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Connecticut Public Act 06-142:
"An Act Concerning Hospital Acquired Infections"

In 2006, the Connecticut General Assembly passed Public Act 06-142, "An Act Concerning Hospital Acquired Infections" (Appendix A). The act created an 11-member "Committee on Healthcare Associated Infections," responsible for developing, operating, and monitoring a mandatory reporting system for healthcare associated infections ("HAI"). The act defines an HAI as any localized or systemic conditions resulting from an adverse reaction to the presence of an infectious agent or its toxin that (1) occurs in a patient in a healthcare setting; (2) was not found present or incubating at the time of admission unless the infection was related to a previous admission to the same setting; and (3) if the setting is a hospital, meets the criteria for a specific infection site, as defined by the national Centers for Disease Control and Prevention (CDC).

The act required the Department of Public Health (DPH) to implement the committee's recommendations concerning a mandatory reporting system for infections and standardized data reporting measures. It required the committee, by April 1, 2007, to (1) advise DPH on the development, implementation, operation, and monitoring of a mandatory system for reporting HAIs; (2) identify, evaluate, and recommend to DPH appropriate standardized measures; and (3) identify, evaluate, and recommend to DPH appropriate ways of increasing public awareness about effective measures to reduce the spread of infections. The Committee on Healthcare Associated Infections issued a report on April 1, 2007 with eight recommendations: http://www.ct.gov/dph/lib/dph/hisr/hcqsar/healthcare/pdf/healthcare_acquired_infections2007.pdf .

The act requires DPH, by October 1, 2007 and within available appropriations, to implement the committee's recommendations. It also required DPH, by October 1, 2007 to submit a report to the General Assembly regarding the plan to implement the mandatory reporting system for healthcare associated infections recommended by the Committee on Healthcare Associated Infections and the status of such implementation. The report was submitted and is available at: http://www.ct.gov/dph

The act also requires DPH, by October 1, 2008 and annually thereafter, to submit a report to the General Assembly on the information collected relating to the mandatory reporting system for healthcare associated infections. The act requires the report to be posted on the DPH website and made available to the public.

Connecticut Healthcare Associated Infections
Advisory Committee Members
CGS Sec. 19a-490n (b)

There is established a Committee on Healthcare Associated Infections, which shall consist of the commissioner or the commissioner's designee, and the following members appointed by the commissioner:

- Two members representing the Connecticut Hospital Association;
- Two members from organizations representing health care consumers;
- Two members who are either hospital-based infectious disease specialists or epidemiologists with demonstrated knowledge and competence in infectious disease related issues;
- One representative of the Connecticut State Medical Society;
- One representative of a labor organization representing hospital based nurses; and
- Two public members.

Healthcare Associated Infections Advisory Committee

Commissioner or Commissioner's designee:

1. Karen Buckley-Bates, Director of Government Relations, CT DPH, Hartford, CT

Two Representatives from the Connecticut Hospital Association

1. Alison Hong, MD, Interim VP, Quality and Patient Safety, CT Hospital Association (CHA), Wallingford, CT
2. Jim Iacobellis, VP Government Relations, CHA, Wallingford, CT

Two Representatives from Organizations Representing Health Care Consumers

1. Vicki Veltri, Office of Healthcare Advocate, State of CT, Hartford, CT
2. Jean Rexford, Exec. Dir., CT 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 Connecticut State Medical Society

1. Douglas Waite, MD, VP for Medial Affairs/CMO, Director of ID, Day Kimball Hospital, Putnam, CT

One Representative from Labor organization Representing Hospital-based Nurses

1. Dale Cunningham, CT 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 S. Andrews, Trustee, The Donaghue Medical Research Foundation, West Hartford, CT

Total Membership: 11 members

Rev. 04/11

Connecticut Healthcare Associated Infections (HAIs)
Advisory Committee Background Brief

Started: May 2006
Meeting schedule: Meets quarterly, conference calls as needed (3-4 per year)
Authorization: Public Act 06-142
Members: Representation specified in law, others can be "participants"
Facilitator: Richard Melchreit, MD, Coordinator, DPH HAI Program
Chairs: None
Subcommittees: Strategic planning, Education (Education Subcommittee has a chair)
Reportable events: CLABSIs, one ICU in each acute care hospital since January 2008
Significant initiatives: Data validation, member of Emerging Infections Program HAI Steering Committee

Status Brief

Connecticut does not now have a comprehensive state healthcare associated infection surveillance and prevention plan. In a provision of the federal Omnibus Act of 2009, each state had to submit a plan by January 1, 2010 or have Public Health and Health Services (PHHS) Block Grant funding withheld. For the plan The Connecticut plan used the template developed and distributed by CDC.

October 1, 2009, the legislature and the public received the second annual report (the latter via posting on the DPH website) that updated the CLABSI data and summarized the validation study.

HAI wrote the health plan in December 2009. The federal government awarded Connecticut $1.2 million out of the $40 million for a two-year period in response to DPH's request for ARRA funding for HAI surveillance and prevention.

EIP- Prevalence Study: Connecticut established an Emerging Infections Program (EIP) project for special and enhanced surveillance to improve our tracking of HAIs. In response to applications for federal stimulus (American Recovery and Reinvestment Act) funding, Emerging Infections Program (EIP) supplemental application for enhanced surveillance of HAIs received $338,531 for a 28 month period to partially support the hiring of an Epidemiologist 2 for Connecticut HAI EIP enhanced surveillance projects. The Epidemiologist also engages in H1N1 vaccine and Guillain Barre Syndrome surveillance with additional EIP funding support.

ELC- Epidemiology and Laboratory Capacity (ELC) Project: The ARRA-funded ELC Project builds our capacity to engage in a full 12 to 18 month-long strategic planning process, involving all stakeholders to expand the state's HAI program in terms of HAIs tracked, healthcare facility types added, and data validated. In addition, strong partnerships are developing between data tracking and prevention collaboratives. The Epidemiology and Laboratory Capacity (ELC) supplemental application received

$878,049. We also received funding for two planner/prevention consortia staff and one surveillance data validator for the CLABSI- Study.

CLABSI- Study- CT Central line Associated Bloodstream Infections (CLABSIs) Data Validation Project: A state nurse epidemiologist performed blinded retrospective medical chart reviews of ICU patients with NHSN-reported CLABSIs during the study period between October to December of 2008. The study analyzed the collection of patient-days, central –line days (denominator data), and central line practices.

The CT HAI Program found 48 of the 476 septic events met the NHSN CLABSIs definition for an infection rate of 3.58 per 1000 CL days. The hospitals reported 48% (23) of total CLABSIs to NHSN. The underreporting of CLABSIs exceeded 50% was the result of misinterpreting the NHSN definitions and CLABSI terms.

Recommendations support continued training and validation to ensure accurate and valid healthcare associated infections (HAI) data reporting. The data validation project is being repeated for the fourth quarter of 2009 and an ongoing validation component has been instituted as part of the CT DPH HAI program. Fourth quarter 2009 data results will be presented in 2011. (*Am J Infect Control* 2010; 38:832-8.)

During 2010, a strategic planning process followed to develop a comprehensive plan for an expanded HAI program. In November 2010, the Connecticut Department of Public Health hosted a statewide HAI Stakeholder Engagement Conference, supported with ARRA funding. The conference convened stakeholders to address reducing HAIs within the state, and to discuss developing a Health Improvement Plan (HIP) focused on HAIs through wide-range sectors of Connecticut's healthcare system. The proceedings of the conference are being used to write the background section of the new state HAI Health Improvement Plan. At an upcoming "priority-setting" conference, DPH will work toward development of sector-specific goals and objectives. This conference will be held June 14, 2011 at Wesleyan University in Middletown, CT.

Websites

1. **DPH Healthcare Associated Infections Program**: **(www.ct.gov/dph/hai).**

Connecticut Healthcare Associated Infections (HAIs) Advisory Committee

This website links to the following information:

- **Laws and Regulations**
  - Connecticut Public Act 06-142
- **CT HAIs Advisory Committee Members**
- **CT HAIs Advisory Committee Meeting Schedule, Agenda and Minutes (Sample)**
- **Publications and Reports**
  - CT HAIs Hospital-specific Report
  - CT HAIs Interim State Plan (2010)

- CT HAIs Program Conferences
- CT Central line Associated Bloodstream Infection (CLABSI) Data Validation Project (*Am J Infect Control* 2010;38:832-8) (**www.ajicjournal.org**)

2. **Department of Health and Human Services: (http://www.hhs.gov/ash/initiatives/hai/index.html).** Select "Initiatives" to access Healthcare Associated Infections. This website access:
   - **HHS Action Plan to Prevent HAIs (http://www.hhs.gov/ophs/initiatives/hai)**
     - **Phase 1: Acute-Care Hospitals-** Phase 1 of the Action Plan addressed the most common infections within acute care inpatient settings and outlined specific recommendations of HAIs prevention strategies.
     - **Phase 2: Ambulatory Surgical Centers, End-Stage Renal Disease Facilities, and Increasing Influenza Vaccination Among Healthcare Personnel-** Phase 2 of the Action Plan expands the scope to the non-acute care settings and addresses the health and safety of healthcare workers, as well as the risks of influenza transmission.

3. **CDC Division of Healthcare Quality Promotion (DHQP): (http://www.cdc.gov/nhsn/index.html).** The website provides recent data and calls to action for important public health issues. Additional HAIs links:
   - **CDC Vital Signs (http://www.cdc.gov/VitalSigns/pdf/2011-03-vitalsigns.pdf)**
   - **CDC National Standardized Infection Ratio (SIR) Report:** This report included national data of central line-associated bloodstream infection (CLABSI) for states mandated by state law to report HAIs. **(http://www.cdc.gov/HAI/pdfs/stateplans/SIR-2010_JunDec2009.pdf)**

4. **CDC National Healthcare Safety Network (NHSN):** The National Healthcare Safety Network (NHSN) is a voluntary, internet-based surveillance system managed by the Division of Healthcare Quality Promotion (DHQP) at CDC**. (http://www.cdc.gov/nhsn/about.html)**

5. **The Society for Healthcare Epidemiologists of America (SHEA)/ Infectious Diseases Society of America (IDSA) *Compendium of Strategies to Prevent Healthcare Associated Infections in Acute Care Hospitals*:** SHEA and the IDSA jointly published these science-based recommendations for acute care hospitals for HAIs prevention from such leading agencies as Association for Professionals in Infection Control Epidemiology (APIC) and The Joint Commission. **(http://www.shea-online.org/about/Compendium.cfm)**

Notice of Quarterly Meetings 2011
Committee on Healthcare Associated Infections
Department of Public Health

Location: Connecticut Hospital Association, 110 Barnes Road, Wallingford, Connecticut

Dates: February 2, May 4, August 3, and November 2 (first Wednesdays).

Time: All meetings will be held 9:00 a.m. to 11:00 a.m.

Purpose of the Meetings: These are regularly scheduled quarterly meetings of the state Healthcare Associated Infections (HAI) Advisory Committee. The agenda for each meeting will include updates on federal stimulus funding and state and federal legislative initiatives. An update on public HAI reporting, state HAI planning, HAI prevention initiatives, and state-federal HAI epidemiology and prevention initiative best practices are discussed.

For information contact: DPH Healthcare Associated Infections Program (860) 509-7995. Current and past agendas, and past committee minutes are on the DPH website at http://www.ct.gov/dph/cwp/view.asp?a=3136&q=421058

Connecticut Healthcare Associated Infections
Advisory Committee Meeting
Connecticut Hospital Association
Wednesday, May 4, 2011
9:00 AM – 11:00 AM

DRAFT AGENDA

1.	Review and approval of prior Advisory Committee meeting minutes (Feb 26, 2011)	
2.	CLABSI data validation	15 minutes
3.	Education initiatives	10 minutes
4.	Infection Control Program infrastructure: assessment, advocacy	20 minutes
5.	Next steps in public HAI reporting in Connecticut	25 minutes
6.	Hospital-specific CLABSI reporting online update	5 minutes
7.	HAI Program, stimulus update & new application (EIP, ELC)	5 minutes
8.	EIP Studies Status report	5 minutes
9.	Prevention Collaboratives Update (CUSP: Stop BSI/CAUTI, MDRO)	10 minutes
10.	New Advisory Committee Member packets	5 minutes
11.	Legislative/Government Relations	5 minutes
12.	Status report on the Interim State HAI Plan & Planning Process	10 minutes
13.	Next steps for the Committee, future meetings	5 minutes

There will be a speakerphone. To call in: toll-free number: 866-796-0396 Participant Passcode: 3391497

FILE: hai agenda 2_2_11.doc

Connecticut Healthcare Associated Infections Advisory Committee Minutes
February 23, 2011
DRAFT

Attendees:
Ray Andrews, Lauren Backman, Laurie Brentlinger, Dale Cunningham, Louise Dembry, Carol Dietz, Diane Dunnigan, Nancy Dupont, Wendy Furniss, Brenda Grant, Robin Heard, Diana Kelly, Cathy Ligi, Alessandra Litro, Robert Magnoli, Meghan Maloney, Harry Mazadoorian, Richard Melchreit, David Neville, Mary Palulski, Lynn Pepin, Julie Petrellis, Jean Rexford, Richard Rodriguez, Jack Ross, Joanne Smarden, Ethel Smith, Lisa Winkler

Call to order: Richard Melchreit called the meeting to order at 9:03 a.m.

Review and approval of prior Advisory Committee meeting minutes (11/4/10): The draft minutes were reviewed and approved.

EIP Projects:
Richard Melchreit gave an update on the spending activities for the EIP grant. Only $3000 has been spent to date and there was a conference call with CDC and they support the DPH spending. DPH assured CDC that the money will be spent by 12/31/11. We now have an Epidemiologist 2, Meghan Maloney that started 1/28/11 and the Dialysis contract is being signed by the Network of New England. The DPH will be hiring temporary nurse chart reviewers to work on the prevalence survey.

DPH recently sent out a survey via survey monkey to determine what types of trainings are needed for infection control staff. DPH will use the money from the ELC grant to put on APIC trainings for staff in CT. Discussion was had amongst the group about what types of hospital personnel need to be trained and what types of trainings will be appropriate.

Prevention Collaboratives update (CUSP: Stop BSI/CAUTI, MDRO):
***CUSP: Stop BSI* – CUSP:** Stop BSI has been operating for 18months and is beginning to wind down as new CUSP initiatives begin. HRET will be releasing project data that is said to be statistically significant and once CHA receives the data, it will be shared. CHA will be beginning the CUSP: CAUTI project, and is still enrolling participants. They hope to reduce the CAUTI rate by 25%.

MDRO Collaborative – The workshop on C.Difficile prevention, environmental cleaning, and culture change/addressing resistance was a success. They are waiting for CMS to give new directions for future initiatives.

Dialysis:
A contract with the Network of New England is in the process of being signed by Jenny Kitsen. The contract is for a planned surveillance project of outpatient hemodialysis patients. The specific goal of this project to identify evidence-based "Core Interventions" that will decrease blood stream infections in at least 35 outpatient dialysis centers located in the States of Connecticut and Massachusetts. The contract will begin March 1, 2011.

Legislative/Government Relations:
Thus far it has been a quiet session. It was suggested that we may need to remind our legislators that this committee exists and to put issues in the hot seat.

CLABSI data validation:
The second cycle of validation (covering data from the last quarter of 2009) continues. Lauren will present the data at the next committee meeting in May.

Hospital-specific CLABSI reporting: rollout plan:
The hospital specific posting of the facility specific data will be on the website within the next few weeks. The new DPH Commissioner has sent a letter to each hospital's CEO (with a cc to key staff: Infection Preventionists and hospital epidemiologists) about the data. Each hospital was given a week or two to review and make comment on the data and webpage. We are still collecting letters from hospitals at this time. When the webpage is ready for posting, DPH will announce it through a press release. The committee suggested a press conference or press release be issued by DPH and the Governor's Office to announce this information to the public. A press release from the Governor's Office will have more of an impact on the public.

