



# An Update on National Stewardship Activities 2019

**CAPT Arjun Srinivasan, MD**

**Associate Director for Healthcare Associated Infection  
Prevention Programs**

**Division of Healthcare Quality Promotion**

**[beu8@cdc.gov](mailto:beu8@cdc.gov)**

# Disclosures

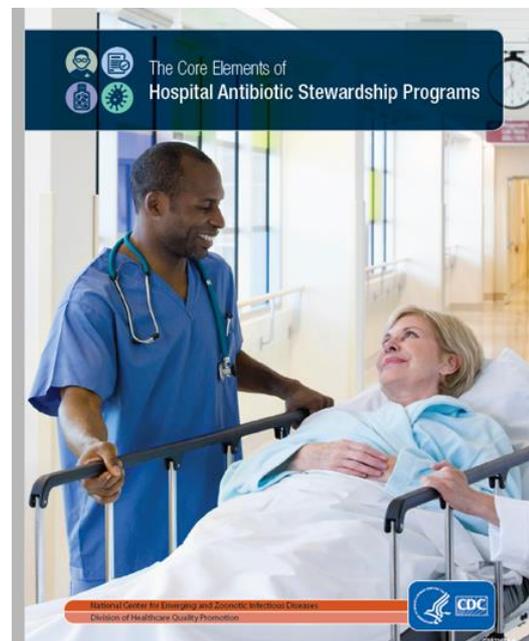
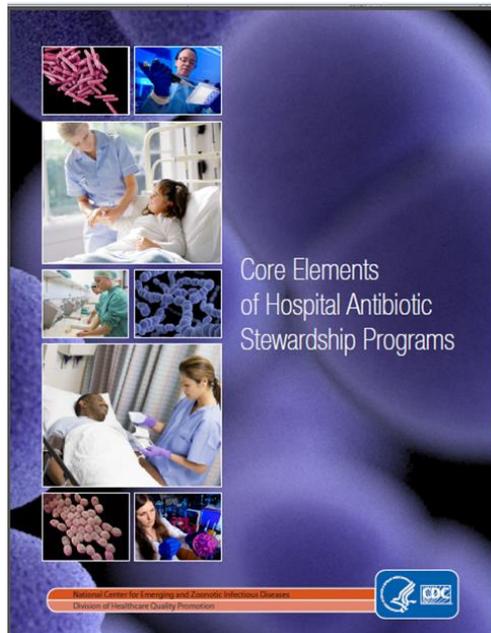
- No financial disclosures
- I'm going to focus on developments in hospital stewardship.
- I'll say a bit about outpatient and nursing home settings.

# Objectives

- Describe implementation of the CDC Hospital Stewardship Core Elements in US and Nebraska hospitals
- List some key changes to the Standardized Antimicrobial Administration Ratio (SAAR)
- List key priorities for stewardship work in non-hospital settings

# “Core Elements of Antibiotic Stewardship”

- Leadership commitment from administration
- Single leader responsible for outcomes
- Single pharmacy leader
- Antibiotic use tracking
- Regular reporting on antibiotic use and resistance
- Educating providers on use and resistance
- Specific improvement interventions



# What's Next For The Hospital Core Elements

- A lot has changed since 2014.
- We need to update the Hospital Core Elements to reflect:
  - Growth in use measurement
  - New data on interventions

## Broad interventions

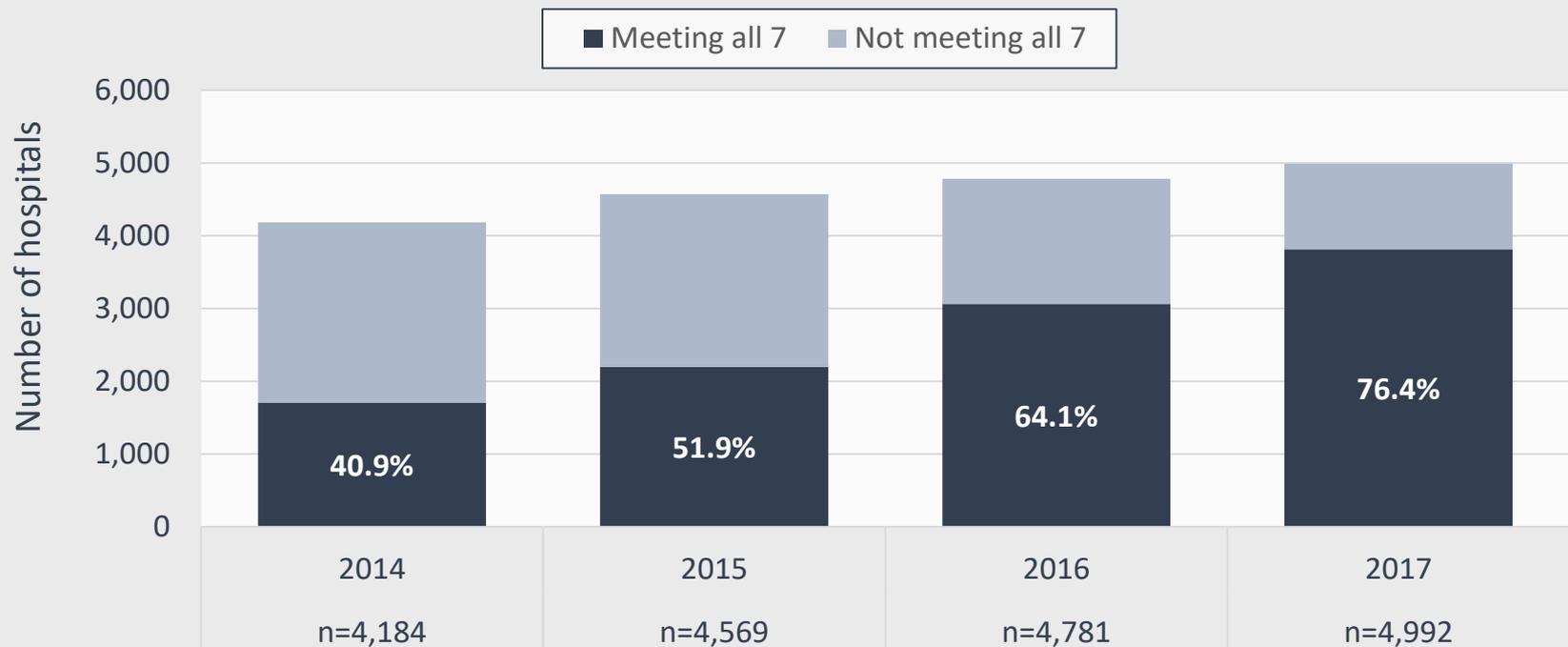
- **Antibiotic "Time outs"**. Antibiotics are often started empirically in hospitalized patients while diagnostic information is being obtained. However, providers often do not revisit the selection of the antibiotic after more clinical and laboratory data (including culture results) become available. (53-56) An antibiotic "time out" prompts a reassessment of the continuing need and choice of antibiotics when the clinical picture is clearer and more diagnostic information is available. All clinicians should perform a review of antibiotics 48 hours after antibiotics are initiated to answer these key questions:
  - Does this patient have an infection that will respond to antibiotics?
  - If so, is the patient on the right antibiotic(s), dose, and route of administration?
  - Can a more targeted antibiotic be used to treat the infection (de-escalate)?
  - How long should the patient receive the antibiotic(s)?
- **Prior authorization**– Some facilities restrict the use of certain antibiotics based on the spectrum of activity, cost, or associated toxicities (57) to ensure that use is reviewed with an antibiotic expert before therapy is initiated. This intervention requires the availability of expertise in antibiotic use and infectious diseases and authorization needs to be completed in a timely manner.
- **Prospective audit and feedback**– External reviews of antibiotic therapy by an expert in antibiotic use have been highly effective in optimizing antibiotics in critically ill patients and in cases where broad spectrum or multiple antibiotics are being used.(25, 58, 59) Prospective audit and feedback is different from an antibiotic "time out" because the audits are conducted by staff other than the treating team. Audit and feedback requires the availability of expertise and some smaller facilities have shown success by engaging external experts to advise on case reviews.(33)

