



# NHSN Antimicrobial Resistance (AR) Option: Reporting

**Annual NHSN Training – March 24, 2022**

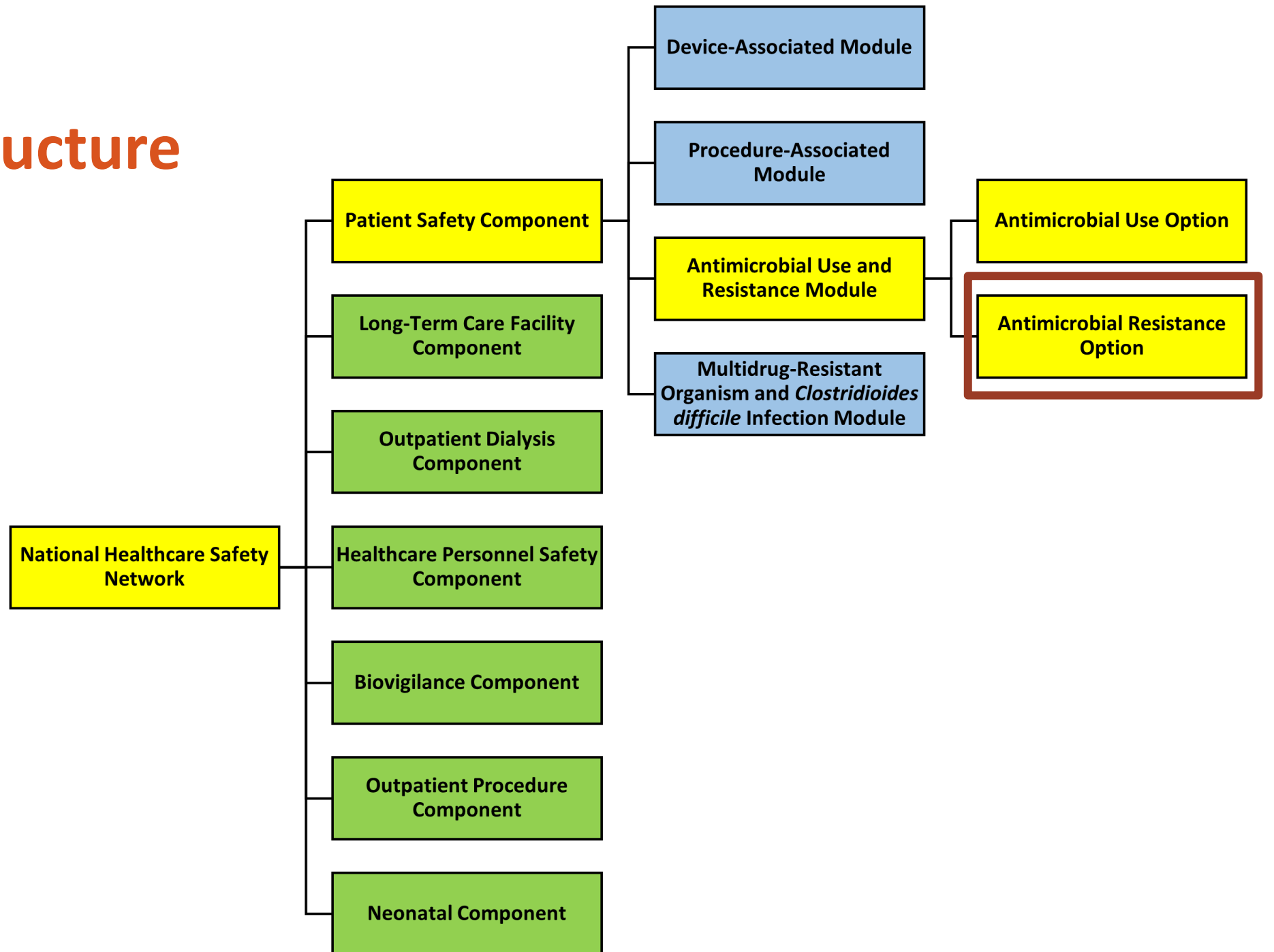
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Healthcare Quality Promotion, CDC

# Objectives

- Outline the requirements for participation in the NHSN AR Option
- Discuss the data elements collected in the NHSN AR Option
- Explain the steps to submit AR Option data

# NHSN Structure



# Antimicrobial Resistance Data in NHSN

	AR Option		MDRO Module		Device & Procedure-Associated Modules
Events reported					
Type of susceptibility data					
Denominator; Metric(s)					
Benefits	--		--		--
Drawbacks					

# Antimicrobial Resistance Data in NHSN: AR Option

	AR Option		MDRO Module		Device & Procedure-Associated Modules
<b>Events reported</b>	AR Events from blood, CSF, urine, & lower respiratory specimens				
<b>Type of susceptibility data</b>	Over 20 specific organisms; detailed lab test results & final interpretation				
<b>Denominator; Metric(s)</b>	# Isolates tested; Cumulative antibiogram (%S) & % Resistant phenotypes	# Patient Days, Admissions & Encounters; Incidence & Prevalence			
<b>Benefits</b>	Wide-spread, 'whole-house' coverage; no manual entry				
<b>Drawbacks</b>	Requires set-up by vendor/homegrown system				

# Antimicrobial Resistance Data in NHSN: MDRO Module

	AR Option		MDRO Module		Device & Procedure-Associated Modules
<b>Events reported</b>	AR Events from blood, CSF, urine, & lower respiratory specimens		Laboratory Identified (LabID) & Infection Surveillance Events		
<b>Type of susceptibility data</b>	Over 20 specific organisms; detailed lab test results & final interpretation		Positive specimens (e.g., MRSA, CDI, CRE) defined by NHSN criteria		
<b>Denominator; Metric(s)</b>	# Isolates tested; Cumulative antibiogram (%S) & % Resistant phenotypes	# Patient Days, Admissions & Encounters; Incidence & Prevalence	# Patient days; rates	# Predicted; SIRs (LabID Only)	
<b>Benefits</b>	Wide-spread, 'whole-house' coverage; no manual entry		Simplified reporting; LabID MRSA & CDI national benchmarks		
<b>Drawbacks</b>	Requires set-up by vendor/homegrown system		Small number of organisms followed		

# Antimicrobial Resistance Data in NHSN: DA/PA Modules

	AR Option		MDRO Module		Device & Procedure-Associated Modules
<b>Events reported</b>	AR Events from blood, CSF, urine, & lower respiratory specimens		Laboratory Identified (LabID) & Infection Surveillance Events		CLABSI, CAUTI, pedVAP, pedVAE VAE, SSI Events
<b>Type of susceptibility data</b>	Over 20 specific organisms; detailed lab test results & final interpretation		Positive specimens (e.g., MRSA, CDI, CRE) defined by NHSN criteria		Susceptibility results for specific antibiotics
<b>Denominator; Metric(s)</b>	# Isolates tested; Cumulative antibiogram (%S) & % Resistant phenotypes	# Patient Days, Admissions & Encounters; Incidence & Prevalence	# Patient days; rates	# Predicted; SIRs (LabID Only)	# Isolates tested; facility & national %R
<b>Benefits</b>	Wide-spread, 'whole-house' coverage; no manual entry		Simplified reporting; LabID MRSA & CDI national benchmarks		Infection control software; data can be manually entered; national AR data published (%R)
<b>Drawbacks</b>	Requires set-up by vendor/homegrown system		Small number of organisms followed		Only get susceptibility info for events that meet NHSN definitions

# Antimicrobial Resistance (AR) Option

- Released in July 2014
- Purpose:
  - Facilitate evaluation of AR data using standardized approach & definitions
  - Provide facilities with improved awareness of AR issues to aid in clinical decision making and prioritize transmission prevention efforts
- Voluntary reporting
  - Not part of CMS Quality Reporting Programs
  - Included as a bonus option for Public Health Registry reporting for Promoting Interoperability (previously Meaningful Use [MU]) in CY 2022\*



# AR Option Data: What's Reported

# Requirements for AR Data Submission

## Who Can Participate?

- Hospitals\* that have:
  - Electronic Laboratory Information System (LIS) and
  - Admission Discharge Transfer (ADT) System
  - *Or electronic access to required data elements*

