

NHSN Antimicrobial Resistance (AR) Option: Incidence and Prevalence Reports

Virgie S. Fields, MS, CPH, CIC

Public Health Analyst

Lantana Consulting Group | Contractor for the Division of Healthcare Quality
Promotion, CDC

NHSN Annual Training

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Objectives

- Discuss what is included in the six new NHSN AR Option incidence and prevalence reports
- Modify, run, and interpret the Rate Table – Hospital-onset Antimicrobial Resistance Incidence report
- Modify, run, and interpret the Rate Table – Community-onset Positive Culture Prevalence by Organism report
- Discuss what happens when denominator data are not reported for a time period

**What's included in the AR Option
Incidence and Prevalence Reports?**

Numerator: AR Events

AR Events

- Event data: Isolate-level susceptibility results for specific organisms

- Qualifying isolate criteria for an AR Event:

1. Collected in an eligible location/unit

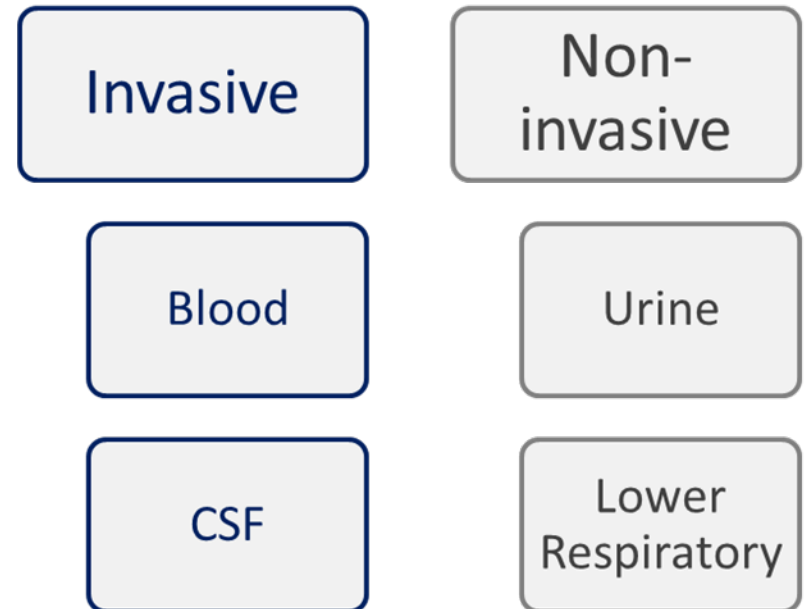
2. Collected from one of four specimen types:

- Blood
- Cerebral spinal fluid (CSF)
- Urine
- Lower respiratory

3. Eligible organism identified (refer to next slide)

4. Antimicrobial susceptibility testing must be completed

- Qualifies for submission regardless of susceptibility results



Eligible Organisms

- All *Acinetobacter* species
- *Candida albicans*; *auris*; *glabrata*; *parapsilosis*; *tropicalis*
- *Citrobacter amalonaticus*; *freundii*; *koseri*
- All *Enterobacter* species
- All *Enterococcus* species
- *Escherichia coli*
- *Klebsiella aerogenes*; *oxytoca*; *pneumoniae*
- *Morganella morganii*
- *Proteus mirabilis*; *penneri*; *vulgaris*
- *Pseudomonas aeruginosa*
- *Serratia marcescens*
- *Staphylococcus aureus*
- *Stenotrophomonas maltophilia*
- *Streptococcus agalactiae* (Group B *Streptococcus*)
- *Streptococcus pneumoniae*

