Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

Enhancing Hospital Antibiotic Stewardship Programs Serving Native American and Alaska Native Communities

Axel A. Vazquez Deida, PharmD, MPH, BCIDP, AAHIVP
Epidemic Intelligence Service Officer
Division of Healthcare Quality Promotion

Indian Health Service – National Pharmacy Council
Antimicrobial Stewardship Program Committee Webinar Series
June 21, 2023

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

Disclosures

- The speaker has no financial relationship(s) or disclosures.
- The findings and conclusions in this presentation are those of the speaker and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Learning Objectives

At the end of this webinar, the learner will be able to:

1. Examine the link between antibiotic use and patient safety
2. Discuss CDC's Core Elements of Antibiotic Stewardship and Priorities for Core Element Implementation in the inpatient healthcare setting
3. Identify initial steps that healthcare facilities and clinicians can take to implement antibiotic stewardship interventions

Pre-Assessment

Question

1. The Core Elements of Hospital Antibiotic Stewardship include:
   a) Tracking
   b) Accountability
   c) Action
   d) Only (b) and (c) are correct
   e) All the above

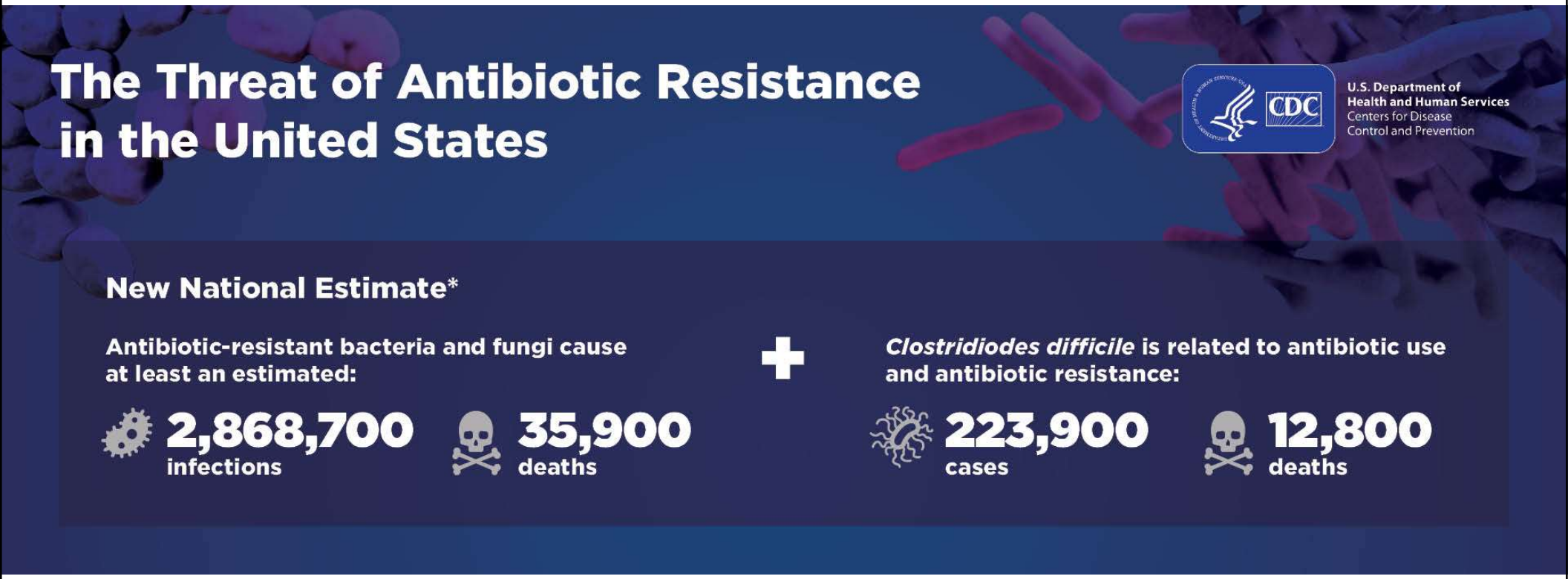
Question

2. The Priorities for Hospital Core Element implementation, which were released in 2022, are meant to replace the Core Elements of Hospital Antibiotic Stewardship Programs, which were last updated in 2019.
   a) True
   b) False

Question

3. Which of the following is NOT one of the Priorities for Hospital Core Element Implementation?
   a) Hospital leadership commitment
   b) Tracking
   c) Reporting
   d) Education
   e) All the above

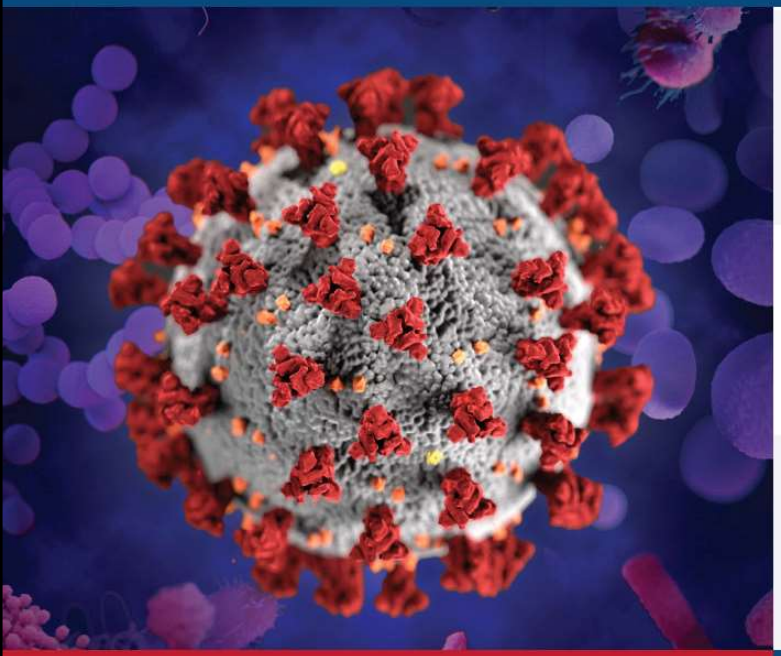
Examining the Link between Antibiotic Use and Patient Safety



CDC. Antibiotic Resistance Threats in the United States, 2019. [2019 Antibiotic Resistance Threats Report | CDC]

COVID-19 CREATED A PERFECT STORM

The U.S. lost progress combating antimicrobial resistance in 2020



↑15% Antimicrobal-resistant infections and deaths increased in hospitals in 2020.

~80% Patients hospitalized with COVID-19 who received an antibiotic March-October 2020.

! Delayed or unavailable data, leading to resistant infections spreading undetected and untreated.

INVEST IN PREVENTION.

Setbacks to fighting antimicrobial resistance can and must be temporary.

Learn more: https://www.cdc.gov/drugresistance/covid19.html

Five Core Strategies to Combat the Threat of Antibiotic Resistant Infections

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

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

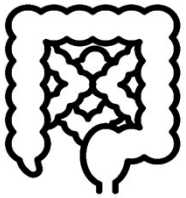
Tracking and data: Share data and improve data collection

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

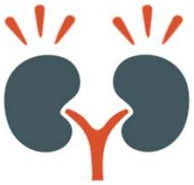
Vaccines, therapeutics, and diagnostics: Invest in development and improved access to vaccines, therapeutics, and diagnostics for better prevention, treatment, and detection

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

Antibiotic Use Can Lead to Adverse Events

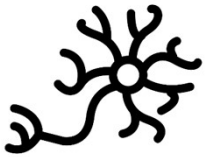


Gastrointestinal disturbances



Nephrotoxicity

Secondary infections
(e.g., yeast infections, *Clostridioides difficile*)



Neurotoxicity

Allergic reactions including anaphylaxis

Shehab et al. *Clin Infect Dis*. 2008;47(6):735-43.
Robertson et al. *Pharmacotherapy*. 2018;38(12):1184-1193.
Brown et al. *Antimicrob Agents Chemother*. 2013;57(5):2326-2332.

Antibiotic Use is the Most Important Modifiable Patient Risk Factor for *C. difficile* Infections

People are 7 to 10 times more likely to get *C. diff* infection while taking an antibiotic and during the month after.[3]

More than 80% of *C. diff* deaths occur in people 65 and older.

https://www.cdc.gov/cdiff/pdf/Cdiff-Factsheet-P.pdf

Estimating Daily Antibiotic Harms

Umbrella Review and Meta-Analysis

Public Health Ontario | Santé publique Ontario

35 Systematic Reviews

71 Short vs. Long Antibiotic Duration Trials

92% studies evaluated respiratory tract and urinary tract infections

23,174 patients evaluated

Adverse Events
N=20,345
4%↑ odds ratio/day

Antibiotic Resistance
N=2,330
3%↑* odds ratio/day

Super-infections
N=5,776
2%↓* odds ratio/day

Each Additional Day Can Cause Harm

5 vs 3 Days → **9%↑** odds ratio Of adverse events

7 vs 3 Days → **19%↑** odds ratio Of adverse events

* Non-statistically significant difference

Source: Curran J et al. Estimating daily antibiotic harms: An Umbrella Review with Individual Study Meta-analysis Clin Micro Infect. 2021

Ontario Agency for Health Protection and Promotion / Agence de protection et de promotion de la santé

Antibiotic Adverse Events Can Lead to *Emergency Department Visits*

1 in 1,000 antibiotic prescriptions lead to an ED visit for an adverse event

↓

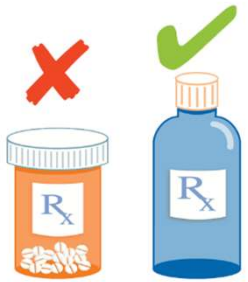
≈150,000 ED visits/year in U.S.

Shehab et al. *Clin Infect Dis*. 2008;47(6):735-43.
Shehab et al. *JAMA*. 2016;316(20):2115-2125.
Geller et al. *J Gen Intern Med*. 2018;33(7):1060-1068.

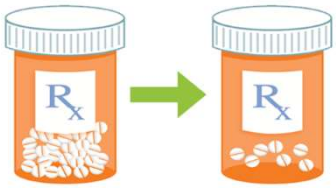
Antibiotic Stewardship is About *Patient Safety* and *Delivering High-Quality Healthcare*

