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

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

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[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.

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[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)	Completed January 2008
	☐ ☐	☐ ☐	ii. *Clostridium difficile* Infections (CDI) iii. Catheter-associated Urinary Tract Infections (CAUTI)	
	☒	☒	iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections	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).	Begun, January 2008
	☒	☒	ii. Establish baseline measurements for prevention targets	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/disch arge 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.