Education Initiative:
The Education Subcommittee is working on standard presentations about HAIs that can be given at schools, nursing homes, senior centers etc. Different members of the committee will be able to give the presentation to any audience. The DPH will be examining possible revisions to the DPH HAI webpage. The handwashing education campaign will be looked over for 2012. The DPH HAI Program will look to collaborate with nursing programs to educate the new workforce. Different advertising methods were discussed to educate about HAI's.

State HAI planning process, timeline:
The planning conference has been moved to June 2011. We will be having a call with the HIP Steering Committee to inform them of the upcoming conference. Upcoming brainstorming sessions will be scheduled for the sectors to come up with goals & objectives. DPH will send out an email to everyone with the date change of the planning conference. DPH will send out the notes from the breakout sessions for the November conference to all speakers and facilitators.

Connecticut Healthcare Associated Infections

INTERIM STATE PLAN 2010

CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
Public Health Initiatives Branch
Infectious Diseases Section

December 29, 2009

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

J. Robert Galvin, M.D., M.P.H.
Commissioner

M. Jodi Rell
Governor

December 29, 2009

Howard K. Koh, M.D., M.P.H.
Assistant Secretary for Health
Office of Public Health and Science
Washington, D.C. 20201

Dear Dr. Koh:

The attached document is the State of Connecticut Healthcare Associated Infections Plan that you requested in your letter of December 7th, and anticipated receiving by January 1, 2010. It is the plan that I certified would be completed and submitted to the Department of Health and Human Services pursuant to requirements of the Omnibus Act of 2009.

Connecticut appreciates your efforts in the preparation of the template that has been used to develop and organize this plan, and to ensure that it is consistent with the *2009 HHS Action Plan to Prevent Healthcare-Associated Infections*.

Our plan is the product on an active partnership between the Department of Public Health and our state Healthcare Associated Infections Advisory Committee. The Committee voted to recommend I submit it to you, and I concur with that recommendation.

We look forward eagerly to your review of our plan, and to your advice on ways to improve it and build on our progress in Healthcare Associated Infections surveillance and prevention.

Sincerely,

J. Robert Galvin, MD, MPH, MBA
Commissioner

PHONE: (860) 509-7101 FAX: (860) 509-7111
410 CAPITOL AVENUE - MS#13COM, P.O. BOX 340308, HARTFORD, CONNECTICUT 06134-0308

Connecticut Healthcare Associated Infections Interim State Plan – 2010

Introduction

Healthcare Associated Infections (HAI) are infections that occur during, or as a consequence of, the provision of healthcare. HAIs are a significant medical and public health problem in Connecticut, and across the nation. Not only do HAIs put the patient at risk, but they also increase the days of hospitalization required for patients and add considerable healthcare costs. In hospitals alone, healthcare associated infections affect an estimated 1.7 million Americans, including 500,000 intensive care unit (ICU) patients, resulting in an estimated 99,000 deaths and $4.5 billion to $5.7 billion in annual health care costs.[1, 2] A survey based on the data from 20% of U.S. hospitals revealed that patients who acquire an infection as a result of medical care in hospitals spend an average of almost ten additional days in the hospital and incur over $38,000 in added health care costs[3].

In 2006, the Connecticut General Assembly passed Public Act 06-142, *An Act Concerning Hospital Acquired Infections,* now codified in state statue as CGS 19a 490 n-o. It created an 11-member Committee on Healthcare Associated Infections to advise the Department of Public Health (DPH) on the development, operation, and monitoring of a mandatory Healthcare Associated Infections (HAI) reporting system. The Committee includes representation from consumers, the public, hospital prevention practitioners and infectious disease physicians, the Connecticut State Medical Society (CSMS), the Connecticut Hospital Association (CHA), and the Department of Public Health (DPH). Committee meetings are open to the public and the participation of others is encouraged to ensure that a wide array of expertise participates and a variety of viewpoints is considered. In 2007 the Committee made its initial recommendations which launched the program in Connecticut:

- Use the CDC's National Healthcare Safety Network (NHSN) reporting system.
- Begin in a clearly defined manner and expand incrementally to ensure accurate data; start with one NHSN Patient Safety Module and implement additional modules once hospitals are able to conduct surveillance and report in a standardized manner. The first module should be Central Line Associated Blood Stream Infections (CLABSIs) in Intensive Care Unit (ICU) patients.
- Use the data to implement evidence-based prevention methods.
- Deliver HAI-related education, because it is critical element of the HAI reporting system.

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[1] Klevens RM, Edwards JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Health Reports* 2007 March-Apr; 122(2): 160-6.,2.

[2] McKibben L, Horan TC, Tokars JI, et al.; Guidance on public reporting of healthcare-associated infections: recommendations of the Healthcare Infection Control Practices Advisory Committee. *Infect Control Hosp Epidemiol* 2005; 26: 580-7.

[3] Weinstein RA. Nosocomial infection update. *Emerging Infectious Disease* 1998; 4: 416-4203.

- Make a state funding commitment - hire DPH staff for the initiative and provide funding to Connecticut hospitals to report on and reduce HAIs.

Following the recommendations of the Committee, DPH required hospitals to begin submitting data January 1, 2008, using the NHSN reporting system, on patients in one medical or medical/surgical ICU. Hospital infection prevention personnel were trained on methods and protocols for reporting and collecting HAI surveillance data. Since then, all 30 acute care hospitals in the state have been reporting CLABSIs each month.

The state law requires DPH to submit an annual report to the legislature and to make the report available to the public, and post it on the DPH website, which also includes additional information on HAIs for the public, health providers, and policy makers.

National HAI Prevention Plan

In response to the increasing concerns nationally about the public health impact of healthcare-associated infections (HAIs), the US Department of Health and Human Services (DHHS) has developed an *Action Plan to Prevent Healthcare-Associated Infections* (HHS Action Plan). The HHS Action Plan includes recommendations for surveillance, research, communication and metrics for measuring progress towards national goals. Three overarching priorities have been identified:

- Progress towards 5-year national prevention targets (e.g., 50-70% reduction in bloodstream infections);
- Improve use and quality of the metrics and supporting systems needed to assess progress towards meeting the targets; and
- Prioritization and broad implementation of current evidence-based prevention recommendations.

In a concurrent development, the 2009 federal Omnibus (funding) bill requires states receiving Preventive Health and Health Services (PHHS) Block Grant funds to certify that they will submit a plan to reduce HAIs to the Secretary of Health and Human Services not later than January 1, 2010. In order to assist states in responding within the short timeline required by that language and to facilitate coordination with national HAI prevention efforts, the Centers for Disease Control and Prevention (CDC) drafted a template to assist state planning efforts in the prevention of HAIs. The template provides choices for developing or enhancing state HAI prevention activities in the four areas identified below. States can choose to target different levels of HAI prevention efforts indicated by checking appropriate boxes. (Level I indicates basic elements to begin HAI prevention efforts, Level II for intermediate and Level III more mature efforts). While these levels will generally be addressed in order (Level I before Level 2 and Level 2 before Level 3), this order is not strict, and the higher-level activities might be undertaken before lower-level activities are completed, if justified. Current activities are those in which the state is presently engaged and includes activities that are scheduled to begin using currently available

resources. Planned activities represent future directions the state would like to move in to meet currently unmet needs, contingent on available resources and competing priorities. A section for additional activities is included to accommodate plans beyond the principal categories.

This template will help to ensure progress towards national prevention targets as described in the HHS Action Plan, and the implementation of priority prevention recommendations, while allowing flexibility to tailor the plan to each state's specific needs. The template is being used by many states to develop a well-structured state plan that is consistent with the federal plan. The template has several advantages. One is that it permits ready comparison with the federal plan and other states, which will foster consistency across states (while permitting reasonable variation to ensure the plans are individual state circumstances), which will make interstate comparisons easier. Another is that it ensures that each state is considering and potentially incorporating a range of issues and initiatives into the state plans that might otherwise be overlooked. Finally, it creates a well-organized plan structure that will permit tracking the evolution of the plan over time.

Initial emphasis for HAI prevention may focus on acute care, inpatient settings, yet the need for prevention activities for outpatient settings is recognized. State health departments are increasingly challenged by the needs to identify, respond to, and prevent HAI across the continuum of settings where healthcare is currently delivered. The public health model's population based perspective places health departments in a unique and important role in this area, particularly given shifts in healthcare delivery from acute care settings to ambulatory and long term care settings. In the non-hospital setting, infection control and oversight have been lacking and outbreaks –which can have a wide-ranging and substantial impact on affected communities-, are increasingly reported. At the same time, trends toward mandatory reporting of HAIs from hospitals reflect increased demand for accountability from the public.

Framework and Funding for Prevention of HAIs

CDC's framework for the prevention of HAIs, as reflected in the template used for this interim state plan, builds on a coordinated effort of federal, state and partner organizations. The framework is based on a collaborative public health approach that includes surveillance, outbreak response, research, training and education, and systematic implementation of prevention practices. Recent legislation in support of HAI prevention provides a unique opportunity to strengthen existing and expand state capacity for prevention efforts.

Support for HAI prevention has been enhanced through the American Recovery and Reinvestment Act (ARRA). Congress allocated $40 million through CDC to support state health department efforts to prevent HAIs by enhancing state capacity for HAI prevention, to leverage CDC's National Health Care Safety Network to assess progress and support the dissemination of HHS evidence-based practices within healthcare facilities, and to pursue state-based collaborative implementation strategies. In addition, the Center for

Medicaid and Medicare Services (CMS) will support expansion of State Survey Agency inspection capability of Ambulatory Surgery Centers nationwide through $10 million of ARRA funds. This template is intended to support the high level of reporting and accountability required of ARRA recipients. The federal government awarded Connecticut $1.2 million for a two-year period in response to DPH's request for ARRA funding for HAI surveillance and prevention. This will permit Connecticut to establish an Emerging Infections Program (EIP) project for special and enhanced surveillance to improve our tracking of HAIs and an ARRA-funded Epidemiology and Laboratory Capacity (ELC) project that will build our capacity to engage in a full 12 to 18 month-long strategic planning process, involving all stakeholders to expand the state's HAI program in terms of HAIs tracked, healthcare facility types added, and data validated. It will also develop strong partnerships between data tracking and prevention collaboratives, which will improve our understanding and targeting of successful prevention efforts to reduce HAIs in Connecticut. It will also serve as a training ground for new workers in infection control that will improve the state's capacity to fight HAIs in the future.

Template for developing HAI plan

This interim (calendar year 2010) Connecticut state HAI surveillance and prevention plan is based on a template that lists activities and target dates for implementation in the following areas:

1. Develop or Enhance HAI Program Infrastructure
2. Surveillance, Detection, Reporting, and Response
3. Prevention
4. Evaluation, Oversight and Communication

1. Develop or Enhance HAI program infrastructure

Successful HAI prevention requires close integration and collaboration with state and local infection prevention activities and systems. Consistency and compatibility of HAI data collected across facilities will allow for greater success in reaching state and national goals.

Table 1: State infrastructure planning for HAI surveillance, prevention and control.

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	☒	☐	1. Establish a statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council i. Collaborate with local and regional partners (e.g., state hospital associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians and networks of acute care hospitals and long term care facilities (LTCFs))	Completed 2006
	☒	☒	ii. Identify specific HAI prevention targets consistent with HHS priorities	Initial target completed November 2007; additional target added December 2009; planning regarding remaining targets will be reviewed during strategic planning through December 2011

[1] Level 1: basic elements; Level 2: intermediate elements; Level 3: more mature efforts

[2,3] NB: Both "items underway" and "items planned" will be checked if a given item is partially underway , but significant additional planning and activity development is planned. Neither box is checked if concrete planning has not yet been undertaken, or if the activity has not been addressed (see narrative for more details and to determine which of these two possibilities is the case).

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): Connecticut is one of several states that have passed laws mandating reporting of healthcare associated infections. The Connecticut law was passed in July 2006. It established an 11-member committee that decided on what to report (different from many states, the specific HAIs to be reported are not listed in the Connecticut law). Pursuant to the provisions of the law; DPH followed these recommendations within available appropriations. This is different than several other states, the others usually specify certain conditions or "events" such the facility type and type of HAI to be reported. 1.1 The 11 voting members of the committee include a representative of the Connecticut Hospital Association, the Connecticut State Medical Society (CSMS), a labor organization that represents hospital-based nurses, two public members, the state patient advocate, a hospital epidemiologist DPH (the Commissioner's representative is a member of the staff of the DPH Office of Government Relations), and two public members. Many non-voting "participants" also regularly attend and make major contributions to the discussion and work of the committee; these include several Infection Preventionists from hospitals (there is no APIC chapter in the state, but there is a New England region chapter), the chief of the at DPH Health Care Systems (survey) Branch, hospital epidemiologists, patient safety experts, and a representative of the dialysis community Discussion has begun and in future planning the current HAI committee will be addressing the issue of expanding the scope of the group to involve other types of healthcare facilities, such as dialysis centers and long term care facilities. The full range of healthcare providers and types of facilities will be identified and included in the state strategic planning process that will begin in January 2010, and will be included in any expansion of the membership of the HAI Committee that will occur as a result of the strategic planning process and plan. (A listing of the current membership is available on the DPH HAI program website). 1.2 The process of choosing the first measure to report was accomplished, plans for future expansions are noted below.	

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒	☐	2. Establish an HAI surveillance prevention and control program i. Designate a State HAI Prevention Coordinator	Completed February 2008
	☒	☐	ii. Develop dedicated, trained HAI staff with at least one FTE (or contracted equivalent) to oversee the four major HAI activity areas (Integration, Collaboration, and Capacity Building; Reporting, Detection, Response and Surveillance; Prevention; Evaluation, Oversight and Communication)	Completed April 2008
			Other activities or descriptions (not required): The DPH HAI Program Healthcare Associated Infections Program, Infectious Disease Section was established early in 2008 when three staff persons were hired. These positions were funded with state funding in an appropriation by the legislature that accompanied the reporting law. 2.1 Richard Melchreit, MD, Coordinator – focus on integration, collaboration, and capacity building (program planning, supervision, and HAI committee facilitation). 2.2 Lauren Backman, RN, MHS, Epidemiologist 3, (epidemiologist RN with infection prevention and hospital microbiology laboratory experience) – focus on Evaluation, Oversight and Communication (validation, training and technical assistance, writing); Richard Rodriguez, MPH, Epidemiologist 2 – focus on Reporting, Detection, Response and Surveillance (NHSN data management and analysis).	
			3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.	