## Impact of a Prescriber-driven Antibiotic Time-out on Antibiotic Use in Hospitalized Patients

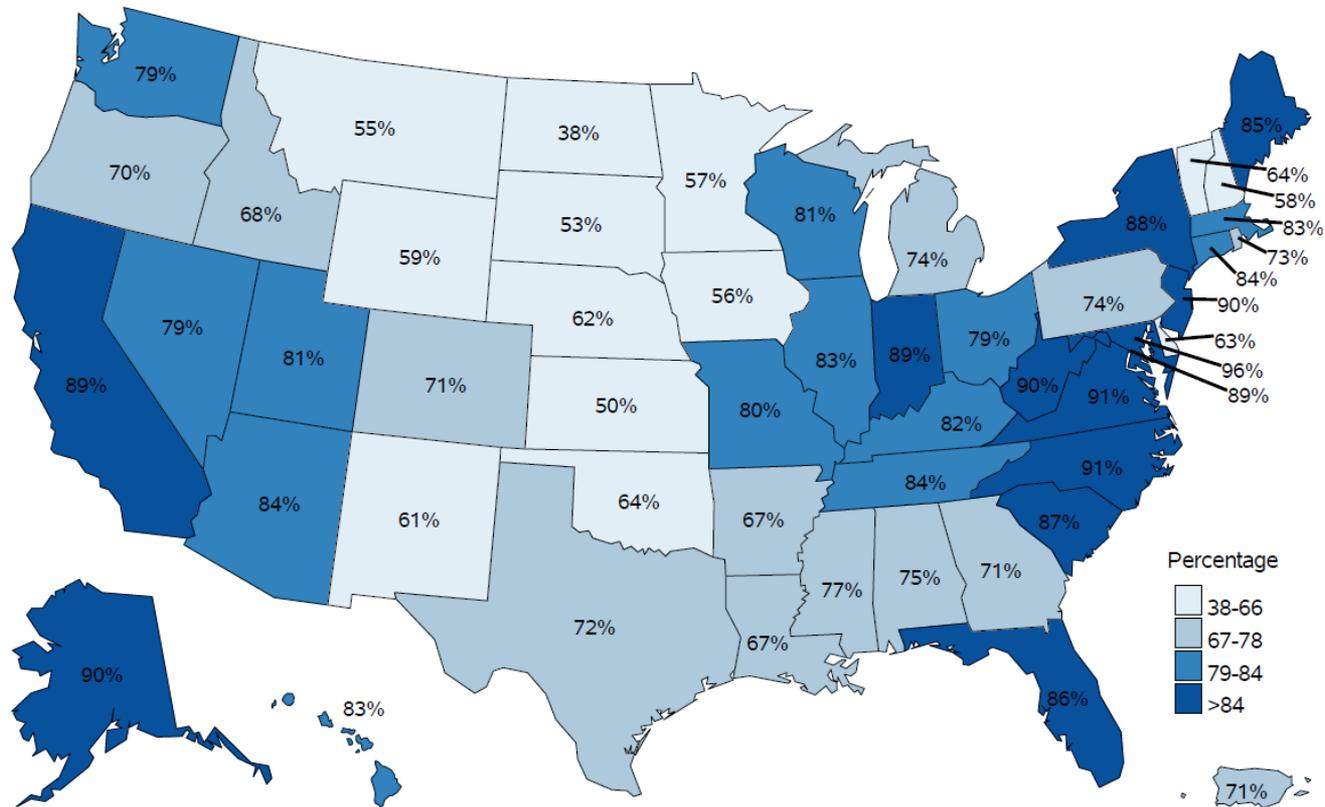
Clin Infect Dis. 2018 Dec 4. doi: 10.1093/cid/ciy852. [Epub ahead of print]

- **A multicenter quasi-experimental study of a provider-driven antibiotic "time-out" in 3470 antibiotic courses showed no difference in antibiotic use before and after implementation, but did show a decrease in inappropriate therapy (45% vs 31%,  $P < .05$ ). Single time-outs without input from antibiotic stewardship teams are insufficient to optimize prescribing.**

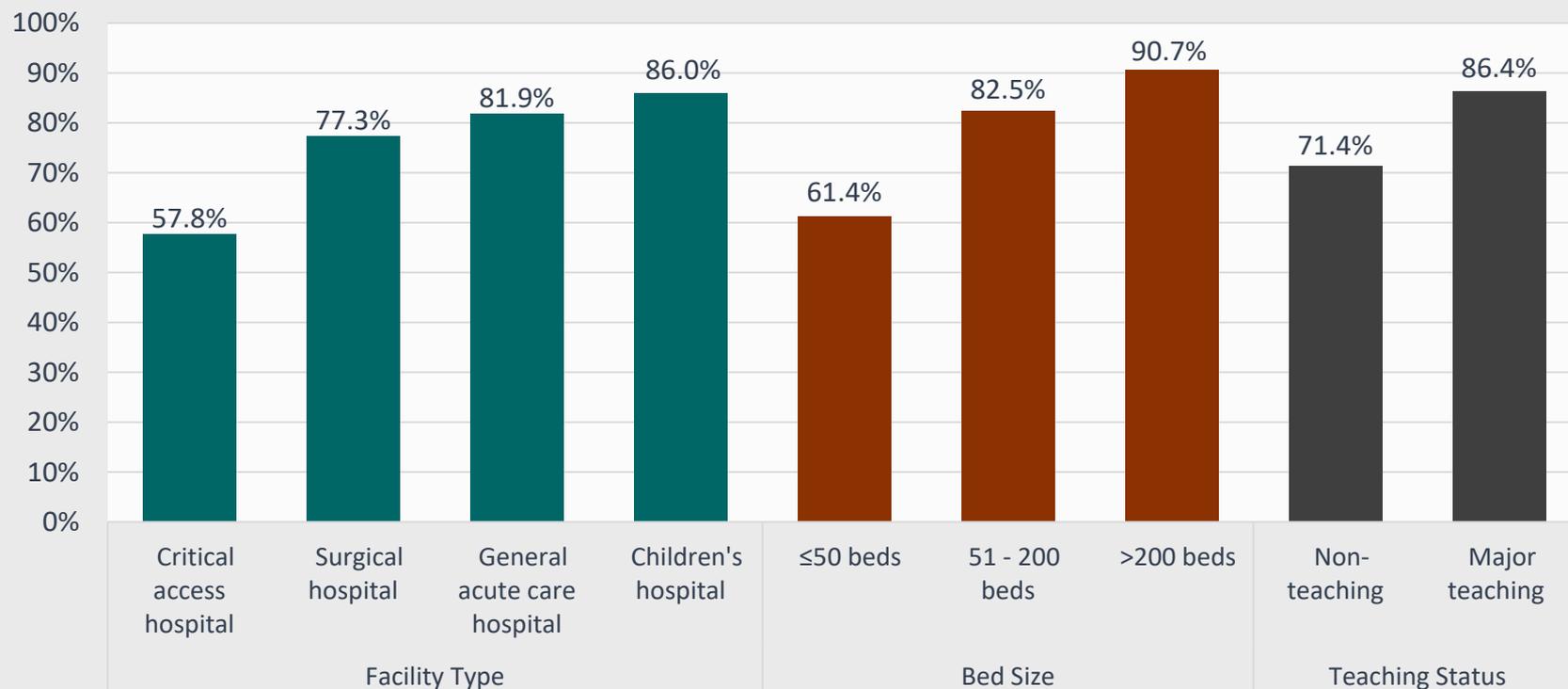
## NHSN Annual Hospital Surveys 2014-2017: Number and percentage of hospitals meeting all 7 Core Elements



# 2017 NHSN Annual Hospital Survey: Core Element Uptake



### Percentage of U.S. acute care hospitals reporting uptake of all 7 CDC Core Elements, 2017 NHSN Annual Hospital Survey, by facility demographic



# Assessing the NHSN Annual Facility Survey Stewardship Questions

- The annual NHSN hospital survey is almost always completed by an infection preventionist.
  - Instructions encourage seeking input from stewardship program.
- How often is that input sought?
- How would the results be different if we directly surveyed stewardship leads?
- Vizient added the NHSN stewardship questions to their annual survey of members of their stewardship network.
- We were able to compare the answers to the NHSN stewardship questions for 189 hospitals that also completed the Vizient survey.

