How to Use Healthcare-associated Infection (HAI) Data for Prevention of HAIs?

Denise M. Cardo, MD

Director

Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

Disclaimer

The findings and conclusions are those of the presenter and do not necessarily represent the view of the Centers for Disease Control and Prevention.

Disclosures: none

Goal of our programs: Prevent infections and protect patients

CDC: Science and Data for Action

- Responds to and controls outbreaks in collaboration with healthcare facilities and health departments
- Provides real-time HAI data for prevention through the National Healthcare Safety Network (NHSN)
- Develops evidence-based guidelines - the standard of care to prevent HAIs
- Implements prevention strategies with public and private partners
- Provides national and international laboratory expertise
- Conducts applied research to inform prevention

Data for Action to Prevent HAIs and Protect Patients

- **Outbreaks**
- **Surveillance data**
  - Local
  - State and national

Outbreak data for prevention

- **Local action**
  - best time to engage clinicians and leadership to improve prevention practices
  - Use visibility for improving infection control overall

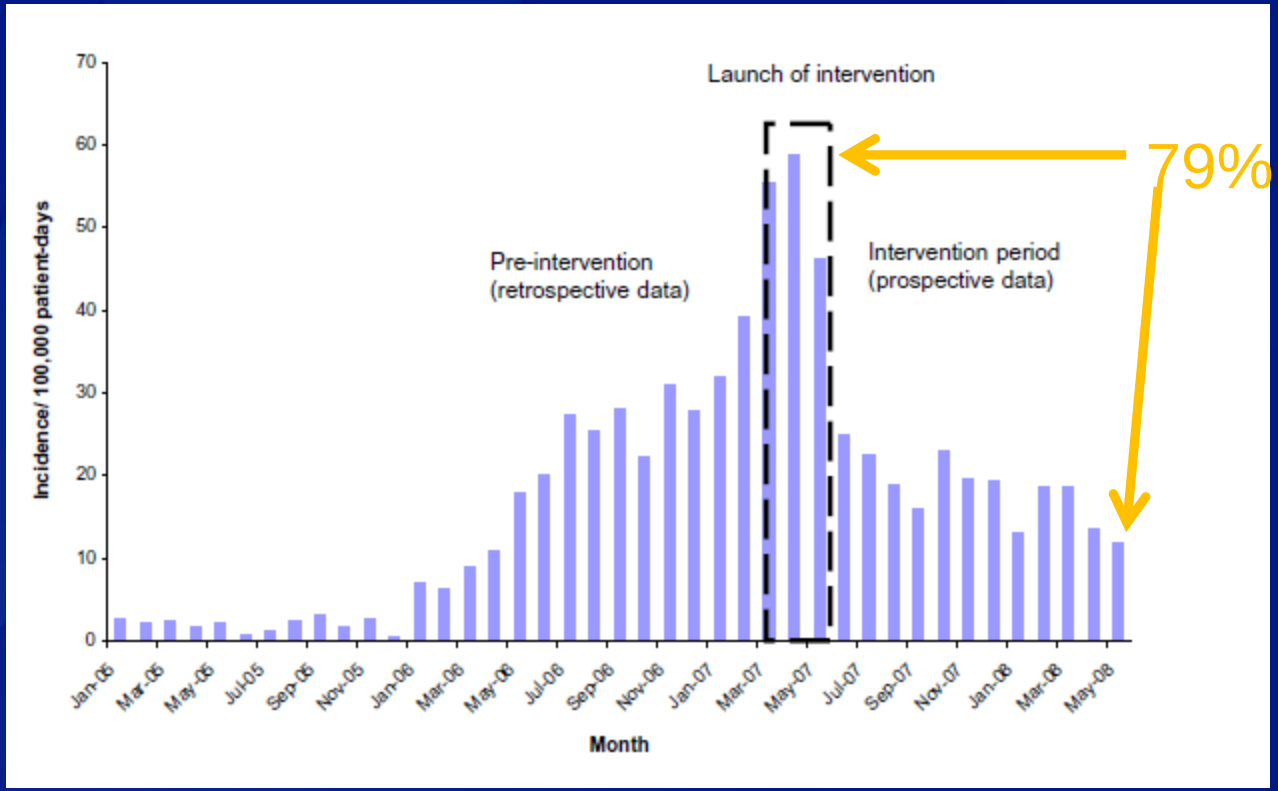
Outbreak data for prevention: regional/national

- **Changes in prevention recommendations or device design**
  - Needleless devices
- **Recall of medication/devices**
  - Fungal outbreak – contaminated methylprednisolone acetate vials
- **Improvement of clinical management**
  - Detection of VRSA and CRE in clinical labs

Outbreak data for action: Israel experience

- **KPC-producing CRE likely originally from US identified in Israel beginning in late 2005**
- **By early 2006, increase in cases (epidemic)**
- **Initiated National coordinated effort to control CRE in acute care hospitals**
  - Mandatory reporting of patients with CRE
  - Mandatory isolation (CP) of CRE patients
    - Staff and patient cohorting
  - Task Force developed
    - Collect data and
    - Intervene

Incidence of CRE from clinical cultures



Schwaber et al. CID 2011; 848-855

Surveillance data

- **Data to promote prevention and identify gaps/opportunities**
- **Local action**
  - Feed back to clinicians and units
  - Engagement of leadership
  - Transparency to patients
  - Use simple and easy ways to provide information

Use of Surveillance Data in the United States

- **In the past, the focus was on benchmarking**
- **Current focus**
  - impact towards national goals
  - Opportunities for prevention

Patient Protection and Affordable Care Act - 2010

TITLE III—IMPROVING THE QUALITY AND EFFICIENCY OF HEALTH CARE

Subtitle A—Transforming the Health Care Delivery System

PART I—LINKING PAYMENT TO QUALITY OUTCOMES UNDER THE MEDICARE PROGRAM

SEC. 3001. HOSPITAL VALUE-BASED PURCHASING PROGRAM.

(a) PROGRAM.—

(1) IN GENERAL.—Section 1886 of the Social Security Act (42 U.S.C. 1395ww), as amended by section 4102(a) of the HITECH Act (Public Law 111–5), is amended by adding at the end the following new subsection:

"(o) HOSPITAL VALUE-BASED PURCHASING PROGRAM.—

"(1) ESTABLISHMENT.—

Healthcare-associated infections reporting is included in Section 3001- Hospital Value Based Purchasing Program

"(2) MEASURES.—

"(A) IN GENERAL.—The Secretary shall select measures for purposes of the Program. Such measures shall be selected from the measures specified under subsection (b)(3)(B)(viii).

"(B) REQUIREMENTS.—

"(i) FOR FISCAL YEAR 2013.—For value-based incentive payments made with respect to discharges occurring during fiscal year 2013, the Secretary shall ensure the following:

"(I) CONDITIONS OR PROCEDURES.—Measures are selected under subparagraph (A) that cover at least the following 5 specific conditions or procedures:

"(aa) Acute myocardial infarction (AMI).

"(bb) Heart failure.

"(cc) Pneumonia.

"(dd) Surgeries, as measured by the Surgical Care Improvement Project (formerly referred to as 'Surgical Infection Prevention' for discharges occurring before July 2006).

"(ee) Healthcare-associated infections, as measured by the prevention metrics and targets established in the HHS Action Plan to Prevent Healthcare-Associated Infections (or any successor plan) of the Department of Health and Human Services.