Avoiding unnecessary antibiotic use

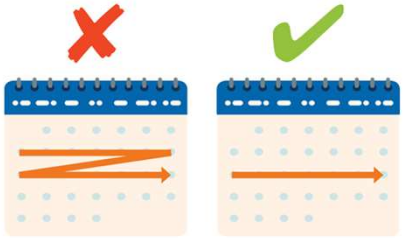
Right antibiotic



Right dose



Right duration



CDC Released the Core Elements of Hospital Antibiotic Stewardship Programs

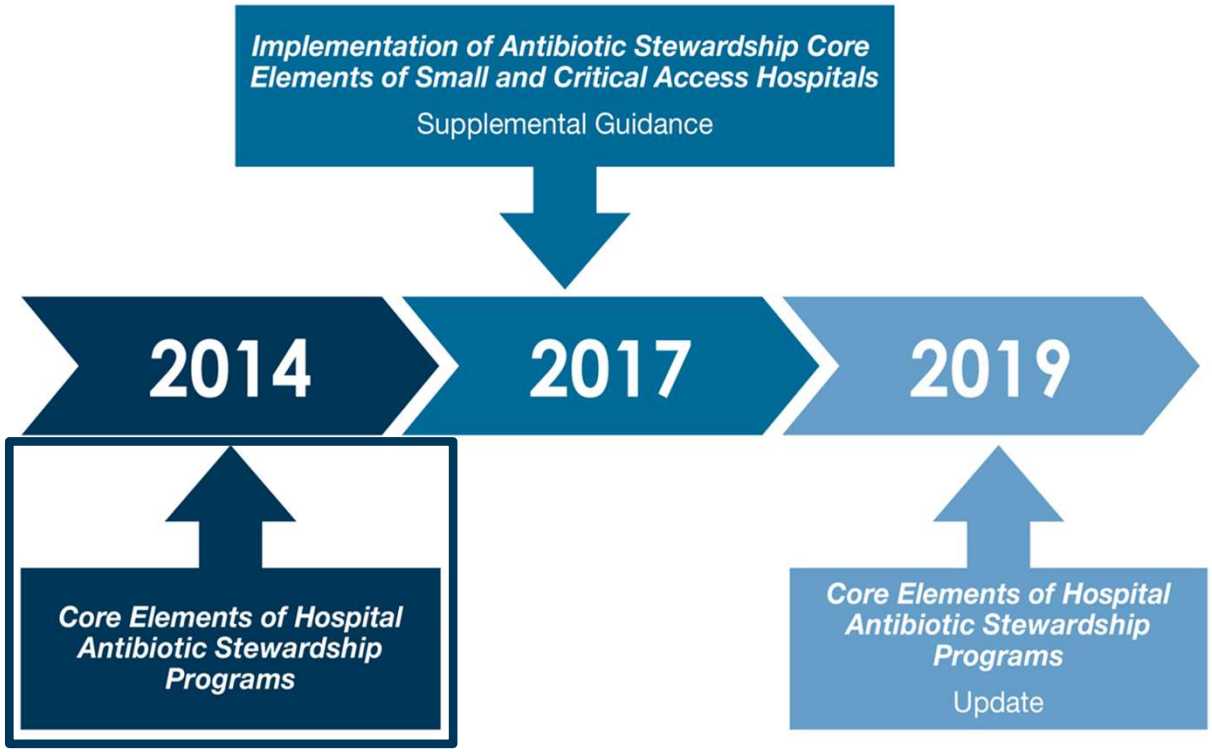


Figure. Timeline of Core Elements of Hospital Antibiotic Stewardship Programs

CDC Released the Core Elements of Hospital Antibiotic Stewardship Programs

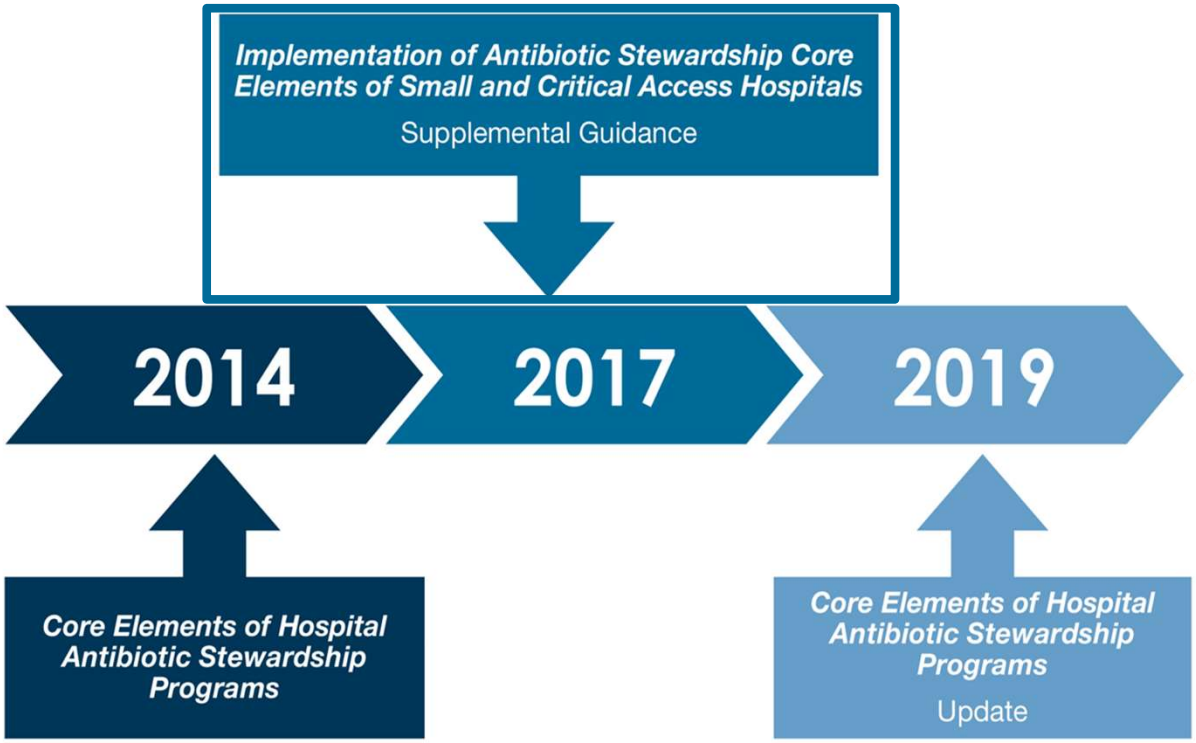


Figure. Timeline of Core Elements of Hospital Antibiotic Stewardship Programs

CDC Released the Core Elements of Hospital Antibiotic Stewardship Programs

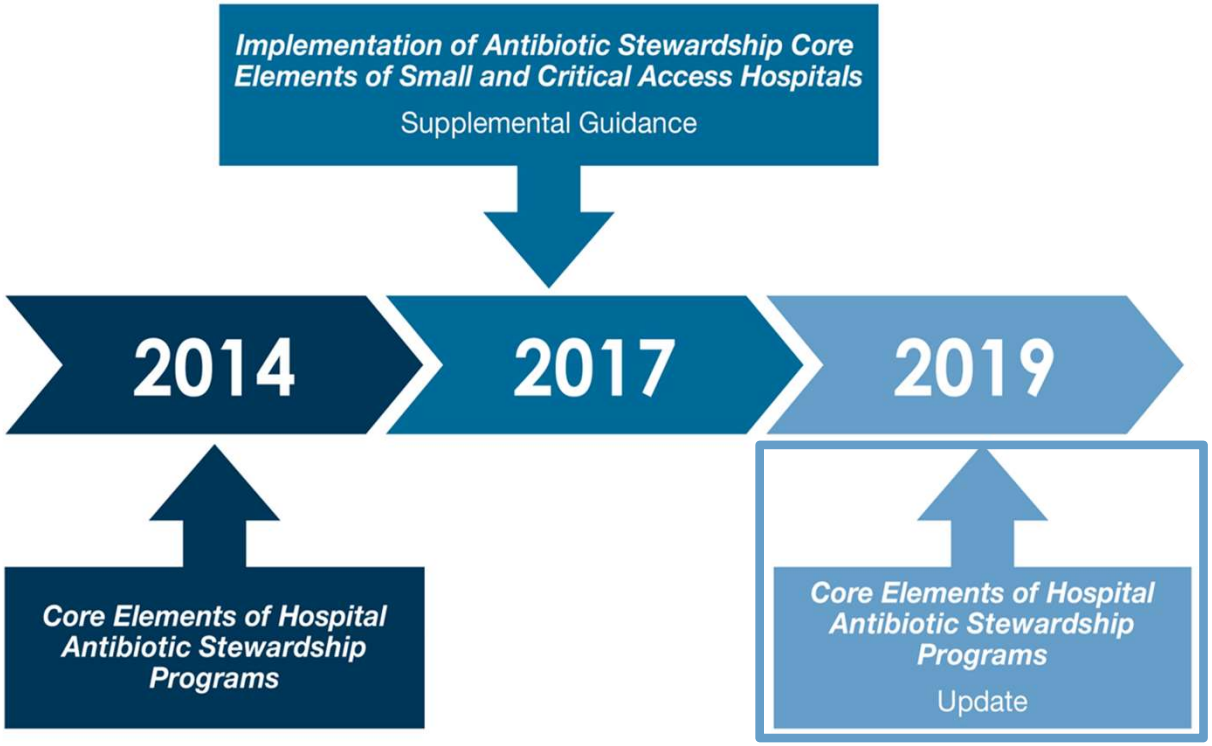
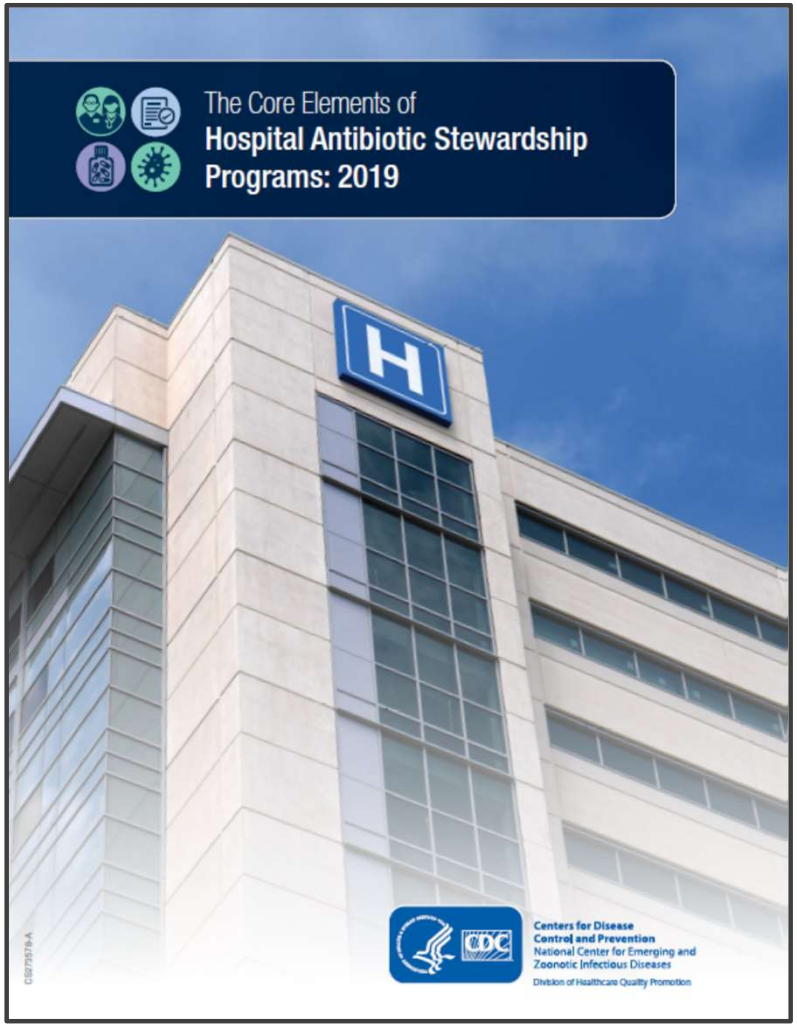


Figure. Timeline of Core Elements of Hospital Antibiotic Stewardship Programs



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.

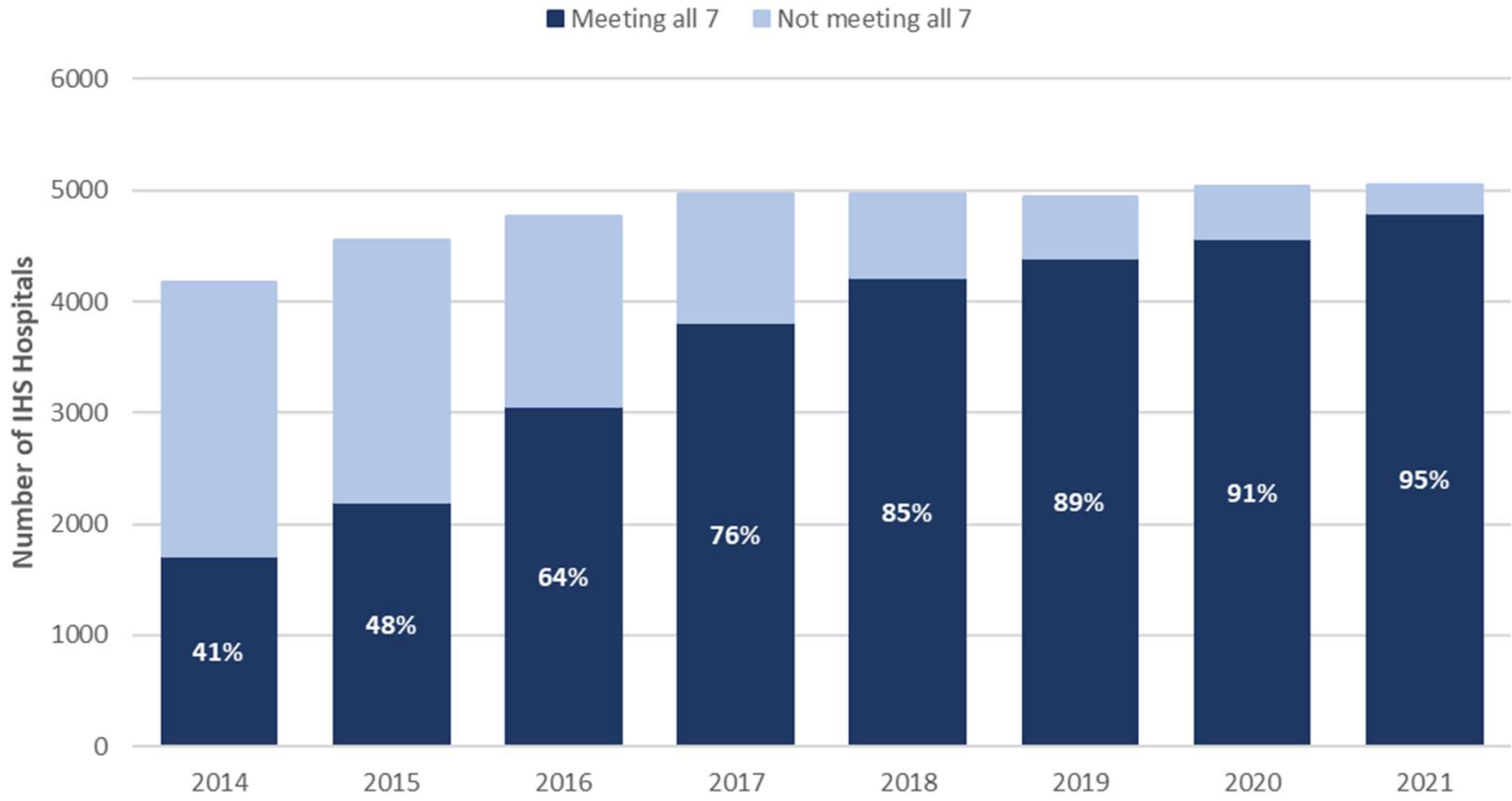
The Core Elements of Hospital Antibiotic Stewardship Programs

Core Elements of Hospital Antibiotic Stewardship Programs at the Indian Health Service

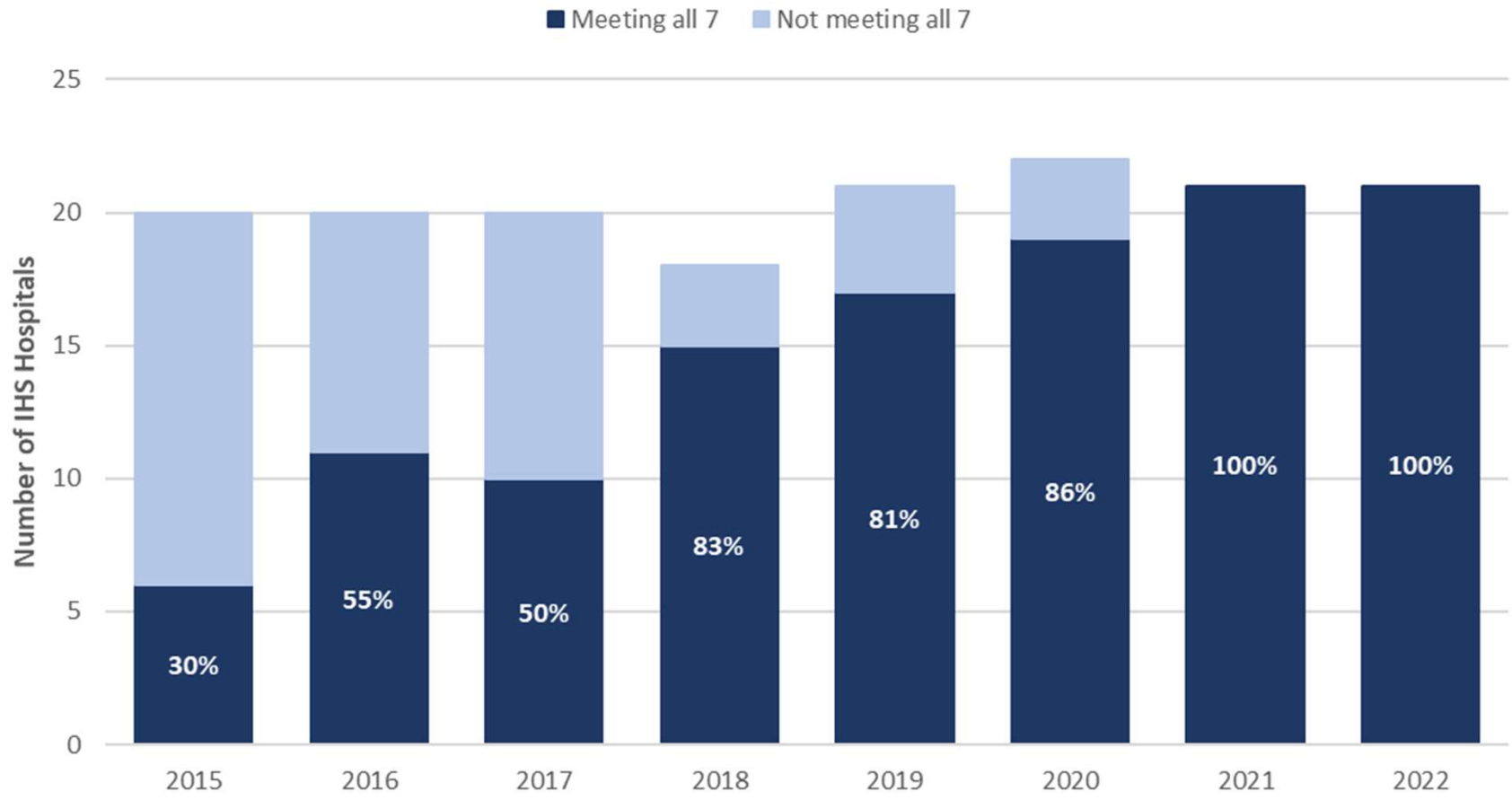
Assessment

- Indian Health Service acute care facilities that submitted the NHSN Patient Safety Component – Annual Hospital Survey
- Questions from the Annual Hospital Survey were mapped
- Descriptive statistics
  - Proportion of hospitals that self-reported implementation of core elements

NHSN Annual Hospital Surveys 2014–2021: Number and Percent of *U.S. Hospitals* Meeting All 7 Core Elements



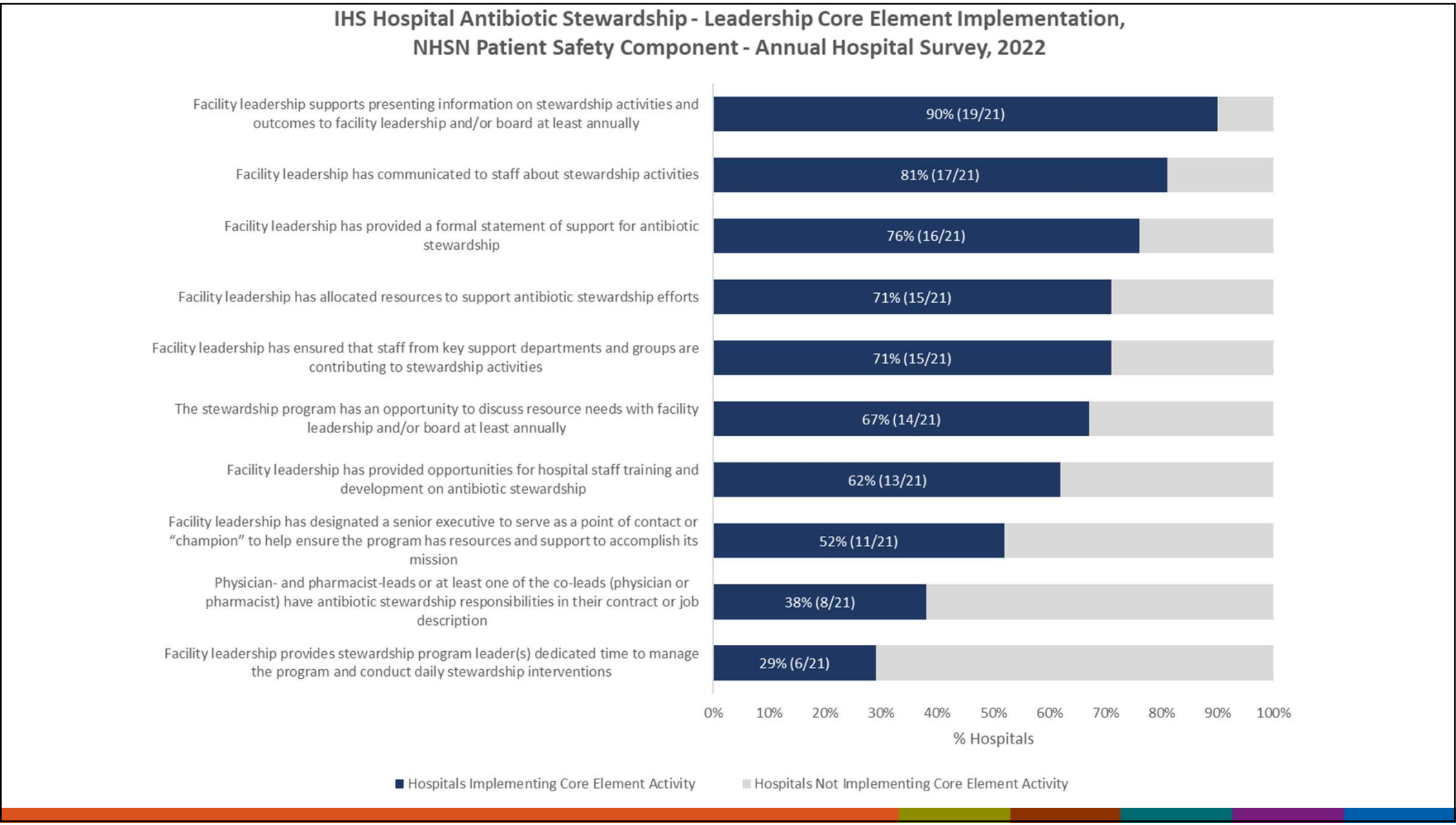
NHSN Annual Hospital Surveys 2015–2022: Number and Percent of *IHS Hospitals* Meeting All 7 Core Elements

