

# Combatting Healthcare-Associated Infections and Antibiotic Resistance: Policy, Progress, and Opportunities

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# **Presentation Roadmap**

- Laying the Groundwork
- Gaining Momentum
- What CDC is Doing
- How CDC is Supporting States
- 2017 and Beyond
- (And some holiday trivia embedded throughout!)



# Laying the Groundwork

COMBATTING HEALTHCARE-ASSOCIATED INFECTIONS AND ANTIBIOTIC RESISTANCE

# Healthcare-Associated Infections and Antibiotic Resistance: A CDC Priority

Preventing HAIs has long been an agency priority

- State legislation/policy HAI public reporting, MRSA legislation, C.Diff infection reporting
- Federal legislation/policy Deficit Reduction Act, Affordable Care Act: CMS Value-based purchasing
- 2009 Agency Priority Goal Road to Elimination

Antibiotic resistance has complicated efforts

- Infections can be harder to treat
- Delayed recovery
- Increased risk of sepsis

- Healthcare is an amplifier of antibiotic resistance
- More is needed because antibiotic-resistant HAIs are a threat to all patients
  - 1 in 6 CLABSIs were caused by urgent or serious antibiotic-resistant threats.
  - 1 in 10 CAUTIs were caused by urgent or serious antibiotic-resistant threats.
  - 1 in 7 SSIs were caused by urgent or serious antibiotic-resistant threats.
  - 9 in 10 patients diagnosed with C.difficile are related to healthcare.
- Our Vital Signs series tells the story

# Vital Signs Detect, Respond, Coordinate Prevention

Vitälsigns Making Health Care Safer Stop Infections from Lethal CRE Germs Now Untreatable and hard-to-treat infections from CRE germs are on the rise among patients in medical facilities. CRE germs have become resistant to all or nearly all the 4% 18% antibiotics we have today. Types of CRE include KPC and NDM. By following CDC guidelines, we can halt CRE infections before they become widespread in hospitals t 4% of US hospitals had one patient with a and other medical facilities and potentially spread to bapenem-resistan otherwise healthy people outside of medical facilities. teriaceae) infection Health Care Providers can luring the first half of 2012. Know if patients in your facility have CRE. About 18% of long-term acute care hospitals\* had one. 42 *Vitalsigns* One type of CRE infection has been reported in medical facilities in 42 states during th Making Health Care Safer 1in2Antibiotic Rx in Hospitals: Proceed with Caution ents who get blo ctions from them Antibiotics can save lives but they are often prescribed incorrectly. These errors put patients at risk for preventable allergic reactions, super-resistant infections, and deadly diarrhea. Poor prescribing also makes antibiotics less likely to 1 in 2 work in the future To protect patients and preserve the power of More half of all hospital antibiotics, hospital CEOs/medical officers can: ♦ Be sure your hospital has an antibiotic stewardship program that includes, at a minimum, this checklist: 1. Leadership commitment: Dedicate necessary human, 3x ( financial, and IT resources. 2. Accountability: Appoint a single leader responsible for program outcomes. Physicians have proven Doctors in some hospitals successful in this role. prescribed 3 times more 3. Drug expertise: Appoint a single pharmacist leader antibiotics than doctors in other hospitals. to support improved prescribing. 4. Act: Take at least one prescribing improvement action such as requiring reassessment within 48 hours to check drug choice, dose, and duration. 30% 5. Track: Monitor prescribing and antibiotic resistance patterns 6. Report: Regularly report to staff prescribing and resistance acing prescription patterns, and steps to improve. of high-risk antibiotics 7. Educate: Offer education about antibiotic by 30% can lower deadly resistance and improving prescribing practices. Work with other health care facilities to prevent infections, transmission, and resistance. -> See page 4 Want to learn more? Visit S. CDC

#### 2013: Stop Infections from Lethal CRE Germs Now

Alerts when lab identifies patient with CRE

Coordinate regional tracking and control efforts

Prescribe antibiotics wisely

Remove temporary medical devices as soon as possible

# 2014: Antibiotic Rx in Hospitals: Proceed with Caution

- Track antibiotic use and resistance
- Implement antibiotic stewardship program
- Facilities should work together to prevent infections, transmission and resistance