"(II) HCAHPS.—Measures selected under subparagraph (A) shall be related to the Hospital

Progress Toward the National Action Plan Targets: Elimination of HAIs in Acute Care Hospitals

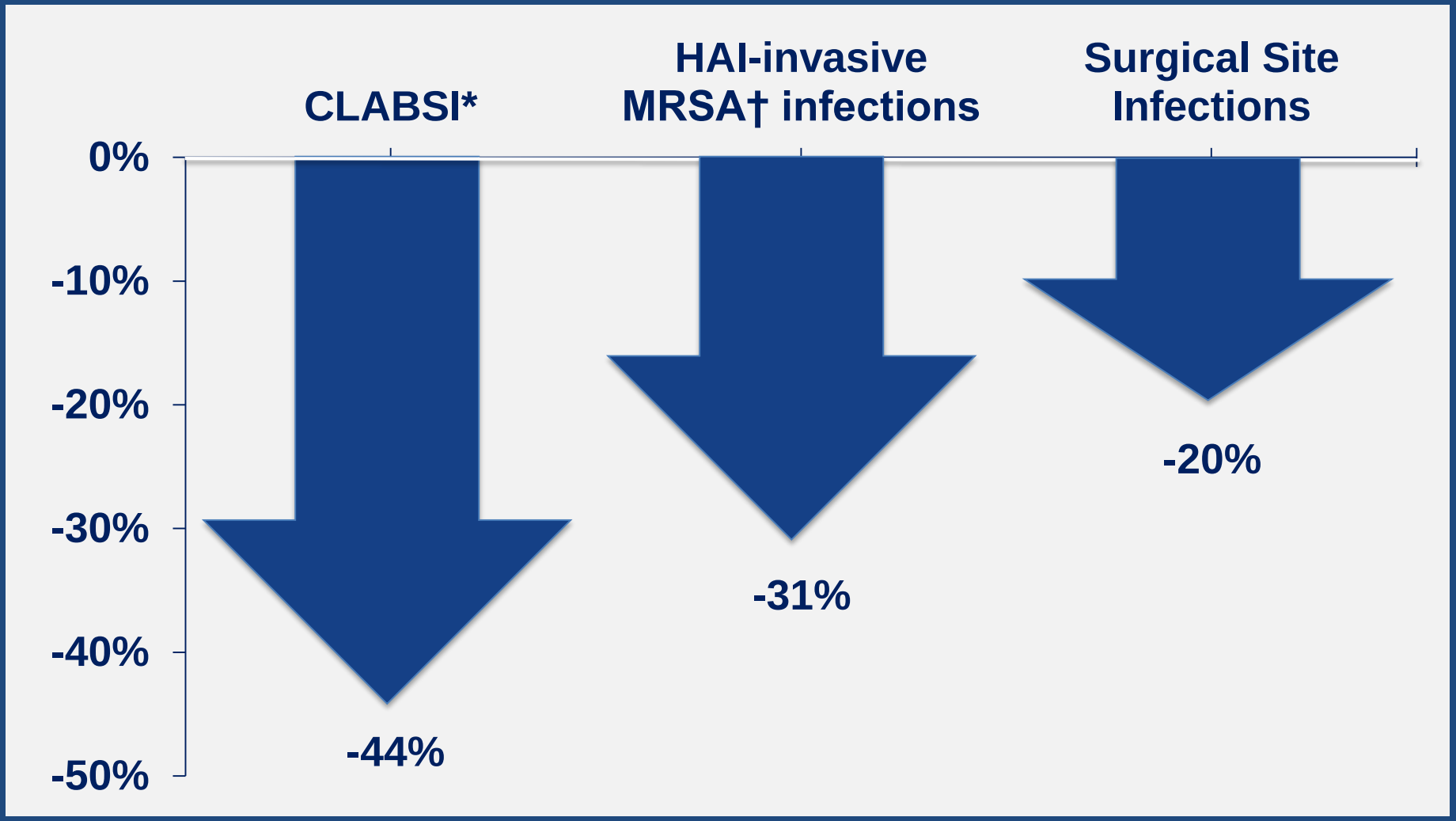
Infection	Baseline Period	Metric Measure / Source	5-Year Target (2013)	Target SIR or Rate
Central Line-Associated BSI*	2006-08	SIR / NHSN	**50%** reduction	0.50
Catheter-Associated UTI	2009	SIR / NHSN	**25%** reduction	0.75
Surgical Site Infection	2006-08	SIR / NHSN	**25%** reduction	0.75
Surgical Care Improvement Project	2006-08	SCIP	**95%** adherence	--
MRSA Bacteremia (Hospital-based)	2010-11	SIR / NHSN	**25%** reduction	0.75
Invasive MRSA (Population-based)*	2007-08	Rate / EIP	**50%** reduction	13.5 per 100,000 population
C. difficile Infection	2010-11	SIR / NHSN	**30%** reduction	0.70
C. difficile hospitalization	2008	Rate / HCUP	**30%** reduction	8.1 per 1000 hospitalizations

HAI Reporting in NHSN

- **Nationwide Coverage Due to CMS Reporting Requirements:**
  - Acute care hospitals
    - CLABSI and CAUTI in ICUs (+ Med, Surg, Med/Surg Wards in 2015)
    - SSI from colon and abdominal hysterectomy inpatient procedures
  - Long-term acute care hospitals
  - Inpatient rehabilitation facilities
  - Outpatient dialysis facilities
    - BSI from all patients
- **State mandates add patient care locations, facility types, and HAI requirements**

NATIONAL AND STATE HEALTHCARE ASSOCIATED INFECTIONS
PROGRESS REPORT
CDC
Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases
THIS REPORT IS BASED ON 2012 DATA, PUBLISHED MARCH 2014

Progress Reducing HAIs: 2012



**CLABSI: Central line-associated bloodstream infections*
†MRSA: Methicillin-resistant Staphylococcus aureus

NATIONAL

HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. The standardized infection ratio (SIR) is a statistic used to track HAI prevention progress over time; lower SIRs indicate better progress. The infection data are collected through CDC's National Healthcare Safety Network (NHSN). HAI data gives healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

NATIONAL PROGRESS OVERVIEW	NATIONAL SIR	CHANGES IN INFECTION VS. NATIONAL BASELINE
Central Line-associated Bloodstream Infections (**CLABSI**)	0.56	↓ 44%
Catheter-associated Urinary Tract Infections (**CAUTI**)	1.03	↑ 3%
Surgical Site Infections, Colon Surgery (**SSI**)	0.80	↓ 20%
Surgical Site Infections, Abdominal Hysterectomy Surgery (**SSI**)	0.89	↓ 11%
Hospital-onset *Clostridium difficile* Infections	0.98	↓ 2%
Hospital-onset MRSA Bloodstream Infections	0.96	↓ 4%*

CAUTIs ↑ 3% HIGHER COMPARED TO NAT'L BASELINE

CATHETER-ASSOCIATED URINARY TRACT INFECTIONS

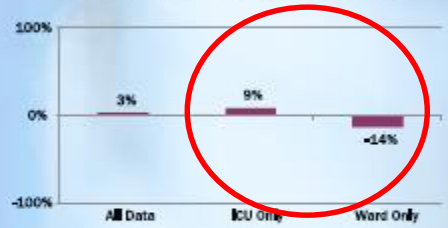
When a urinary catheter is not inserted correctly, not kept clean, or left in a patient for too long, germs can travel through the catheter and cause a catheter-associated urinary tract infection in the urinary system, which includes the bladder and kidneys.

US hospitals reported a significant increase in CAUTIs between 2011 and 2012.

3,597 hospitals across the nation reported CAUTI data in 2012.

13% 13% of hospitals have an SIR significantly worse than the national SIR of 1.03.

Changes in CAUTI vs. 2009 National Baseline



Learn how well your hospital prevents infections: www.medicare.gov/hospitalcompare

- 2012 HAI Progress Report: www.cdc.gov/hai/progress-report/
- Preventing HAIs: www.cdc.gov/hai
- NHSN: www.cdc.gov/nhsn

THIS REPORT IS BASED ON 2012 DATA, PUBLISHED MARCH 2014

http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf

CLABSI in NICU

- Significant decreases in overall CLABSI incidence for specified pathogens in U.S. NICUs
- For MRSA and MSSA, the trend was not significant for all birthweight categories
- Overall CLABSI incidence, pathogen-specific CLABSI incidence, and DUR are highest among the lowest birthweight NICU patients

NATIONAL

HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. The standardized infection ratio (SIR) is a statistic used to track HAI prevention progress over time; lower SIRs indicate better progress. The infection data are collected through CDC's National Healthcare Safety Network (NHSN). HAI data gives healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

NATIONAL PROGRESS OVERVIEW	NATIONAL SIR	CHANGES IN INFECTION VS. NATIONAL BASELINE
Central Line-associated Bloodstream Infections (**CLABSI**)	0.56	↓ 44%
Catheter-associated Urinary Tract Infections (**CAUTI**)	1.03	↑ 3%
Surgical Site Infections, Colon Surgery (**SSI**)	0.80	↓ 20%
Surgical Site Infections, Abdominal Hysterectomy Surgery (**SSI**)	0.89	↓ 11%
Hospital-onset *Clostridium difficile* Infections	0.98	↓ 2%
Hospital-onset MRSA Bloodstream Infections	0.96	↓ 4%*

CAUTIs ↑ 3% HIGHER COMPARED TO NAT'L BASELINE

CATHETER-ASSOCIATED URINARY TRACT INFECTIONS

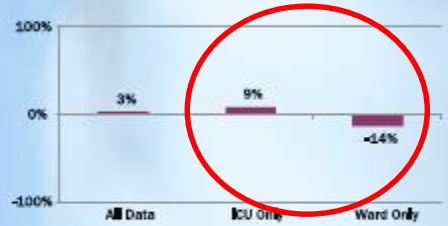
When a urinary catheter is not inserted correctly, not kept clean, or left in a patient for too long, germs can travel through the catheter and cause a catheter-associated urinary tract infection in the urinary system, which includes the bladder and kidneys.

