North Carolina State Plan for Prevention of Healthcare-Associated Infections (HAI)

2010–2015

Prepared by:

North Carolina Department of Health and Human Services
Division of Public Health, Epidemiology Section
Communicable Disease Branch,
Healthcare-Associated Infections Prevention Program

North Carolina Healthcare-Associated Infections State Plan: Introduction

Healthcare-associated infections (HAIs) are infections that patients acquire within a healthcare setting while receiving treatment for other conditions. These infections can be devastating and even deadly. Although most information about HAIs has come from hospital settings such as intensive care units (ICUs) and special care units, HAIs also occur in long-term care facilities, outpatient surgery centers, dialysis centers, and other settings.

The US Centers for Disease Control and Prevention (CDC) estimates that 5 percent of all hospital admissions result in HAIs, culminating in 1.7 million infections and 99,000 deaths each year[1] as well as $28–33 billion in excess costs[2]. There are no statewide HAI morbidity and mortality statistics available for North Carolina, but it was recently estimated that HAIs in North Carolina cost $281–779 million dollars each year in direct expenditures[3].

As our ability to prevent HAIs grows, these infections are increasingly unacceptable. For the past several years, many North Carolina healthcare facilities and organizations focusing on healthcare quality have worked to track and prevent HAIs. These efforts have led to substantial reductions in many facilities. Despite these successes, HAIs continue to occur in facilities statewide.

Acknowledging the need for a coordinated, statewide response to HAI, in April 2008 the NC General Assembly established the Joint Study Committee on Hospital Infection Control and Disclosure. In 2009, the Committee recommended to the General Assembly that North Carolina implement a mandatory, state-operated, statewide HAI surveillance and reporting system operating within the Department of Health and Human Services, Division of Public Health (DPH). In early 2010, with funding from the 2009 American Recovery and Reinvestment Act (ARRA), DPH established the statewide HAI Prevention Program and convened the North Carolina HAI Advisory Group as a forum to develop the North Carolina State Plan for Healthcare-Associated Infections.

The HAI Advisory Group has collaborated with the CDC to identify the most important components of the statewide response to HAIs. The product of this collaboration is a plan that focuses on the following four key areas:

1. Establishment of state HAI program infrastructure;
2. Surveillance and response;
3. Prevention; and
4. Evaluation and communication.

Each of these four areas is described in the sections below.

1. Establishment of the State HAI Program Infrastructure

Until the 2009 recommendation by the North Carolina Joint Study Committee on Hospital Infection Control Disclosure, no centralized HAI infrastructure existed in North Carolina. With the advent of this recommendation and with funding from the American Recovery and Reinvestment Act, DPH began the process of establishing an infrastructure to directly address healthcare-associated infections at a statewide level. This process included four key stages, namely: convening the state HAI Advisory Group; designating specific HAI targets; formally establishing the NC state HAI prevention program; and designating an infrastructure for reporting of HAI.

HAI Advisory Group: In 2009 and early 2010, DPH extended invitations to stakeholders from state and local government, infection control and healthcare quality organizations, laboratories, academic centers, regulatory agencies, and to consumer advocates to form the HAI Advisory Group. Appendix A lists the current group membership. The primary responsibilities of the HAI Advisory Group are to direct the establishment of the State Plan and to serve as consultants to DPH during rollout of HAI activities.

HAI Prevention Program: The Communicable Disease Branch of DPH includes a medical director, HAI program coordinator / nurse consultant, an HAI epidemiologist and an HAI administrative assistant. Together, this team is responsible for directing state-level HAI activities and working with local and state partners.

