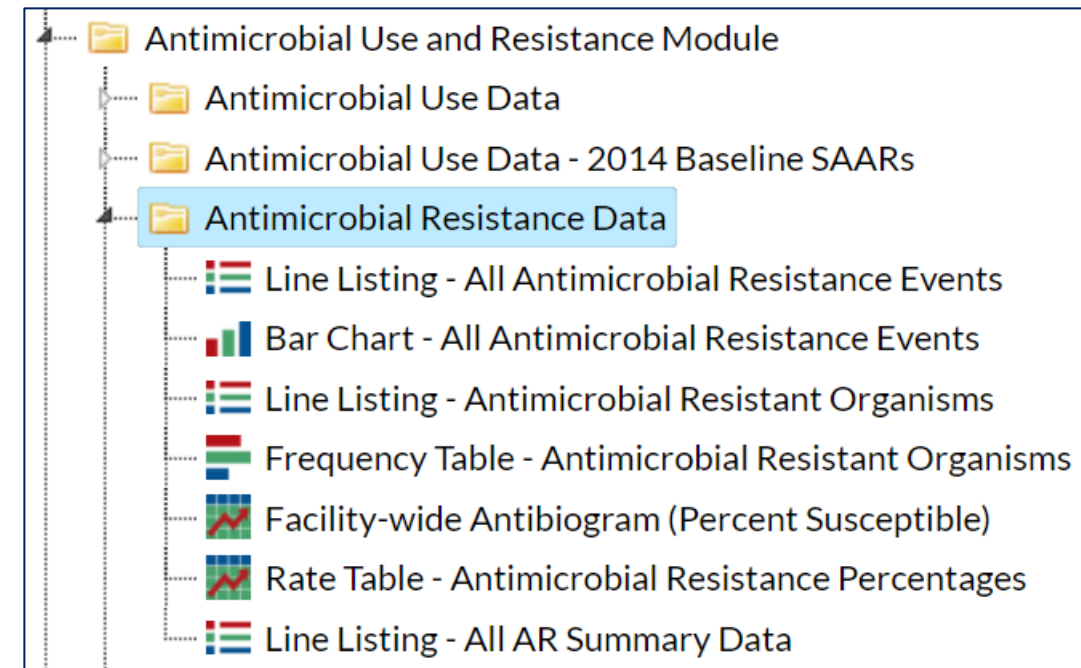
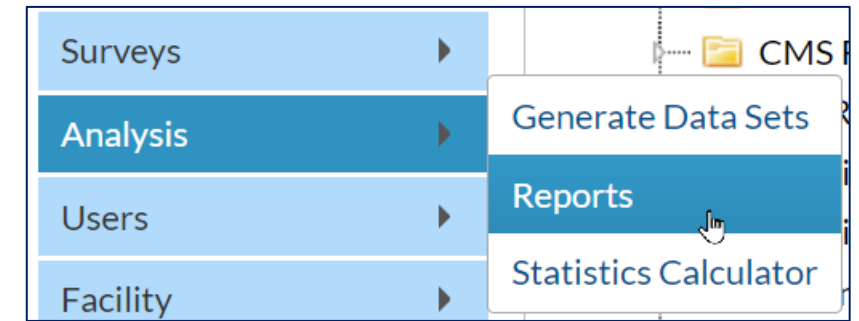
Remember: Always Generate Data Sets!

- When new data have been uploaded, generate new data sets within NHSN
- Click Analysis then Generate Data Sets
- Specify the beginning & ending dates or leave blank to include all data ever entered into NHSN
- Click Generate Reporting Data Sets

A screenshot of the 'Generate Data Sets (Patient Safety)' form. The form has a header with a nurse icon and the title 'Generate Data Sets (Patient Safety)'. Below the header is a tab labeled 'Reporting Data Sets'. To the left of the date fields is an icon of a server rack with a gear and circular arrows. The text 'Include data for the following time period:' is above the date fields. The 'Beginning' date field contains '01/2019' and the 'Ending' date field contains 'mm/yyyy'. Both fields have a calendar icon with the number '1'. To the right of the date fields is a blue button labeled 'Clear Time Period'. At the bottom left is a large blue button labeled 'Generate Reporting Data Sets'. At the bottom right is a yellow box labeled 'Last Generated: Not generated'.

AR Option Reports

- Once data sets are finished generating, click Analysis then Reports
- Various reports within the AR Data folder
 - AR Event reports
 - Line list, bar chart, antibiogram
 - AR Organism reports
 - Line list, frequency table, rate table
 - AR Summary (aka Denominator)
 - Line list



Run/Modify/Export

- Three options exist for viewing data that's been uploaded to NHSN:

1. Run Report

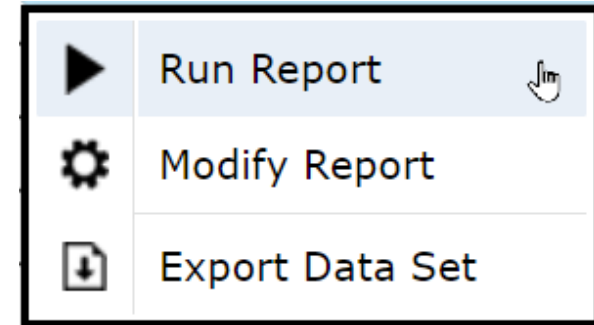
- Generates the report using default settings

