



The Role of Law and Policy in Addressing Healthcare- Associated Infections

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Deputy Assistant Secretary for Health

**Director, Office of Disease Prevention and Health
Promotion (ODPHP), U.S. Department of Health and
Human Services (HHS)**

October 30, 2019

- Healthy People Background and the Role of Law and Policy in Addressing Healthcare-Associated Infections
 - Don Wright, MD, MPH, Deputy Assistant Secretary for Health; Director, ODPHP, HHS
- Preventing Infections and Combating Antibiotic Resistance in Healthcare — Centers for Disease Control and Prevention Strategy
 - Arjun Srinivasan, MD, MPH, Associate Director for Healthcare Associated Infection Prevention Programs, Division of Healthcare Quality Promotion, CDC
- Overview and National Perspective
 - Peter Pronovost, MD, PhD, Chief Clinical Transformation Officer, University Hospitals



- Perspective from the States
 - Marion Kainer, MD, MPH, Director of Healthcare Associated Infections & Antimicrobial Resistance Program, Tennessee Dept. of Health (former)
- Slow Progress on HAIs: Some Cautionary Notes
 - Bernard Black, JD, MA, Nicholas D. Chabraja Professor, Northwestern University Law School and Kellogg School of Management
- Summary and Lessons Learned
 - Peter Pronovost
- Question and Answer Session



Healthy People Background and the Role of Law and Policy in Addressing Healthcare- Associated Infections

What Is Healthy People?

- Provides a strategic framework for a **national prevention agenda** that communicates a vision for improving health and achieving health equity
- Identifies science-based, **measurable objectives with targets** to be achieved by the end of the decade
- Requires tracking of **data-driven outcomes** to monitor progress and to motivate, guide, and focus action
- Offers a model for international, state, and local **program planning**



Reports and Related Products

- Reports and community “Bright Spots”

Webinar Series

- Focused on specific HP2020 topics
- Shares community examples of innovative uses of law and policy to improve health outcomes

Supporting the Development of Healthy People 2030 (HP2030)

- HP2030 Listening Session: 2018 Public Health Law Conference

For more information:

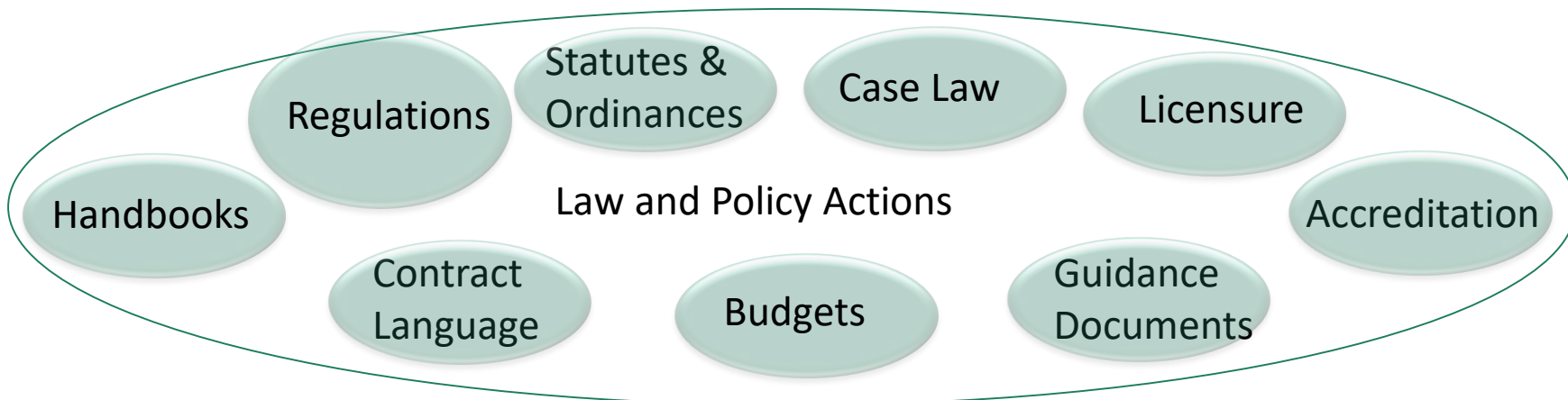
www.healthypeople.gov/2020/law-and-health-policy



Robert Wood Johnson Foundation



What is Law and Policy?



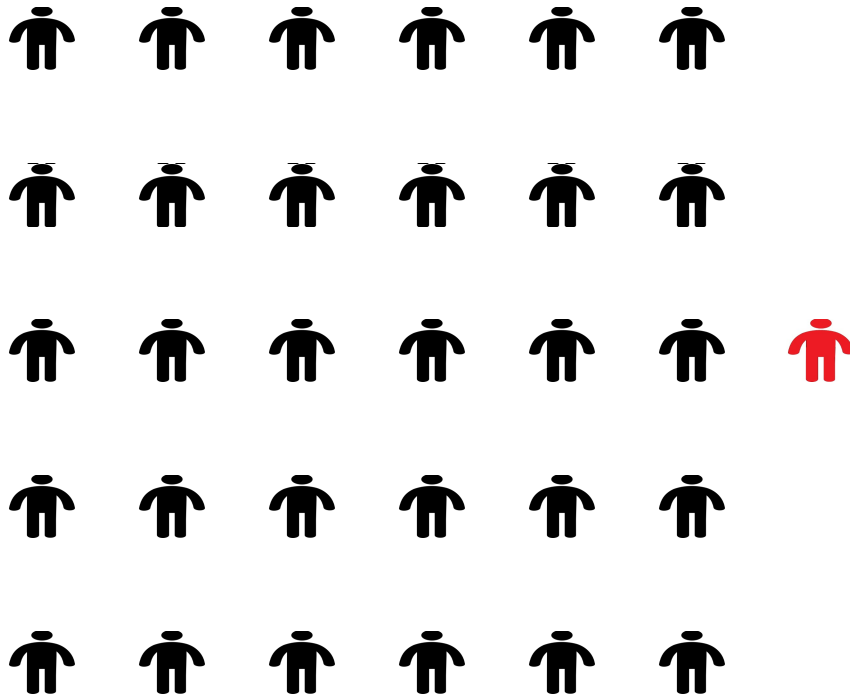
Healthcare-Associated Infections (HAI) — Definition and Common Types

- **Healthcare-Associated Infections (HAIs)** are infections that people acquire while receiving treatment for another condition in health care settings:
 - Inpatient hospitals
 - Ambulatory settings
 - Long-term care facilities
 - Any healthcare setting where people receive care

Majority of hospital-acquired HAIs include:

- Central line-associated blood stream infections (CLABSI)
- Catheter-associated urinary tract infections (CAUTI)
- Surgical site infections
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- *Clostridium difficile* (C. difficile)





- 1 in 31 U.S. hospital patients has a HAI at any given time
- Resulting in **\$33 billion** in potentially preventable health care costs annually (2009)

Icon made by [Freepik](http://www.flaticon.com) from www.flaticon.com



Reduce Central Line-Associated Bloodstream Infections (CLABSIs)

Central Line-Associated Bloodstream Infections
(standardized infection ratio)

Baseline (2015)

1.00



HP2020 Target
0.50



Most Recent
Data (2017)

0.81



38.3%
Decrease Needed

HP2020 Objective: HAI-1
Data Source: National Healthcare Safety Network (NHSN),
CDC/NCEZID



ODPHP

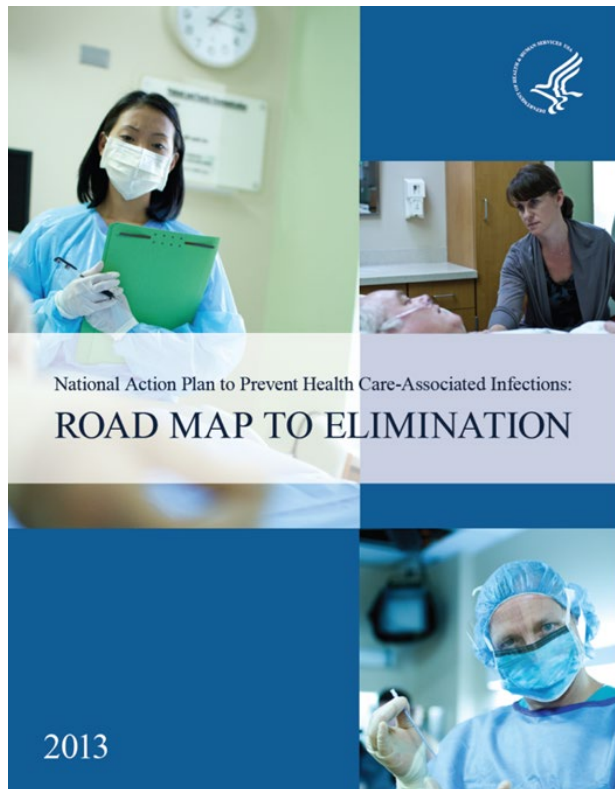
Office of Disease Prevention
and Health Promotion



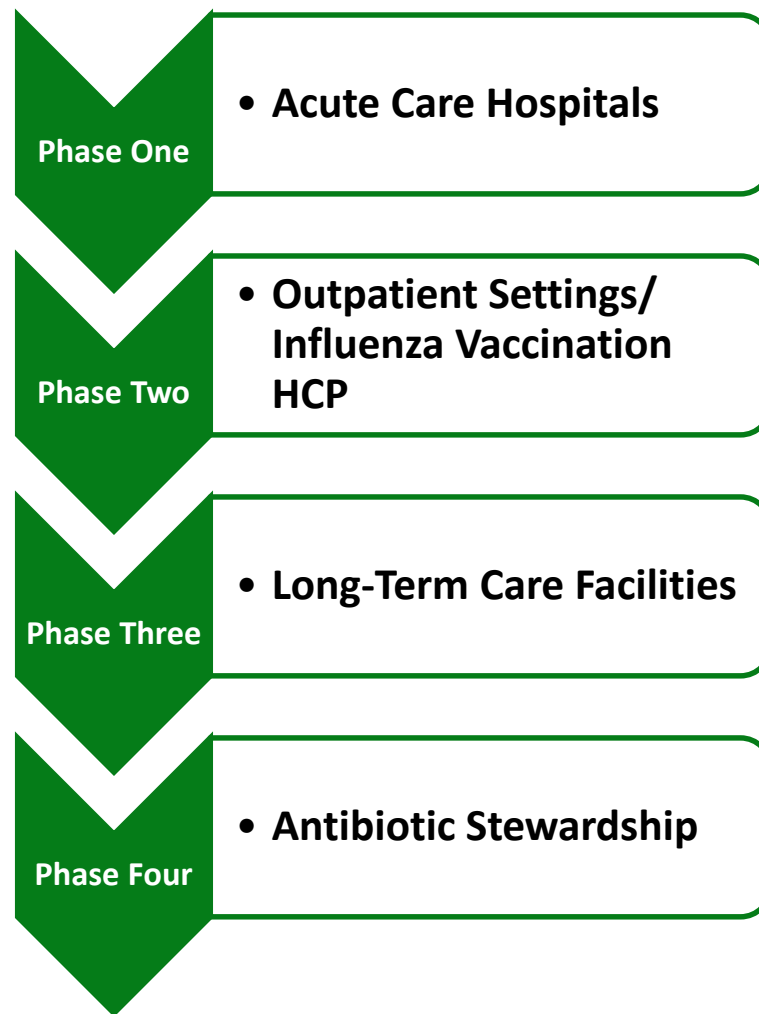
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Office of Disease Prevention
and Health Promotion

National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination

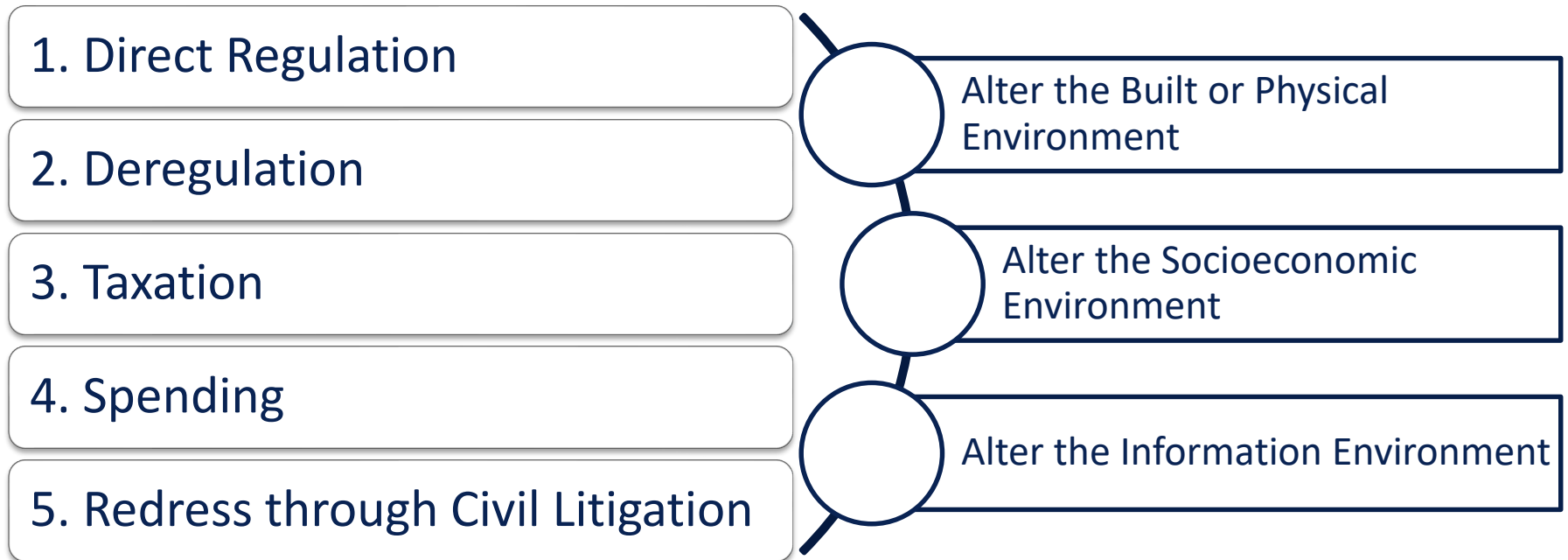


Maintained as a living document



The Role of Law and Policy in Preventing HAIs





Adapted from: Gostin LO, Wiley LF. Public health law: power, duty, restraint. Univ of California Press; 2016 Feb 2.