Initial HAI targets: According to national estimates, approximately 83 percent of HAIs are attributable to four categories of device-associated infections: surgical site infections (22%), central line-associated bloodstream infections (14%), ventilator-associated pneumonias (15%), and catheter-associated urinary tract infections (32%)[1]. The HAI advisory group chose to focus state surveillance and prevention efforts on two initial targets:

1. Central line-associated bloodstream infections (CLABSI), and
2. Catheter-associated urinary tract infections (CAUTI).

These were selected because of the high mortality associated with CLABSI and the high number of cases associated with CAUTI. These two categories of HAI result in an estimated $178,000–$578,000 in direct costs for the average North Carolina hospital each year[3]. The NC HAI Prevention Program will attempt to align future reporting requirements from Centers for Medicaid and Medicare Services (CMS) in order to reduce the reporting burden on healthcare facilities.

Infrastructure for HAI reporting: The National Healthcare Safety Network (NHSN) has been adopted as the state HAI surveillance reporting platform. NHSN is a CDC-operated surveillance system that has become the gold standard for HAI surveillance and reporting in the United States. NHSN is easily accessible by healthcare facilities, has no additional user fees, and is used by other states currently required to report HAIs. NHSN also provides support and training modules for the infection preventionists and hospital epidemiologists who will be using the system.

2. Surveillance & Response

Timely and accurate monitoring (surveillance) is necessary to track progress towards HAI elimination. Public health surveillance is crucial to determine which prevention programs are succeeding and where more work is needed. Reporting of HAIs is already mandated in the majority of states and is now required for all hospitals nationwide that participate in the Centers for Medicare & Medicaid Services (CMS) Inpatient Prospective Payment System.

The NC HAI Advisory Group supports mandatory reporting of selected HAIs by healthcare facilities. (For more information on the legislative language being proposed, please see Appendix B). The state HAI program is working with all hospitals statewide to encourage voluntary reporting of specific HAIs, beginning with central line-associated bloodstream infections (CLABSI). This voluntary process allows the HAI Prevention Program to track, evaluate and determine a baseline rate for CLABSI in North Carolina and will allow healthcare facilities to become familiar with the process of reporting through NHSN.

Identify targets for HAI surveillance prioritization: The two targets that have been identified for prioritization by the state HAI Advisory Group are:

1. *Central line-associated bloodstream infections (CLABSI)*: CLABSIs were selected because of the high death rate associated with this particular category of infections.
2. *Catheter-associated urinary tract infections (CAUTI)*: CAUTIs were selected because of the high frequency of events associated with this particular category of infections.

Currently, only limited information is available regarding the baseline rates of HAI in North Carolina. Information obtained through the NC Quality Center indicates that the rate of CLABSI among those hospitals participating in their CLABSI prevention collaborative was 1.274 infections per 1000 central line days during January–September 2010; this estimate is 32 percent below the expected national average[4].

Provide training and support for facilities reporting HAIs: The North Carolina Statewide Program for Infection Control and Epidemiology (NC SPICE) has a state mandate to provide infection control

education for healthcare providers throughout the state. In partnership with DPH, NC SPICE developed a two-part webinar which helps healthcare facilities learn how to start reporting through NHSN. A rebroadcast of the webinar is available through the NC SPICE website (http://www.unc.edu/depts/spice/). Additional training and ongoing support for NHSN users is also available from DPH, the North Carolina Quality Center for Hospital Quality and Patient Safety (NC Quality Center) and the Division of Healthcare Quality and Promotion (DHQP) at CDC.

Perform validation of HAI data: Validation of data entered into NHSN is a crucial component of accurate statewide surveillance and reporting of HAI. In partnership with DPH, NC SPICE is performing a two-year quality assurance project on data entered into NHSN by the 32 facilities that were reporting CLABSI and CAUTI to NHSN as of January 2010. Ongoing validation of HAI data reported through NHSN will be the responsibility of the NC HAI Prevention Program.

Develop tailored reports on HAI: DPH will issue statewide reports on HAI to inform consumers and allow healthcare providers and government agencies to monitor progress towards eliminating HAIs. HAI reports must be clear and must allow for accurate comparisons across different types of facilities. A subgroup of the HAI Advisory Group has been established to guide the content of statewide reports on HAI.