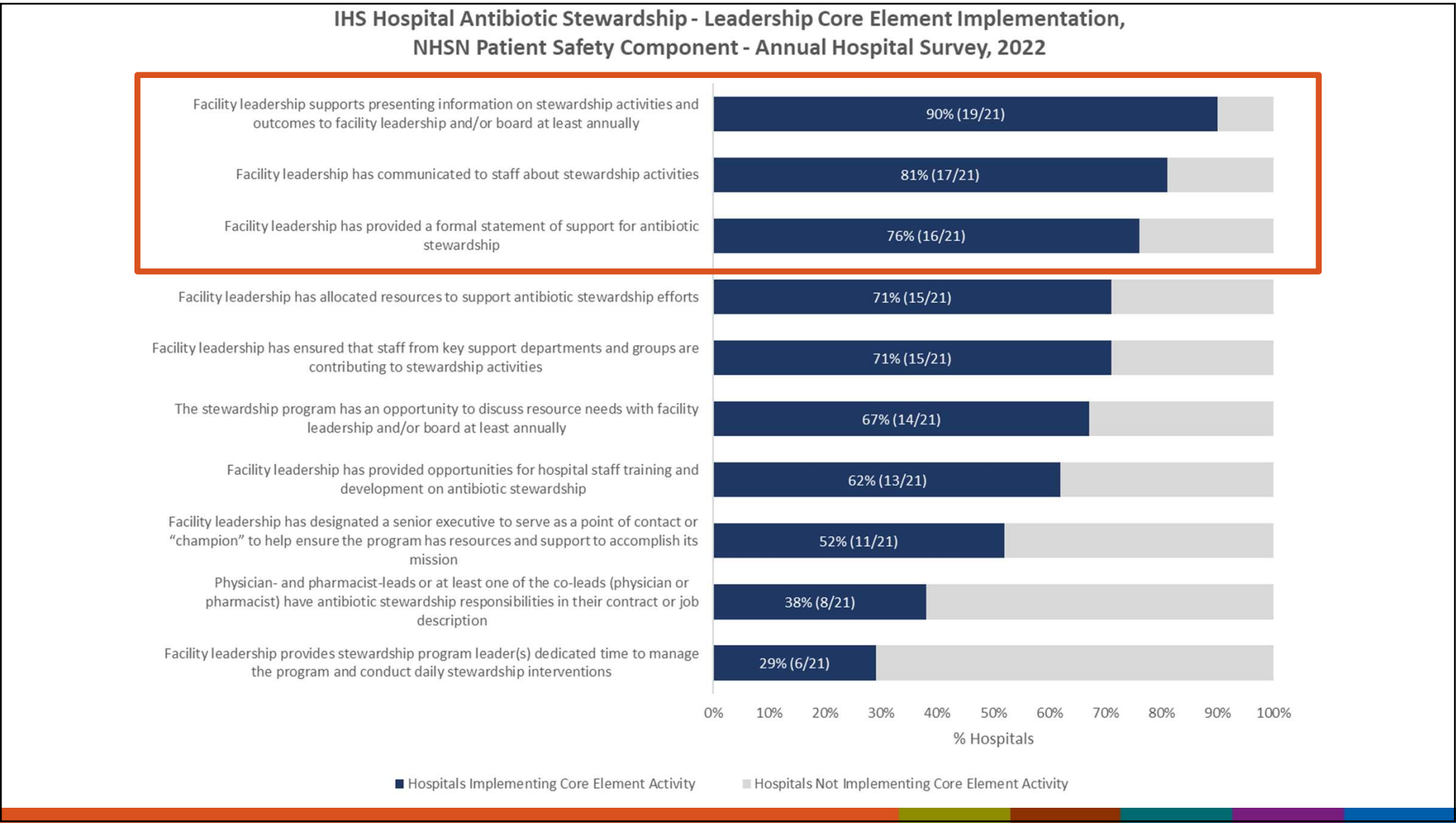


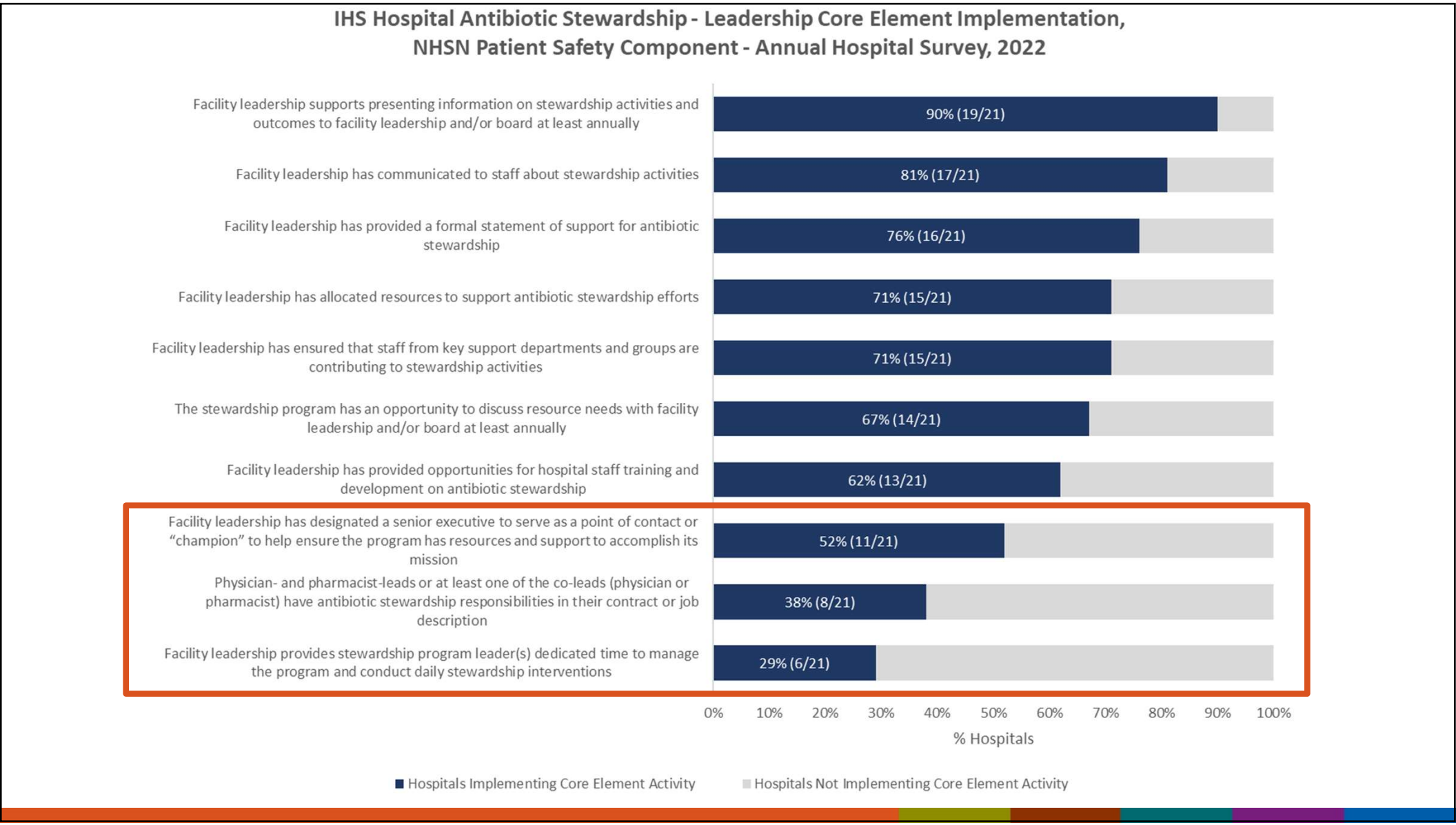
Core Elements of Hospital Antibiotic Stewardship Programs

Hospital Leadership Commitment

Dedicate necessary human, financial, and information technology resources.


IHS Hospital Antibiotic Stewardship - Leadership Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility leadership supports presenting information on stewardship activities and outcomes to facility leadership and/or board at least annually
90% (19/21)
Facility leadership has communicated to staff about stewardship activities
81% (17/21)
Facility leadership has provided a formal statement of support for antibiotic stewardship
76% (16/21)
Facility leadership has allocated resources to support antibiotic stewardship efforts
71% (15/21)
Facility leadership has ensured that staff from key support departments and groups are contributing to stewardship activities
71% (15/21)
The stewardship program has an opportunity to discuss resource needs with facility leadership and/or board at least annually
67% (14/21)
Facility leadership has provided opportunities for hospital staff training and development on antibiotic stewardship
62% (13/21)
Facility leadership has designated a senior executive to serve as a point of contact or "champion" to help ensure the program has resources and support to accomplish its mission
52% (11/21)
Physician- and pharmacist-leads or at least one of the co-leads (physician or pharmacist) have antibiotic stewardship responsibilities in their contract or job description
38% (8/21)
Facility leadership provides stewardship program leader(s) dedicated time to manage the program and conduct daily stewardship interventions
29% (6/21)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Leadership Core Element Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility leadership supports presenting information on stewardship activities and outcomes to facility leadership and/or board at least annually
90% (19/21)
Facility leadership has communicated to staff about stewardship activities
81% (17/21)
Facility leadership has provided a formal statement of support for antibiotic stewardship
76% (16/21)
Facility leadership has allocated resources to support antibiotic stewardship efforts
71% (15/21)
Facility leadership has ensured that staff from key support departments and groups are contributing to stewardship activities
71% (15/21)
The stewardship program has an opportunity to discuss resource needs with facility leadership and/or board at least annually
67% (14/21)
Facility leadership has provided opportunities for hospital staff training and development on antibiotic stewardship
62% (13/21)
Facility leadership has designated a senior executive to serve as a point of contact or "champion" to help ensure the program has resources and support to accomplish its mission
52% (11/21)
Physician- and pharmacist-leads or at least one of the co-leads (physician or pharmacist) have antibiotic stewardship responsibilities in their contract or job description
38% (8/21)
Facility leadership provides stewardship program leader(s) dedicated time to manage the program and conduct daily stewardship interventions
29% (6/21)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Leadership Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility leadership supports presenting information on stewardship activities and outcomes to facility leadership and/or board at least annually
90% (19/21)
Facility leadership has communicated to staff about stewardship activities
81% (17/21)
Facility leadership has provided a formal statement of support for antibiotic stewardship
76% (16/21)
Facility leadership has allocated resources to support antibiotic stewardship efforts
71% (15/21)
Facility leadership has ensured that staff from key support departments and groups are contributing to stewardship activities
71% (15/21)
The stewardship program has an opportunity to discuss resource needs with facility leadership and/or board at least annually
67% (14/21)
Facility leadership has provided opportunities for hospital staff training and development on antibiotic stewardship
62% (13/21)
Facility leadership has designated a senior executive to serve as a point of contact or "champion" to help ensure the program has resources and support to accomplish its mission
52% (11/21)
Physician- and pharmacist-leads or at least one of the co-leads (physician or pharmacist) have antibiotic stewardship responsibilities in their contract or job description
38% (8/21)
Facility leadership provides stewardship program leader(s) dedicated time to manage the program and conduct daily stewardship interventions
29% (6/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

Core Elements of Hospital Antibiotic Stewardship Programs

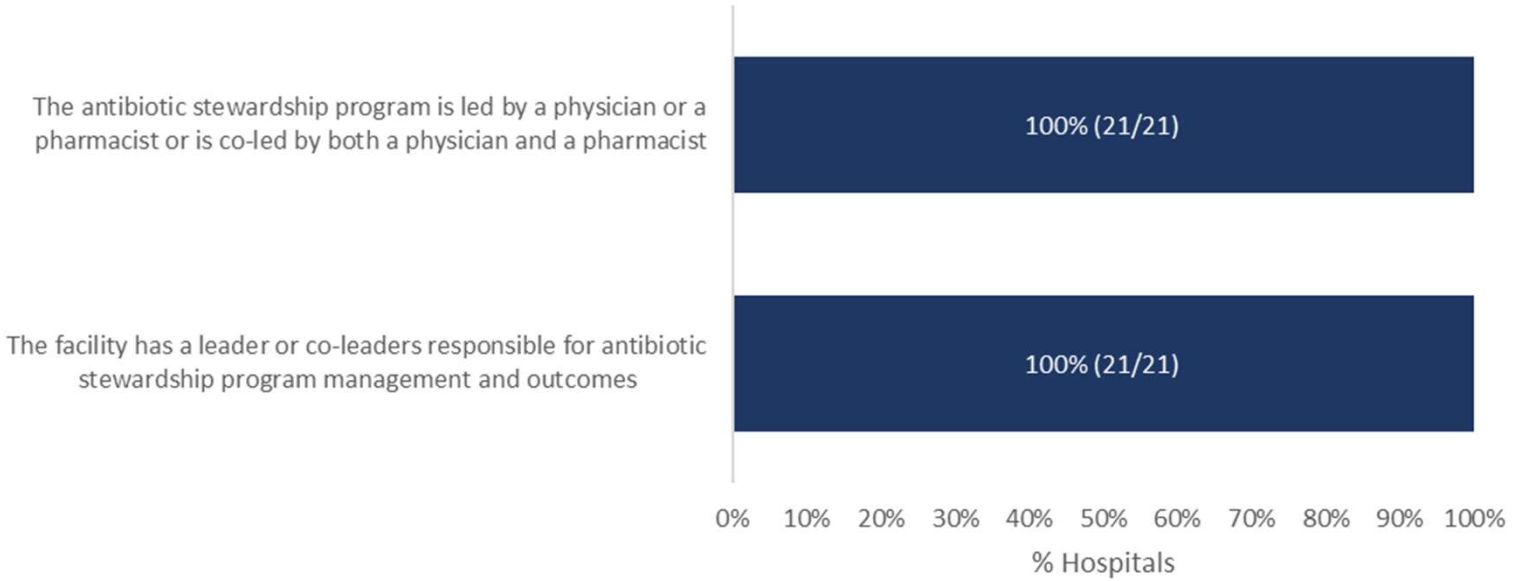
Accountability

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.

IHS Hospital Antibiotic Stewardship
Accountability & Pharmacy Expertise Core Elements Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2022

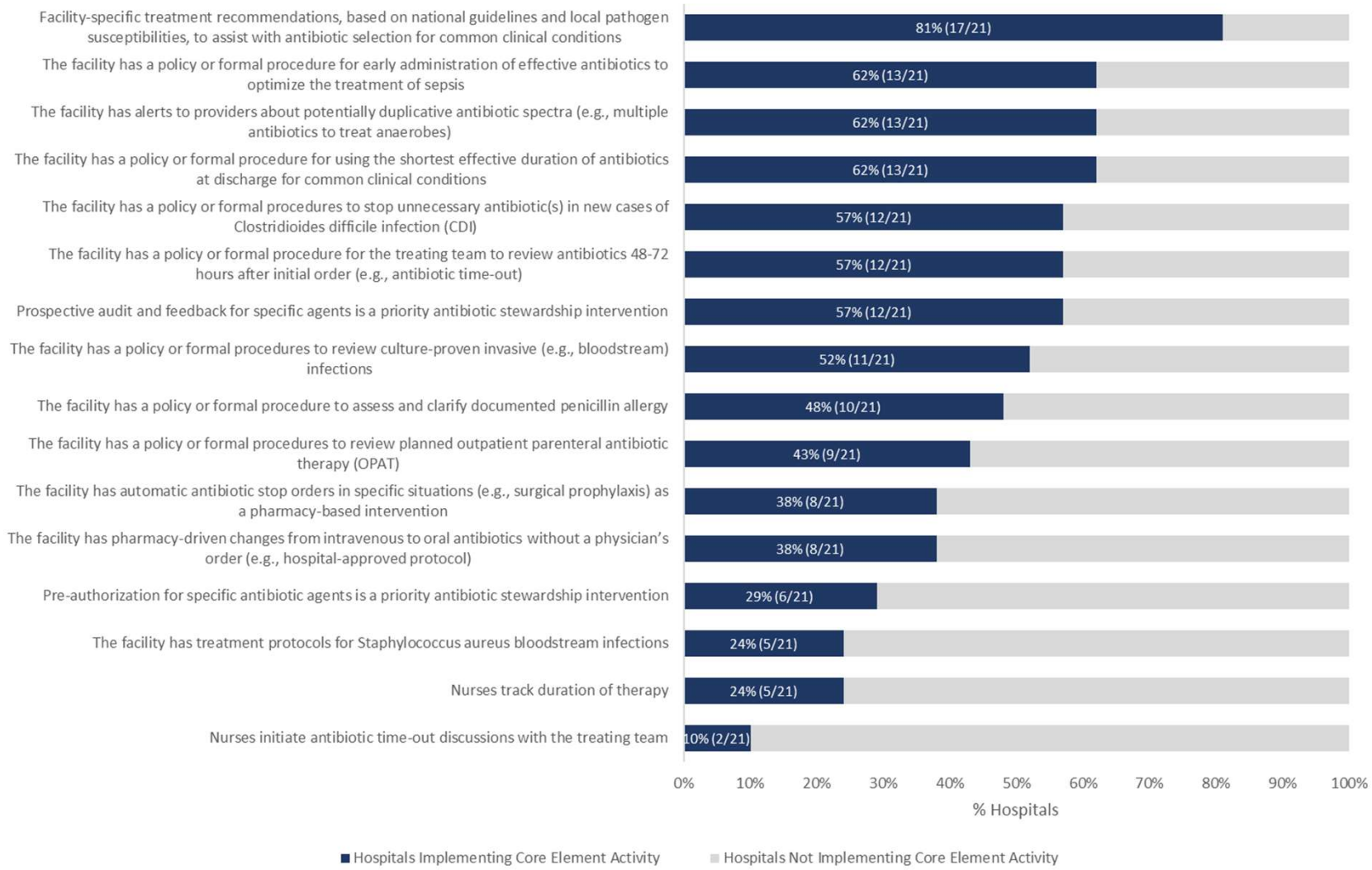


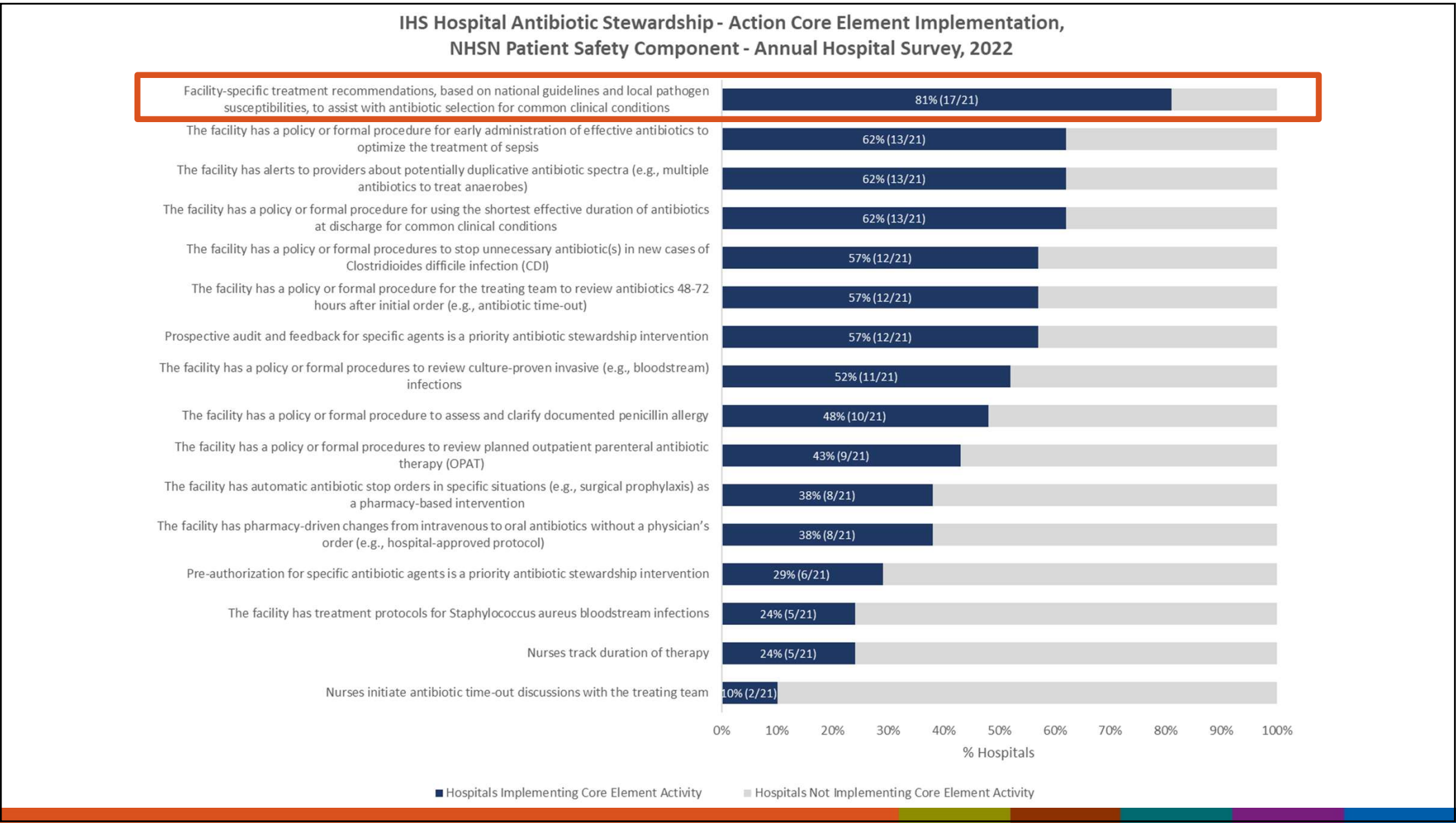
Core Elements of Hospital Antibiotic Stewardship Programs

Action

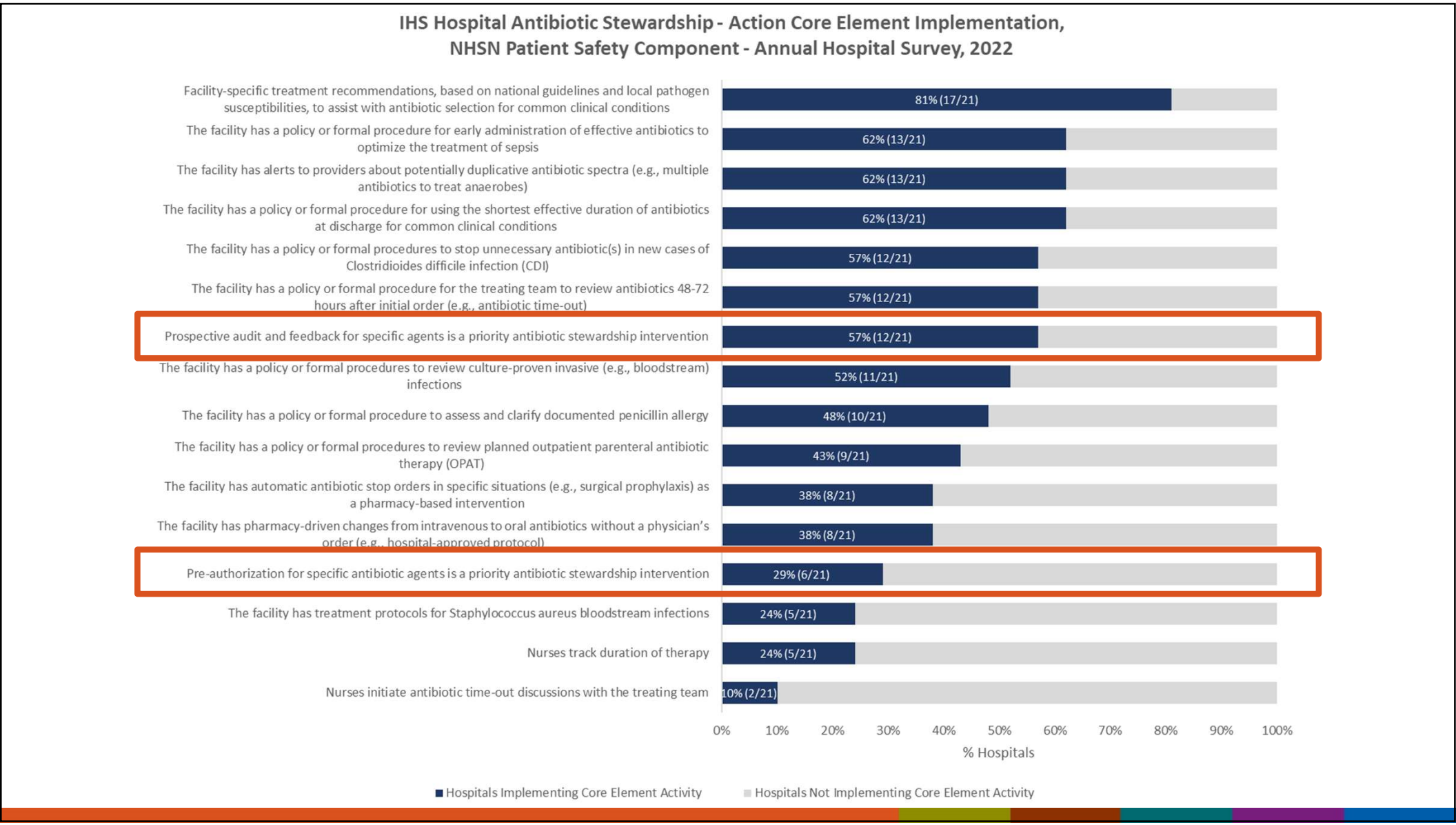
Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.