AND

- Ability to collect and package data using HL7 standardized format: Clinical Document Architecture <https://www.cdc.gov/nhsn/cdaportal/index.html>
- Data cannot be typed in by hand

\*General acute care hospitals, long-term acute care hospitals (LTAC), inpatient rehabilitation facilities (IRF), oncology hospitals, and critical access hospitals enrolled in NHSN & participating in the Patient Safety Component

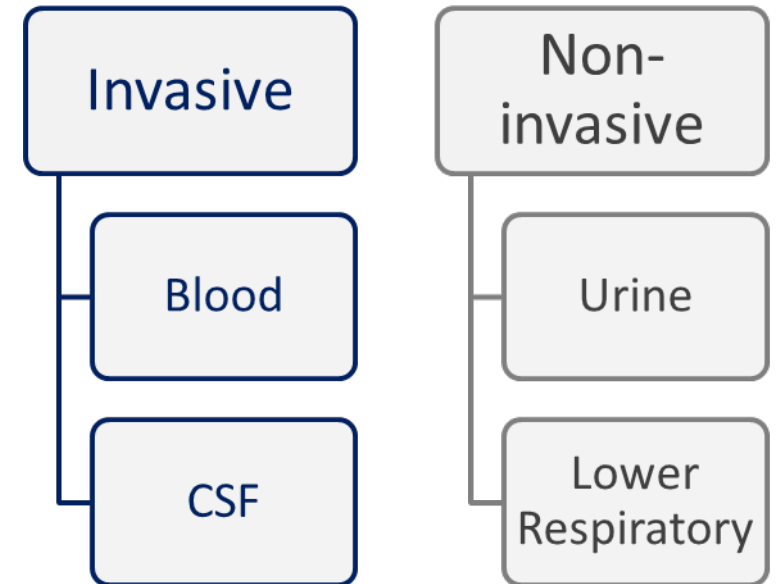
# AR Data Elements

## What Data Are Collected?

- Two separate file types (similar to MDRO/CDI Module LabID reporting):
  1. AR Event files – contain all information associated with the individual isolate
    - Each AR Event is a separate, individual file
    - Reported from:
      - All inpatient locations
      - 3 outpatient location types: ED, pediatric ED & 24-hour observation area
  2. AR Summary files – contain summary-level data
    - FacWideIN: patient days & admissions
      - Not submitted for *individual* inpatient locations
    - Outpatient locations: encounters

# AR Events – What Qualifies?

- Event data: Isolate-level susceptibility results for specific organisms
- Qualifying isolate criteria for an AR Event:
  1. Collected from one of four specimen types:
    - Blood
    - Cerebral spinal fluid (CSF)
    - Urine
    - Lower respiratory
  2. One of over 20 organisms identified
    - See list on next slide
  3. 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*

# Organism/Agent Combinations

- Selected antimicrobial agents are required to be reported/included in the CDA file 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

# AR Event Required Fields – Patient Information

- Patient information
  - DOB, gender, date admitted to facility/encounter date, location during specimen collection, whether the patient was admitted during that encounter

# AR Event Required Fields – Specimen Information

- Patient information
  - DOB, gender, date admitted to facility, location during specimen collection, whether the patient was admitted during that encounter
- Specimen information
  - Collection date, specimen source

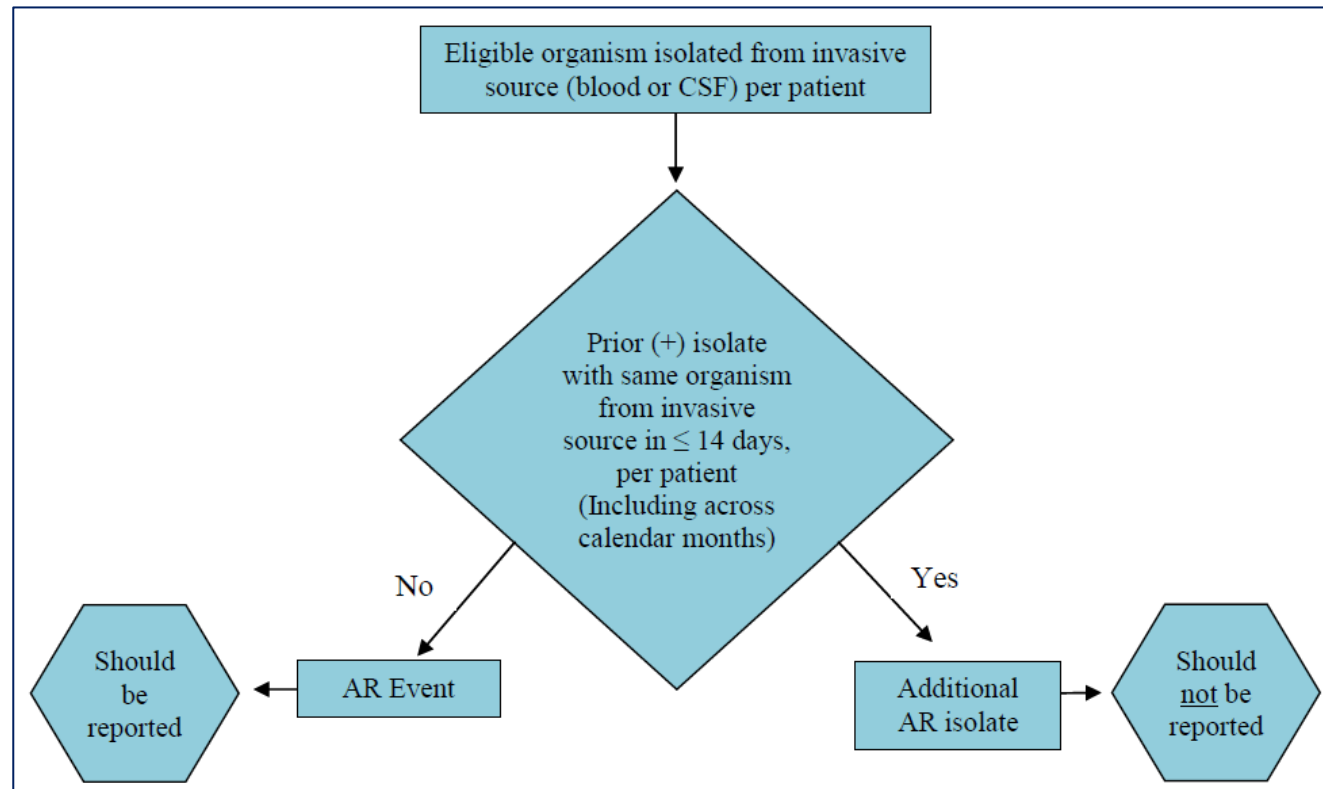


# AR Event Required Fields – Organism/Susceptibility

- Patient information
  - DOB, gender, date admitted to facility, location during specimen collection, whether the patient was admitted during that encounter
- Specimen information
  - Collection date, specimen source
- Organism & antimicrobial susceptibility testing information
  - For each antimicrobial required for the isolated organism/specimen type
  - Sign, value and interpretation for E-test, MIC, and/or Disk diffusion (KB)\*
  - Final lab interpretation
    - Susceptible, Susceptible-Dose Dependent, Intermediate, Resistant, Non-Susceptible, Not Tested

# AR Event Reporting Rules – Invasive Sources

- Per 14 day period: Same organism from invasive specimen source (blood & CSF) reported once per patient



# Reporting Rules – Invasive Sources Example

- 14 day rule for invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	Staph aureus isolated from blood culture	Yes	Patient's first blood culture of admission; <i>Staph aureus</i> is isolated; <b>AR event reported</b>

# Reporting Rules – Invasive Sources Example

- 14 day rule for invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	Staph aureus isolated from blood culture	Yes	Patient's first blood culture of admission; <i>Staph aureus</i> is isolated; AR event reported
January 4	Staph aureus isolated from blood culture	No	<14 days since last positive culture (Jan 1) of <i>Staph aureus</i>

