



# CDC Updates on Hospital Antimicrobial Stewardship Efforts

2024 NHSN Patient Safety Component Annual Training  
March 18, 2024

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# Outline

- Provide an update on the uptake of CDC's seven core elements of Antibiotic Stewardship
- Discuss the Priorities for Hospital Core Elements implementation
- Highlight new and updated stewardship resources, including tools for using NHSN AU data for action

# Five core strategies to combat the threat of antibiotic resistant infections

## Antibiotic use and access:

- Improve **appropriate** use
- Reduce **unnecessary** use
- Ensure **improved access**



**Infection prevention and control:** Prevent infections and reduce the spread of germs



**Tracking and data:** Share data and improve data collection



**Antibiotic use and access:** Improve appropriate use of antibiotics, reduce unnecessary use (called antibiotic stewardship), and ensure improved access to antibiotics



**Vaccines, therapeutics, and diagnostics:** Invest in development and improved access to vaccines, therapeutics, and diagnostics for better prevention, treatment, and detection



**Environment and sanitation:** Keep antibiotics and antibiotic-resistant threats from entering the environment through actions like improving sanitation and improving access to safe water

## Core Elements of Hospital Antibiotic Stewardship Programs



### Hospital Leadership Commitment

Dedicate necessary human, financial, and information technology resources.



### Accountability

Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.



### Pharmacy Expertise (previously “Drug Expertise”):

Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.



### Action

Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.



### Tracking

Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.



### Reporting

Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.



### Education

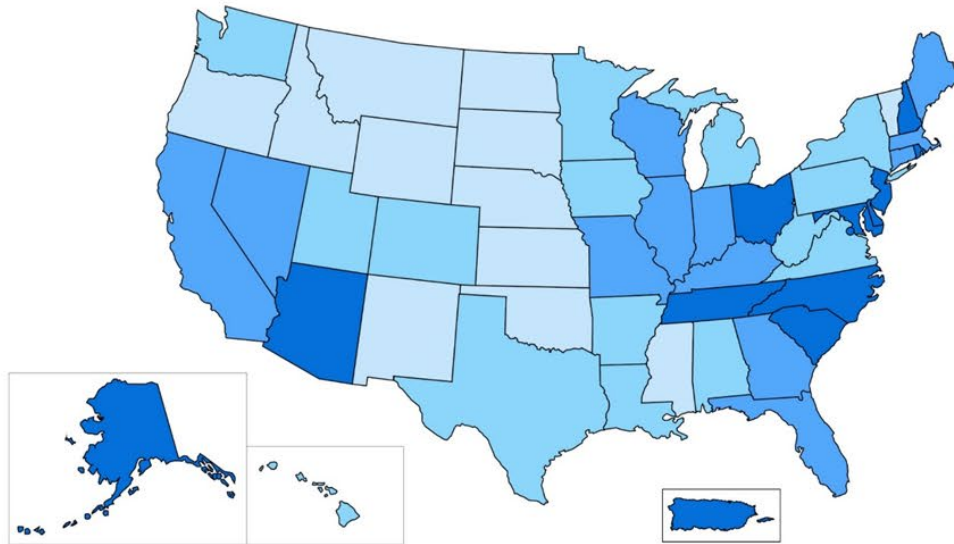
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.

# Antibiotic Resistance & Patient Safety Portal



**BE  
ANTIBIOTICS  
AWARE**

SMART USE, BEST CARE



Explore and Visualize Data on  
Antibiotic Use and Stewardship

For more information, visit [www.cdc.gov/antibiotic-use](http://www.cdc.gov/antibiotic-use) or call 1-800-CDC-INFO.



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[Antibiotic Use and Stewardship Antibiotic Resistance and Patient Safety Portal \(ARPSP\) website](http://www.cdc.gov/antibiotic-use)

# Antibiotic Stewardship Core Elements



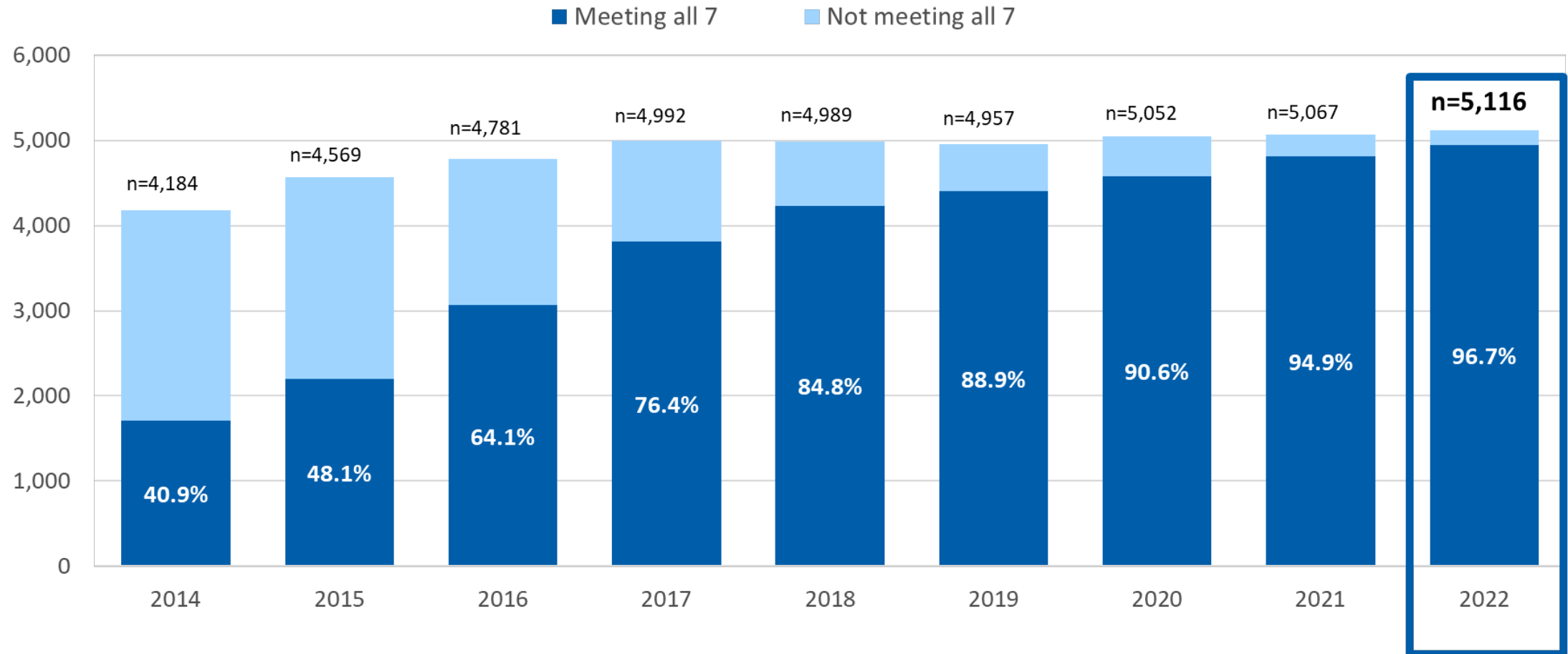
## Antibiotic Use & Stewardship

### Antibiotic Use

### Antibiotic Stewardship Core Elements

Antibiotic stewardship refers to a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use. The Centers for Disease Control and Prevention (CDC) recommends that all hospitals and nursing homes implement the [Core Elements of Antibiotic Stewardship](#) to improve antibiotic prescribing practices and reduce the threat of antibiotic resistance.