IHS Hospital Antibiotic Stewardship - Action Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022

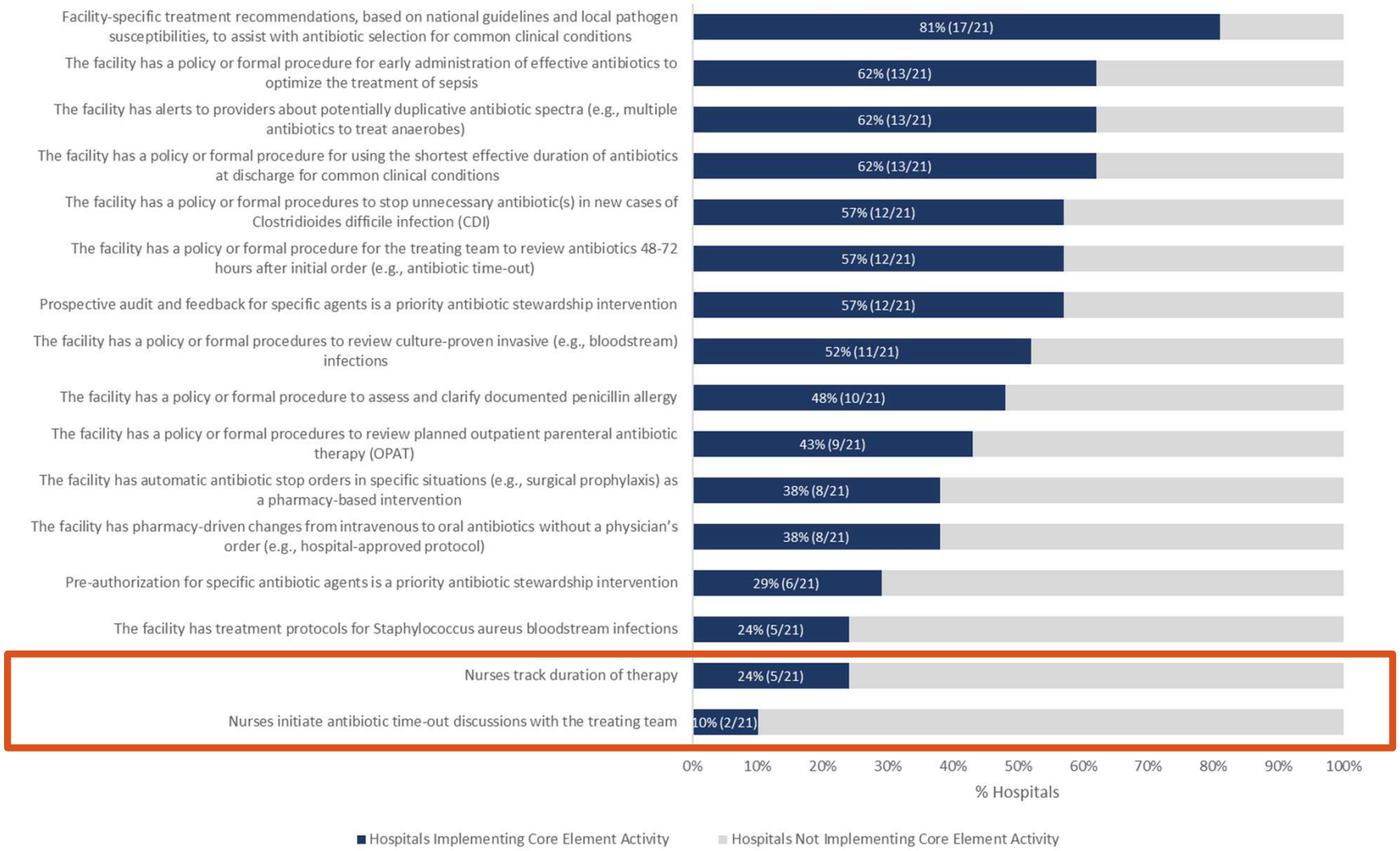



IHS Hospital Antibiotic Stewardship - Action Core Element Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility-specific treatment recommendations, based on national guidelines and local pathogen susceptibilities, to assist with antibiotic selection for common clinical conditions
81% (17/21)
The facility has a policy or formal procedure for early administration of effective antibiotics to optimize the treatment of sepsis
62% (13/21)
The facility has alerts to providers about potentially duplicative antibiotic spectra (e.g., multiple antibiotics to treat anaerobes)
62% (13/21)
The facility has a policy or formal procedure for using the shortest effective duration of antibiotics at discharge for common clinical conditions
62% (13/21)
The facility has a policy or formal procedures to stop unnecessary antibiotic(s) in new cases of Clostridioides difficile infection (CDI)
57% (12/21)
The facility has a policy or formal procedure for the treating team to review antibiotics 48-72 hours after initial order (e.g., antibiotic time-out)
57% (12/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
The facility has a policy or formal procedures to review culture-proven invasive (e.g., bloodstream) infections
52% (11/21)
The facility has a policy or formal procedure to assess and clarify documented penicillin allergy
48% (10/21)
The facility has a policy or formal procedures to review planned outpatient parenteral antibiotic therapy (OPAT)
43% (9/21)
The facility has automatic antibiotic stop orders in specific situations (e.g., surgical prophylaxis) as a pharmacy-based intervention
38% (8/21)
The facility has pharmacy-driven changes from intravenous to oral antibiotics without a physician's order (e.g., hospital-approved protocol)
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
The facility has treatment protocols for Staphylococcus aureus bloodstream infections
24% (5/21)
Nurses track duration of therapy
24% (5/21)
Nurses initiate antibiotic time-out discussions with the treating team
10% (2/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Action Core Element Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility-specific treatment recommendations, based on national guidelines and local pathogen susceptibilities, to assist with antibiotic selection for common clinical conditions
81% (17/21)
The facility has a policy or formal procedure for early administration of effective antibiotics to optimize the treatment of sepsis
62% (13/21)
The facility has alerts to providers about potentially duplicative antibiotic spectra (e.g., multiple antibiotics to treat anaerobes)
62% (13/21)
The facility has a policy or formal procedure for using the shortest effective duration of antibiotics at discharge for common clinical conditions
62% (13/21)
The facility has a policy or formal procedures to stop unnecessary antibiotic(s) in new cases of Clostridioides difficile infection (CDI)
57% (12/21)
The facility has a policy or formal procedure for the treating team to review antibiotics 48-72 hours after initial order (e.g., antibiotic time-out)
57% (12/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
The facility has a policy or formal procedures to review culture-proven invasive (e.g., bloodstream) infections
52% (11/21)
The facility has a policy or formal procedure to assess and clarify documented penicillin allergy
48% (10/21)
The facility has a policy or formal procedures to review planned outpatient parenteral antibiotic therapy (OPAT)
43% (9/21)
The facility has automatic antibiotic stop orders in specific situations (e.g., surgical prophylaxis) as a pharmacy-based intervention
38% (8/21)
The facility has pharmacy-driven changes from intravenous to oral antibiotics without a physician's order (e.g., hospital-approved protocol)
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
The facility has treatment protocols for Staphylococcus aureus bloodstream infections
24% (5/21)
Nurses track duration of therapy
24% (5/21)
Nurses initiate antibiotic time-out discussions with the treating team
10% (2/21)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Action Core Element Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2022
Facility-specific treatment recommendations, based on national guidelines and local pathogen susceptibilities, to assist with antibiotic selection for common clinical conditions
81% (17/21)
The facility has a policy or formal procedure for early administration of effective antibiotics to optimize the treatment of sepsis
62% (13/21)
The facility has alerts to providers about potentially duplicative antibiotic spectra (e.g., multiple antibiotics to treat anaerobes)
62% (13/21)
The facility has a policy or formal procedure for using the shortest effective duration of antibiotics at discharge for common clinical conditions
62% (13/21)
The facility has a policy or formal procedures to stop unnecessary antibiotic(s) in new cases of Clostridioides difficile infection (CDI)
57% (12/21)
The facility has a policy or formal procedure for the treating team to review antibiotics 48-72 hours after initial order (e.g., antibiotic time-out)
57% (12/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
The facility has a policy or formal procedures to review culture-proven invasive (e.g., bloodstream) infections
52% (11/21)
The facility has a policy or formal procedure to assess and clarify documented penicillin allergy
48% (10/21)
The facility has a policy or formal procedures to review planned outpatient parenteral antibiotic therapy (OPAT)
43% (9/21)
The facility has automatic antibiotic stop orders in specific situations (e.g., surgical prophylaxis) as a pharmacy-based intervention
38% (8/21)
The facility has pharmacy-driven changes from intravenous to oral antibiotics without a physician's order (e.g., hospital-approved protocol)
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
The facility has treatment protocols for Staphylococcus aureus bloodstream infections
24% (5/21)
Nurses track duration of therapy
24% (5/21)
Nurses initiate antibiotic time-out discussions with the treating team
10% (2/21)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

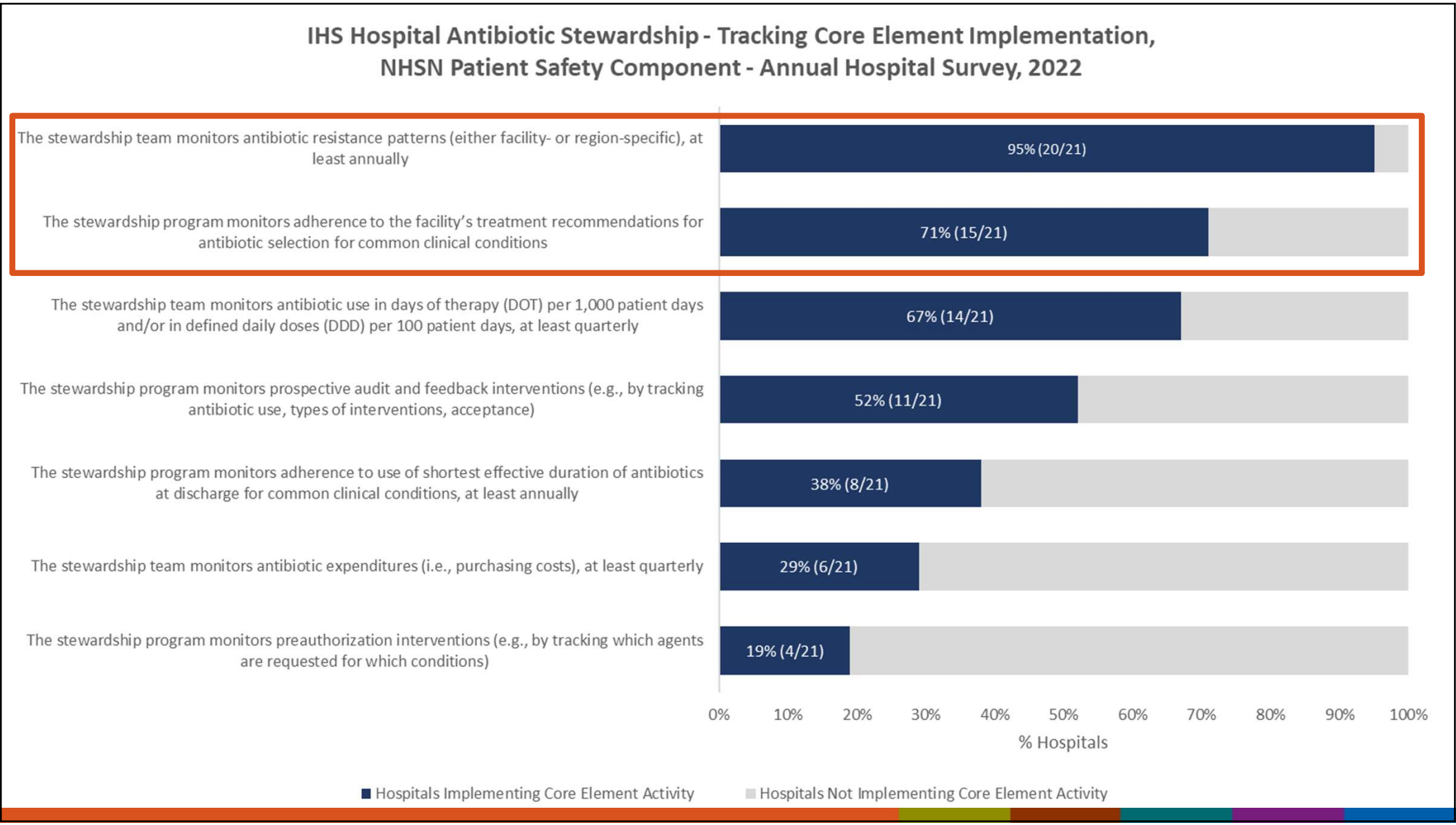
IHS Hospital Antibiotic Stewardship - Action Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022

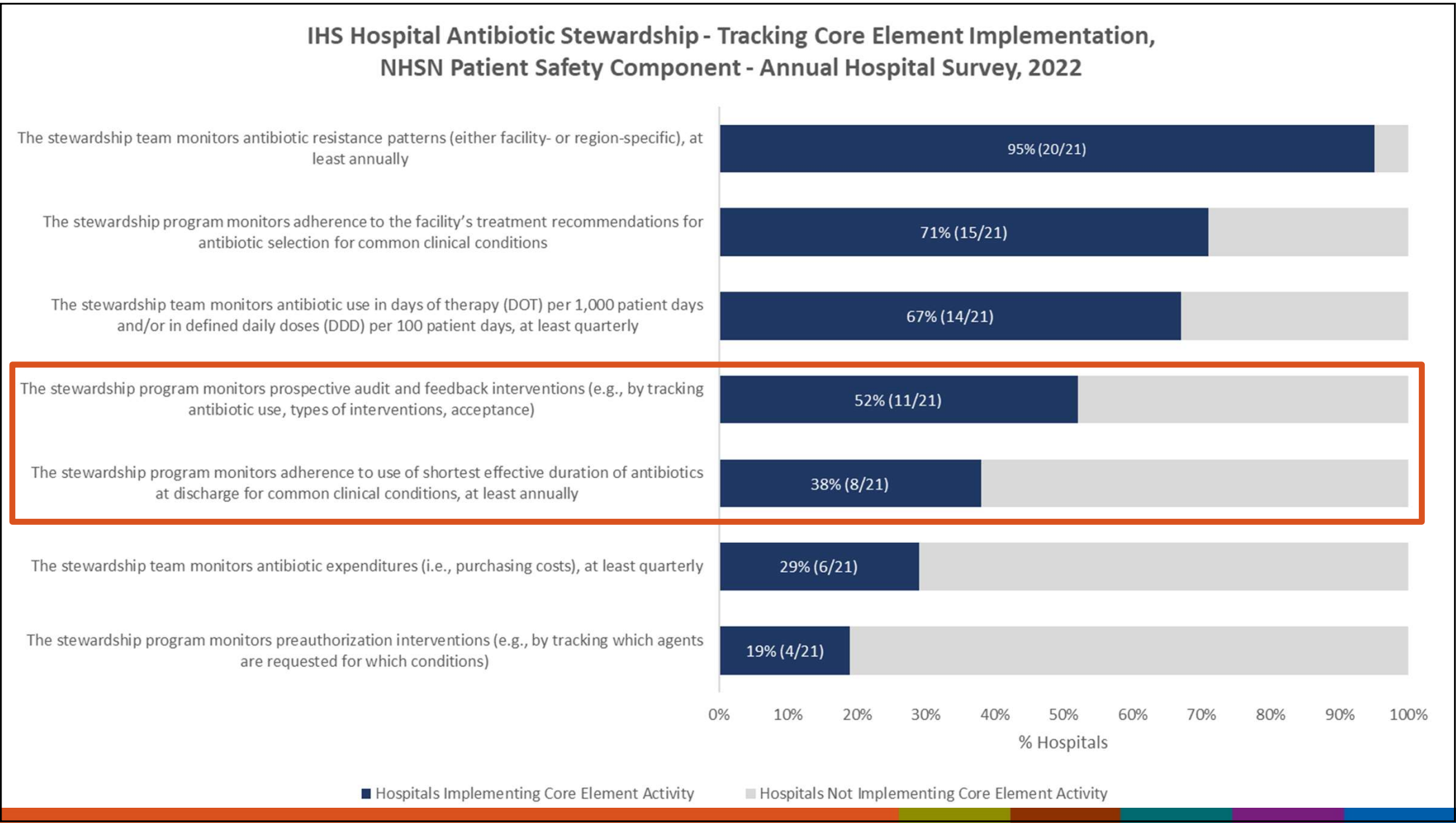


Core Elements of Hospital Antibiotic Stewardship Programs

Tracking

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


IHS Hospital Antibiotic Stewardship - Tracking Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
The stewardship team monitors antibiotic resistance patterns (either facility- or region-specific), at least annually
95% (20/21)
The stewardship program monitors adherence to the facility's treatment recommendations for antibiotic selection for common clinical conditions
71% (15/21)
The stewardship team monitors antibiotic use in days of therapy (DOT) per 1,000 patient days and/or in defined daily doses (DDD) per 100 patient days, at least quarterly
67% (14/21)
The stewardship program monitors prospective audit and feedback interventions (e.g., by tracking antibiotic use, types of interventions, acceptance)
52% (11/21)
The stewardship program monitors adherence to use of shortest effective duration of antibiotics at discharge for common clinical conditions, at least annually
38% (8/21)
The stewardship team monitors antibiotic expenditures (i.e., purchasing costs), at least quarterly
29% (6/21)
The stewardship program monitors preauthorization interventions (e.g., by tracking which agents are requested for which conditions)
19% (4/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