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒	☒	i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, electronic (HL7) messaging of laboratory results to automate data entry from health facility IT systems into public health reporting databases)	*Methicillin-resistant Staphylococcus Aureus* (MRSA) testing began September 2008, HL7 messaging pending
			Other activities or descriptions (not required): DPH offers MRSA Pulsed-Field Gel Electrophoresis (PFGE) testing to hospitals and other healthcare providers to assist in characterization of outbreaks. PFGE is a laboratory test that can "genetically fingerprint" strains of MRSA. Such fingerprinting can assist in outbreak control by characterizing possible sources and chains of transmission. The DPH State Laboratory is building a new Information Technology (IT) system (the Laboratory Information Management System (LIMS)) that when interfacing with the pending DPH state electronic public health reporting system (the MAVEN system) will permit HL7 messaging of data already in healthcare-facility based IT system or direct entry of the data by facility and laboratory staff into MAVEN.	
Level II	☒	☒	4. Improve coordination among government agencies or organizations that share responsibility for assuring or overseeing HAI surveillance, prevention and control (e.g., State Survey agencies, Communicable Disease Control, state licensing boards)	Partially completed 2007; new activities February 2010

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): DPH Health Care Systems (HCS) Branch is the Connecticut survey agency for CMS, and has participated with the HAI Committee since its inception; this important continuing collaboration will foster participation in strategic planning activities that will lead to the state HAI plan that will succeed this one. Improved coordination will include putting the state HAI program on the agenda of the state licensure boards (medical, nursing), convened by DPH, on a regular basis. The first of these presentations will be a presentation of this state HAI plan, followed by regular updates, at least annually to keep them informed and to solicit their ideas and perspectives.	
	☐	☒	5. Facilitate use of standards-based formats (e.g., Clinical Document Architecture, electronic messages) by healthcare facilities for purposes of electronic reporting of HAI data. Providing technical assistance or other incentives for implementation of standards-based reporting can help develop capacity for HAI surveillance and other types of public health surveillance, such as for conditions deemed reportable to state and local health agencies using electronic laboratory reporting (ELR). Facilitating use of standards-based solutions for external reporting can strengthen relationships between healthcare facilities and regional nodes of healthcare information, such as Regional Health Information Organizations. (RHIOs) and Health Information Exchanges (HIEs). These relationships, in turn, can yield broader benefits for public health by consolidating electronic reporting through regional nodes.	December 2011
			Other activities or descriptions (not required): 5.1 The Connecticut Electronic Laboratory Reporting (ELR) system,	

Planning Level[1]	Check Items Underway[2]	Check Items Planned[3]	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			MAVEN, will have these capabilities, and will be used to reduce the reporting burden of participating healthcare facilities, which will improve the efficiency of reporting and free time for essential prevention promotion activities in the facilities.	
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

2. Surveillance, Detection, Reporting, and Response

Timely and accurate monitoring remains necessary to gauge progress towards the elimination of HAIs. Public health surveillance has been defined as the ongoing, systematic collection, analysis, and interpretation of data essential to the planning, implementation, and evaluation of public health practice, and timely dissemination to those responsible for prevention and control.[1] Increased participation in systems such as the National Healthcare Safety Network (NHSN) has been demonstrated to promote HAI reduction. Systematic surveillance (which can be facilitated by NHSN), combined with improvements to simplify and enhance data collection and improve dissemination of results to healthcare providers and the public, are essential steps toward increasing HAI prevention capacity.

The DHHS Action Plan identifies targets and metrics for five categories of HAIs and identified Ventilator-associated Pneumonia as an HAI under development for metrics and targets (for more detail see Appendix 2):

- Central Line-associated Blood Stream Infections (CLABSI)
- *Clostridium difficile* Infections (CDI)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections
- Surgical Site Infections (SSI)
- Ventilator-associated Pneumonia (VAP)

Work is ongoing to identify optimal metrics and targets for VAP infection. However, detection and measurement with existing tools and methods can be combined with recognized prevention practices in states where an opportunity exists to pursue prevention activities on that topic.

State capacity for investigating and responding to outbreaks and emerging infections among patients and healthcare providers is central to HAI prevention. Investigation of outbreaks helps identify preventable causes of infections including issues with the improper use or handling of medical devices; contamination of medical products; and unsafe clinical practices.

[1] Thacker SB, Berkelman RL. Public health surveillance in the United States. Epidemiol Rev 1988;10:164-90.

Table 2: State planning for surveillance, detection, reporting, and response for HAIs

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I			1. Improve HAI outbreak detection and investigation	
	☒	☒	i. Work with partners including the Council of State and Territorial Epidemiologists (CSTE), CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments	
	☐	☒	ii. Establish protocols and provide training for health department staff (in Connecticut, state) to investigate outbreaks, clusters or unusual cases of HAIs.	Protocols: September 2010 Training: December 2010
	☒	☐	iii. Develop mechanisms to protect facility/provider/patient identity when investigating incidents and potential outbreaks during the initial evaluation phase where possible to promote reporting of outbreaks	Completed, 1990
	☒	☐	iv. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs)	Completed, 2004

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): 1.1 While Connecticut has not characterized specific collaborations and activities to improve outbreak reporting, we have a flexible reportable disease list (authorized by the legislature and promulgated yearly by the State Epidemiologist) that can be modified as necessary. The list is already capable of identifying diseases of interest that can indicate an outbreak (e.g., MRSA, hepatitis) but might be expanded if indicated. 1.2 DPH received federal stimulus funding and can hire and train additional HAI staff, including an Epidemiologist 2 and two half-time Infection Control Practitioners/data validators. As part of their duties these staff will be trained in HAI outbreak response and HAI prevention, and would be available to assist in outbreak response. 1.3 Connecticut has a stringent public health confidentiality law, 19a-25, which protects the identity of individuals that protects the identity of patients, providers, and facilities during any investigation of infectious diseases (whether in healthcare facilities or community settings). 1.4 The DPH Hepatitis Prevention Program, a CDC-funded program, interviews all reported acute hepatitis B and C patients, and any pregnant chronic hepatitis case. DPH is one of 10 hepatitis B/C prevention program sites funded by CDC.	
	☐	☐	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	
			Other activities or descriptions (not required):	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level II	☐ ☐	☐ ☐	3. Improve communication of HAI outbreaks and infection control breaches i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards)	
			Other activities or descriptions (not required): DPH could prepare written and published protocols that would give transparency and assure various stakeholders that DPH is balancing the role of the HAI program (surveillance, prevention, program evaluation) and regulation, which are housed in two separate and distinct sections of the department. However, this will require more discussion before the expected product (such as listed above) and target dates can be determined.	
	☒ ☐ ☐ ☒	☐ ☐ ☐ ☒	4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan i. Central Line-associated Bloodstream Infections (CLABSI) ii. *Clostridium difficile* Infections (CDI) iii. Catheter-associated Urinary Tract Infections (CAUTI) iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections	Completed January 2008 12/2010

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☐ ☐	☐ ☐	v. Surgical Site Infections (SSI) vi. Ventilator-associated Pneumonia (VAP)	
			Other activities or descriptions (not required): 4.1 Connecticut began collecting CLABSI data in January 2008. Reporting is from one medical or medical-surgical and any pediatric ICU in each of the state's 30 acute care hospitals. We will continue this reporting, and have opted not to expand CLABSI reporting to additional locations (ICUs or wards in the hospitals) at this time. The advisability of expanding CLABSI reporting will be considered during the strategic planning process. We are considering adding reporting of central line insertion practices: this could entail using the NHSN CLIP module. Whether or not CLIP is used, it would be important to include all five elements of the Institute for Healthcare Improvement central line "bundle." This includes four from the CLIP; the fifth element being discontinuation of lines as soon as practicable. 4.2–3 Not planned at this time 4.4 We will make the MRSA 1 metric a reporting event, beginning in 2010: incidence rate of invasive MRSA infections, target is a 50% reduction in the incidence of invasive healthcare-associated MRSA infections in the next five years. Connecticut is already a statewide EIP program and already receives reports that can be used to generate this data (therefore, no extra reporting burden on healthcare facilities). *4.5-6* Not planned at this time	Reporting of CDI, CAUTI, MRSA, SSIs, VAPs will be considered during the upcoming state HAI strategic planning process that will be held in 2010
			5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒ ☒	☐ ☒	i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1). ii. Establish baseline measurements for prevention targets	Begun, January 2008 CLABSIs, January 2008; Other measures pending adoption of the various National Targets in Connecticut
			Other activities or descriptions (not required): 5.1 At the onset of the HAI Committee's work, Connecticut began considering metrics for measuring HAI prevention progress. CLABSIs in ICUs are such a metric. 5.2 Connecticut already has baseline CLABSI data that has been validated and can serve as baseline data. Connecticut's EIP ABCs program performs statewide MRSA surveillance in hospitals and other healthcare facilities.	
	☒	☐	6. Develop state surveillance training competencies i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis	Completed: December 2007 and July-August 2008 and 2009
			Other activities or descriptions (not required): Training has been completed on NSHN, basic training; refresher face-to-face training was completed in 2008 after the state HAI program staff was hired; the 2009 trainings were based on the findings of the validation study.	
	☒	☐	7. Develop tailored reports of data analyses for state or region prepared by state personnel	Completed October 2008

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): DPH has an Epidemiologist 2 that has performed such analyses of CLABSI data. This was placed on the DPH website incorporated into the October 2008 annual report. Invasive MRSA data is published on the DPH website annually, and DPH anticipates performing and publishing additional data analyses on Vancomycin Resistant Enterococci (VRE) surveillance data.	
Level III	☒	☐	8. Validate data entered into HAI surveillance (e.g., through healthcare records review, parallel database comparison) to measure accuracy and reliability of HAI data collection	Completed 2009; repeat 2010
	☒	☐	i. Develop a validation plan	Completed 2009; June 2010
	☐	☐	ii. Pilot test validation methods in a sample of healthcare facilities	Completed 2009; repeat Jan-June 2010
	☐	☐	iii. Modify validation plan and methods in accordance with findings from pilot project	2009, June 2010
	☒	☐	iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance	Completed 2009; August 2010
	☐	☒	v. Analyze and report validation findings	Presented to HAI Committee June 2009, Training of IPs September 2009; Sept. 2010
	☐	☒	vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected	Training of IPs September 2009; September 2010

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): The Connecticut validation study protocol will be continued on a repeating cycle or continuously when validators are hired with ARRA funds.	
	☐	☐	9. Develop preparedness plans for improved response to HAI i. Define processes and tiered response criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks	
			Other activities or descriptions (not required): This has not been done. It would need to follow completion of the Level 1 planning around this issue. DPH has worked extensively with hospital on Bioterrorism and other Emergency Preparedness planning, capability development, and evaluation. These plans will be reviewed for possible synergies with HAI outbreak preparedness.	
	☐	☒	Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control practice in non-hospital settings, and set standards for continuing education and training.	Training planning: December 2010
			Other activities or descriptions (not required): The DPH is the professional licensing organization in Connecticut. The DPH Health Care Systems (HCS) Branch already takes the lead on investigations in non-hospital settings. The DPH HAI program and HCS Branch could collaborate on continuing education and training, but this will require additional planning, including the strategic planning process that will be engaging non-hospital stakeholders.	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒ ☐	☐ ☐	10. Adopt integration and interoperability standards for HAI information systems and data sources i. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in healthcare settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs) across the spectrum of inpatient and outpatient healthcare settings ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation.	
			Other activities or descriptions (not required): 10.1 Connecticut is currently developing its public health (MAVEN) and laboratory (LIMS) electronic systems, which should form the basis for integration and interoperability standards in the state. 10.2 This is a national initiative; therefore, Connecticut will need additional technical assistance from DHHS before we can plan to address this issue.	MAVEN: fully operational December 2010 LIMS: fully operational December 2010
	☒	☐	11. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data i. Report HAI data to the public	Began October 2008

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): Connecticut is an Emerging Infections Program state, and one of the activities that the federal stimulus (ARRA) funding will support is a pilot project to develop direct input of data from healthcare facility data systems into NHSN.	
	☐	☐	12. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.	
			Other activities or descriptions (not required):	
	☐	☐	13. Enhance surveillance and detection of HAIs in nonhospital settings	
			Other activities or descriptions (not required): Connecticut received ARRA (federal stimulus) Emerging Infection Program supplemental funds that will hire staff to join the EIP HAI steering committee and network that will develop surveillance protocols to expand use of NHSN and perform MRSA surveillance. DPH will also collaborate with the New England Network (CMS QIO for dialysis centers) and the EIP HAI network on development of possible model protocols for non-hospital based surveillance activities. However, specific planning to develop initiatives and deadlines has not been done pending statewide strategic planning, and additional work in the EIP Dialysis Workgroup.	
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

3. Prevention

State implementation of HHS Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendations is a critical step towards the elimination of HAIs. CDC, with HICPAC, has developed evidence-based HAI prevention guidelines cited in the HHS Action Plan for implementation. These guidelines are translated into practice and implemented by multiple groups in hospital settings for the prevention of HAIs. CDC guidelines have also served as the basis the Centers for Medicare and Medicaid Services (CMS) Surgical Care Improvement Project. These evidence-based recommendations have also been incorporated into Joint Commission standards for accreditation of U.S. hospitals and have been endorsed by the National Quality Forum (NQF).

Table 3: State planning for HAI prevention activities

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	☒	☒	1. Implement HICPAC recommendations. i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group.	Completed January 2009 and ongoing

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Other activities or descriptions (not required): The HICPAC recommendations for CLABSIs include use of a set of prevention practices that need to be used in concert to be effective in preventing CLABSIs, commonly referred to as "the central line bundle." The implementation of the bundle is the state's strategy, which would include adoption of the Johns Hopkins or similar checklists (such as the Institute for Healthcare Improvement (IHI) or CLIP checklists). HICPAC MDRO recommendations are the basis for technical assistance for the state's MDRO collaborative, a CMS 9th Scope of Work activity undertaken by the state's Quality Improvement Organization. Connecticut's approach is to support statewide hospital prevention collaboratives to implement the HICPAC recommendations for the CLABSI prevention target (#1) and the MDRO prevention collaborative to address the MRSA prevention target (#5a. MRSA 1)	
	☐	☒	2. Establish prevention working group under the state HAI advisory council to coordinate state HAI collaboratives i. Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaboratives	Planning around this issue: December 2010
			Other activities or descriptions (not required): This would be advisable, but has not been considered yet by the group. One of the issues to address in the strategic planning process is the composition and organization of the state HAI committee, and development of a "Prevention" subcommittee would be very worthwhile to consider. This will assist in developing standardization, cutting down on redundancy (such as redundant assessments surveys) and efficiently disseminating best practices. In the meantime, a workgroup will be considered for the strategic planning process.	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			3. Establish HAI collaboratives with at least 10 hospitals (i.e. this may require a multi-state or regional collaborative in low population density regions)	
	☒	☐	i. Identify staff trained in project coordination, infection control, and collaborative coordination	May 2009
	☒	☐	ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices	May 2009
	☒	☐	iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress	May 2009
			Other activities or descriptions (not required): The CUSP: Stop BSI project is a statewide collaborative involving 16 hospitals to implement the central line insertion "checklists" and to foster organizational change needed to support initiatives to reduce central inline associated infections in ICUs.	
	☐	☐	4. Develop state HAI prevention training competencies i. Consider establishing requirements for education and training of healthcare professionals in HAI prevention (e.g., certification requirements, public education campaigns and targeted provider education) or work with healthcare partners to establish best practices for training and certification	
			Other activities or descriptions (not required): This could be a rich area for development during the strategic planning process of the HAI Committee in consultation with the DPH Workforce Development Section. DPH will assess whether resources can be procured to partner with APIC to engage in training	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			of hospital (and if resources permit, non-hospital) infection prevention staff on best practice surveillance and infection prevention activities, and to encourage them to participate actively in the work of the prevention collaboratives in the state.	
Level II	☐	☐	5. Implement strategies for compliance to promote adherence to HICPAC recommendations i. Consider developing statutory or regulatory standards for healthcare infection control and prevention or work with healthcare partners to establish best practices to ensure adherence	
	☐	☐	ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs	
	☐	☐	iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data	
	☐	☐	iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered or work with healthcare partners to establish best practices to ensure adherence	
			Other activities or descriptions (not required): These activities will be considered during the strategic planning process.	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☐	☒	6. Enhance prevention infrastructure by increasing joint collaboratives with at least 20 hospitals (i.e. this may require a multi-state or regional collaborative in low population density regions)	December 2010
			Other activities or descriptions (not required): Both the CUSP: Stop BSI and the MDRO collaboratives are open expansion and are encouraging additional hospitals to join the 16 in the CUSP collaborative and five currently in the MDRO collaborative. The two Health Program Associates (HPAs) that will be hired with federal stimulus funds will each spend ¾ of their time assisting the two prevention collaboratives in various administrative and programmatic duties which will assist the collaboratives as they expand.	
	☐	☐	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	
			Other activities or descriptions (not required): This has not been planned yet, but DPH and hemodialysis centers are following the work of the Delmarva Foundation, and this area could be incorporated into strategic planning.	
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

4. Evaluation and Communications

Program evaluation is an essential organizational practice in public health. Continuous evaluation and communication of practice findings integrates science as a basis for decision-making and action for the prevention of HAIs. Evaluation and communication allows for learning and ongoing improvement to occur. Routine, practical evaluations can inform strategies for the prevention and control of HAIs.