## NHSN Annual Hospital Surveys 2014-2022: Number and percentage of hospitals meeting all 7 Core Elements



# CDC released *Priorities* to enhance the quality and impact of hospital antibiotic stewardship programs

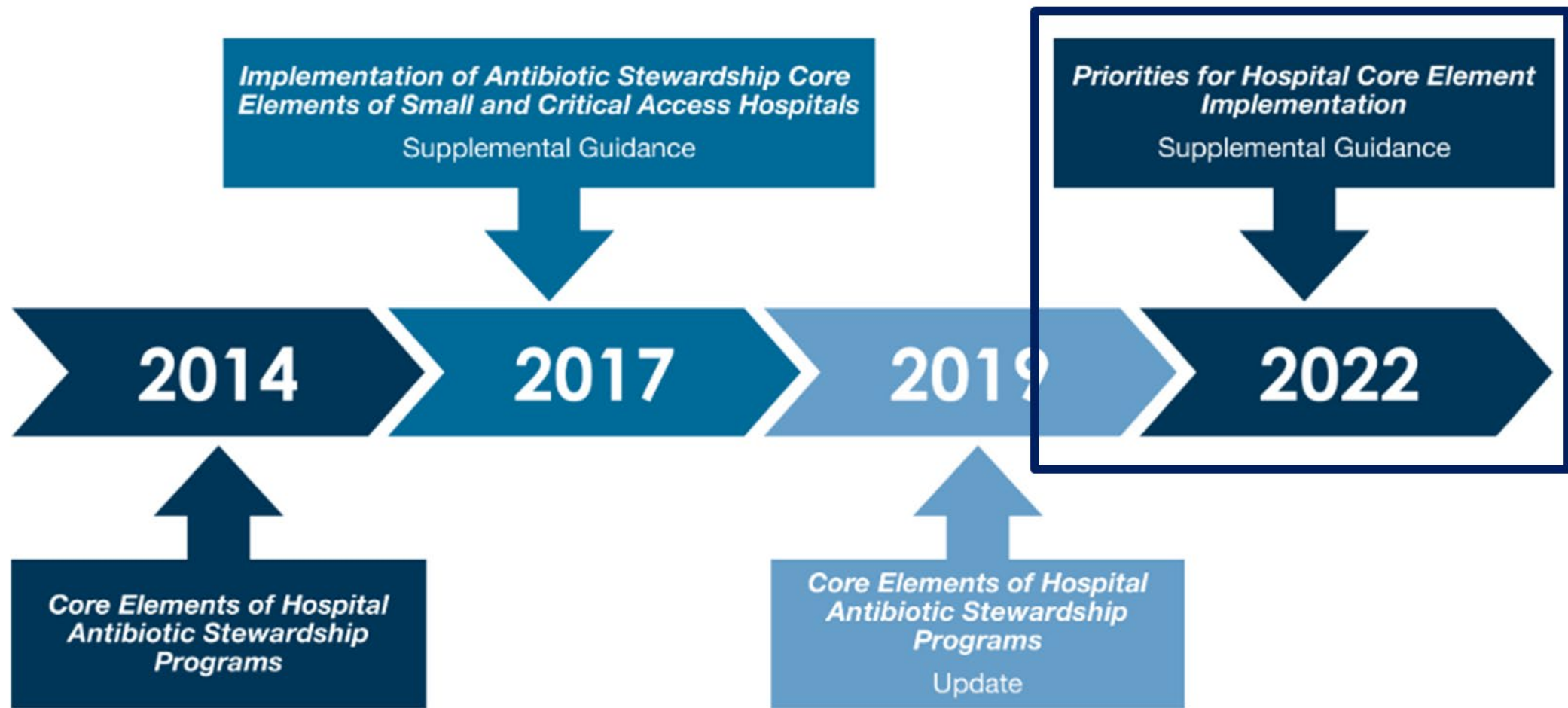



Figure. Timeline of Core Elements of Hospital Antibiotic Stewardship Programs



# Priorities are derived from the Hospital Core Elements

- Highlight a subset of effective stewardship implementation approaches that are supported by evidence and/or recommended by stewardship experts.
- Provide hospital leadership and antibiotic stewards opportunities to **expand** their antibiotic stewardship programs.

Hospital Core Elements	Priorities for Hospital Core Element Implementation
<b>Hospital Leadership Commitment</b>  Dedicate necessary human, financial, and information technology resources.	Antibiotic stewardship physician and/or pharmacist leader(s) have antibiotic stewardship responsibilities in their contract, job description, or performance review.
<b>Accountability</b>  Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.	Antibiotic stewardship program is co-led by a physician and pharmacist.*
<b>Pharmacy/Stewardship Expertise</b>  Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.	Antibiotic stewardship physician and/or pharmacist leader(s) have completed infectious diseases specialty training, a certificate program, or other training on antibiotic stewardship.
<b>Action</b>  Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.	Antibiotic stewardship program has facility-specific treatment recommendations for common clinical condition(s) and performs prospective audit/feedback or preauthorization.
<b>Tracking</b>  Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like <i>C. difficile</i> infections and resistance patterns.	Hospital submits antibiotic use data to the NHSN Antimicrobial Use Option.
<b>Reporting</b>  Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.	Antibiotic use reports are provided at least annually to target feedback to prescribers. In addition, the antibiotic stewardship program monitors adherence to facility-specific treatment recommendations for at least one common clinical condition.
<b>Education</b>  Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.	No implementation priority identified.

- Antibiotic Use
- About Antibiotic Use +
- Patient Resources and Education +
- Healthcare Professional Resources and Training +
- Improving Antibiotic Use +
- Core Elements of Antibiotic Stewardship -
- Health Department +
- Hospital -
- Priorities for Hospital Core Element Implementation
- Implementation Resources for Hospitals
- Small and Critical Access Hospitals
- Outpatient +
- Nursing Home +
- Resource-Limited Settings
- U.S. Antibiotic Awareness Week +

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## Priorities for Hospital Core Element Implementation

[Print](#)

### Opportunities to Enhance Hospital Antibiotic Stewardship Programs

The *Hospital Core Elements* outline structural and procedural components that are associated with successful antibiotic stewardship programs, which was updated in 2019 to reflect new evidence and lessons learned from implementing programs. In 2021, nearly 95% of U.S. hospitals had antibiotic stewardship programs that met all seven of the *Core Elements of Hospital Antibiotic Stewardship Programs (Hospital Core Elements)*.

To continue enhancing hospital antibiotic stewardship programs, CDC has released *Priorities for Hospital Core Element Implementation (Priorities)* in 2022 to help enhance the quality and impact of existing antibiotic stewardship programs. The *Priorities (Table)* highlight highly effective implementation approaches and are supported by evidence and stewardship experts.

### Priorities for Hospital Core Element Implementation

Hospitals that have implemented the *Hospital Core Elements* can implement the *Priorities* to further enhance their stewardship program. The *Priorities* have been identified for six of the seven *Core Elements* and provide hospital leadership and antibiotic stewards opportunities to expand their antibiotic stewardship programs.

[Downloadable Table](#)

Hospital Leadership Commitment	▼
Accountability	▼
Pharmacy Expertise	▼
Action	▼
Tracking	▼
Reporting	▼
Education	▼

[Top of Page](#)

#### Mapping of the Patient Safety Component - Annual Hospital Survey



Questions from the Annual Hospital Survey are mapped to Hospital Core Elements and Priorities.

#### Antibiotic Resistance & Patient Safety Portal



The uptake of the Priorities can be viewed on the Antibiotic Resistance & Patient Safety Portal.

#### How to Run the Priorities Line List in NHSN



The uptake of the Priorities can be found when running the Priorities for Hospital Core Element Implementation line list within National Healthcare Safety

# Priorities website

### Mapping of the Patient Safety Component - Annual Hospital Survey



Questions from the Annual Hospital Survey are mapped to Hospital Core Elements and Priorities.

[Learn More](#)

### Antibiotic Resistance & Patient Safety Portal



The uptake of the Priorities can be viewed on the Antibiotic Resistance & Patient Safety Portal.

[Learn More](#)

### How to Run the Priorities Line List in NHSN



The uptake of the Priorities can be found when running the Priorities for Hospital Core Element Implementation line list within National Healthcare Safety network.

[Learn More](#)

# Priority core element uptake added to AR & PSP



## PRIORITY CORE ELEMENTS REPORTING

In 2022, CDC identified specific priorities for hospital Core Element implementation. The priorities are derived from six of the seven Core Elements to help enhance the quality and impact of antibiotic stewardship programs.

### HOSPITAL ANTIBIOTIC STEWARDSHIP IMPLEMENTATION BY PRIORITY ELEMENT

STATE

All States

YEAR

2022

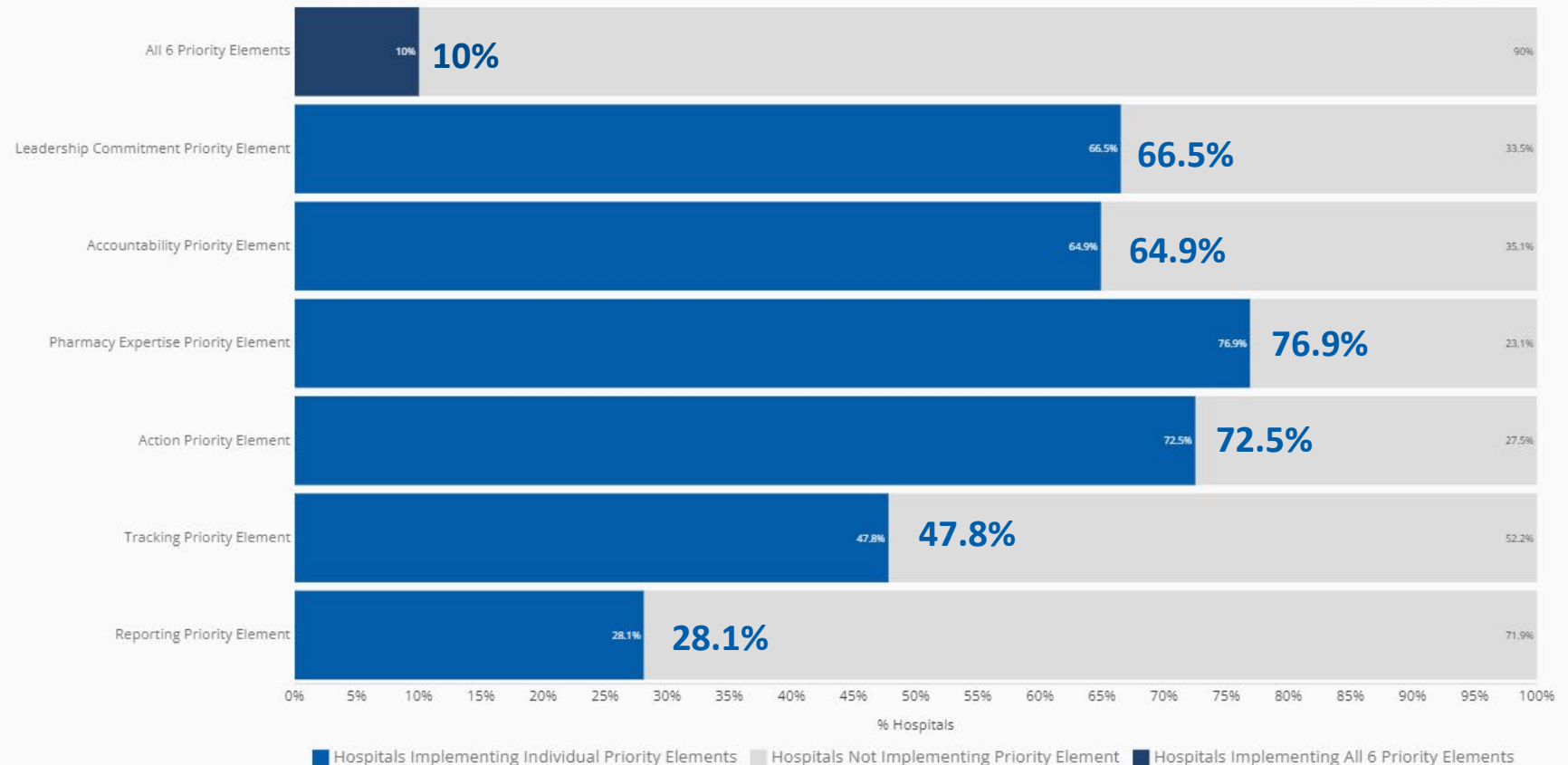
2021

The graphic shows the percent of acute care hospitals that report implementation of Priority Elements of hospital antibiotic stewardship programs for the nation in 2022. Visit the [United States Profile](#) to learn more about Antibiotic Stewardship reporting by geography.