US hospitals reported a significant increase in CAUTIs between 2011 and 2012.

3,597 hospitals across the nation reported CAUTI data in 2012.

13% 13% of hospitals have an SIR significantly worse than the national SIR of 1.03.

Changes in CAUTI vs. 2009 National Baseline



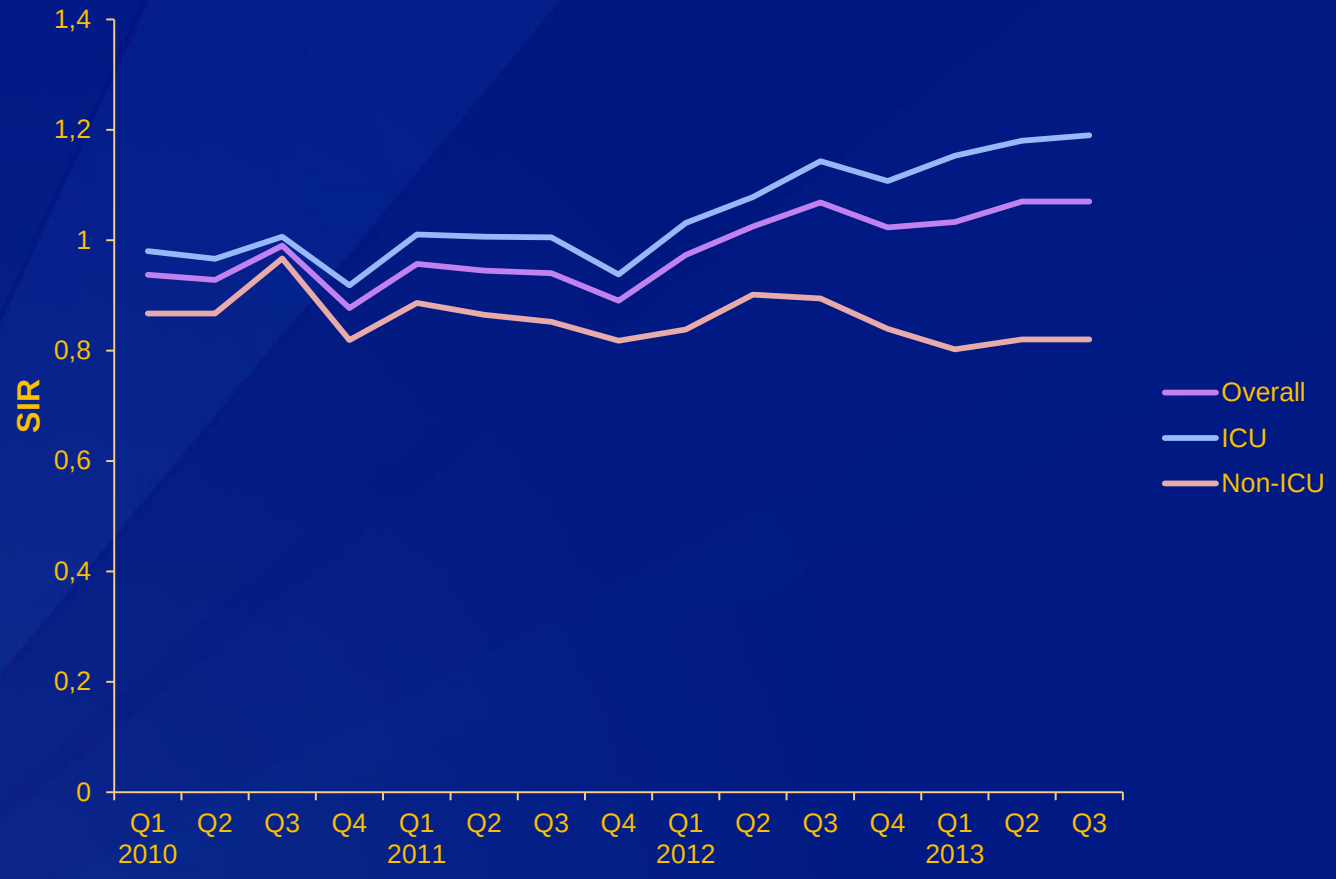
Learn how well your hospital prevents infections: www.medicare.gov/hospitalcompare

- 2012 HAI Progress Report: www.cdc.gov/hai/progress-report/
- Preventing HAIs: www.cdc.gov/hai
- NHSN: www.cdc.gov/nhsn

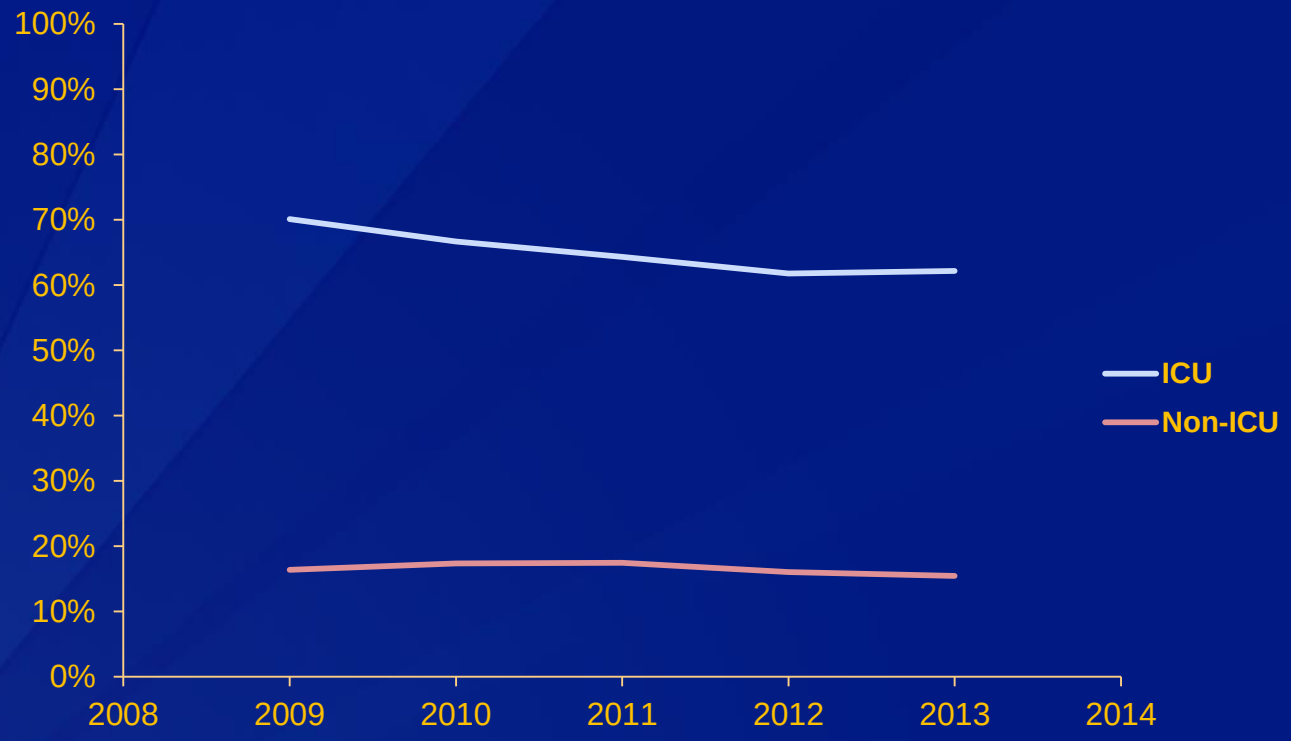
THIS REPORT IS BASED ON 2012 DATA, PUBLISHED MARCH 2014

http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf

National Data: Trends in CAUTI SIRs



National Data: Trends in Urinary Catheter Device Utilization Ratios (DUR)



