Report on Healthcare Associated Infections (HAIs) to the General Assembly

2011

State of Connecticut

Connecticut HAI Program

May 2012

INTRODUCTION

A healthcare associated infection (HAI) is an infection that a patient gets while receiving treatment within a healthcare facility such as a hospital, nursing home, and outpatient surgery center or dialysis clinic. These infections can occur while patients are receiving routine care; or after surgery; or as a complication from a medical device such as a ventilator, urinary catheter, central or intravenous line; or as a side effect of the use of antibiotics. Some patients, like those with a weakened immune system, run a higher risk of infection than others do. A facility that performs a large number of complex procedures on very sick patients would be expected to have a higher infection rate than a facility that performs routine procedures on healthier patients. Therefore, healthcare associated infection is only one of several important factors to consider before choosing where to receive health care.

Patients, especially those who are critically ill, are at increased risk of bloodstream infections. These patients often require a type of catheter or tube, called a "central line" or "central venous catheter," that is inserted into a blood vessel near the heart to deliver drugs or fluids. CLABSIs are infections of the bloodstream in patients who also have a Central Line. Many, though not all, of these blood stream infections are due to the presence of the central line. CLABSIs are serious infections that can increase the patient's stay in the hospital, increase the cost of medical care, and even cause death. National experts have given the highest priority to the public reporting of CLABSIs based on criteria that include the frequency, severity and preventability of the infection, the likelihood that the infection can be detected and reported accurately, and the availability of well-established prevention strategies.

The primary function of this report is to give policymakers in Connecticut the information they seek about the current trends in HAIs in Connecticut healthcare institutions. Different audiences will want information that is specifically targeted to their needs. To that end, the DPH HAI program website (http://www.ct.gov/dph/cwp/view.asp?a=3136&q=417318) includes more content specifically aimed to make health providers and patients more informed in ways that they will find useful, including hospital-specific HAI data.

Currently, hospital-specific CLABSI data for the year July 1, 2010 through June 30, 2011 are available on the website listed above. The hospital specific data for the calendar years covered by this report, 2010 and 2011, are in the final stages of analysis and preparation for posting on the DPH website. We anticipate posting them on the fully renovated DPH HAI program website in late May or early June 2012.

At one time, HAIs were considered an unfortunate but unavoidable result of healthcare. Recently, there has been a change in this view. Now HAIs are thought of as largely preventable, and therefore unacceptable. While there is no single cause or simple way to eliminate HAIs, demand from policymakers, payors, and the public for transparency, accountability, and reduction of healthcare costs are providing the driving force toward eliminating the preventable fraction of HAIs. Reaching this goal requires disease tracking and prevention programs, and a new level of cooperation among many partners including consumers, healthcare professionals, insurers, and policymakers.

HAIs are among the leading causes of preventable death in the United States, affecting 1 in 20 hospitalized patients, as well as accounting for an estimated 1.7 million infections and an associated

99,000 deaths in 2002.[1][2] This is more than the annual death toll from motor vehicle accidents and HIV/AIDS combined. These infections not only hurt patients and their families, they also contribute to the nation's healthcare costs. In 2007, the annual economic burden of HAI in Massachusetts ranged from $200 to $400 million.[3]   A report from the Centers for Disease Control and Prevention (CDC) published in 2009 estimates the U.S. direct medical cost of treating HAI ranges from $35.7 billion to $45 billion annually.[4] Yet adherence to evidence based practices can reduce at least one type of HAI by as much as 70 percent.[5][6]

In 2006, the Connecticut Legislature established a state HAI Advisory Committee and directed the Connecticut Department of Public Health to develop a state public health HAI program to raise awareness, promote transparency for healthcare consumers, and promote the collection, analysis, and sharing of data for infection prevention action in healthcare settings.

The Connecticut HAI Program is located in the DPH Infectious Diseases Section and focuses on surveillance and the use of data to promote prevention activities. However, many other perspectives and skills are needed to address HAIs, and the program works with other DPH programs, in particular the Health Care Safety and Quality Branch (the state's regulatory and survey agency). Other collaborating organizations, including the Connecticut Hospital Association and Qualidigm, the state's Centers for Medicare and Medicaid Services (CMS)-designated Quality Improvement Organization (QIO) are active collaborators with the DPH HAI program, are essential for any progress against HAIs.

The state HAI Advisory Committee meets quarterly to provide recommendations to DPH on HAI public reporting and public awareness. It consists of 11 voting members and approximately 40 regular non-member participants. Among these committed individuals are hospital epidemiologists, infection preventionists, consumers and advocates, quality improvement professionals, and professional and healthcare associations. Non-voting "participants" attend meetings and participate in discussion, but do not have the authority to vote on formal motions before the Committee. All substantive business, such as recommendations to the DPH on which HAIs should be publicly reported, must be made through formal motion and majority vote of the voting members.