# Vital Signs Detect, Respond, Coordinate Prevention



#### 2015: Stop the Spread of AR

- Public health departments and facilities share antibiotic resistance and other HAI data; alert facilities to infections to take proper infection control actions
- Prompt and accurate laboratory testing for antibiotic-resistant germs
- Up to 70% fewer patients will get CRE when a coordinated approach is used

#### **2016: Protect Patients from AR**

- Prevent infections related to surgery or placement of a catheter
- Prevent spread of bacteria between patients
- Improve antibiotic use

# Gaining Momentum

# But first!

In the song "Jingle Bells," who is seated by my side?





# Fanny Bright, of course...before "we got into a drift and then, oh wee! We got upsot!"

### Recent Federal Momentum Behind CDC Infection Prevention & Control Programs

HHS HAI Action Plan (2009), ARRA Funding for State HAI Programs (2009)

MERS-COV (2012), Fungal Meningitis Outbreak (2012), CMS reporting NHSN (2011)

CDC's AR Threat Report (2013)



National Strategy on Combating Antibiotic-Resistant Bacteria (CARB) President's Council of Advisors on Science and Technology (2014)

Ebola Outbreak in West Africa (2014)

National Action Plan for CARB (2015)



Antibiotic Resistance White House Announces the National Strategy for Combating Antibiotic Resistance.

# State Policy Momentum as Well

## Examples of State Policies for Addressing Antibiotic Use and Resistance:

- CA law requires stewardship programs in hospitals and nursing homes
- MO law requires NHSN AUR reporting; stewardship programs
- Many states require CRE to be reported from healthcare facilities and labs to the state health department

### GA law requires:

- All healthcare facilities provide the state with access to all NHSN data submitted to meet CMS quality reporting requirements
- Antibiotic-resistant Streptococcus pneumoniae and Vancomycin resistant Staphylococcus aureus (VRSA) to be reported from healthcare facilities and labs to the state health department

## National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)

National Action Plan for CARB called for a CDC response to:

- Detect and respond to resistant pathogens
- Prevent spread of resistant infections
- Encourage innovation for new strategies



# Implementing CARB

# Steps needed to meet CARB goals:

•Build state capacity

Expand nation-wide lab capacity

Expand efforts to address community AR threats



# What CDC is Doing

2016 IN REVIEW

# Okay, another trivia question first:

Snow is mostly air which is why it is so fluffy.

One inch of rain can create approximately *how many* inches of snow?





# Ten inches of snow for every one inch of rain!

### CDC's Antibiotic Resistance Solutions Initiative: Transforming the Nation's Fight Against AR



Funds to support CDC's subject matter experts, labs, and all operational costs, as well as CDC's Working Capital Fund, are distributed across activities.

### Build State Capacity: Detect, Respond & Protect



http://www.cdc.gov/drugresistance/solutions-initiative http://www.cdc.gov/vitalsigns/stop-spread Core capacity in all 50 states to detect, respond to, protect against HAI/AR threats

Across all healthcare settings, networks of facilities in up to 25 states working with health departments to:

- Better detect and respond to AR threats
- Prevent infections across healthcare
- Improve prescribing

FY 17: Expand coordinated approach across All 50 states, six large cities, and Puerto Rico

### Expand Lab Network: Detecting Threats with Gold-Standard Lab Capacity



Map placement of labs illustrative only. Regional lab awardees anticipated August 2016.

### Addressing Community AR Threats: Antibiotic Stewardship, Sepsis Recognition & Prevention

#### Better data to drive action

Define sepsis epidemiology and pilot new sepsis surveillance definition

Expand NHSN antibiotic use reporting to guide local prevention

Turn state outpatient prescribing rate data into action

Support diagnostic innovations to improve prescribing



#### **Enhanced prevention to save lives**

Assess impact of strategies to improve prescribing, treat and prevent sepsis Implement more stewardship programs using CDC's Core Elements, integrated with sepsis early recognition programs

Tailor state programs to improve prescribing in hospitals and communities



#### Heightened public awareness to improve use and prevent sepsis

Promote sepsis recognition awareness among healthcare professionals, patients and families, and partners