[Priorities for Hospital Core Element Implementation](#) | [Antibiotic Use](#) | [CDC](#)

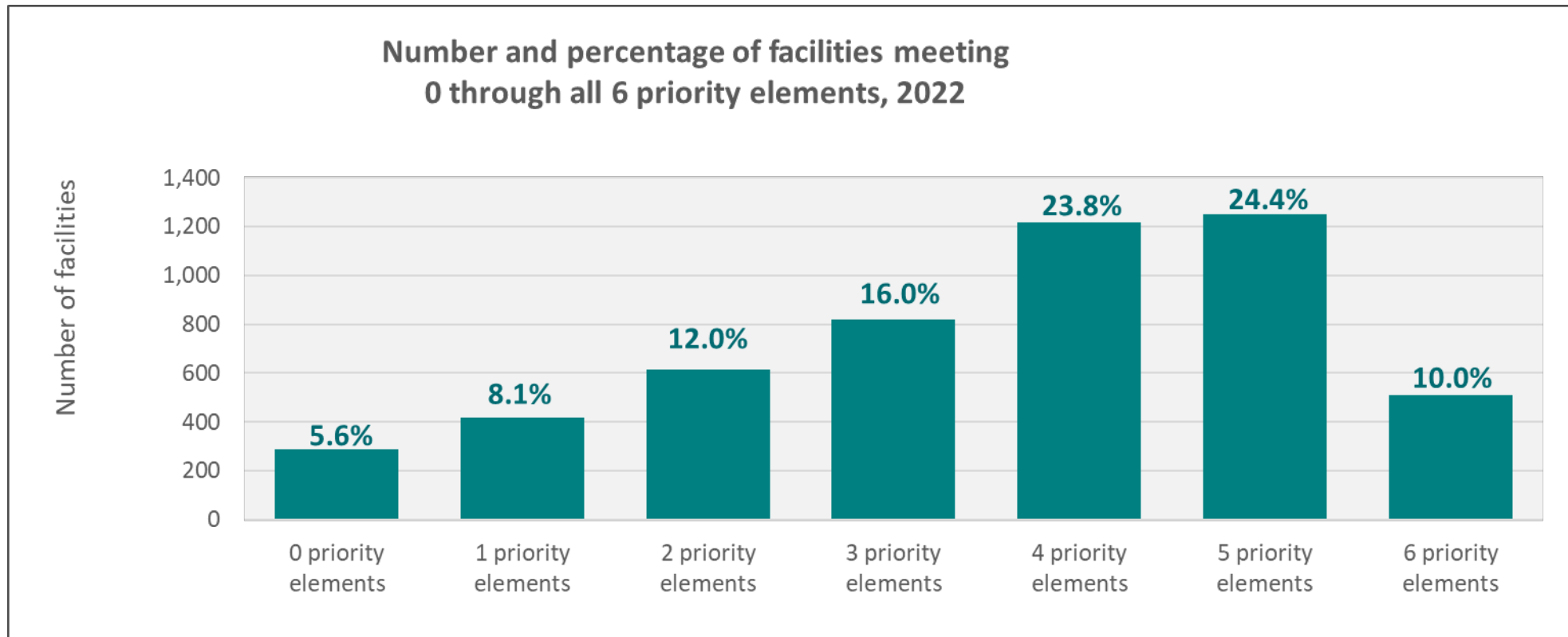
### HOSPITAL PRIORITY ELEMENT REPORTING IN ALL STATES

[VIEW DATA](#) [SAVE IMAGE](#) [SHARE](#)



# Priorities for Hospital Core Element Implementation

- **510** (10.0%) hospitals met all 6 priority elements in 2022
- **2,465** (48.2%) hospitals met 4 or 5 of the priority elements in 2022



# Hospital Antimicrobial Use

# Tracking & Reporting Hospital Antibiotic Use Data

- **CDC's National Healthcare Safety Network (NHSN)** reports AU from >3,300 hospitals
  - Standardized Antimicrobial Administration Ratio (**SAAR**) is a risk-adjusted summary measure of AU.
  - Hospitals can use the SAAR to:
    - Track AU;
    - Compare their AU to national benchmarks; and
    - Assess the impact of interventions aimed at improving prescribing practices.

# Antibiotic Use & Stewardship



## Antibiotic Use & Stewardship

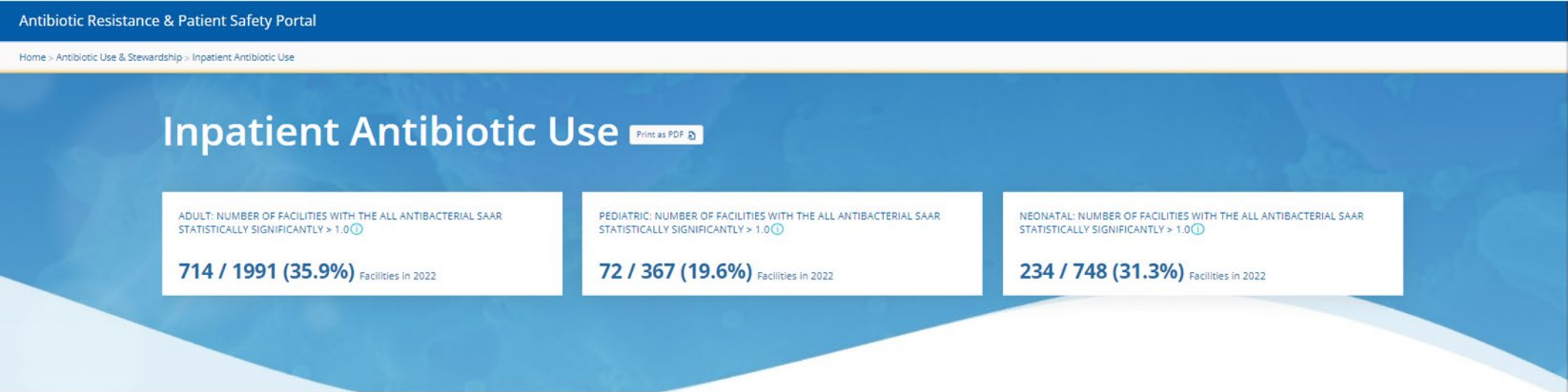
**Antibiotic Use**

**Antibiotic Stewardship Core Elements**

These data reflect antibiotic use data from inpatient facilities enrolled in the NHSN's Patient Safety Component Antimicrobial Use and Resistance (AUR) Module Antimicrobial Use (AU) Option and oral antibiotic prescriptions dispensed to humans in US outpatient pharmacies during 2019-2021.

# Hospital AU

## NHSN AU Option Standardized Antimicrobial Administration Ratio (SAAR)



### Inpatient Antibiotic Use

The Standardized Antimicrobial Administration Ratio (SAAR) is a risk-adjusted summary measure of antimicrobial use available to acute care hospitals participating in the National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Option. Hospitals can use the SAAR to track AU, compare their AU to a national benchmark, and assess the impact of interventions aimed at improving prescribing practices.

#### DATA SOURCE

NATIONAL HEALTHCARE SAFETY NETWORK (NHSN)

#### YEARS INCLUDED

(2021 - 2022)