---

[1] Morbidity and Mortality Weekly Report (MMWR) Vital Signs: Central Line Associated Blood Stream Infections United States, 2001, 2008, and 2009. March 4, 2011.

[2] Klevens RM, Edwards J, Richards C, Horan T, Gaynes R, Pollock D, Cardo D. Estimating Health Care Associated Infections and Deaths in U.S. Hospitals, 2002. Public Health Reports 2006; 122.

[3] http://www.mass.gov/eohhs2/docs/dph/patient_safety/hai pcp_final_report_pt1.pdf

[4] http://www.cdc.gov/ncidod/dhqp/pdf/Scott_CostPaper.pdf

[5] MMWR. Reduction in Central Line Associated Bloodstream Infections Among Patients in Intensive Care Units; Pennsylvania, April 2001 – March 2005. October 14, 2005 / 54(40); 1013y1016.

[6] Pronovost P, Needham D, Berenholtz S, et al. An Intervention to Decrease Catheter–Related Bloodstream Infections in the ICU. NEJM 2006; 355:2725.

The intentions of public reporting and criteria for Advisory Committee recommendations are to raise awareness, to promote transparency for consumers, to motivate healthcare facilities to prioritize infection prevention, and to guide these prevention activities. Tracking, measuring, and reporting of HAI data are important to understand statewide trends, identify patterns of infection, and ensure readiness for the possible emergence of new or unusual organisms.

Members of the HAI Advisory Committee

Department of Public Health Commissioner or Commissioner's designee
   1. Wendy Furniss, Chief, Healthcare Safety & Quality Branch, Connecticut DPH, Hartford, CT

Two representatives from the Connecticut Hospital Association
   1. Alison Hong, MD, Director, Quality and Patient Safety, CT Hospital Association, Wallingford, CT
   2. James Iacobellis, Connecticut Hospital Association, Wallingford, CT

Two representatives from organizations representing health care consumers
   1. Liz Lemiska, BSN, RN, Office of Healthcare Advocate, State of CT, Hartford, CT
   2. Jean Rexford, Executive Director, Connecticut Center for Patient Safety, Hartford, CT

Two representatives that are hospital-based infectious disease specialists or epidemiologists
   1. Louise Dembry, MD, Hospital Epidemiologist, Yale-New Haven Hospital, New Haven, CT
   2. Brenda Grant, RN, MPH, CIC, Infection Preventionist, Stamford Hospital, Stamford, CT

One representative from the Connecticut State Medical Society
   1. Douglas Waite, MD, VP for Medical Affairs/CMO, Director of ID, Day Kimball Hospital, Putnam, CT

One representative from a labor organization representing hospital-based nurses
   1. Dale Cunningham, American Federation of Teachers, Rocky Hill, CT

Two members from the public
   1. Harry Mazadoorian, JD, Quinnipiac University School of Law, Hamden, CT
   2. Raymond Andrews, Trustee, The Donaghue Medical Research Foundation, West Hartford, CT

HAI PUBLIC REPORTING

Once the state HAI Advisory Committee makes a recommendation in accordance with Connecticut General Statutes Section 19a-490 n-o, about which HAIs are to be reported and how, their recommendation is considered by the DPH Reportable Conditions Committee for inclusion in the annual reportable conditions list. These lists are revised and published each year in compliance with C.G.S. 19a-2a and Section 19a-36-A2 of the Public Health Code. When the recommendation is accepted by DPH (as it has both times a recommendation from the Committee has been made), it is then placed on the annual reportable conditions list with reporting instructions.

The instructions require acute care hospitals to report specific HAI-related data to the CDC National Healthcare Safety Network (NHSN). NHSN is a secure, internet-based surveillance system for healthcare facilities to submit information about HAI and to monitor patient safety. NHSN includes standardized

definitions, built-in analytical tools, user training and support, as well as integrated data quality checks. It is free to all participants. NHSN has become the standard for HAI monitoring in the United States: twenty-six states, including Connecticut, require its use. The CDC makes NHSN available to all United States healthcare facilities at no charge, and is currently collecting data from more than 6,000 facilities in all fifty states, the District of Columbia, and several territories.

Participation in NHSN requires a considerable commitment by each participating healthcare facility. Qualified infection preventionists (IPs) conduct HAI surveillance. IPs can be training in nursing, microbiology, epidemiology, and/or medical technology, and all have obtained additional education in infection prevention and control.

Only persons who have completed training on the standard definitions and surveillance methodology may perform NHSN data entry, and all protocols must be followed precisely. These protocols provide a rigorous national and state standard to ensure consistent collection of comparable data. Once data are entered, they are immediately available to the facility, to CDC, and to the DPH HAI Program for viewing, analysis, and editing. All patient and facility information is protected by state and federal law and are stored on secure computers.