Proposed 2020 Targets

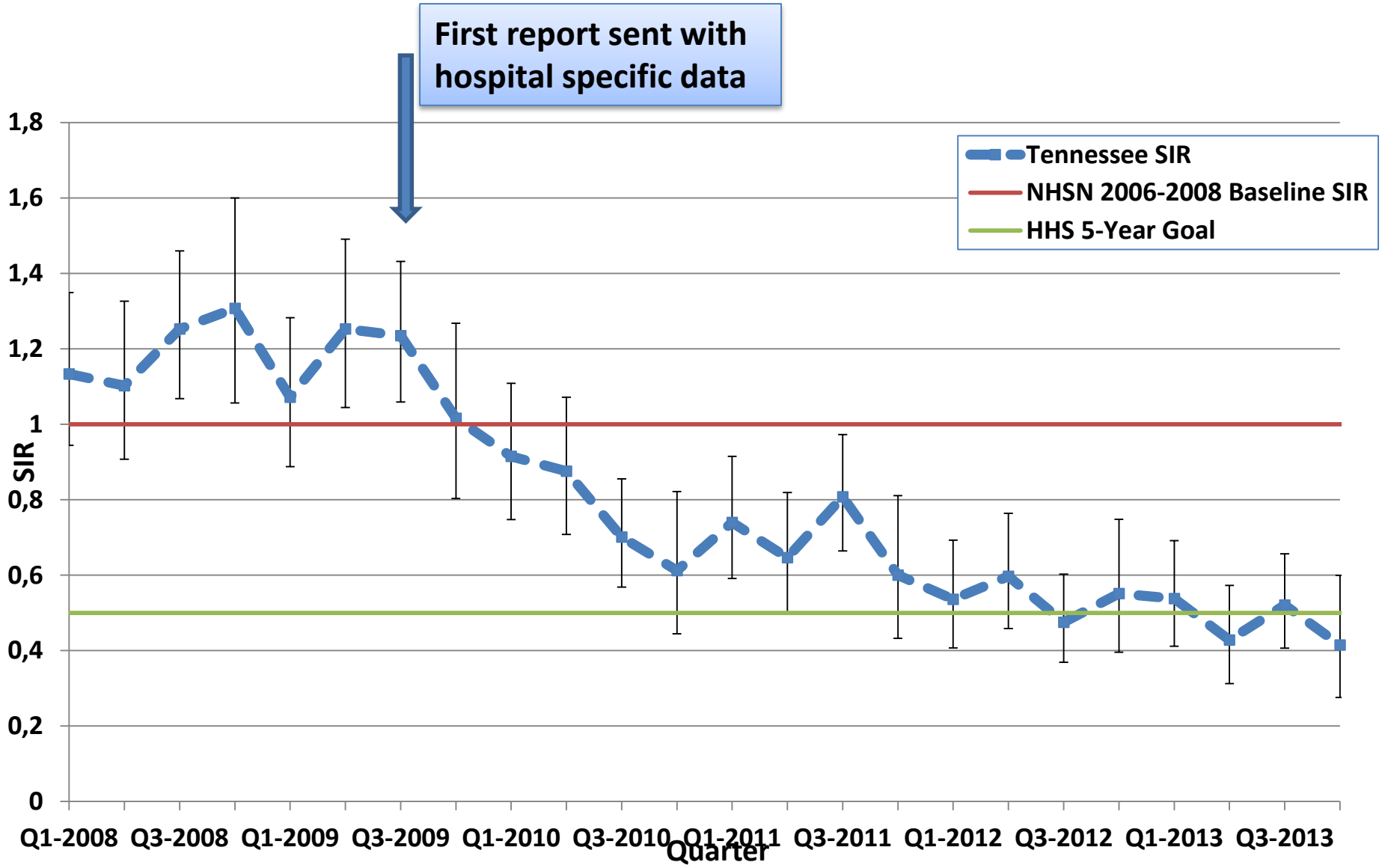
Metric	2015	2016	2017	2018	2019	2020
		Evaluate progress during these years				
CLABSI	New baseline					50% ↓
CAUTI						25% ↓
SSI						50% ↓
MRSA (invasive)	Rates are calculated using this year of data					50% ↓
MRSA (HO)						25% ↓
C. diff						30% ↓
Others						

Progress State Reports

Table 2. State-specific Standardized Infection Ratios (SIRs) for States Using NHSN to Comply With a Legislative Mandate* to Report Central Line-Associated Bloodstream Infections to the State Health Department: January 2009 – June 2009.

State	No. of Facilities Reporting	Observed	Predicted	SIR	95% CI for SIR Lower	95% CI for SIR Upper	Graphic Representation of SIR† 0 1.0 2.0
Colorado	50	64	94.25	0.68	0.52	0.87	
Connecticut§	30	65	69.46	0.94	0.72	1.19	
Delaware	8	20	33.84	0.59	0.36	0.91	
Illinois	140	301	333.46	0.90	0.80	1.01	
Maryland§	48	234	179.95	1.30	1.14	1.48	
Massachusetts	70	124	211.44	0.59	0.49	0.70	
New Hampshire	24	13	22.93	0.57	0.34	0.90	
New Jersey	72	183	222.97	0.82	0.71	0.95	
New York§	182	604	610.22	0.99	0.91	1.07	
Oklahoma	48	59	118.95	0.50	0.38	0.64	

CLABSI Adult/Pediatric ICUs, Tennessee



TENNESSEE

HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. The **standardized infection ratio (SIR)** is a statistic used to track HAI prevention progress over time; lower SIRs indicate better progress. The infection data are collected through CDC's National Healthcare Safety Network (NHSN). Tennessee requires hospitals to publicly report at least one HAI to NHSN, and HAI data for nearly all U.S. hospitals are published on the Hospital Compare website.

Q CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS

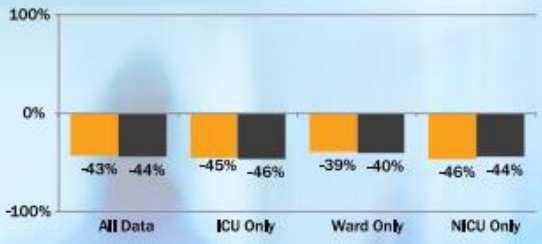
CLABSIs ↓ 43% LOWER COMPARED TO NAT'L BASELINE

A **central line** is a tube that a doctor usually places in a large vein of a patient's neck or chest to give important medical treatment. When not put in correctly or kept clean, central lines can become a freeway for germs to enter the body and cause deadly infections in the blood.

Tennessee hospitals reported a significant decrease in CLABSIs between 2011 and 2012.

11% 11% of Tennessee hospitals have an SIR worse than the national SIR of 0.56.

Changes in CLABSI vs. 2008 National Baseline



LEGEND

- State
- National
- ✓ State examines data and reviews medical charts for this infection to confirm accuracy and completeness
- Q State investigates data for this infection to assess completeness and quality
- * Statistically significant difference
- v Fewer than 5 facilities reported data

CAUTIs ↑ 38% HIGHER COMPARED TO NAT'L BASELINE

CATHETER-ASSOCIATED URINARY TRACT INFECTIONS Q

When a urinary catheter is not inserted correctly, not kept clean, or left in a patient for too long, germs can travel through the catheter and cause a **catheter-associated urinary tract infection** in the urinary system, which includes the bladder and kidneys.

16% 16% of Tennessee hospitals have an SIR worse than the national SIR of 1.03.

Changes in CAUTI vs. 2009 National Baseline

SSIs: COLON SURGERY ↓ 7% LOWER COMPARED TO NAT'L BASELINE

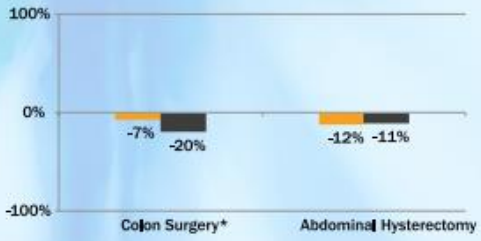
SSIs: ABDOMINAL HYSTERECTOMY ↓ 12% LOWER COMPARED TO NAT'L BASELINE

SURGICAL SITE INFECTIONS: COLON SURGERY AND ABDOMINAL HYSTERECTOMY SURGERY

When germs get into an area where surgery is or was performed, patients can get a **surgical site infection**. Sometimes these infections involve the skin only. Other SSIs can involve tissues under the skin, organs, or implanted material.

10% 10% of Tennessee hospitals have a colon surgery SIR worse than the national SIR of 0.80.