Table 4: State HAI communication and evaluation planning

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	☐ ☐	☐ ☐	1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact i. Establish evaluation activity to measure progress towards targets and ii. Establish systems for refining approaches based on data gathered	
			Other activities or descriptions (not required): This activity is not yet planned. An assessment could be incorporated into a comprehensive strategic planning process. Once a strategic plan is developed, we would have the criteria we need to develop an evaluation plan. This plan should include various audiences, including the public and providers in various types of healthcare facilities (hospitals, dialysis centers, ambulatory surgical centers, long term care facilities, etc.).	
			2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders needs	

	☐	☒	i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public	
			Other activities or descriptions (not required): We are planning to disseminate the annual report each year, but a specific and detailed communications plan has not been planned or developed. This would be a worthwhile next activity for the Education subcommittee. An initial version could be developed based on this state plan and it could be updated as a component of the strategic planning process.	Initial version January 2010, update January 2011
Level II	☐	☒	3. Provide consumers access to useful healthcare quality measures	September 2010
			Other activities or descriptions (not required): The Education Subcommittee of the state HAI Committee will be conducting an assessment, using a focus group and other methods of obtaining consumer advice, to redevelop the current Connecticut DPH HAI program website. As a short term and immediate project, the Education Committee will work with DPH HAI program in updating the program's website to make it more interactive and include additional information presented in accessible ways for the public. This project will also gather data that can be used to inform the longer-term strategic plan for HAI communications and education.	
Level III	☒	☒	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	2008 and ongoing

		Other activities or descriptions (not required): A consumer representative on the state HAI Committee was a participant on the national consultation that resulted in the DHHS plan; another member, a hospital epidemiologist, has regularly served as a CDC consultant on HAI issues, and Connecticut representatives will be participating the CDC's EIP HAI strategic planning group.	
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.			

Appendix 1.

The HHS Action plan identifies metrics and 5-year national prevention targets. These metrics and prevention targets were developed by representatives from various federal agencies, the Healthcare Infection Control Practices Advisory Committee (HICPAC), professional and scientific organizations, researchers, and other stakeholders. The group of experts was charged with identifying potential targets and metrics for six categories of healthcare-associated infections:

- Central Line-associated Bloodstream Infections (CLABSI)
- Clostridium difficile Infections (CDI)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Methicillin-resistant Staphylococcus aureus (MRSA) Infections
- Surgical Site Infections (SSI)
- Ventilator-associated Pneumonia (VAP)

Following the development of draft metrics as part of the HHS Action Plan in January 2009, HHS solicited comments from stakeholders for review.

Stakeholder feedback and revisions to the original draft Metrics

Comments on the initial draft metrics published as part of the HHS Action Plan in January 2009 were reviewed and incorporated into revised metrics. While comments ranged from high level strategic observations to technical measurement details, commenters encouraged established baselines, both at the national and local level, use of standardized definitions and methods, engagement with the National Quality Forum, raised concerns regarding the use of a national targets for payment or accreditation purposes and of the validity of proposed measures, and would like to have both a target rate and a percent reduction for all metrics. Furthermore, commenters emphasized the need for flexibility in the metrics, to accommodate advances in electronic reporting and information technology and for advances in prevention of HAIs, in particular ventilator-associated pneumonia.

To address comments received on the Action Plan Metrics and Targets, proposed metrics have been updated to include source of metric data, baselines, and which agency would coordinate the measure. To respond to the requests for percentage reduction in HAIs in addition to HAI rates, a new type of metric, the standardized infection ratio (SIR), is being proposed. Below is a detailed technical description of the SIR.

To address concerns regarding validity, HHS is providing funding, utilizing Recovery Act of 2009 funds, to CDC to support states in validating NHSN-related measures and to support reporting on HHS metrics through NHSN. Also, most of the reporting metrics outlined here have already

been endorsed by NQF and for population-based national measures on MRSA and *C. difficile*, work to develop hospital level measures will be conducted in the next year utilizing HHS support to CDC through funds available in the Recovery Act.

Finally, to address concerns regarding flexibility in accommodating new measures, reviewing progress on current measures, and incorporating new sources of measure data (e.g., electronic data, administrative data) or new measures, HHS and its constituent agencies will commit to an annual review and update of the HHS Action Plan Targets and Metrics.

Below is a table of the revised metrics described in the HHS Action plan.

National Healthcare Associated Infections Metrics and Targets

National Healthcare Associated Infections Prevention Plan – Department of Health and Human Services, February 2009

Metric Number and Label	Original HAI Elimination Metric	HAI Comparison Metric	Measurement System	National Baseline Established (State Baselines Designated by DHHS)	National 5-Year Prevention Target	Coordinator of Measurement System	Is the metric NQF endorsed?
1. CLABSI 1	CLABSIs per 1000 device days by ICU and other locations	CLABSI SIR	CDC NHSN Device-Associated Module	2006-2008 (proposed 2009, in consultation with states)	Reduce the CLABSI SIR by at least 50% from baseline or to zero in ICU and other locations	CDC	Yes*
2. CLIP 1 (formerly CLABSI 4)	Central line bundle compliance	CLIP Adherence percentage	CDC NHSN CLIP in Device-Associated Module	2009 (proposed 2009, in consultation with states)	100% adherence with central line bundle	CDC	Yes†
3a. C diff 1	Case rate per patient days; administrative/discharge data for ICD-9 CM coded *Clostridium difficile* Infections	Hospitalizations with *C. difficile* per 1000 patient discharges	Hospital discharge data	2008 (proposed 2008, in consultation with states)	At least 30% reduction in hospitalizations with *C. difficile* per 1000 patient discharges	AHRQ	No
3b. C diff 2 (new)		*C. difficile* SIR	CDC NHSN MDRO/CDAD Module LabID‡	2009-2010	Reduce the facility-wide healthcare facility-onset *C. difficile* LabID event SIR by at least 30% from baseline or to zero	CDC	No
4. CAUTI 2	# of symptomatic UTI per 1,000 urinary catheter days	CAUTI SIR	CDC NHSN Device-Associated Module	2009 for ICUs and other locations	Reduce the CAUTI SIR by at least 25% from baseline or to zero in ICU and other locations	CDC	Yes*

National Healthcare Associated Infections Metrics and Targets

National Healthcare Associated Infections Prevention Plan – Department of Health and Human Services, February 2009

Metric Number and Label	Original HAI Elimination Metric	HAI Comparison Metric	Measurement System	National Baseline Established (State Baselines Designated by DHHS)	National 5-Year Prevention Target	Coordinator of Measurement System	Is the metric NQF endorsed?
			Module	2009 for other hospital units (proposed 2009, in consultation with states)	locations		
5a. MRSA 1	Incidence rate (number per 100,000 persons) of invasive MRSA infections	MRSA Incidence rate	CDC EIP/ABCs	2007-2008 (for non-EIP states, MRSA metric to be developed in collaboration with EIP states)	At least a 50% reduction in incidence of healthcare-associated invasive MRSA infections	CDC	No
5b. MRSA 2 (new)		MRSA bacteremia SIR	CDC NHSN MDRO/CDAD Module LabID‡	2009-2010	Reduce the facility-wide healthcare facility-onset MRSA bacteremia LabID event SIR by at least 25% from baseline or to zero	CDC	No
6. SSI 1	Deep incision and organ space infection rates using NHSN definitions (SCIP procedures)	SSI SIR	CDC NHSN Procedure-Associated Module	2006-2008 (proposed 2009, in consultation with states)	Reduce the admission and readmission SSI§ SIR by at least 25% from baseline or to zero	CDC	Yes¶
7. SCIP 1 (formerly SSI 2)	Adherence to SCIP/NQF infection process measures	SCIP Adherence percentage	CMS SCIP	To be determined by CMS	At least 95% adherence to process measures to prevent surgical site infections	CMS	Yes

* A standardized infection ratio (SIR) is identical in concept to a standardized mortality ratio and can be used as an indirect standardization method for summarizing HAI experience across any number of stratified groups of data. To illustrate the method for calculating an SIR and understand how it could be used as an HAI comparison metric. The NHSN SIR metric is derived from NQF-endorsed metric data

† NHSN does not collect information on daily review of line necessity, which is part of the NQF

‡ LabID, events reported through laboratory detection methods that produce proxy measures for infection surveillance
§ Inclusion of SSI events detected on admission and readmission reduces potential bias introduced by variability in post-discharge surveillance efforts
¶ The National Quality Forum (NQF)-endorsed metric includes deep wound and organ space SSIs only which are included the target.

An Overview of
Phase 1: Acute-Care Hospitals AND
Phase 2: Ambulatory Surgical Centers, End-Stage Renal Disease Facilities

Phase 1: Acute-Care Hospitals

Phase 1 of the *Action Plan* addressed the most common infections in acute care inpatient settings and outlined specific recommended optimum clinical practices, a prioritized research agenda, an integrated information systems strategy, policy options for linking payment incentives or disincentives to quality of care and enhancing regulatory oversight of hospitals, and a national messaging and communications plan to raise awareness of HAIs among the general public and prevention strategies among healthcare workers:

- HHS Action Plan to Prevent Healthcare-Associated Infections (complete document, printable PDF - 424 KB)
- HHS Action Plan to Prevent Healthcare-Associated Infections (in sections)
- Action Plan Targets and Metrics lists the nine metrics with corresponding five-year goals to focus efforts in reducing healthcare-associated infections.

This *Action Plan* includes five-year goals for nine specific measures of improvement in HAI prevention. The plan was initially released in January 2009 for public comment; a final version that incorporated additional content and responses to comments was released in June 2009.

Phase 2: Ambulatory Surgical Centers, End-Stage Renal Disease Facilities, and Increasing Influenza Vaccination Among Healthcare Personnel

The healthcare and public health communities are increasingly challenged to identify, respond to, and prevent HAIs across the continuum of settings where healthcare is delivered. The public health model's population-based perspective can increasingly be deployed to enhance the prevention of HAIs, particularly given the shifts in healthcare delivery from acute care settings to ambulatory and long-term care settings. The Steering Committee clearly articulated the need to maintain the *Action Plan* as a "living document," developing successor plans in collaboration with key public and private stakeholders to incorporate advances in science and technology, shifts in the ways healthcare is delivered, changes in healthcare system processes and cultural norms, and other factors.

In late 2009, the Steering Committee approved an expansion of the *Action Plan* through the addition of three draft modules:

- Ambulatory Surgical Centers (September 2009 Draft) [PDF - 89 KB]
- End-Stage Renal Disease Facilities (September 2009 Draft) [PDF - 402 KB]
- Influenza Vaccination of Healthcare Personnel (September 2009 Draft) [PDF - 113 KB]

These modules comprised the second phase – Phase 2 – of the *Action Plan*, extending its scope to the outpatient environment and addressing the health and safety of healthcare workers, as well as the risks of transmission of influenza from healthcare personnel to patients.

State of Connecticut
Healthcare Associated Infections (HAI)
Stakeholders Engagement Conference

Southern Connecticut State University
Friday November 19, 2010
8:00 am to 4:30 pm

Agenda

Time	Event	Location
8:00 am - 8:30 am	**Registration & Breakfast**	**Ballroom**
8:30 - 8:45	**Welcome and Introduction** ***J. Robert Galvin, MD, MPH, MBA*** *Commissioner, Connecticut Department of Public Health* Representative from SCSU	Ballroom
	Opening Plenary	
8:45 - 9:00	**HAI- A personal Perspective** ***Susan Manganello*** ***Carrie Simon***	Ballroom
9:00 - 9:30	**This Health Improvement Plan Planning Process and Principles** ***Richard Melchreit, MD*** ***Alessandra Litro*** State of Connecticut Department of Public Health Healthcare Associated Infections Program	Ballroom
9:30 – 10:15	**The Healthcare System** **Cristine Vogel, MPH** Special Advisor to the Governor Health Care Reform	Ballroom
10:15 – 10:30	**BREAK**	Ballroom
10:30 - 11:30	**Healthcare Associated Infections** ***Alice Guh, MD, MPH*** Medical Officer Prevention and Response Branch Division of Healthcare Quality Promotion Centers for Disease Control and Prevention	
11:30 – 12:15	**Prevention Methods for HAI's** ***Alice Guh, MD, MPH*** Medical Officer Prevention and Response Branch Division of Healthcare Quality Promotion Centers for Disease Control and Prevention	Ballroom
12:15 – 12:30	**Activities and Expected Outcomes of the Afternoon** ***Richard Melchreit, MD*** State of Connecticut Department of Public Health Healthcare Associated Infections Program	Ballroom
12:30 – 1:30	**LUNCH**	

	BREAKOUT SESSIONS (Concurrent)	
1:30 – 2:45	**Hospital** Speaker: Louise Dembry, MD, MS, MBA Associate Professor of Medicine (Infectious Diseases) and Epidemiology, Yale University Hospital Epidemiologist, Yale-New Haven Hospital Speaker: Alison L. Hong, MD Interim Vice-President, Quality and Patient Safety Connecticut Hospital Association Speaker: Carol Dietz Project Manager Consulting Services Hospital Setting Qualidigm Facilitator: Douglas C. Waite, MD Vice President for Medical Affairs and Quality Director of Infectious Disease Day Kimball Hospital	Ballroom
1:30 – 2:45	**Long Term Care** Speaker: Manisha Juthani-Mehta, MD Assistant Professor Yale School of Medicine Department of Medicine Section of Infectious Diseases Facilitator: Mag Morelli President CANPFA	Room 1
1:30 – 2:45	**Dialysis** Speaker:*Jay Ginsberg MD,MMM* Vice Chairperson Medical Advisory Committee of the Forum of ESRD Networks Facilitator: Jenny Kitsen Executive Director ESRD Network of New England	Room 2
1:30 – 2:45	**Ambulatory Surgical Centers** Speaker: Donna Nucci, RN CIC Infection Prevention Consulting Services Facilitator: Lisa Winkler Ambulatory Surgery Center Patient Safety Organization, LLC	Room 3
1:30 – 2:45	**Homecare & Hospice** Speaker: Barbara Citarella, RN Private Consultant Facilitator: Allison J. Breault, RN, MS Vice President, Clinical Services VNA East	Room 4
2:45-3:00	**BREAK**	
	Afternoon Plenary	
3:00 – 4:00	Panel Discussion	Ballroom
4:00 – 4:30	Next Steps- Preparing for Planning Conference	Ballroom

Healthcare-associated Infections
HAI Elimination

Toward Elimination

Newsletter for State Partners in HAI Prevention

Volume 14, March 2011

CDI Collaborative: Southeastern Pennsylvania

In 2009, a *Clostridium difficile* Infections (CDI) collaborative was formed in southeastern Pennsylvania by the Health Care Improvement Foundation (HCIF) supported with ARRA funding. The collaborative was designed to promote and accelerate evidence-based interventions aimed at reducing CDI by 30% in 18 months. Thirty-two organizations are currently enrolled in the collaborative including hospitals/ health systems, long-term acute care hospitals, rehabilitation centers and nursing homes.

Early in 2010, organizations began collecting data. HCIF contracted with a software development firm to design a measurement module which utilizes the Pennsylvania Health Care Quality Alliance (PHCQA) web portal. The module allows organizational teams to submit data and run real-time trend and benchmarking reports, providing timely feedback to clinical teams for use in implementing targeted improvement strategies.

Current and planned activities include the implementation of two webinar series and an in-person workshop. Dr. Carolyn Gould, Medical Epidemiologist at CDC, kicked off a CDI prevention series featuring expert speakers addressing key challenges in CDI prevention. A future webinar series will be conducted among nursing homes across the region.