Improve outbreak detection and investigation: For many years, DPH has worked with local health departments to investigate and control outbreaks in long-term care facilities and other healthcare settings. Recent investigations have included hepatitis B, influenza and norovirus outbreaks in long-term facilities and hepatitis C transmission in a cardiology clinic. These investigations have led to important practice and policy changes, including a strengthening of rules governing infection control in healthcare settings and improved coordination with the NC Division of Health Service Regulation and other key partners.

The HAI Advisory Group established a subgroup specifically to address issues surrounding outbreak detection and response in healthcare facilities. This group recommended that outbreaks originating in healthcare facilities should be made mandatorily reportable to local health directors in situations where these outbreaks represent a threat to the health of the broader community. In order to respond to outbreaks once they have been reported, NC-DPH is providing training to local health department staff on outbreak investigation methods, as well as ongoing support during every phase of the investigation and response.

Enhance surveillance and detection of HAI in non-hospital settings: NHSN is currently enabled to receive data from non-hospital healthcare settings. While HAI surveillance in North Carolina will initially focus on hospitals, it is anticipated that non-hospital settings will begin reporting in the future. DPH will work with local health departments to strengthen local capacity to investigate and respond to disease outbreaks in non-hospital settings and will provide direct assistance when necessary.

3. Prevention

Prevention and eventual elimination of HAIs is the ultimate goal of the NC HAI Prevention Program. Several organizations currently offer guidelines and best practices for the prevention of HAIs. North Carolina will emphasize the US Health and Human Services Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendations as the gold standard for prevention of HAIs in all healthcare settings. Additionally, adherence to supplementary guidelines from the Centers for Disease Control and Prevention (CDC), Society of Healthcare Epidemiology of America (SHEA), and the Association for Professionals in Infection Control and Epidemiology (APIC) will be promoted.

Promote state HAI prevention collaboratives: Collaborative prevention projects involving multiple healthcare facilities (known as "collaboratives") have been a successful model for HAI prevention in North Carolina. Several state organizations have developed expertise in their development and implementation. In March 2010, the NC Quality Center, in collaboration with DPH and NC SPICE, began a prevention collaborative to reduce CAUTI in acute care settings with an emphasis on enrolling critical access hospitals. Currently, the CAUTI prevention collaborative has 21 hospitals enrolled.

In addition to the establishment of the CAUTI prevention collaborative, the NC Quality Center is continuing an existing collaborative on CLABSI with 27 hospitals participating. Other CLABSI prevention collaboratives in the state include the Perinatal Quality Collaborative of North Carolina (PQCNC), which is continuing its prevention efforts in 13 pediatric and neonatal care units across the state. The NC HAI Prevention Program will continue to work with statewide partners to expand current collaboratives and develop additional programs to fit the growing HAI prevention needs of North Carolina. As part of the 5 year plan to reduce HAI in North Carolina, prevention activities are being considered for nonhospital settings such as long-term–care facilities and ambulatory surgical centers.

Improve compliance with HICPAC recommendations: HICPAC is a federal advisory committee of 14 independent infection control experts which issues recommendations on the prevention of HAI. Recommendations from HICPAC can be accessed on the CDC website at: http://www.cdc.gov/hicpac/pubs.html. DPH will work with statewide partners to promote HICPAC guidelines through prevention collaboratives as well as through direct communication.

1. Recommendations for prevention of CLABSI can be accessed at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5110a1.htm

2. Recommendations for prevention of CAUTI can be accessed at: http://www.cdc.gov/hicpac/pdf/CAUTI/CAUTIguideline2009final.pdf

Improve compliance with state infection prevention rules: The HAI Prevention Program will work with partners to improve compliance with the North Carolina Rule (10A NCAC 41A .0206), which requires that every healthcare facility where invasive procedures are performed must have a written infection control plan overseen by a dedicated staff member who has completed a state approved course in infection control. Currently, NC SPICE has been approved by the NC Department of Health and Human Services to offer infection prevention courses to staff in various types of healthcare settings. More information on NC SPICE courses is available through the NC SPICE website (http://www.unc.edu/depts/spice/).