Changes in SSI vs. 2008 National Baseline



5% 5% of Tennessee hospitals have an abdominal hysterectomy SIR worse than the national SIR of 0.89.

CDC

THIS REPORT IS BASED ON 2012 DATA, PUBLISHED MARCH 2014

TENNESSEE

HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

Learn how your hospital is preventing infections: **www.medicare.gov/hospitalcompare**
For more information:

- 2012 HAI Progress Report: **www.cdc.gov/hai/progress-report/**
- Preventing HAIs: **www.cdc.gov/hai**
- NHSN: **www.cdc.gov/nhsn**
- HAIs in Tennessee: **health.state.tn.us/ceds/hai/index.htm**

HEALTHCARE-ASSOCIATED INFECTION (HAI) DATA gives healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

WHAT IS THE STANDARDIZED INFECTION RATIO?

The **standardized infection ratio (SIR)** is a statistic used to track healthcare-associated infection prevention progress over time. The SIR for a facility or state is adjusted to account for factors that might cause infection rates to be higher or lower, such as hospital size, teaching status, the type of patients a hospital serves, and surgery and patient characteristics.

✓Q In some cases, states that work to validate, or double check, HAI data may have higher SIRs since they are actively looking for infections.

WHAT DOES THE STANDARDIZED INFECTION RATIO MEAN?

IF THE STATE SIR IS:

MORE THAN 1 — There were more infections reported in the state in 2012 compared to the national baseline data, **indicating there has been an increase in infections.**

1 — There were about the same number of infections reported in the state in 2012 compared to the national baseline data, **indicating no progress has been made.**

LESS THAN 1 — There were fewer infections reported in the state in 2012 compared to the national baseline data, **indicating progress has been made in preventing infections.**

WHAT IS TENNESSEE DOING TO PREVENT HEALTHCARE-ASSOCIATED INFECTIONS?

Tennessee is one of 10 state health departments participating in CDC's Emerging Infections Program, which allows for extra surveillance and research of HAIs. Tennessee has a state mandate to publicly report at least one HAI to NHSN.

Tennessee has several prevention efforts (known as prevention collaboratives) to reduce specific HAIs, including:

- Central line-associated bloodstream infections
- Catheter-associated urinary tract infections
- Surgical site infections
- *Clostridium difficile*, deadly diarrheal infections
- MRSA infections

Tennessee implemented prevention efforts in long-term care facilities and dialysis facilities, and to improve antibiotic stewardship.

[+] Not all hospitals are required to report these infections; some hospitals do not use central lines or urinary catheters, or do not perform colon or abdominal hysterectomy surgeries.

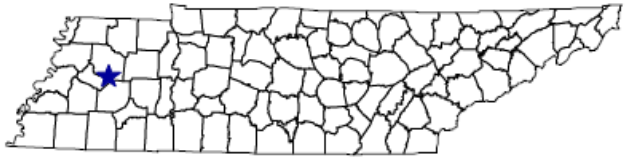
NUMBER OF TENNESSEE HOSPITALS THAT REPORTED DATA TO CDC'S NHSN IN 2012 **Total Hospitals: 154[+]**		STATE SIR	NAT'L SIR
CLABSI 94 hospitals	Tennessee's 2012 state **CLABSI** SIR is similar to the 2012 national SIR.	0.57	0.56
CAUTI 95 hospitals	Tennessee's 2012 state **CAUTI** SIR is significantly worse than the 2012 national SIR.	1.38	1.03
SSI, Colon Surgery 90 hospitals	Tennessee's 2012 state **Colon Surgery SSI** SIR is significantly worse than the 2012 national SIR.	0.93	0.80
SSI, Abdominal Hysterectomy 90 hospitals	Tennessee's 2012 state **Abdominal Hysterectomy SSI** SIR is similar to the 2012 national SIR.	0.88	0.89

THIS REPORT IS BASED ON 2012 DATA, PUBLISHED MARCH 2014

Hospital A, City, X County

Medical School Affiliation: Graduate teaching

Bed Size Category: 100-399 beds



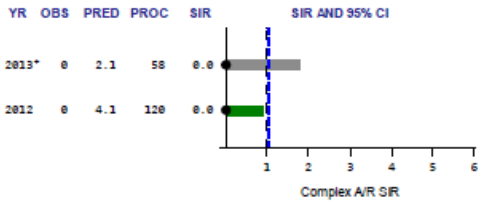
Standardized Infection Ratio (SIR) by Infection Type, 01/01/2013-06/30/2013

		Infections			Standardized Infection Ratio (SIR)		
HAI	Type/Unit	Observed	Predicted	Procedures Performed/ Patient Days	SIR*	95% CI	TN SIR
SSI	Colon surgery	0	2.1	58	0.00	(0.00, 1.79)	1.06
	Abdominal hysterectomy	0	0.0	0	N/A	N/A	0.93
LabID	MRSA	0	1.3	15,519	0.00	(0.00, 2.94)	1.12
	CDI	1	8.3	16,648	0.12	(0.00, 0.67)	0.80

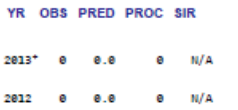
Green highlighting indicates an SIR significantly LOWER than the national baseline (SSI - 2006-2008; LabID - 2010-2011)
Red highlighting indicates an SIR significantly HIGHER than the national baseline (SSI - 2006-2008; LabID - 2010-2011)
*Complex Admission/Readmission SIRs are presented for surgical site infections (SSI)

Surgical Site Infections (SSI)

SSI - Colon Surgery



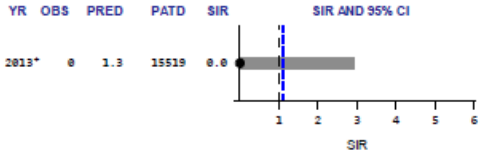
SSI - Abdominal Hysterectomy



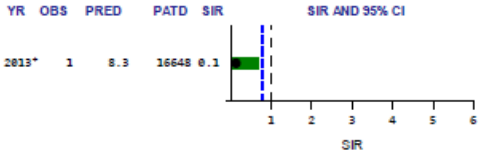
N/A: Number of predicted infections <1; no SIR calculated

Healthcare-Onset Laboratory-Identified (LabID) Events

LabID - Methicillin-Resistant S. aureus (MRSA)



LabID - C. difficile Infection (CDI)



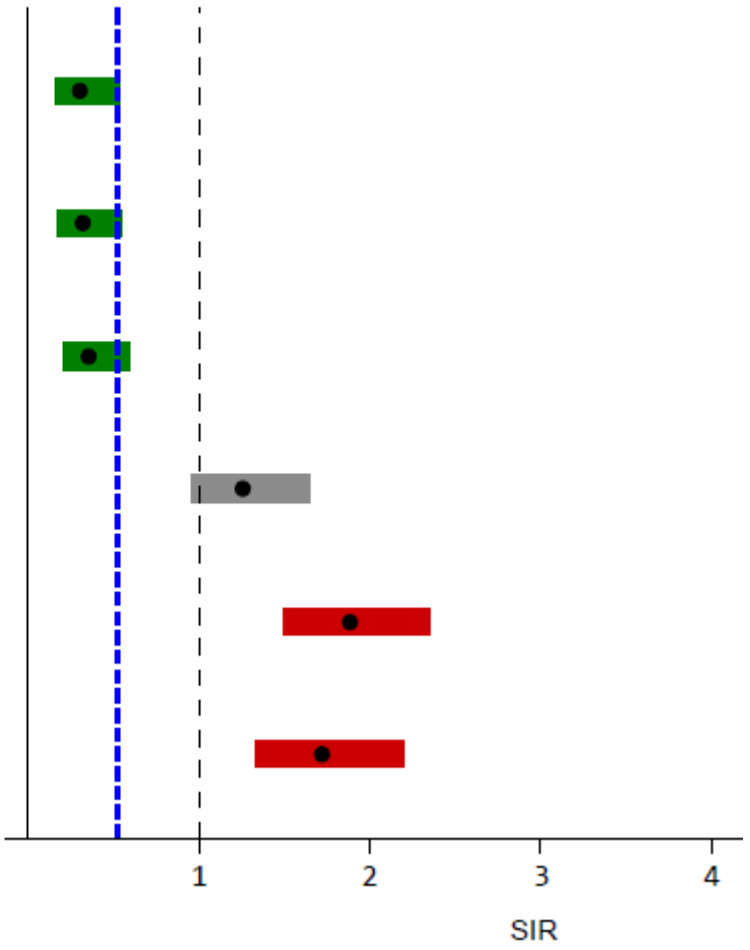
Data reported as of January 30, 2014
*2013 includes data from 1/1/2013-6/30/2013
YR = reporting year; OBS = observed number of infections
PRED = statistically 'predicted' number of infections, based on NHSN pooled mean baseline data
SIR = standardized infection ratio (observed/predicted number of infections)
PROC = number of procedures performed (SSI);
PATD = number of patient days (LabID); N/A = number of infections predicted <1; no SIR calculated