2. Modify Report

- Allows user to make changes to the default settings

3. Export Data Set

- Allows user to take AR data out of NHSN and analyze in a different software (e.g., Excel, SAS)



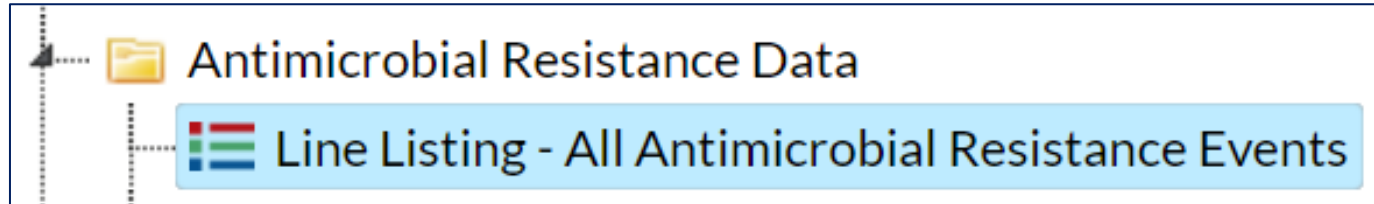
Run/Modify/Export continued

- This presentation covers mostly default output.
- Modifying reports:
 - How to Modify a Report: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/howtomodifyreport.pdf>
 - Analysis Quick Reference Guides: <https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html#accordion-1-collapse-5>
- Exporting data:
 - How to Export data from NHSN: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/exportdata.pdf>

AR Event Reports

Line List, Bar Chart, & Antibigram

AR Event Line List



- A detailed list of all AR Events uploaded into your NHSN facility
 - Includes patient, specimen, organism, & susceptibility testing variables
 - One row per drug for each event
- Due to the number of AR Events, you'll likely reach the maximum number of rows for a line list within a few months of reporting. Workarounds include:
 - Make modifications to narrow selections
 - Export data

AR Event Line List – Example of Default Report

- 1 AR Event with susceptibility results for 6 drugs

National Healthcare Safety Network

Line Listing - Antimicrobial Resistance Events by Pathogen

As of: February 10, 2022 at 12:47 PM

Date Range: AUR_DETAIL SpecimenDateYr After and Including 2022

Pathogen Description=CA

Facility Org ID	Event ID	Patient ID	Fac Admission Date	Date Specimen Collected	Location	Isolate ID	Specimen Group	Pathogen Description	Drug Description	Final interpretation Description
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	ANID - Anidulafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	CASPO - Caspofungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	FLUCO - Fluconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	MICA - Micafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	POSAC - Posaconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	VORI - Voriconazole	N - Not Tested

This line list shows a limited number of variables by default. To expand the number of variables shown, export the data out of NHSN or use the "modify" option to edit the line list.

Sorted by PathogenDesc specimenDate

Data contained in this report were last generated on February 9, 2022 at 3:22 PM to include data beginning January 2018 .

AR Event Line List – Example Modifications

- Line lists can be modified to show additional variables included in the AR Event
 - Examples: individual lab test sign, value and interpretation

National Healthcare Safety Network											
Line Listing - Antimicrobial Resistance Events by Pathogen											
As of: February 10, 2022 at 12:51 PM											
Date Range: AUR_DETAIL SpecimenDateYr After and Including 2022											
Pathogen Description=CA											
Facility Org ID	Event ID	Date Specimen Collected	Location	Specimen Group	Pathogen Description	Drug Description	MIC sign	MIC value	Interpretation of MIC test	Final interpretation Description	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	ANID - Anidulafungin	>	2.000	R	R - Resistant	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	CASPO - Caspofungin	>	2.000	R	R - Resistant	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	FLUCO - Fluconazole	>	4.000	R	R - Resistant	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	MICA - Micafungin	>	2.000	R	R - Resistant	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	POSAC - Posaconazole	>	2.000	R	R - Resistant	
33617	50199744	01/02/2022	ED	Blood	Candida albicans - CA	VORI - Voriconazole		.	N	N - Not Tested	

This line list shows a limited number of variables by default. To expand the number of variables shown, export the data out of NHSN or use the "modify" option to edit the line list.

Sorted by PathogenDesc specimenDate

Data contained in this report were last generated on February 9, 2022 at 3:22 PM to include data beginning January 2018 .

AR Event Line List – Interpreting the Output

- *Candida albicans* was isolated from a blood specimen collected in the ED

National Healthcare Safety Network

Line Listing - Antimicrobial Resistance Events by Pathogen

As of: February 10, 2022 at 12:47 PM

Date Range: AUR_DETAIL SpecimenDateYr After and Including 2022

Pathogen Description=CA

Facility Org ID	Event ID	Patient ID	Fac Admission Date	Date Specimen Collected	Location	Isolate ID	Specimen Group	Pathogen Description	Drug Description	Final interpretation Description
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	ANID - Anidulafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	CASPO - Caspofungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	FLUCO - Fluconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	MICA - Micafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	POSAC - Posaconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	VORI - Voriconazole	N - Not Tested

This line list shows a limited number of variables by default. To expand the number of variables shown, export the data out of NHSN or use the "modify" option to edit the line list.

Sorted by PathogenDesc specimenDate

Data contained in this report were last generated on February 9, 2022 at 3:22 PM to include data beginning January 2018 .