Surveillance

Surveillance of infectious diseases is the systematic collection, analysis, and interpretation of data on the occurrence of infectious diseases or related events to determine actions to protect the public from illness. All acute care hospitals that collect data on infections report those data to the Connecticut DPH and the CDC. These agencies then analyze the data for concerning trends or outliers not only for the state as a whole, but also within each individual facility. For surveillance to provide meaningful information across facilities, the state, and the nation, all healthcare facilities reporting data must use the same definitions of the reportable event or condition. Data must be collected consistently, measuring the same thing in the same way to be comparable between healthcare facilities and over time between and within a given facility. These definitions must be based on objective findings that should be readily available at different types of facilities (e.g., not data obtainable only at research institutions).

Data Cleaning and Validation

Data need to be validated to ensure its timeliness, completeness, accuracy, and compliance with the HAIs reporting system.   The DPH works to ensure that hospitals are all applying the definitions in the same way by checking the data for inconsistencies. The DPH has developed a data validation process to review the data for completeness and accuracy. There are a number of points at which these data are checked for validity. This begins with the facilities where infection preventionists, data managers, and others responsible for collecting, synthesizing, and entering HAI data can review the data they have entered using report templates NHSN provides to them. The NHSN software, where the data are entered and stored, has a series of internal logic checks that prevent users from entering inaccurate data, such as accidentally recording a vaginal hysterectomy procedure for a male or entering a procedure date before the patient's date of birth. Further data checks are conducted by the state HAI Program with review for keystroke errors, and missing, incomplete, or duplicate data. It includes technical assistance calls to review surveillance questions and case classification gray areas, and hospital visits during which charts are reviewed to determine if the cases are being counted correctly and

completely. Hospital data managers are notified of any flagged data that may be missing or erroneously entered and make corrections. Finally, since the fourth quarter of 2008, DPH epidemiologists have visited every hospital in the state to validate a sample of patient records. These chart reviews are intended to identify patient outcomes that have been misclassified according to the NHSN definitions. Any inconsistencies are discussed with the hospital IP and changed accordingly to ensure adherence to the reporting guidelines. In total, these tiers of data cleaning and validation act as a broad safety net, catching any missing or invalid data that may otherwise be publicly reported.

HEALTHCARE ASSOCIATED INFECTIONS SUBJECT TO REPORTING

On the recommendations of the state HAI Advisory Committee, Connecticut has taken a deliberate approach to the number of HAI types, locations, and health facilities publicly reported. The emphasis in Connecticut has been on the quality of the data rather than rapidly expanding to cover a large quantity of data. CLABSIs were chosen for reporting because they relate to procedures that are performed frequently, may result in significant harm to patients, have surveillance definitions that are generally recognized, are relatively easily identified and counted, and have widely accepted prevention methods.

From the beginning of HAI reporting in 2008 through the period covered by this report (2010-2011), CLABSIs were the only HAI type reported in Connecticut. The term "central line associated blood stream infection" is instructive. This type of HAI involves a "central line." A central venous catheter (CVC), often called a "central line," is a special type of flexible tube that is placed through the skin into a large vein in a patient's chest, arm, neck, or groin and ends in or close to the heart or one of the major blood vessels near the heart. CVCs are used to administer fluids, nutrition, chemotherapy, antibiotics, blood and blood products, to monitor the cardiovascular system, or to draw blood. While central venous catheters are considered an essential part of providing medical care in many patients, their use also places the patients at risk for infection because the line can serve as a way for bacteria to get across the barrier posed by intact skin and into the blood. These infections are serious, costly, and most can be prevented by following accepted practices for inserting and caring for central lines.

The CDC estimates that there were 28,000 CLABSIs in intensive care units in the United States in 2009. It is estimated that up to 12-25% of patients with CLABSIs die. Each episode results in $16,550 of additional healthcare costs.[7] Prevention practices include steps to ensure that bacteria are not put into the bloodstream when the line is put in or when the line is touched during care. The practices include careful hand hygiene before inserting or touching it, careful cleaning of connections to the line when injecting fluids or medicines, and removal of the line as soon as it is no longer needed.

In the past several years, many of the CLABSIs have been identified in patients in intensive care units and this population was at high risk for bad outcomes as they are already critically ill. Patients requiring intensive care are usually sicker, require more complex treatment, and are at greater risk for CLABSI. Moreover, surveillance is relatively easy to perform in this location because these patients are already

---

[7] Morbidity and Mortality Weekly Report (*MMWR*) Vital Signs: Central Line Associated Blood Stream Infections United States, 2001, 2008, and 2009. March 4, 2011 /60(08);243-248]

aggressively monitored. For these reasons, the HAI Advisory Committee recommended that HAI reporting in Connecticut start with CLABSIs in ICUs. Beginning in January 2008, all Connecticut acute care hospitals have been required to monitor and report CLABSIs occurring in patients from selected intensive care units (ICUs). There are many different types of ICUs, each with different types of patients. Examples include medical, cardiac, trauma, and neurosurgical ICUs. Not all hospitals have each type of ICU. Each type of ICU differs in how frequently they use central lines, which contributes to risk for infection. Greater use of central lines means a greater opportunity for infections to occur in that ICU. As all hospitals have a medical or medical-surgical ICU, the HAI Advisory Committee recommended that Connecticut begin HAI reporting in those locations. It also recommended that pediatric intensive care units (PICUs) be included.