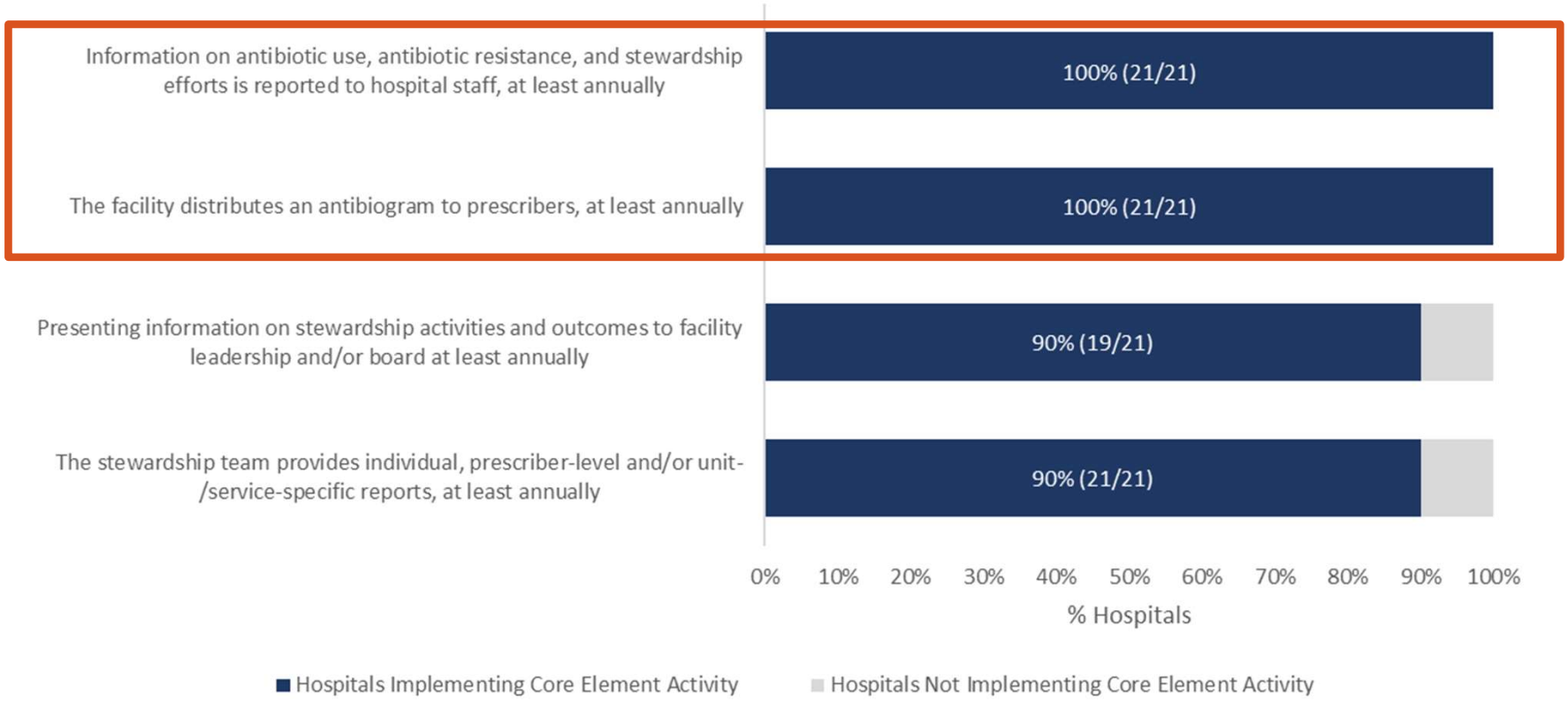

IHS Hospital Antibiotic Stewardship - Tracking Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
The stewardship team monitors antibiotic resistance patterns (either facility- or region-specific), at least annually
95% (20/21)
The stewardship program monitors adherence to the facility's treatment recommendations for antibiotic selection for common clinical conditions
71% (15/21)
The stewardship team monitors antibiotic use in days of therapy (DOT) per 1,000 patient days and/or in defined daily doses (DDD) per 100 patient days, at least quarterly
67% (14/21)
The stewardship program monitors prospective audit and feedback interventions (e.g., by tracking antibiotic use, types of interventions, acceptance)
52% (11/21)
The stewardship program monitors adherence to use of shortest effective duration of antibiotics at discharge for common clinical conditions, at least annually
38% (8/21)
The stewardship team monitors antibiotic expenditures (i.e., purchasing costs), at least quarterly
29% (6/21)
The stewardship program monitors preauthorization interventions (e.g., by tracking which agents are requested for which conditions)
19% (4/21)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

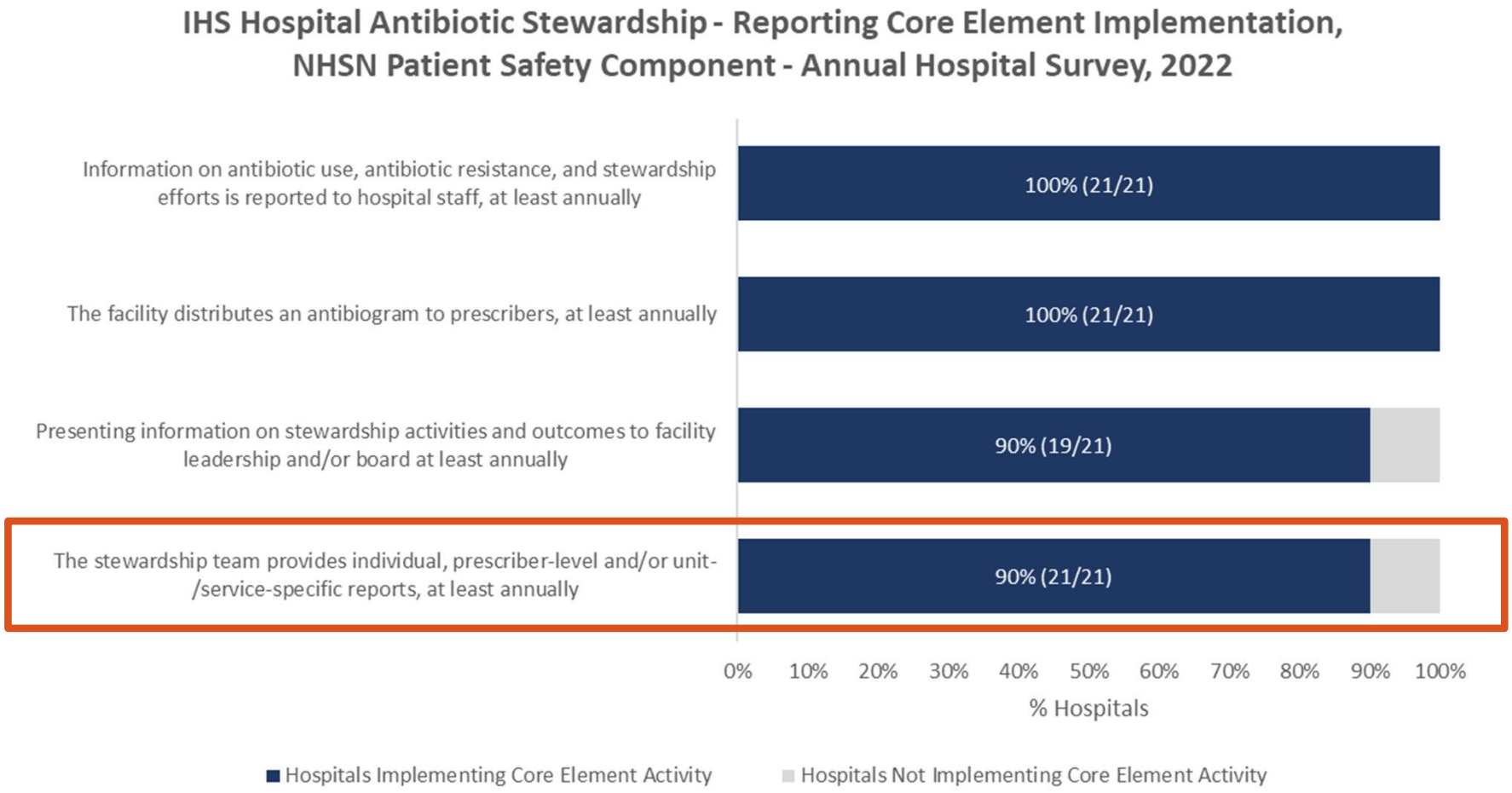
Core Elements of Hospital Antibiotic Stewardship Programs

Reporting

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

IHS Hospital Antibiotic Stewardship - Reporting Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022

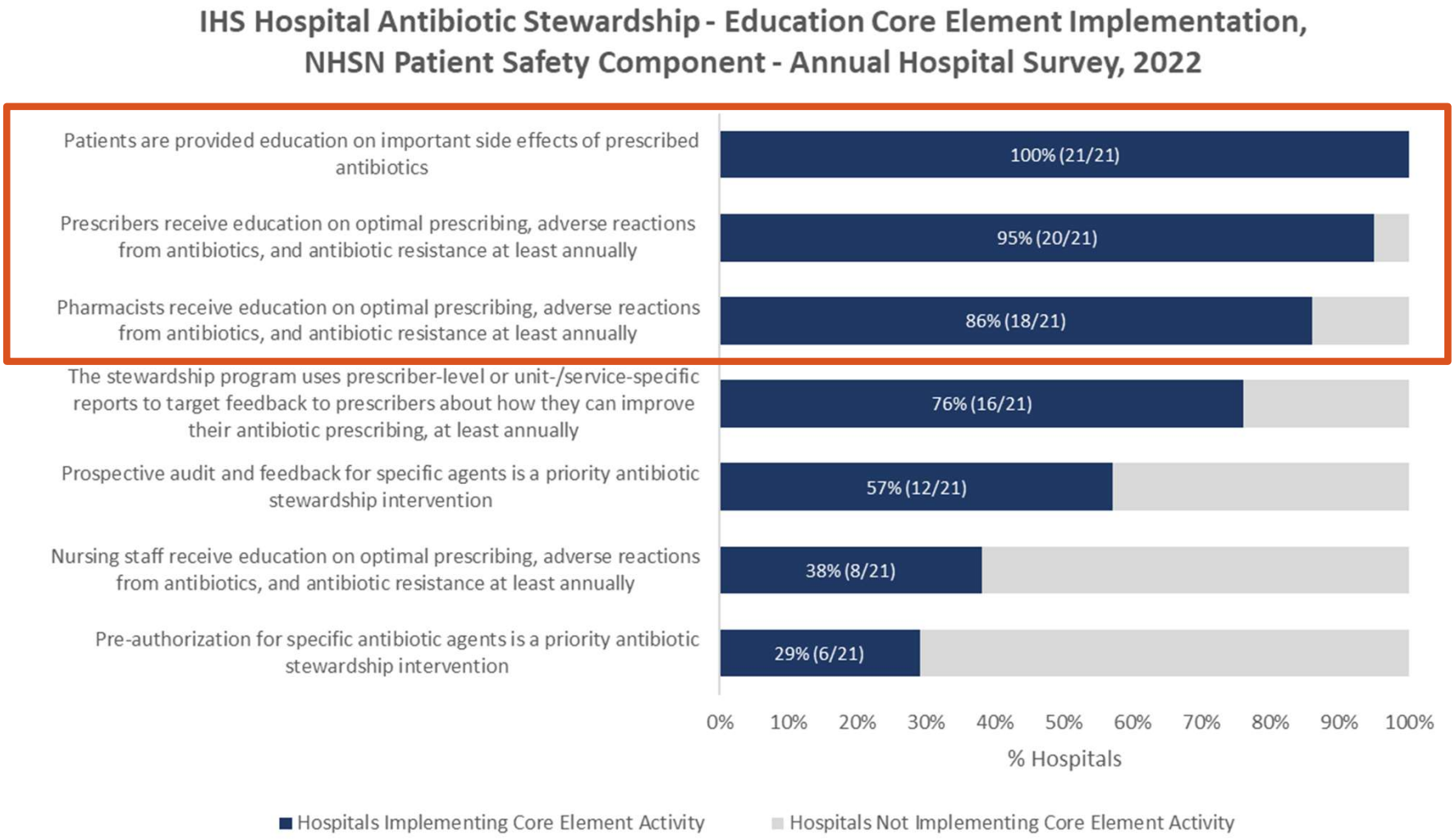


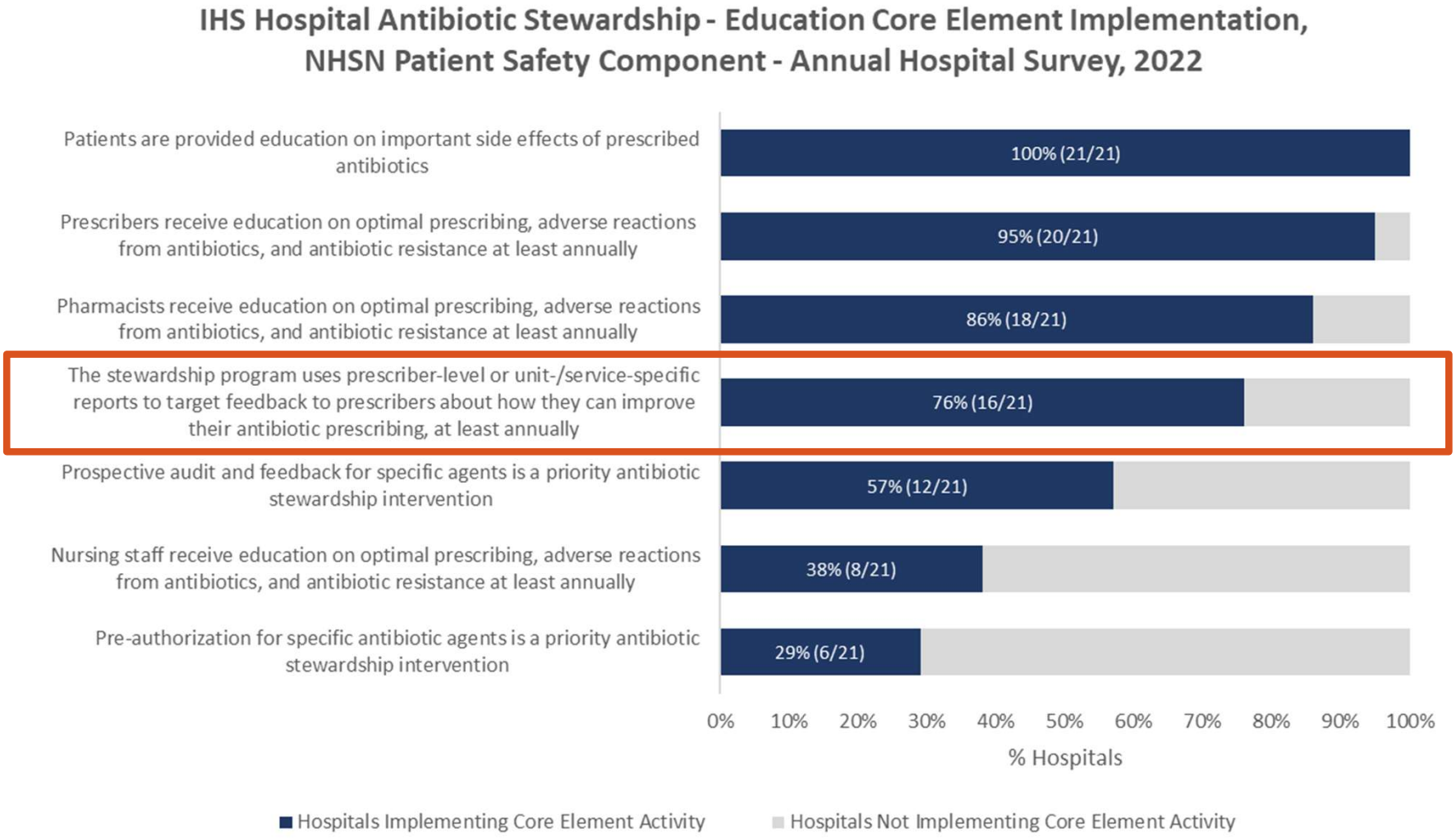

IHS Hospital Antibiotic Stewardship - Reporting Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Information on antibiotic use, antibiotic resistance, and stewardship efforts is reported to hospital staff, at least annually
100% (21/21)
The facility distributes an antibiogram to prescribers, at least annually
100% (21/21)
Presenting information on stewardship activities and outcomes to facility leadership and/or board at least annually
90% (19/21)
The stewardship team provides individual, prescriber-level and/or unit-/service-specific reports, at least annually
90% (21/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

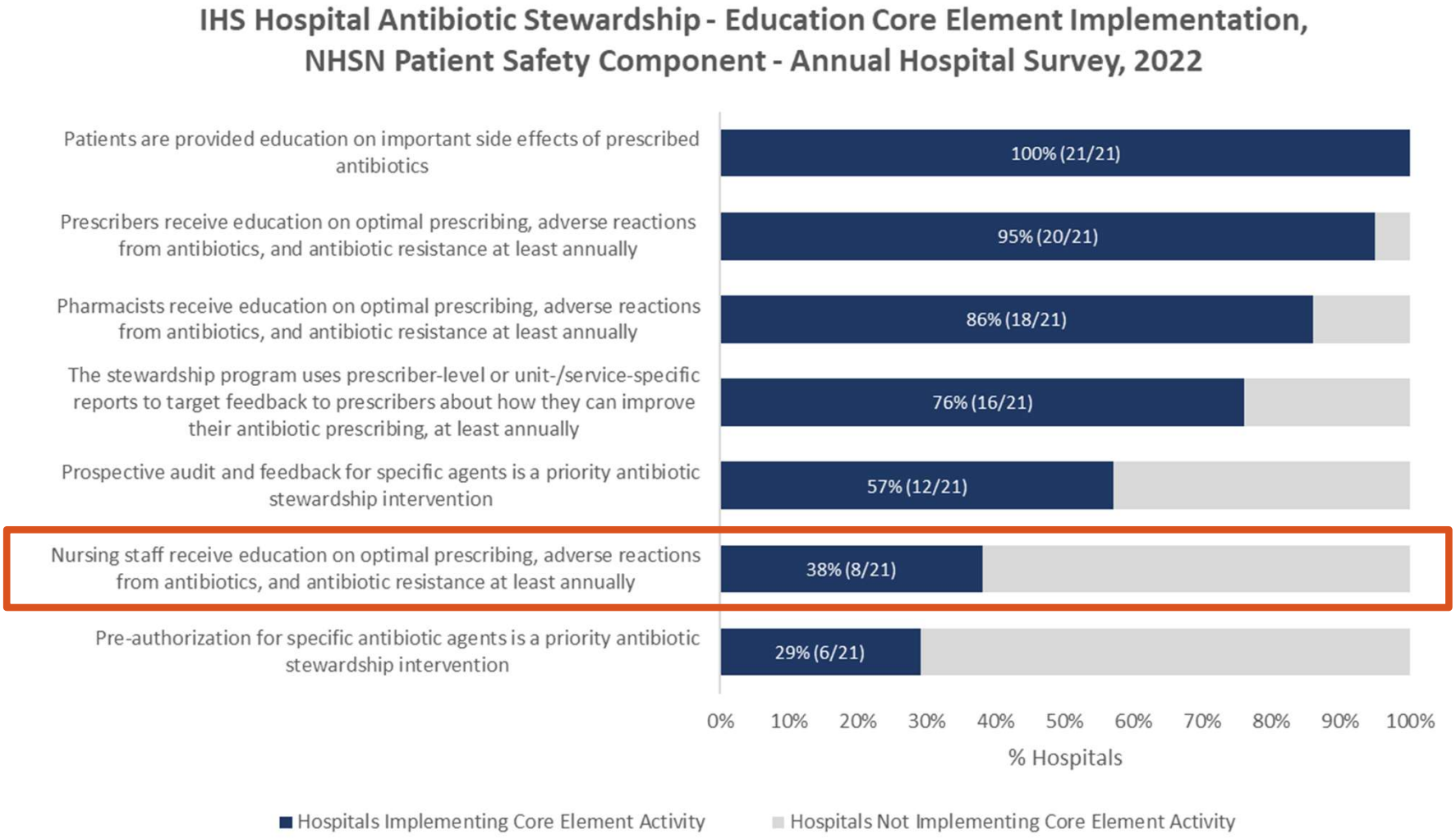
Core Elements of Hospital Antibiotic Stewardship Programs