AR Event Line List – Interpreting the Output

- *Candida albicans* was isolated from a blood specimen collected in the ED
- This isolate was resistant to anidulafungin, caspofungin, fluconazole, micafungin, and posaconazole; the isolate was not tested against voriconazole

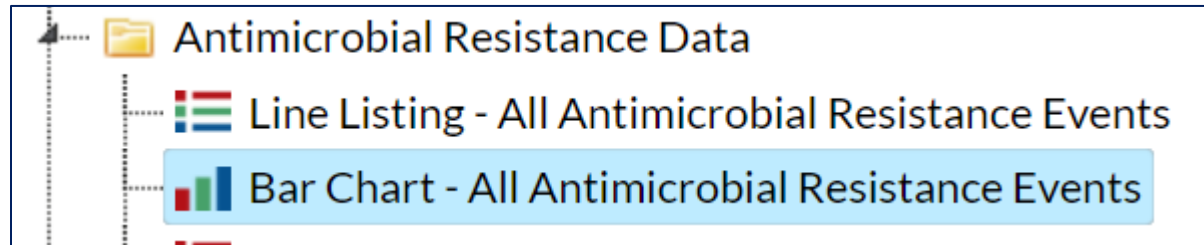
National Healthcare Safety Network										
Line Listing - Antimicrobial Resistance Events by Pathogen										
As of: February 10, 2022 at 12:47 PM										
Date Range: AUR_DETAIL SpecimenDateYr After and Including 2022										
Pathogen Description=CA										
Facility Org ID	Event ID	Patient ID	Fac Admission Date	Date Specimen Collected	Location	Isolate ID	Specimen Group	Pathogen Description	Drug Description	Final interpretation Description
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	ANID - Anidulafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	CASPO - Caspofungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	FLUCO - Fluconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	MICA - Micafungin	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	POSAC - Posaconazole	R - Resistant
33617	50199744	CA_BLOOD_IMP	11/18/2021	01/02/2022	ED	CAlbicans_Blood_2022	Blood	Candida albicans - CA	VORI - Voriconazole	N - Not Tested

This line list shows a limited number of variables by default. To expand the number of variables shown, export the data out of NHSN or use the "modify" option to edit the line list.

Sorted by PathogenDesc specimenDate

Data contained in this report were last generated on February 9, 2022 at 3:22 PM to include data beginning January 2018 .