Expand CDC's Get Smart: Know When Antibiotics Work program

### Addressing Community AR Threats: Innovation

#### Conduct innovative research with academic partners

Collaborate with academic, healthcare, and veterinary investigators

(e.g., CDC Prevention Epicenters, SHEPheRD)



Discover new ways to protect patients & scale up effective interventions across health systems

- Develop healthcare facility social networking tools to implement coordinated approach to stop spread of AR in connected facilities
- Improve sepsis recognition and prevention approaches
- Use electronic health record data to define appropriate antibiotic use
- Further examine the hospital environment as a source of AR transmission
- Explore microbiome impact on protecting people from AR

# How CDC is Suporting States

# More trivia fun!

Which President was believed to be the first to have a White House Christmas tree?

\*Hint: It's not the Kennedys, although they're featured here!





# 14<sup>th</sup> U.S. President, Franklin Pierce

12/20/2016

# State Programmatic Overview – HAI/AR Programs

#### **Public health departments**

HAI/AR DETECT & RESPOND PROGRAMS quickly detect and then contain the spread of resistant infections, protecting patients from new resistance threats.

HAI/AR PREVENTION PROGRAMS work with partners to prevent infection and contain spread of germs between patients and healthcare facilities, and increase antibiotic stewardship education, to protect patients

Laboratory testing for Carbapenem Resistant Enterobacteriaciae (CRE) and establishing Antibiotic Resistance Regional Laboratory Network (ARLN)

#### **Academic partners**

Prevention EpiCenters A unique research program in which CDC collaborates with medical academic investigators to conduct innovative infection control and prevention research in healthcare settings. Learn more: <u>http://www.cdc.gov/hai/epicenters</u>.

Innovation and Research projects - academic centers, healthcare systems

Emerging Infections Program (EIP) – 10 sites conduct population based surveillance and

special projects to identify prevalence of HAIs and risk factors 12/20/2016

# CDC-Funded AR Activities in Georgia (\$3.6M)

#### **Health Department**

- Detect and Respond
- AR Prevention Networks (GA will have CDC medical officer on site)
- CRE lab testing

#### EMERGING INFECTIONS PROGRAM

 Improve public health by translating population-based surveillance and research activities into informed policy and public health practice.

#### **Innovation Projects**

- GEORGIA TECH RESEARCH CORPORATION: Microbiome Assessment & Intervention
- EMORY UNIVERSITY: Innovative Prevention & Tracking
- UNIVERSITY OF GEORGIA: Innovative Prevention & Tracking

# Where does GA stand? NHSN data



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#### **GEORGIA ACUTE CARE HOSPITALS**

Healthcare-associated infection (HAI) data give healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

- Learn how your hospital is performing: www.medicare.gov/hospitalcompare For additional information:
- 2014 HAI Progress Report: www.cdc.gov/hai/progress-report/
- NHSN: www.cdc.gov/nhsn



- HAIs and prevention activities in Georgia: dph.georgia.gov/healthcare-associated-infections
- Georgia validation efforts: www.cdc.gov/hai/pdfs/state-progress-landscape.pdf

LEGEND	HAI TYPE	# OF GEORGIA HOSPITALS THAT REPORTED DATA TO CDC'S NHSN, 2014 <sup>+</sup> Total Hospitals in Georgia: 157	2014 STATE SIR vs. 2013 State SIR	2014 STATE SIR vs. 2014 Nat'l SIR	2014 STATE SIR vs. Nat'l Baseline‡	2014 STATE SIR	2014 NAT'L SIR
2014 state SIR is significantly lower (better) than comparison group in column header	CLABSI Nat'l Baseline: 2008	108	个 9%	<b>1</b> 30%	36%	0.64	0.50
Change in 2014 state SIR compared to group in column header is not statistically significant	<b>CAUTI</b> Nat'l Baseline: 2009	111	13%	14%	14%	1.14	1.00
	<b>SSI, Abdominal Hysterectomy</b> Nat'l Baseline: 2008	91	√ 5%	企 13%	- √ 7%	0.93	0.83
2014 state SIR is significantly higher (worse) than comparison group in column header	SSI, Colon Surgery Nat'l Baseline: 2008	96	∲ %	16%	<b>4</b> 18%	0.82	0.98
	MRSA Bacteremia Nat'l Baseline: 2011	111	0%	<b>1</b> 21%	☆ 5%	1.05	0.87
	<b>C. difficile Infections</b> Nat'l Baseline: 2011	112	12%	<b>↓</b> 1%	₽ 8%	0.92	0.92