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

AR CDA Toolkit: <https://www.cdc.gov/nhsn/cdaportal/toolkits.html>

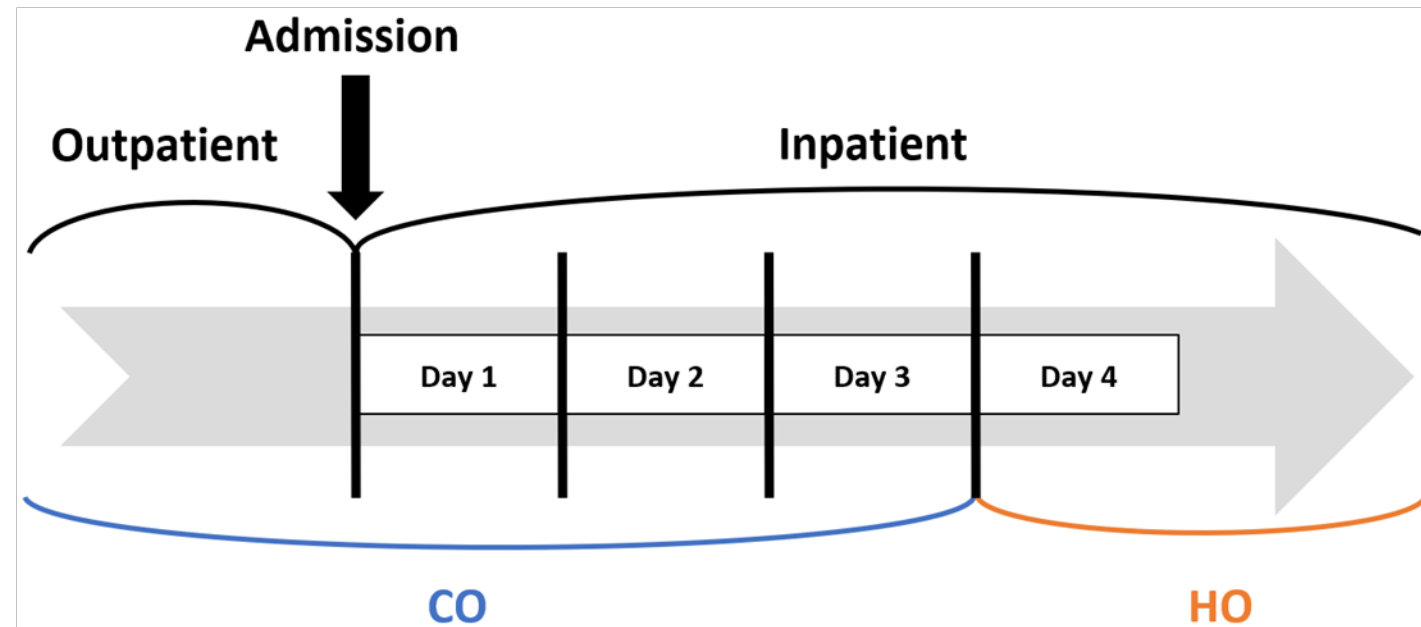
Organism/Agent Combinations

- Selected antimicrobial agents are required to be reported for each of the organisms per specimen type
 - Full list (i.e., drug panels) can be found in the NHSN AUR Module Protocol:
<http://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf>

Organism	Specimen Type	Antimicrobial Agents
<i>Acinetobacter</i> (All <i>Acinetobacter</i> species noted in the AR Option Pathogen Roll-up Workbook)	Blood, Urine, Lower Respiratory, CSF	Amikacin Ampicillin-sulbactam Cefepime Cefiderocol Cefotaxime Ceftazidime Ceftriaxone Ciprofloxacin Colistin Doripenem Doxycycline Gentamicin Imipenem with Cilastatin Levofloxacin Meropenem Minocycline Piperacillin-tazobactam Polymyxin B Tobramycin Trimethoprim-sulfamethoxazole
	Additional Agents for Urine	Tetracycline

Hospital-onset vs. Community-onset

- NHSN classifies AR events as hospital-onset or community-onset based on the specimen collection date and date of admission
- **Hospital-onset:** Specimen collected in an inpatient location on or after day 4 (where day 1 is date of admission)
- **Community-onset:** Specimen collected in an inpatient or outpatient location ≤ 3 days after admission to the facility (i.e., days 1, 2, or 3)



Denominator: AR Summary Data

Patient Days, Admissions, Encounters

AR Summary Data

- Facilities can submit two types of AR summary records:
 1. Facility-wide inpatient (aka FacWideIN)
 - Report patient days and admissions for ALL inpatient locations combined
 2. Outpatient locations
 - Report outpatient encounters for EACH reportable individual outpatient location (i.e., ED, pediatric ED, 24-hour observation area)
- Summary records are not submitted for:
 - Individual inpatient locations
 - Combined outpatient locations (FacWideOUT) or outpatient locations beyond those mapped as the three location types above