Patients with central lines can be cared for in hospitals "floor" locations, in long-term care facilities, or even at home. These locations were not the initial priority, but in time and with progress in reducing CLABSI in ICUs, they are likely to become future priorities for both surveillance and prevention.

Risk Adjustment

Certain factors increase the risk for HAIs, CLABSIs among them:

• Illnesses like cancer, diabetes and heart disease that may make patients more at risk for infection and lower their immune system's ability to fight infections;

• Medical treatments, such as chemotherapy, which suppress the immune system;

• Devices, such as surgical implants and intravenous lines, that may permit microorganisms to enter the body;

• Long term or repetitive use of antimicrobial drugs (including antibiotics) that may lead to infections with microorganisms difficult to prevent or treat.

The chance of getting an HAI is not just due to problems with medical care. The predisposing risk factors of patients vary a lot and are often different in different healthcare settings and facilities. It makes sense that the risk of patients in a "tertiary care" setting where complex and sicker patients are cared for will be greater than that of patients in a lower acuity facility, such as a small community hospital.

The CDC has collected a large sample of nationwide data through NHSN that can be used as a reference group for benchmarking: a standard for comparisons. These data have gone through a process of risk adjustment, which permits comparison of infection rates in hospitals or other sites of care with one another in the context of how sick patients are and their predisposition for infection. For CLABSI, risk adjustment is based on the type of patient care locations (e.g., ICU) where the central line was inserted or maintained, and some healthcare facility characteristics. For example, we know that burn ICUs historically have had higher rates of infection than surgical ICUs, due to the difference in underlying risks for burn patients

Standardized Infection Ratio

The standardized infection ratio (SIR) is a statistical measure used to compare how a given healthcare facility's rate of infection compares to a predicted number of infections. The predicted number of infections is the number of infections the hospital would have if that hospital had exactly the same infection rate as the national average of their peer group during a baseline period. If the SIR is 1, there is no difference between the numbers of infections at the location in question and the predicted number of events. If the SIR is less than 1, there were fewer infections at that location than predicted. If the SIR is above 1, there were more infections at that location than predicted. The SIR is a standard ratio that can be used to compare a healthcare facility's performance to a national benchmark and to itself over time.   The SIR statistic can be applied to the wide variety of HAI types that can be tracked (e.g., CLABSIs, Surgical Site Infections, etc.) The SIR method can also be used to develop statewide SIRs for comparison of states to the national benchmark. The formula for calculating the SIR is:

$$\text{Standardized Infection Ratio (SIR)} = \frac{\text{Actual Number of Infections}}{\text{Predicted Number of Infections}}$$

**Calculating Predicted Values for Central Line Associated Blood Stream Infection (CLABSI):**

From 2006-2008, NHSN compiled all CLABSI data submitted nationally to produce baseline infection rates by location type (e.g., medical ICU, medical-surgical ICU, pediatric ICU). This permitted prediction of the number of infections that could be expected in the future for those location types. The predicted number of infections for a particular location (e.g., a hospital's medical ICU) is calculated by multiplying the hospital location's number of central line days by the NHSN rate for that location type collected during the baseline period, and dividing by 1,000. Locations can be added together ("aggregated") to develop facility-wide, statewide, and nationwide SIRs.

How do I interpret the CLABSI SIR?

The CLABSI SIR is used to compare Connecticut hospitals to the national benchmark reported from all US hospitals reporting to the NHSN during the baseline period (2006-2008). A CLABSI SIR of 1 means that a state or facility is doing the same as the national benchmark for CLABSIs; a CLABSI SIR of less than 1 means there were fewer CLABSIs than expected; and a CLABSIs SIR above 1 means that there were more CLASBIs than expected when compared to the national benchmark. It is important to note that when dealing with samples, sometimes apparent differences can be due to chance. To help account for this, statistical testing is used to determine if the difference between the observed number of infections and predicted number of infections has meaning or is due to chance. If chance is ruled out, the difference is termed as being "statistically significant". One measure of statistical significance is the 95% confidence interval. The confidence interval is built around the sample SIR and the assumption is that the true SIR value lies in this range of values. For the SIR statistic, any confidence interval that does not contain 1 is considered statistically significant (either higher or lower than the benchmark). This is represented graphically below in Figure 1.