Establish collaboratives to prevent HAIs in nonhospital settings: As part of the 5 year plan to reduce HAI in North Carolina, prevention activities are being planned for nonhospital settings such as long-term–care facilities and ambulatory surgical centers.

4. Evaluation & Communication

Continuous evaluation and communication of findings will be the basis for decision-making and action. The state HAI Prevention Program and state HAI Advisory Group recognize that evaluation and communication will allow learning and ongoing improvement to occur and that routine, practical evaluation will inform strategies for the prevention and control of HAIs in North Carolina.

Provide consumers access to useful healthcare quality measures: The format for distributing useful healthcare quality information is currently being developed by the Reporting & Surveillance Sub-Group of the HAI Advisory Group. The HAI Prevention Program will make HAI reports and other information relating to surveillance and prevention of HAIs available to the public on the DPH website.

Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders' needs: Under the direction of the State Epidemiologist, the Communicable Disease Branch, and the State HAI Coordinator, a communication plan will be developed detailing the state's priorities and progress. This plan will be made available for public review.

Conduct ongoing assessment and evaluation HAI surveillance of the state HAI program: NC DPH will conduct a formal surveillance system evaluation to assess if surveillance activities are meeting the needs of consumers and partners.

References

1. Klevens RM, Edwards J, Richards C, Horan T, Gaynes R, Pollock D, Cardo D. (2007) Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002. *Public Health Reports.* Vol. 122:160-166.

2. Scott RD. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention (2009). Internal Report. Division of Healthcare Quality Promotion, National Center for Preparedness, Detection, and Control of Infectious Diseases, Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention, February 2009.

3. Estimates for Cost of Healthcare-Associated Infections (HAIs) in North Carolina Acute Care Hospitals: Report from the Economic Impact Subgroup of the North Carolina Department of Public Health HAI Advisory Group. (2011) Unpublished Internal Report, NC-DHHS.

4. Benchmark report for CLABSI data through September 2010: Unpublished data. (2011) North Carolina System for Hospital Infection Management. North Carolina Center for Hospital Quality and Patient Safety. North Carolina Hospital Association.

The official N.C. State Plan and timeline follow.

For more information on the North Carolina State Plan for the Prevention of Healthcare-Associated Infections, please visit the CDC website at www.cdc.gov/HAI/stateplans/state-hai-plans/nc.html.

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. Please select areas for development or enhancement of state HAI surveillance, prevention and control efforts.