<sup>+</sup>The number of hospitals that reported to NHSN and are included in the SIR calculation. This number may vary across HAI types; for example, some hospitals do not use central lines or urinary catheters, or do not perform colon or abdominal hysterectomy surgeries

For additional data points, refer to the technical data tables.

<sup>‡</sup>Nat'l baseline time period varies by HAI type. See first column of this table for specifics.

WHAT IS THE STANDARDIZED INFECTION RATIO?

#### WHAT IS GEORGIA DOING TO PREVENT HEALTHCARE-ASSOCIATED INFECTIONS?

#### Percent of Hospitals with Antibiotic Stewardship Programs by State, 2015\*

Nationally, 48.1% of all hospitals have stewardship programs (2,199 of 4,549); the national goal is 100% of hospitals by 2020.



\*A hospital stewardship program is defined as a program following all 7 of CDC's Core Elements of Hospital Antibiotic Stewardship Programs.

Source: CDC's National Healthcare Safety Network (NHSN) Survey



#### **HAI Prevention Stories**

#### from the States



#### Measure

Georgia assessed stewardship activities statewide. At the start of their efforts, they found that about half of Georgia hospitals had committees to improve prescribing, but few were implementing specific stewardship actions.

#### Focus on Pharmacists

After focus groups identified a statewide need for training and education related to running antibiotic stewardship programs, Georgia is providing modest funding to hospitals for additional pharmacists to attend such training.

#### Convene

To develop a statewide network of hospital champions for antibiotic stewardship, Georgia conducted a full-day seminar for pharmacists and a follow-up webinar for physicians.

#### Honor Roll

To rally hospital engagement, Georgia developed a recognition program to honor hospitals that meet state goals for antibiotic stewardship programs.

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#### Improving Inpatient Antibiotic Prescribing Practices Across Georgia

Antibiotic resistance is a significant public health threat. Each year in the United States, more than 2 million people become infected with bacteria that are resistant to antibiotics; 23,000 people die as a result.

Antibiotics are commonly used in U.S. hospitals and offer tremendous benefits to patients with infectious diseases. But multiple studies have found that up to half of the time, these drugs are given without proper evaluation or for too long, fueling antibiotic resistance and putting patients at risk for *Clostridium difficile* infection (deadly diarrhea), and future infections that are harder to treat.

The Georgia Department of Public Health provides leadership to healthcare facilities across the state to improve antibiotic prescribing practices. Long-term goals are to decrease *Clostridium difficile* and drug-resistant infections across the state.

CDC

12/20/2016

# Are we feeling jolly yet?

# Another seasonal TRIVIA question!

# What was the coldest temperature ever recorded on Earth?

The lowest natural temperature ever directly recorded at ground level on Earth is -89.2 °C (-128.6 °F), which was at the Soviet Vostok Station in Antarctica, on July 21, 1983.



# Implementation of AR Activities

- Coordinated Prevention of CDI, CRE, MRSA
- Using NHSN data for action TAP
- NHSN AU/AR Reporting
- Tools for stewardship implementation

# Preventing Infections in Highly Connected Facilities – testing the model

Orange County, CA & Chicago, IL are testing Vital Signs models that predict specific interventions will slow spread of resistant bacteria in highly connected facilities.

Orange County - Network of highly connected hospitals and nursing homes are analyzing patient movement.

All patients/residents treated with topical nasal products and chlorhexidine antiseptic bathing to reduce MRSA and CRE across facilities in the region.

Rush University Prevention Epicenter using CRE tracking system (XDRO registry) since 2014. Patients who test CRE positive are identified and tracked as they move between facilities for regional awareness.

Interventions will be targeted at facilities that are more likely to admit patients previously identified as being CRE colonized, as determined by analysis of patient movement data.