Statewide Aggregate Data: Central Line Associated Blood Stream Infections (CLABSI)

Figure 1: Combined CLABSI SIRs from all reporting Connecticut acute care hospital ICUs from January 1, 2009 through December 31, 2011 compared to the 2006-2008 national reference group
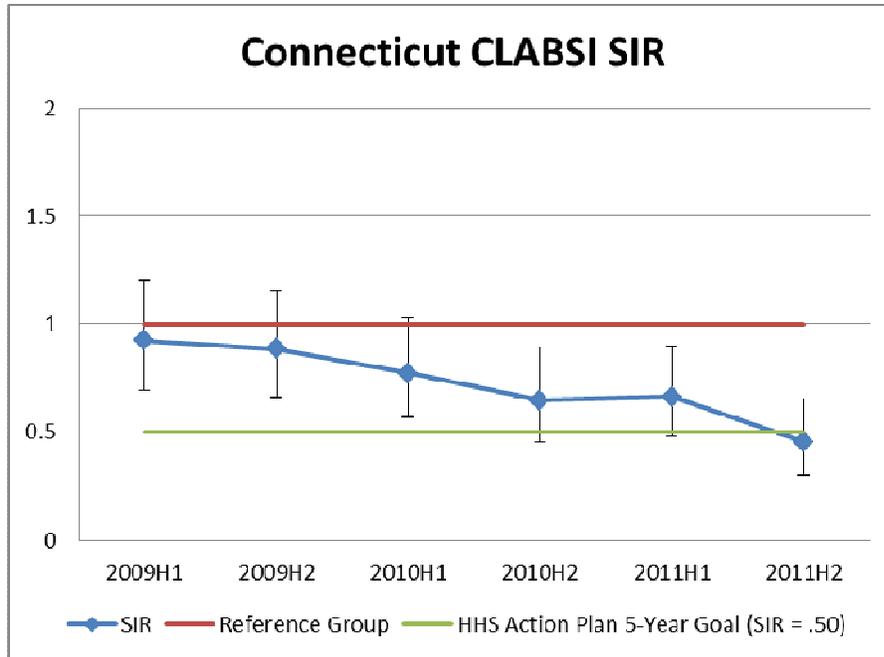
The graph above shows the statewide CLABSI SIR, combining all hosptials that are reporting CLABSIs to DPH from all the types of reporting ICUs (medical, medical-surgical, and pediatric). The graph covers the period January 1, 2009 through December 31, 2011. "H1" means "the first half of the calendar year" and H2 means "the second half of the calendar year." The red line is the benchmark value = 1, and a statewide SIR less than 1 means that Connecticut has made progress since 2006-2008 in preventing CLABSIs from the reporting hospitals and ICUs. The vertical grey bars (so-called "whiskers") surrounding each blue data point on the blue SIR line are the 95% confidence intervals, which indicate the range of SIRs that could be the true SIR, taking chance into account. The graph shows that, even taking chance into account, Connecticut has maintained a statewide SIR below 1 for 18 months. The green line represents the Department of Health and Human Services (DHHS) Action Plan 5 year goal. The graph shows the national target for CLABSI prevention. Not only have we made progress in preventing CLABSIs, in the second half of 2011 Connecticut reduced reported CLABSIs to the national target for CLABSI prevention: an SIR of 0.5. This represents a 50% reduction in CLABSIs from the 2006-2008 baseline period.

Figure 2 : Combined CLABSI SIRs from pediatric ICUs in Connecticut acute care hospitals from January 1, 2009 through December 31, 2011 compared to the 2006-2008 national reference group (PICUs = 3)
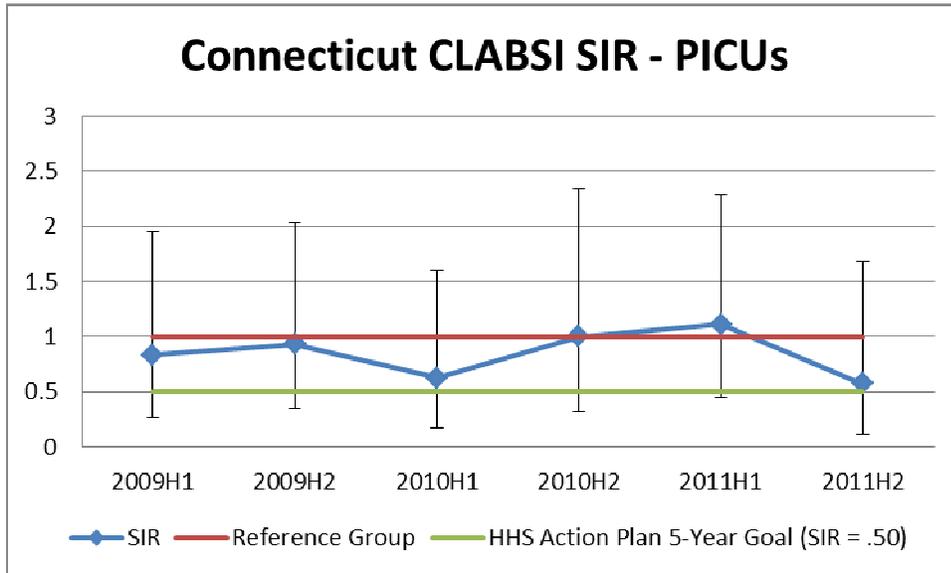
Though the combined SIR of all 32 intensive care units from the 30 reporting acute care hospitals in Connecticut has been decreasing since 2009, the combined SIRs of the three pediatric ICUs (PICUs) in Connecticut have not, nor have they increased. This trend is also true nationwide, and experts are considering how CLABSI prevention guidelines will need to be modified to lower CLABSIs in PICUs.