State HAI Prevention Plans

State-based HAI prevention

Healthcare-associated Infections

Map: HAI Prevention Activities

HAI Prevention Projects

Tracking

Investments

State Success

Resources for States

Healthcare-associated Infections

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Prevention Projects

State Prevention Collaboratives consist of multiple hospitals within a state which:

- Target an infection as a team.
- Implement prevention strategies through culture change.
- Share experiences between facilities.
- Measure their progress as a group.
- Provide feedback to clinicians and staff.

Contact Us:

Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA 30333
800-CDC-INFO (800-232-4636)
TTY: (888) 232-6348
Contact CDC-INFO

Prevention collaboratives your state may have:

CLABSI Central Line-associated Bloodstream Infection	CAUTI Catheter-associated Urinary Tract Infections
C. diff Clostridium difficile Infection (CDI, C. diff)	MRSA Methicillin-resistant Staphylococcus aureus
SSI Surgical Site Infection	VAP Ventilator-associated Pneumonia
MDRO Multi-drug Resistant Organisms	Long Term Care/Nursing Homes Prevention Collaborative for Long Term Care Facilities
CUSP Comprehensive Unit-based Safety Program	Other Access the clickable map to find which prevention collaboratives are in your state

CDC Home

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People.™

SEARCH

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

Healthcare-associated Infections (HAIs)

State-based HAI prevention

State-based HAI Prevention Activities

Financial and/or technical support provided by CDC

Select a state: Select One GO

Select by activities to prevent HAIs: Select One GO

Select by Epidemiology and Laboratory Capacity (ELC) HAI funded activities: Select One GO

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Prevention Projects

State health department's HAI prevention efforts reinforce patient safety across all healthcare.

Tracking

Over 17,000 hospitals and other healthcare facilities provide data to NHSN, the nation's most widely used healthcare-associated infection tracking system.

Investments

Federal investments bolster states' abilities to protect patients from HAIs.

State Success

Many states are showing impressive progress in reducing HAIs.

CDC Resources for States

Resources for States

CDC tools and technical assistance support state efforts to prevent HAIs.

Laws that provide requirements for state health departments, healthcare facilities, and healthcare providers and promote best practices in HAI prevention include:

- Authorities granted to state health agencies
- Definitions for the infections and facilities covered under state laws
- HAI advisory councils
- Pilot phases for state programs
- Reporting requirements for facilities
- Licensure and training requirements for facilities and providers, including injection safety
- Financial incentives and disincentives
- Protection of HAI data

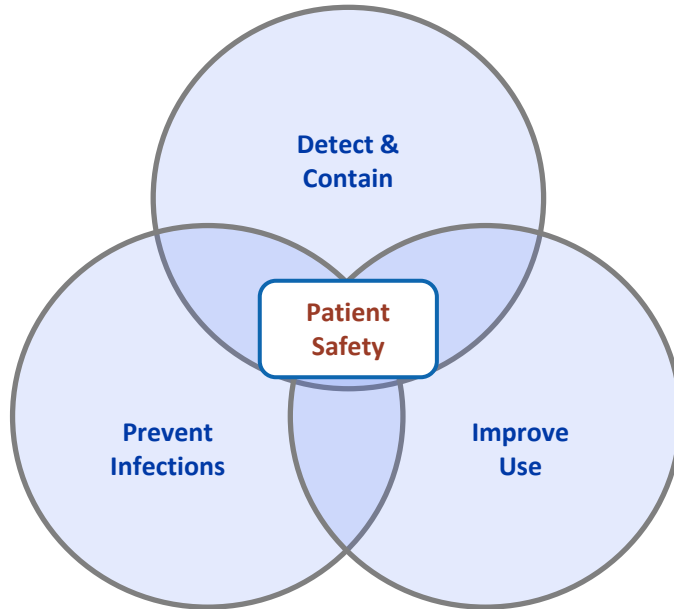
Source: CDC Public Health Law Program - <http://www.cdc.gov/phlp/publications/topic/hai.html>



- For more on the Healthy People initiative, including the development of Healthy People 2030:
 - www.healthypeople.gov
- For the Law and Health Policy project:
 - <https://www.healthypeople.gov/2020/law-and-health-policy>
- For any other questions, please contact:
 - Angie McGowan, Project Director (CDC Assignee), ODPHP: Angela.McGowan@hhs.gov



Preventing Infections and Combating Antibiotic Resistance in Healthcare Centers for Disease Control and Prevention Strategy

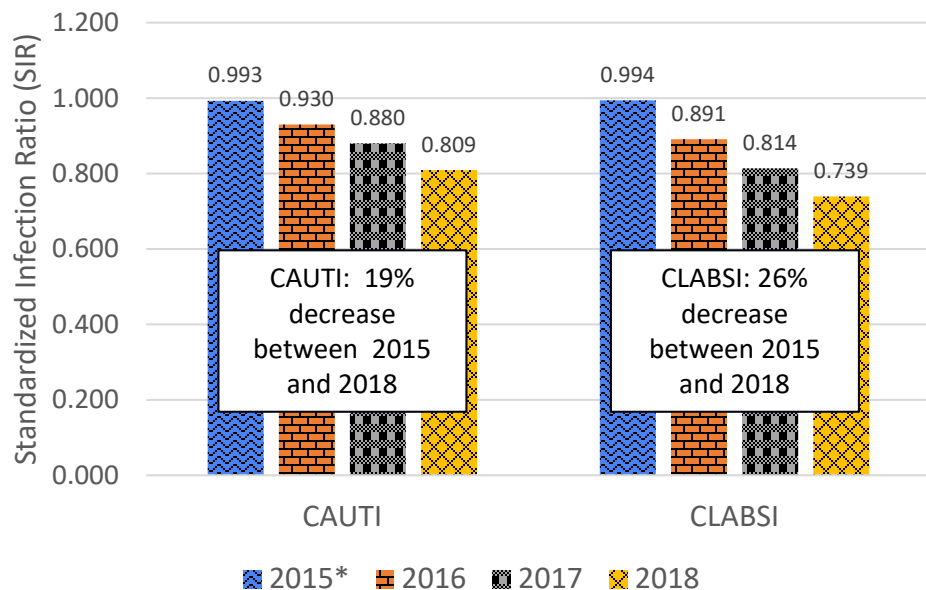


- **Data for Action**
 - NHSN
 - Emerging Infections Program (EIP)
 - Outbreaks
 - ARLN
- **Evidence-based Guidelines and Tools**
- **Programs & Partnerships for Implementation**
- **Innovation**

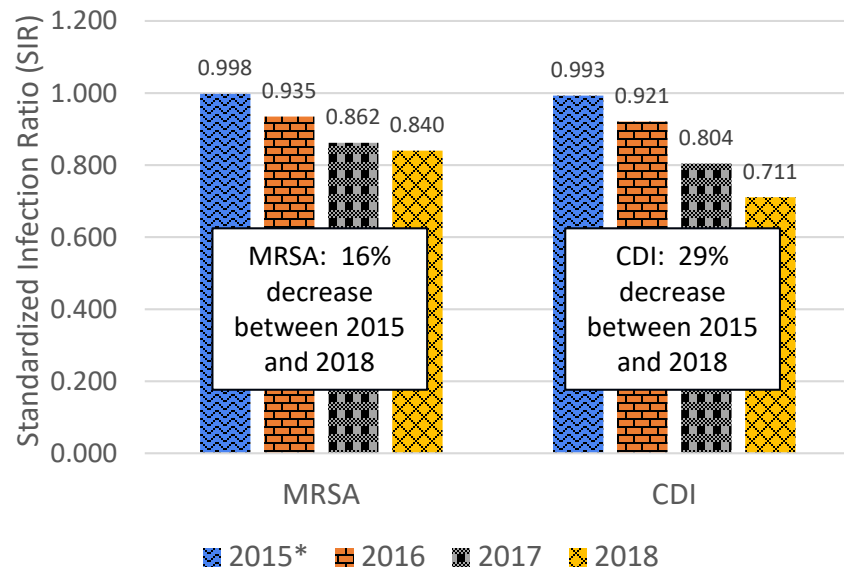
Prevention of HAIs: National Level Progress, 2015-2018

NHSN, Acute Care Hospitals. Data to be released Fall 2019

Device-associated HAI Data, NHSN,
2015-2018



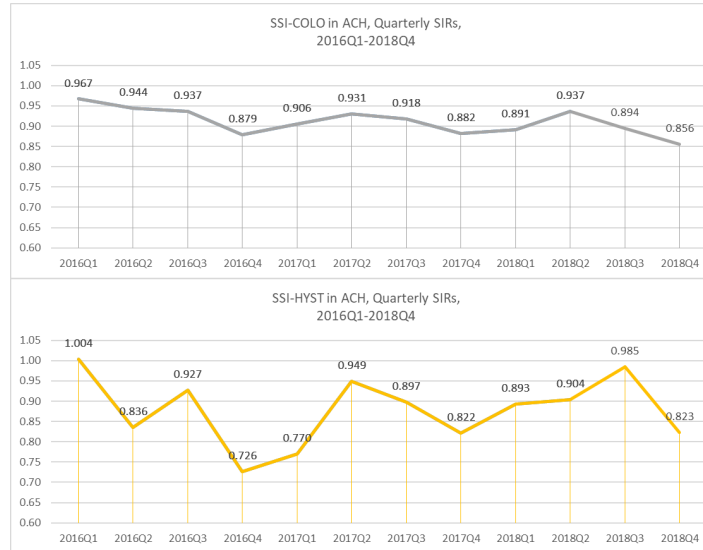
LabID Data, NHSN,
2015-2018



CAUTI – Catheter-associated urinary tract infection; CLABSI – central line-associated bloodstream infection; MRSA – Methicillin-resistant *S. aureus*; CDI – *C. difficile* infection; *Baseline year

SSI prevention: some progress, but more work is needed

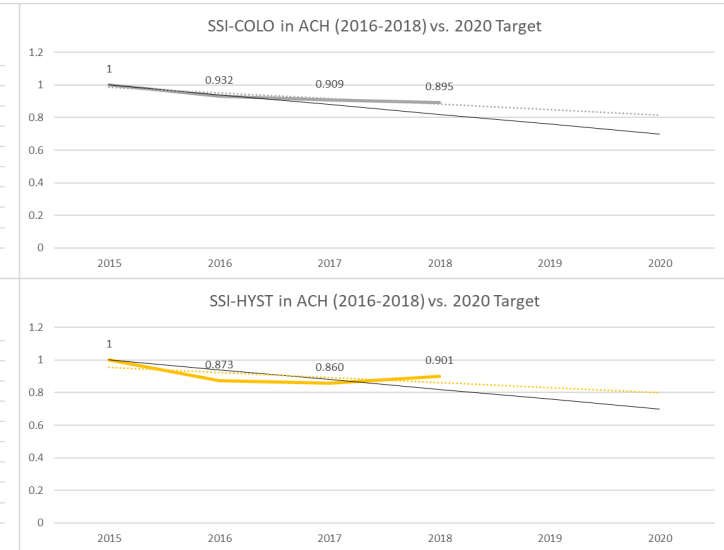
Acute care hospital quarterly standard infection ratio (SIR), 2016 Q1 – 2018 Q4