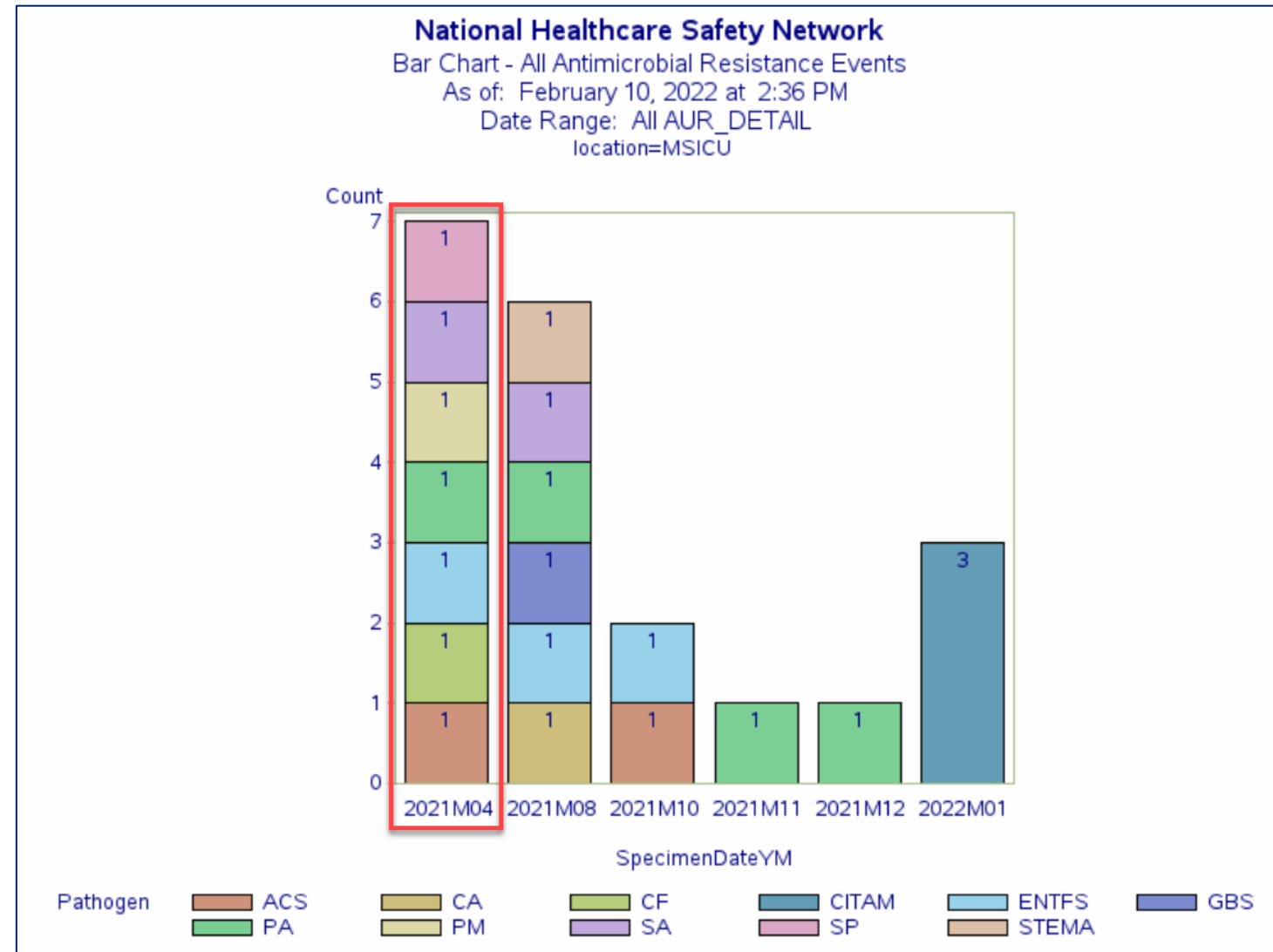
AR Event Bar Chart



- Graphically displays the number of AR Events submitted by location over time
- Defaults to display monthly AR Events by pathogen & location
- Shows a maximum of 12 bars

AR Event Bar Chart – Interpreting the Output

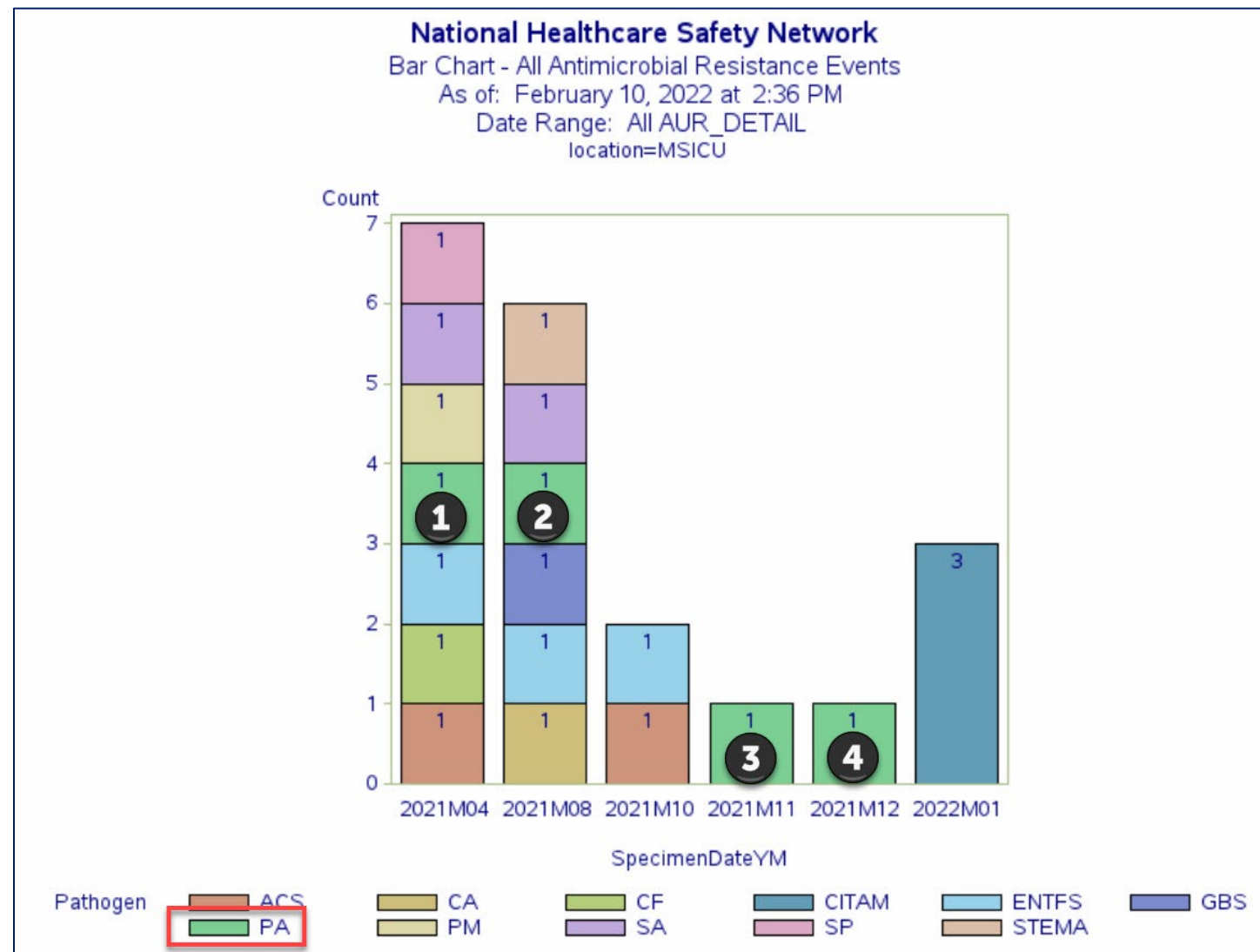
- In April 2021, 7 AR Events were reported from the MSICU