# Assessing the NHSN Annual Facility Survey Stewardship Questions

- 58% of respondents to the Vizient survey indicated they had helped with the NHSN survey.
- Reported implementation of all 7 elements:
  - NHSN: 54.5%
  - Vizient: 58.2%
- Larger variations in some individual elements.
- Some variations by position in Vizient survey, e.g. clinical pharmacist vs. director of pharmacy.

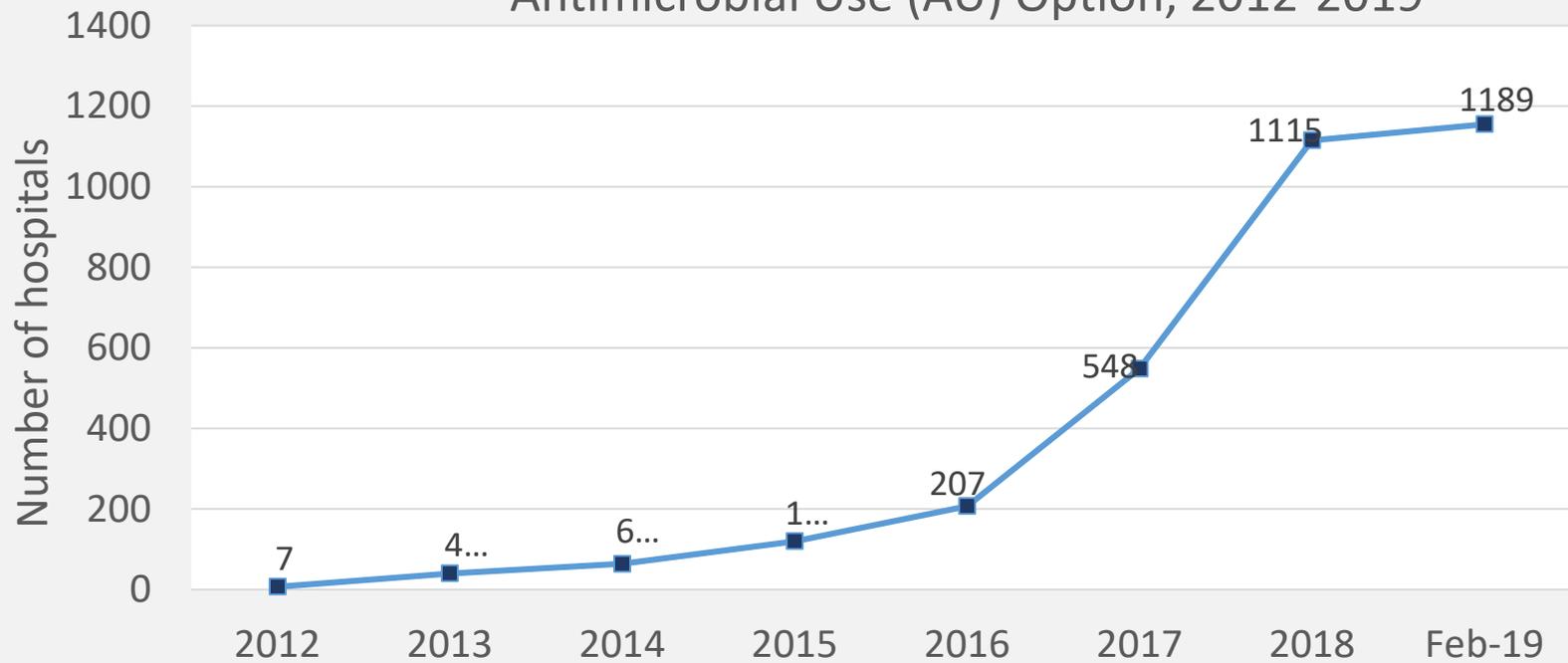
# Goal: Improve the Measurement of Implementation of Hospital Stewardship Programs

- The annual facility survey stewardship questions present an important opportunity to advance our understanding of program implementation.
- Now that the majority of hospitals have the basics, we should revise the survey to try and go deeper.
  - More details on program structure and support
  - What specific actions and practices are hospitals implementing?
- CDC sought input from the stewardship community to see what you all wanted to know.
- The revised questions were released as part of the 2019 annual survey.
- Can we pair the survey with data on outcomes (antibiotic use, resistance, *C. difficile*) to find structures and practices that might be associated with good outcomes?

## New Questions/Domains

- Details on support provided by leadership (e.g. IT support, communicating with staff, supporting training)
- Details on the composition of the stewardship committee
- Details on program leaders: e.g. is stewardship in the job description?, time allocated **and** time spent, stewardship training
- Details on prior authorization and post-prescription review- which drugs?
- Details on engagement and support of other groups (e.g. pharmacy, nursing, IT, quality)
- To whom does the stewardship program leader(s) report?
- Use of tele-stewardship
- Use of any decision support

Number of acute care hospitals ever-reporting\* to NHSN's Antimicrobial Use (AU) Option, 2012-2019