The CDC recently released an update of national HAI reports to NHSN, comparing HAI reports between states. The following data are for CLABSIs from intensive care locations (adult and pediatric ICUs). Table 1 displays the CLABSI SIR in Connecticut compared to the nation as a whole.

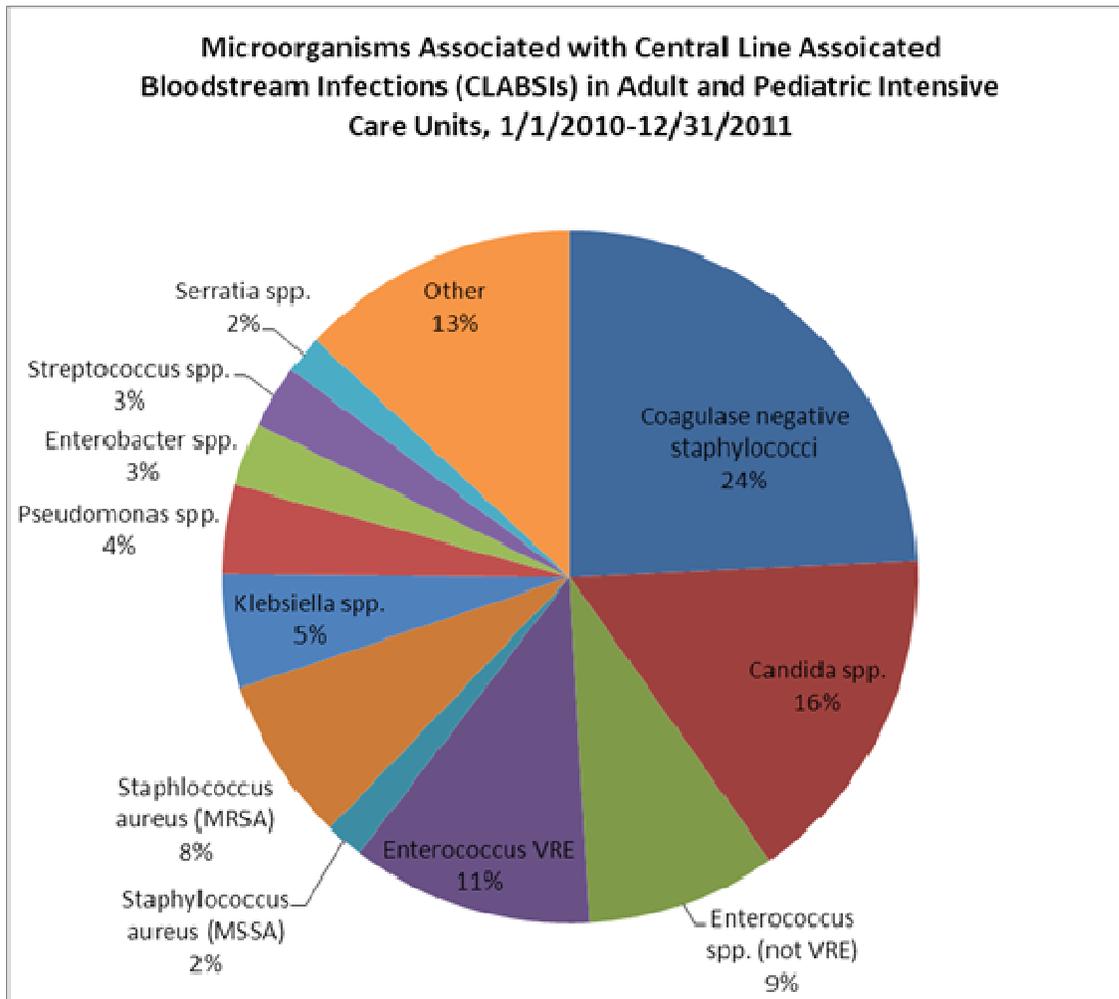**TABLE 1: Connecticut and national CLABSI SIR in ICUs January 1 - December 31, 2010**