# Reporting Rules – Invasive Sources Example

- 14 day rule for invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	Staph aureus isolated from blood culture	Yes	Patient's first blood culture of admission; <i>Staph aureus</i> is isolated; AR event reported
January 4	Staph aureus isolated from blood culture	No	<14 days since last positive culture (Jan 1) of <i>Staph aureus</i>
January 16	Staph aureus isolated from CSF culture	No	<14 days since last positive culture (Jan 4) of <i>Staph aureus</i>

# Reporting Rules – Invasive Sources Example

- 14 day rule for invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	Staph aureus isolated from blood culture	Yes	Patient's first blood culture of admission; <i>Staph aureus</i> is isolated; AR event reported
January 4	Staph aureus isolated from blood culture	No	<14 days since last positive culture (Jan 1) of <i>Staph aureus</i>
January 16	Staph aureus isolated from CSF culture	No	<14 days since last positive culture (Jan 4) of <i>Staph aureus</i>
January 31	Staph aureus isolated from blood culture	Yes	>14 days since last positive culture (Jan 16) of <i>Staph aureus</i> ; <b>AR event reported</b>

# Reporting Rules – Invasive Sources Example

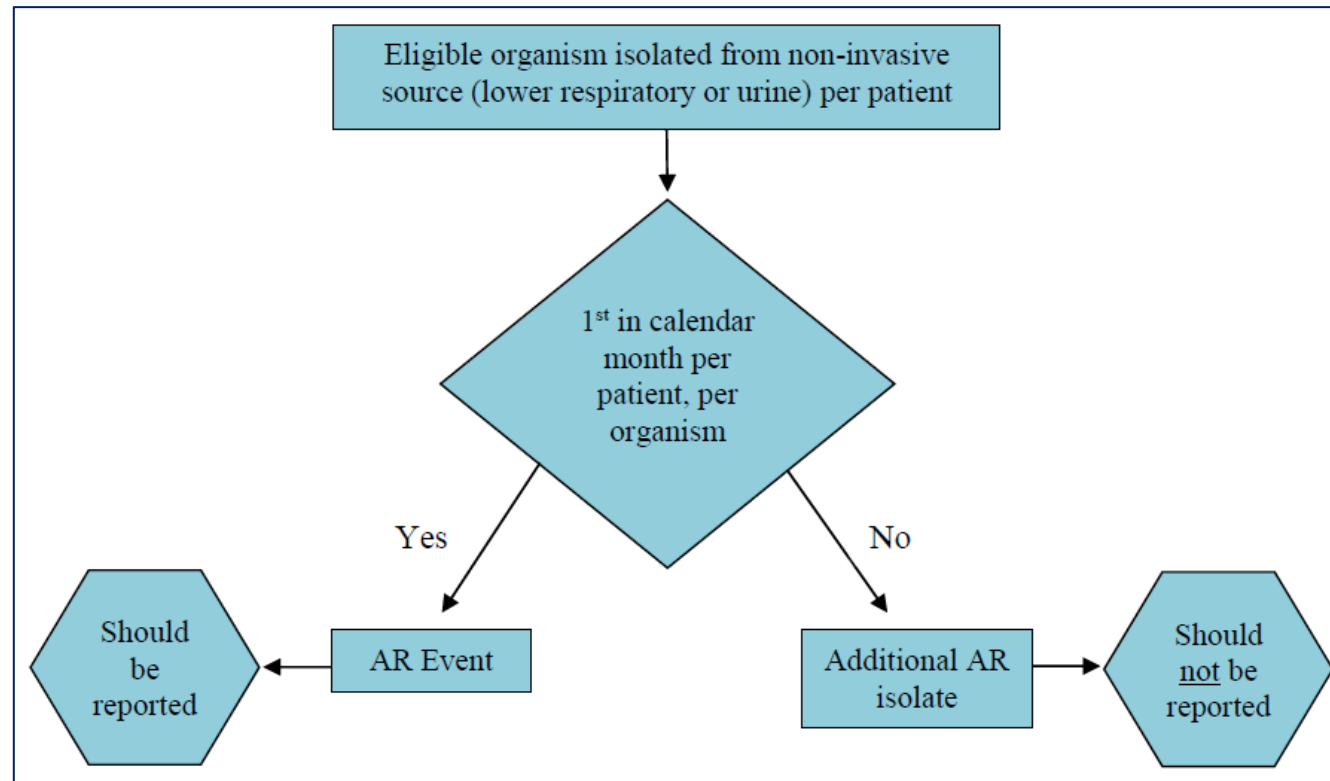
- 14 day rule for invasive sources:

2 AR Events reported to NHSN

Date	Lab Result	Reported to NHSN?	Justification
1 January 1	Staph aureus isolated from blood culture	Yes	Patient's first blood culture of admission; <i>Staph aureus</i> is isolated; <b>AR event reported</b>
January 4	Staph aureus isolated from blood culture	No	<14 days since last positive culture (Jan 1) of <i>Staph aureus</i>
January 16	Staph aureus isolated from CSF culture	No	<14 days since last positive culture (Jan 4) of <i>Staph aureus</i>
2 January 31	Staph aureus isolated from blood culture	Yes	>14 days since last positive culture (Jan 16) of <i>Staph aureus</i> ; <b>AR event reported</b>

# AR Event Reporting Rules – Non-Invasive Sources

- Per calendar month: Same organism from non-invasive source (urine & lower respiratory) reported once per patient





# Reporting Rules – Non-Invasive Sources Example

- 1 per month rule for non-invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	<i>E.Coli</i> isolated from urine culture	Yes	Patient's first <i>E.Coli</i> isolate from urine culture of admission; <b>AR event reported</b>

# Reporting Rules – Non-Invasive Sources Example

- 1 per month rule for non-invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	<i>E.Coli</i> isolated from urine culture	Yes	Patient's first <i>E.Coli</i> isolate from urine culture of admission; AR event reported
January 4	<i>E.Coli</i> isolated from urine culture	No	Only 1 AR event from non-invasive source per organism per month submitted

# Reporting Rules – Non-Invasive Sources Example

- 1 per month rule for non-invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	<i>E.Coli</i> isolated from urine culture	Yes	Patient's first <i>E.Coli</i> isolate from urine culture of admission; AR event reported
January 4	<i>E.Coli</i> isolated from urine culture	No	Only 1 AR event from non-invasive source per organism per month submitted
January 16	<i>E.Coli</i> isolated from lower respiratory culture	No	Only 1 AR event from non-invasive source per organism per month submitted

# Reporting Rules – Non-Invasive Sources Example

- 1 per month rule for non-invasive sources:

Date	Lab Result	Reported to NHSN?	Justification
January 1	<i>E.Coli</i> isolated from urine culture	Yes	Patient's first <i>E.Coli</i> isolate from urine culture of admission; AR event reported
January 4	<i>E.Coli</i> isolated from urine culture	No	Only 1 AR event from non-invasive source per organism per month submitted
January 16	<i>E.Coli</i> isolated from lower respiratory culture	No	Only 1 AR event from non-invasive source per organism per month submitted
February 1	<i>E.Coli</i> isolated from urine culture	Yes	<i>E.Coli</i> isolated from patient's first urine culture of calendar month; <b>AR event reported</b>

# Reporting Rules – Non-Invasive Sources Example

- 1 per month rule for non-invasive sources:

2 AR Events  
reported to NHSN

Date	Lab Result	Reported to NHSN?	Justification
January 1 <b>1</b>	<i>E.Coli</i> isolated from urine culture	Yes	Patient's first <i>E.Coli</i> isolate from urine culture of admission; AR event reported
January 4	<i>E.Coli</i> isolated from urine culture	No	Only 1 AR event from non-invasive source per organism per month submitted
January 16	<i>E.Coli</i> isolated from lower respiratory culture	No	Only 1 AR event from non-invasive source per organism per month submitted
February 1 <b>2</b>	<i>E.Coli</i> isolated from urine culture	Yes	<i>E.Coli</i> isolated from patient's first urine culture of calendar month; <b>AR event reported</b>

# AR Summary Files (aka AR Denominator)

- Two types of summary records:
  1. Facility-wide inpatient (aka FacWideIN)
    - 1 file reporting the patient days and admissions for all inpatient locations combined
  2. Outpatient locations
    - 1 file for EACH reportable individual outpatient location (i.e., ED, pediatric ED, 24hr Obs)
    - Reports outpatient encounters
- Summary records are not submitted for:
  - Individual inpatient locations
  - Combined outpatient locations or outpatient locations beyond those mapped as the three location types above