A highlight of the collaborative was the in-person workshop held in November, 2010. Keynote speaker, Dr. Julie Mangino from the Ohio State University Medical Center shared some of the lessons learned from Ohio's statewide CDI collaborative, an initiative funded by the CDC's Epicenters Program. In addition, workshop attendees shared their organization's best practices and offered solutions to common challenges in CDI prevention.

Explore the new
State-based HAI Prevention Activities Map
which replaces the HAI Recovery Act map and includes state-based HAI prevention activities financially and/or technically supported by CDC

State Highlight: Connecticut

Dr. Alice Guh, MD, MPH, CDC's Division of Healthcare Quality Promotion (DHQP)

Comprehensive Planning for HAI Surveillance and Prevention – Stakeholder Engagement

In November 2010, the Connecticut Department of Public Health hosted a statewide HAI Stakeholder Engagement Conference, supported with ARRA funding. The conference convened stakeholders to address reducing HAIs within the state, and to discuss development a Health Improvement Plan (HIP) focused on HAIs through wide-range sectors of Connecticut's healthcare system.

The conference included presentations by leaders from a variety of healthcare settings, including homecare and acute care hospitals. The highlight of the morning plenary was presentations by Alice Guh, MD, MPH with CDC's DHQP, on the science and epidemiology of HAI transmission. The afternoon plenary provided breakout sessions for five focus sector groups: Hospitals, Long Term Care facilities (LTCFs), Ambulatory Surgical Centers (ASCs), Homecare & Hospice, and Dialysis. The conference concluded with a panel that summarized the breakout sessions, and HAI issues that cut across healthcare sectors. The proceedings of the conference is being used to write the background section of the new state HAI Health Improvement Plan.

DPH will continue to build newly robust relationships between the public health and medical communities on HAIs. At an upcoming "priority-setting" conference, DPH will work toward development of sector-specific goals and objectives. Once the plan is written, a third statewide conference will be held to focus on commitment to the plan, ensuring implementation, and celebrating shared achievement toward HAI prevention.

www.cdc.gov/hai/recoveryact

CT Central line Associated Bloodstream Infections (CLABSIs) Data Validation Project

The purpose of HAIs reporting is to measure progress in reducing rates of infection. In 2008, all acute care hospitals in CT conducted mandated reporting of CLABSIs using the National Healthcare Safety Network (NHSN). A state nurse epidemiologist performed blinded retrospective medical chart reviews of ICU patients with NHSN-reported CLABSIs during the study period between October to December of 2008. The study analyzed the collection of patient- days, central –line days (denominator data), and central line practices.

The CT HAI Program found 48 of the 476 septic events met the NHSN CLABSIs definition for an infection rate of 3.58 per 1000 CL days. The hospitals reported 48% (23) of total CLABSIs to NHSN. The underreporting of CLABSIs, which exceeded 50%, was the result of misinterpreting the NHSN definitions and CLABSI terms.

Recommendations support continued training and validation to ensure accurate and valid healthcare associated infections (HAI) data reporting. (*Am J Infect Control* 2010; 38:832-8.)

The data validation project is being repeated for the fourth quarter of 2009 and an ongoing validation component has been instituted as part of the CT DPH HAI program. Fourth quarter 2009 data results will be presented in 2011.

About NHSN

The National Healthcare Safety Network (NHSN) is a voluntary, secure, internet-based surveillance system that integrates patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion (DHQP) at CDC. During 2008, enrollment in NHSN was opened to all types of healthcare facilities in the United States, including acute care hospitals, long term acute care hospitals, psychiatric hospitals, rehabilitation hospitals, outpatient dialysis centers, ambulatory surgery centers, and long term care facilities.

NHSN makes use of recent advances in information technology. While maintaining data security, integrity, and confidentiality, NHSN has the capacity for healthcare facilities to share data in a timely manner between healthcare facilities (e.g., a multihospital system) or with other entities (e.g., public health agencies or quality improvement organizations).

NHSN's information technology architecture enables data exchanges in accordance with the standards adopted by the U.S. Department of Health and Human Services in the National Health Information Technology Initiative. CDC collaborates with federal and national partners to create standards that will prevent duplication of efforts at the facility level. To reduce the burden of reporting, harmonization of healthcare performance measures across national organizations is in progress, and for some measures has been achieved (i.e., pneumonia and bloodstream infections). In addition, we are working with private sector vendors so that facilities collecting data using commercially-available systems will be able to voluntarily upload those data electronically into NHSN.

There is no fee for participation in the NHSN.

Review of NHSN

External Peer Review of the Division of Healthcare Quality Promotion (DHQP) Surveillance Branch Report [PDF - 99KB]
In 2008, CDC convened an External Peer Review of the Division of Healthcare Quality Promotion (DHQP) Surveillance Branch, which handles the National Healthcare Safety Network (NHSN). The primary focus of this external peer review was NHSN. This report provides the proceedings and final recommendations from the panel. May 2008.

The purposes of NHSN are to:

- Collect data from a sample of healthcare facilities in the United States to permit valid estimation of the magnitude of adverse events among patients and healthcare personnel.
- Collect data from a sample of healthcare facilities in the United States to permit valid estimation of the adherence to practices known to be associated with prevention of these adverse events.
- Analyze and report collected data to permit recognition of trends.
- Provide facilities with risk-adjusted metrics that can be used for inter-facility comparisons and local quality improvement activities.
- Assist facilities in developing surveillance and analysis methods that permit timely recognition of patient and healthcare worker safety problems and prompt

intervention with appropriate measures.

- Conduct collaborative research studies with NHSN member facilities (e.g., describe the epidemiology of emerging healthcare-associated infection [HAI] and pathogens, assess the importance of potential risk factors, further characterize HAI pathogens and their mechanisms of resistance, and evaluate alternative surveillance and prevention strategies).
- Comply with legal requirements – including but not limited to state or federal laws, regulations, or other requirements – for mandatory reporting of healthcare facility-specific adverse event, prevention practice adherence, and other public health data.
- Enable healthcare facilities to report HAI and prevention practice adherence data via NHSN to the U.S. Centers for Medicare and Medicaid Services (CMS) in fulfillment of CMS's quality measurement reporting requirements for those data.
- Provide state departments of health with information that identifies the healthcare facilities in their state that participate in NHSN.
- Provide to state agencies, at their request, facility-specific, NHSN patient safety component and healthcare personnel safety component adverse event and prevention practice adherence data for surveillance, prevention, or mandatory public reporting.

Confidentiality

Each NHSN facility is afforded the following Assurance of Confidentiality:

"The voluntarily provided information obtained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not otherwise be disclosed or released without the consent of the individual, or the institution in accordance with Section 304, 306, and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d))."

How data are used

Data collected in NHSN are used for improving patient safety at the local and national levels. In aggregate, CDC analyzes and publishes surveillance data to estimate and characterize the national burden of healthcare-associated infections. At the local level, the data analysis features of NHSN that are available to participating facilities range from rate tables and graphs to statistical analysis that compares the healthcare facility's rates with the national aggregate metrics.

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National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)
Division of Healthcare Quality Promotion (DHQP)

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FIRST STATE-SPECIFIC HEALTHCARE-ASSOCIATED INFECTIONS SUMMARY DATA REPORT

CDC's National Healthcare Safety Network (NHSN)

January – June, 2009

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

CS213377

Background

The National Healthcare Safety Network (NHSN) is a public health surveillance system that the Centers for Disease Control and Prevention's (CDC) Division of Healthcare Quality Promotion (DHQP) maintains and supports as a mainstay of its healthcare-associated infection (HAI) surveillance and prevention program. NHSN is used by healthcare facilities in all 50 states; Washington, D.C.; and Puerto Rico. Participation in NHSN is a state-mandated requirement for healthcare facilities in an increasing number of states. As of December 2009, 21 states had plans to require, or already required, use of NHSN for their reporting mandate. Central line-associated bloodstream infections (CLABSIs) are one of the HAI types for which reporting is most frequently mandated by states that are using NHSN as their operational system for mandatory reporting.[1] Related to these mandates as well as to the increased visibility of HAIs among facilities and healthcare organizations, the number of facilities utilizing NHSN for reporting HAI data has doubled in the past 2 years.

Since NHSN's inception in 2005, DHQP has used HAI data from the system for national-level analysis and reporting. The annual NHSN reports are prime examples.[2] Recently, DHQP extended its roles and responsibilities in analyzing and reporting HAI data from the national level to the state level. Several factors account for this new focus on state-specific HAI data. First, DHQP is administering a federal-state cooperative agreement program, funded by the American Recovery and Reinvestment Act (ARRA) of 2009, which is designed to improve surveillance and prevention of HAIs, encourage multi-facility collaborative efforts, train the workforce in HAI surveillance and prevention, and measure outcomes. HAI data reported to NHSN are the primary data available for measuring the impact of the ARRA-funded program.

Second, these data can inform state-based HAI surveillance and prevention efforts (e.g., aid in decisions regarding resource allocations for state-based HAI prevention activities). State-specific data reported by DHQP may be the primary source of HAI data in states where systems have not yet been established for healthcare facilities to share HAI data with the state department of health. Third, HAI data reported through NHSN enable the U.S. Department of Health and Human Services (HHS) to assess progress toward the national HAI targets set in the *HHS Action Plan to Prevent Healthcare-Associated Infections*.[3]

This initial report presents composite statistics summarizing HAI data available from NHSN at the national and state levels. The HAI data reported are limited to CLABSIs. The CLABSI data are summarized using the Standardized Infection Ratio (SIR), a statistic used to measure relative difference in HAI occurrence during a reporting period compared to a common referent period (i.e., standard population). The SIR can be used to track HAIs at the national, state, and local levels over time, and is closely related to the Standardized Mortality Ratio (SMR), a summary statistic widely used in public health to analyze mortality data.[4] In HAI data analysis, the SIR compares the actual number of HAIs in a facility or state with the baseline U.S. experience (i.e., standard population), adjusting for several risk factors that have been found to be most associated with differences in infection rates. In this report, the factors adjusted for are based on past analyses of decades of HAI data reported to NHSN and its predecessor, the National Nosocomial Infections Surveillance System (NNIS), as indicated in the most recent annual NHSN Report, where CLABSI rates were stratified by over 35 patient-groups based on type of patient-care location and, in some cases, also by type of hospital or bed size of the patient-care location.[2]

The CLABSI SIRs presented in this report are intended to serve as starting points for analysis and action that will help states identify HAI priorities and guide prevention efforts; these data are meant to be helpful for public health and policy decisions. Although the SIRs are not put forth as comprehensive and conclusive HAI measures for any state, nor for direct comparisons between states, they do represent a high-level aggregate outcome measure that can be used to assess state and national goals toward HAI prevention. This report is a first step in the process of increasing transparency related to HAIs, with the ultimate goal of improving healthcare delivery in the nation. These are the first in a series of SIRs to be calculated semi-annually over the next several years. As data become available for subsequent time intervals, serial comparisons against previous metrics within each state will provide an improved means for monitoring the impact of interventions, and will better indicate the successes of state-based HAI reduction efforts. This first report includes only CLABSI data; additional HAI data, as they become available, will augment the utility of this report. As facilities increase reporting on catheter-associated urinary tract infections, methicillin-resistant *Staphylococcus aureus* (MRSA), and *Clostridium difficile*, SIRs related to these pathogens may be added. Additionally, inclusion of HAI data from surgical site infections is planned for the next report. Ongoing interactions with health departments will be critical to determine ways to improve the reporting of HAIs and to act on these data to prevent HAIs. SIRs have been used by several state departments of health to present annual HAI summary data. In adherence to state legislative mandates, South Carolina, Pennsylvania, Tennessee, and Colorado have reported hospital-specific SIRs.[5–8] Other organizations have also utilized the SIR as a summary HAI measure, including the American College of Surgeons and reporting authorities in Germany, Thailand, and Japan.[9–12]

Methods

State-Specific NHSN Data Reported

This report includes data reported mandatorily and voluntarily by healthcare facilities to NHSN. National summary data are reported on NHSN participation from facilities across all 50 states; Washington, D.C.; and Puerto Rico. However, for this first report, the SIRs reported are limited to only states in which a mandate for reporting CLABSIs to NHSN had been in place as of June 30, 2009.

The CLABSI data used in these calculations are restricted to CLABSIs reported using the most up-to-date NHSN definition, which was introduced in 2008.[13] The data were reported from short stay acute-care hospitals only. Certain specific patient-care locations were excluded from this report: long-term acute-care locations (both free-standing and hospital within a hospital) and specialty care units such as hematology/oncology and bone-marrow transplant locations. These locations were excluded because the reporting from these areas just began in 2006-2007; there is limited experience with appropriate risk stratification within these areas, and the number of reporting facilities is low. Therefore, the incidence estimates within the standard population are not robust enough to justify comparisons and calculations of an SIR.

Calculation of SIRs

National-level HAI data from NHSN were used as the common referent to estimate the predicted number of HAIs in the observed-to-predicted ratios that comprise the SIRs. The referent period includes January 2006 through December 2008. All

facilities reporting at least 1 month of relevant data to NHSN during this time period (regardless of any mandate) were included in the referent period; these data are comparable to those reported in the NHSN annual report.[2] The reporting period (January 2009 through June 2009) takes into account a latency period of up to 6 months between the HAI event itself and the reporting of that event to NHSN. As subsequent reports will have distinct reporting periods but will continue to use the same referent period (January 2006 through December 2008), the SIRs will represent comparisons of observed HAI occurrence during each distinct reporting period with the predicted occurrence based on this referent population. Illustrative examples of how an SIR is calculated are provided in Appendix B.

In this first state summary report, the CLABSI SIRs are adjusted for patient-mix by type of patient-care location, hospital affiliation with a medical school, and bed size of the patient-care location. Other factors, such as facility bed size, were not associated with differences in CLABSI rates and therefore were not included in CLABSI SIR risk adjustment.

Interpretation of SIRs

An SIR of 1.0 should be interpreted as indicating that the number of events the entity (e.g., state, healthcare facility) observed is no different than if its experience had been the same as that of the referent population. Because the SIR is an estimate based on calculations of reported data, confidence intervals (CIs) are calculated to allow for accurate interpretation of the SIR. If these CIs include a value of 1.0, the SIR should be interpreted as if it was 1.0. An SIR significantly greater than 1.0 (i.e., where the CIs exclude 1.0) indicates an excess of observed events over the predicted number of events; conversely, an SIR of significantly less than 1.0 indicates that fewer events were observed than predicted. The CIs around the SIR depend on several factors, including the number of facilities reporting data from the relevant patient-care locations, the number of device-days that were reported, and the types of facilities reporting.

Results

Table 1 summarizes the variability and extent of state HAI reporting to NHSN for CLABSIs. Data were reported in 47 states and Washington, D.C. States with reporting mandates for CLABSI provided the most data; however, in many instances a large number of facilities reported data in states without mandates. Table 2 displays state-specific CLABSI SIRs for those states with a mandate for reporting CLABSI data. This table also displays SIRs for the national aggregate data. Eleven of the 17 states with a state mandate to report CLABSI had SIRs significantly less than 1.0, while only two had SIRs significantly higher than 1.0. Nationally, among 1,538 facilities reporting CLABSI data to NHSN during the reporting period, 4,615 CLABSIs were reported. This is estimated to be 18 percent fewer than predicted, resulting in an SIR of 0.82 (95 percent CI 0.80 - 0.85).

Table 3 shows key percentiles within the distribution of the CLABSI SIRs calculated at the facility level within each state. During this first reporting period, in nearly all of the states with a mandate for CLABSI, at least 25 percent of healthcare facilities reported zero CLABSIs.