	# Facilities	OBS	EXP	SIR	95% CI Low	95% CI High
Connecticut	30	99	131.28	0.754	0.613	0.918
US	2,140	7,206	11,021.00	0.654	0.639	0.669

OBS = observed EXP = expected CI = confidence interval

These data comparing the number of CLABSIs in reporting intensive care units to what would be expected based on national baseline data from 2006-2008 show that Connecticut has reduced the number of CLABSIs significantly: more than could be expected by chance alone. This is evident because the higher boundary of the 95% confidence interval (CI) is less than 1.0. The SIR of 0.754 indicates overall statewide reduction is 24.6% for 2010 compared to the reference period.

Public health and health providers track the types of microorganisms causing the CLABSIs to identify any factors, such as the proportion of antibiotic-resistant organisms, which might be helpful in determining how to target treatments, or diagnostic or prevention activities.

Figure 5: CLABSI Pathogens: Connecticut

Microorganisms Associated with Central Line Associated Bloodstream Infections (CLABSIs) in Adult and Pediatric Intensive Care Units, 1/1/2010-12/31/2011

*VRE is Enterococcus that is resistant to the commonly used antibiotic Vancomycin. 11% of the pathogens causing reported CLABSIs were Vancomycin-resistant enterococci.
**MRSA is *Staphylococcus aureus* that is resistant to methicillin and similar antibiotics. 8% of the pathogens causing reported CLABSIs were MRSA.

HAI ACTIVITIES IN THE STATE

Support for Hospitals

Connecticut DPH staff provides technical support for hospitals. Before statewide NHSN reporting began, hospitals completed CDC training on how to use NHSN. DPH continues that training with annual

updates and individual mentoring, including technical assistance and training on NHSN enrollment procedures, standard definitions, NHSN data entry, and data analysis. Working in partnership with the Connecticut Hospital Association (CHA) and Qualidigm, the DPH collaborates with hospitals to facilitate sharing local and national best practices, tools and resources, implementation strategies, and leadership support. The DPH has either hosted or participated in a number of seminars on infection prevention and approaches for promoting quality improvement. All hospitals participated in one or more of these trainings. Programs were also developed to ensure senior hospital leadership involvement in this initiative including the CHA CUSP: Stop BSI initiative and the Qualidigm Leadership Academy series. The DPH Commissioner has been regularly communicating with hospital Chief Executive Officers through circular letters and memos about HAI reporting initiatives. In November 2011, with American Recovery and Reinvestment Act (ARRA) funds from the federal government, the DPH hosted a free full-week Association for Professionals in Infection Control and Epidemiology, Inc. (APIC) introductory training for 85 persons entering the profession of infection control and prevention. This training gives participants an excellent grounding in HAI surveillance and prevention methods and builds Connecticut's capacity to track and prevent HAIs. Intermediate-level training for more experienced infection prevention staff is being held in May 2012.

Hospital and other healthcare facility efforts to prevent HAIs

HAI surveillance is only one of the steps that healthcare facilities and DPH are taking to improve patient safety. Other components include participating in collaboratives with other facilities to determine best practices, or implementing initiatives to improve hand hygiene, disinfection procedures for medical equipment, and other preventive measures.

All hospitals licensed by the DPH have a hospital-wide program for the prevention, control, and investigation of infectious diseases. Nurses, physicians, medical technologists, and other professionals who have acquired special training in infection control or epidemiology manage these programs. Through their infection prevention and control programs, hospitals strive to improve the care and safety of patients by following the recommendations and standards of agencies such as the DPH and the CDC.

The efforts of these infection prevention and control programs have resulted in the development of several national HAI prevention programs that offer participants opportunities for shared learning, support, and tools to help eliminate HAI. The best known of these is the Comprehensive Unit-based Safety Program (CUSP) developed by staff of the Johns Hopkins Center for Patient Safety under the leadership of Dr. Peter Pronovost (a Connecticut native). This uses carefully crafted quality improvement and workplace culture change methods to achieve the goal of consistently and sustainably incorporating proven best practices to prevent CLABSIs (including the famous "checklist"). CUSP has been used to reduce CLABSIs at Hopkins and in a consortium of most of the hospitals in the state of Michigan. The Michigan "Keystone Center" project has sustained a 70 percent reduction in CLABSI over several years in a wide variety of hospitals.

Successful implementation of these models is dependent upon executive leadership guiding overall institutional commitment to foster, promote, and support collaborative goals of improvement. Hospitals have also implemented facility-driven prevention activities to eliminate HAI based on needs identified within their facilities, frequently focusing in hand hygiene.