#### RESOURCES

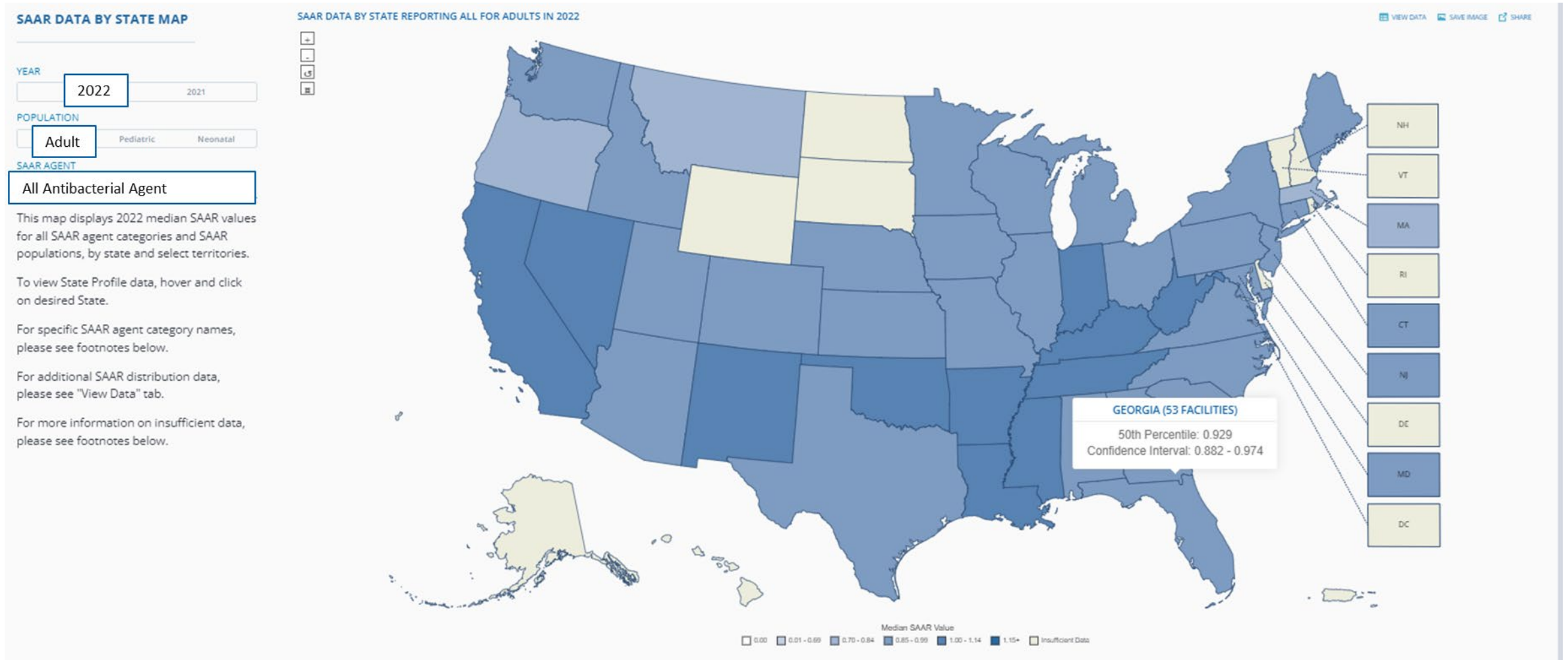
→ NHSN Antimicrobial Use Report

→ AUR Module Protocol

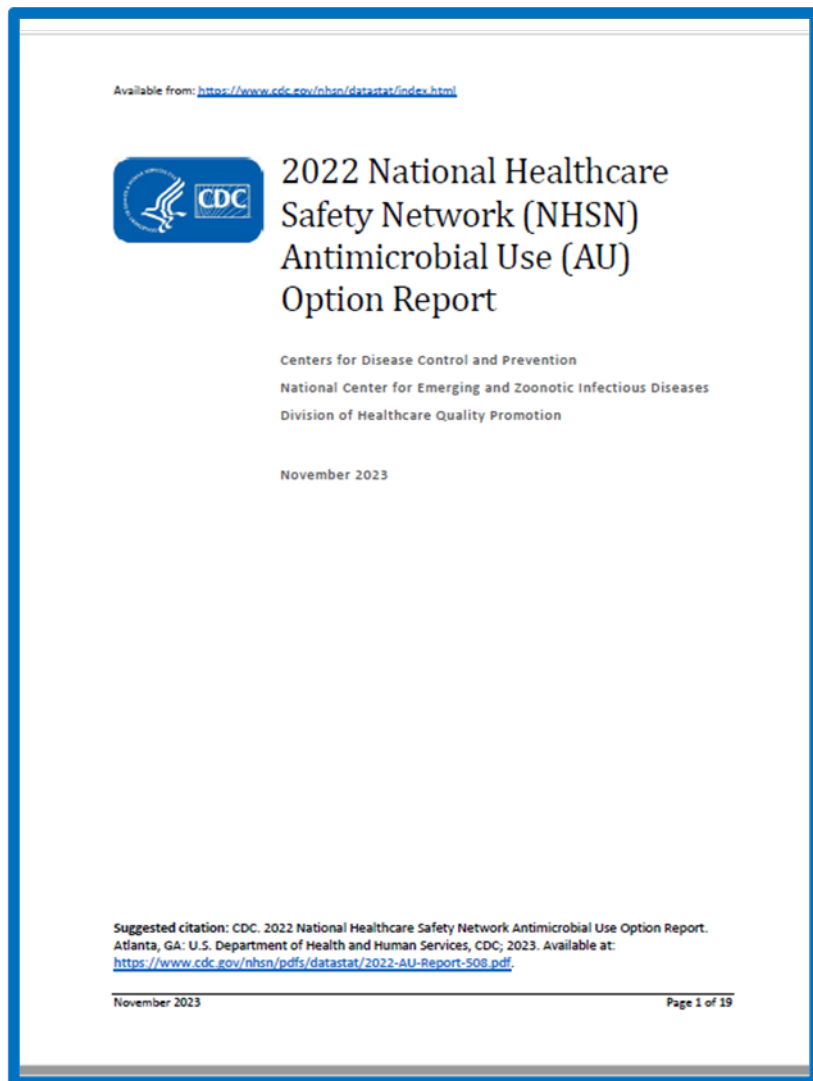


# Hospital AU

## Median SAAR values in 2022 for all agent category for adult population

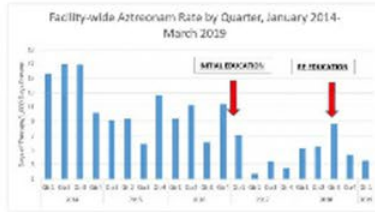


# 2022 NHSN AU Option Report



- Summary of **SAAR distribution** and **percentages of use** within SAAR antimicrobial agent categories in adult, pediatric, and neonatal patient care locations.
- **Inform stewardship efforts** by showing hospitals how their SAARs compare to national or state distributions.

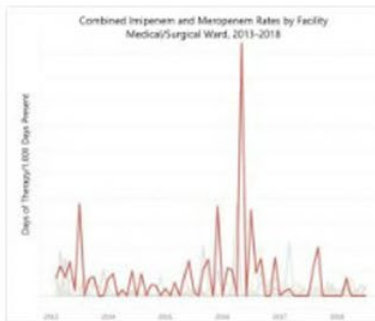
# AU Option Case Examples



## Decreasing Aztreonam Use in a Veterans Affairs Hospital

Jesse Brown VA Medical Center has submitted data to the National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Option since January 2013. In response to high aztreonam use, the facility developed training and educational materials to evaluate the risk of an adverse reaction from beta-lactam administration in a patient whose recorded medical history included a penicillin allergy. [Read More.](#)

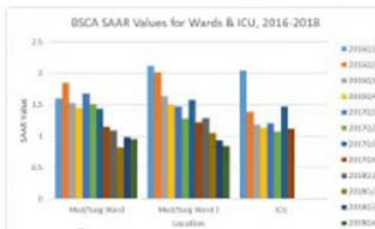
Posted On: June 18, 2019



## Using Telehealth to Decrease Carbapenem Use in a Critical Access Hospital

Using NHSN Antimicrobial Use (AU) Option data submitted from 2013-2018, Intermountain Healthcare system compared carbapenem use among its facilities and identified an outlier. After meeting with the local stewardship physician and pharmacist champions, an active prospective audit and feedback approach was initiated using telehealth. [Read More.](#)

Posted On: April 16, 2019



## Targeting a Reduction in Fluoroquinolone Use within a Community Hospital

Submitting data into the NHSN Antimicrobial Use (AU Option) since 2016, Wilson Medical Center, a community hospital in North Carolina, used AU Option data to identify an area

# New AU Resources

- CDC funded [DASON](#) to develop resources leveraging NHSN AU data to inform, implement and assess antibiotic stewardship activities
- Video guides that demonstrate manipulation of AU data for different clinical scenarios

## METRICS

Leveraging National Health Safety Network Antibiotic Use Data to Inform, Implement and Assess Antibiotic Stewardship Activities

The CDC provides many robust tools to aid users in running the analytics provided within the NHSN platform. These are available for the AU and AR options as well as the targeted assessments for stewardship (TAS) strategy. Where applicable, these specific guides have been linked throughout the clinical implementation guide.

In addition, our project team has prepared some additional quick guides, each with an embedded “stew-tube” video to demonstrate how of quick additional manipulations of the NHSN data itself, or adding in supplemental data from local sources can be used in everyday stewardship work. These are also linked within the clinical stewardship scenarios but the full list appears below.

- **Manipulations of NHSN Extracts**
  - [Specific Antimicrobial use bar chart](#)
  - [Antimicrobial use by route of delivery](#)
  - [Antimicrobial specific DOT/1000 days present](#)
- **Combining NHSN Data with Additional Data from Local Sources**
  - [Antimicrobial-specific Average Length of Therapy](#)
  - [NHSN Infection Rate Extracted to Combine with Antibiotic Data](#)
- **Metrics Using Local Data Sources**
  - [Antimicrobial use by Indication](#)
  - [Durations based on date of event](#)
  - [Percent of Patient Admissions receiving a Specific Antimicrobial](#)
  - [Targeted admissions denominator](#) (diagnosis code or antibiotic use)
  - [Provider Specific Prescribing.\(DOT\)](#)
  - [Provider Specific Prescribing- Stratified by Route or Indication](#)
  - [Laboratory Test Utilization Rate](#)



# New interactive web-based tools

Leveraging NHSN AU Option to inform, implement and assess antibiotic stewardship activities

## Category 1: Using AU Data to Identify and Inform Stewardship Opportunities for High Antimicrobial Use

- + 1. Individual SAAR category
- + 2. Targeted antimicrobial within a SAAR category
- + 3. SAAR category on a targeted unit type
- + 4. Specific antimicrobial in a select population

## Category 2: Using AU Data to Assess Opportunities to Optimize Antimicrobial Use

- + 1. Intravenous to oral conversions
- + 2. De-escalation tracking with AU data
- + 3. Targeting providers or provider groups
- + 4. Long antimicrobial durations
- + 5. Guideline adherence
- + 6. Select antimicrobials/SAAR category for a targeted indication

## Category 3: Using AU Data to Support Other Quality Initiative Implementation

- + 1. NHSN CDI rates in context of AU data
- + 2. HAI outbreak investigation
- + 3. Antimicrobial adverse events
- + 4. High-cost antimicrobial use reduction

# Example Clinical Scenario-IV to PO Conversion

## Using Data to Track Intravenous (IV) to Oral (PO) Conversions

**Example Scenario:** During a pharmacy budget review, IV doxycycline was identified as a large, potentially modifiable expense. IV doxycycline costs considerably more than its oral (PO) counterpart (~\$30/day vs. <\$1/day). The hospital pharmacy leadership requested that the antibiotic stewardship program track and report IV and PO doxycycline and identify opportunities to optimize the IV to PO conversion. The hospital pharmacy has a Pharmacy & Therapeutics approved IV to PO conversion protocol that includes doxycycline.

**Background:** The NHSN AU Option Line List provides each antimicrobial agent as total days of therapy (DOT) and is stratified by route of administration (IV, intramuscular, digestive (i.e., PO) and respiratory). Stewards can export total doxycycline days of therapy stratified by IV and PO route to an external spreadsheet program (such as Excel™) and create reports for tracking IV and PO administration of doxycycline.