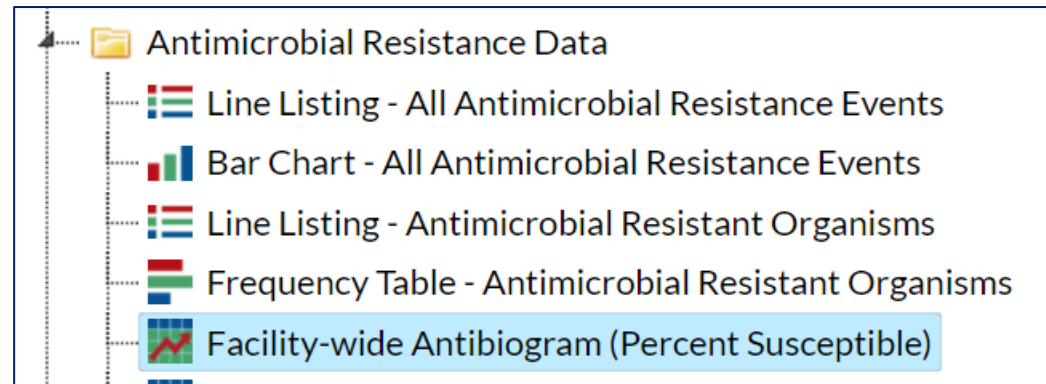
15 *All data presented are fictitious and used for illustrative purposes only

AR Event Bar Chart – Interpreting the Output

- In April 2021, 7 AR Events were reported from the MSICU
- 4 total *Pseudomonas aeruginosa* events were reported from this location
 - April 2021
 - August 2021
 - November 2021
 - December 2021



AR Facility-wide Antibigram



- Provides a table based on AR Events reported in NHSN
- Displays the calculated percent susceptible (%S) for each organism-antimicrobial combination reported from all locations (inpatient and outpatient)
- Defaults to show by month but can roll up to additional time groupings
- Available to both facilities and groups
- Filters allow for customization of the output

AR Facility-wide Antibigram – Percent Susceptible

- The %S is calculated for each organism-antimicrobial pairing using the following formula:

$$\frac{\text{Number isolates tested susceptible}}{\text{Number of isolates tested}} = \%S$$

- %S only calculated if at least 30 isolates are tested for the specific antimicrobial

AR Facility-wide Antibigram – Default Settings

- Tables by month
- Isolates from:
 - all specimen types (blood, cerebrospinal fluid, urine, and lower respiratory)
 - all patient ages
 - all locations
- All isolates regardless of organism category (gram negative, gram positive, or fungal)
- Both healthcare facility and community onset

AR Facility-wide Antibigram – Table Details

- Percent susceptible shown for January 2022

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC"))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

*All data presented are fictitious and used for illustrative purposes only

AR Facility-wide Antibigram – Organism category

- Organisms are grouped by category:
 - Gram-negative
 - Gram-positive
 - Fungal

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC"))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

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AR Facility-wide Antibigram – Drug Class

- Drugs are sorted into drug classes organized alphabetically

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**Full drug names can be found here:

<https://www.cdc.gov/nhsn/xls/aur/aur-eligible-antimicrobial-agents.xlsx>

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC"))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

AR Facility-wide Antibigram – Non-valid Combinations

- Cells shaded in grey represent non-valid pathogen/drug combinations – susceptibility tests for those drugs are not reported for those pathogens
- Refer to the AUR Module protocol for all valid pathogen/drug combinations.

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC"))))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

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AR Facility-wide Antibigram – Interpretation

- Of *Acinetobacter* spp. isolates tested, 54% were susceptible to amikacin (AMK) and 96% were susceptible to tobramycin (TOBRA)

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC"))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

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AR Facility-wide Antibigram – Interpretation

- Of *Acinetobacter* spp. isolates tested, 54% were susceptible to amikacin (AMK) and 96% were susceptible to tobramycin (TOBRA)
- Of *Enterobacter* spp. isolates tested, 64% were susceptible to amikacin (AMK)
 - Less than 30 isolates were tested for tobramycin (TOBRA) susceptibility so %S is not calculated

National Healthcare Safety Network Facility-wide Antibigram (Percent Susceptible) Rate per 100 Isolates

As of: February 11, 2022 at 9:02 AM

Date Range: All AUR_SUMMARY

if (((Pathogen IN ("ACS", "ESP", "EC")))))

orgID=13860 CCN=999999 SpecimenDateYM=2022M01

		Pathogen		
		Gram-Negative		
Drug Class	Drug	Acinetobacter - ACS	Enterobacter - ESP	Escherichia coli - EC
Aminoglycosides	AMK	54.0	64.0	88.0
	GENTA	86.0	76.0	88.0
	TOBRA	96.0	.	.
B-lactam/ B-lactamase inhibitor combination	AMOXWC		93.0	88.0
	AMPIWS	24.0	2.0	1.0
	CEFTAVI		98.0	87.0
	CEFTOTAZ		98.0	87.0
	IMICILRE		.	.
	MEROVAB		.	.
	PIPERWT	88.0	98.0	88.0
	TICARWC		.	.