Education

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


IHS Hospital Antibiotic Stewardship - Education Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Patients are provided education on important side effects of prescribed antibiotics
100% (21/21)
Prescribers receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
95% (20/21)
Pharmacists receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
86% (18/21)
The stewardship program uses prescriber-level or unit-/service-specific reports to target feedback to prescribers about how they can improve their antibiotic prescribing, at least annually
76% (16/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
Nursing staff receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Education Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Patients are provided education on important side effects of prescribed antibiotics
100% (21/21)
Prescribers receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
95% (20/21)
Pharmacists receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
86% (18/21)
The stewardship program uses prescriber-level or unit-/service-specific reports to target feedback to prescribers about how they can improve their antibiotic prescribing, at least annually
76% (16/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
Nursing staff receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity


IHS Hospital Antibiotic Stewardship - Education Core Element Implementation, NHSN Patient Safety Component - Annual Hospital Survey, 2022
Patients are provided education on important side effects of prescribed antibiotics
100% (21/21)
Prescribers receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
95% (20/21)
Pharmacists receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
86% (18/21)
The stewardship program uses prescriber-level or unit-/service-specific reports to target feedback to prescribers about how they can improve their antibiotic prescribing, at least annually
76% (16/21)
Prospective audit and feedback for specific agents is a priority antibiotic stewardship intervention
57% (12/21)
Nursing staff receive education on optimal prescribing, adverse reactions from antibiotics, and antibiotic resistance at least annually
38% (8/21)
Pre-authorization for specific antibiotic agents is a priority antibiotic stewardship intervention
29% (6/21)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
% Hospitals
Hospitals Implementing Core Element Activity
Hospitals Not Implementing Core Element Activity

How Can We Continue to Strengthen Hospital Antibiotic Stewardship Programs?

Priorities for Hospital Core Element Implementation

CDC Released *Priorities* to Enhance the Quality and Impact of Hospital Antibiotic Stewardship Programs

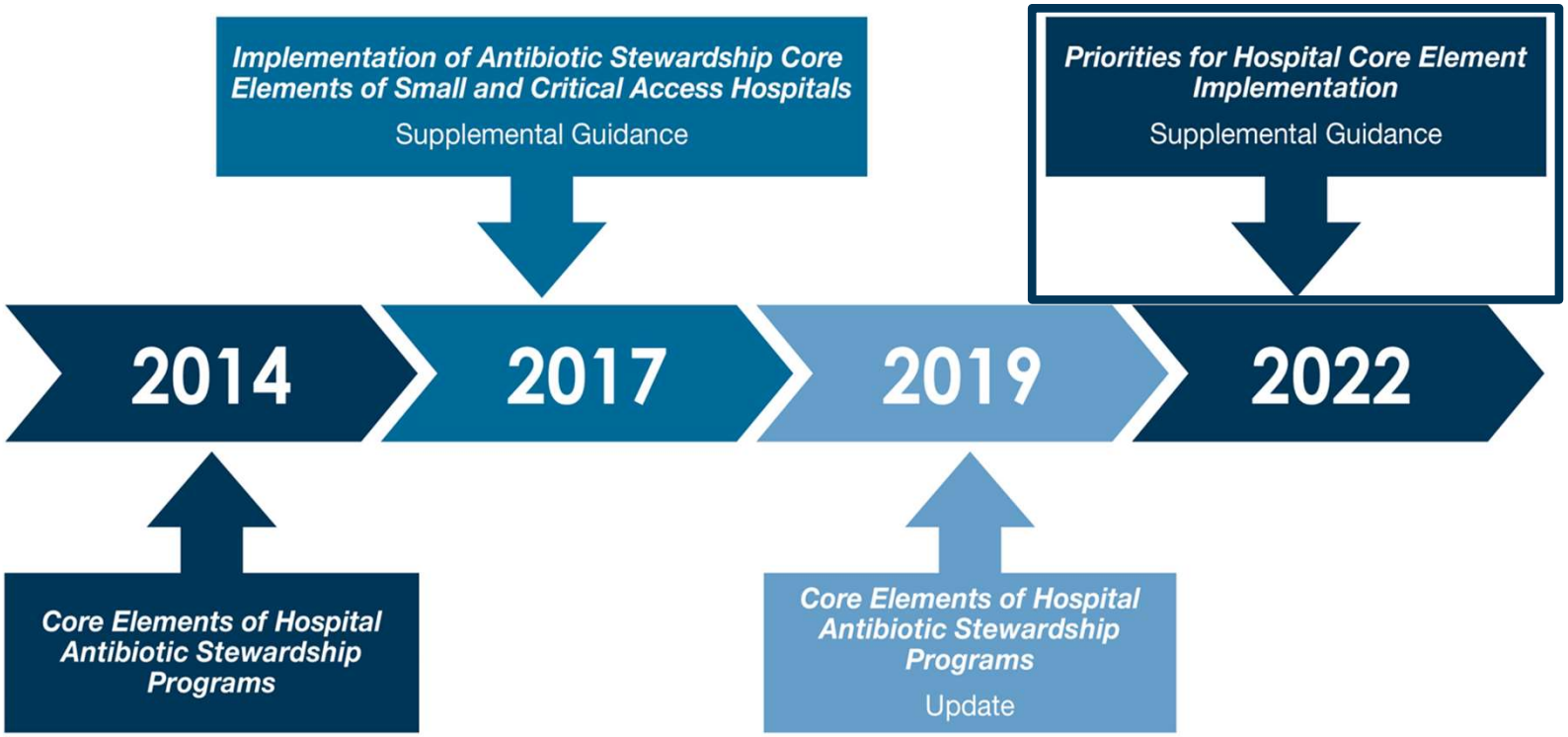


Figure. Timeline of Core Elements of Hospital Antibiotic Stewardship Programs

Priorities Are Derived from the Hospital Core Elements

- Highlight a **subset** of effective stewardship implementation approaches supported by evidence and/or recommended by stewardship experts

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Hospital Leadership Commitment	
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.
Accountability	
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.*
Pharmacy/Stewardship Expertise	
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.
Action	
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.
Tracking	
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.	Hospital submits antibiotic use data to the NHSN Antimicrobial Use Option.
Reporting	
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.
Education	
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.	No implementation priority identified.

* For critical access hospitals (CAHs), this criterion can be met if the hospital has a physician leader with a pharmacist involved in stewardship (recognizing that some CAHs do not have pharmacists on staff, so co-leadership is not possible).

CS 335529-B

https://www.cdc.gov/antibiotic-use/core-elements/hospital/priorities.html

Priorities Are Derived from the Hospital Core Elements

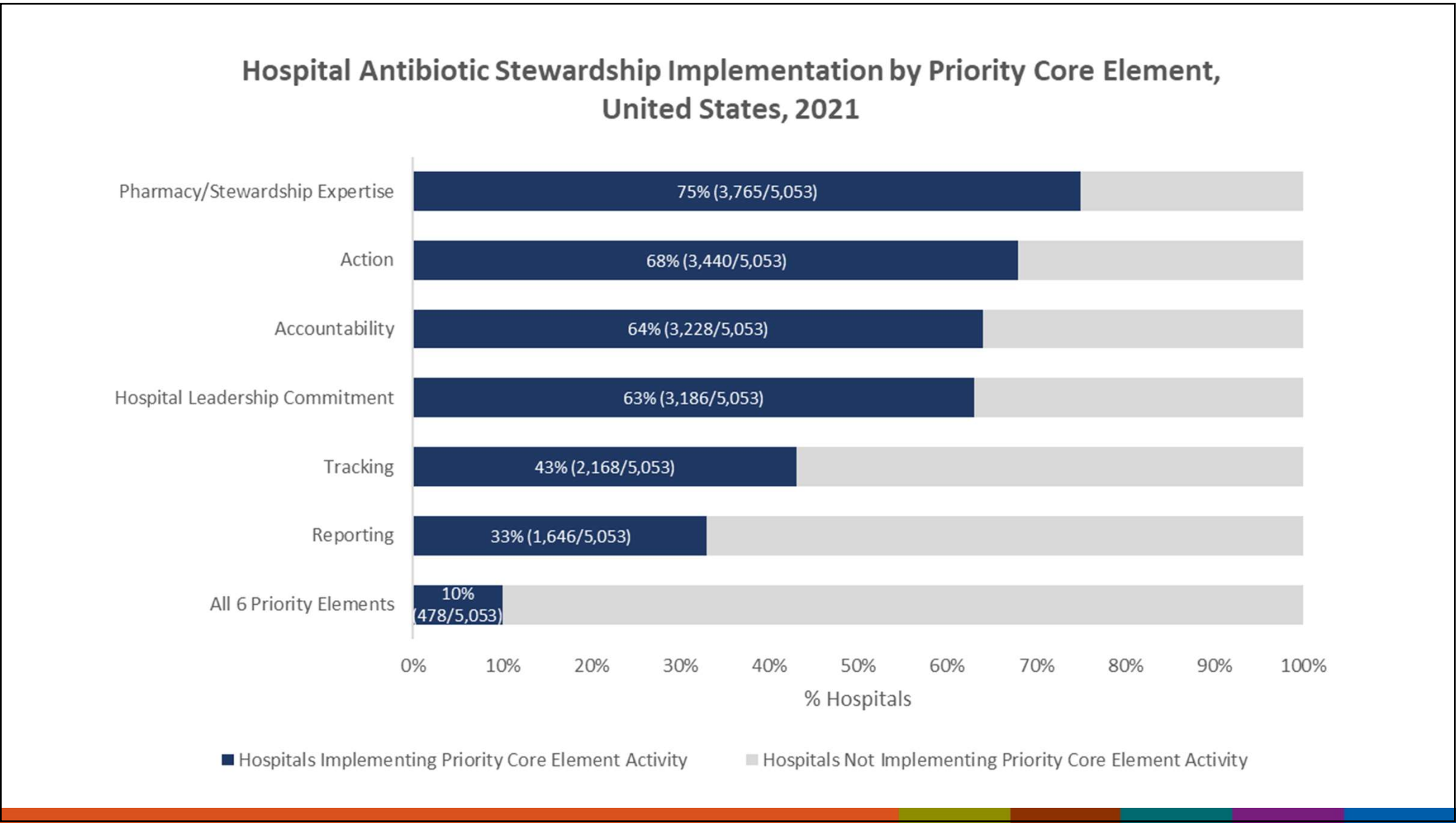
- Highlight a subset of effective stewardship implementation approaches supported by evidence and/or recommended by stewardship experts
- Provide hospital leadership and antibiotic stewards opportunities to **expand** their antibiotic stewardship programs

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Hospital Leadership Commitment	
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.
Accountability	
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.*
Pharmacy/Stewardship Expertise	
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.
Action	
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.
Tracking	
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.	Hospital submits antibiotic use data to the NHSN Antimicrobial Use Option.
Reporting	
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.
Education	
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.	No implementation priority identified.

* For critical access hospitals (CAHs), this criterion can be met if the hospital has a physician leader with a pharmacist involved in stewardship (recognizing that some CAHs do not have pharmacists on staff, so co-leadership is not possible).

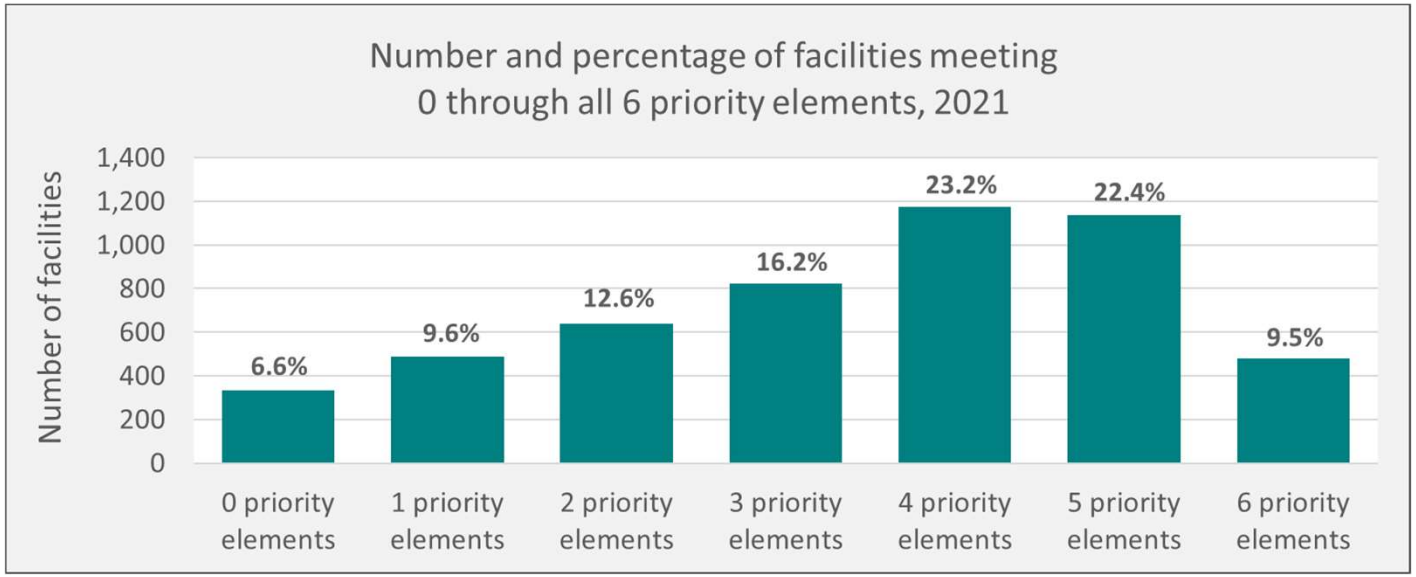
CS 335529-B

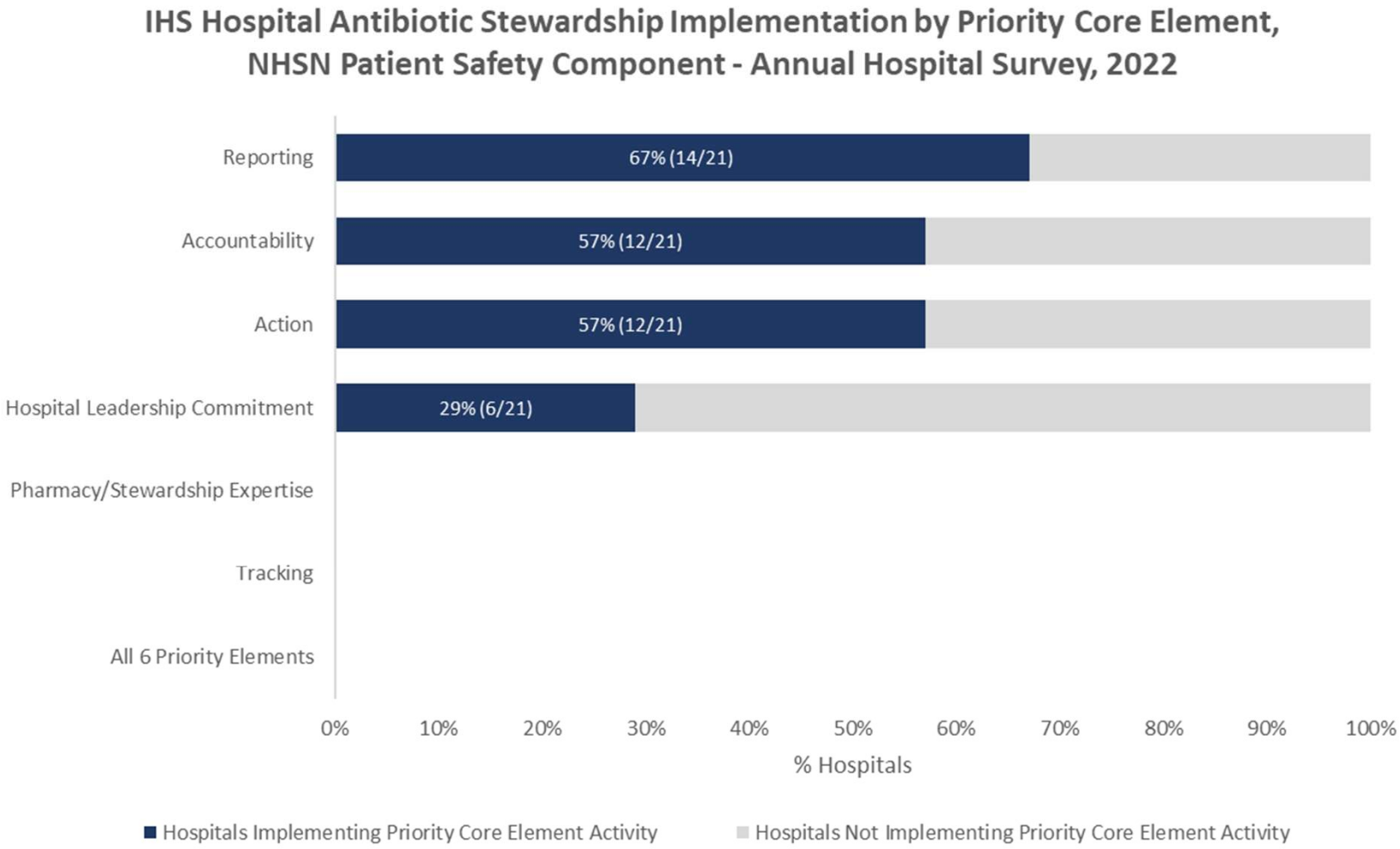
https://www.cdc.gov/antibiotic-use/core-elements/hospital/priorities.html


Hospital Antibiotic Stewardship Implementation by Priority Core Element, United States, 2021
Pharmacy/Stewardship Expertise
75% (3,765/5,053)
Action
68% (3,440/5,053)
Accountability
64% (3,228/5,053)
Hospital Leadership Commitment
63% (3,186/5,053)
Tracking
43% (2,168/5,053)
Reporting
33% (1,646/5,053)
All 6 Priority Elements
10% (478/5,053)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% Hospitals
Hospitals Implementing Priority Core Element Activity
Hospitals Not Implementing Priority Core Element Activity

Priorities for Hospital Core Element Implementation

- 479 (9.5%) hospitals met all 6 priority elements in 2021
- 2,308 (45.6%) hospitals met 4 or 5 of the priority elements in 2021





Pharmacy/Stewardship Expertise and Tracking priorities could not be assessed in the 2022 NHSN Annual Hospital Survey data

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Hospital Leadership Commitment	
 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.