This approach can be applied to other tracking and reporting scenarios where route of administration is of interest (such as the respiratory route for inhalational antimicrobials).

# Data Visualization-NHSN Extracts

## Data Visualizations using NHSN AU Option for Days of Therapy by Route of Administration At the Facility-level

Quarterly doxycycline DOT stratified by route are shown in Figures 1 & 2.

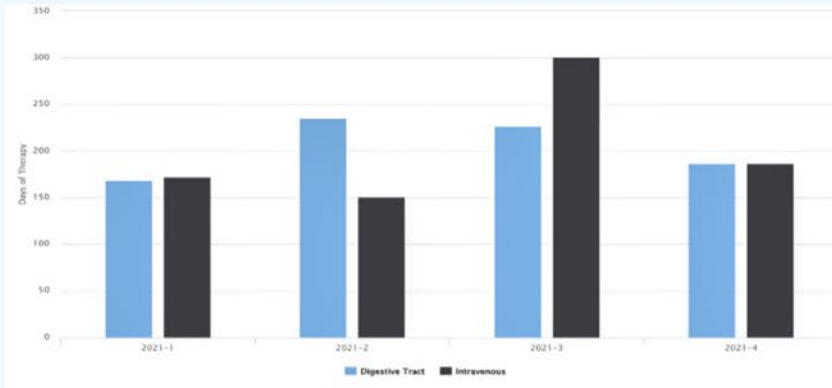


Figure 1. Quarterly Doxycycline Use Stratified by Route (2021)

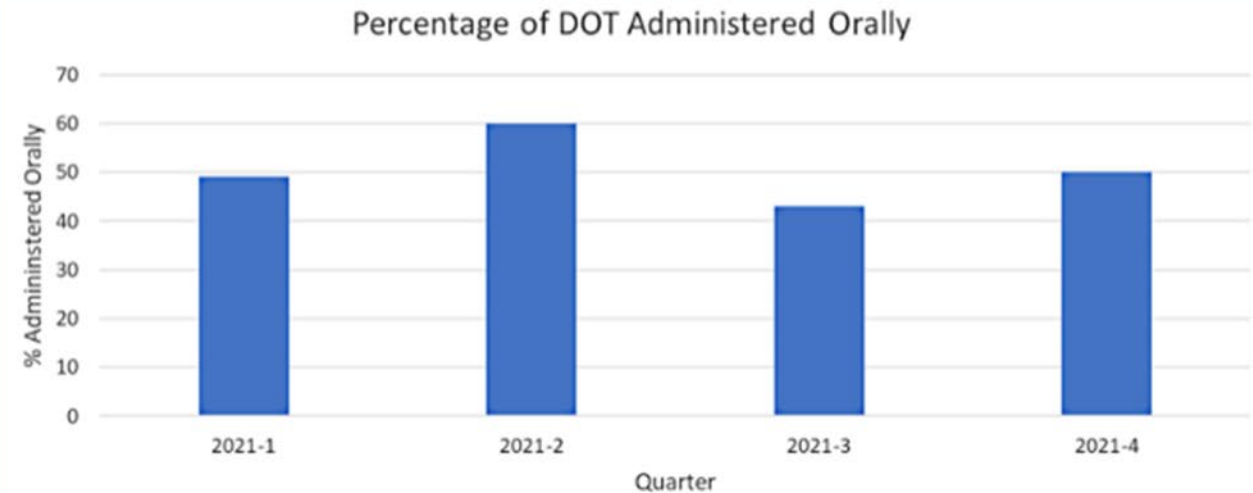


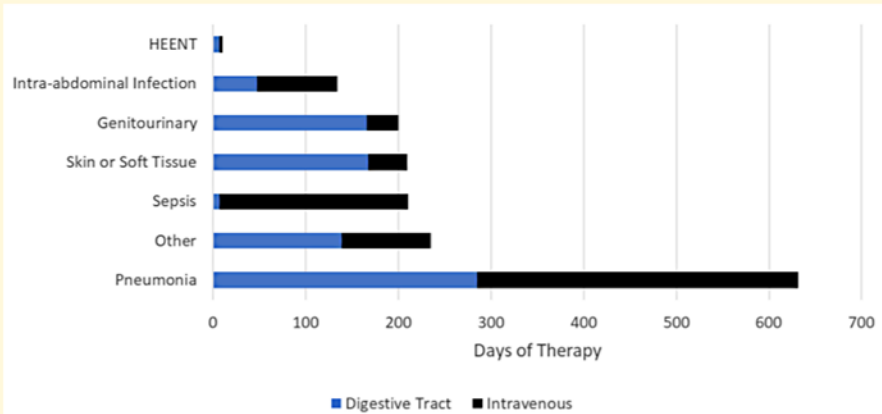
Figure 2. Percentage of Doxycycline Days of Therapy (DOT) Given Orally by Quarter (2021)

# Data visualization-Local Data Sources

## Metrics Using Local Data Sources (Augmented Data)

### Data Visualizations using Augmented Data for Provider-Selected Clinical indication and Route of Administration

Local data sources, such as clinical indication, can be used to augment NHSN AU data to inform potential stewardship interventions.



### Data Visualizations using Augmented Data by Prescriber and Route of Administration

Stratifying DOTs by prescriber using augmented data can help inform audit and feedback stewardship interventions.

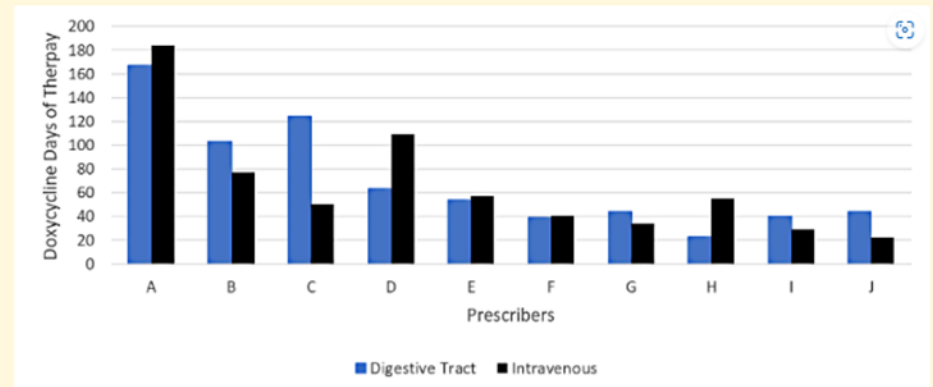


Figure 5. Oral and Intravenous Doxycycline Days of Therapy by Prescriber (2021)



# Stewardship Interventions and Resources

## Potential Stewardship Interventions:

To address the high rate of IV doxycycline, there are several potential targets for stewardship intervention:

- Review the IV to PO conversion protocol:
  - Does the IV to PO conversion protocol exist in the policy manual?
  - Does the current policy include doxycycline as part of the protocol?
  - Are the inclusion/exclusion criteria in the protocol too strict, preventing appropriate changes?
  - What is the timing of the switch in the protocol? Earlier IV to PO switches could lead to more oral agent use.
- Review cases of IV doxycycline and/or IV to PO conversion to see how often the protocol was followed and to see if there are common reasons why it might not have been followed.
- Who is implementing the IV to PO switch protocol?
  - Is this group aware that doxycycline is included in the protocol?
  - If using an electronic task list in the electronic health record, is doxycycline included in the work list?
  - Does this work sometimes get triaged due to other higher-acuity tasks?
- Make sure that PO doxycycline is an option on order sets when appropriate. Also, consider adding durations for doxycycline to order sets.
- Engage nursing staff in encouraging IV to PO switches in patients who are tolerating oral therapy.

## Resources:

<https://www.idstewardship.com/resource-help-changing-iv-po-antibiotics/>

Refer to Moment 3: <https://www.ahrq.gov/antibiotic-use/acute-care/four-moments/index.html>