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AR Organism Reports

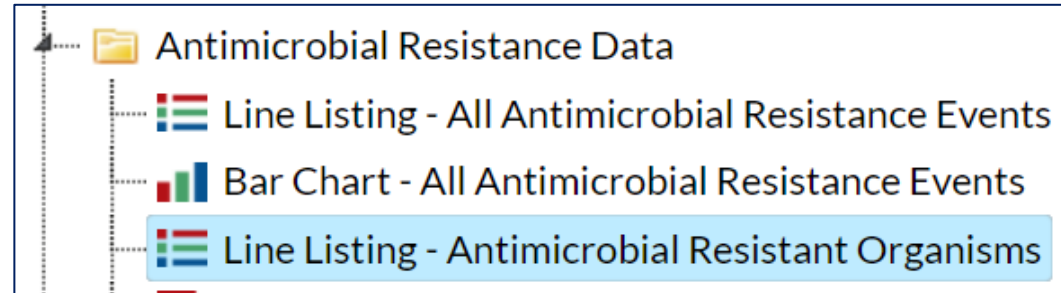
Line List, Frequency Table, Rate Table

Antimicrobial Resistant Phenotype Definitions

- Reported AR Events are assigned a phenotype if they meet the NHSN-defined susceptibility testing criteria
 - <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf>

Phenotype Name	Phenotype Code	Phenotype Definition ^a
Methicillin-resistant <i>Staphylococcus aureus</i>	MRSA_AR	<i>Staphylococcus aureus</i> that has tested Resistant (R) to at least one of the following: oxacillin or ceftiofur
Carbapenem-resistant Enterobacterales (expanded)	CREexpanded_AR	Any <i>Citrobacter amalonaticus</i> , <i>Citrobacter freundii</i> , <i>Citrobacter koseri</i> , <i>Enterobacter</i> spp., <i>E. coli</i> , <i>Klebsiella aerogenes</i> , <i>Klebsiella oxytoca</i> , <i>Klebsiella pneumoniae</i> , and <i>Serratia marcescens</i> that has tested Resistant (R) to at least one of the following: imipenem, meropenem, doripenem, ertapenem, meropenem/vaborbactam, or imipenem/relebactam OR Any <i>Proteus mirabilis</i> , <i>Proteus penneri</i> , <i>Proteus vulgaris</i> , and <i>Morganella morganii</i> that has tested Resistant (R) to at least one of the following: meropenem, doripenem, ertapenem, or meropenem/vaborbactam

AR Organisms Line List



- Lists all AR Events that meet an AR Organism phenotype definition
- Includes patient & specimen information

AR Organisms Line List – Interpretation

- 4 AR Events met the NHSN AR Option definition for CRE
- 2 specimens were *E.coli* and 2 were *K.oxytoca*

National Healthcare Safety Network

Line Listing - Antimicrobial Resistant Organisms

CREall_AR - Carbapenem-resistant Enterobacterales (E. coli, Klebsiella, or Enterobacter)

As of: February 10, 2022 at 2:39 PM

Date Range: ANTIBIOGRAM_AR specDateYr After and Including 2022

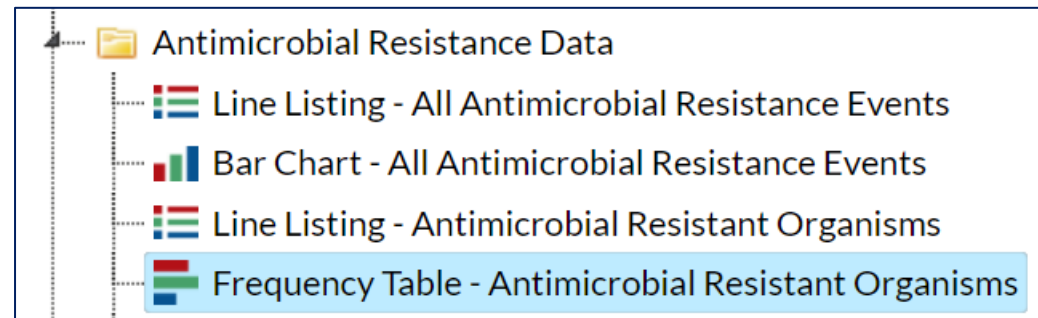
if (((phenotype_AR IN ("MRSA_AR", "ESCecoli_AR", "ESCKlebsiella_AR", "carbNS_Acine_AR", "carbNS_PA_AR", "MDR_Acine_AR", "MDR_PA_AR", "VREfaecium_AR", "VREfaecalis_AR", "CREexpanded_AR", "FR_Candi_AR", "DR_SP_AR", "CREall_AR")))

Facility Org ID	Patient ID	Date of Birth	Gender	Fac Admission Date	Event ID	Date Specimen Collected	Event Type	Location	Pathogen Description
13860	ECOLI_10067	01/25/1969	M	01/01/2022	104365	01/01/2022	AR	MSICU	Escherichia coli - EC
13860	KLEBOXY_10067	07/25/1998	M	01/01/2022	104366	01/02/2022	AR	MSICU	Klebsiella oxytoca - KO
13860	ECOLI_2022B	01/25/1974	M	10/23/2021	104569	01/13/2022	AR	MSICU	Escherichia coli - EC
13860	KLEBOXY_2022B	07/25/1989	M	10/20/2021	104570	01/14/2022	AR	MSICU	Klebsiella oxytoca - KO

1. Please find the document containing Phenotype_AR definitions at <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf>

Sorted by orgID specimenDate

AR Organisms Frequency Table



- Table displaying counts of AR Events meeting NHSN-defined phenotype definitions
- Defaults to show totals by month