Patient Days

- Total number of patient days for all facility inpatient locations (FacWideIN) collected at the same time each day combined for the month (“daily census”)
 - Reported for FacWideIN only
 - Same definition used for HAI reporting

Admissions

- Total number of admissions for all facility inpatient locations (FacWideIN) combined for the month
 - A patient is counted as an admission when they arrive in an NHSN designated inpatient location regardless of patient status (for example, inpatient, observation)
 - Reported for FacWideIN only
 - Same definition used for AU Option

Encounters

- Total number of patient visits to the given outpatient location (specifically: ED, pediatric ED, 24-hour observation area)
 - A visit to an eligible outpatient location counts as a single encounter
- Example scenarios:
 - If a patient arrives in the ED on Monday, then is transferred to the 24-hour Observation Area on Tuesday, the patient should be counted only as 1 encounter within the ED and zero encounters within the 24-hour Observation Area.
 - If a patient arrives in the ED at 07:00 on Monday, is discharged at 11:00 on Monday then returns to the ED at 18:00 on Monday, that patient counts as two separate encounters for the ED.

Calculating Incidence and Prevalence Rates

Incidence and Prevalence Rates

Incidence Rate:

$$\frac{\# \text{ Hospital—onset AR Events}}{\# \text{ Patient Days}} \times 10,000$$

Community-onset Prevalence Rate:

$$\frac{\# \text{ Community—onset AR Events from inpatient and outpatient locations}}{\# \text{ Admissions}} \times 10,000$$

Outpatient Prevalence Rate:

$$\frac{\# \text{ Community—onset AR Events from outpatient locations only}}{\# \text{ Encounters}} \times 10,000$$

Rates are provided for each individual specimen type (i.e., blood, urine, CSF, lower respiratory) and for all specimen types combined

AR Pathogen Groups

- Individual rate tables for 10 pathogen groups
 - *Acinetobacter*
 - *Candida*
 - Enterobacterales_all (*E. coli*, *Enterobacter*, *Klebsiella*)
 - Enterobacterales_expanded (*E. coli*, *Enterobacter*, *Klebsiella*, *Citrobacter*, *Morganella morganii*, *Proteus*, *Serratia marcescens*)
 - *Enterococcus*
 - *Pseudomonas aeruginosa*
 - *Staphylococcus aureus*
 - *Stenotrophomonas maltophilia*
 - *Streptococcus agalactiae* (Group B *Streptococcus*)
 - *Streptococcus pneumoniae*

AR Phenotypes

- Individual rate tables for 16 AR phenotypes
 - Methicillin-resistant *Staphylococcus aureus*
 - Carbapenem-resistant (CR) Enterobacterales (expanded)
 - CR Enterobacterales (*E. coli*, *Klebsiella*, or *Enterobacter*)
 - CR *E. coli*
 - CR *Enterobacter* spp. and *Klebsiella aerogenes*
 - CR *Klebsiella pneumoniae/oxytoca*
 - Carbapenem-non-susceptible *Pseudomonas aeruginosa*
 - Extended-spectrum cephalosporin-resistant *E. coli*
 - Extended-spectrum cephalosporin-resistant *Klebsiella pneumoniae/oxytoca*
 - Multidrug-resistant (MDR) *Pseudomonas aeruginosa*
 - Carbapenem-non-susceptible *Acinetobacter* spp.
 - MDR *Acinetobacter* spp.
 - Vancomycin-resistant *Enterococcus faecalis*
 - Vancomycin-resistant *Enterococcus faecium*
 - Fluconazole-resistant *Candida albicans/auris/glabrata/parapsilosis/tropicalis*
 - Drug-resistant *Streptococcus pneumoniae*


AR Phenotype Definitions: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/aur/ar-phenotype-definitions-508.pdf>

**Where can I find the new AR Option
Incidence and Prevalence Reports?**

First, Generate Data Sets

- Click Analysis then Generate Data Sets
- Newly uploaded data do not appear until you generate new data sets

Reporting Data Sets



Include data for the following time period:

Beginning


mm/yyyy

1

Ending

mm/yyyy

1

 Clear Time Period

Generate Reporting Data Sets

Last Generated:

February 21, 2023 4:10 PM

to include all data

AR Option Incidence and Prevalence Reports

- Click Analysis then Reports
- On the Analysis Reports page:
 - Antimicrobial Use and Resistance Module
 - Antimicrobial Resistance Data
- Six new rate tables available
 - Two incidence reports
 - By phenotype (#1) & by pathogen group (#4)
 - Four prevalence reports
 - By phenotype (#2, #3) & by pathogen group (#5, #6)

The screenshot shows the 'Analysis Reports' interface. At the top, there is a header with a user icon and the title 'Analysis Reports'. Below the header, there are buttons for 'Expand All' and 'Collapse All', and a search bar. A tree view on the left lists various modules: 'Device-Associated (DA) Module', 'Procedure-Associated (PA) Module', 'HAI Antimicrobial Resistance (DA+PA Modules)', 'Antimicrobial Use and Resistance Module' (selected), 'Antimicrobial Use Data', 'Targeted Assessment for Stewardship (TAS) Reports', 'Antimicrobial Use Data - 2014 Baseline SAARs', and 'Antimicrobial Resistance Data' (highlighted). Under 'Antimicrobial Resistance Data', there is a list of reports: 'Line Listing - All Antimicrobial Resistance Events', 'Bar Chart - All Antimicrobial Resistance Events', 'Line Listing - Antimicrobial Resistant Organisms', 'Frequency Table - Antimicrobial Resistant Organisms', 'Facility-wide antibiogram (Percent Susceptible) and Percent Tested', 'Rate Table - Antimicrobial Resistance Percentages', and a group of six new rate tables (1-6) highlighted with a purple box. The six new rate tables are: 1. Rate Table - Hospital-onset Antimicrobial Resistance Incidence, 2. Rate Table - Community-onset Antimicrobial Resistance Prevalence, 3. Rate Table - Outpatient Antimicrobial Resistance Prevalence, 4. Rate Table - Hospital-onset Positive Culture Incidence by Organism, 5. Rate Table - Community-onset Positive Culture Prevalence by Organism, and 6. Rate Table - Outpatient Positive Culture Prevalence by Organism. At the bottom of the list is 'Line Listing - All AR Summary Data'.

Example: Rate Table – Hospital-onset Antimicrobial Resistance Incidence Report (New Rate Table #1)

Note: The following example uses fictitious data for illustrative purposes only.

Modifying the Rate Table

The screenshot displays the 'Analysis Reports' interface. At the top, there is a header bar with a user icon and the title 'Analysis Reports'. Below the header, there are two buttons: 'Expand All' and 'Collapse All', followed by a search input field. The main area shows a tree view of reports. The 'Antimicrobial Use and Resistance Module' is expanded, showing several sub-items. The 'Antimicrobial Resistance Data' folder is also expanded, revealing a list of reports. The 'Rate Table - Hospital-onset Antimicrobial Resistance Incidence' report is highlighted in blue. A context menu is open over this report, showing three options: 'Run Report' (with a play icon), 'Modify Report' (with a gear icon and a mouse cursor pointing to it), and 'Export Data Set' (with a download icon). Other reports visible in the tree include 'Line Listing - All Antimicrobial Resistance Events', 'Bar Chart - All Antimicrobial Resistance Events', 'Line Listing - Antimicrobial Resistant Organisms', 'Frequency Table - Antimicrobial Resistant Organisms', 'Facility-wide antibiogram (Percent Susceptible) and Percent Tested', 'Rate Table - Antimicrobial Resistance Percentages', 'Rate Table - Hospital-onset Antimicrobial Resistance Prevalence', 'Rate Table - Outpatient Positive Culture Prevalence by Organism', and 'Line Listing - All AR Summary Data'.

Rate Table – Time Period Tab

Modify "Rate Table - Hospital-onset Antimicrobial Resistance Incidence"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AntibigramRates_HO_PHEN

Type: Rate Table

Last Generated: [March 8, 2023 9:22 AM](#)

Title/Format

Time Period

Filters

Display Options

Time Period:

Date Variable

Beginning

Ending

Summary~Yr



2021

2022

Clear Time Period

☐ Enter Date variable/Time period at the time you click the Run button

Run

Save...