\*Reporting at least one month of data

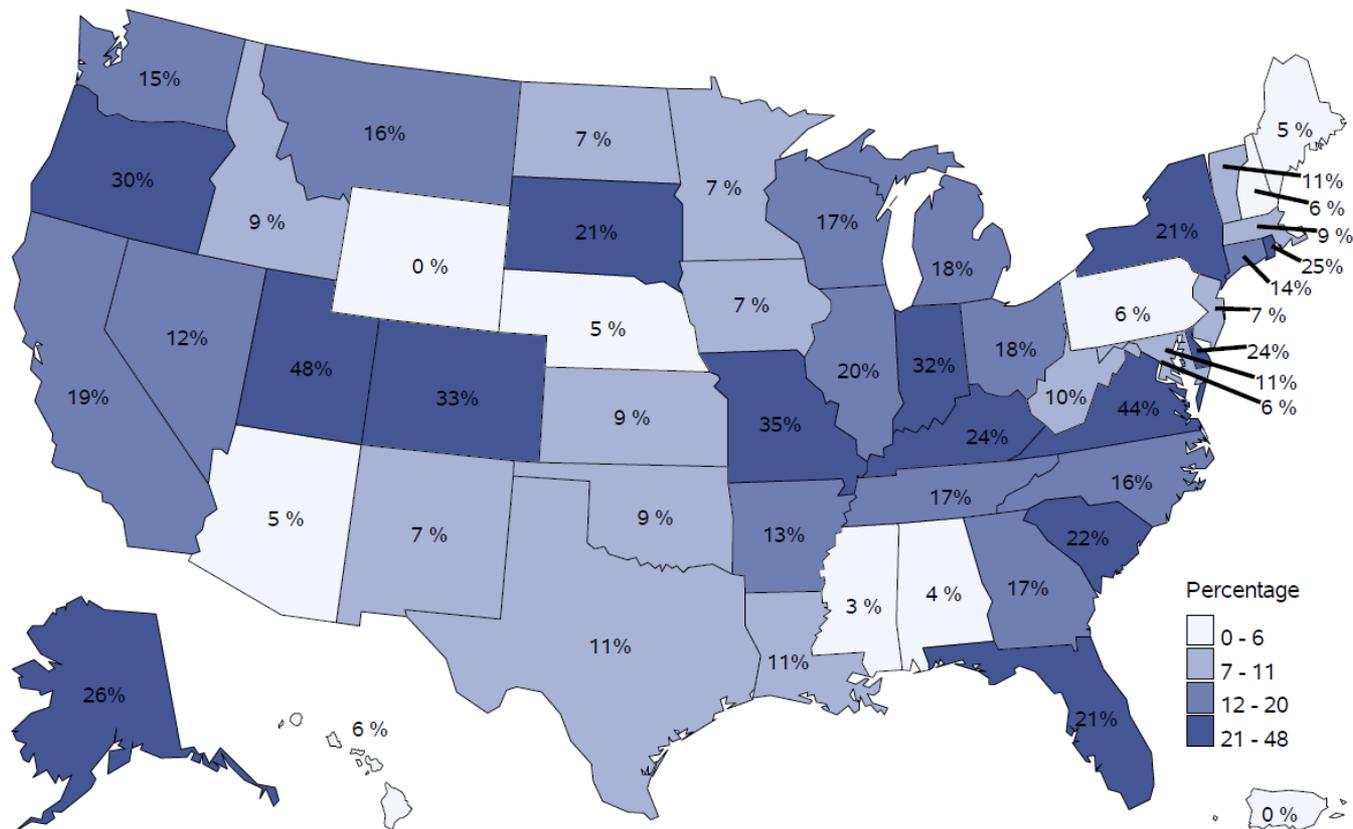
# Reporting Metrics

- 1189 facilities submitted at least one month of data
  - From 49 states (+AE & DC)
  - Bed size
    - Average = 217
    - Median = 166
    - Min/Max = 3, 1455
  - Teaching status
    - Teaching: 63%
      - (of all Teaching) Major teaching: 50%

\*As of February 1, 2019

# Acute care hospital participation in AU Option

Percentage of facilities reporting at least one month of data to NHSN's AU Option



\*As of February 1, 2019

# Goal: Improve the Measurement of Hospital Antibiotic Use

- The larger number of reporting hospitals affords an opportunity to revisit the models used to produce the Standardized Antimicrobial Administration Ratios (SAARs).
- CDC has been working with the stewardship community to make decisions about updating the SAARs.
- And working to validate and improve the data currently being submitted.

# Standardized Antimicrobial Administration Ratio (SAAR)

- SAAR expresses observed to predicted antibiotic use where use is predicted based on data being submitted to produce models using facility characteristics.
  - Endorsed by The National Quality Forum in 2016.
- SAARs for different groups of antibiotics.
- SAARs for adult and pediatric locations.
- SAARs for ICU and non-ICU locations.
- SAARs can be calculated at the individual unit level or hospital wide.

# Standardized Antimicrobial Administration Ratio (SAAR) Evolution

- **2014** baseline SAAR models were developed using AU Option data from:
  - 77 acute care hospitals (350 adult and 33 pediatric locations)
- **2017** baseline SAAR models were developed using AU Option data from:
  - Adult models: 449 acute care hospitals, 2156 locations
  - Pediatric models: 109 acute care hospitals, 170 locations
- The larger sample size in 2017 enabled:
  - Inclusion of new location types in SAAR models
  - Adult and pediatric patient populations to be modeled separately
  - Increased precision of SAAR model estimates

## Changes for the SAAR and AU Option

- SAARs for 2 new adult location types: stepdown and oncology.
- Adding a SAAR for anti-fungals.
- Adding a SAAR for agents posing the highest risk for *C. difficile*.
- Adding an azithromycin SAAR for pediatrics
- Adding a rate distribution for agents used to treat highly resistant pathogens (e.g. colistin).

## 2017 baseline SAAR Antimicrobial Categories

- Broad spectrum antibacterial agents predominantly used for hospital-onset infections
- Broad spectrum antibacterial agents predominantly used for community-acquired infections
- Antibacterial agents predominantly used for resistant gram-positive infections (e.g., MRSA)
- Narrow spectrum beta-lactam agents\*
- Azithromycin (peds only)\*
- Antifungal agents predominantly used for invasive candidiasis\*
- Antibacterial agents posing the highest risk for CDI (Clostridium difficile infection)\*^
- All antibacterial agents

\*New categories

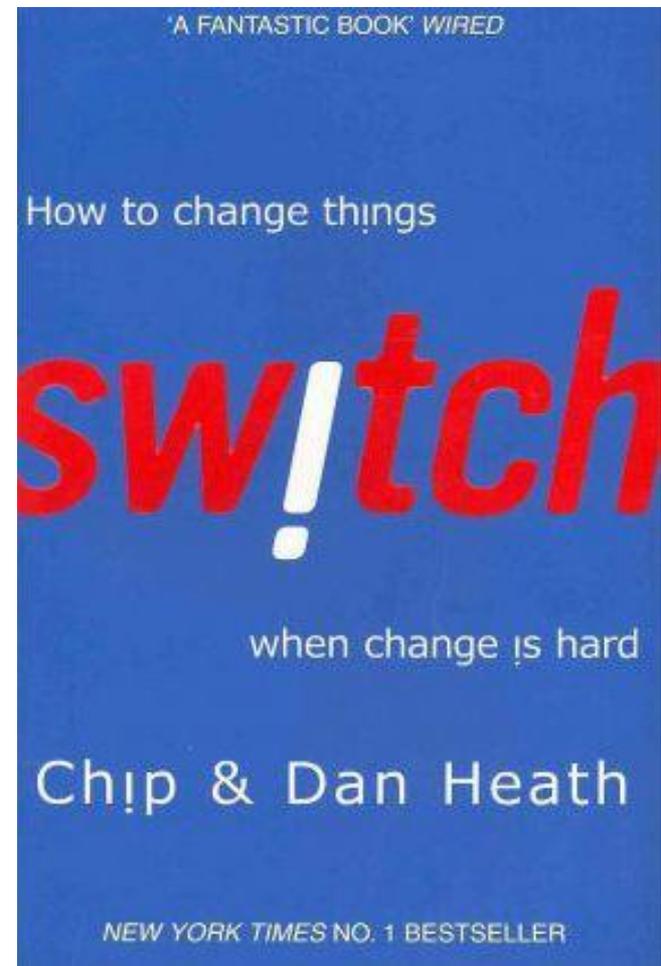
^Not mutually exclusive (includes antimicrobials found in other SAAR categories)

## 2017 baseline SAAR Location Types

- Adult
  - Medical ICU
  - Surgical ICU
  - Medical-Surgical ICU
  - Medical Ward
  - Surgical Ward
  - Medical-Surgical Ward
  - Step-down unit
  - General Hematology-Oncology
- Pediatric
  - Medical ICU
  - Medical-Surgical ICU
  - Medical Ward
  - Surgical Ward
  - Medical-Surgical Ward