Discussion

This initial state summary report provides baseline data that can help identify priorities and guide prevention plans and activities. Overall, during the first half of 2009, many states using NHSN for their CLABSI reporting mandates experienced fewer CLABSIs observed than predicted. These are encouraging results, but they are not definitive

assessments of healthcare facility performance in any state, and they are limited to an initial 6-month reporting period. States with knowledge of SIRs are likely to need additional data to refine assessments and pinpoint specific opportunities where new or intensified infection prevention efforts can yield the most immediate benefits. Over the coming few years, serial SIRs will add value to this initial report by enabling evaluations of prevention programs in individual states over time. In the future, when reported SIRs extend beyond CLABSIs to additional HAI types and locations, a more comprehensive understanding of HAI prevention opportunities will emerge. One example of a future location is the neonatal intensive care unit, which was not mentioned in the HHS Action Plan's HAI prevention targets and for which additional risk stratification challenges exist.

A major consideration for interpretation of these data and for future reports includes assessing the confidence in the validity of the data reported. First, specific validation efforts have only begun at the state level, and there is a necessity for more widespread validation of HAI data reported to NHSN. In this report, only five states report some validation studies for CLABSIs (Table 1). These studies were conducted during 2009 but were evaluating the validity of 2008 HAI data reported to NHSN; continued validation efforts of 2009 data are ongoing in these states. Validation efforts by state departments of health represent an important step toward a more complete understanding of the HAI data reported to NHSN. In fact, the studies themselves could have an impact on HAI rates and the calculated SIRs. In some facilities, when validation studies are initiated, higher than predicted HAI rates might be reported, as training efforts lead to better identification of HAIs that previously would have been overlooked. This may lead to a scenario where subsequent SIRs appear elevated compared to these baseline SIRs in places where validation efforts are implemented. CDC is already attempting to facilitate and promote more validation efforts. In October 2009, as part of ARRA, CDC provided to state health departments resources that are to be used in part for validation efforts. As validation studies become more standardized and commonplace, they are likely to help assure consistent quality and completeness of HAI data.

Previous analysis of NHSN CLABSI data, comprised almost exclusively of data reported before state mandates for reporting CLABSI were in place, documented annual decreases in CLABSI incidence rates among intensive care unit patients. In addition, a subset of these CLABSIs, those associated with MRSA, documented a decrease in CLABSI incidence estimated at 8-10 percent per year. This paralleled changes in population-based incidence of MRSA bloodstream infections documented from a distinct CDC surveillance program dedicated to invasive MRSA surveillance.[14] This observation suggests that the national SIR in this report likely reflects rates that are truly less than the referent population rates, and not artificially low rates resulting from poor reporting. Regardless, additional steps to bolster the reliability of these HAI data include efforts planned by CDC to evaluate NHSN HAI data using external data sources, to improve assessment of training and application of appropriate methodology by those reporting to NHSN, and to develop novel measures relying more on electronically-captured data elements.

The SIRs summarize complex data related to HAIs in a single set of indicators that use national data for a specified time period as a common referent. The indirect standardization technique used to calculate SIRs is the same as for SMRs, a commonly used method in epidemiology for comparing mortality between two groups.[15] There are distinct

advantages to using this indirect standardization method, including its utility when the events being compared are few in number, such as HAIs.[16] As HAI rates continue to decrease, facilities and states will continue to report fewer HAIs and this will become a more relevant issue. Furthermore, over time, comparisons will focus on interval changes in the SIR (i.e., 6-month intervals), and the advantage of using the SIR as an ongoing method to evaluate intrastate comparisons will be more fully realized.

Despite the advantages, one issue that arises when using SIRs is the validity of deriving the predicted number of an adverse health outcome (such as HAI) in a referent group using indirect standardization and comparing that predicted number with the number observed in another group. Under certain conditions, when the distribution of patients in each risk strata differs markedly between the groups being compared, the comparison is invalid. Such would be the case if, for example, the medical intensive care unit patients from all facilities in a single state were intrinsically at greater risk for HAI compared to the medical intensive care unit patients from all facilities in the next state or in all other states. However, this marked discrepancy in HAI risks is unlikely to occur. Further, the alternative approach, direct standardization, may not offer an advantage, as suggested by recent research comparing the two methods in calculating SMRs, which found equality in the two approaches.[4]

The issue of mandatory versus voluntary HAI reporting in different states must be considered as well. It has been suggested that facilities reporting under a mandate may be less likely to report HAIs compared to facilities reporting voluntarily. Although it may be too early to detect with certainty, initial evaluation identified no evidence that facilities reporting under a mandate were systematically under-reporting infections, compared to those reporting in a voluntary environment.[17]

Although SIRs for CLABSIs are only presented for states that had mandates in place to report these types of infections, SIRs may also include summarized data on these types of infections from healthcare facilities or specific locations within facilities that were not covered under the mandates (e.g., data from non-intensive care units when mandate may be inclusive of only intensive care units). The number of healthcare facilities eligible to report data to NHSN under a mandate in a given state is not reported systematically to CDC. Determining exactly what proportion of facilities needs to be reporting in order to consider the summary statistic representative of the state is difficult and ultimately arbitrary. DHQP is putting a system in place to obtain reliable and up-to-date information about each state's HAI reporting mandate. Future reports may include a second type of analysis, restricted to only facility-level data reported mandatorily to NHSN. Every state may have unique goals toward increasing participation and representativeness, depending on their specific prevention programs and goals. However, these data may be useful to states either with or without mandates.

When interpreting data in this report, it is important to understand the extent to which SIRs are appropriately risk adjusted. The risk-specific strata used to calculate the CLABSI SIRs are based on evaluation of all the data reported to NHSN since its inception in 2006; these strata reflect the major differences in CLABSI rates between subsets of patients. However, the data available to form these strata are limited to facility- or patient-location descriptive variables and device days. Additional data, such as monthly counts of neutropenia days

or data on number of central lines per patient, if available, may result in improved risk adjustment. However, the incremental improvement in risk adjustment would need to be weighed against the added data collection burden, which could be substantial. While improving risk adjustment is an ongoing goal, the methodology incorporated into the SIR calculations of this report is sufficient to make reasonable interpretation of the data presented. Although the amount of data present in the referent period reported from critical-care units is greater than that from non-critical care units, there is considerable reporting from the non-critical care units, allowing development of reasonable baseline rates from these non-critical care areas.[2] For example, in the referent period, CLABSI surveillance was reported from adult inpatient wards in 288 facilities across 29 states, representing 1,100 unique non-critical care adult inpatient wards.

Conclusion

This report presents an initial set of state-specific and national summary statistics for CLABSI, providing a reference point for establishing or intensifying prevention programs and serially evaluating prevention impact. CDC will continue to report SIRs at the national and state level as a measure of progress toward the HHS Action Plan targets and to gauge the impact of ARRA support to the states for HAI prevention. As CDC and state departments of health work with facilities to increase participation in NHSN and extend HAI reporting, CDC will provide more comprehensive coverage of data related to HAI occurrence for analysis and action at the local, state, and national levels.

Table 1. NHSN Reporting Characteristics by State‡, January 2009 – June 2009: Central Line-Associated Bloodstream Infections.

					Healthcare Facilities Reporting to NHSN		
State	Mandate†	No. of Healthcare Facilities*	No. of Healthcare Facilities Covered by Mandate†	Any Validation§	No.	Percent¤	Data Submission Percent ¶
Alabama		122			1-4	<10.0	85.1
Alaska		29			1-4	<10.0	50
Arizona		105			1-4	<10.0	100
Arkansas		112			1-4	<10.0	70.6
California		431			118	27.4	77.4
Colorado	Yes	100	59		50	50.0	90.5
Connecticut	Yes	42	30	Yes	30	71.4	98.7
Delaware	Yes	13	9		8	61.5	92.9
Florida		281			17	6.0	75.1
Georgia		186*			14	7.5	83.7
Hawaii		30			1-4	<10.0	50
Idaho		52			1-4	<10.0	100
Illinois	Yes	210	150		140	66.7	88.8
Indiana		157			1-4	<10.0	75.6
Iowa		117			1-4	<10.0	86.1
Kansas		156			6	3.8	97.2
Kentucky		125			12	9.6	87.5
Louisiana		259			10	3.9	91.3
Maine		37			1-4	<10.0	87.9
Maryland	Yes	70	45	Yes	48	68.6	99.5
Massachusetts	Yes	116	73		70	60.3	95.2
Michigan		188			26	13.8	87.5
Minnesota		140			1-4	<10.0	37.5
Mississippi		120			6	5.0	89.1
Missouri		156*			6	3.8	98.6
Montana		61			5	7.7	94.4
Nebraska		101			1-4	<10.0	94
Nevada		59			1-4	<10.0	100
New Hampshire	Yes	26	25		24	92.3	85.8
New Jersey	Yes	100*	72		72	72.0	93.9
New Mexico		53			7	13.2	100
New York	Yes	182	182	Yes	182	100.0	95.7
North Carolina		124			20	16.1	88.2
North Dakota		51*			1-4	<10.0	100
Ohio		242			14	5.8	84.4
Oklahoma	Yes	149	50		48	32.2	91.7
Oregon	Yes	64*	44		37	57.8	90.9
Pennsylvania	Yes	253	253		204	80.6	88.5
Puerto Rico		65			0	.	.
Rhode Island		16			1-4	<10.0	66.7
South Carolina	Yes	79	79	Yes	63	79.7	83.7
South Dakota		66			0	.	.
Tennessee	Yes	157	71	Yes	72	45.9	97
Texas		622			13	2.1	70
Utah		59			0	.	.
Vermont	Yes	13	8		8	61.5	96.7
Virginia	Yes	122*	122		76	62.3	94.7
Washington	Yes	105*	62		62	59.0	95.6
Washington, D.C.		16			1-4	<20.0	100
West Virginia		66			23	34.8	61.8
Wisconsin		141			13	9.2	83.8
Wyoming		49			0	.	.
US		**6,400***			**1,538**	**24.0**	**88.8**

Appendix A defines all column headings - footnotes listing on following page

‡ United States; Washington, D.C.; and Puerto Rico.

†The number of healthcare facilities eligible to report CLABSI data under a mandate, for states in which a mandate exists to report CLABSIs to the state health department using NHSN, is self-reported to CDC by the state health department.

* The number of healthcare facilities is self-reported to CDC by the state health department. Where indicated by a "*," this number was taken from the 2008 American Hospital Association survey of healthcare facilities and acknowledged by the State.

§ State health department self-reported the completion of any validation study of NHSN data (studies conducted on 2008 data).

¤ This measure is calculated using multiple data sets. It is calculated by dividing "No. of Healthcare Facilities Reporting" by "No. of Healthcare Facilities," and multiplying by 100. The denominator comes from either the state health department's self-reported data, or the 2008 AHA dataset. The numerator comes from the NHSN system. In states for which the AHA count is acknowledged by the State as the best estimate of number of healthcare facilities, this percentage assumes that all NHSN facilities are included in the AHA facilities count; that is, that the NHSN facilities are a subset of the AHA facilities. In these cases, this percentage assumes that all NHSN facilities are included in the AHA facilities count; that is, that the NHSN facilities are a subset of the AHA facilities. However, the AHA data do not necessarily comprise the total pool of facilities eligible to participate in NHSN. There are some AHA facilities that are not participating in NHSN; also, there are some facilities within the NHSN system that are not included in the AHA list. In states with a mandate to report HAI data using NHSN, some facilities in the number provided by the state health department, or in the AHA number, might not be included in mandate (e.g., facilities do not have the units or perform the procedures covered by the mandate; or the mandate covers only facilities above a certain bed size).

¶ This metric is the rate at which facilities submitted data to NHSN during the reporting period. It is calculated by dividing the number of months of data submitted to NHSN by the total number of months of data eligible to be submitted, and multiplying by 100. For example, if a state has two facilities reporting to NHSN, then 12 total months of data could have been submitted to NHSN in a 6-month period. If those two facilities sent in 12 total months of data, the state participation percent is 100 percent. If one facility submitted data for 4 months and the other for 2 months, then the state participation percent is 50 percent (data were reported for 6 out of 12 total months). This metric is also a proxy measure for a state's weight in the overall calculations. A state with 100 facilities with 98-percent participation affects the pooled mean estimates much more than does a state with two facilities with a 50-percent participation rate. High participation rates suggest facilities are reporting continuously and contributing greater to any summary statistic compared to facilities with low participation rates. For states with a mandate, it is possible for this percentage to be <100 for several reasons, including that some facilities reporting might not be covered by the mandate, and might only be submitting selected months of data.

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		Graphic Representation of SIR†
					Lower	Upper	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	
Oregon	37	50	82.21	0.61	0.45	0.80	
Pennsylvania	204	818	1,176.83	0.70	0.65	0.74	
South Carolina §	63	183	158.11	1.16	1.00	1.34	
Tennessee §	72	282	245.99	1.15	1.02	1.29	
Vermont	8	3	10.99	0.27	0.07	0.71	
Virginia	76	161	193.81	0.83	0.71	0.97	
Washington	62	86	148.07	0.58	0.47	0.72	
US-all	1,538	4,615	5,618.75	0.82	0.80	0.85	

* Presence of mandate to report CLABSIs to the state health department using NHSN as of June 30, 2009
† Solid diamonds=SIR <1.0, solid X=SIR >1.0, open circle=SIR not different than 1.0
§ State health department self-reported the completion of any validation study of NHSN data (studies conducted on 2008 data).

Table 3. Key Percentiles* for Facility-Specific Standardized Infection Ratios (SIRs) Reported Within Each State Using NHSN to Comply With a Legislative Mandate† to Report Central Line-Associated Bloodstream Infections to the State Health Department: January 2009 – June 2009.

			95% CI for SIR		Facility-Specific SIRs at Key Percentiles*				
State	No. of Facilities Reporting	SIR	Lower	Upper	10%	25%	Median (50%)	75%	90%
Colorado	50	0.68	0.52	0.87	0.00	0.00	0.00	0.71	1.25
Connecticut §	30	0.94	0.72	1.19	0.00	0.00	0.78	1.81	3.31
Illinois	140	0.90	0.80	1.01	0.00	0.00	0.36	0.98	2.29
Maryland §	48	1.30	1.14	1.48	0.00	0.15	0.71	1.58	2.88
Massachusetts	70	0.59	0.49	0.70	0.00	0.00	0.00	0.81	1.80
New Hampshire	24	0.57	0.34	0.90	0.00	0.00	0.00	0.56	1.22
New Jersey	72	0.82	0.71	0.95	0.00	0.00	0.40	1.06	1.89
New York §	182	0.99	0.91	1.07	0.00	0.00	0.58	1.43	2.30
Oklahoma	48	0.50	0.38	0.64	0.00	0.00	0.00	0.25	1.30
Oregon	37	0.61	0.45	0.80	0.00	0.00	0.00	0.74	2.38
Pennsylvania	204	0.70	0.65	0.74	0.00	0.00	0.30	0.90	1.70
South Carolina §	63	1.16	1.00	1.34	0.00	0.00	0.70	1.85	2.64
Tennessee §	72	1.15	1.02	1.29	0.00	0.00	0.45	1.33	1.69
Virginia	76	0.83	0.71	0.97	0.00	0.00	0.48	1.30	2.82
Washington	62	0.58	0.47	0.72	0.00	0.00	0.00	0.66	1.09
US-all	1,538	0.82	0.80	0.85	0.00	0.00	0.29	1.01	1.97

* Key percentiles only calculated for states with ≥20 facilities reporting; only these states are shown
† Presence of mandate to report CLABSIs to the state health department using NHSN as of June 30, 2009
§ State health department self-reported the completion of any validation study of NHSN data (studies conducted on 2008 data)

Appendix A: Column Definitions and Interpretations

Note: All definitions and interpretations below refer to conditions during the designated reporting period: January 1, 2009 through June 30, 2009.

Mandate

This variable is included to show whether a state had a mandate to report data on a given HAI type through NHSN. However, data in this report include both those reported directed by a mandate and those voluntarily reported.