Surgical Site Infection (SSI): Colon Surgery

Surgical Site Infection (SSI): Abdominal hysterectomy

Annual acute care hospital SIR vs. 2020 Target

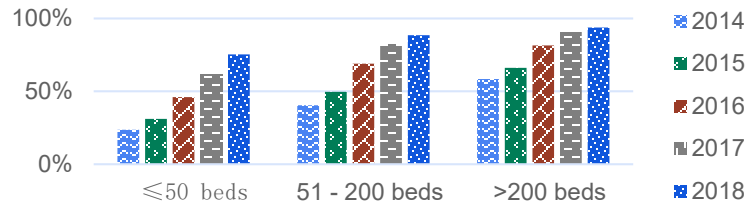


- Continue to work with partners (e.g., CMS, healthcare systems, state HAI/AR programs, American College of Surgeons (ACS) and accreditation groups)
- Continue to promote adherence to CDC guidelines, e.g. SSI prevention guideline updated in 2017

Improve antibiotic use

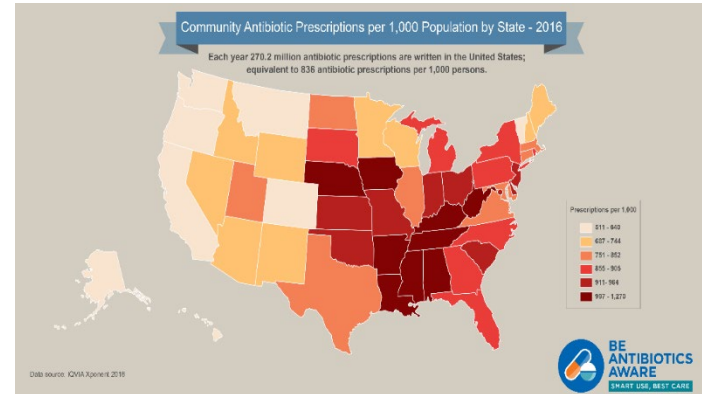
Inpatient

Percentage of U.S. Hospitals with Antibiotic Stewardship Programs Meeting All Core Elements



- Progress: Number of hospitals with stewardship programs increased to 80%
- **Focus for 2020:** Continue to work with partners (e.g., Joint Commission) to improve the quality of stewardship programs

Outpatient



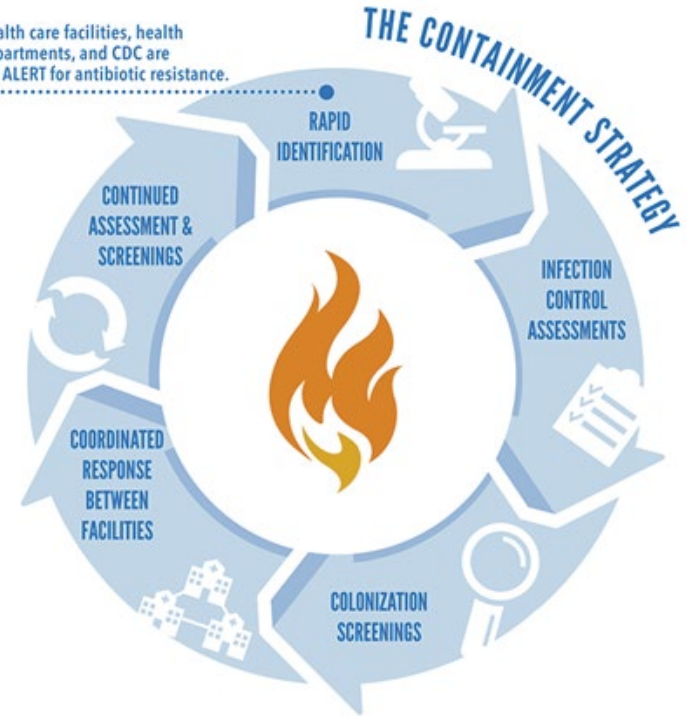
- Progress: 5% overall decrease in outpatient antibiotic use, driven by 13% decrease in children
- **Focus for 2020:** Decrease inappropriate outpatient prescribing by targeting specific populations (i.e., older adults), drugs (i.e., fluoroquinolones), settings (i.e., urgent care and ambulatory clinics), and infections (i.e., URI and UTI)

Detect, contain, and control emerging threats: emerging resistance

- Labs in all states are testing isolates to detect resistance threats.
- Dedicated staff in state health departments are supporting investigations to limit spread of those threats.
- >40,000 isolates tested
- Hundreds of responses initiated.
- We are learning:
 - Some settings are historically linked to amplification (skilled nursing facilities (SNFs))
 - Close connection to international efforts



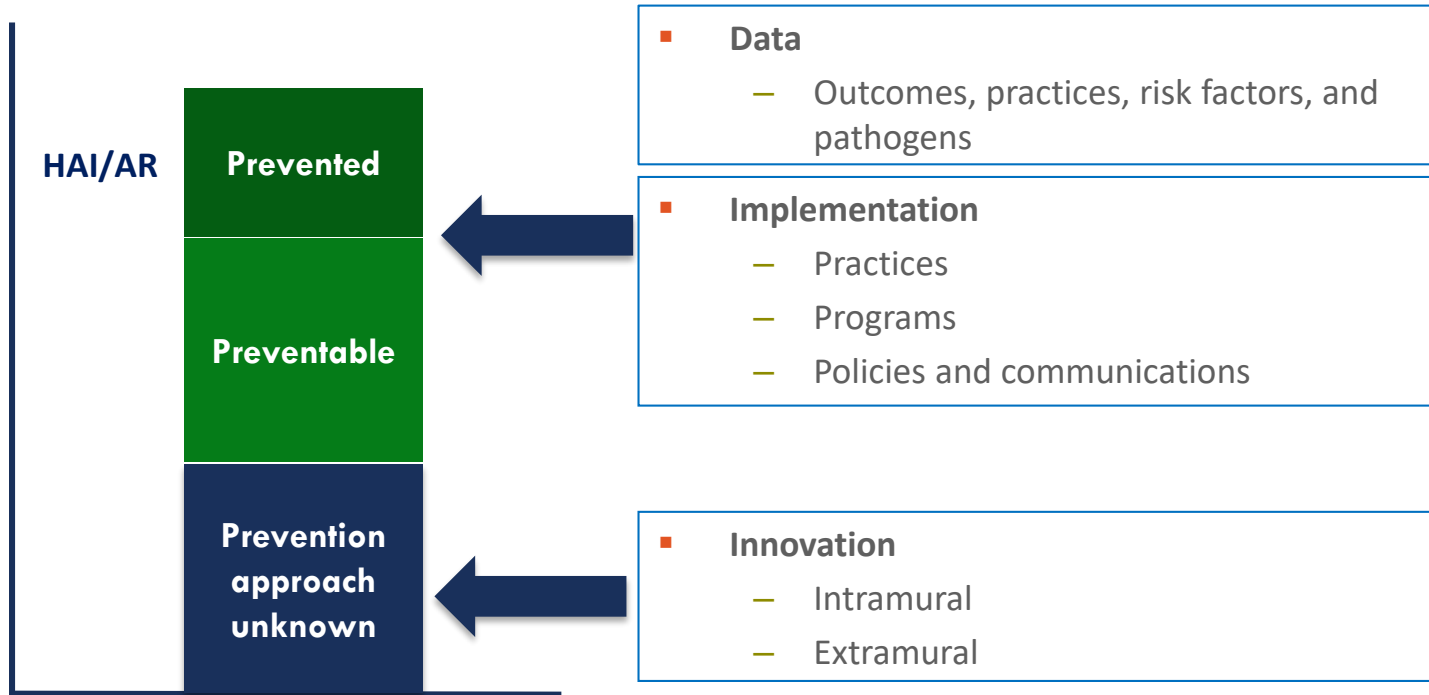
Health care facilities, health departments, and CDC are ON ALERT for antibiotic resistance.



Another Related Challenge: Sepsis

- Each year, at least 1.7 million adults in America develop sepsis.
- Nearly 270,000 Americans die as a result of sepsis.
- 1 in 3 patients who die in a hospital have sepsis.
- Preventing infections and antibiotic resistance will help prevent sepsis from occurring at all and, if it does occur, make it easier to treat effectively.
- CDC has developed a toolkit to help hospitals track sepsis more effectively.
- Many patients who develop sepsis have underlying health conditions and regular interactions with healthcare- how can we better protect patients?

Protect patients and improve healthcare



Use Data for Action: Targeted Assessment for Prevention



- Uses the data hospitals are already collecting and reporting to CDC through the National Healthcare Safety Network (NHSN).
- Helps hospitals determine where prevention efforts are needed- locations with large numbers of potentially preventable infections.
- Provides tools to help assess gaps in prevention and then close those gaps.

Find Better Ways to Implement What Works

- We need to help direct people to interventions and implementation ideas that are most effective.

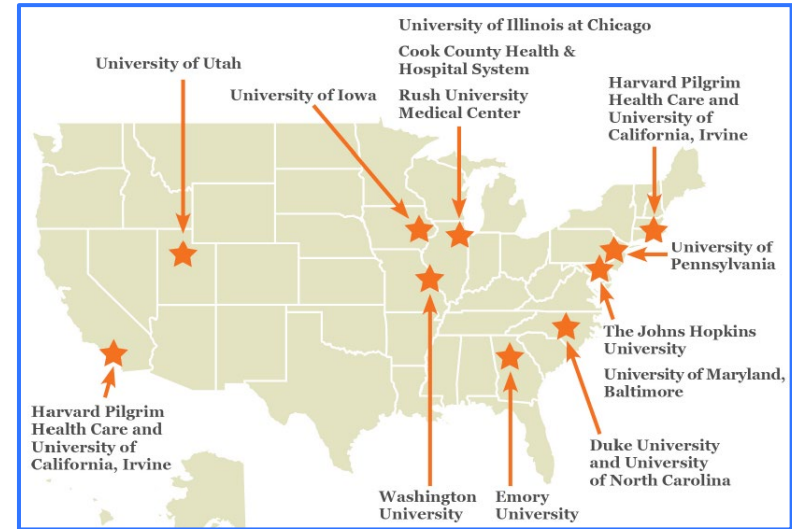
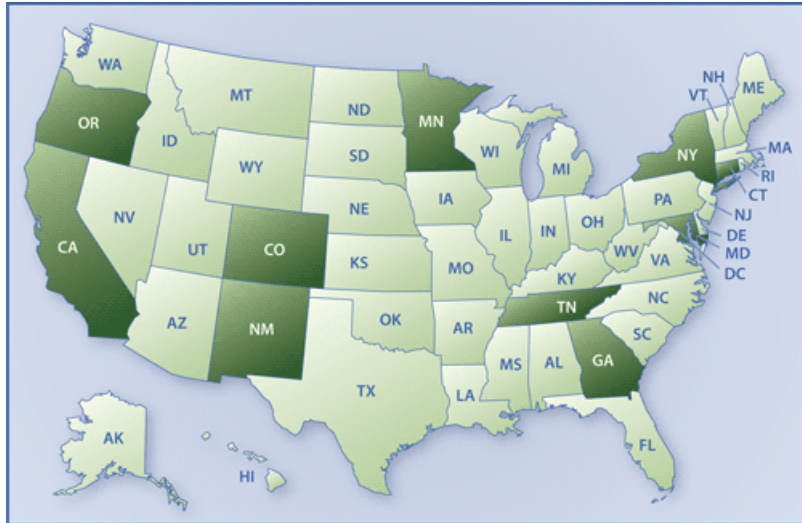
This screenshot shows the CDC website page for 'Strategies to Prevent *Clostridioides difficile* Infection in Acute Care Facilities'. The page features a search bar at the top right with the text 'A-Z Index' and 'Search'. Below the search bar is a green header with the text 'Healthcare-associated Infections'. The main content area is titled 'Strategies to Prevent *Clostridioides difficile* Infection in Acute Care Facilities' and includes a 'Purpose:' section. On the left side, there is a navigation menu with the following items: 'Healthcare-associated infections (HAI)', 'HAI Data', 'Types of Infections', and 'Diseases and Organisms', each with a plus sign next to it. Social media icons for Facebook, Twitter, LinkedIn, YouTube, and Instagram are located below the breadcrumb trail.

This screenshot shows the CDC website page for 'Strategies to Prevent Hospital-onset *Staphylococcus aureus* Bloodstream Infections in Acute Care Facilities'. The page features a search bar at the top right with the text 'A-Z Index' and 'Search'. Below the search bar is a green header with the text 'Healthcare-associated Infections'. The main content area is titled 'Strategies to Prevent Hospital-onset *Staphylococcus aureus* Bloodstream Infections in Acute Care Facilities' and includes a 'Purpose:' section. On the left side, there is a navigation menu with the following items: 'Healthcare-associated Infections (HAI)', 'HAI Data', 'Types of Infections', and 'Diseases and Organisms', each with a plus sign next to it. Social media icons for Facebook, Twitter, LinkedIn, YouTube, and Instagram are located below the breadcrumb trail. A 'On This Page' box is visible on the right side of the page, containing the text '1. IMPLEMENT INTERVENTIONS'.