# AR Option Data: How It's Reported

# Submitting AR Option Data to NHSN

- Hospitals\* that have:
  - Electronic Laboratory Information System (LIS) and
  - Admission Discharge Transfer (ADT) System
  - *Or electronic access to required data elements*

## AND

- Ability to collect and package data using standardized format: Clinical Document Architecture <https://www.cdc.gov/nhsn/cdaportal/index.html>
  - Commercial software vendors: <http://www.sidp.org/aurvendors>
  - “Homegrown” vendors (facility’s internal IT/informatics resources)

\*General acute care hospitals, long-term acute care hospitals, inpatient rehabilitation facilities, oncology hospitals, and critical access hospitals enrolled in NHSN



# Clinical Document Architecture (CDA)

- Data must be uploaded via CDA
  - Too much data to enter by hand!
- Health Level 7 (HL7) standard
- Provides facilities with standardized way to package & upload data
  - AR, AU, & HAI
- CDA ≠ CSV (Excel)
  - CDA uses XML

```
<!-- pathogen identified -->
<playingEntity>
  <code code="91288006" displayName="Acinetobacter baumannii"
        codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"/>
</playingEntity>
</participantRole>
</participant>

<!--***** Begin #1 AntiP20 drug = Amikacin susceptibility testing ***** -->
<!-- Amikacin Susceptibility Testing -->
<component>
  <organizer classCode="CLUSTER" moodCode="EVN">
    <!-- [C-CDA R1.1] Result Organizer -->
    <templateId root="2.16.840.1.113883.10.20.22.4.1"/>
    <!-- [HAI R3D1.1] Antimicrobial Susceptibility Tests Organizer (V3) -->
    <templateId root="2.16.840.1.113883.10.20.5.6.177" extension="2016-08-01"/>
    <id nullFlavor="NA"/>
    <code code="18725-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
          displayName="Microbiology Studies"/>
    <statusCode code="completed"/>
    <component>
      <organizer classCode="BATTERY" moodCode="EVN">
        <!-- [C-CDA R1.1] Result Organizer -->
        <templateId root="2.16.840.1.113883.10.20.22.4.1"/>
        <!-- [HAI R3D1.1] Antimicrobial Susceptibility Result Organizer (V3) -->
        <templateId root="2.16.840.1.113883.10.20.5.6.200" extension="2016-08-01"/>
        <id nullFlavor="NA"/>
        <code code="18725-2" codeSystem="2.16.840.1.113883.6.1"
              codeSystemName="LOINC" displayName="Microbiology Studies"/>
        <statusCode code="completed"/>

        <!--begin E Test -->
        <component> <!-- This observation specifies the susceptibility test was done.
        (NegationInd = false) -->
          <observation classCode="OBS" moodCode="EVN" negationInd="false">
            <!-- [C-CDA R1.1] Result Observation -->
            <templateId root="2.16.840.1.113883.10.20.22.4.2"/>
            <!-- [HAI R3D1.1] Antimicrobial Susceptibility Result Observation (V3) -->
            <templateId root="2.16.840.1.113883.10.20.5.6.186"
                      extension="2016-08-01"/>
            <id nullFlavor="NA"/>
            <!-- specific LOINC code for this susceptibility test -->
            <code code="18860-7" displayName="Amikacin Susc Islt"
                  codeSystemName="LOINC" codeSystem="2.16.840.1.113883.6.1"/>
            <statusCode code="completed"/>
            <effectiveTime nullFlavor="NA"/>
            <value xsi:type="IVL_PQ">
              <low value="5.0" unit="ug/ml"/> <!-- greater than 5.0 ug/ml -->
            </value>
            <interpretationCode codeSystem="2.16.840.1.113883.5.83"
                               codeSystemName="HL7 Observation Interpretation" code="R"
                               displayName="Resistant"/>
            <methodCode codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
                        code="49589-5"
                        displayName="Bacterial susceptibility panel by Gradient strip (E-test)"/>
          </observation>
        </component>
      </organizer>
    </component>
  </organizer>
</component>
```

# Types of AR Option CDA Files

1. Event files:
  - 1 CDA file per AR Event (patient, specimen & susceptibility data)
2. Summary files:
  - 1 CDA file for FacWideIN (patient day & admission counts)
  - 1 CDA file for each mapped ED (encounters)
  - 1 CDA file for each mapped 24hr observation (encounters)
  - 1 CDA file for each mapped pediatric ED (encounters)

# Monthly AR Data Submission




- Recommend: Upload within 30 days following the completion of the month
- Example:
  - 50 AR Events identified per NHSN definitions in the month = 50 CDA files
  - FacWideIN summary data = 1 CDA file
  - ED summary data = 1 CDA file
  - 24hr observation summary data = 1 CDA file
  - Totals:
    - Event files + Summary files = monthly submission
    - 50 Event CDA files + (1 FacWideIN + 1 ED + 1 24hr obs) = 53 files for the month
- All CDA files can be uploaded within 1 Zip file
  - Maximum: 1000 CDAs or file size of 2 MB per zip file


# Submission Steps

# Step 1: Monthly Reporting Plans

- Add locations to NHSN monthly reporting plan prior to uploading data
  - Selecting FacWideIN allows AR Events to be reported from all mapped inpatient locations
  - Each outpatient location is listed separately
- Same monthly reporting plan used for HAI reporting

**Antimicrobial Use and Resistance Module**

	Locations	Antimicrobial Use	Antimicrobial Resistance
	FACWIDEIN - Facility-wide Inpatient (FacWIDEIn) ▼	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	ER - EMERGENCY DEPARTMENT - AU ▼	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	24HROBS - 24-HR OBS. ▼	<input type="checkbox"/>	<input checked="" type="checkbox"/>



# Monthly Reporting Plans (cont.)

**Device-Associated Module**

	Locations	CLABSI	VAE	CAUTI	CLIP	PedVAP (<18 years)
	5MEDWARD - MEDICAL WARD ON THE 5TH FLOOR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ICU - MED/SURG	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	NICU - NICU-2/3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ONCGEN - ONC-HEM- GENERAL WARD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Procedure-Associated Module**

	Procedures	SSI
		IN: <input type="checkbox"/> OUT: <input type="checkbox"/>

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**Antimicrobial Use and Resistance Module**

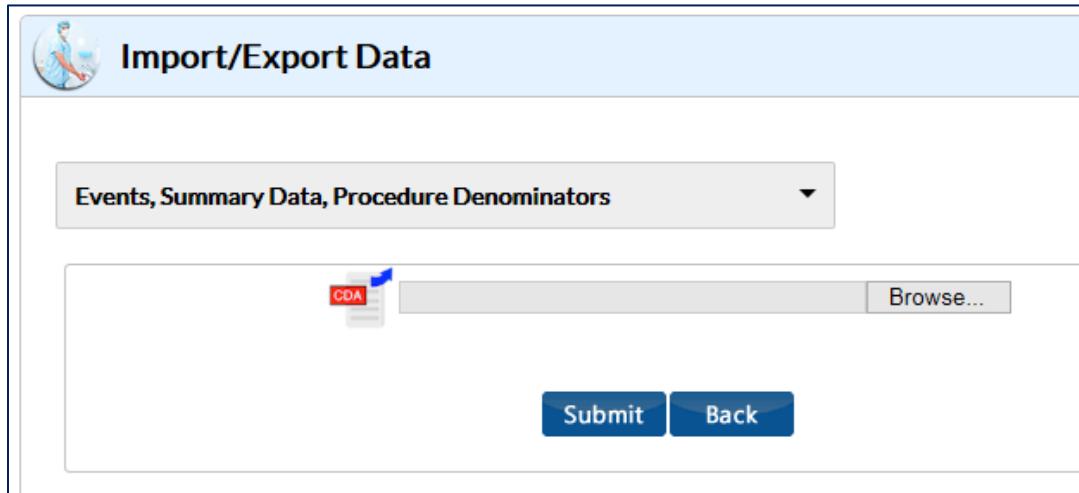
	Locations	Antimicrobial Use	Antimicrobial Resistance
	FACWIDEIN - Facility-wide Inpatient (FacWIDEIn)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	5MEDWARD - MEDICAL WARD ON THE 5TH FLOOR	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	ICU - MED/SURG	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	NICU - NICU-2/3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	ONCGEN - ONC-HEM- GENERAL WARD	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	24HROBS - 24-HR OBS.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	EMERG - EMERGENCY DEPT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Step 2: Gather CDA Files