AR Organisms Frequency Table – Interpretation

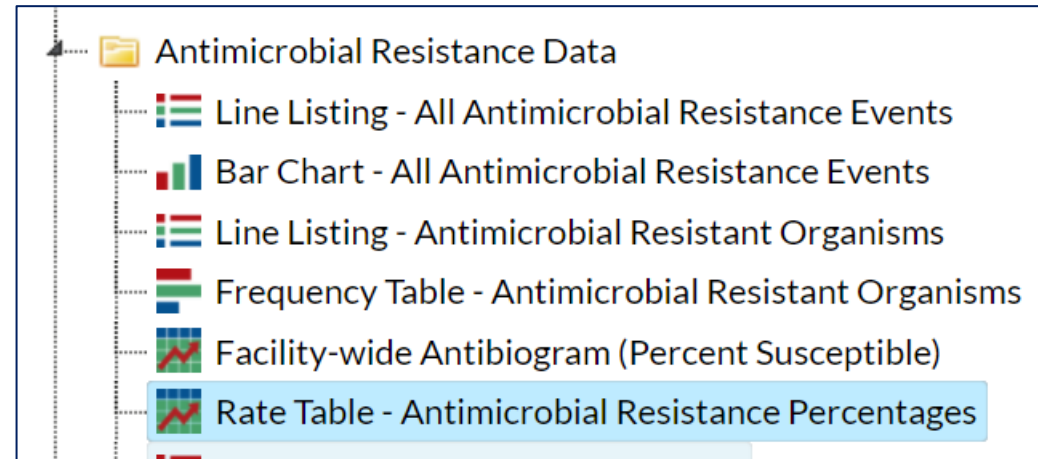
- From Oct 2021-Jan 2022, 11 AR Events met the definition of multidrug-resistant Acinetobacter.
 - 7 events met the criteria in Oct 2021
 - 4 events met the criteria in Jan 2022

National Healthcare Safety Network
Frequency Table - Antimicrobial Resistant Organisms
As of: February 10, 2022 at 2:41 PM
Date Range: ANTIBIOGRAM_AR specDateYM After and Including 2021M10
 if (((phenotype_AR IN ("MRSA_AR", "ESCecoli_AR", "ESCKlebsiella_AR", "carbNS_Acine_AR", "carbNS_PA_AR", "MDR_Acine_AR", "MDR_PA_AR", "VREfaecium_AR", "VREfaecalis_AR", "CREexpanded_AR", "FR_Candi_AR", "DR_SP_AR")))

Frequency	Table of phenotype_AR by specDateYM					
	specDateYM(Spec Collected~Yr/Mon)					
phenotype_AR(Resistant Organism)	2021M10	2021M11	2021M12	2022M01	Total	
CREexpanded_AR	19	0	1	4	24	
DR_SP_AR	0	2	0	0	2	
ESCecoli_AR	3	0	0	2	5	
ESCKlebsiella_AR	6	0	0	2	8	
FR_Candi_AR	2	1	1	1	5	
MDR_Acine_AR	7	0	0	4	11	
MDR_PA_AR	3	0	0	1	4	
MRSA_AR	3	1	0	0	4	
carbNS_Acine_AR	7	0	1	4	12	
carbNS_PA_AR	3	0	0	1	4	
Total	53	4	3	19	79	

1. Please find the document containing Phenotype_AR definitions at <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf>

AR Organism Percentages



- Displays # isolated, # tested, and # resistant by month
- Displays % of organisms that tested non-susceptible or resistant to certain antimicrobials for each defined phenotype
 - If at least 30 isolates were tested

$$\frac{\text{\# organisms NS or R to specific antimicrobials}}{\text{\# organisms tested for susceptibility to specific antimicrobials}} \times 100$$

AR Organism Percentages – Interpretation

- In October 2021: 44 *Staphylococcus aureus* AR Events were reported

National Healthcare Safety Network

Rate Table - Antimicrobial Resistance Percentages

As of: February 10, 2022 at 2:42 PM

Date Range: All ANTIBIOGRAM_RATESAR

Facility Org ID=13860 Phenotype Description=Methicillin-resistant *Staphylococcus aureus*

Facility Org ID	Resistant Organism	Spec Collected Yr/Mon	Number Isolated	Number Tested	Number Resistant	Percent Resistant	95% confidence interval
13860	MRSA_AR	2021M10	44	39	36	92.3	80.5,98.0
13860	MRSA_AR	2021M11	146	146	97	66.4	58.5,73.7

1. MRSA includes any *Staphylococcus aureus* that has tested Resistant (R) to oxacillin or ceftazidime.
2. Percent resistant is only calculated when at least 30 isolates have been tested.
3. If the percent of isolates tested is less than 70%, caution should be used when interpreting the percent resistant.

*All data presented are fictitious and used for illustrative purposes only

AR Organism Percentages – Interpretation

- In October 2021: 44 *Staphylococcus aureus* AR Events were reported
- 39 of those were tested and 36 were resistant to oxacillin or ceftiofur

National Healthcare Safety Network

Rate Table - Antimicrobial Resistance Percentages

As of: February 10, 2022 at 2:42 PM

Date Range: All ANTIBIOGRAM_RATESAR

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AR Organism Percentages – Interpretation

- In October 2021: 44 *Staphylococcus aureus* AR Events were reported
- 39 of those were tested and 36 were resistant to oxacillin or ceftazidime
- 92.3% (36 resistant/39 tested) of the SA events reported met the NHSN AR Option definition for MRSA

National Healthcare Safety Network

Rate Table - Antimicrobial Resistance Percentages

As of: February 10, 2022 at 2:42 PM

Date Range: All ANTIBIOGRAM_RATESAR

Facility Org ID=13860 Phenotype Description=Methicillin-resistant *Staphylococcus aureus*