Export...

Close

Rate Table – Filters Tab

Modify "Rate Table - Hospital-onset Antimicrobial Resistance Incidence"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AntibigramRates_HO_PHEN

Type: Rate Table

Last Generated: March 8, 2023 9:22 AM

Title/Format

Time Period

Filters

Display Options

Additional Filters:



Show



Clear

AND OR

Add group

AND OR

Add rule

Resistant Organism



equal



Carbapenem-non-susceptible Acinetobacter spp.



Delete

Run

Save...

Export...

Close

Rate Table – Display Options Tab

- Rates available by Quarter, Half-Year, Year, and Cumulative
 - Default is by Quarter
- Users do not have the option to generate rates by Month

Modify "Rate Table - Hospital-onset Antimicrobial Resistance Incidence"

☒ Show descriptive variable names ([Print List](#))

Analysis Data Set: AntibigramRates_HO_PHEN

Type: Rate Table

Last Generated: March 8, 2023 9:22 AM

Title/Format

Time Period

Filters

Display Options

Rate Table Options:

Group by: Summary~Yr ▼

▶ Run

📁 Save...

📄 Export...

Close

Rate Table – Output

National Healthcare Safety Network

Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

if (((phenotype_AR = "carbNS_Acine_AR")))

Facility Org ID=10009 Phenotype Description=Carbapenem-non-susceptible Acinetobacter spp.

Phenotype_AR	Summary Yr	Patient Days	Blood Count	Blood Incidence Rate	CSF Count	CSF Incidence Rate	LRS Count	LRS Incidence Rate	Urine Count	Urine Incidence Rate	All Specimen Type Count	All Specimen Type Incidence Rate
carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

1. This phenotype includes any Acinetobacter spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem.

2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Rate Table Interpretation – Phenotype_AR

- Rate table for incidence of hospital-onset carbapenem-non-susceptible *Acinetobacter* spp. per 10,000 patient days
 - Includes any *Acinetobacter* spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem

National Healthcare Safety Network

Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

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carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

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2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Rate Table Interpretation – Time Period

- Each row in the report represents one year

National Healthcare Safety Network												
Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)												
As of: March 8, 2023 at 5:59 PM												
Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022												
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carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19
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2. Incidence: number of hospital-onset AR Events / patient days * 10,000.												
Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .												

Rate Table Interpretation – Patient Days

- Patients contributed 4785 patient days for all facility inpatient locations in 2021 and 5150 patient days for all facility inpatient locations in 2022

National Healthcare Safety Network

Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

if (((phenotype_AR = "carbNS_Acine_AR")))

Facility Org ID=10009 Phenotype Description=Carbapenem-non-susceptible Acinetobacter spp.

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carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

1. This phenotype includes any Acinetobacter spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem.

2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

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Rate Table Components – Counts

- **Blood Count:** Number of hospital-onset AR events isolated from blood
- **CSF Count:** Number of hospital-onset AR events isolated from CSF
- **LRS Count:** Number of hospital-onset AR events isolated from lower respiratory specimen
- **Urine Count:** Number of hospital-onset AR events isolated from urine
- **All Specimen Type Count:** Total number of hospital-onset AR events

Rate Table Interpretation – Counts

- There were **4** carbapenem-non-susceptible *Acinetobacter* spp. isolated in 2021: 0 from blood, 0 from CSF, 1 from lower respiratory, and 3 from urine
- There were **31** carbapenem-non-susceptible *Acinetobacter* spp. isolated in 2022: 5 from blood, 4 from CSF, 18 from lower respiratory, and 4 from urine

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Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

if (((phenotype_AR = "carbNS_Acine_AR")))

Facility Org ID=10009 Phenotype Description=Carbapenem-non-susceptible Acinetobacter spp.