Significantly lower than NHSN SIR of 1
Not significantly different from NHSN SIR of 1
Significantly higher than NHSN SIR of 1
2013H1 TN SIR
NHSN SIR=1

TN report to Hospital A: CLABSIs in Adult & Pediatric ICU

CLABSI - Adult/Pediatric ICU, excluding burn and trauma units

YR	N	OBS	PRED	DD	SIR
2013	4	11	37	17338	0.3
2012	4	12	38	17855	0.3
2011	4	14	39	18438	0.4
2010	4	54	43	19757	1.3
2009	4	75	40	17402	1.9
2008	4	63	37	15982	1.7



Using Data: Targeted Assessment for Prevention (TAP)

- TAP report ranks facilities by excess numbers of infections above a set benchmark defined at a national, state, or group level
- CDC is partnering with organizations to target prevention efforts toward facilities with highest excess numbers of infections
- TAP report function will be built into NHSN application for 2015

Decreasing Central Line-associated Bloodstream Infections

- **Data for Action**
  - Number of hospitals reporting to NHSN:
    - ICU: 3272 (SIR = 0.516)
    - WARD: 1603 (SIR = 0.621)
    - NICU: 937 (SIR = 0.487)
  - TAP Report
    - Need to target only <100 facilities to reach SIR 0.50 HHS goal
  - LTACH - reporting began in October 2012; SIRs/TAPs will be calculated once baseline established
  - BSIs in dialysis facilities
    - Working with ESRD networks to promote CDC recommendations and to include use of prevention tools in the FY14 ESRD Scope of Work
- **Partners for Implementation**
  - HDs
  - CMS/QIOs, AHRQ and new partners

NHSN Data for Action

NHSN Data
Over 4,700 hospitals currently reporting CAUTI data

Targeted assessment for prevention (TAP) strategy

Target hospitals with highest excess numbers of infections

Technical Assistance

- HENs
- QIOs
- CUSP
- Other partners

CAUTI Data: CDC National Healthcare Safety Network (NHSN)

2013 (National CAUTI SIR = 1.06)	*N = 3,639 hospitals reporting CAUTI to NHSN*		
	No. of hospitals	*No. of excess CAUTIs**	*National SIR achieved if excess CAUTIs eliminated*
No. of hospitals with excess numbers of CAUTIs (using a benchmark SIR of 1.0)	1,204	9,537	0.766
No. of hospitals to target to achieve HHS SIR goal (using a benchmark SIR of 0.975)	1,039	9,893	0.75
No. of hospitals with excess of ≥ 5 CAUTIs	420	8,255	0.805

* Excess CAUTIs = observed – expected CAUTIs

Data courtesy of Minn Soe, CDC

Sample CAUTI TAP Report: Facility Level

FACILITY RANK	ORGID	STATE	BEDS	NO.LOCATION (ICU,NON-ICU)	CAUTIS (ICU,NON-ICU)	DEVICE DAYS (ICU,NON-ICU)	DU% (ICU,NON-ICU)	CAD (ICU, NON-ICU)	SIR (ICU,NON-ICU)	ICU: TOTAL NO. PATHOGENS (% EC,YS,PA,KPO,FS,PM,ES)
1	001	AA	325	6(4,2)	42(34,8)	6861(5364,1497)	26(56,9)	22.9(17.8,5.2)	2.2(2.1,2.8)	37 (24, 14, 16, 8, 11, 0, 0)
2	002	AA	586	3(2,1)	73(70,3)	14292(13898,394)	48(70,4)	21.6(20.1,1.5)	1.4(1.4,2)	78 (27, 17, 10, 17, 12, 1, 0)
3	003	AA	471	3(2,1)	28(26,2)	6255(5880,375)	51(72,9)	15.6(15.1,0.6)	2.3(2.4,1.4)	28 (21, 36, 7, 7, 7, 0, 0)
4	004	AA	340	1(1,0)	36(36,.)	6760(6760,.)	84(84,.)	13(13,.)	1.6(1.6,.)	36 (36, 36, 8, 6, 0, 0, 0)
5	005	AA	646	4(4,0)	45(45,.)	11569(11569,.)	71(71,.)	12.2(12.2,.)	1.4(1.4,.)	45 (22, 31, 4, 9, 2, 2, 16)
6			469	16(7,9)	39(32,7)	14240(9989,4251)	24(55,10)	7.8(7.6,0.2)	1.3(1.3,1)	36 (19, 47, 3, 3, 11, 0, 0)
7			200	3(2,1)	14(12,2)	4408(4125,283)	40(61,7)	4.9(4,0.9)	1.5(1.5,1.9)	12 (42, 25, 25, 0, 0, 0, 0)
8			500	3(3,0)	13(13,.)	6322(6322,.)	59(59,.)	3.7(3.7,.)	1.4(1.4,.)	13 (23, 54, 0, 8, 0, 8, 8)
9			418	1(1,0)	12(12,.)	3614(3614,.)	81(81,.)	3.7(3.7,.)	1.4(1.4,.)	13 (38, 31, 8, 0, 0, 0, 8)
10			283	3(2,1)	9(8,1)	4690(3744,946)	36(63,14)	2.9(3.4,-0.5)	1.5(1.7,0.7)	9 (22, 22, 0, 11, 22, 0, 0)
11			258	3(2,1)	13(11,2)	7784(6588,1196)	44(63,16)	2.8(3.1,-0.3)	1.3(1.4,0.9)	11 (18, 9, 18, 0, 9, 0, 0)
12			200	3(2,1)	6(6,0)	3010(2590,420)	38(56,13)	2.2(2.8,-0.7)	1.6(1.9,.)	6 (0, 50, 0, 17, 17, 0, 0)

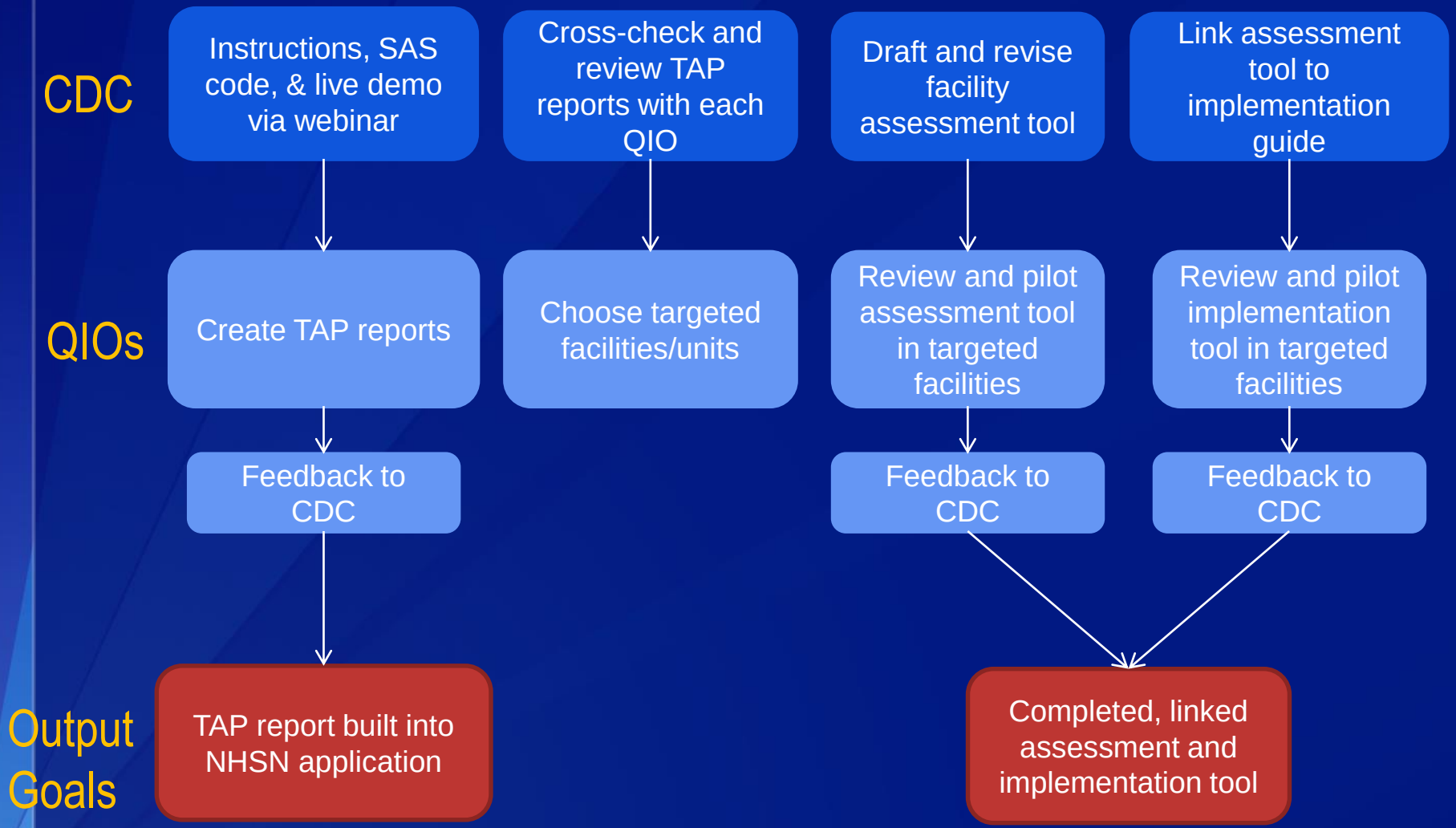
- Facilities are ranked by “CAD” (cumulative attributable difference) in descending order
  - CAD = observed – expected number of CAUTIs
- Data separated by ICU vs. non ICU locations
- TAP report also includes data on device utilization and pathogens