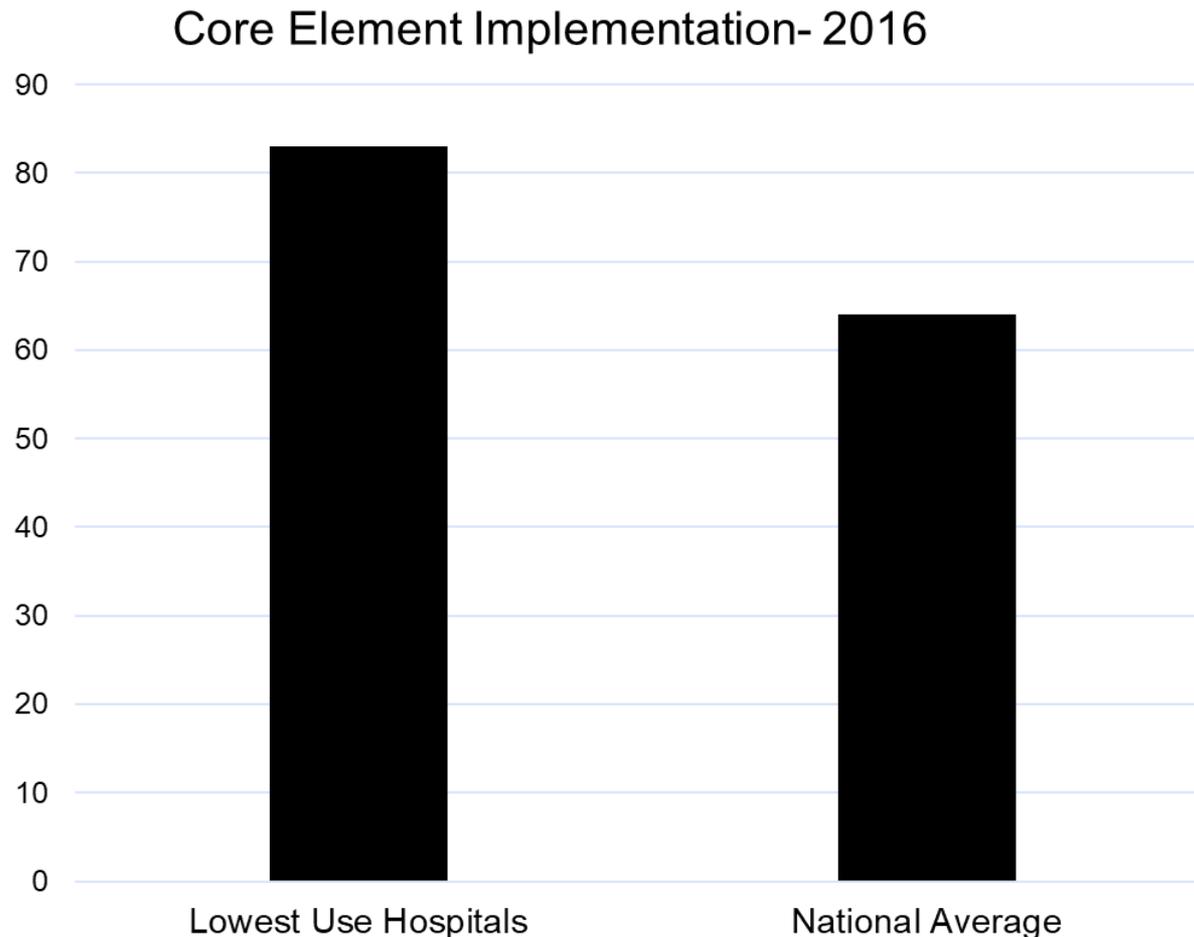
# How Can We Drive Change In Stewardship?

- Direct the rider
  - Follow the bright spots
- Motivate the elephant
  - Find the feeling
- Shape the path
  - Tweak the environment



# Follow The Bright Spots

- What can we learn from the top performers?
- All of them do prior authorization and/or post prescription review.



# Antibiotic Resistance Won't Motivate The Elephant.

- We need to emphasize the fact that avoiding unnecessary antibiotics can help protect against serious and near-term potential harms:
- *C. difficile*
- Adverse drug reactions- which land people in the ED 200,000 times per year.
- Disruption of the microbiome- which can cause diarrhea and yeast infections and which can increase the risk of sepsis
- Patients who got antibiotics for asthma exacerbations had longer lengths of stay than patients who did not and no reduction in treatment failure (JAMA Intern Med. 2019;179(3):333-339)

## Motivate the Elephant- The “Ikea Effect”

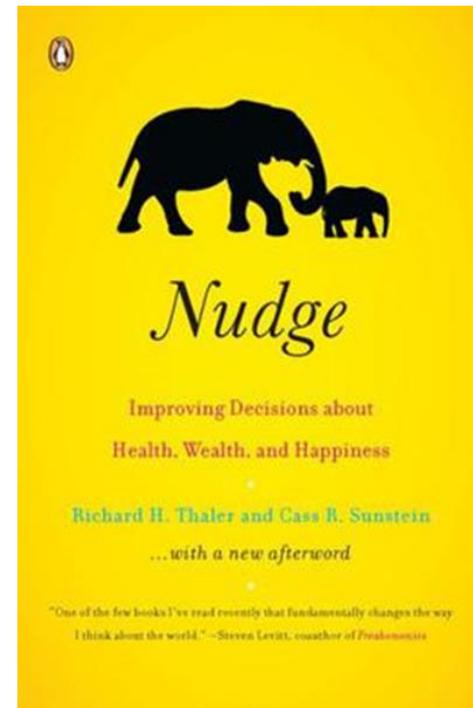
- Perhaps stewardship interventions would be more effective if they were designed in collaboration with providers.
- Maybe especially with the providers who are the worst offenders.
- This approach has been effective in improving prescribing in hospitals Europe and the US.
- And had added benefits:
  - Stewardship interventions became a partnership
  - Stewardship programs could refer outliers and complainers to someone in their own department

Haas MK et al. Open Forum Infectious Diseases. 2016

Sikkens et al. JAMA Intern Med, 2017

# Shape The Path. How To Put New Ideas Into Practice?

- Max Planck:
  - A scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it.
- Thaler and Sunstein:
  - You find ways to nudge them forward.



# The Core Elements Got Some Important Nudges . . .

## NATIONAL STRATEGY FOR COMBATING ANTIBIOTIC- RESISTANT BACTERIA

*Vision: The United States will work domestically and internationally to prevent, detect, and control illness and death related to infections caused by antibiotic-resistant bacteria by implementing measures to mitigate the emergence and spread of antibiotic resistance and ensuring the continued availability of therapeutics for the treatment of bacterial infections.*

September 2014



## NATIONAL ACTION PLAN FOR COMBATING ANTIBIOTIC-RESISTANT BACTERIA

MARCH 2015



## Call to Action for Human Health Stewardship



FORUM ON ANTIBIOTIC STEWARDSHIP

JUNE 2, 2015

# And Then Some Shoves . . .

- CMS 2016 Proposed Hospital Conditions of Participation
- Requirements for antibiotic stewardship programs

## Joint Commission Accreditation Standard



**New Antimicrobial Stewardship Standard**

APPLICABLE TO HOSPITALS AND CRITICAL ACCESS HOSPITALS

**Effective January 1, 2017**

Medication Management (MM)

*Note: An example of an educational tool that can be used for patients and families includes the Centers for Disease Control and Prevention's Get Smart document, "Viruses or Bacteria—What's got you sick?" at <http://www.cdc.gov/getsmart/community/downloads/getsmart-chart.pdf>.*

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 482 and 485

[CMS-3295-P]

RIN 0938-AS21

Medicare and Medicaid Programs; Hospital and Critical Access Hospital (CAH) Changes

to Promote Innovation, Flexibility, and Improvement in Patient Care

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Proposed rule.