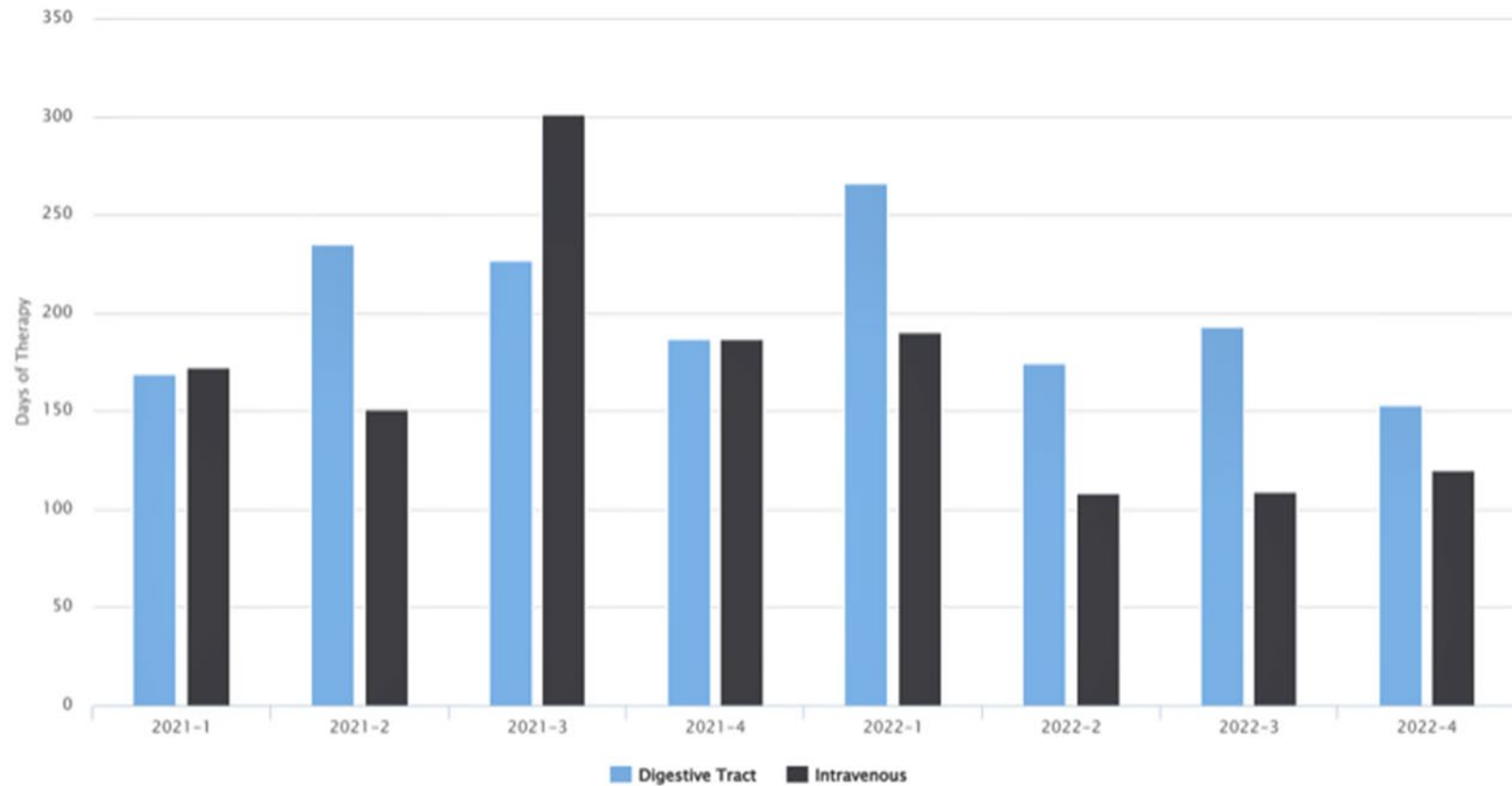
Nurse-driven IV To PO Programs: [http://static1.1.sqspcdn.com/static/f/920943/28132630/1558564927807/Poster\\_Brenden.pdf?token=DYYc4nYDI92nt6901LH5ISr1zf8%3D](http://static1.1.sqspcdn.com/static/f/920943/28132630/1558564927807/Poster_Brenden.pdf?token=DYYc4nYDI92nt6901LH5ISr1zf8%3D)

Nurse-drive stewardship Programs: <https://pubmed.ncbi.nlm.nih.gov/32645472/>

Economic and Clinical Outcomes of IV to PO Programs: <https://pubmed.ncbi.nlm.nih.gov/24399573/>

# Monitoring

## Suggestions for Ongoing Monitoring:



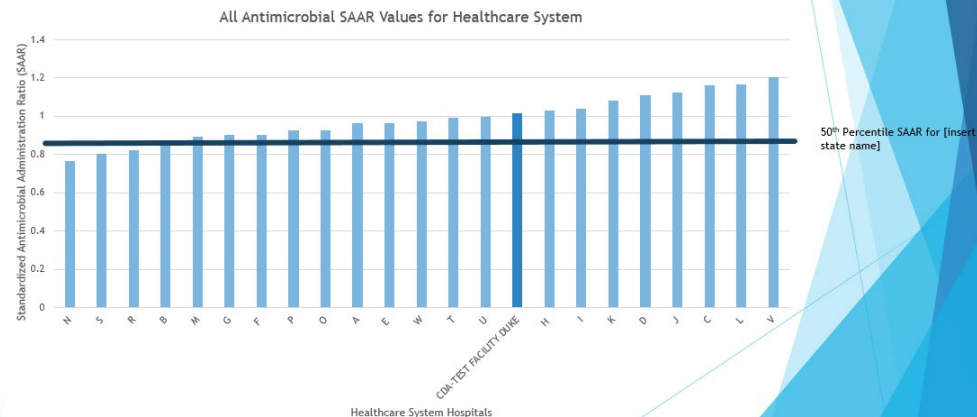
# Slide Template for AS Leaders

## Antimicrobial Stewardship Program Annual Update

ASP PROGRAM LEADERS



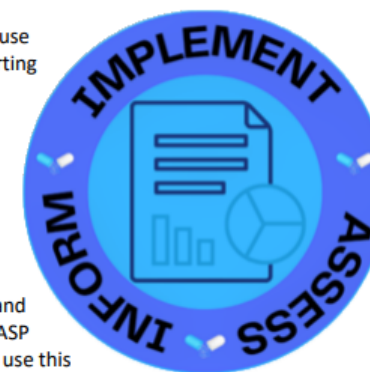
How does our hospital compare to other hospitals within our healthcare system?



## Slide Template for Reporting to Facility Administration User Guide

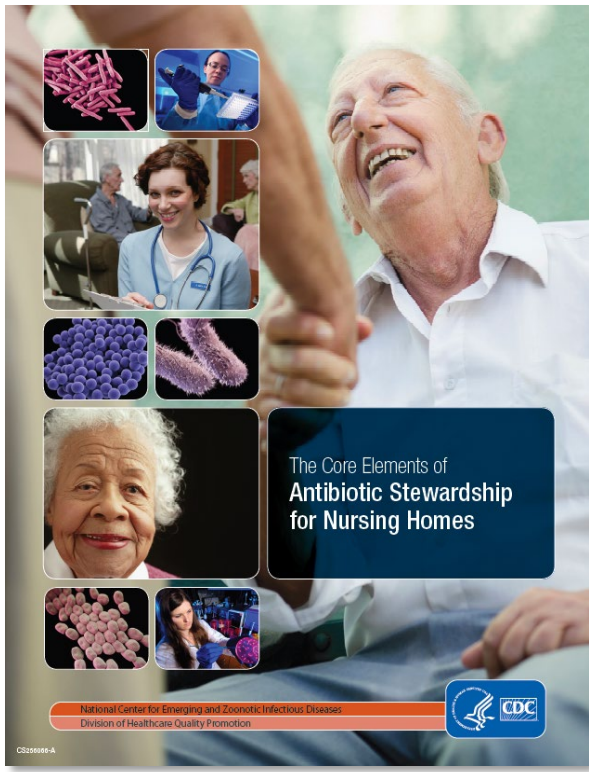
These template slides have been prepared as an example of an antimicrobial stewardship program (ASP) can use antimicrobial use (AU) data in routine reports to senior hospital leadership. Reporting to leadership at least annually is recommended and included in the REPORTING element of the [CDC Core Elements of Hospital Antibiotic Stewardship Programs](#). These template slides should be considered a minimum set of information to provide to hospital leadership and should be supplemented, where appropriate, with information on facility-specific interventions and outcomes.

**Slide 1- Title Slide-** Please update with the name of the facility and the name(s) of the stewardship leader(s) for the facility. Some ASP programs have an internal acronym or logo. It is always best to use this for your slide presentation template where possible.