Sample CAUTI TAP Report: Unit Level

FACILITY		LOCATION								
FACILITY RANK	ORGID	LOCATION RANK*	LOCATION	CDC LOCATION TYPE	EVENT	DEVICE DAYS	DU	CAD	SIR	TOTAL NO. PATHOGENS (%EC,YS,PA,KPO,FS,PM,ES)
1	001	1	1073	IN:ACUTE:CC:B	14	1783	48%	6.2	1.78	16 (31, 6, 25, 13, 0, 0, 0)
		1	11001	IN:ACUTE:CC:S	10	1443	64%	6.2	2.66	10 (30, 10, 0, 10, 10, 0, 0)
		3	1004	IN:ACUTE:CC:M_PED	4	197	18%	3.8	.	5 (20, 0, 20, 0, 40, 0, 0)
		4	10011	IN:ACUTE:STEP	5	964	13%	3.2	2.72	5 (20, 80, 0, 0, 0, 0, 0)
		5	1012	IN:ACUTE:WARD:M	3	533	6%	2	2.96	4 (50, 0, 25, 0, 0, 0, 0)
		6	1002	IN:ACUTE:CC:M	6	1941	78%	1.5	1.34	6 (0, 50, 17, 0, 17, 0, 0)
2	002	1	POD	IN:ACUTE:CC:MS	24	5358	80%	11.7	1.94	26 (19, 31, 12, 12, 4, 4, 0)
		2	NSTU	IN:ACUTE:CC:NS	46	8540	65%	8.4	1.22	52 (31, 10, 10, 19, 15, 0, 0)
		3	N- REHA	IN:ACUTE:WARD:REHAB	3	394	4%	1.5	2.00	3 (0, 0, 33, 67, 0, 0, 0)
3	003	1	ICU	IN:ACUTE:CC:MS	19	4666	74%	13.4	3.39	21 (19, 48, 0, 10, 5, 0, 0)
		2	NCCU	IN:ACUTE:CC:NS	7	1214	64%	1.7	1.31	7 (29, 0, 29, 0, 14, 0, 0)
		3	REHAB	IN:ACUTE:WARD:REHAB	2	375	9%	0.6	1.40	2 (0, 0, 0, 50, 0, 50, 0)
4	004	1	ICU OSB	IN:ACUTE:CC:T	36	6760	84%	13	1.56	36 (36, 36, 8, 6, 0, 0, 0)
5	005	1	1A	IN:ACUTE:CC:MS	19	4729	75%	8.1	1.74	19 (21, 47, 0, 0, 0, 0, 11)
		2	2AB	IN:ACUTE:CC:T	12	1706	69%	6.2	2.06	12 (33, 17, 8, 8, 0, 0, 17)
		3	2CD	IN:ACUTE:CC:CT	4	2410	71%	-0.1	0.97	4 (0, 75, 0, 0, 25, 0, 0)
		4	1BD	IN:ACUTE:CC:NS	10	2724	65%	-2	0.83	10 (20, 0, 10, 30, 0, 10, 30)

- Reporting locations ranked within facilities

Pilot Process



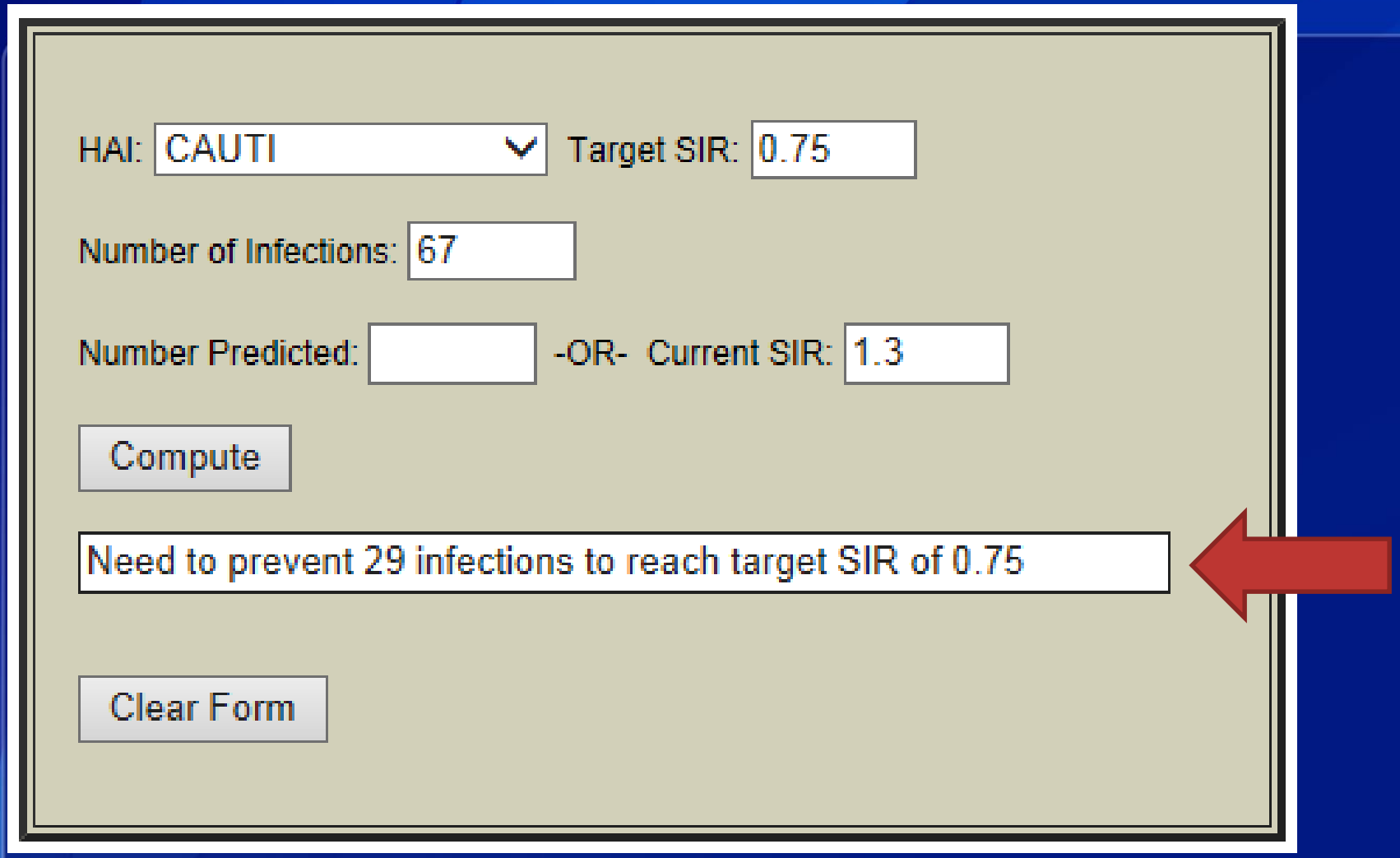
Initial Facility Assessment Tool: Major CAUTI Domains