Phenotype_AR	Summary Yr	Patient Days	Blood Count	Blood Incidence Rate	CSF Count	CSF Incidence Rate	LRS Count	LRS Incidence Rate	Urine Count	Urine Incidence Rate	All Specimen Type Count	All Specimen Type Incidence Rate
carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

1. This phenotype includes any *Acinetobacter* spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem.

2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Incidence Rate per 10,000 Patient Days

$$\frac{\# \text{ Hospital—onset AR Events}}{\# \text{ Patient Days}} \times 10,000$$

Rate Table Components – Incidence Rates per 10,000 Patient Days

- **Blood Incidence Rate:** Hospital-onset AR events that meet the AR phenotype definition isolated from blood per 10,000 patient days
- **CSF Incidence Rate:** Hospital-onset AR events that meet the AR phenotype definition isolated from CSF per 10,000 patient days
- **LRS Incidence Rate:** Hospital-onset AR events that meet the AR phenotype definition isolated from lower respiratory specimen per 10,000 patient days
- **Urine Incidence Rate:** Hospital-onset AR events that meet the AR phenotype definition isolated from urine per 10,000 patient days
- **All Specimen Type Incidence Rate:** Total hospital-onset AR events that meet the AR phenotype definition per 10,000 patient days

Rate Table Interpretation – Incidence Rates per 10,000 Patient Days

- Incidence rates of hospital-onset carbapenem-non-susceptible *Acinetobacter* spp. in 2021:
 - Blood = 0
 - CSF = 0
 - Lower respiratory = 2.09 events per 10,000 patient days
 - Urine = 6.27 events per 10,000 patient days
- The overall incidence rate of hospital-onset carbapenem-non-susceptible *Acinetobacter* spp. in 2021 was 8.36 events per 10,000 patient days

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Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

if (((phenotype_AR = "carbNS_Acine_AR")))

Facility Org ID=10009 Phenotype Description=Carbapenem-non-susceptible Acinetobacter spp.

Phenotype_AR	Summary Yr	Patient Days	Blood Count	Blood Incidence Rate	CSF Count	CSF Incidence Rate	LRS Count	LRS Incidence Rate	Urine Count	Urine Incidence Rate	All Specimen Type Count	All Specimen Type Incidence Rate
carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

1. This phenotype includes any *Acinetobacter* spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem.

2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Rate Table Interpretation – Incidence Rates per 10,000 Patient Days

- Incidence rates of hospital-onset carbapenem-non-susceptible *Acinetobacter* spp. in 2022:
 - Blood = **9.71** events per 10,000 patient days
 - CSF = **7.77** events per 10,000 patient days
 - Lower respiratory = **34.95** events per 10,000 patient days
 - Urine = **7.77** events per 10,000 patient days
- The overall incidence rate of hospital-onset carbapenem-non-susceptible *Acinetobacter* spp. in 2022 was **60.19** events per 10,000 patient days

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Rate Table for Incidence of Hospital-onset Antimicrobial Resistance by Phenotype (per 10,000 patient days)

As of: March 8, 2023 at 5:59 PM

Date Range: ANTIBIOGRAMRATES_HO_PHEN summaryYr 2021 to 2022

if (((phenotype_AR = "carbNS_Acine_AR")))

Facility Org ID=10009 Phenotype Description=Carbapenem-non-susceptible Acinetobacter spp.

Phenotype_AR	Summary Yr	Patient Days	Blood Count	Blood Incidence Rate	CSF Count	CSF Incidence Rate	LRS Count	LRS Incidence Rate	Urine Count	Urine Incidence Rate	All Specimen Type Count	All Specimen Type Incidence Rate
carbNS_Acine_AR	2021	4785	0	0	0	0	1	2.09	3	6.27	4	8.36
carbNS_Acine_AR	2022	5150	5	9.71	4	7.77	18	34.95	4	7.77	31	60.19

1. This phenotype includes any *Acinetobacter* spp. that has tested either Intermediate (I) or Resistant (R) to imipenem, meropenem, or doripenem.

2. Incidence: number of hospital-onset AR Events / patient days * 10,000.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Example: Rate Table – Community-onset Positive Culture Prevalence by Organism Report (New Rate Table #5)

Note: The following example uses fictitious data for illustrative purposes only.