No. of Healthcare Facilities

The number of healthcare facilities is self-reported to CDC by the state health department. Where indicated by a "*," this number was taken from the 2008 American Hospital Association survey of healthcare facilities and acknowledged by the State. This AHA count is the number of hospitals in a state, as defined by AHA in this survey. For more information on how these data are obtained and defined, visit www.ahadata.com. This is a reasonable estimate of the number of acute care facilities that could be reporting data to NHSN. Limitations of using this value as an estimate of all acute care facilities in the state include: (1.) in some instances, multiple facilities report as a single facility to NHSN, but may report as multiple facilities to AHA; (2.) some states do not promote enrollment in NHSN if the mandate is limited to specific facility types, but all facilities may report to the AHA survey; (3.) not all facilities may report to the AHA survey and be counted in this measure.

No. of Healthcare Facilities Covered by Mandate

The number of healthcare facilities eligible to report CLABSI data under a mandate, for states in which a mandate exists to report CLABSIs to the state health department using NHSN, is self-reported to CDC by the state health department. Where indicated by a "*," this number was taken from the 2008 American Hospital Association survey of healthcare facilities and acknowledged by the State.

Any Validation

This variable indicates whether the state self-reported to CDC the completion of any validation studies of data reported to NHSN. Validation helps improve the accuracy of the data. Refer to a state health department's website for specifics on that state's validation efforts.

Healthcare Facilities Reporting to NHSN

No.

This number is a count of the unique facilities reporting any data to NHSN. For example, if a state had 50 facilities enrolled in NHSN, but only 38 submitted data during the reporting period, the value for this variable is 38. For CLABSI data, only acute care hospitals are included.

Percent

This measure is calculated using multiple data sets. It is calculated by dividing "No. of Healthcare Facilities Reporting" by "No. of Healthcare Facilities," and multiplying by 100. The denominator comes from either the state health department's self-reported data, or the 2008 AHA dataset. The numerator comes from the NHSN system. In states for which the AHA count is acknowledged by the State as the best estimate of number of healthcare facilities, this percentage assumes that all NHSN facilities are included in the AHA facilities count; that is, that the NHSN facilities are a subset of the AHA facilities. In these cases, this percentage assumes that all NHSN facilities are included in the AHA facilities count; that is, that the NHSN facilities are a subset of the AHA facilities. However, the AHA data do not necessarily comprise the total pool of facilities eligible to participate in NHSN. There are some AHA facilities that are not participating in NHSN; also, there are some facilities within the NHSN system that are not included in the AHA list. In states with a mandate to report HAI data using NHSN, some facilities in the number provided by the state health department, or in the AHA number, might not be included in mandate (e.g., facilities do not have the units or perform the procedures covered by the mandate; or the mandate covers only facilities above a certain bed size).

Data Submission Percent

This metric is the rate at which facilities submitted data to NHSN during the reporting period. It is calculated by dividing the number of months of data submitted to NHSN by the total number of months of data eligible to be submitted, and multiplying by 100. For example, if a state has two facilities reporting to NHSN, then 12 total months of data could have been submitted to NHSN in a 6-month period. If those two facilities sent in 12 total months of data, the state participation percent is 100 percent. If one facility submitted data for 4 months and the other for 2 months, then the state participation percent is 50 percent (data were reported for 6 out of 12 total months). This metric is also a proxy measure for a state's weight in the overall calculations. A state with 100 facilities with 98-percent participation affects the pooled mean estimates much

more than does a state with two facilities with a 50-percent participation rate. High participation rates suggests facilities are reporting continuously and contributing greater to any summary statistic compared to facilities with low participation rates. For states with a mandate, it is possible for this percentage to be <100 for several reasons, including that some facilities reporting might not be covered by the mandate, and might only be submitting selected months of data.

SIR

Standardized infection ratio (SIR) = the observed number of infections divided by the predicted number of infections.

95 Percent CI for SIR: Upper and Lower

These are the upper and lower bounds of the SIR confidence interval (CI): this is an indication of the uncertainty associated with the estimation of the SIR and allows interpretation in terms of statistical significance. As a general convention, epidemiologists work at a confidence level of 95 percent. Therefore, if the SIR is 1.70 and the 95-percent CI is 0.90 - 2.18, then the CI includes 1.0. This means that at the 95-percent level of confidence, we cannot be certain that our result is different from 1.0 (i.e., it is no different from the reference population). The calculations for determining the 95-percent CI given the methodology outlined in this report are taken from:
Liddell FD. Simple exact analysis of the standardised mortality ratio. *Journal of Epidemiology and Community Health*, 1984;38:85-88.

Key Percentiles:

These are the state-specific percentiles of the SIR, calculated using SAS's PROC Univariate. For example, if a state has a 90th percentile number of 1.0, this indicates that 90 percent of the facilities have an SIR at or *below* 1.0. If a state's 50th percentile is 0, then half of the facilities in that state have an SIR of 0.

Appendix B: Understanding the Relationship between HAI Rate and SIR Comparison Metrics

CLABSI Risk Adjustment

Historically, NHSN has published CLABSI event rates based on the number of CLABSI events per 1,000 device (central line) days by type of intensive care unit (ICU) and other locations. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally or even for an individual healthcare facility across multiple patient care locations. For instance, when comparing CLABSI rates, there may be quite a number of different types of locations for which a CLABSI rate could be reported. Given CLABSI rates among 15 different types of locations, one may observe many different combinations of patterns of changes over time. This raises the need for a way to combine CLABSI rate data across location types to communicate the status of HAI incidence and prevention success to hospital staff, public health officials, and potentially to consumers.

A standardized infection ratio (SIR) is identical in concept to a standardized mortality ratio (SMR) and can be used as an indirect standardization method for summarizing HAI experience across any number of stratified groups of data. To illustrate the method for calculating an SIR and understand how it could be used as an HAI comparison metric, the following example data are displayed below:

Risk Group Stratifier	Observed CLABSI Rates in 2009			NHSN CLABSI Rates for 2006-2008 (Standard Population)		
Location Type	**No. of CLABSIs**	**No. of Central line-days**	**CLABSI rate***	**No. of CLABSIs**	**No. of Central line-days**	**CLABSI rate***
Medical ICU	170	100,000	1.7	1,200	600,000	2.0
Surgical Ward	58	58,000	1.0	600	400,000	1.5

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170+58}{100{,}000 \times \left(\frac{2}{1{,}000}\right) + 58{,}000 \times \left(\frac{1.5}{1{,}000}\right)} = \frac{228}{200+87} = \frac{228}{287} = 0.79$$

95% CI = (0.628,0.989)

*defined as the number of CLABSIs per 1,000 central line-days

In the table above, there are two strata to illustrate risk adjustment by location type for which national data exist from NHSN. The SIR calculation is based on dividing the total number of observed CLABSI events by an "predicted" number using the CLABSI rates from the standard population. This "predicted" number, which can also be understood as a prediction or projection, is calculated by multiplying the national CLABSI rate from the standard population by the observed number of central line-days for each stratum. If the observed data represented a follow-up period, such as 2009, one would state that an SIR of 0.79 implies that there was a 21-percent reduction in CLABSIs overall for the nation, region, or facility.

The SIR concept and calculation is completely based on the underlying CLABSI rate data that exist across a potentially large group of strata. In the above example, many more rows of data for each patient location could be added for any facility, and rows of data for all facilities in any state. Always though, the type of patient location is mapped to the appropriate type of patient location from the standard population to maintain the risk adjustment (the patient locations are defined in the annual NHSN report). Thus, the SIR provides a single metric for performing comparisons rather than attempting to perform multiple comparisons across many strata utilizing rates, which makes the task cumbersome. For instance, if a hospital has 10-15 different patient-locations, it can be very difficult to get a sense of whether the overall performance is better or worse than desired; summarizing these data at the state level, where 30-40 different location types may be present, would be impossible. Given the underlying CLABSI rate data, one retains the option to perform comparisons within a particular set of strata, where observed rates may differ significantly from the standard populations. These types of more detailed comparisons could be very useful and necessary for identifying areas for more focused prevention efforts.

The National 5-year prevention target for CLABSIs outlined in the HHS Action Plan to Reduce HAIs (www.hhs.gov/ophs/initiatives/hai/actionplan/index.html) uses the concept of an SIR equal to 0.25 as the goal. That is, an SIR value based on the observed CLABSI rate data at the 5-year mark could be calculated using NHSN CLABSI rate data stratified by location type as the baseline to assess whether the 75-percent reduction goal was met. There are statistical methods that allow for calculation of CIs, hypothesis testing and graphical presentation using this HAI summary comparison metric called the SIR.

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Connecticut Central Line Associated Bloodstream (CLABSI) Infection Rates

Hospitalized patients, especially those who are critically ill, often require the placement of a medical device called a "central line" or "central venous catheter" to deliver fluids, medications, blood or nutrition directly into patients' large veins usually in the neck, chest, arm or groin. Placement of a central line can sometimes cause an infection called a Central Line Associated Bloodstream Infection (CLA-BSI). There are nationally recognized best practices to follow to minimize the risk of an infection developing from a central line. [link to SHEA/APIC/CDC fact sheet] Connecticut hospitals have been working in collaboration with the Department of Public Health, the Connecticut Hospital Association and Qualidigm to implement and follow these central line best practices to ensure the highest quality of care for patients in Connecticut hospitals.

All Connecticut acute care hospitals are required to monitor and report CLA-BSIs identified in patients receiving treatment in Intensive Care Units (ICU). These infections are identified and reported using standard definitions and methods as outlined by the Centers for Disease Control and Prevention (CDC). While the goal is always to have no infections (a rate of 0), not all CLA-BSIs can be prevented even when all best practices are followed.

The CDC reports CLA-BSI data by hospital type (teaching affiliation, size) and ICU type (medical, pediatric, medical-surgical, etc.) as ICUs are not all the same or care for the same type of patients. The CLA-BSI rates shown below use the Standardized Infection Ratio or "SIR" which allows for comparison of similar hospital and ICU types. The SIR measures how a single hospital's rate of infection compares to a "gold standard". In this case, the gold standard is the national rates reported by the CDC. The SIR compares the actual number of infections at each hospital to an expected number of infections based on hospitals and ICUs of the same type (bed size, teaching status, etc and type of ICU: medical, surgical, medical-surgical, etc.). An SIR of 1 indicates that a hospital's CLA-BSI rate is the same as the national average for that type of ICU. If a hospital has more or less infections than expected, statistical testing is performed to determine if that difference is meaningful (meaning the difference is due to more than random chance).

There are three categories that describe how a Connecticut hospital compares to the national averages using the SIR:

- The hospital can be "**In the Expected Range**", meaning their CLA-BSI rate is not significantly different than the national average.
- The hospital can be "**Better than Expected** ", meaning their CLA-BSI rate is significantly lower than the national average.
- The hospital can be "**Worse than Expected"**, meaning their CLA-BSI rate is significantly higher than the national average.

Results are presented for each type of ICU. There are many different types of ICUs, each with different types of patients. Patients requiring intensive care are usually sicker, require complex treatment and are at the highest risk for Healthcare Associated Infection (HAI). Each type of ICU differs in how frequently it uses central lines, which contributes to risk for infection; greater use of central lines means more opportunity for infections to occur in that ICU.

Keep in mind that a hospital's infection rate is just one factor to consider when choosing where to get your care. You are encouraged to discuss this information with your physician. The advice of your physician, the hospital's and specialist's experience with the type of care you need, and other factors unique to your situation should be considered as well. Be careful when drawing conclusions from this information. Small numbers of patients may distort reported performance.

CT SIR CLABSI Rates by Hospital ICU type and Teaching Status

CT Central Line Associated Bloodstream (CLABSI) Infection Rates in COMBINED MEDICAL/SURGICAL ICU – Major Teaching Hospitals
September 1, 2009 through December 31, 2009

HOSPITAL	CL Days	OBS	EXP	SIR	INTERPRETATION
Lower volume ICUs					
Hospital A	232	0	0.3	0	In the expected range
Hospital C	604	8	0.99	9	Worse than expected
Hospital E	355	3	0.8	3.6	In the expected range
Hospital G	107	0	0.3	0	In the expected range
Moderate volume ICUs					
Hospital B	4736	2	11	0.2	Better than expected
Hospital D	1446	3	2.1	1.4	In the expected range
Higher volume ICUs					
Hospital F	14149	34	31	1.1	In the expected range
Hospital H	3239	7	7.4	1	In the expected range

Lower volume ICUs - ICUs with fewer Central Line days (less than 1000 CL days)
Moderate volume ICUs - ICUs with 1000 to 10,000 Central Line days
Higher volume ICUs - ICUs with more Central Line days (over 10,000 CL days)

CT Central Line Associated Bloodstream (CLABSI) Infection Rates in COMBINED MEDICAL/SURGICAL ICU – All other Hospitals September 1, 2009 through December 31, 2009					
HOSPITAL	**CL Days**	**OBS**	**EXP**	**SIR**	**INTERPRETATION**
Hospital I					
Hospital J					
Hospital K					
Hospital L					
Hospital M					
Hospital N					
Hospital O					
Hospital P					
Hospital Q					
Hospital R					
Hospital S					
Hospital T					
Hospital U					

CT Central Line Associated Bloodstream (CLABSI) Infection Rates in MEDICAL ICU – Major Teaching Hospitals September 1, 2009 through December 31, 2009					
HOSPITAL	**CL Days**	**OBS**	**EXP**	**SIR**	**INTERPRETATION**
Hospital V					
Hospital W					
Hospital X					
Hospital Y					

CT Central Line Associated Bloodstream (CLABSI) Infection Rates in MEDICAL ICU – All other hospitals September 1, 2009 through December 31, 2009					
HOSPITAL	**CL Days**	**OBS**	**EXP**	**SIR**	**INTERPRETATION**
Hospital Z					
Hospital ZZ					

CT Central Line Associated Bloodstream (CLABSI) Infection Rates in PEDIATRIC: COMBINED MEDICAL/SURGICAL ICU September 1, 2009 through December 31, 2009					
HOSPITAL	**CL Days**	**OBS**	**EXP**	**SIR**	**INTERPRETATION**
Hospital AA					
Hospital BB					
Hospital CC					

NOTES:

CL = Central Line Days (sometimes referred to as “Device Days”)
These are the number of patients with one or more central lines of any type in an ICU. The numbers are collected daily, at the same time each day, during the month. The number of CL days is the denominator for calculating the Central Line Associated Blood Stream infection rate (CLABSI) and the number of central line related blood stream infections for the same period of time is the numerator. The number of central lines days reflects 1) the number of patients with central lines, 2) how long central lines are used or 3) a combination of both the number of patients with central lines and how long they are used for. ICUs with more patients and/or sicker patients generally have a larger number of central line days than smaller ICUs and/or ICUs with less sick patients
OBS = Observed (or actual) number of CLA-BSI.