FUTURE STEPS: expansion of HAI reporting in Connecticut

The federal government and the states are engaged in a coordinated effort to implement the Department of Health and Human Services *National Action Plan to Prevent Healthcare-Associated Infections.* This plan has specific and very ambitious goals for HAI reduction by the end of 2013 and is being updated to continue after that time. It will also expand beyond the acute care setting to the full range of healthcare settings. The current metrics that are being tracked by the federal government are for hospitals and are summarized in this table derived from the *Action Plan*:

Metric	Data	Target
Central line bloodstream infections	NHSN	↓ 50%
Adherence to central line insertion practices	NHSN	100%
Hospitalizations with *Clostridium difficile*	Admin	≥ ↓ 30%
Clostridium difficile infections	NHSN	≥ ↓ 30%
Catheter-associated urinary tract infections	NHSN	≥ ↓ 25%
MRSA incidence rate (healthcare-associated)	EIP	≥ ↓ 50%
MRSA bacteremia (healthcare facility-wide)	NHSN	≥ ↓ 25%
Surgical site infections	NHSN	≥ ↓ 25%
Surgical Care Improvement Program adherence	SCIP	≥ 95%

The CMS is aligning their payment incentive programs (e.g., Inpatient Prospective Payment System, Quality Improvement Program) to align with the overall federal metrics, as outlined in the following table prepared by the CDC Division of Healthcare Quality Promotion:

Healthcare Facility HAI Reporting to CMS via NHSN – Current and Proposed Requirements
DRAFT (11/23/2011)

HAI Event	Facility Type	Reporting Start Date
CLABSI	Acute Care Hospitals Adult, Pediatric, and Neonatal ICUs	January 2011
CAUTI	Acute Care Hospitals Adult and Pediatric ICUs	January 2012
SSI	Acute Care Hospitals Colon and abdominal hysterectomy	January 2012
I.V. antimicrobial start	Dialysis Facilities	January 2012
Positive blood culture	Dialysis Facilities	January 2012
Signs of vascular access infection	Dialysis Facilities	January 2012
CLABSI	Long Term Care Hospitals *	October 2012
CAUTI	Long Term Care Hospitals *	October 2012
CAUTI	Inpatient Rehabilitation Facilities	October 2012
MRSA Bacteremia LabID Event	Acute Care Hospitals	January 2013
C. difficile LabID Event	Acute Care Hospitals	January 2013
HCW Influenza Vaccination	Acute Care Hospitals	January 2013
HCW Influenza Vaccination	ASCs	October 2014
SSI (future proposal)	Outpatient Surgery/ASCs	TBD
* Long Term Care Hospitals are called Long Term Acute Care Hospitals in NHSN		

In the fall of 2011, the HAI Advisory Committee recommended an expansion in the HAI surveillance measures that should be publicly reported in Connecticut to follow the CMS pay for reporting (Inpatient Prospective Payment System-IPPS) expectations. As a part of their recommendation, the Committee advised the DPH to continue to use the CDC NHSN for these additional measures; to train persons from healthcare facilities who are collecting, recording, and reporting the additional data; and to validate the accuracy of the data before it is publicly posted. The DPH accepted this recommendation and presented it to the Committee on Reportable Conditions, which concurred. The HAI Advisory Committee also recommended that the DPH send hospital Chief Executive Officers a letter informing them of these initiatives. The Department concurred with this recommendation, and followed it, to assure that hospital CEOs were aware of the link that has been established between the CMS reporting programs and the additional HAIs that are to be publicly reported in Connecticut.

Therefore, beginning January 1, 2012, the types of reportable HAIs in Connecticut expanded dramatically from CLABSIs in one adult and any pediatric ICU in each of the 30 acute care hospitals to CLABSIs from all ICUs in acute care hospitals (increasing the number of reporting adult or pediatric ICUs from 32 to 47). In addition, CLABSIs from the 11 Newborn Intensive Care Units Level II/III or III in the state were made reportable for a total of 58 reporting locations. Another type of device-associated HAI was added: Catheter Associated Urinary Tract Infections (CAUTI) in all ICUs in Connecticut, which are reported from all adult or pediatric ICUs. Moreover, procedure-associated HAIs, Surgical Site Infections associated with colon surgery or abdominal hysterectomies, were added. All of these are being tracked using the NHSN surveillance software and protocols. Dialysis facility enrollment is starting incrementally in accordance with CMS requirements. Therefore, it has been deferred for state reporting and will be considered for 2013.

Additional measures and facility types will be added in future years, following the plan summarized in the above table, to ensure that Connecticut mirrors the future expansion in CMS reporting.   Each fall the measures that CMS will require will be presented to the Reportable Conditions Committee for review, and inclusion in the list promulgated each January. CMS metrics with October start dates will generally be deferred three months to start state reporting in January.