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Accountability	
 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.*

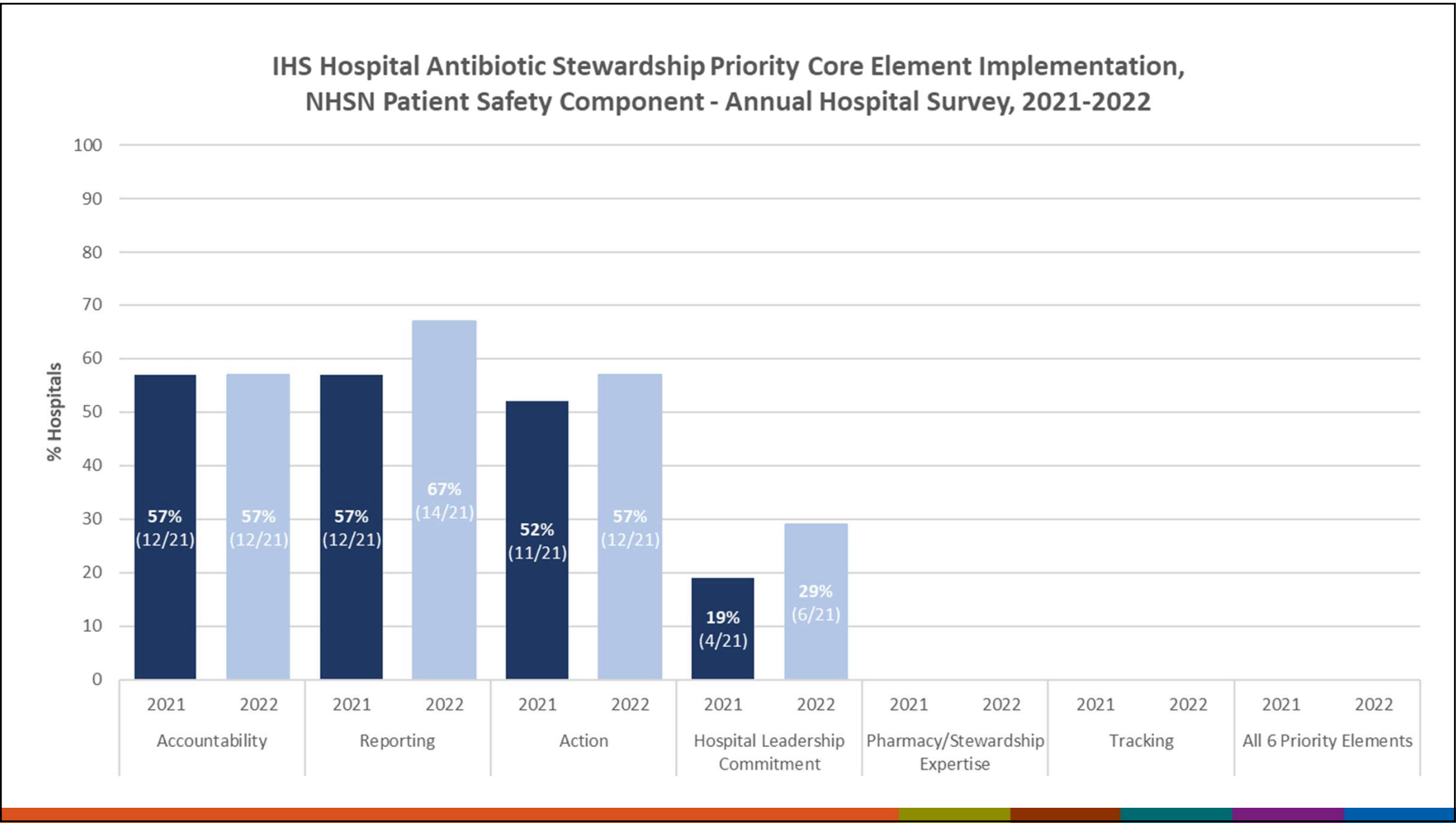
*For critical access hospitals (CAHs), accountability can be met if the hospital has a physician leader with a pharmacist involved in stewardship

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Pharmacy/Stewardship Expertise	
 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.

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Action	
 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.

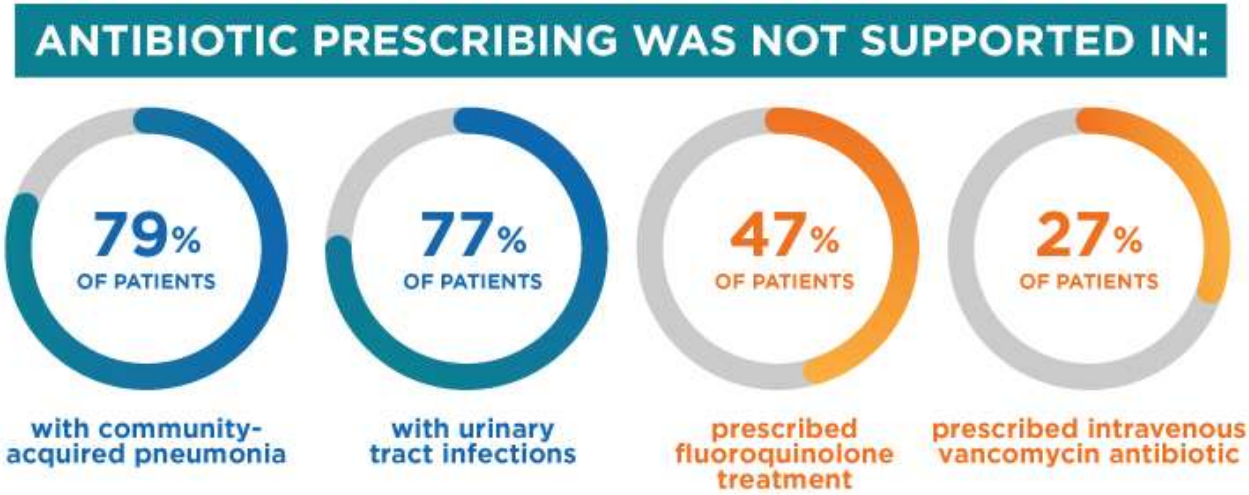
Hospital Core Elements	Priorities for Hospital Core Element Implementation
Tracking	
 Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.	Hospital submits antibiotic use data to the NHSN Antimicrobial Use Option.

Hospital Core Elements	Priorities for Hospital Core Element Implementation
Reporting	
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.


IHS Hospital Antibiotic Stewardship Priority Core Element Implementation,
NHSN Patient Safety Component - Annual Hospital Survey, 2021-2022
% Hospitals
100
90
80
70
60
50
40
30
20
10
0
57% (12/21)
57% (12/21)
57% (12/21)
67% (14/21)
52% (11/21)
57% (12/21)
19% (4/21)
29% (6/21)
2021
2022
Accountability
Reporting
Action
Hospital Leadership Commitment
Pharmacy/Stewardship Expertise
Tracking
All 6 Priority Elements

Resources for Implementing Antibiotic Stewardship Activities

Inappropriate Antibiotic Prescribing is Common in Hospitals



The Pew Charitable Trusts. 2021. Health Experts Establish Targets to Improve Hospital Antibiotic Prescribing | The Pew Charitable Trusts (pewtrusts.org)

Infection	Diagnostic Considerations	Empiric Therapy	Definitive Therapy Tailor to culture results and define duration, including discharge prescription
Urinary tract infection (UTI)	Implement criteria for ordering urine cultures to ensure that positive cultures are more likely to represent infection than bladder colonization. **Examples include:** • Order a urine culture only if the patient has signs and symptoms consistent with UTI such as urgency, frequency, dysuria, suprapubic pain, flank pain, pelvic discomfort or acute hematuria. • For patients with urinary catheters, avoid obtaining urine cultures based solely on cloudy appearance or foul smell in the absence of signs and symptoms of UTI. Non-specific signs and symptoms such as delirium, nausea and vomiting should be interpreted with caution as, by themselves, they have a low specificity for UTI.	Avoid empiric use of antipseudomonal beta-lactams and/or MRSA agents unless clinically indicated.	Use the shortest duration of antibiotic therapy that is clinically appropriate.

Nicolle et al. *Clin Infect Dis*. 2019;68(10):e83-e110.

Infection	Diagnostic Considerations	Empiric Therapy	Definitive Therapy Tailor to culture results and define duration, including discharge prescription
Skin and soft tissue infection	Develop diagnostic criteria to distinguish purulent and non-purulent infections and severity of illness (i.e., mild, moderate and severe) so that skin and soft tissue infections can be managed appropriately according to guidelines.	Avoid empiric use of antipseudomonal beta-lactams and/or anti-anaerobic agents unless clinically indicated. Use of therapy specific for MRSA may not be necessary in uncomplicated non-purulent cellulitis.	Guidelines suggest that most cases of uncomplicated bacterial cellulitis can be treated for 5 days if the patient has a timely clinical response.

Stevens et al. *Clin Infect Dis*. 2014;59(2):147-159.

Infection	Diagnostic Considerations	Empiric Therapy	Definitive Therapy Tailor to culture results and define duration, including discharge prescription
Community-acquired pneumonia	Review cases after initiation of therapy to confirm pneumonia diagnosis versus non-infectious etiology.	Avoid empiric use of antipseudomonal beta-lactams and/or MRSA agents unless clinically indicated.	Guidelines suggest that in adults, most cases of uncomplicated pneumonia can be treated for 5 days when a patient has a timely clinical response. Data also suggest that negative results of MRSA nasal colonization testing can help guide decisions to discontinue empiric therapy for MRSA pneumonia.

Metlay et al. *Am J Respir Crit Care Med*. 2019;200(7):e45-e67.
McCabe et al. *Arch Intern Med*. 2009;169(16):1525-1531.
Murray et al. *J Antimicrob Chemother*. 2014;69(2):515-518.
Parente et al. *Clin Infect Dis*. 2018;67(1):1-7.

Implementation Resources for Hospitals

Print

Pharmacy Expertise

- 5 Ways Hospital Pharmacists can *Be Antibiotics Aware*

Action

- Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America [PDF – 27 pages]
- Urine Culture Stewardship in Hospitalized Patients
- Healthcare Professionals: *Be Antibiotics Aware* – At Hospital Discharge *(Print Only)* [PDF – 1 page]
- Antimicrobial Stewardship Transition of Care (Henry Ford Health System)
- Toolkit to Enhance Nursing and Antibiotic Stewardship Partnership (The Johns Hopkins Hospital Department of Antimicrobial Stewardship)
- Redefining the Antibiotic Stewardship Team: Recommendations from the American Nurses Association/Centers for Disease Control and Prevention Workgroup on the Role of Registered Nurses in Hospital Antibiotic Stewardship Practices [PDF – 14 pages]
- AHRQ Safety Program for Improving Antibiotic Use

https://www.cdc.gov/antibiotic-use/core-elements/hospital/implementation.html

5 WAYS HOSPITAL PHARMACISTS CAN *BE ANTIBIOTICS AWARE*

1. Verify Penicillin Allergy

- Although 10% of the population in the United States reports a penicillin allergy, less than 1% of the population is truly penicillin allergic.[1]
- When possible, obtain a more detailed history of the penicillin reaction and review previously prescribed antibiotics. Alert the provider of your findings if you think the patient can tolerate a beta-lactam antibiotic, when appropriate.

2. Avoid Duplicative Anaerobic Coverage

- Duplicative anaerobic coverage, such as piperacillin/tazobactam and metronidazole, is unnecessary in most cases.[2]
- When the pharmacy receives antibiotic orders for two or more agents with anaerobic activity, alert the provider that the antibiotics have overlapping spectra of activity.

3. Reassess Antibiotic Therapy

- Review the patient's microbiology results (e.g., rapid diagnostic tests and clinically relevant cultures).[3]
- Prompt the provider to consider **stopping** or **tailoring** antibiotic therapy as appropriate.

4. Avoid Treatment of Asymptomatic Bacteriuria

- Patients with asymptomatic bacteriuria should not be treated with antibiotics in most cases.[4]
- Consider the importance of signs and symptoms consistent with urinary tract infection (UTI) when reviewing positive urine cultures and/or making treatment recommendations.

5. Use the Shortest Effective Antibiotic Duration

- Guidelines for treatment duration are available for common infectious diseases such as pneumonia, UTI, and skin and soft tissue infection.[5,6,7]
- Alert the provider if the total days of inpatient and post-discharge antibiotic therapy exceeds the recommended duration.

The scenarios and recommendations 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.

BE ANTIBIOTICS AWARE
SMART USE. BEST CARE

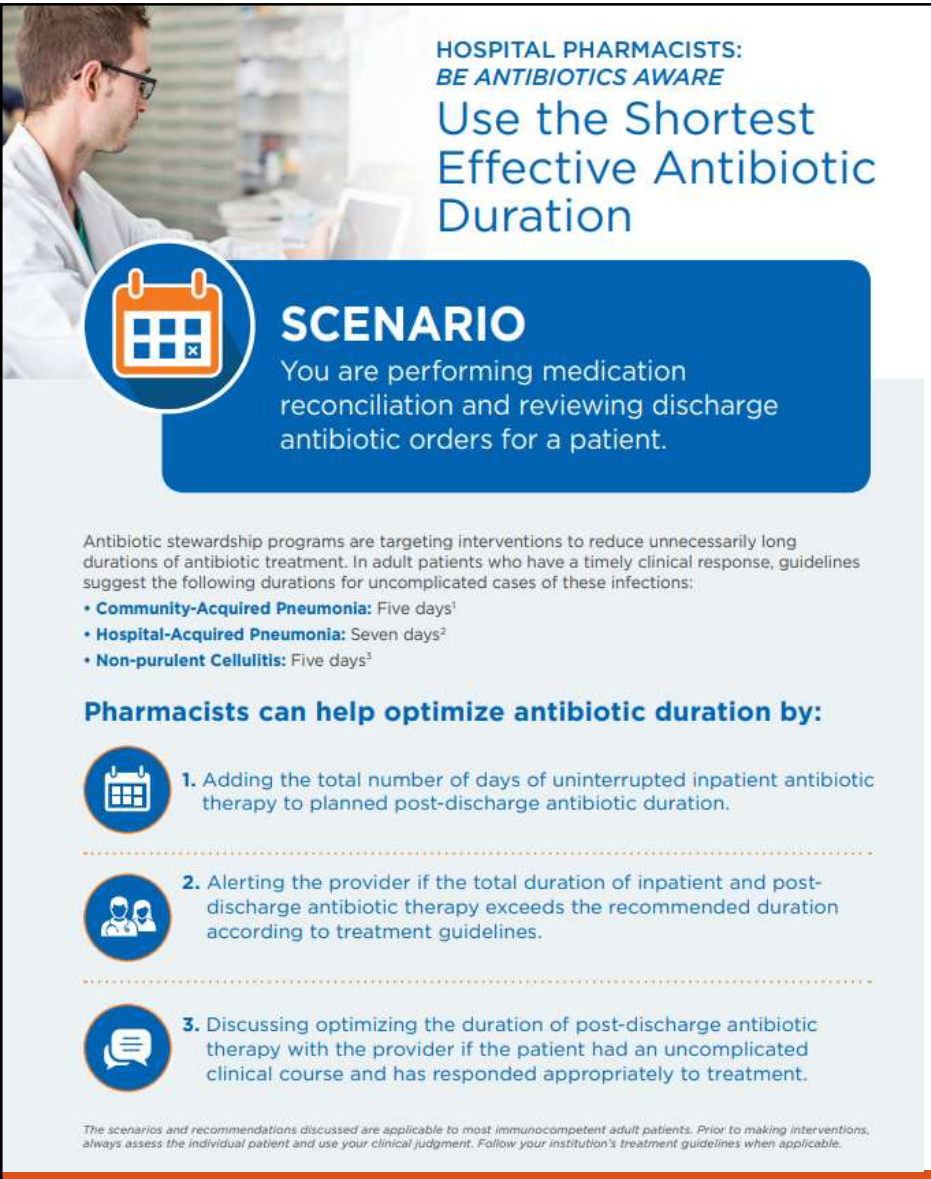
ashp SIDP CDC

www.cdc.gov/antibiotic-use

References:
1. "Is It Really a Penicillin Allergy?" Centers for Disease Control and Prevention, https://www.cdc.gov/antibiotic-use/community/pdfs/penicillin-factsheet.pdf.
2. Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals. Centers for Disease Control and Prevention, www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements-hospital.html.
3. Core Elements of Hospital Antibiotic Stewardship Programs. Centers for Disease Control and Prevention, www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html.
4. Nicolle LE, Gupta K, Bradley SF, et al. Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America. Clin Infect Dis. 2019 March 21 [Epub] https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciz081/5372011
5. Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis. 2007;44 Suppl 2:S27-72. https://academic.oup.com/cid/article/44/Supplement_2/S27/373076
6. Gupta K, Hooton TM, Naber KG, et al. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: A 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis. 2011;52(5):e103-120. https://academic.oup.com/cid/article/52/5/e103/298282
7. Stevens DL, Bisno AL, Chambers HF, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis. 2014;59(2):e10-52. https://academic.oup.com/cid/article/59/2/e10/388285

5 Ways Hospital Pharmacists Can Be Antibiotics Aware

https://www.cdc.gov/antibiotic-use/training/materials.html#anchor_1626372074279



5 Ways Hospital Pharmacists Can Be Antibiotics Aware: *Use the Shortest Effective Antibiotic Duration*

https://www.cdc.gov/antibiotic-use/training/materials.html#anchor_1626372074279

Improving Antibiotic Use at Hospital Discharge

https://www.cdc.gov/antibiotic-use/pdfs/BAA-Hospital-Discharge-Flowchart-P.pdf

Improving antibiotic use at **hospital discharge** through a pharmacist-led transition-of-care intervention

Pre-Intervention Handout for Physicians and Nurses

Antimicrobial Stewardship Transitions of Care Overview

OPPORTUNITY

Within HFHS, about 400 patients per week are treated on medicine wards for common respiratory, skin, urinary, and intra-abdominal infections

40% receive an excess duration, **25%** develop antibiotic-side effects, **5%** develop multi-drug resistant infections

RESOURCES

To help manage this transition, over the years HFHS developed

- Accessible local guidelines
- Progressive rounds
- Antimicrobial stewardship
- Transitions of care services
- Prescription coverage check

Collaboration can distribute workload!