EXP = Expected (or predicted) number of CLA-BSI. This is calculated from the CDC (NSHN [National Healthcare Safety Network) average infection rate for that specific ICU type and the hospital ICU's number of central line days.
Interpretation:

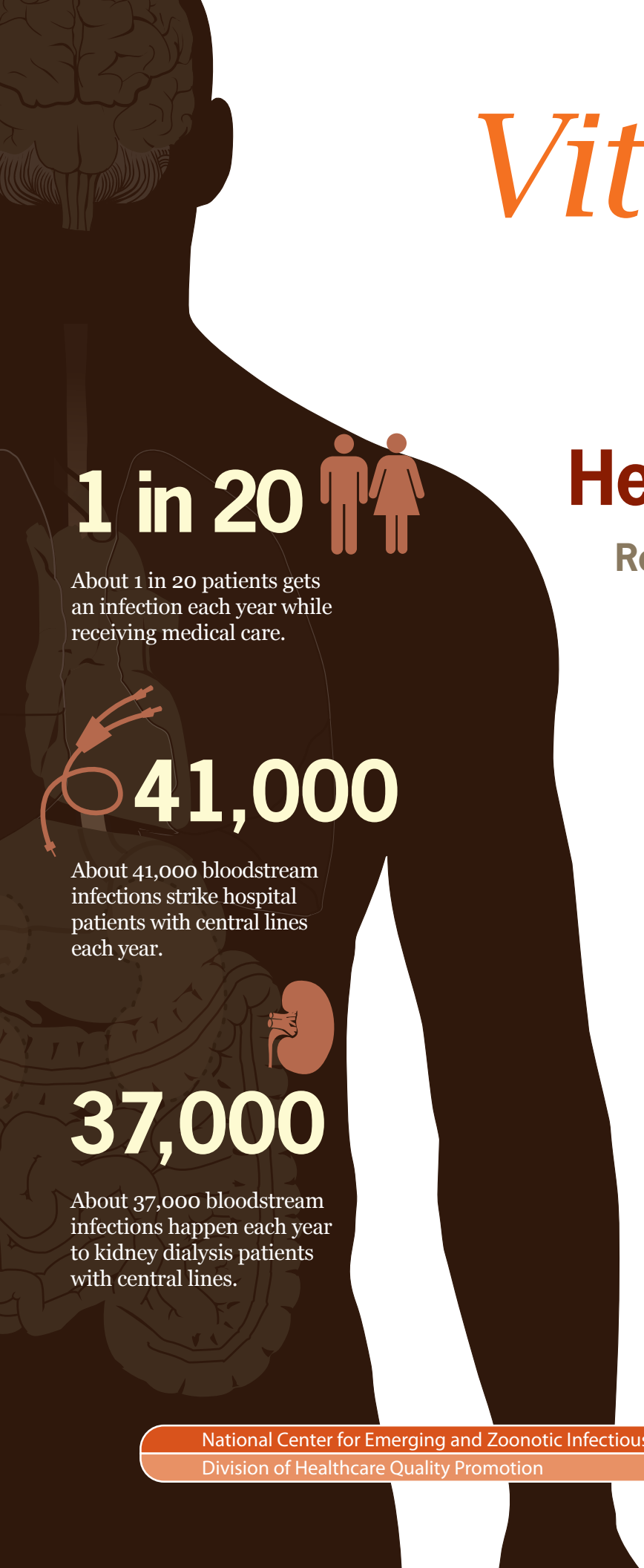
- In the expected range = not significantly different from the CDC (NHSN) average
- Better than expected = significantly lower than the CDC (NHSN) average
- Worse than expected = significantly higher than the CDC (NHSN) average

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

CDC Vitalsigns™
March 2011

Making Health Care Safer

Reducing bloodstream infections



1 in 20

About 1 in 20 patients gets an infection each year while receiving medical care.

41,000

About 41,000 bloodstream infections strike hospital patients with central lines each year.

37,000

About 37,000 bloodstream infections happen each year to kidney dialysis patients with central lines.

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 serious bloodstream infections. These infections can be deadly. Of patients who get a bloodstream infection from having a central line, up to 1 in 4 die. Bloodstream infections in patients with central lines are largely preventable when healthcare providers use CDC-recommended infection control steps. Medical professionals have reduced these infections in hospital intensive care unit (ICU) patients by 58% since 2001. Even so, many still occur in ICUs, in other parts of hospitals, and in outpatient care locations. In 2008, about 37,000 bloodstream infections occurred in hemodialysis* outpatients with central lines.

*Use of a machine to clean or filter the blood when kidneys no longer work.

Learn what you can do to reduce central line bloodstream infections.

→ See page 76

Want to learn more? Visit

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National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

Bloodstream Infections in Patients with Central Lines

Problem

A preventable and costly threat to patient safety.

1. Progress has been made in hospitals, but more needs to be done to protect patients from infection.

◇ New data show that 58% fewer bloodstream infections occurred in hospital ICU patients with central lines in 2009 than in 2001. In 2009, about 18,000 bloodstream infections occurred in ICU patients with central lines. About 23,000 more happened to patients who got treatment in other areas of the hospital.

◇ Overall, the decrease in infections saved up to 27,000 lives and is associated with $1.8B in excess medical costs. In 2009 alone, reducing infections saved about 3,000-6,000 lives and about $414 million in extra medical costs compared with 2001.

◇ Bloodstream infections from staph (*Staphylococcus aureus*) in ICU patients with central lines were reduced by 73%, more than from any other germ.

2. Many bloodstream infections occur in people who receive outpatient hemodialysis treatment through central lines.

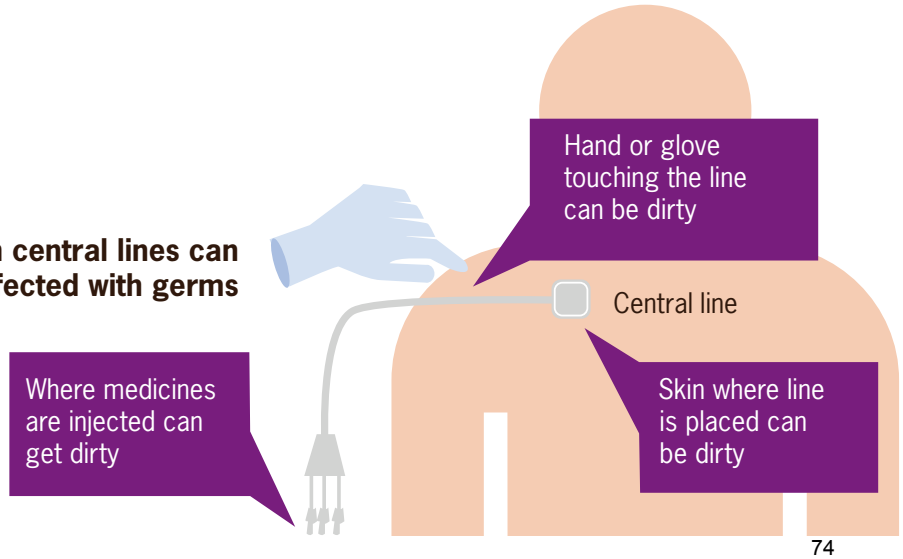
◇ About 350,000 people receive life-saving hemodialysis treatment at any given time. About 8 in 10 of these patients start treatment through a central line.

◇ Infections are one of the leading causes of hospitalization and death for patients on hemodialysis.

◇ About 37,000 bloodstream infections occurred in 2008 in hemodialysis patients with central lines.

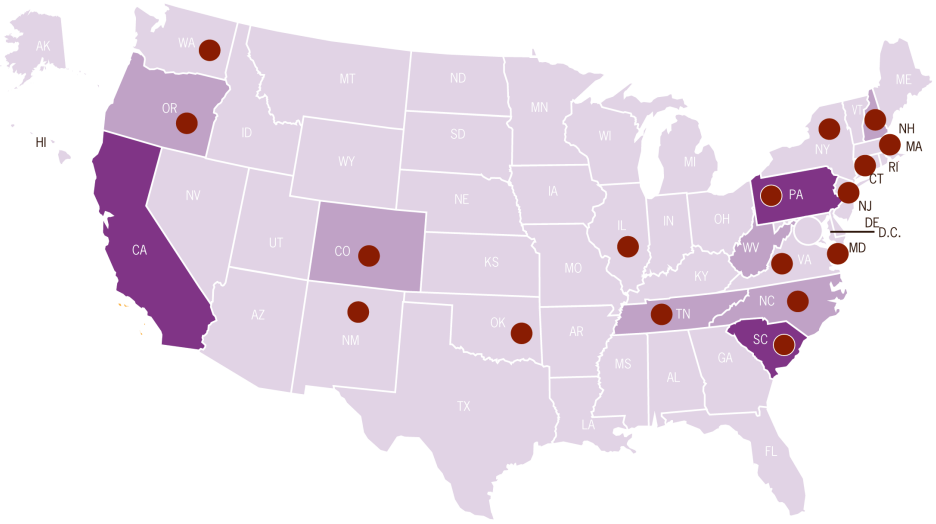
◇ A hemodialysis patient is 100 times more likely to get a bloodstream infection from MRSA than other people. MRSA is a type of staph that is resistant to certain antibiotics.

How patients with central lines can get infected with germs



US State Info

States where hospitals are tracking central line bloodstream infections using CDC's National Healthcare Safety Network



ICU only

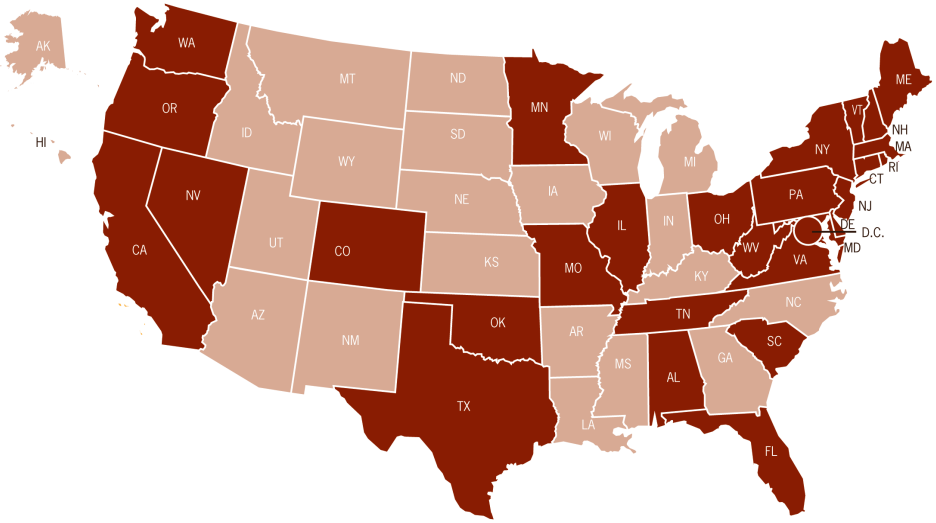
ICU and ward – Ward tracking less than or equal to 20%

ICU and ward – Ward tracking greater than or equal to 70%

State validating healthcare-associated infection data as of 2010

Validation means double checking data to ensure accurate infection tracking.

States required to publicly report some healthcare-associated infections



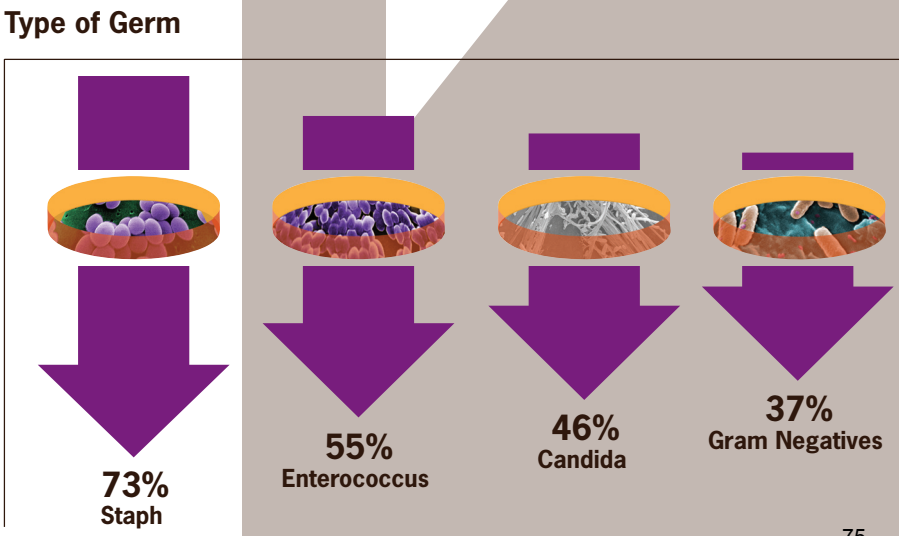
(Both maps as of 2011)

YES

NO

Decrease in bloodstream infections in patients with central lines, by germ

SOURCE: CDC's National Healthcare Safety Network, 2010



What Can Be Done

US Government can

◇ Develop and promote further guidelines and tools that increase widespread adoption of best practices to prevent infections.

◇ Engage partners to promote prevention.

◇ Apply the success in reducing central line bloodstream infections to other types of infections in health care. Identify which actions and germs cause the most problems and how to prevent them.

◇ Promote research of new methods to prevent bloodstream infections. Track and report progress toward reducing infections.

State governments can

◇ Join, start, or expand programs to keep bloodstream infections from happening in patients with central lines.

◇ Encourage facilities to join CDC's infection tracking system and validate their data (National Healthcare Safety Network, http://www.cdc.gov/NHSN).

◇ Join **On the CUSP: Stop BSI** program to develop a prevention roadmap and share best practices (http://www.onthecuspstophai.org).

◇ Build partnerships with and give technical support to hospitals, dialysis centers, and other medical care locations.

Hospitals, dialysis centers, and other medical care locations can

◇ Use CDC-recommended infection control guidelines every time a central line is put in and for central line care.

◇ Use central lines for hemodialysis only when other options are not available.

◇ Use data for action. Track infection rates and germ types with CDC's National Healthcare Safety Network (NHSN) to learn where and why infections are happening, target actions to stop them, and track progress.

◇ Recognize staff members or units that work hard to prevent central line infections.

◇ Join state and local health department prevention programs, quality improvement projects, and state-based partnerships to foster best practices.

Doctors and nurses can

◇ Use CDC-recommended infection control steps every time a central line is put in and used.

◇ Remove central lines as soon as they are no longer needed.

◇ Be sure that all people taking care of the patient follow the right steps.

◇ Speak up if someone is not following the right steps.

Patients and caregivers can

◇ Ask doctors and nurses to explain why the central line is needed, how long it will be in place, and which infection prevention methods they will use.

◇ Make sure that all healthcare providers clean their hands with soap and water or alcohol-based hand rub before and after caring for the patient.

◇ Inform a nurse or doctor if the area around the central line is sore or red, or if the bandage falls off or becomes wet or dirty.

www http://www.cdc.gov/vitalsigns

www http://www.cdc.gov/mmwr

CS220503B

For more information, please contact
Telephone: 1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov
Web: www.cdc.gov
Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Publication date: 03/01/2011

Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals

SHEA and the Infectious Diseases Society of America (IDSA) jointly published these science-based and practical recommendations for acute care hospitals for the prevention of common HAIs.

The document represents practical recommendations by the leading champions in infection prevention and healthcare quality improvement: SHEA, IDSA, AHA, APIC, and the Joint Commission. The Compendium is included in the Joint Commission's Patient Safety Goals.

The Compendium:

- Synthesizes best evidence for the prevention of surgical site infections, central line-associated bloodstream infections, catheter-associated urinary tract infections, ventilator-associated pneumonia, *Clostridium difficile*, and MRSA
- Highlights basic HAI prevention strategies plus advanced approaches for outbreak management and other special circumstances
- Recommends performance and accountability measures to apply to individuals and groups working to implement infection prevention practices

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- *Clostridium difficile*
- Methicillin-Resistant *Staphylococcus aureus* (MRSA)

The Compendium is available in English, Spanish, and Portuguese.

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SAVE THE DATE

TUESDAY JUNE 14, 2011

CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
HEALTHCARE ASSOCIATED INFECTIONS PROGRAM

HEALTH IMPROVEMENT PLAN PLANNING CONFERENCE

WHEN AND WHERE:

TUESDAY JUNE 14, 2011
Wesleyan University
Middletown, Connecticut
8:30 am to 4:30 pm

TOPICS WILL INCLUDE:

Setting Program &
Resources Priorities for the
Connecticut State HAI Plan

The November 19, 2010 Stakeholder Engagement Conference was an educational conference and opportunity to share information that will help us all plan and take action to prevent HAIs. The Health Improvement Plan (HIP) Planning Conference will be an opportunity to share your ideas and help direct future activities and resource allocations for our state's effort to combat HAI's.

The State of Connecticut will address the range of sectors and settings in the healthcare system (e.g. dialysis centers, long term care, community health centers, hospitals, ambulatory surgical centers, homecare and hospice).

For more information about the conference please visit our website www.ct.gov/dph/hai or call 860-509-7995 to speak to program staff.

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