## Critical Access Hospital Requirement

# MBQIP New Required Measure FY2018 – 2021 Antibiotic Stewardship Summary

# Are Stewardship Requirements Good or Bad? Of course!

## ■ Pro

- Spurs interest from the C-suite.
- Drives investment- “need to have” beats “nice to have”.
- Create an environment where interventions are more likely to succeed

## ■ Con

- Creates resentment in said C-suite
- Lead to “gaming” and “box checking” rather than real improvements
- Stifle innovation

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY APRIL 2012, VOL. 33, NO. 4

SHEA/IDSA/PIDS POLICY STATEMENT

Policy Statement on Antimicrobial Stewardship by the Society for Healthcare Epidemiology of America (SHEA), the Infectious Diseases Society of America (IDSA), and the Pediatric Infectious Diseases Society (PIDS)

# Regulations Can “Drive” Innovation



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## Clean Air Act Overview

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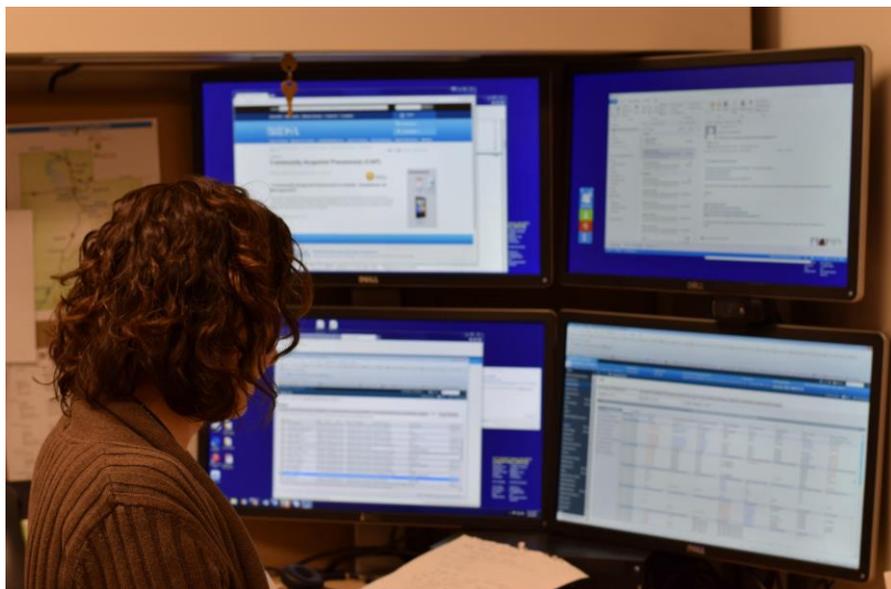
Clean Air Act Overview  
Home

## Evolution of the Clean Air Act

- In the 1970s, the Environmental Protection Agency issued regulations to sharply reduce car emissions.
- Chrysler engineer tells the US Senate the standards will mean the end of station wagons and large sedans.
- Instead, car companies developed innovative solutions: catalytic converters, electronic fuel injection.
- “. . .because of these innovations, “about five hundred current-model-year vehicles emit what a single 1970 model did.””

The New Yorker, April 2, 2018

# It's Happening in Stewardship



Intermountain  
Healthcare

**dason** Duke Antimicrobial Stewardship Outreach Network

About Member Services Infection Prevention The Center Training

## About

A group photo of nine diverse professionals in business attire standing together in a hallway.

# A Standard Is Only As Good As Its Enforcement

- Box checking enforcement will drive box checking behavior.
- But, enforcement that is aware of advances, informed by experts and adapts to input has the power to educate and drive implementation of best practices.

# A Standard That Is Informed and Informative

- ▀ Requirement for hospitals is being eliminated
  - ▀ Focus in hospitals will instead be on proper education around discharge medications



## Leading Practices in Antimicrobial Stewardship

David W. Baker, MD, MPH, FACP

Executive Vice President, Healthcare Quality Evaluation

# Goal: Use The Joint Commission Stewardship Standard and Survey Process to Support Improvements

- The Joint Commission wants its standards to inform improvements in practice.
- CDC and TJC are working together to find ways to do this for the stewardship standard.
  - In partnership with Pew Trusts, American Hospital Association and The National Quality Forum.
- Expert consultation in May 2018 to discuss options:
  - What policies and practices have been most important for your success?
  - What measures do you use to assess the success of your program?
  - Have you done anything novel that was successful?

# Using Accreditation To Drive Improvement

- Important for success:
  - Prior authorization and post-prescription audit with feedback- implemented by all programs we talked to but in different ways
  - Engagement of front line providers
  - Availability of treatment guidelines
  - Efforts to improve diagnostic testing
- Recommended measures:
  - Antibiotic use- days of therapy per 1000 patient days
  - *C. difficile*
  - Compliance with guidelines
- What's novel:
  - Moving to physician level measures and reports on use

## What's Next For This Work?

- What are key things surveyors can look for and questions they can ask that would:
  - Help get the best sense of how good the stewardship program is- how do we make sure people aren't just "checking the boxes"?
  - Direct stewardship programs to policies and practices that are most effective?
- How can we embed this work into the existing survey process?
- More to come on this . . .

# What Other Hospital Stewardship Work is CDC Supporting?

- Exploring facility level vs. patient level risk adjustment of hospital antibiotic use.
- Assessing the impact of stewardship efforts on SAAR values.
- Stewardship interventions specifically targeting *C. difficile*, including post-discharge.
- Implementing a “smart prompt” using electronic health record data to identify patients at low risk for resistant organisms (INSPIRE).
- An “opt out” protocol to guide antibiotic discontinuation in patients started on antibiotics for suspected sepsis (DETOURS).
- Seeking ways to expand engagement of pharmacists.
- Engaging and training nurses to support stewardship.

# Critical Role of Bedside Nurses- Lessons Learned From CLABSI Prevention

- Nurses can play a critical role when they know the process and can watch for omissions.
- Nurses are key in prompting the provider/team to perform key actions that might get overlooked.
- Nurses are critical in patient and family education.
- CDC partnering with Johns Hopkins on a project to engage nurses in stewardship.
- The project is focused on:
  - Collection of urine cultures- why and how
  - Collection of respiratory cultures- why and how
  - Assessment of penicillin allergy