# Using Data for Action: TAP Strategy

### Target $\rightarrow$ Assess $\rightarrow$ Prevent

<u>Target facilities/units</u> with high burden/excess of HAIs <u>Assess gaps</u> in infection prevention in targeted facilities/units <u>Prevent infections</u> by implementing interventions to address the gaps

A linear progression framework for quality improvement

NHSN application - http://www.cdc.gov/hai/prevent/tap.html

### CDC TAP Tools http://www.cdc.gov/hai/prevent/tap.html

- Target: TAP Report
  - Run, interpret, communicate results
- Assess Gaps in Infection Prevention: Facility Assessment Tool
  - Captures awareness/perceptions among personnel of prevention policies/ practices
    - General Infrastructure, Capacity, and Processes
    - Antibiotic Stewardship
    - Early Detection and Isolation, Appropriate Testing
    - Contact Precautions / Hand Hygiene
    - Environmental Cleaning
- Prevent: Implementation Guides
  - CLABSI, CAUTI, CDI

#### HAIPrevention@cdc.gov for individualized technical support!!

# States Targeting Infections via Engagement (STRIVE)

- CDC-funded contract with American Hospital Association, Health Research and Educational Trust (HRET) (Oct 2015 – Sept 2018)
  - Project Objective: To improve implementation of infection prevention and control efforts in acute care hospitals across the United States
- Scope of Work:
  - HRET collaborating with state partners to facilitate HAI prevention efforts in short-stay and long-term acute care hospitals
    - Help engage hospital leadership
    - Facilitate data sharing
    - Assist with targeting, assessment, and implementation strategies
    - Promote alignment and reduce burden
- Used NHSN data to target hospitals and LTACHs
  - Focused on CDI TAP reports, state SIRs

# NHSN: Antibiotic Use (AU)Reporting

#### Purpose:

- Provide a mechanism for facilities to report and analyze antimicrobial usage as part of antimicrobial stewardship efforts at their facility
- Allow for risk-adjusted comparison of antimicrobial use to a national aggregate

Voluntary reporting

AUR Reporting has been included in Meaningful Use Stage 3. Facilities can submit data as early as 2017 in MU3 Option year 1.

Seven GA hospitals are reporting AU data to NHSN

NHSN@CDC.GOV for more information on the AU option

#### **Quarterly Submission to NHSN AU Option\***



\*As of November 2016

# CDC Antibiotic Stewardship Core Elements Implementation and Partnerships

- Percent of U.S. hospitals with antibiotic stewardship programs with all 7 core elements increased from 39% in 2014 to 48% in 2015
- The Leapfrog Group is adding questions on the CDC Core Elements to their annual hospital survey
- The Joint Commission issued an accreditation standard based on the Core Elements that will require hospitals to implement stewardship programs
- CMS nursing home rule and a hospital rule include requiring antibiotic stewardship programs as a condition of participation
- National Quality Forum Playbook (released May 2016)
  - Practical suggestions for implementing the Core Elements
- Pew Charitable Trusts -A Path to Better Antibiotic Stewardship in Inpatient Settings: 10 case studies map how to improve antibiotic use in acute and longterm care facilities

Antibiotic Stewardship in Acute-Care Hospitals: A Practical Playbook from NQF



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# 2017 and Beyond

# Turning the Tide on Prevention CONTAIN - CONTROL - PREVENT

 $\checkmark$  Rapid detection of existing and emerging types of antibiotic resistance with gold-standard lab capacity

 ✓ More effective and faster investigation of emerging resistance (e.g., C. auris, mcr-1, CRE)

✓ Faster outbreak response and containment

 $\checkmark$  Stronger data for improved infection control to protect patients and to prevent and combat future resistance threats

✓ Improved antibiotic prescribing

 $\checkmark$  Insights for research innovation and better patient care

✓ Nationwide implementation of CDC Core Elements for Antibiotic Stewardship in hospitals, nursing homes and outpatient settings



For more information please contact

Division of Healthcare Quality Promotion (DHQP)

National Center of Emerging and Zoonotic Infectious Disease

Centers for Disease Control and Prevention

404-639-4000

www.cdc.gov/hai

www.cdc.gov/drugresistance