DHQP Networks for Research and Innovation

Prevention Epicenters

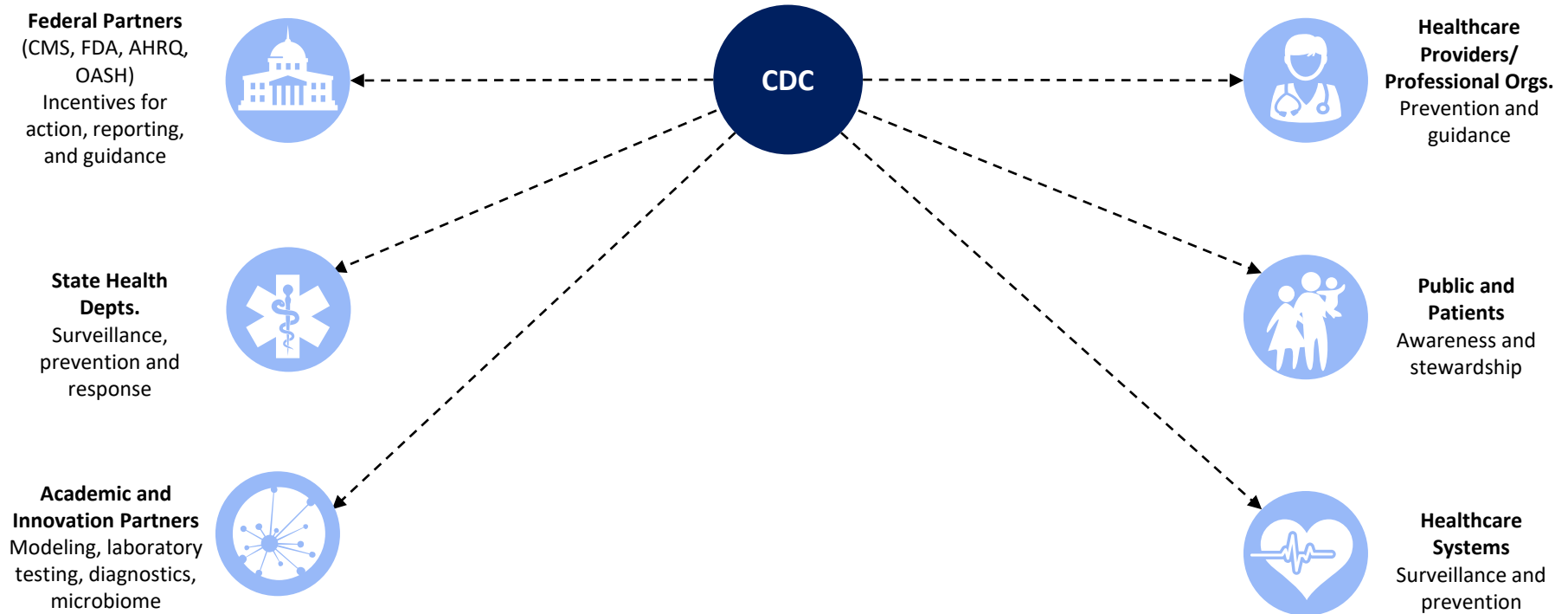
Collaborate with leading medical investigators and state health departments to more rapidly identify the best approaches to prevent the spread of infections in health care facilities, including antimicrobial resistance and other important infectious threats



Emerging Infections Program

Exploration of innovations to improve national surveillance and evaluation of healthcare-associated infection prevention and control strategies

How We Achieve Progress: Partners are Critical for Implementation, Evaluation and Education



Partnering to Amplify Messages

CDC leverages partners from around the world and across industries and sectors to amplify messages related to patient safety, infection prevention, AMR, antibiotic stewardship, and sepsis.

CDC provides partners with educational materials, messages, and updated information on CDC's patient safety portfolio.

“Could this infection be leading to sepsis?”

GET AHEAD OF SEPSIS

BE ALERT TO THE SIGNS OF SEPSIS AND, WHEN SUSPECTED, ACT FAST.

GET AHEAD OF SEPSIS
KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

Help your patients understand why antibiotics don't treat viruses.

AN ANTIBIOTIC IS THE WRONG TOOL TO TREAT A VIRUS.

Make sure you use the right tool for the job.

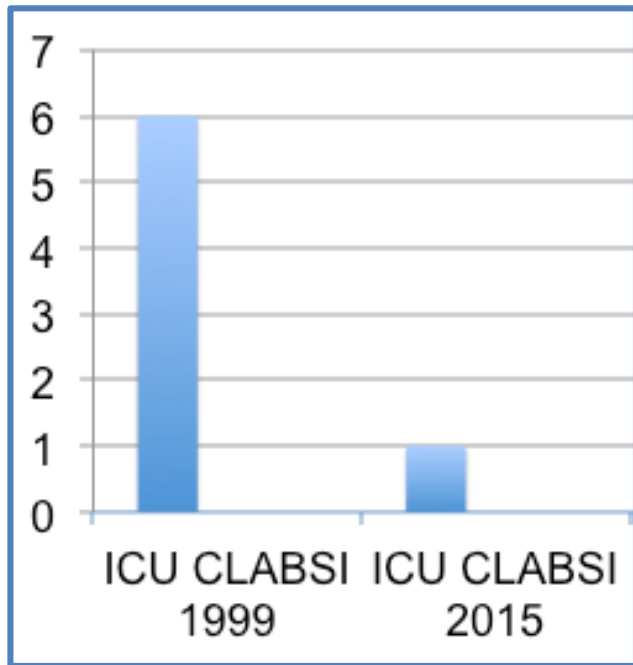
Antibiotics save lives by treating certain infections caused by bacteria, not viruses like colds or flu. When they're not needed, antibiotics won't help you, and the side effects could still hurt you. Ask your doctor when an antibiotic is the right tool for your illness and when it's not.

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

Partnering to Prevent Infections

- Collaborating with the Health Research and Education Trust of the American Hospital Association on a national prevention collaborative for *C. difficile*.
- Collaborating with Health Departments and hospitals in TN and KY to reduce MRSA infections in high burden locations.

1 Change in US CLABSI Rates per 1000 catheter days



Why did CLABSI Work at Policy Level?

- ▶ Reliable and valid measurement system
- ▶ Evidence-based practices from clinical and basic research
- ▶ Investment in implementation (improvement) science*
- ▶ Local ownership (CUSP team) and peer learning communities
- ▶ Investment by hospitals in measuring CLABSI
- ▶ Align and synergize efforts of many around a common goal and measure



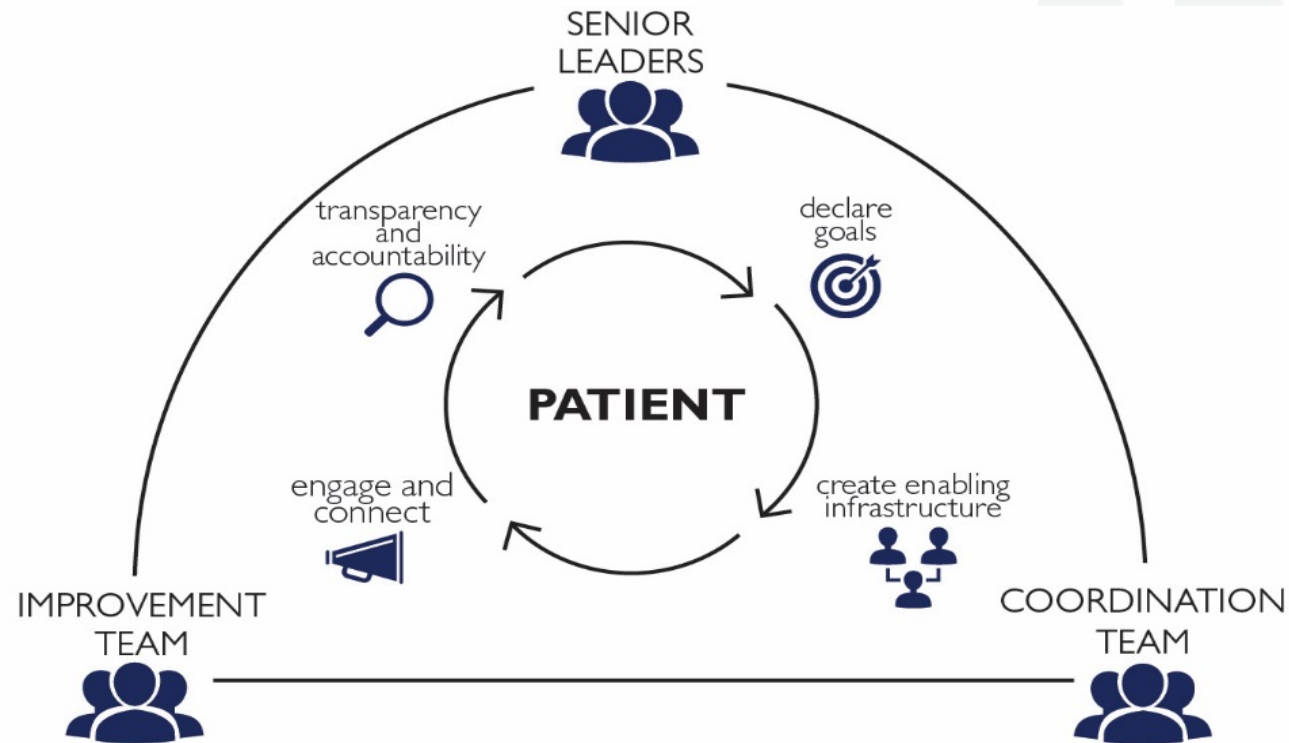
Source: Pronovost; 5 years after to err is human: a success story to learn from; BMJQS 2015

*Dixon-Woods, what is improvement science the Health foundation 2013

Marshall, Promotion of improvement as a science; Lancet 2013

[*http://www.obesity-cancer.wustl.edu/en/About/What-Is-Transdisciplinary-Research](http://www.obesity-cancer.wustl.edu/en/About/What-Is-Transdisciplinary-Research)

Framework for Improvement Science



What did this work at a team and individual level



Dixon-Woods; Explaining Michigan Milbank Quarterly

Reducing Healthcare Associated Infections

Role of Laws and Policies

Marion A. Kainer MD, MPH, FRACP, FSHEA

Former:

***Director, Healthcare Associated Infections & Antimicrobial Resistance Program,
Tennessee Department of Health (TDH)
Nashville, TN***

Current:

- **Head of Infectious Diseases, Western Health, Melbourne, Australia**
- **Adjunct Associate Professor Health Policy, Vanderbilt University, Nashville, TN**

State Laws

Promote Prevention of HAIs

- **Broad authorities for the health department to promote best practices**
- **Focus on specific, preventable infections**
- **Identifying responsible facilities, units, and providers**
- **Reporting of facility-specific infection rates to the health department**
- **Reporting of facility-specific infection rates to the public**
- **Immunity for providers and facilities for reporting**
- **Protection from litigation**
- **Financial incentives to prevent HAIs or penalties for failure to report or prevent**

http://www.cdc.gov/hai/pdfs/toolkits/toolkit-HAI-POLICY-FINAL_01-2012.pdf

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experience with health care.

Latest News

- TV drug ads should tell how to report side effects
New Consumer Reports poll finds most Americans know they should tell the FDA 04/01/08
- More states debating MRSA screening program
New study shows screening patients for MRSA can dramatically reduce infection rates 03/18/08
- Consumer groups endorse credit card reform
Consumers Union joins other groups in urging Congress support HR 5244 and S. 2753 03/12/08
- OH Governor urged to rescind rule on milk
The rule is not pro-consumer, restricts free speech of dairies, and interferes with free markets 03/11/08

Guidance on Public Reporting of Healthcare-Associated Infections: Recommendations of the Healthcare Infection Control Practices Advisory Committee

Linda McKibben, MD,^a Teresa Horan, MPH,^b Jerome I. Tokars, MD, MPH,^b Gabrielle Fowler, MPH,^b Denise M. Cardo, MD,^a Michele L. Pearson, MD,^c Patrick J. Brennan, MD,^d and the Healthcare Infection Control Practices Advisory Committee*

APIC Convenes Conference on Mandatory Public Reporting



TN Hospital Infections Study Group:
“We want to drive the train”
Do the Right Thing; Proactive

Emphasis was placed on collection of actionable, verifiable data. Use of NHSN.