- Locate the AR Option CDA files within your vendor software
  - Remember to include:
    - All AR Option Events
    - Summary records for FacWideIN, ED, 24hr observation, & pediatric ED (as applicable)
- If manually uploading into NHSN: Export the files from the vendor software
- If sending the files to NHSN from within your vendor software: Click the buttons as outlined by your vendor

# Step 3: Upload CDA Files into NHSN

- Manual upload:
  - How to Upload CDA files:  
<https://www.youtube.com/watch?v=T4DLtimpB5M>



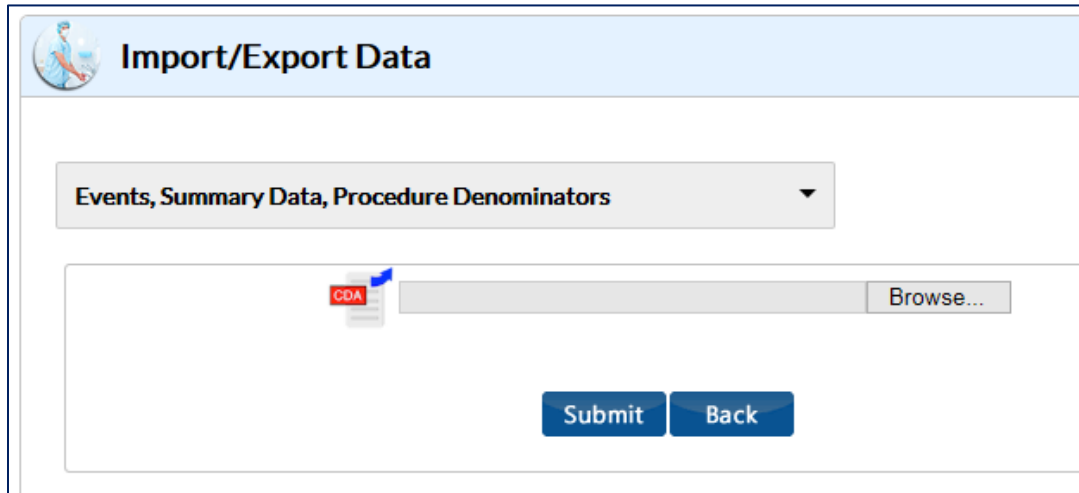
The screenshot shows the 'Import/Export Data' interface. At the top left is a circular icon of a person in a blue uniform. The title 'Import/Export Data' is in a light blue header. Below the header is a dropdown menu with the text 'Events, Summary Data, Procedure Denominators'. Underneath is a file upload area with a 'CDA' icon, a text input field, and a 'Browse...' button. At the bottom are two blue buttons labeled 'Submit' and 'Back'.

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



# Step 3: Upload CDA Files into NHSN

- Manual upload:
  - How to Upload CDA files:  
<https://www.youtube.com/watch?v=T4DLtimpB5M>
- Automatic upload from vendor/IT solution using DIRECT CDA Automation

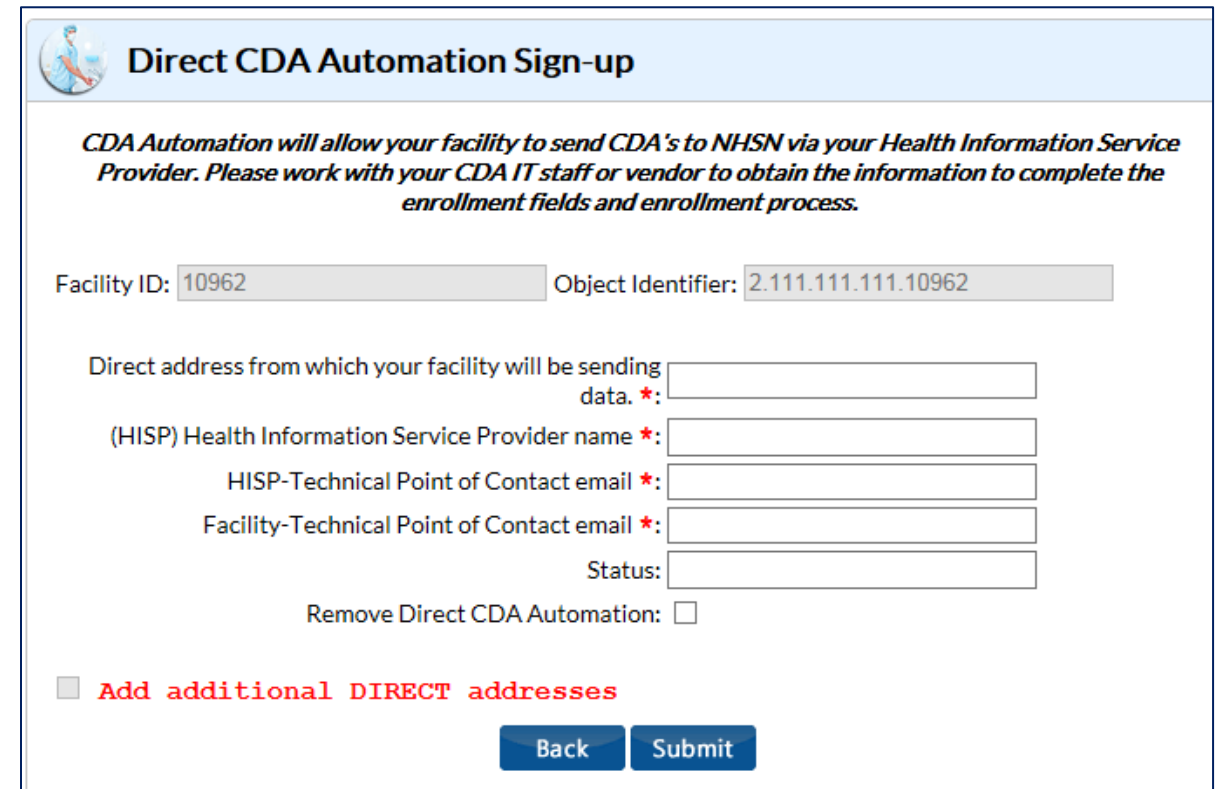


**Import/Export Data**

Events, Summary Data, Procedure Denominators

CDA Browse...

Submit Back



**Direct CDA Automation Sign-up**

*CDA Automation will allow your facility to send CDA's to NHSN via your Health Information Service Provider. Please work with your CDA IT staff or vendor to obtain the information to complete the enrollment fields and enrollment process.*

Facility ID: 10962 Object Identifier: 2.111.111.111.10962

Direct address from which your facility will be sending data. \*:

(HISP) Health Information Service Provider name \*:

HISP-Technical Point of Contact email \*:

Facility-Technical Point of Contact email \*:

Status:

Remove Direct CDA Automation:

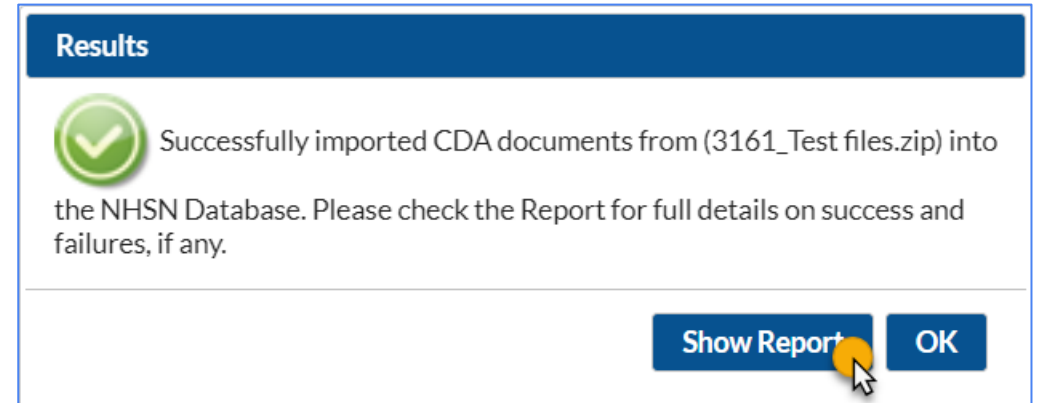
Add additional DIRECT addresses

Back Submit

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

## Step 4: Review the Upload Results

- Always review the results
  - Click “Show Report”
  - Opens the PDF showing:
    - NHSN facility name and orgID
    - Date the files were imported
    - Number of successful and failed files
    - Error messages for the files that failed to import
  - Save the PDF for your records & use for NHSN/vendor troubleshooting