- General Infrastructure, capacity, and processes
  - Leadership
  - Training
  - Competency assessments
  - Audits & Feedback
- Appropriate indications for urinary catheter insertion
- Timely removal of urinary catheters
- Aseptic urinary catheter insertion
- Proper urinary catheter maintenance
- Preventing candiduria and detection of asymptomatic bacteriuria

TN report to hospitals

Facility [redacted]								
		Facility SIR and 95% Confidence Interval*		Number of Infections			Statewide Comparison	
HAI	Type/Unit	SIR	CI	Actual	Must Prevent To Reach Goal**	SIR Goal**	TN SIR (CY 2013)	Top 5 Most Preventable Infections (CY 2013)?
CAUTI	AP ICU	1.41	(1.14, 1.72)	97	46	0.75	1.38	YES
CLABSI	AP ICU	0.39	(0.24, 0.61)	19	.	0.50	0.50	NO
LabID	CDI	0.90	(0.76, 1.05)	145	32	0.70	0.79	YES
	MRSA	1.68	(1.24, 2.24)	47	27	0.75	1.13	YES
SSI	CABG	0.30	(0.04, 1.09)	2	.	0.50	0.52	NO
	COLO	1.37	(0.88, 2.02)	25	12	0.75	0.91	YES
	HYST	1.28	(0.35, 3.28)	4	2	0.75	0.92	YES

TN - Report sent to each facility every quarter



http://health.state.tn.us/ceds/HAI/calculator.shtml

TAP report capability in NHSN for CLABSI, CAUTI, CDI

CAUTI Prevention

- **Pilot of Targeted Assessment for Prevention (TAP) strategies in 7 CMS QIOs**
  - QIOs used NHSN data for TAP reports to target facilities
  - Piloting assessment tool
- **CAUTI EpiAid –** field investigation of high CAUTI rate facility in MD
  - CAUTI rates have decreased over 60% following interventions
- **Prevention Epicenter –** using EMR to identify patients that don't need catheters
- **NHSN TAP analytic functions –** available Jan 2015
- **Expanding partnerships e.g., American Nurses Association**
  - CDC providing technical expertise, recommendations

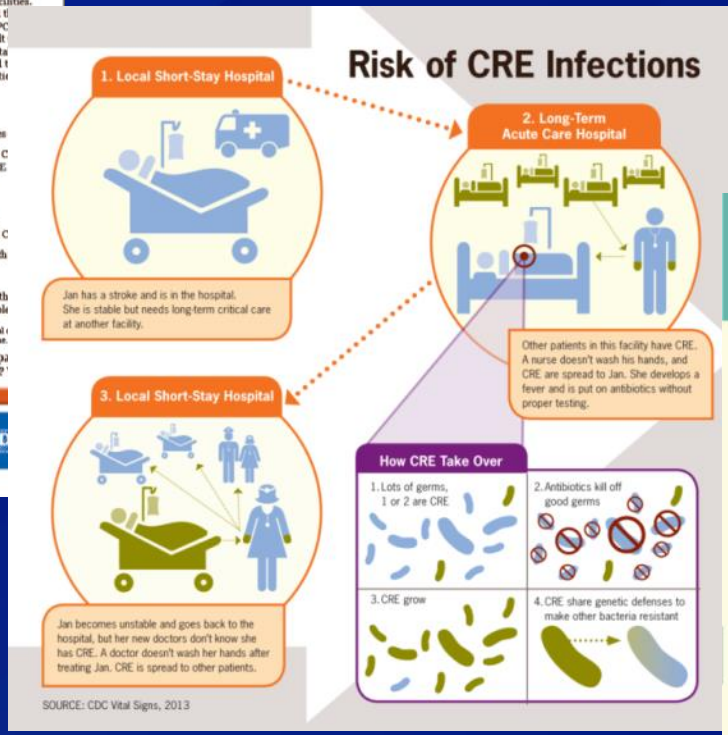
Data for Action

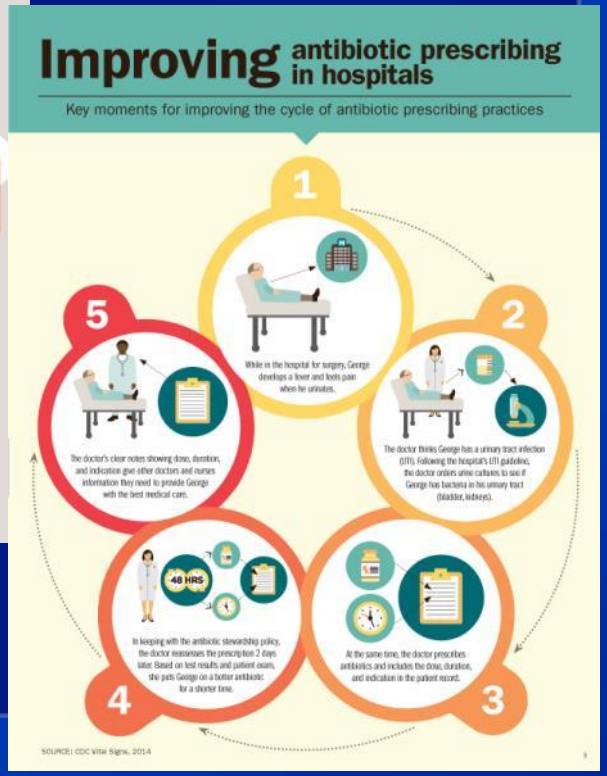
- **NHSN data linked to other data sources**
  - Return on investment
  - Potential new risk adjustment
  - Patient level adjustments
  - Analysis by payors

Comprehensive Use of NHSN Data

- **CDC National Annual Reports**
  - Device- and procedure-associated data summaries
  - State and national standardized infection ratio reports
  - HAI antimicrobial resistance data
- **CMS Facility/State/National Reports**
  - Preview reports for hospitals/hospital systems
  - Hospital Compare for public reporting
  - Hospital value-based purchasing for facility reimbursement
- **State and Local Health Departments**
  - Data required for public reporting
- **Quality Improvement Groups**
  - Quality improvement orgs (QIOs)
  - End-stage renal disease networks
  - Partnership for Patients Hospital Engagement Networks
- **Collaboratives**
  - Comprehensive unit-based safety program (CUSP)
  - State, regional, local initiatives
- **Research Groups**
  - Prevention of nosocomial infections and cost effectiveness (PNICE)
  - Preventing avoidable infections by adjusting payment (PAICAP)

Information for Action: Vital Signs



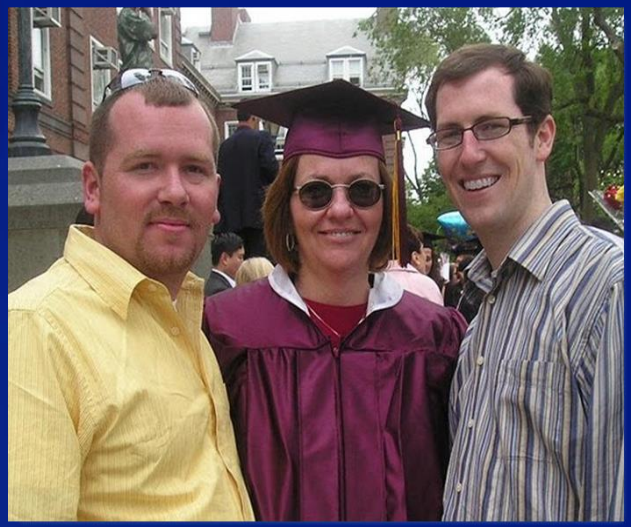


Engaging Partners for Action

- **It is essential**
- **Need clarity from scientific perspective**
- **Ongoing relationship**

- **Old and New Partners:**
  - Clinicians, nurses, pharmacists
  - Leaders in the institutions
  - Public health groups
  - Hospital associations
  - Professional organizations
  - Cosumers/patients
  - Etc. etc

Data to prevent a tragedy for many families..



Consumers
Medical Professionals
Public Health
Industry
Prevention of HAIs is Everyone's Responsibility
Patients
Government
Healthcare Facilities
Payors