Law passed in 2006: Tennessee



Western Health

- Department must publish public reports
- May identify individual facilities
- Not release patient level data
- Data from report cannot be utilized for civil litigation
- Use of NHSN
 - CLABSI
 - SSI (cardiac bypass surgery)

Chapter No. 904] PUBLIC ACTS, 2006 1

CHAPTER NO. 904
SENATE BILL NO. 2978

By Fowler, Black, McLeary, Bryson, Finney

Substituted for: House Bill No. 3067

By Shepard, Hackworth, Ferguson, Litz, Cooper, Campfield, Marrero

AN ACT to amend Tennessee Code Annotated, Title 68, relative to disclosures concerning infections.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE:

SECTION 1. Tennessee Code Annotated, Title 68, Chapter 11, Part 2, is amended by adding the following as a new section:

68-11-263.

(a) Each facility regulated under this chapter with an annual average daily census of at least twenty-five (25) inpatients based on the most recent JAR public data, where applicable, or an outpatient facility that performs an annual average of twenty-five (25) procedures per day shall join the Centers for Disease Control's National Nosocomial Infection Surveillance/National Healthcare Safety Network (NNIS/NHSN) surveillance system within one hundred twenty (120) days of when it becomes open to the facility's type of license in order to unify reporting systems and to benchmark against a national standard. Facilities shall meet data reporting timeframes as required by NHSN and will utilize standard methods including healthcare acquired case-finding techniques, CDC infection definitions and other relevant terms, and NHSN software for data collection and reporting. Data submitted by the reporting facility shall be reported without any patient identifiers.

(b) Facilities shall grant the Tennessee Department of Health access to the NHSN database on:

(1) Central line associated bloodstream infections (CLABSI) in intensive care units for hospital specific reporting on the Department of Health's Web site. CLABSIs for burn units and Level 1 trauma units are excluded. The department shall disseminate the public reports based on data compiled for a period of twelve (12) months, no sooner than six (6) months but not later than eight (8) months following the month the facility reports the data. The reports shall be updated every six (6) months with the most recent four (4) quarters of data. The department shall only display facility specific rates for facilities with greater than thirty (30) central line insertions per year.

(2) Surgical site infections for coronary artery bypass grafts (CABG). On surgical site infections for CABG data all facility identifiers will be confidential and may not be released by the department. The department will report only aggregate statewide performance on CABG surgical infection rates.

<http://tennessee.gov/sos/acts/104/pub/pc0904.pdf>

Slide courtesy HAI/AR program, TDH



National Healthcare Safety Network (NHSN)

- ❑ **NHSN is a surveillance system that serves multiple users and uses**
 - **Standardized definitions, protocols**
 - **Infrastructure for reporting, analysis**

- ❑ **NHSN is used by**
 - **>22,000 healthcare facilities to track HAIs, antimicrobial use and resistance, and adherence to prevention guidelines; guide prevention efforts; submit data for public reporting and quality measurement purposes**
 - **Health departments for surveillance, prevention, and public reporting**
 - **CMS for quality measurement and reporting, reimbursement, and prevention**
 - **HHS to measure national progress**

<http://www.cdc.gov/nhsn/>

Use of the NHSN Patient Safety Component is Mandated in 36 States, Philadelphia, and the District of Columbia – January 1, 2018



Western Health



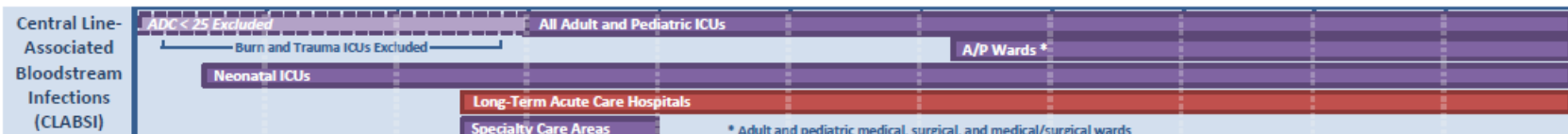
Central line-associated bloodstream infections (CLABSIs)	AK, AL, AR, CA, CO, CT, DC, DE, GA, HI, IL, IN, KY, MA, MD, ME, MO, MS, NC, NE, NH, NJ, NM, NV, NY, OK, OR, PA, SC, TN, TX, UT, VA, VT, WA, WV, WY
Surgical site infections (SSIs)	AK, AL, AR, CA, CO, CT, DC, DE, GA, HI, IL, IN, KY, MA, MD, ME, MO, MS, NC, NE, NH, NJ, NV, NY, OK, OR, PA, SC, TN, TX, UT, VA, VT, WA, WV, WY
Multidrug-resistant organisms and <i>Clostridium difficile</i> infections	AK, AR, CA, CT, DC, GA, HI, IL, KY, MD, ME, MO, MS, NC, NE, NJ, NM, NV, NY, OK, OR, PA, SC, TN, UT, WV, WY
Ventilator-associated pneumonias (VAP) or Ventilator-associated events (VAE)	OK, PA, TN, WA
Catheter-associated urinary tract infections (CAUTIs)	AK, AL, AR, CT, DC, DE, GA, HI, IN, KY, MD, ME, MO, MS, NC, NE, NH, NJ, OK, OR, PA, TN, TX, UT, WV, WY
Central line insertion practices (CLIP)	CA, NH
Dialysis events	CO, HI, TN

Phased-in Reporting of HAI in Tennessee

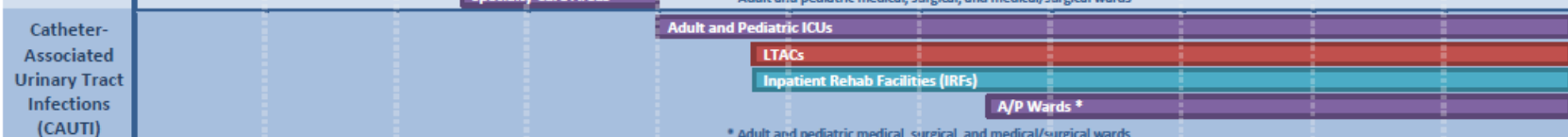


Western Health

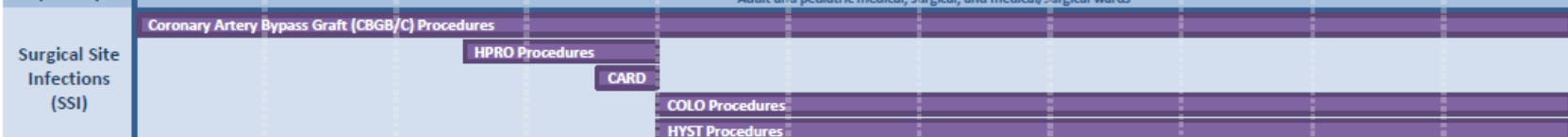
CLABSI



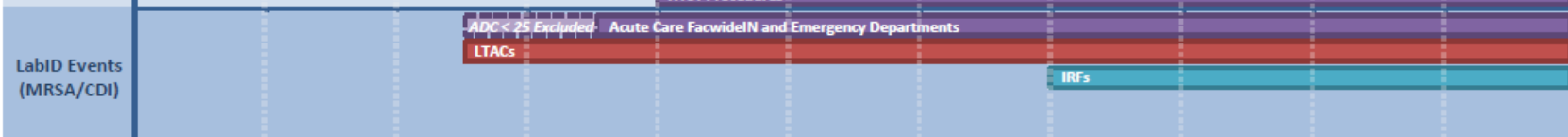
CAUTI



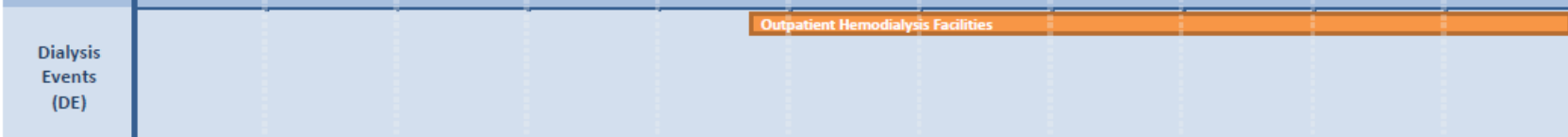
SSI



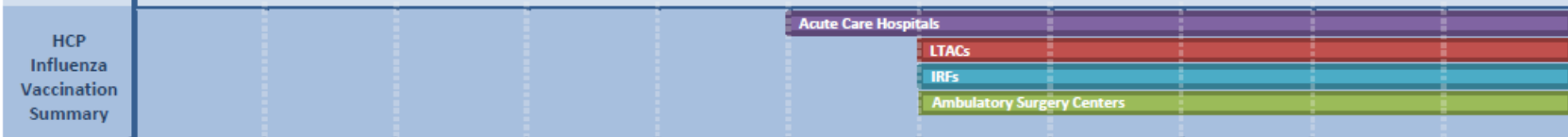
MRSA/ CDI



DIALYSIS



HCW FLU VAX



2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

Slide courtesy HAI/AR program, TDH

Example: Preventing CLABSI - Elements of Success

Five Elements Contributed to Success:

1. **Reliable and Valid Measurement System**
 - **NHSN (CDC) (www.cdc.gov/nhsn)**
2. **Evidence-Based Care Practices & Recommendations**
3. **Investment in Implementation Sciences**
4. **Local Ownership and Peer Learning Communities**
5. **Align and Synergize Efforts**
 - **HAI National Action Plan**
 - **Setting 5-year CLABSI goals**
 - **ACA - Value-Based Purchasing**
 - **CMS requires ICU CLABSI data reported to Hospital Compare**

Pronovost PJ, Cleeman, JI, Wright D, Srinivasan A, "Fifteen years after To Err is Human: a success story to learn from." BMJ Qual Saf 2015;0:1-4. <http://qualitysafety.bmj.com/content/early/2015/12/15/bmjqs-2015-004720.extra>

Standardized Infection Ratio (SIR): Risk Adjusted Summary Measure

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Predicted (P) HAIs}}$$

To calculate O, sum the # of HAIs among a group

To calculate P, requires the use of the appropriate aggregate data (risk-adjusted rates) (e.g., national NHSN data for 2006-2008, then 2015)

SIR > 1.0: # infections are HIGHER than predicted

SIR= 1.5: # infections = 50% HIGHER than predicted

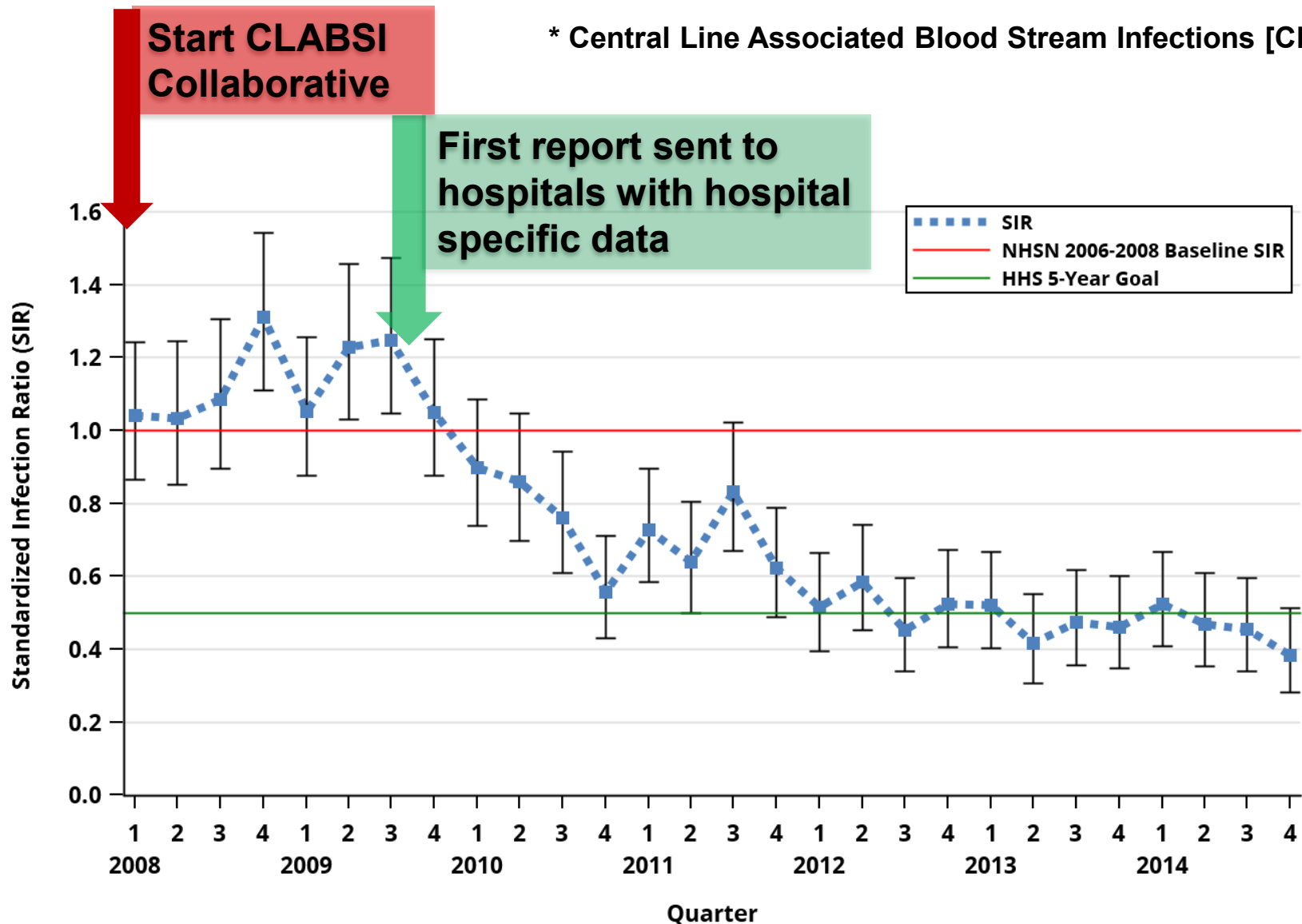
SIR < 1.0: # infections are LOWER than predicted