Facility Org ID	Resistant Organism	Spec Collected Yr/Mon	Number Isolated	Number Tested	Number Resistant	Percent Resistant	95% confidence interval
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13860	MRSA_AR	2021M11	146	146	97	66.4	58.5,73.7

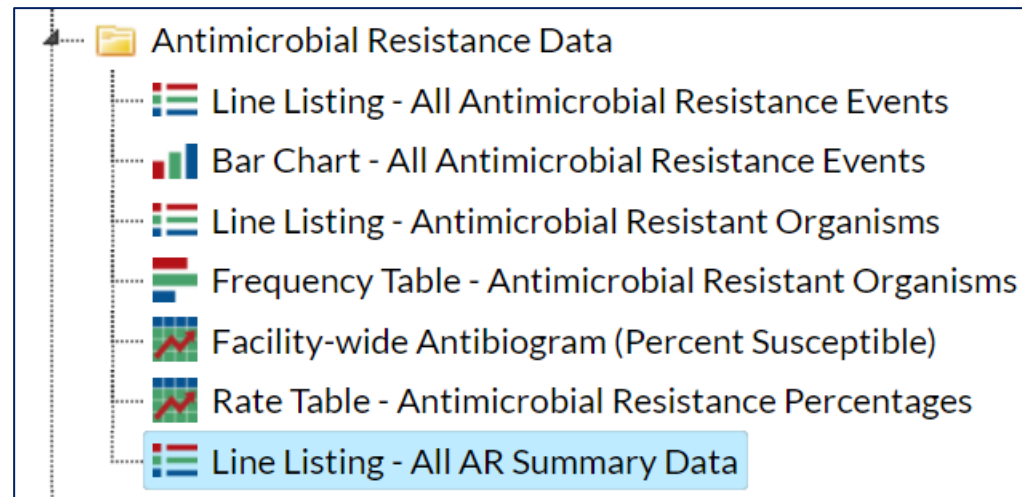
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3. If the percent of isolates tested is less than 70%, caution should be used when interpreting the percent resistant.

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AR Denominator Report

Line List

AR Denominator Line List



- Lists the summary AR data by month & location
 - FacWideIN: Patient Days & Admissions
 - Outpatient locations: Encounters
- Includes the “Report No Events” variable

AR Denominator Line List – Interpretation

- In Oct 2021, there were 5,350 total patient days and 368 admissions for FacWideIN (all inpatient locations combined) and AR Events were reported (No AR Events = N)

National Healthcare Safety Network Line Listing for All AR Summary Data

As of: February 10, 2022 at 2:45 PM

Date Range: AR_SUMMARY summaryYr After and Including 2021

Facility Org ID	Summary Year/Month	Location	Patient Days	Admissions	Total Facility Encounters	No AR Events
13860	2021M09	FACWIDEIN	5400	325	.	
13860	2021M10	FACWIDEIN	5350	368	.	N
13860	2021M11	ED	.	.	507	N
13860	2021M12	ED	.	.	422	Y
13860	2021M12	FACWIDEIN	2200	475	.	N

Sorted by orgID summaryYM location

*All data presented are fictitious and used for illustrative purposes only

AR Denominator Line List – Interpretation

- In Oct 2021, there were 5,350 total patient days and 368 admissions for FacWideIN (all inpatient locations combined) and AR Events were reported (No AR Events = N)
- In Dec 2021, there were 422 total encounters in ED and the “Report No Events” box was clicked (No AR Events = Y)

National Healthcare Safety Network Line Listing for All AR Summary Data

As of: February 10, 2022 at 2:45 PM

Date Range: AR_SUMMARY summaryYr After and Including 2021

Facility Org ID	Summary Year/Month	Location	Patient Days	Admissions	Total Facility Encounters	No AR Events
13860	2021M09	FACWIDEIN	5400	325	.	
13860	2021M10	FACWIDEIN	5350	368	.	N
13860	2021M11	ED	.	.	507	N
13860	2021M12	ED	.	.	422	Y
13860	2021M12	FACWIDEIN	2200	475	.	N

Sorted by orgID summaryYM location

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AR Denominator Line List – Interpretation

- The facility has not yet reported AR Events for Sept 2021 and has not clicked the “Report No Events” box for that month (No AR Events = (blank))

National Healthcare Safety Network						
Line Listing for All AR Summary Data						
As of: February 10, 2022 at 2:45 PM						
Date Range: AR_SUMMARY summaryYr After and Including 2021						
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13860	2021M10	FACWIDEIN	5350	368	.	N
13860	2021M11	ED	.	.	507	N
13860	2021M12	ED	.	.	422	Y
13860	2021M12	FACWIDEIN	2200	475	.	N

Sorted by orgID summaryYM location

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AR Option Reporting Resources

AUR Module Webpage

- Direct link: <https://www.cdc.gov/nhsn/psc/aur/index.html>
- One-stop shop for:
 - Protocol
 - Validation material
 - Link to training resources
 - Link to Analysis Quick Reference Guides
 - Link to FAQs
 - Link to CDA Toolkits

AR Option Analysis Resources

- NHSN AUR Protocol:
 - <http://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf>
- NHSN Analysis Quick Reference Guides:
 - <http://www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html>
- NHSN AUR Training (recordings and Quick Learns):
 - <https://www.cdc.gov/nhsn/training/patient-safety-component/aur.html>
- NHSN Helpdesk:
 - NHSN@cdc.gov

Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