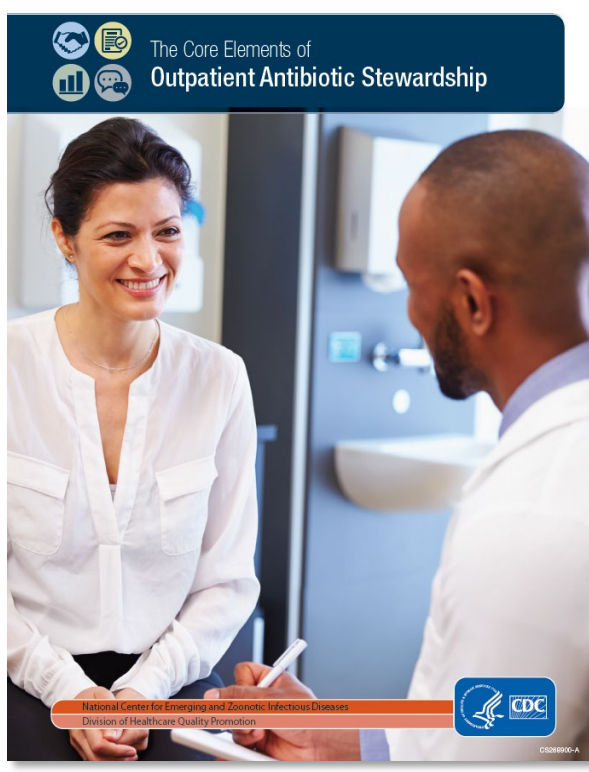


# New Guidance and Resources

# CDC's Core Elements of Antibiotic Stewardship Across Settings



Nursing Homes



Outpatient



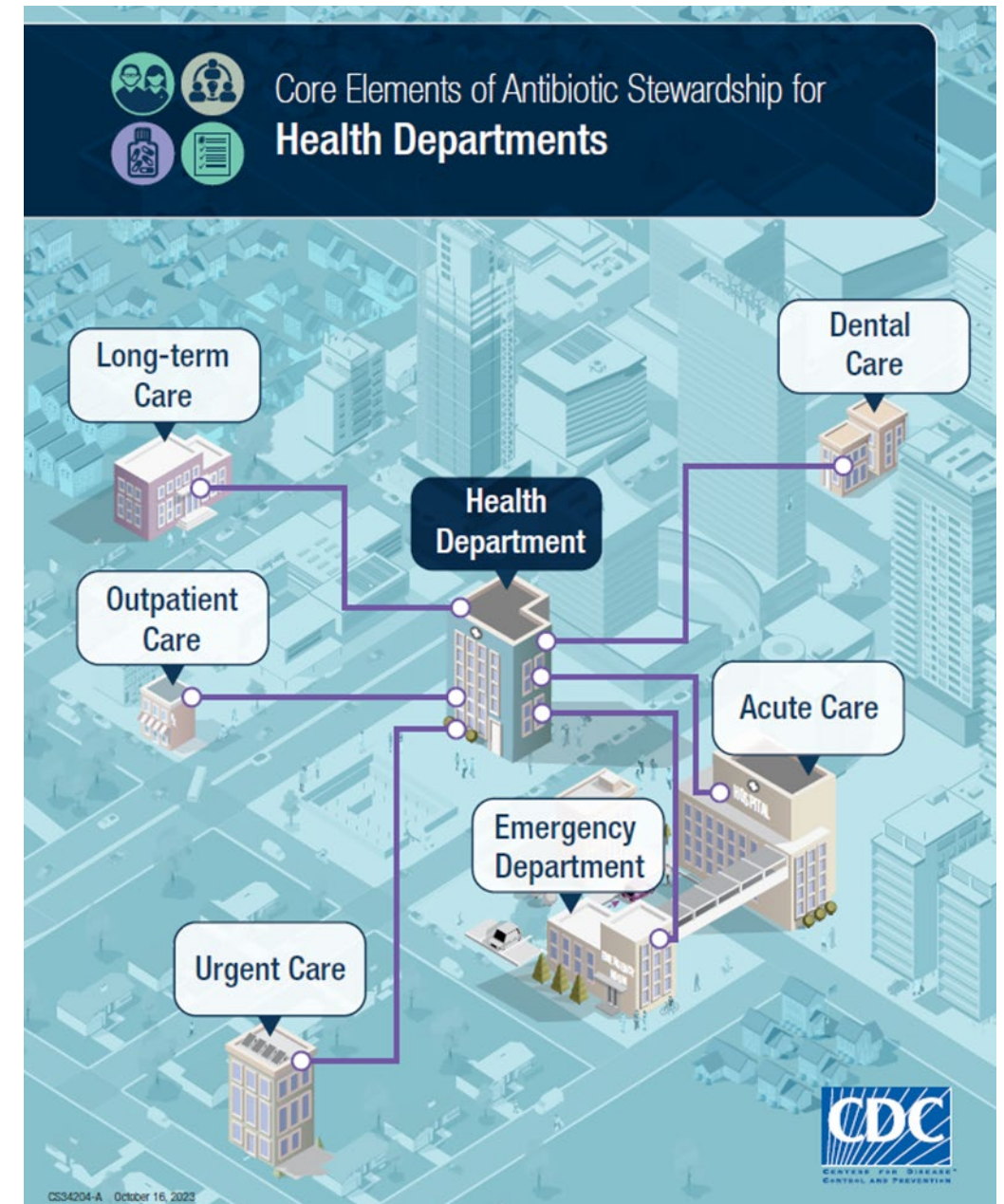
Small and Critical Access Hospitals



Resource-Limited Setting

# Expansion of health department stewardship staff and activities

- **State and local health departments** play an important role in guiding antimicrobial stewardship efforts
- A portion of COVID-19 supplemental funding (\$120 million) was dedicated to public health antibiotic stewardship
- The Core Elements were adapted for health departments



# Many opportunities to partner with health departments

**Leadership Commitment**  
Dedicate human and financial resources for state and local health department antibiotic stewardship programs.

**Accountability**  
Designate a leader or co-leaders, such as physician and pharmacist, responsible for the health department antibiotic stewardship program.

**Stewardship Expertise**  
Ensure that the antibiotic stewardship program leader or co-leaders have expertise and experience implementing stewardship activities.

**Action**  
Support the implementation of antibiotic stewardship activities by leveraging local partners or stewardship collaboratives.

**Tracking**  
Monitor stewardship activities and antibiotic use data to inform and assess stewardship actions across the spectrum of health care.

**Reporting**  
Report data on stewardship activities and antibiotic use to health department leadership, local partners, stewardship collaboratives, healthcare professionals and the public.

**Education**  
Provide antibiotic stewardship education to healthcare professionals and the public to optimize antibiotic use.

- Multidisciplinary advisory group
- Collaboratives focused on NHSN AUR or interventions in various healthcare settings
- Education (webinars, workshops)
- USAAW activities

# Integrating Sepsis and Antibiotic Stewardship

## Activities

- CDC released the *Hospital Sepsis Program Core Elements* in 2023 to outline structural and procedural components that are associated with the multidisciplinary expertise required to support the care of patients with sepsis.
- The Sepsis Core Elements emphasize the importance of:
  - Integrating **sepsis activities** into antibiotic stewardship activities
  - Engagement of antibiotic stewards in the development of sepsis treatment **recommendations**



# All Healthcare Professionals can *Be Antibiotics Aware*



**BE  
ANTIBIOTICS  
AWARE**

**SMART USE, BEST CARE**



For more information, visit [www.cdc.gov/antibiotic-use](http://www.cdc.gov/antibiotic-use).



CS335343-A

# New Resource – Antibiotic Stewardship Bundles

## Antibiotic Prescribing and Use

CDC > Antibiotic Use > U.S. Antibiotic Awareness Week > Be Antibiotics Aware Partner Toolkit

### Antibiotic Use

About Antibiotic Use +

Patient Resources and Education +

Healthcare Professional  
Resources and Training +

Improving Antibiotic Use +

Core Elements of Antibiotic  
Stewardship +

U.S. Antibiotic Awareness Week –

Be Antibiotics Aware Partner  
Toolkit –

Graphics & Videos

Antibiotic Stewardship Resource  
Bundles

Get Involved

Related Programs

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Email Address

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## Antibiotic Stewardship Resource Bundles

[Print](#)

### On this Page

Outpatient Care

Acute Care

Dental Care

Transitions of Care

Long-Term Care

For patient education resources, see our [Print Materials](#) page.

To order select free print resources, call 1-800-CDC-INFO or visit [CDC-INFO on Demand – Publications](#) and select “Antibiotic Use” from the Program drop-down menu. Then click the “Apply” button to view all available publications.

Healthcare professionals and partner organizations—including health departments and professional societies — can review and share the **Antibiotic Stewardship Resource Bundles** as part of their organization's U.S. Antibiotic Awareness Week promotion efforts.



The **Antibiotic Stewardship Resource Bundles** organize CDC and partner stewardship resources for antibiotic stewards and healthcare professionals by setting of care, audience and type of resource.

Outpatient Care



Dental Care



Long-Term Care



Acute Care



Transitions of Care



# Transition of Care Bundle

## HEALTHCARE PROFESSIONALS: BE ANTIBIOTICS AWARE At Hospital Discharge

### 1 Use the most targeted and safe antibiotic<sup>1,2</sup>

- If a penicillin allergy is listed in the medical record, determine whether the patient is truly allergic.
- If the patient is to be discharged on a fluoroquinolone, consider a safer alternative when appropriate.
- If planning outpatient parenteral antibiotic therapy, consider review by the antibiotic stewardship program or infectious disease consultation service.

### 2 Use the shortest effective antibiotic duration<sup>1,3,4</sup>

- Account for inpatient antibiotic days when considering the duration of a post-discharge prescription.
- Examples of total treatment duration for common infections:
  - Community-acquired pneumonia: 5 days<sup>2</sup>
  - Hospital-acquired pneumonia: 7 days<sup>2</sup>
  - Non-purulent cellulitis: 5 days<sup>2</sup>

### 3 Document and communicate a structured and timely discharge summary<sup>4</sup>

- Information communicated across transitions of care may include:
- Diagnosis and treatment plan
  - Antibiotic therapy
    - List inpatient antibiotic(s) and total number of days received in the hospital.
    - Specify if antibiotic therapy was completed in the hospital or if continued therapy post-discharge is needed.
    - For a post-discharge prescription, list the planned antibiotic, dose, and end date.
  - Results of relevant diagnostic tests (including pending tests)
  - Instructions for follow-up medical care, including contact information for additional questions

### 4 Educate patients and caregivers<sup>1</sup>

- Indication and planned antibiotic course
- Instructions for follow-up medical care
- Signs and symptoms of worsening infection, and sepsis.
- Signs and symptoms of antibiotic-associated adverse events, including *Clostridioides difficile* infection

## HOSPITAL PHARMACISTS: BE ANTIBIOTICS AWARE Use the Shortest Effective Antibiotic Duration

### SCENARIO

You are performing medication reconciliation and reviewing discharge antibiotic orders for a patient.

Antibiotic stewardship programs are targeting interventions to reduce unnecessarily long durations of antibiotic treatment. In adult patients who have a timely clinical response, guidelines suggest the following durations for uncomplicated cases of these infections:

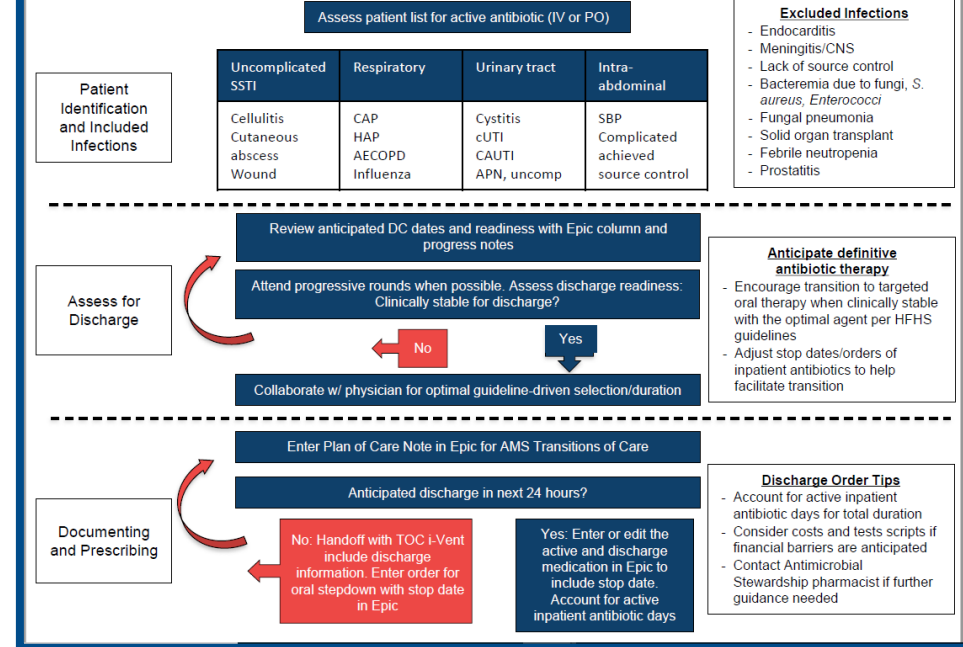
- **Community-Acquired Pneumonia:** Five days<sup>1</sup>
- **Hospital-Acquired Pneumonia:** Seven days<sup>2</sup>
- **Non-purulent Cellulitis:** Five days<sup>3</sup>

### Pharmacists can help optimize antibiotic duration by:

1. Adding the total number of days of uninterrupted inpatient antibiotic therapy to planned post-discharge antibiotic duration.
2. Alerting the provider if the total duration of inpatient and post-discharge antibiotic therapy exceeds the recommended duration according to treatment guidelines.
3. Discussing optimizing the duration of post-discharge antibiotic therapy with the provider if the patient had an uncomplicated clinical course and has responded appropriately to treatment.