SIR= 0.4: # infections = 60% LOWER than predicted

SIR is used to measure progress towards HHS action plan goal (2020) and HP2020

CLABSI* (Adult/Ped ICU), TN 2008-14

* Central Line Associated Blood Stream Infections [CLABSI]



Report: Consumer & Technical



Tennessee's Report on Healthcare-Associated Infections for Healthcare Consumers

January 1, 2017 – December 31, 2018

Tennessee Department of Health | Report | September 2019



Tennessee's Report on Healthcare-Associated Infections

January 1, 2017 – December 31, 2018

Tennessee Department of Health | Report | September 2019



<https://www.tn.gov/health/cedep/hai.html>

Sample Table (Consumer Report)

Tennessee Acute Care Hospitals, Infections Compared to the National Experience, 2017

Facility Name	Bloodstream Infections (CLABSI) in Adult/Pediatric ICUs	Bloodstream Infections (CLABSI) in Neonatal ICUs	Urinary Tract Infections (CAUTI) in Adult/Pediatric ICUs	Surgical Site Infections from Colon Surgeries	Surgical Site Infections from Abdominal Hysterectomies	<i>C. difficile</i> Events†	Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA) Events†
Hospital A	=	No Conclusion	★	=	No Conclusion	★	=
Hospital B	No Conclusion	N/A**	=	No Conclusion	No Conclusion	✗	=
Hospital C	★	=	✗	=	=	=	=
Hospital D	=	N/A**	✗	=	✗	=	✗

**N/A - Facility was not subject to this reporting requirement during 2014
 † These refer to hospital-onset laboratory-identified events. MRSA events include only those identified in the bloodstream.

Legend

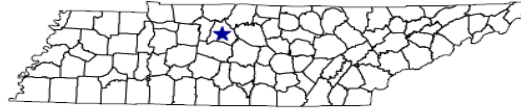
★	Fewer infections (better) than predicted based on the national experience.*	=	About the same number of infections as predicted based on the national experience.*	✗	More infections (worse) than predicted based on the national experience.*	No Conclusion	When the number of predicted infections is less than 1, no conclusion can be made.
---	--	---	--	---	--	---------------	--

***National experience contains data from 2015 baseline for CLABSI, CAUTI, SSI, MRSA and *C. difficile* Laboratory-Identified Events.**

Facility specific Summary Page (Technical Report)



TDH Central, Nashville, Davidson County
 Medical School Affiliation: Graduate teaching
 Bed Size Category: 400+ beds



TDH Central, Nashville, Davidson County

Standardized Infection Ratio (SIR) by Infection Type, 01/01/2018-12/31/2018

HAI	Type/Unit	Infections		Device Days/Procedures Performed/Patient Days	Standardized Infection Ratio (SIR)		TN SIR
		Observed	Predicted		SIR*	95% CI	
CLABSI	Adult/Pediatric ICU	13	20.3	17993	0.64	(0.36, 1.07)	0.74
	Adult/Pediatric Ward	8	15.5	15994	0.51	(0.24, 0.97)	0.62
CAUTI	Adult/Pediatric ICU	43	50.2	25061	0.86	(0.63, 1.14)	0.70
	Adult/Pediatric Ward	9	12.6	10199	0.71	(0.35, 1.31)	0.74
SSI	Colon surgery	21	32.3	790	0.65	(0.41, 0.98)	0.80
	Abdominal hysterectomy	0	2.9	282	0.00	(0.00, 1.03)	0.78
LabID	MRSA bacteremia	27	21.4	236148	1.26	(0.85, 1.81)	1.29
	C. difficile infection	128	182.7	236148	0.70	(0.59, 0.83)	0.68

Green highlighting indicates a SIR significantly LOWER than the 2015 national baseline

Red highlighting indicates a SIR significantly HIGHER than the 2015 national baseline

N/A: Data not shown for <50 device days or <20 procedures / SIR not calculated when <1 infection predicted

*Complex Admission/Readmission SIRs are presented for surgical site infections (SSI)

Central Line-Associated Bloodstream Infections (CLABSI)

CLABSI - Adult/Pediatric ICUs

YR	N	OBS	PRE	CLD	SIR	SIR & 95% CI
2018	4	13	20.3	17993	0.6	
2017	4	20	19.9	17676	1.0	
2016	4	14	20.2	17966	0.7	
2015	6	26	30.6	25179	0.8	

CLABSI - Adult/Pediatric Wards

YR	N	OBS	PRE	CLD	SIR	SIR & 95% CI
2018	3	8	15.5	15994	0.5	
2017	3	10	11.4	11729	0.9	
2016	3	8	13.7	14138	0.6	
2015	5	29	22.9	23389	1.3	

Catheter-Associated Urinary Tract Infections (CAUTI)

CAUTI - Adult/Pediatric ICUs

YR	N	OBS	PRE	UCD	SIR	SIR & 95% CI
2018	6	43	50.2	25061	0.9	
2017	6	22	42.0	21196	0.5	
2016	6	23	43.1	21964	0.5	
2015	8	41	45.3	23401	0.9	

CAUTI - Adult/Pediatric Wards

YR	N	OBS	PRE	UCD	SIR	SIR & 95% CI
2018	3	9	12.6	10199	0.7	
2017	3	3	11.3	9232	0.3	
2016	3	7	11.5	9407	0.6	
2015	5	17	11.6	9752	1.5	

Surgical Site Infections (SSI)

SSI - Colon Surgery

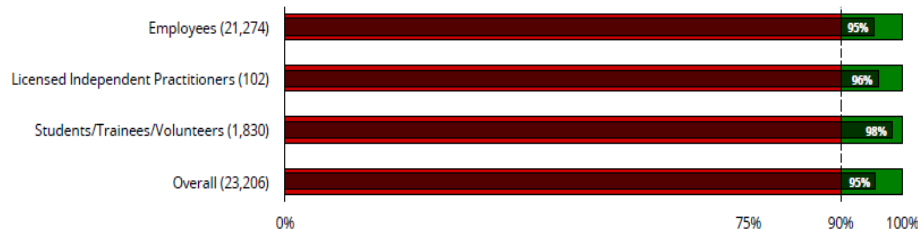
YR	OBS	PRE	PROC	SIR	SIR & 95% CI
2018	21	32.3	790	0.6	
2017	10	28.8	725	0.3	
2016	30	22.9	580	1.3	
2015	13	20.0	496	0.6	

SSI - Abdominal Hysterectomy

YR	OBS	PRE	PROC	SIR	SIR & 95% CI
2018	0	2.9	282	0.0	
2017	2	2.9	282	0.7	
2016	3	3.5	346	0.9	
2015	3	3.3	347	0.9	

Healthcare Personnel Influenza Vaccination - '2018/2019' Influenza Season

Healthcare Personnel Category (Total)



Healthcare Personnel Vaccinated (%)

Below 90% (red bar) | >90% (HHS Healthy People 2020 Goal) (green bar)

Healthcare Facility-Onset Laboratory Identified (LabID) Events

LabID - Methicillin-resistant *S. aureus* (MRSA) Bacteremia

YR	OBS	PRE	PATD	SIR	SIR & 95% CI
2018	27	21.4	236148	1.3	
2017	24	24.1	222294	1.0	
2016	34	19.4	215158	1.7	
2015	32	28.0	309640	1.1	

LabID - *C. difficile* Infection (CDI)

YR	OBS	PRE	PATD	SIR	SIR & 95% CI
2018	128	182.7	236148	0.7	
2017	116	163.9	222294	0.7	
2016	130	172.2	215158	0.8	
2015	143	211.9	270675	0.7	

Data reported as of June 20, 2019

YR = reporting year; N = number of units reporting (CLABSI/CAUTI); OBS = observed number of infections
 PRE = statistically 'predicted' number of infections, based on NHSN national baseline data
 SIR = standardized infection ratio (observed/predicted number of infections)
 CLD = central line days; UCD = urinary catheter days; PROC = procedures performed; PATD = patient days;
 N/A = data not shown for <50 device days or <20 procedures / SIR not calculated when <1 infection predicted

Significantly lower than NHSN SIR of 1 (green box)
 Not significantly different from NHSN SIR of 1 (grey box)
 Significantly higher than NHSN SIR of 1 (red box)
 --- 2018 TN SIR (dashed line)
 --- NHSN SIR=1 (dotted line)

Standardized Infection Ratio (SIR)

Data Table: Summarize facility-specific 2018 data

Standardized Infection Ratio (SIR) by Infection Type, 01/01/2018-12/31/2018

HAI	Type/Unit	Infections		Device Days/Procedures Performed/Patient Days	Standardized Infection Ratio (SIR)		TN SIR
		Observed	Predicted		SIR*	95% CI	
CLABSI	Adult/Pediatric ICU	13	20.3	17993	0.64	(0.36, 1.07)	0.74
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Green highlighting indicates an SIR significantly **LOWER** than the 2015 national baseline

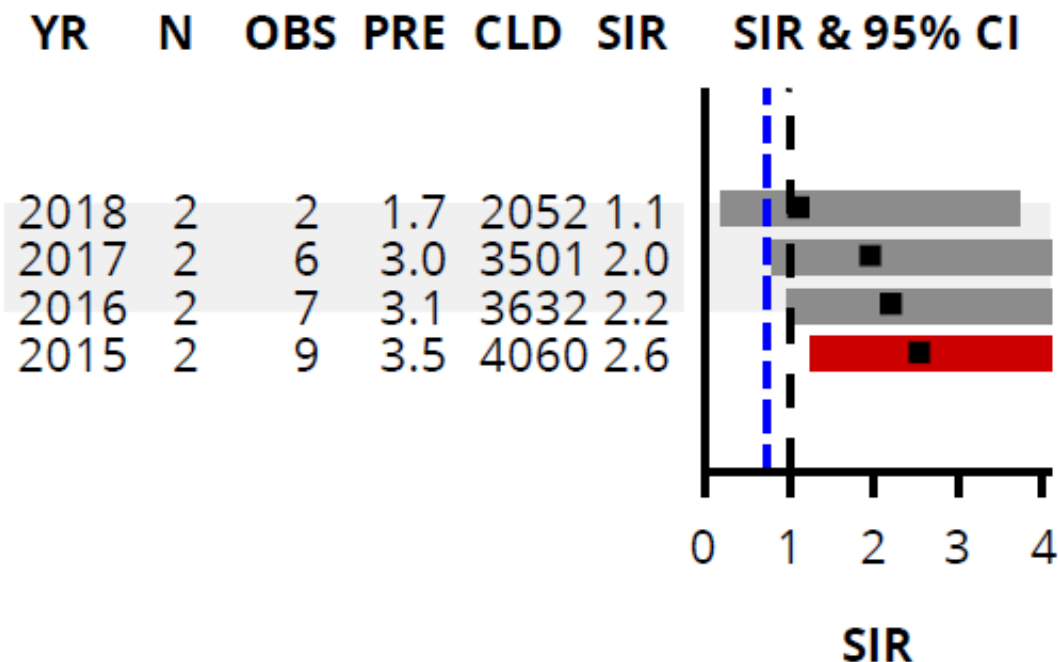
Red highlighting indicates an SIR significantly **HIGHER** than the 2015 national baseline

N/A: Data not shown for <50 device days or <20 procedures / SIR not calculated when <1 infection predicted

*Complex Admission/Readmission SIRs are presented for surgical site infections (SSI)

Progress over Time (Technical Report)