PROCESS

- Patients eligible to receive PO antibiotics at discharge
- Pharmacist will discuss antibiotic selection/duration with primary team on clinical/ progressive rounds
- Inpatient/discharge order placed with dose/ duration for specific infection, antibiotic, and renal function
- Pharmacist leaves note in chart, and provider signs order at discharge

Included	Excluded
Respiratory tract: • CAP • HAP • Acute COPD exacerbation • Influenza **Urinary tract:** • Cystitis • Complicated UTI • Pyelonephritis **Skin/soft tissue** • Cellulitis • Cutaneous abscess **Intra-abdominal** • SBP • Complicated peritonitis w/ adequate source control	• Solid organ transplant/ neutropenia • OPAT patients • Age <18 years • Endocarditis/endovascular infections • Bone/joint infection • Meningitis • Bacteremia due to: *S. aureus, Enterococci,* fungi • Necrotizing fasciitis • Abscess/fluid collection without removal of foci • Prostatitis • Pneumocystis pneumonia • Mycobacterial infections

What to expect:

- Pharmacist will routinely conduct surveillance on patients expected to be discharged on oral antibiotics: anticipate questions regarding discharge status
- When the plan for oral antibiotics has been determined with the team, a note will be placed in the chart for selection and duration based on patient-specific attributes
- The pharmacists' Transitions of Care note can be used for patient education and to communicate where the medication will be sent

Go Live Date for Your Unit: _____

Contact for questions: _____

Henry Ford Health System

https://www.cdc.gov/antibiotic-use/core-elements/implementation.html

Antimicrobial Stewardship Resource Bundles *New*

SETTING	AUDIENCE	RESOURCES
Transitions of Care	**Healthcare Professionals** • ***Physicians*** • ***Nurse Practitioners*** • ***Physician Associates*** • ***Pharmacists***	⇒ **Online Training Module(s):** Antibiotic Stewardship in Hospitals ⇒ **Tools and Guidance:** *Be Antibiotics Aware* at Hospital Discharge Antimicrobial Stewardship Transition of Care *(Henry Ford Health System)*
	Pharmacists	⇒ **Tools and Guidance:** Use the Shortest Effective Antibiotic Duration

Draft; subject to change

CDC Training with Over 8 Hours of Free CE Credits

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

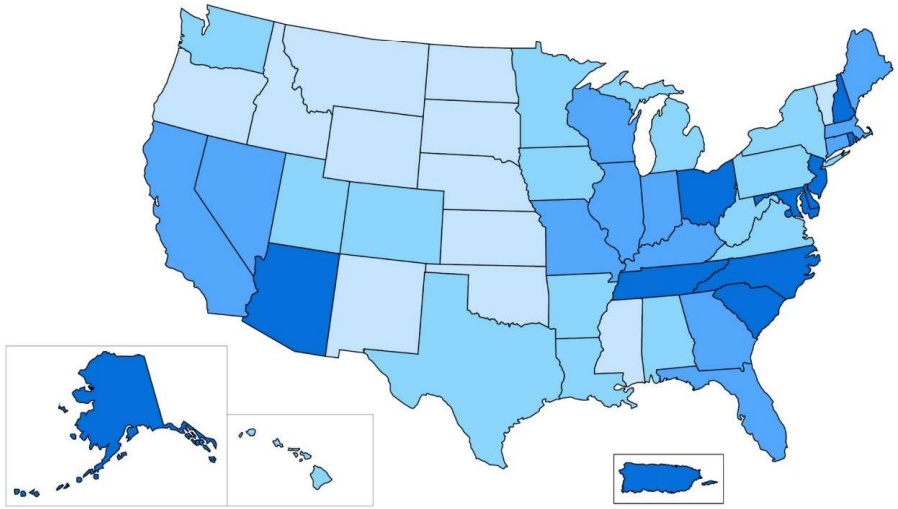
UPDATED CDC Training on Antibiotic Stewardship

To access the training and free continuing education credits, visit *www.train.org/cdctrain/training_plan/3697*.

CS336932-A

Antibiotic Resistance & Patient Safety Portal

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

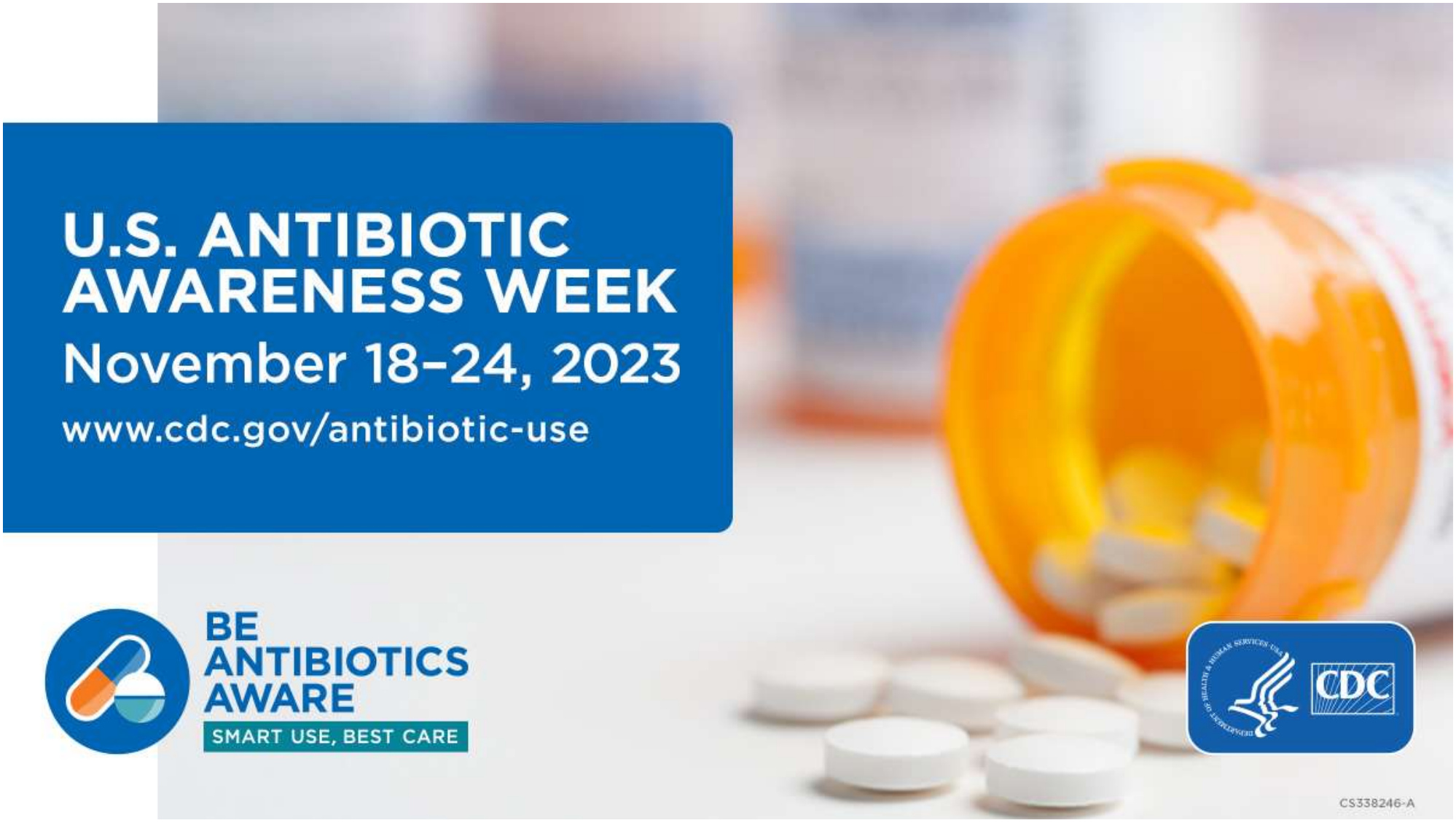


Explore and Visualize Data on Antibiotic Use and Stewardship

For more information, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.

CDC

CS335177-A


U.S. ANTIBIOTIC AWARENESS WEEK
November 18–24, 2023
www.cdc.gov/antibiotic-use
BE ANTIBIOTICS AWARE
SMART USE, BEST CARE
CDC
CS338246-A

All Healthcare Professionals can *Be Antibiotics Aware*

BE ANTIBIOTICS AWARE

SMART USE, BEST CARE

For more information, visit www.cdc.gov/antibiotic-use.

CS335343-A

Summary

- Antibiotic stewardship is important to address the problem of antibiotic resistance and optimize patient safety
- All IHS facilities that submitted the 2021 and 2022 NHSN Annual Hospital Survey met the seven Core Elements of Hospital Antibiotic Stewardship
- CDC released the six Priorities for Hospital Core Element implementation to help enhance the quality and impact of existing antibiotic stewardship programs
- The Core Elements and the Priorities can serve as a resource to support the implementation of antibiotic stewardship interventions

Post-Assessment

Question

1. The Core Elements of Hospital Antibiotic Stewardship include:
   a) Tracking
   b) Accountability
   c) Action
   d) Only (b) and (c) are correct
   e) All the above

Question

1. The Core Elements of Hospital Antibiotic Stewardship include:
   a) Tracking
   b) Accountability
   c) Action
   d) Only (b) and (c) are correct
   e) All the above

Question

2. The Priorities for Hospital Core Element implementation, which were released in 2022, are meant to replace the Core Elements of Hospital Antibiotic Stewardship Programs, which were last updated in 2019.
   a) True
   b) False

Question

2. The Priorities for Hospital Core Element implementation, which were released in 2022, are meant to replace the Core Elements of Hospital Antibiotic Stewardship Programs, which were last updated in 2019.

   a) True

   b) False

Question

3. Which of the following is NOT one of the Priorities for Hospital Core Element Implementation?
   a) Hospital leadership commitment
   b) Tracking
   c) Reporting
   d) Education
   e) All the above

Question

3. Which of the following is NOT one of the Priorities for Hospital Core Element Implementation?
   a) Hospital leadership commitment
   b) Tracking
   c) Reporting
   d) Education
   e) All the above

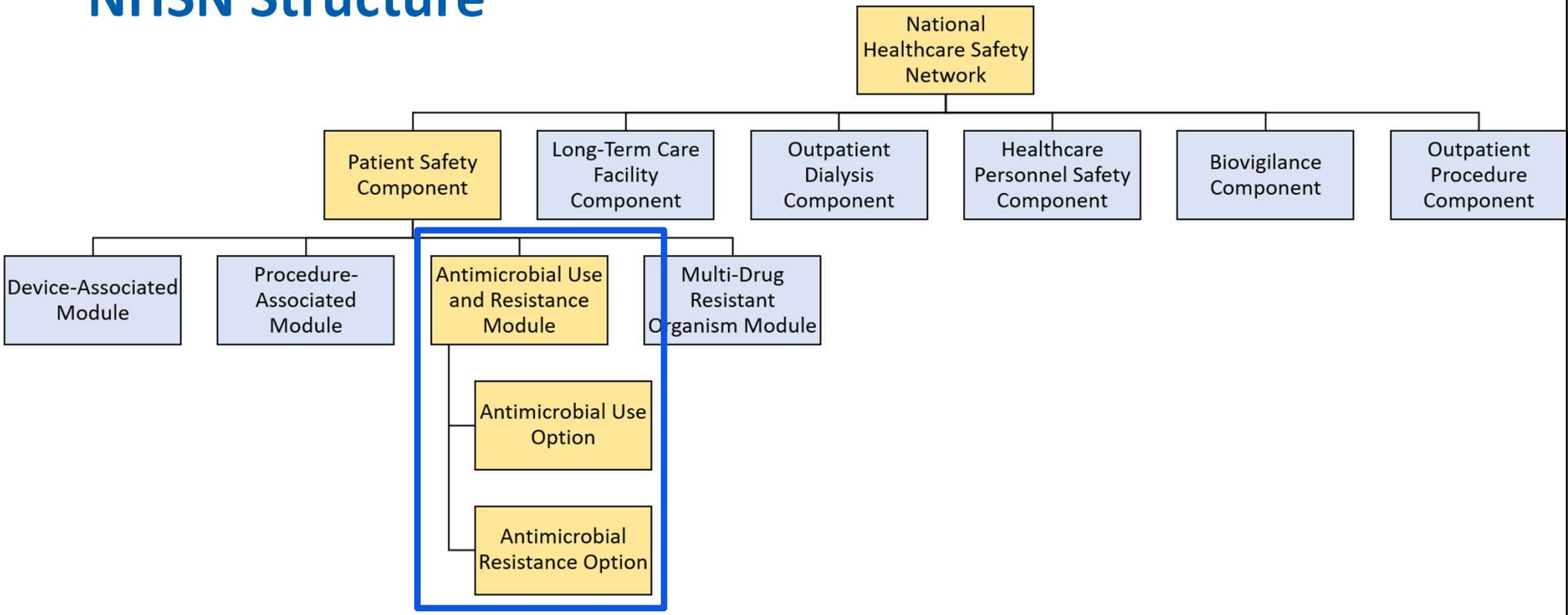
www.cdc.gov/antibiotic-use

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

AVazquez-Deida@cdc.gov
AntibioticUse@cdc.gov

Supplemental Slides

NHSN Structure



Requirements for AU Data Submission: Who Can Participate?

- Hospitals that have:
  - Electronic Medication Administration Record (eMAR), or
  - Bar Coding Medication Administration (BCMA) systems, and
  - Admission Discharge Transfer (ADT) system

  AND
  - Ability to collect and package data using HL7 standardized formation
    - Clinical Document Architecture: https://www.cdc.gov/nhsn/cdaportal/index.html
      - Commercial software vendors: https://sidp.org/AURVendors/
      - "Homegrown" vendors (facility's internal IT/Informatics resources)

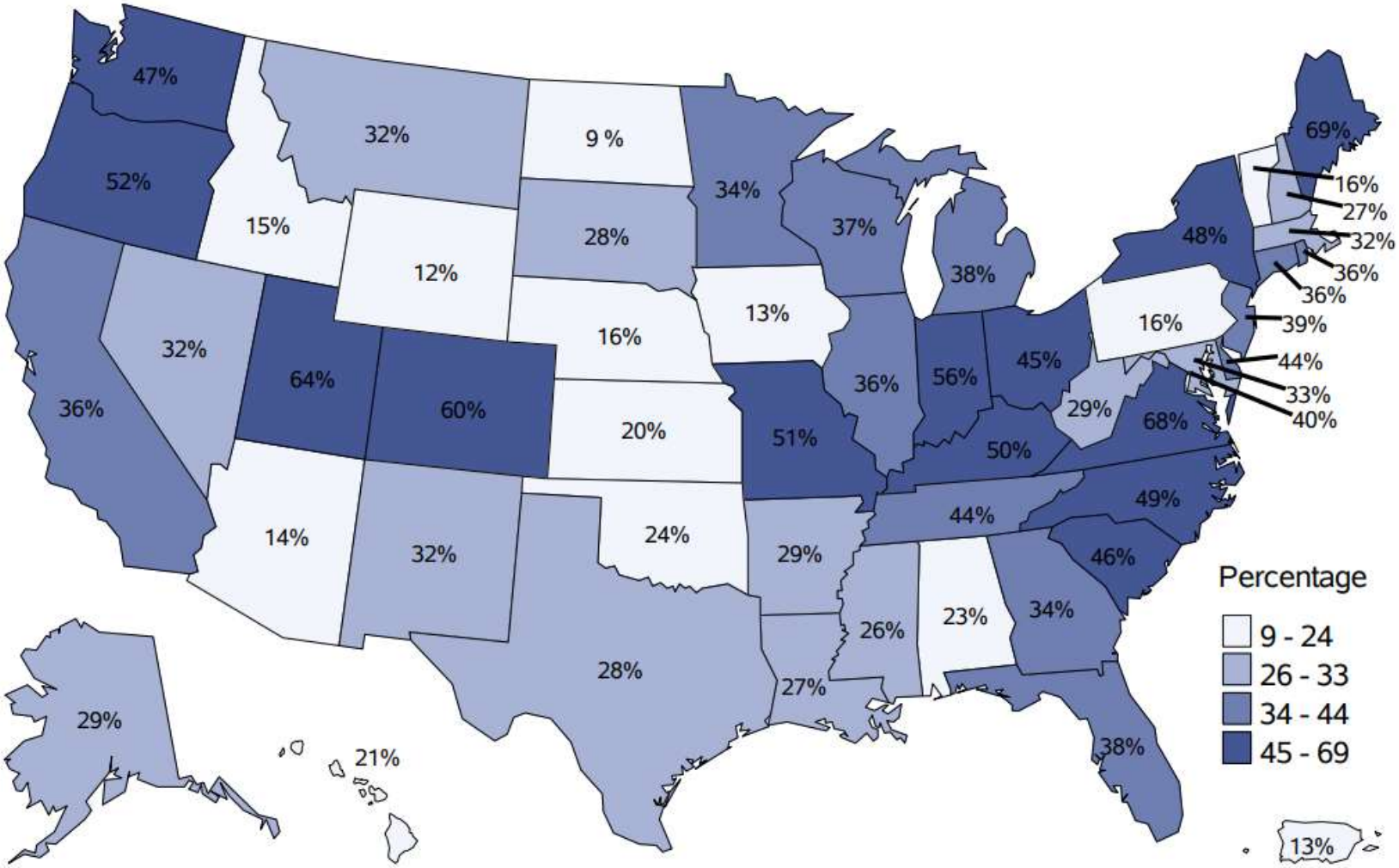
AU Option: Summary Data

- Monthly aggregate, summary-level data
  - By location
    - All inpatient locations individually
    - All inpatient locations combined (Facility-wide inpatient)
    - 3 outpatient locations (ED, pediatric ED, 24-hour observation)
    - **Use same mapped locations throughout the NHSN application**
  - **Important:** Requires accurate/complete electronic capture of both the numerator and denominator for the given locations
- Data are aggregated prior to sending to NHSN
- No patient-level data shared with NHSN for AU Option

AUR Module – Steps for Facility Participation

- Prerequisite: eMAR/BCMA system for inpatient locations
- Identify facility lead(s)/champion(s) for AUR Module
  - Add AUR users to your NHSN facility so they can start SAMS process
- Discuss roles and responsibilities within NHSN
  - Who will update the reporting plans? Who will upload the data? Who will run the analysis reports?
- Discuss location mapping
- Monthly submission and review of data
- Assist with HAI/AUR data comparison requests during validation process

Percent of facilities reporting at least one month of AU data



*As of 9/1/22

AUR Module data are required in CY 2024

- Beginning in **CY 2024**, AUR Module data are required under the Public Health and Clinical Data Exchange Objective of the CMS PI Program
- Applies to eligible hospitals and critical access hospitals that participate in the CMS PI Program
- **Measure includes submission of both AU and AR Option data**
- For CY 2024 facilities attest to either:
  - Being in active engagement with NHSN to submit AUR data or,
  - Claim an applicable exclusion

https://www.cms.gov/regulations-and-guidance/legislation/ehrincentiveprograms

AUR Module Reporting Resources

NHSN AUR Module Resources

NHSN Helpdesk
(protocol & submission questions)
NHSN@cdc.gov

NHSN CDA Helpdesk
(technical CDA related questions)
NHSNCDA@cdc.gov

- NHSN AUR Module homepage:
  - https://www.cdc.gov/nhsn/psc/aur/index.html
- NHSN AUR Protocol:
  - http://www.cdc.gov/nhsn/PDFs/pscManual/11pscAURcurrent.pdf
- AU Option Case Examples:
  - https://www.cdc.gov/nhsn/au-case-examples/index.html
- 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