# 5 WAYS PHARMACISTS CAN BE ANTIBIOTICS AWARE



Verify Penicillin Allergy



Avoid Duplicative Anaerobic Coverage



De-escalate Anti-MRSA Coverage



Avoid Treatment of ASB

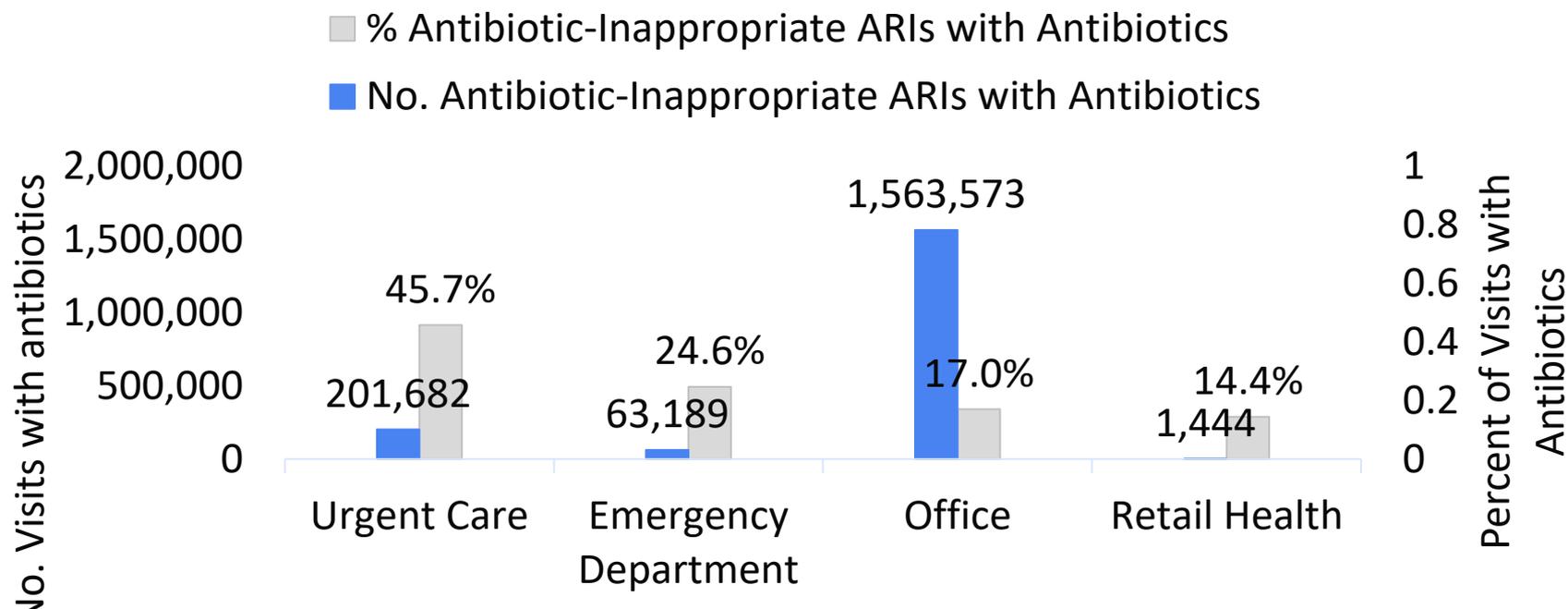


Limit Antibiotic Duration

Stewardship Pharmacy Posters to be launched soon:

- Engage all pharmacists in stewardship
- Suggestions for hospital stewardship implementation and/or quality improvement projects

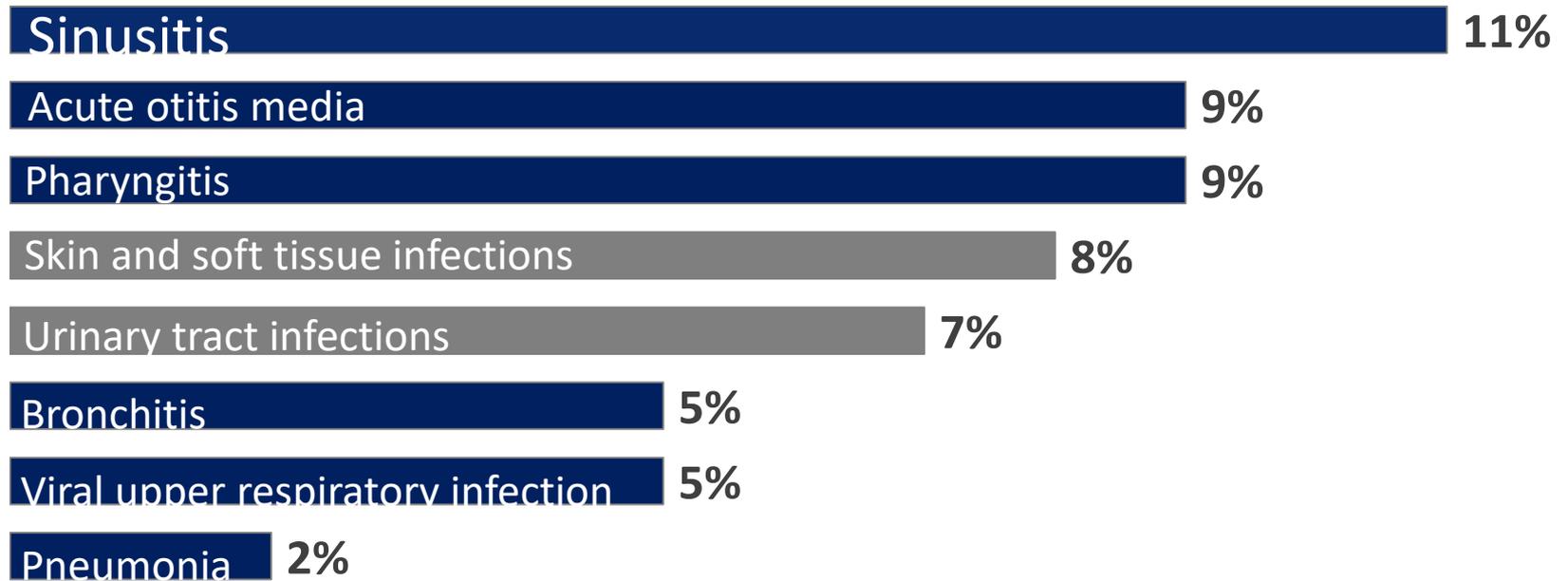
# Antibiotic prescribing for antibiotic-inappropriate acute respiratory illnesses (ARIs)\* by outpatient setting — MarketScan, 2014



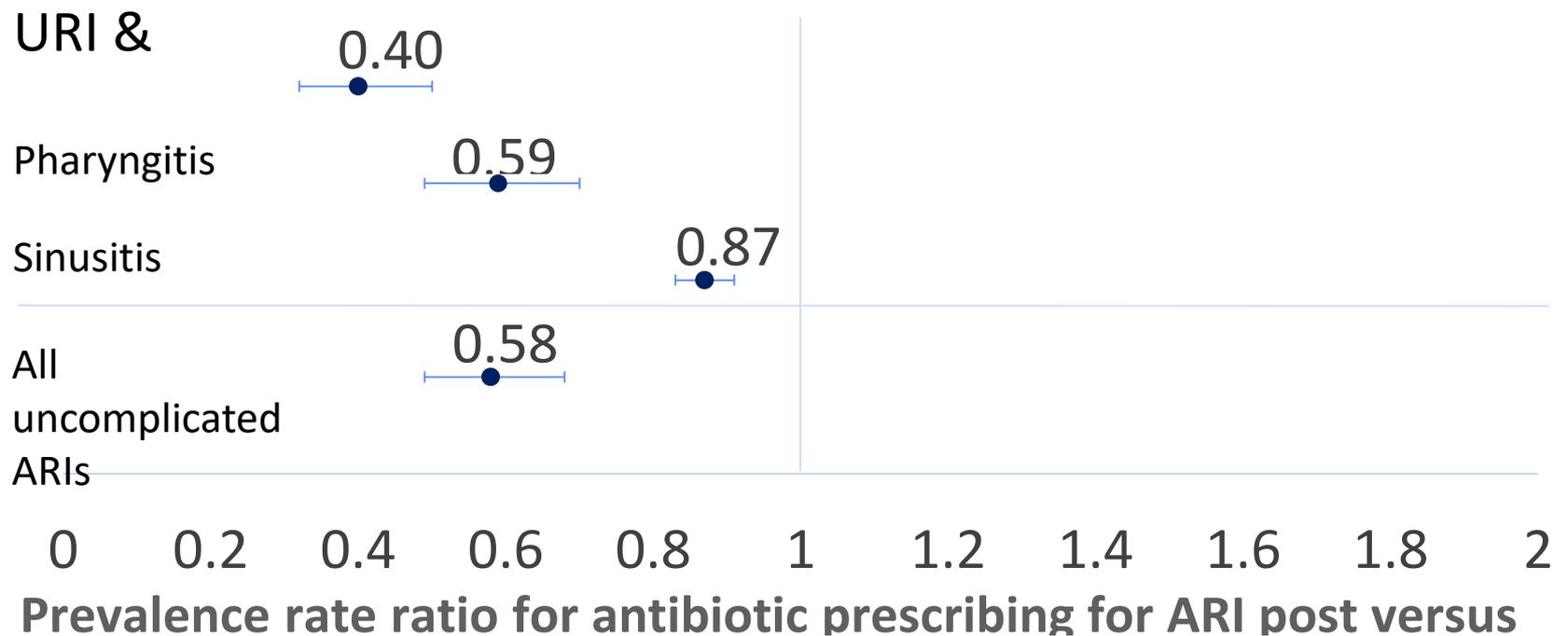
\*Antibiotic-inappropriate ARIs include: Viral URI, bronchitis, bronchiolitis; influenza; nonsuppurative otitis media; viral pneumonia; asthma/allergy. Visits with additional diagnoses of concomitant bacterial infections (e.g. pneumonia, urinary tract infections, acute otitis media, sinusitis) were excluded.  
 Palms D, Hicks L, Hersh AL, et al. *JAMA Int Med*. E-Publish Ahead of print July 16, 2018.