Modifying the Rate Table

The screenshot displays the 'Analysis Reports' interface. At the top, there is a header bar with a user icon and the title 'Analysis Reports'. Below the header, there are three buttons: 'Expand All', 'Collapse All', and a 'Search' input field. The main content area is a tree view of reports. The 'Antimicrobial Use and Resistance Module' is expanded, showing several sub-items. The 'Antimicrobial Resistance Data' folder is also expanded, revealing a list of reports. The report 'Rate Table - Community-onset Positive Culture Prevalence by Organism' is selected and highlighted in blue. A context menu is open over this report, showing three options: 'Run Report' (with a play button icon), 'Modify Report' (with a gear icon and a mouse cursor hovering over it), and 'Export Data Set' (with a download icon). The 'MD' folder is partially visible at the bottom of the tree view.

Analysis Reports

Expand All Collapse All Search

- Device-Associated (DA) Module
- Procedure-Associated (PA) Module
- HAI Antimicrobial Resistance (DA+PA Modules)
- Antimicrobial Use and Resistance Module
 - Antimicrobial Use Data
 - Targeted Assessment for Stewardship (TAS) Reports
 - Antimicrobial Use Data - 2014 Baseline SAARs
 - Antimicrobial Resistance Data
 - Line Listing - All Antimicrobial Resistance Events
 - Bar Chart - All Antimicrobial Resistance Events
 - Line Listing - Antimicrobial Resistant Organisms
 - Frequency Table - Antimicrobial Resistant Organisms
 - Facility-wide antibiogram (Percent Susceptible) and Percent Tested
 - Rate Table - Antimicrobial Resistance Percentages
 - Rate Table - Hospital-onset Antimicrobial Resistance Incidence
 - Rate Table - Community-onset Antimicrobial Resistance Prevalence
 - Rate Table - Outpatient Antimicrobial Resistance Prevalence
 - Rate Table - Hospital-onset Positive Culture Incidence by Organism
 - Rate Table - Community-onset Positive Culture Prevalence by Organism

Run Report

Modify Report

Export Data Set

Rate Table – Modifications

- We would like to look at the community-onset prevalence rate of Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) for the first and second halves of 2021.
- Time Period: 2021 – 2021
- Filters: pathogenGroup=Enterobacterales_all
- Display Options: GroupBy = Summary Half-Year

Rate Table – Output

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009 pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Rate Table Interpretation – Pathogen Group

- Rate table for prevalence of community-onset Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) per 10,000 admissions
 - Includes *Escherichia coli*, *Klebsiella aerogenes*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, and *Enterobacter* spp.

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes *Escherichia coli*, *Klebsiella aerogenes*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, and *Enterobacter* spp.

Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .

Rate Table Interpretation – Time Period

- Each row in the report represents one half-year of 2021

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009 pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

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Rate Table Interpretation – Admissions

- There were 824 admissions to the facility's inpatient locations in 2021H1 and 842 admissions to the facility's inpatient locations in 2021H2

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009 pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

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Rate Table Components – Counts

- **Blood Count:** Number of community-onset AR events isolated from blood
- **CSF Count:** Number of community-onset AR events isolated from CSF
- **LRS Count:** Number of community-onset AR events isolated from lower respiratory specimen
- **Urine Count:** Number of community-onset AR events isolated from urine
- **All Specimen Type Count:** Total number of community-onset AR events

Rate Table Interpretation – Counts

- There were 5 Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) isolated in 2021H1: 2 from blood, 1 from CSF, 1 from lower respiratory, and 1 from urine
- There were 5 Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) isolated in 2021H2: 4 from blood, 0 from CSF, 0 from lower respiratory, and 1 from urine

National Healthcare Safety Network												
Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)												
As of: March 8, 2023 at 6:19 PM												
Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021												
if (((PathogenGroup = "Enterobacterales_all")))												
Facility Org ID=10009 pathogenGroup=Enterobacterales_all												
Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.
2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

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Prevalence Rate per 10,000 Admissions

$$\frac{\# \text{ Community—onset AR Events from inpatient and outpatient locations}}{\# \text{ Admissions}} \times 10,000$$

Rate Table Components – Prevalence Rates per 10,000 Admissions

- **Blood Prevalence Rate:** Community-onset AR events isolated from blood per 10,000 admissions
- **CSF Prevalence Rate:** Community-onset AR events isolated from CSF per 10,000 admissions
- **LRS Prevalence Rate:** Community-onset AR events isolated from lower respiratory specimen per 10,000 admissions
- **Urine Prevalence Rate:** Community-onset AR events isolated from urine per 10,000 admissions
- **All Specimen Type Prevalence Rate:** Total community-onset AR events per 10,000 admissions