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

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation and Current Status
Level I	☒	☐	1. Establish 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))	*January 2010* Completed
	☒	☐ ii.	ii. Identify specific HAI prevention targets consistent with HHS priorities	*September 2009* Completed
			NC Division of Public Health hosted the first meeting of the STATE HAI ADVISORY GROUP on January 14, 2010. The State Health Director and State Epidemiologist together with key partners - the NC Center for Hospital Quality and Patient Safety (NC Quality Center) and the Statewide Program for Infection Control and Epidemiology (SPICE) - extended invitations to selected state legislators, as well as representatives from the NC Chapter of the Association for Professionals in Infection Control and Epidemiology (APIC-NC), The Society for Healthcare Epidemiology of America(SHEA), the NC Association of Local Health Directors, Duke Infection Control Outreach Network (DICON), The Carolinas Center for Medical Excellence (CCME), NC	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation and Current Status
			Division of Health Service Regulation, consumer advocates and others. The Advisory Group held conference calls on a monthly basis from February 2010 thru September 2010 to review and revise the STATE HAI Plan. The Advisory Group has been expanded to include representation from Indian Health Services, Federally Funded Health Care, Blue Cross Blue Shield of North Carolina, NC Medical Society, Perinatal Quality Collaborative of NC, and the NC Laboratory Response Forum. Sub-Groups were formed to examine questions surrounding Laboratory Surveillance, Economic Impact of HAI, Reporting of Surveillance Data and Outbreak Reporting. *Advisory Group conference calls will continue on a quarterly basis, or more often as needed* *NC DPH and its partners have elected to focus on two HAI Prevention targets: Central Line-Associated Bloodstream Infections (CLABSI) and Catheter Associated Urinary Tract Infections (CAUTI). The CLABSI collaborative is not funded by ARRA; however the NC Quality Center will make available to NC DPH CLABSI data from the North Carolina System for Hospital Infections Management (NCSHIM) for analysis. The CAUTI collaborative is supported entirely by ARRA funds.*	
	☒	☐	2. Establish an HAI surveillance prevention and control program i. Designate a State HAI Prevention Coordinator	*January 2010* **Completed**
	☐	☒	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)	*March 2011* **Completed**
			A HAI Prevention Coordinator was hired and started work during March 2010. Primary responsibilities for this position include integration, collaboration, and capacity building; reporting, detection, response and surveillance; prevention; evaluation, oversight and communication. The State HAI Coordinator (a Nurse Epidemiologist/Infection Preventionist) receives programmatic direction from the State Advisory Group, the Medical Consultation Unit's Medical director, and the State epidemiologist. *In addition to the HAI Prevention Coordinator, a Public Health Epidemiologist*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation and Current Status
			and an administrative assistant were hired and began work during March 2010. These three DPH staff positions will work closely with its key partners *Recommendations for permanent infrastructure for HAI surveillance and prevention will be made at the end of the ARRA HAI project.*	
	☒	☐	3. Integrate laboratory activities with HAI surveillance, prevention and control efforts. i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, HL7 messaging of laboratory results)	*December 2011* **Ongoing**

			Selected laboratory activities for HAI are already part of NC DPH surveillance.
			
			The Laboratory Surveillance Sub-Group recommended that the Advisory Group should: 1) investigate how expand electronic reporting by laboratories and 2) develop a statewide antibiogram to determine statewide resistance patterns.
			
			NC DPH supports the integration of laboratory activities for HAI surveillance, prevention, and control, but does not intend to engage in laboratory surveillance except in the following circumstances:
			    a. "Drug-Bug pairing"
			    b. Reference testing through the NC State Laboratory of Public Health
			    c. Collaboration with other states for typing.	

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)	*September 2009* **Ongoing**
			ARRA funding offers an opportunity for NC DPH to better coordinate surveillance, prevention and control of HAI. The most immediate gains stem from collaboration with the North Carolina Hospital Association (NCHA) and	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation and Current Status
			it's North Carolina Center for Hospital Quality and patient Safety (NC Quality Center) and the Statewide Program for Infection Control and Epidemiology (SPICE) at the University of North Carolina at Chapel Hill. • *The NC Quality Center brings expertise and experience in educational, collaborative and performance measurement programs and services.* • *SPICE is charged with investigating and controlling healthcare-associated infections in hospitals, long-term care facilities, and other medical facilities in the state. The program provides training, education, and consultation to hospitals, long-term care facilities, and other medical facilities to prevent and control healthcare-associated infections.* • *The Epidemiology Section of the NC Division of Public Health and the North Carolina Division of Health Services Regulation worked together during 2008-2009 to do enhanced surveys of ambulatory surgical centers. Additional training in infection prevention practices was obtained for the surveyors through SPICE. Long Term Care surveyors and hospital surveyors have also received training in infection prevention practices and what they should be looking for when they enter a facility. Because of this collaboration and the findings of the investigation of an outbreak of Hepatitis C in an outpatient facility changes were made to the Administrative Code rule 10A NCAC 41A .0206 Infection Prevention – Health Care Settings, including in particular Safe Injection Practices among practices that should be covered in a required course on Infection Control. This rule includes other requirements such as implementing a written infection control policy in each health care organization performing invasive procedures, educating staff in infection prevention procedures, and designating one on-site staff member to direct infection prevention activities in each non-contiguous facility.*	
	☒	☐	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 implementations 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	*September 2009* Ongoing