CLABSI - Adult/Pediatric ICUs



Reporting Period:
• 2015-2018

Data reported as of June 20, 2019

YR = reporting year; N = number of units reporting (CLABSI/CAUTI); OBS = observed number of infections

PRE = statistically 'predicted' number of infections, based on NHSN national baseline data

SIR = standardized infection ratio (observed/predicted number of infections)

CLD = central line days; UCD = urinary catheter days; PROC = procedures performed; PATD = patient days;

N/A = data not shown for <50 device days or <20 procedures / SIR not calculated when <1 infection predicted

- Significantly lower than NHSN SIR of 1
- Not significantly different from NHSN SIR of 1
- Significantly higher than NHSN SIR of 1
- - - 2018 TN SIR
- - - NHSN SIR=1

Targeted Assessment for Prevention (TAP) Strategy

- **Prioritize facilities with highest burden of preventable disease → get biggest return on investment**
- **In TN ~ 5-7 facilities account for ~ 50% of excess (preventable) infections**
- **Number Needed to Prevent to Reach Goal (Observed- Predicted)**
- **Provide context (top 5 in TN)**



HAI Progress Report: Tennessee, 2013

HAI TYPE	# OF TENNESSEE HOSPITALS THAT REPORTED DATA TO CDC'S NHSN, 2013 Total Hospitals in State: 154 ⁺	2013 STATE SIR VS. 2012 State SIR [‡]	2013 STATE SIR VS. 2013 Nat'l SIR	2013 STATE SIR VS. Nat'l Baseline [‡]	2013 STATE SIR	2013 NAT'L SIR
CLABSI Nat'l Baseline: 2008	95	↓ 14%	↓ 10%	↓ 52%	0.49	0.54
CAUTI Nat'l Baseline: 2009	94	↓ 10%	↑ 17%	↑ 24%	1.24	1.06
SSI, Abdominal Hysterectomy Nat'l Baseline: 2008	87	↑ 2%	↑ 3%	↓ 11%	0.89	0.86
SSI, Colon Surgery Nat'l Baseline: 2008	95	↑ 2%	↓ 1%	↓ 9%	0.91	0.92
MRSA Bacteremia Nat'l Baseline: 2011	115	2012 SIR not available	↑ 24%	↑ 13%	1.13	0.92
<i>C. difficile</i> Infections Nat'l Baseline: 2011	115	2012 SIR not available	↓ 16%	↓ 23%	0.77	0.90

<http://www.cdc.gov/hai/pdfs/stateplans/factsheets/tn.pdf>

HAI Progress Report: Tennessee, 2014



HAI TYPE	# OF TENNESSEE HOSPITALS THAT REPORTED DATA TO CDC'S NHSN, 2014 ⁺ Total Hospitals in Tennessee: 131	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
CLABSI Nat'l Baseline: 2008	105	0%	↓ 4%	↓ 52%	0.48	0.50
CAUTI Nat'l Baseline: 2009	106	↓ 17%	↑ 1%	↑ 1%	1.01	1.00
SSI, Abdominal Hysterectomy Nat'l Baseline: 2008	84	↓ 9%	↓ 3%	↓ 20%	0.80	0.83
SSI, Colon Surgery Nat'l Baseline: 2008	92	↓ 2%	↓ 7%	↓ 9%	0.91	0.98
MRSA Bacteremia Nat'l Baseline: 2011	114	↓ 8%	↑ 17%	↑ 1%	1.01	0.87
<i>C. difficile</i> Infections Nat'l Baseline: 2011	114	↑ 3%	↓ 16%	↓ 22%	0.78	0.92

⁺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.

[‡]Nat'l baseline time period varies by HAI type. See first column of this table for specifics.

<http://www.cdc.gov/hai/pdfs/stateplans/factsheets/tn.pdf>

Progress to HP 2020 Goals: 2018

HAI	TN	US	HP 2020
CLABSI	0.69	0.74	0.50
CAUTI	0.71	0.81	0.75
SSI COLO	0.79	0.90	0.75
SSI HYST	0.78	0.90	0.75
CDI	0.68	0.71	0.70
MRSA	1.29	0.84	0.50

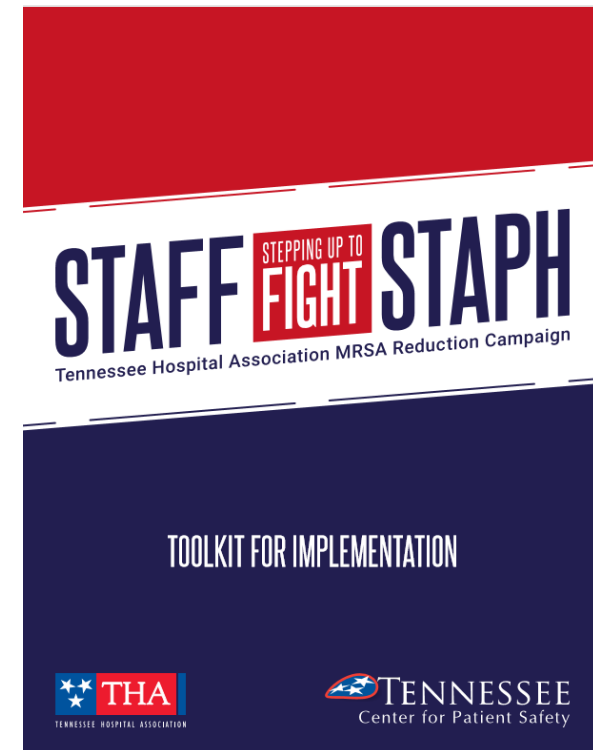
Data courtesy HAI/AR program, TDH and CDC

Strategies to Prevent Hospital-onset *Staphylococcus aureus* Bloodstream Infections in Acute Care Facilities

<https://www.cdc.gov/hai/prevent/staph-prevention-strategies.html>

Published March 2019

https://tha.com/wp-content/uploads/2019/08/THA0257_Booklet_MRSA_Campaign_Toolkit_Aug2019_WEB_FINAL.pdf



Commissioner of Health Letter

“Reporting antibiotic use in acute care hospitals through the National Healthcare Safety Network’s Antibiotic Use and Resistance Module will be required beginning in January 1, 2021. This will be a phased-in approach based on hospital bed size. The Tennessee Department of Health is advising of this future requirement several years in advance to allow adequate preparation.”

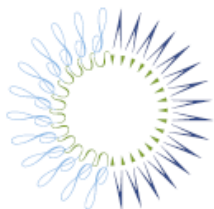
https://www.tn.gov/content/dam/tn/health/documents/reportable-diseases/2019_Commissioners_letter.pdf

Providing Support for NHSN AU Reporting Mandate:

National Healthcare Safety Network Antibiotic Use Reporting Symposium

Hosted by the Tennessee Department of Health and The
Pew Charitable Trusts

Wednesday, October 30, 2019 | 7:30 a.m. - 4:00 p.m. CT



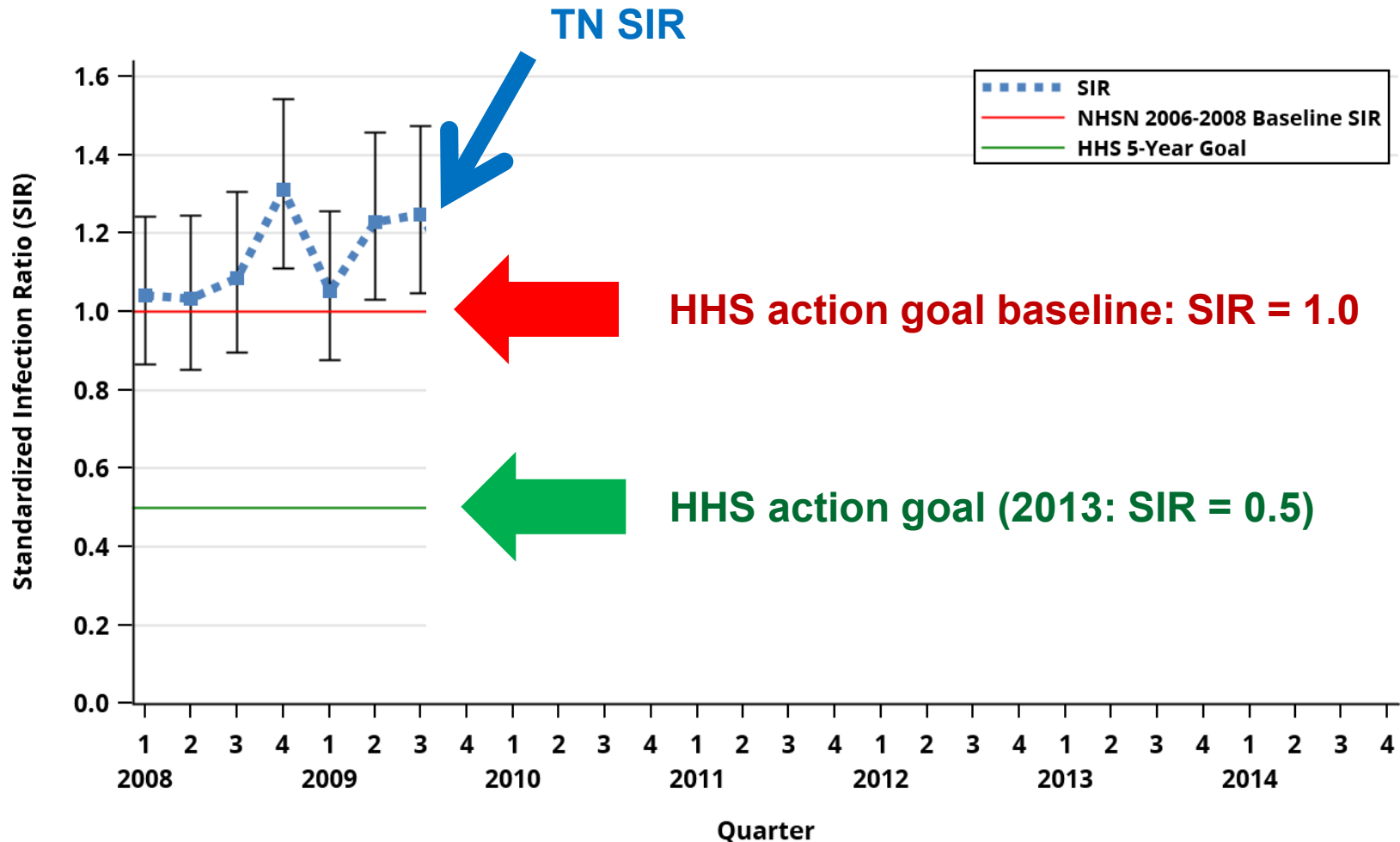
THE
PEW
CHARITABLE TRUSTS



Department of
Health

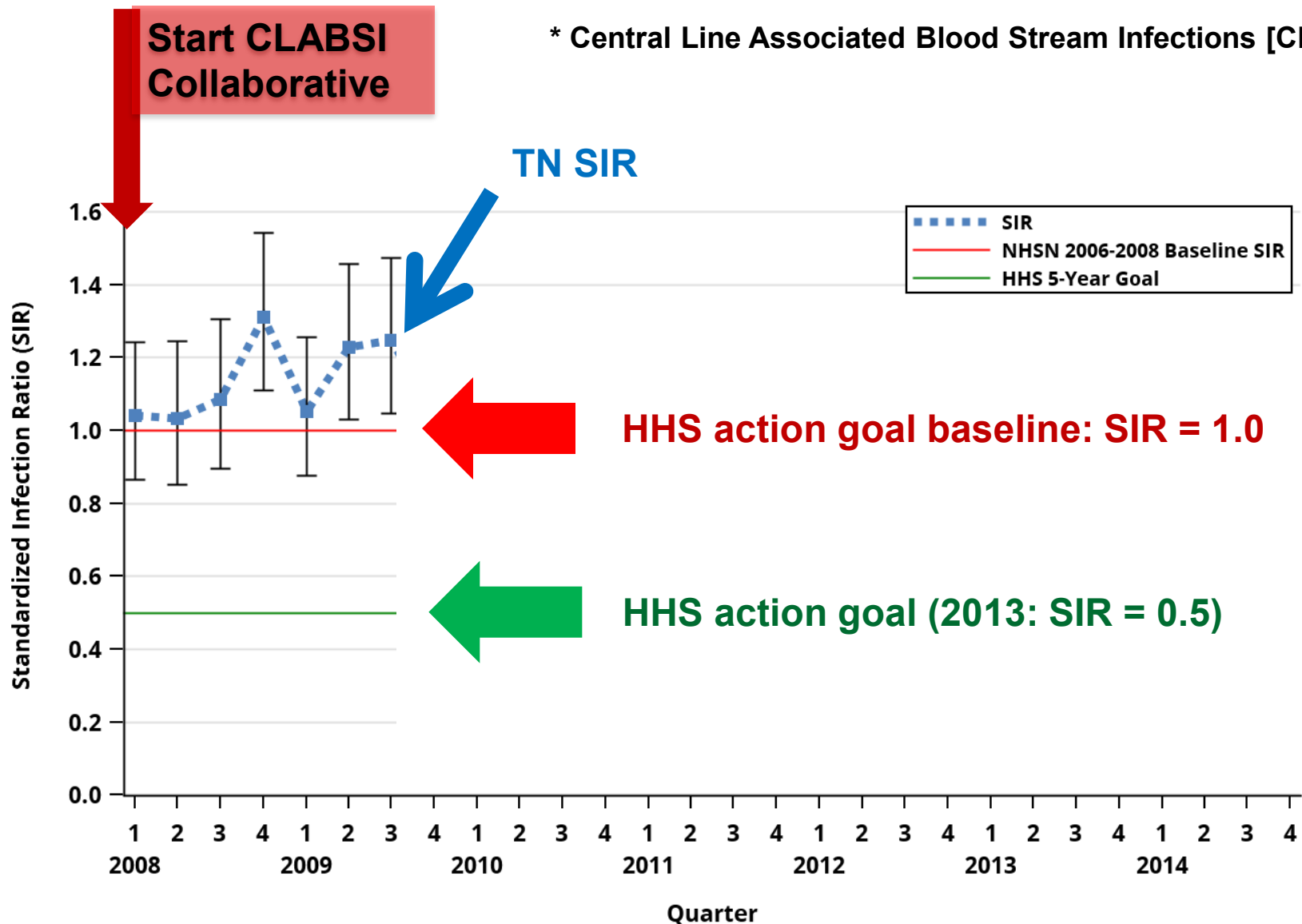
CLABSI* (Adult/Ped ICU), TN 2008-14

* Central Line Associated Blood Stream Infections [CLABSI]