Rate Table Interpretation – Prevalence Rates per 10,000 Admissions

- Prevalence rates of community-onset Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) in 2021H1:
 - Blood = **24.27** events per 10,000 admissions
 - CSF = **12.14** events per 10,000 admissions
 - Lower respiratory = **12.14** events per 10,000 admissions
 - Urine = **12.14** events per 10,000 admissions
- The overall prevalence rate of community-onset Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) in 2021H1 was **60.68** events per 10,000 admissions

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009 pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

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Rate Table Interpretation – Prevalence Rates per 10,000 Admissions

- Prevalence rates of community-onset Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) in 2021H2:
 - Blood = **47.51** events per 10,000 admissions
 - CSF = **0**
 - Lower respiratory = **0**
 - Urine = **11.88** events per 10,000 admissions
- The overall prevalence rate of community-onset Enterobacterales (*E. coli*, *Enterobacter*, *Klebsiella*) in 2021H2 was **59.38** events per 10,000 admissions

National Healthcare Safety Network

Rate Table for Prevalence of Community-onset Organism-specific Events (per 10,000 admissions)

As of: March 8, 2023 at 6:19 PM

Date Range: ANTIBIOGRAMRATES_CO_ORG summaryYr 2021 to 2021

if (((PathogenGroup = "Enterobacterales_all")))

Facility Org ID=10009 pathogenGroup=Enterobacterales_all

Pathogen	Summary Yr/Half	Admissions	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterobacterales_all	2021H1	824	2	24.27	1	12.14	1	12.14	1	12.14	5	60.68
Enterobacterales_all	2021H2	842	4	47.51	0	0	0	0	1	11.88	5	59.38

1. Prevalence: number of community-onset AR Events (including events from inpatient and outpatient locations) / admissions * 10,000.

2. Includes Escherichia coli, Klebsiella aerogenes, Klebsiella oxytoca, Klebsiella pneumoniae, and Enterobacter spp.

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What happens when denominator data are not reported for a time period?

Note: The following example uses fictitious data for illustrative purposes only.

Missing Denominator Data for a Month

- 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).
- For example, encounters were reported for the ED for January and February 2022, and CRE AR events were reported for the ED for January, February, and March 2022.
 - The CRE AR events from March 2022 will not be included in the CRE outpatient prevalence rates for 2022Q1.

Missing Denominator Data for a Full Time Period

- If denominator data (i.e., patient days, admissions, encounters) are not reported for all three months in a quarter or all six months in a half-year or all 12 months of a year, or at all, but AR events were reported for that time period, then the AR events will be included in the counts, but the denominator and rates will be suppressed.

National Healthcare Safety Network												
Rate Table for Prevalence of Outpatient Organism-specific Events (per 10,000 encounters)												
As of: March 8, 2023 at 6:35 PM												
Date Range: All ANTIBIOGRAMRATES_OP_ORG												
orgID=10009 pathogenGroup=Enterococcus												
Pathogen	summaryYQ	Encounters	Blood Count	Blood Prevalence Rate	CSF Count	CSF Prevalence Rate	LRS Count	LRS Prevalence Rate	Urine Count	Urine Prevalence Rate	All Specimen Type Count	All Specimen Type Prevalence Rate
Enterococcus	2021Q1	-	1	-	0	-	0	-	0	-	1	-
Enterococcus	2022Q1	-	5	-	0	-	0	-	3	-	8	-
1. Prevalence: number of community-onset AR Events (events from outpatient locations only) / encounters * 10,000.												
2. Includes Enterococcus spp. including Enterococcus faecalis, Enterococcus faecium, and any species that belong to the genus Enterococcus.												
Data contained in this report were last generated on March 8, 2023 at 9:15 AM to include all data .												

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 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 CDA Submission Support Portal:
 - <https://www.cdc.gov/nhsn/cdaportal/index.html>
- NHSN Helpdesk (protocol, submission, and analysis questions):
 - NHSN@cdc.gov
- NHSN CDA Helpdesk (technical CDA related questions):
 - NHSNCDA@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.