The scenarios and recommendations discussed are applicable to most immunocompetent adult patients. Prior to making interventions, always assess the individual patient and use your clinical judgment. Follow your institution's treatment guidelines when applicable.

## Oral Antibiotic Discharge: Pharmacist Workflow



## HEALTHCARE PROFESSIONALS: Be Antibiotics Aware at Hospital Discharge

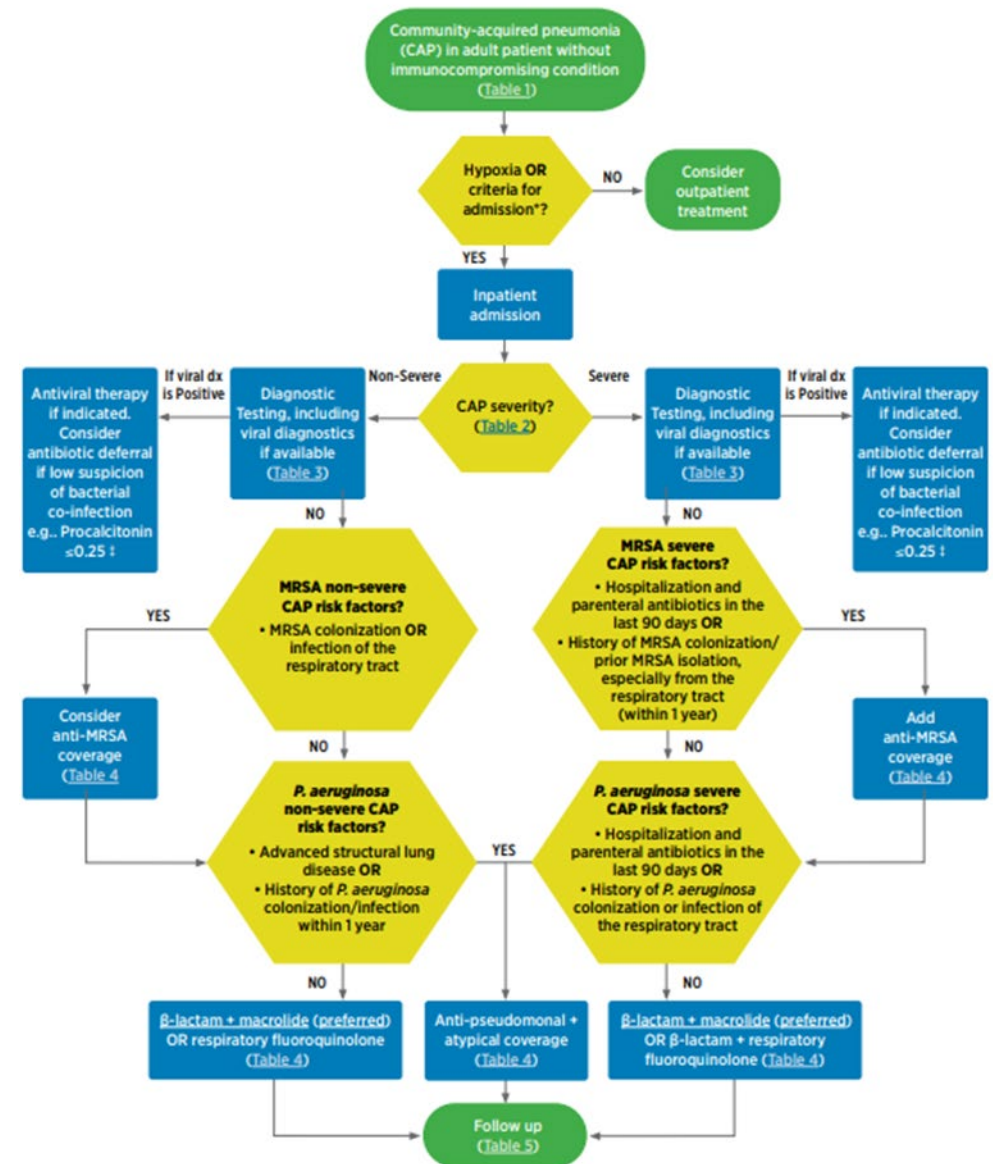


Learn more at [www.cdc.gov/antibiotic-use](http://www.cdc.gov/antibiotic-use).

# IDSA Clinical Pathway for diagnosis and treatment of community acquired pneumonia

- CDC funded IDSA to develop a **clinical pathway** to operationalize the diagnosis and treatment of CAP based on clinical practice guidelines
- IDSA panel overview of diagnostic and antibiotic stewardship principles
  - Manuscript in development

FIGURE 1: Initial Evaluation and Treatment of Community-Acquired Pneumonia (CAP)



# Health Equity and Antibiotic Prescribing in the United States

## A Systematic Scoping Review



**61** studies included



**90%** from outpatient settings



**10%** assessed guideline-concordant treatment

**Variations in antibiotic prescribing by patient- and clinician-level characteristics could impact quality of care and likely represent healthcare inequities.**



### Higher Prescribing

Younger children aged <5 years  
Older adults aged ≥65 years  
Private insurance  
Non-Hispanic White patients  
Emergency department settings  
Advanced practice clinicians



### Lower Prescribing

Older children  
Younger adults  
Public insurance  
Non-Hispanic Black patients  
Physician's office settings  
Pediatric clinicians

vs.



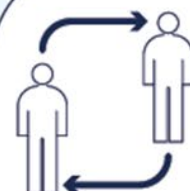
### Clinicians

Be engaged in antibiotic stewardship efforts to address differences in quality of prescribing.



### Researchers

Improve understanding of potential systemic and structural drivers of inequities in all clinical settings.



### Health systems

Incorporate a health equity lens in antibiotic stewardship quality improvement activities.



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Private insurance  
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Emergency department settings

vs.

### ↓ Lower Prescribing

Older children  
Younger adults  
Public insurance  
Non-Hispanic Black patients  
Physician's office settings



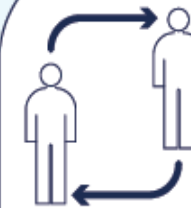
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# SHEA Advancing Health Equity through Antimicrobial Stewardship Workshop



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## Advancing Health Equity through Antimicrobial Stewardship Recordings

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[Accreditation](#)

[Register/Enroll](#)

The recordings for the in person Advancing Health Equity through Antimicrobial Stewardship Workshop are designed for learners to develop skills in building multidisciplinary partnerships that aid in identifying and addressing health inequities as they relate to antimicrobial stewardship and antimicrobial resistance.

**Available credit:**

5.75 ABIM MOC

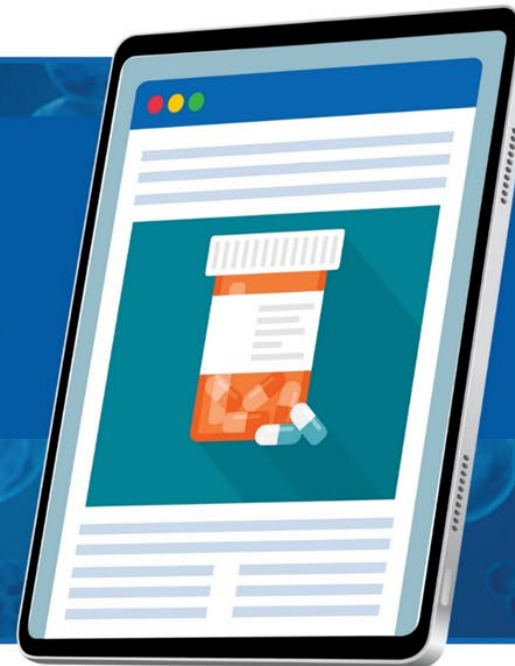
5.75 AMA PRA Category 1 Credit™

5.75 Participation

# CDC training with over 8 hours of free CE credits on antibiotic stewardship



## UPDATED CDC Training on Antibiotic Stewardship



CS336932-A

To access the training and free continuing education credits, visit [www.train.org/cdctrain/training\\_plan/3697](https://www.train.org/cdctrain/training_plan/3697).

[https://www.train.org/cdctrain/training\\_plan/3697](https://www.train.org/cdctrain/training_plan/3697)



# Thank you!

Reach out to us at the NHSN Helpdesk

With SAMS access:

<https://servicedesk.cdc.gov/nhsncsp>

Without SAMS access:

[NHSN@cdc.gov](mailto:NHSN@cdc.gov)

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.



# For any questions or concerns, contact the NHSN Helpdesk using

**NHSN-ServiceNow** to submit questions to the NHSN Help Desk.

The new portal can be accessed at <https://servicedesk.cdc.gov/nhsncsp>.

Users will be authenticated using CDC's Secure Access Management Services (SAMS) the same way you access NHSN. If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at [nhsn@cdc.gov](mailto:nhsn@cdc.gov).

**For more information please contact Centers for Disease Control and Prevention** <sup>42</sup>

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov) Web: [www.cdc.gov](http://www.cdc.gov)

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