## Step 4: Review the Upload Results – PDF: Summary

- Shows a summary table:

<b>CDA Import Report: Zip File Name: 3161_Test files.zip</b>			
<b>FACILITY: _XYZ in PreProd    Date of Import: 09/Feb/2022 01:00:24 EST</b>			
Summary:			
<b>Event ID</b>	<b>Total # attempted</b>	<b>Total # Passed Validation</b>	<b>Total # of Updates*</b>
Events	8	4	0
Summary Data	5	2	0

## Step 4: Review the Upload Results – PDF: Valid files

- Shows files that uploaded successfully:

ImportDetails - Valid  
Line listing for each record that passed the validation.

Facility ID:	Event Type	Event Date	NHSN ID	CDA File Name	setId	*setId Already Exists in the Database	CDA Processing Date/Time Stamp
10009	AR	01/13/2022	538748	3161_R3_AntiP20_AB_Jan2022_authorblank.xml	2.16.840.1.1138.83.3.117.1.1.5.2.1.1.1-AntiP20_AB_2022 AW 3161	No	09/Feb/2022 13:00:24 EST
10009	AR	01/13/2022	538749	3161_R3_AntiP22_EC_Jan2022.xml	2.16.840.1.1138.83.3.117.1.1.5.2.1.1.1-AntiP22_EC_3161	No	09/Feb/2022 13:00:24 EST

- Tip: You know these files successfully uploaded because each was assigned an autogenerated NHSN event/summary ID

## Step 4: Review the Upload Results – PDF: Failed Files

- Shows files that failed to upload with the error message(s):

ImportDetails - CDA(s) Failed						
Line listing for each record that failed validation and did not import						
Facility ID:	Event Type	Event Date	CDA File Name	setId	*setId Already Exists in the Database	CDA Processing Date/Time Stamp
10009	AR	12/09/2021	3161_R1_AntiP20_Acine_Dec2021.xml	2.16.840.1.113883.3.117.1.1.5.2.1.1.1-P20_Acinebld_dec2021_3161_vendorInfoPresent	No	09/Feb/2022 13:00:24 EST
Reason for failure:						
	1.1	AR Event records for months after January 2022 must use the R3-N1 Implementation Guide. Please reach out to your vendor to ensure they update your files to use the correct Implementation Guide.				
	1.2	Admission status is a required variable and is missing from this AR Event CDA file. Please work with your vendor to add this information to your file.				
10009	ARSUM	12/2021	3161_ARO Summary_R3-D4_ED_Dec2021.xml	2.16.840.1.113883.3.117.1.1.5.2.1.1.1-ED_202112_3161	No	09/Feb/2022 13:00:24 EST
Reason for failure:						
	5.1	Location ED does not exist. Please add this location to the facility before importing records.				
	5.2	AR is not followed for this combination of month, year, and location. Please update your NHSN Monthly Reporting Plan to include this month and location.				

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

# Alerts – Missing Events

- Generated when no data have been submitted for a line item in the Monthly Reporting Plan
  - Missing Events – you’ve uploaded summary data but not AR Events
    - Upload your AR Events for the month
- OR
- Check the “Report No Events” box if no AR Events were identified

Incomplete Events	Missing Events	Incomplete Summary Data	Missing Summary Data	Incomplete Procedures	Missing Procedures	Missing Procedure-associated Events	Unusual Susceptibility Profile	Confirm CDI Test Type		
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Location	CDC Location	Month/Year	Alert Type	Event Type/Pathogen	Summary Data Form Type	Report No Events				
FACWIDEIN	FACWIDEIN	06/2021	Summary but no events	AR Event	<a href="#">AR Summary</a>	<input type="checkbox"/>				
FACWIDEIN	FACWIDEIN	07/2021	Summary but no events	AR Event	<a href="#">AR Summary</a>	<input type="checkbox"/>				

# Alerts – Missing Summary Data

- Missing Summary Data – no AR Summary data have been uploaded
  - Upload AR Summary record(s)

Incomplete Events	Missing Events	Incomplete Summary Data	<b>Missing Summary Data</b>	Incomplete Procedures	Missing Procedures	Missing Procedure-associated Events	Unusual Susceptibility Profile	Confirm CDI Test Type
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In-plan locations with no associated summary data.

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Module	Location	CDC Location	Month/Year	Alert Type	Event Type
AUR	24HROBS	OUT:ACUTE:WARD	12/2021	No summary data entered <a href="#">Add Summary</a>	AR Event
AUR	EMER	OUT:ACUTE:ED	12/2021	No summary data entered <a href="#">Add Summary</a>	AR Event
AUR	ER	OUT:ACUTE:ED	12/2021	No summary data entered <a href="#">Add Summary</a>	AR Event
AUR	FACWIDEIN	FACWIDEIN	12/2021	No summary data entered <a href="#">Add Summary</a>	AR Event