## Respiratory infections are major drivers of antibiotic use in outpatient settings.

Top diagnoses leading to antibiotic prescriptions in US doctors' offices and emergency departments, 2010-2011



## Interventions resulted in decreases in antibiotic prescription rates for all ARIs.



**Among older adults, fluoroquinolones account for 22% of all antibiotics prescribed.**

The image shows a screenshot of a document with two overlapping sections. The top section is a header for 'Drug Safety Communications' from the U.S. Food and Drug Administration (FDA), with the tagline 'Protecting and Promoting Your Health'. Below this header, the text reads: 'FDA Drug Safety Communication: FDA updates warnings for oral and injectable fluoroquinolone antibiotics due to disabling side effects'. The bottom section is a white box with a torn-edge effect, containing the title 'FDA In Brief: FDA warns that fluoroquinolone antibiotics can cause aortic aneurysm in certain patients'. Below the title are social media sharing buttons for Facebook (SHARE), Twitter (TWEET), LinkedIn (LINKEDIN), Pinterest (PIN IT), Email (EMAIL), and Print (PRINT). The date 'December 20, 2018' is printed at the bottom of this section.

**FDA** U.S. Food and Drug Administration  
Protecting and Promoting Your Health

**Drug Safety Communications**

**FDA Drug Safety Communication: FDA updates warnings for oral and injectable fluoroquinolone antibiotics due to disabling side effects**

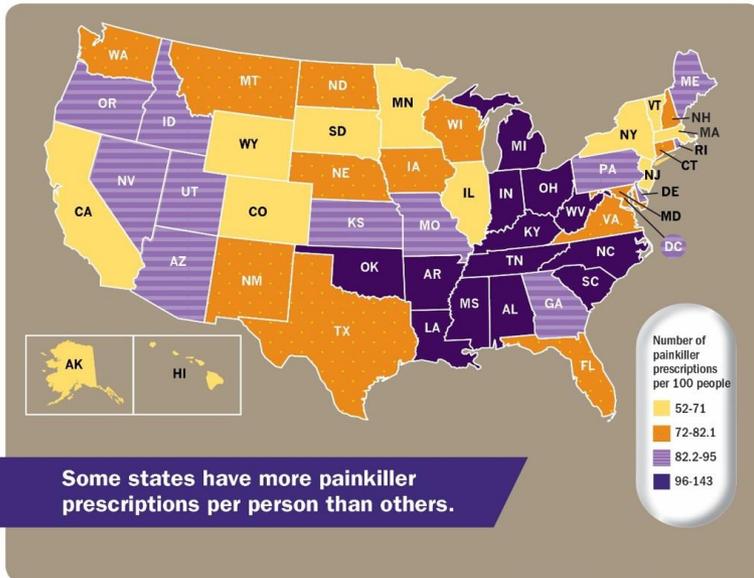
**FDA In Brief: FDA warns that fluoroquinolone antibiotics can cause aortic aneurysm in certain patients**

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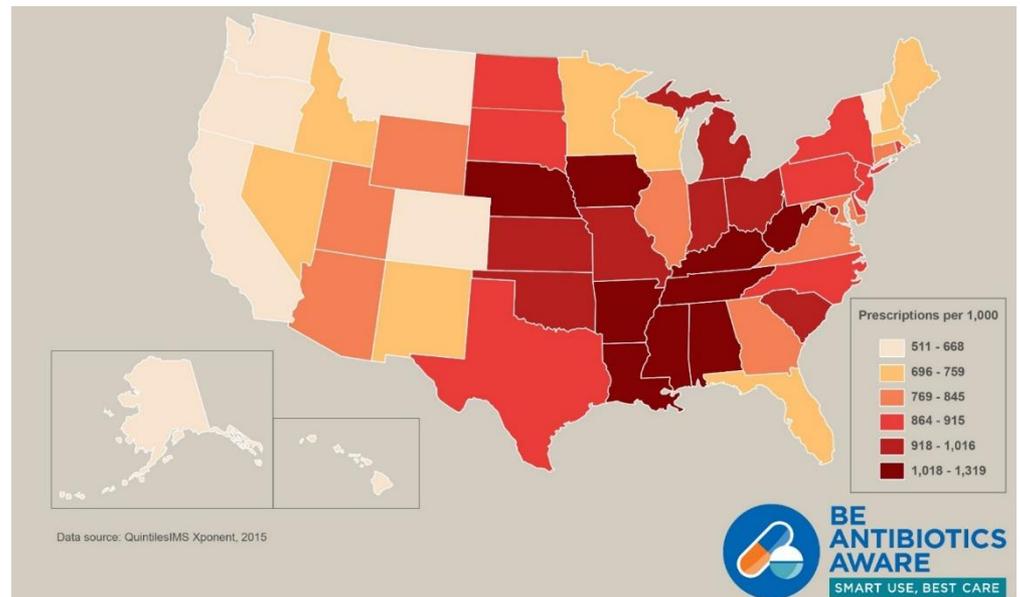
December 20, 2018

# Next Steps in Outpatient Stewardship

- Working with CMS Quality Improvement Networks who have enrolled more than 7,000 outpatient settings in a national project to improve use.
- Focusing efforts on adult providers.
- Working to drive and support stewardship in urgent care.
- Collaborating with CDC opioid to explore opportunities for synergy between efforts to improve opioid and antibiotic prescribing.
  - Bottle of amoxicillin directions: “Take as needed for pain”



SOURCE: CDC Vital Signs, July 2014. [cdc.gov/vitalsigns](http://cdc.gov/vitalsigns).



# Getting Data for Action in Nursing Homes

## Collaboration with Nursing Home Vendors

- Collaboration with long term care pharmacies
  - Data use agreement to share de-identified antibiotic dispensing data with PharMerica to describe antibiotic use at a facility level and explore data elements that can be used for antibiotic use reporting
- Collaboration with nursing home electronic health record companies
  - Analysis with PointClickCare to describe antibiotic use at a facility level, specifically by indication and resident characteristics in 2,600 nursing homes
  - Data use agreement to share de-identified antibiotic use data with Matrixcare to explore data elements for analysis of antibiotic use data

# Collaboration and funded work in nursing home stewardship implementation

- CDC is implementing and evaluating the *Core Elements of Antibiotic Stewardship for Nursing Homes*
  - Tracking both antibiotic use and important clinical outcomes
- Centers for Medicare and Medicaid Services (CMS) tasked the QIN-QIOs to promote *C. difficile* infection reporting, prevention and antibiotic stewardship in nursing homes
  - >3,000 NHs (~20%) of CMS certified NHs enrolled across the country
    - >2,500 nursing home contributing to CDI data into NHSN
  - Ongoing engagement in CDI prevention and stewardship implementation activities over the coming year

# Conclusions

- We know that real progress in improving use comes from the work that you do every day.
- Our goal is to support you.
- Please tell us what we can do to help!

## Assessment Question 1

- The majority of hospitals in the United States have successfully implement the CDC Core Elements for Hospital Antibiotic Stewardship Programs
  - True
  - False

## Assessment Question 2

- Reporting of antibiotic use data into CDC's Antibiotic Use Option of the National Healthcare Safety Network is required by the Centers for Medicaid and Medicare Services (CMS)
  - True
  - False