CLABSI* (Adult/Ped ICU), TN 2008-14

* Central Line Associated Blood Stream Infections [CLABSI]



CLABSI* (Adult/Ped ICU), TN 2008-14

Start CLABSI Collaborative

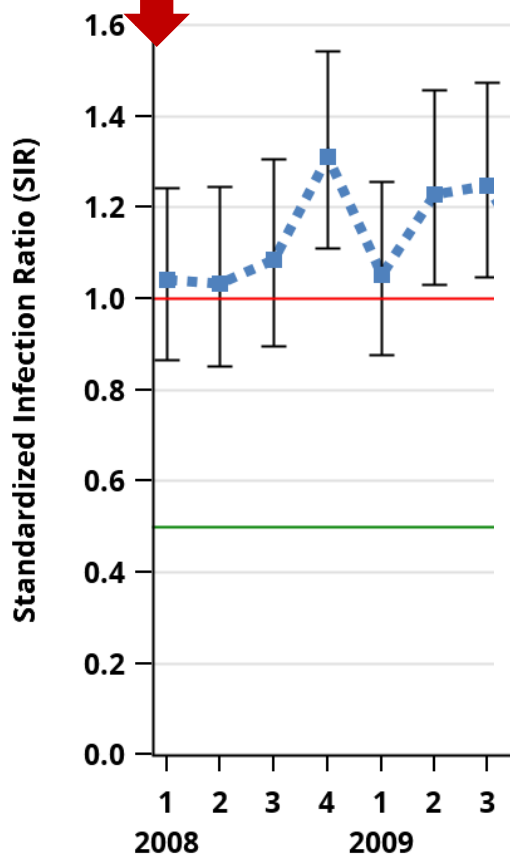
* Central Line Associated Blood Stream Infections [CLABSI]

CLABSI collaborative:

Evidence Based Practices

Peer learning

Implementation Science



The NEW ENGLAND
JOURNAL *of* MEDICINE

ESTABLISHED IN 1812 DECEMBER 28, 2006 VOL. 355 NO. 26

An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

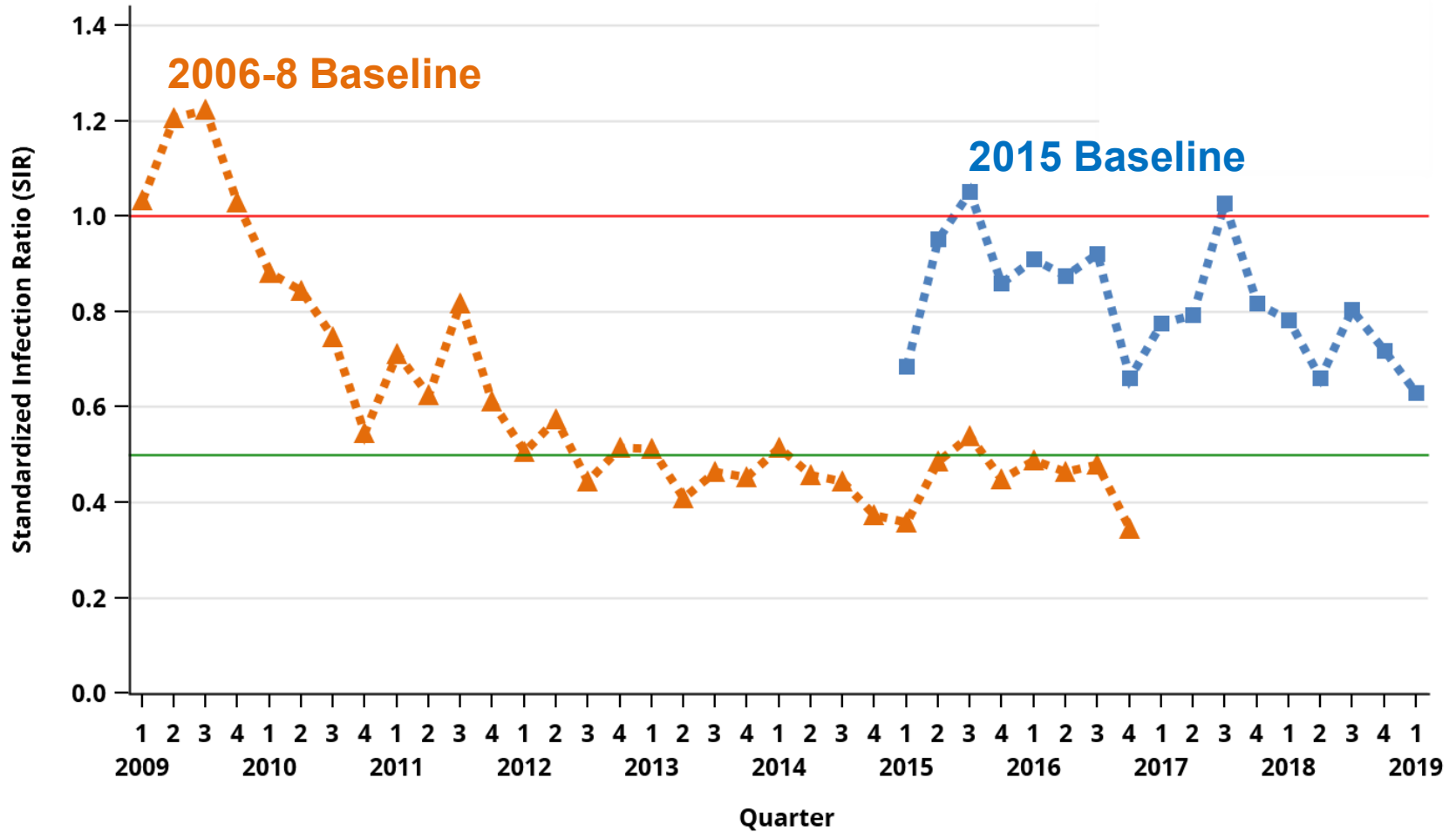
<http://www.cdc.gov/hicpac/>

<http://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/index.html>

CUSP Toolkit



Ongoing Reductions: CLABSI (Adult/Ped ICU), TN 2008-19 Q1



Data Reported as of June 20, 2019

Sample Table (Consumer Report)

Facility Name	Number of Procedures	Observed Infections	Predicted Infections	How Does This Facility Compare to the National Experience?
Hospital A	45	2	1.2	= Same
Hospital B	34	0	Less than 1.0	No Conclusion
Hospital C	421	0	3.2	★ Better
Hospital D	311	15	10.0	= Same
Hospital E	464	28	16.3	✗ Worse
Hospital F	317	3	9.1	★ Better
Hospital G	38	0	1.1	= Same
Hospital H	62	1	1.7	= Same

Legend			
★ Fewer infections (better) than predicted based on the 2015 national experience.	= About the same number of infections as predicted based on the 2015 national experience.	✗ More infections (worse) than predicted based on the 2015 national experience.	No Conclusion When the number of predicted infections is less than 1, no conclusion can be made.

Law passed in 2006: Tennessee

- **Central line associated blood stream infections (CLABSI) with facility identifiers**
- **Surgical Site Infections (SSI) following coronary artery bypass graft surgery (aggregate only, no facility identifiers)**
- **Required use of National Healthcare Safety Network (NHSN)**

<http://tennessee.gov/sos/acts/104/pub/pc0904.pdf>

Progress on HAIs: But More is Possible Some Cautionary Notes

Bernie Black

Nicholas Chabraja Professor, Northwestern University
Pritzker Law School and Kellogg School of Management

What Is Possible for CLABSI: (Almost) Zero

- Pronovost et al. (NEJM, 2006): Michigan consortium study
 - Designed: 2001-2003?
 - Implemented 2004
 - Published 2006
- Median post-intervention CLABSI rate (per 1,000 catheter days): 0
 - Mean = 0.92
 - Versus 2.7 pre-intervention
- But infections pop up, sources need to be traced
 - Training and discipline wears off; needs to be reinforced
 - Easy for senior management to say, “we’re good”, when they could be better

National Data for 2017

15 years later, how are we doing?

- National: 21,173 reported infections: mean rate = 0.80
- Michigan: 522 reported infections: mean rate = 0.74
- Better, but hardly zero
- How can we do better?

Concern 1: Measurement

- We have a reasonable CLBSI definition, from CDC/NHSN
- But we don't know true incidence
- Why? Incomplete, inconsistent auditing. In 2017, of 51 states:
 - 5 conducted audits of **some** individual sites (maybe not very many)
 - NC among them
 - 26 conducted "any validation"
 - 20 didn't even do that
 - Also some CMS auditing of Hospital Compare reports, but how much?
- We require audited financials for public companies?
 - Why not audited quality reports for hospitals?
 - See Austin, Black and Pronovost, *A Standard-Setting Body for US Health Care Quality Management* (Am J Med Quality 2018)

From State Regulator Presentation in 2005

- (Marc Volavka, Head of Pennsylvania Health Care Cost Containment Council, called PHC4)
 - When is a UTI NOT a UTI??
 - When is a blood clot (DVT) NOT a blood clot??
 - When is a central line blood stream infection NOT a CLAB??

Mr. Volavka's Answer

When PHC4 is doing a public report!!

Concern 2: Slow feedback

- NHSN report is through 2017
 - But it's now October 2019
- Hospital Compare: Most recent data through Sept. 2018
- For hospitals to manage CLABSI: want real-time feedback
 - Public reporting demands clean data
 - But internal feedback demands speed
 - Challenge: How can we achieve both?

Concern 3: Everyone is average

- Pressure to improve comes:
 - In a few states, from state regulator
 - Adverse publicity if worse than average
 - Less likely: good publicity if better than average
 - Top down from senior management (if worse than average)
 - **Rarely** from individual patients choosing hospitals
- So let's look at Hospital Compare
 - I searched the first 300 entries for HAIs
 - 199: Relative rank "Not available"
 - 88: No different than national average
 - **10: better than national average**
 - **3: worse than national average**

How Can We Do Better?

- Audit first (base for everything else)
- Then serious reward for good performance/punish poor performance
 - For a few core quality metrics
- Suppose we said: social cost of a CLABSI is \$100k
 - On the low side, given substantial mortality
- CMS could tell hospitals: Your expected number of CLABSIs is x.x
 - If you beat the target
 - we will pay you \$100k times the difference
 - Can also penalize the laggards.

How About Tradeable Permits?

- An idea used for pollution
- Set national CLABSI goal (today, say 20,000)
 - Adjust biannually based on cost and benefit of prevention
- CMS will offer 20,000 CLABSI permits for sale (and no more)
 - Have a CLABSI = must buy a permit (or big fine, say 5x permit price)
- Virtue 1: Learn market price of prevention
 - Hospitals will invest in prevention if cheaper than cost of permit
- Virtue 2: We can ratchet down infection level over time
 - CDC/CMS can set annual targets
 - Informed by cost of prevention (market price of permits)

Thought Experiment

- If we really want to get from 20,000 CLABSI to 10,000, or 5,000
 - We know how, technically (and have known for a long time)
- We can get there through regulation
 - All we need is the will to do so.