# Summary & Resources

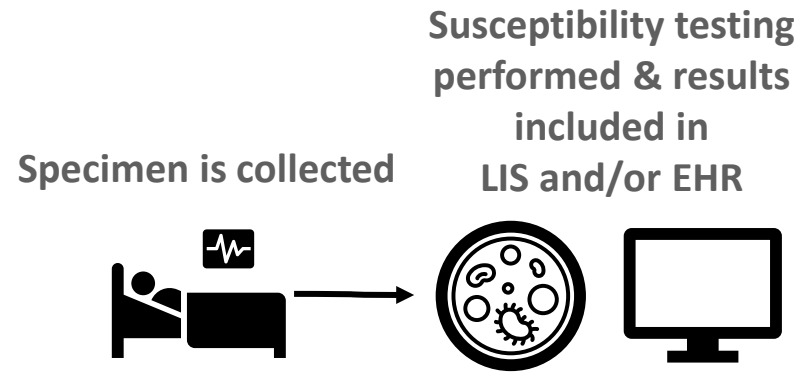


# Flow of AR Data: From Bedside to NHSN

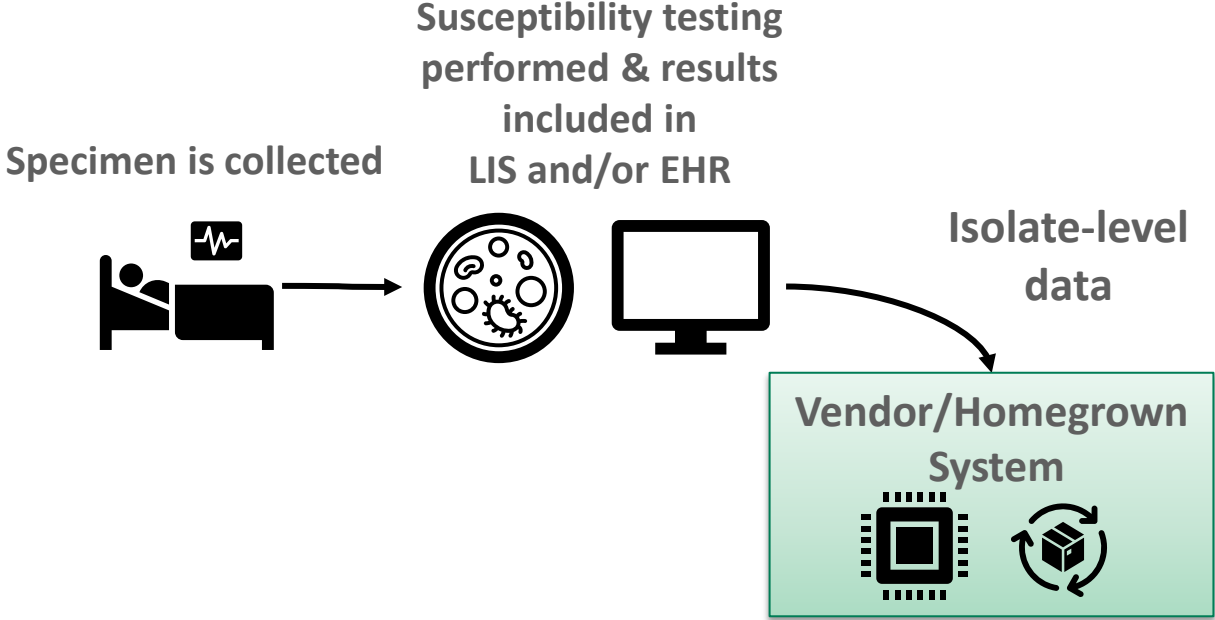
Specimen is collected



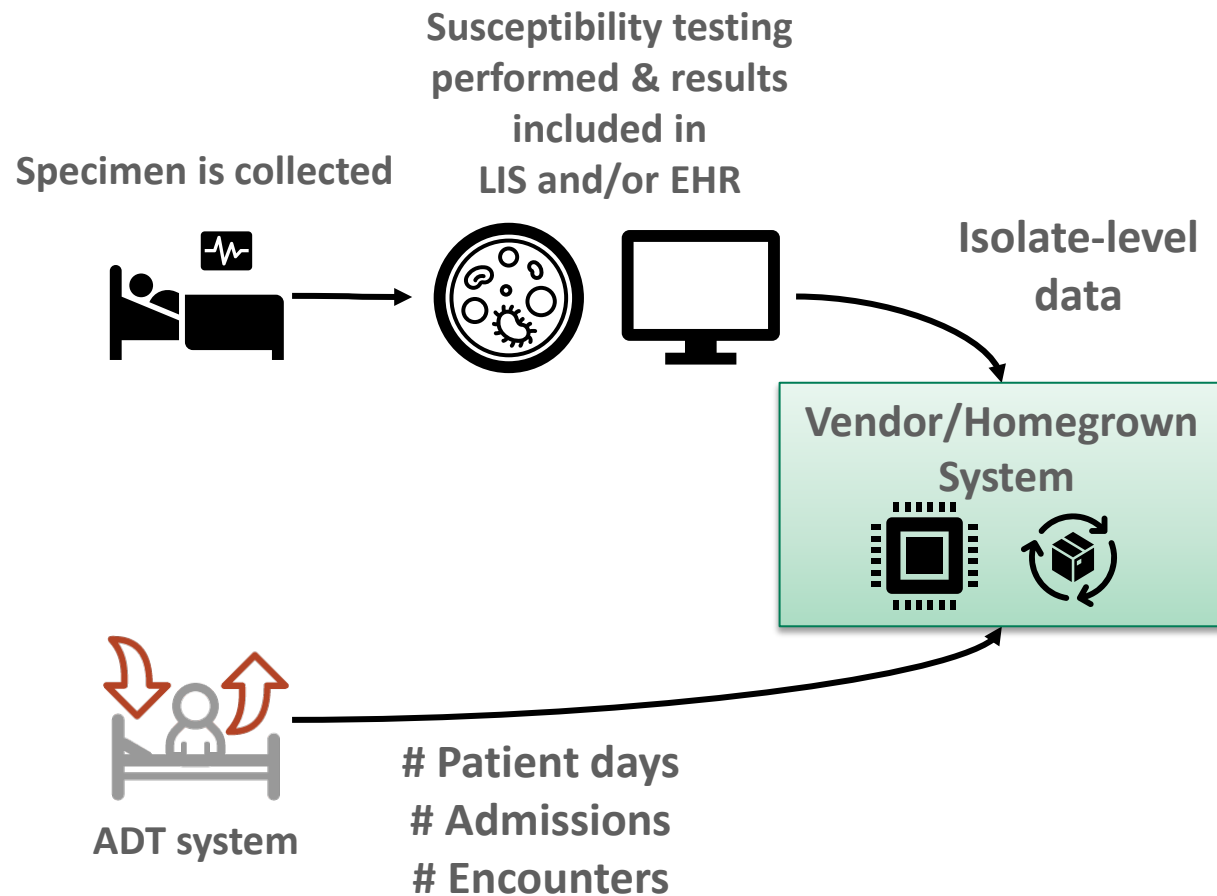
# Flow of AR Data: From Bedside to NHSN



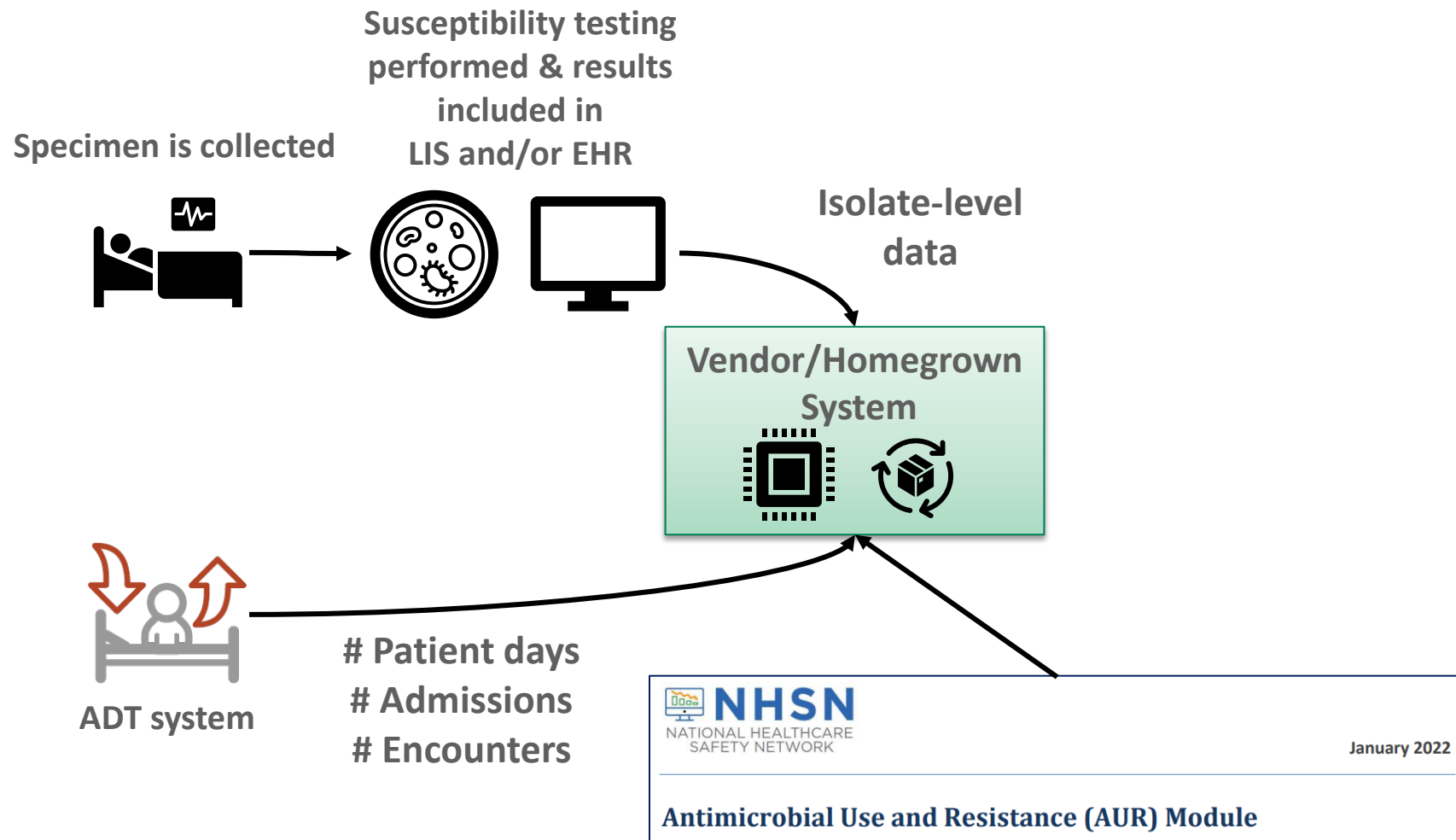
# Flow of AR Data: From Bedside to NHSN



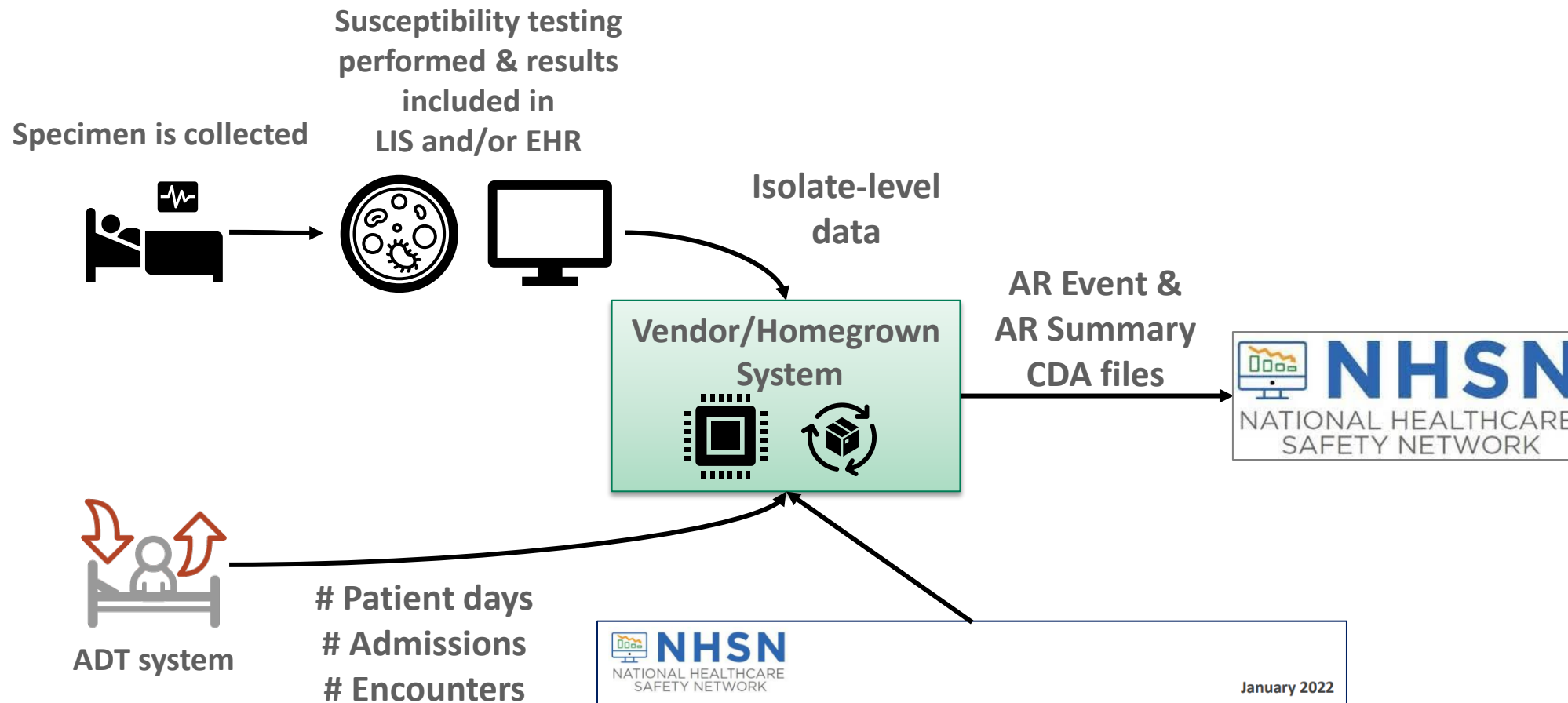
# Flow of AR Data: From Bedside to NHSN



# Flow of AR Data: From Bedside to NHSN



# Flow of AR Data: From Bedside to NHSN



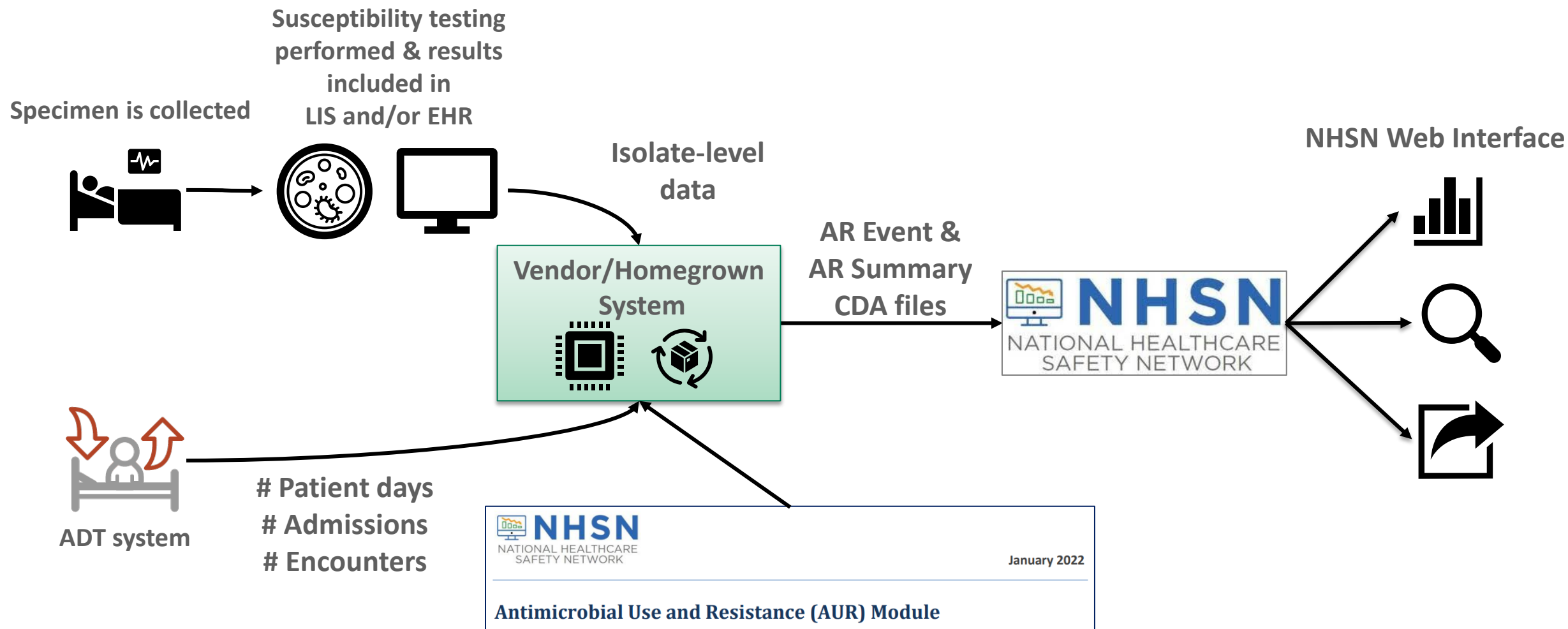
NHSN NATIONAL HEALTHCARE SAFETY NETWORK

January 2022

**Antimicrobial Use and Resistance (AUR) Module**

<https://www.cdc.gov/nhsn/pdfs/pscmanual/11pscacrurrent.pdf>

# Flow of AR Data: From Bedside to NHSN



# Steps for Facility Participation in the AR Option

- Prerequisite: Electronic LIS or electronic access to lab data
- Identify facility lead(s)/champion(s) for AR Option
- Gain support!
- Gather information on current CDA submission capabilities
  - Activate, obtain, or develop system for aggregating and packaging data into CDA files
- Validation
- Monthly submission



# 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 questions):
  - [NHSN@cdc.gov](mailto:NHSN@cdc.gov)
- NHSN CDA Helpdesk (technical CDA related questions):
  - [NHSNCDA@cdc.gov](mailto:NHSNCDA@cdc.gov)

# Thank you!

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