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation and Current Status
			laboratory reporting (ELR). Facilitating use of standards-based solutions for external reporting also 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.	
			• *NC DPH and the Advisory Group supports standards-based formats.* • *NC DPH and the Advisory Group supports the use of the National Healthcare Safety Network (NHSN) as a platform for voluntary reporting of HAI. Currently 28 of NC's 124 hospitals report data voluntarily to NHSN.* • *NC DPH has created a state users group within NHSN and is in the process of determining how best to request that healthcare facilities share data for as long as reporting is not mandatory (NC has a total of 34 registered NHSN users, but not all users submit data). Advantages to using NHSN include the availability of CDC training modules and standardization within NC and across states, allowing comparison of infection rates. Another advantage is that the Centers for Medicare & Medicaid Services recently released a new rule that lays out HAI reporting requirements for Medicare eligible hospitals that participate in CMS' pay-for-reporting program. More than 3,500 hospitals will soon use CDC's National Healthcare Safety Network (NHSN) to report central line-associated bloodstream infection (CLABSI) data to CMS.* • *NC DPH recently implemented the NC Electronic Disease Surveillance System (NC EDSS) that incorporates the capacity for Electronic Laboratory Reporting.* *Note: NC believes that surveillance is an important component of an effective infection prevention program; however, as per the APIC Position Paper, "manual methods to identify potential HAIs by laboratory results, chart reviews, data entry and looking for associations can be inefficient, labor intensive, and error prone." NC intends to move forward with standards-based solutions being careful not to "divert efforts away from prevention activities."*	

2. Surveillance, Detection, Reporting, and Response

Timely and accurate monitoring remains necessary to gauge progress towards HAI elimination. 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. This, 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 HHS 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 (Appendix 1):

- 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. Please choose items to include in your plan at the planning levels desired.

[1] Thacker SB, Berkelman RL. Public health surveillance in the United States. Epidemiol Rev 1088;10:164-90.

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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 CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments	*Pre- Existing activities with ongoing development*
	☒	☐	ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs.	
	☒	☐	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	
	☒	☐	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)	
			• *Healthcare institutions have traditionally managed HAIs as a quality measure and have been responsible for surveillance, prevention and control. Recently, an outbreak of HCV infection led to legislation in NC requiring every health care organization performing invasive procedures to designate a staff member to receive approved training in infection control, have a written policy on infection control, and monitor compliance with this policy.* ◦ *The HAI Advisory Group developed a sub-group to discuss this issue and how to best address outbreak reporting in the state of North Carolina. The sub-group met on May 10, 2010 and determined that outbreaks in healthcare facilities should be made a part of mandatory reporting to the local health department director. The director will determine after discussion with the facility and if necessary the Division, if assistance is needed in*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			the outbreak investigation. ○ *Because of the above decision to make healthcare associated outbreaks reportable, changes are needed in NC Statute and in NC Administrative Code rules, to include language commensurate to that decision. Work is currently underway to propose these changes.* ○ *NC provides training to local health department staff on outbreak investigations through a variety of educational opportunities including Preparedness Training and a required 60 hour Communicable Disease Course for all local health department nurses in charge of communicable disease control. If it is determined that a healthcare facility needs assistance with an outbreak investigation the local health director may request that the Communicable Disease Nurse be the one to provide the assistance.* • *NC DPH has an established practice of disclosing information to the public on a need-to-know basis. Sometimes this means person-to person, institutional, or community disclosure.* • *The NC Electronic Disease Surveillance System gives NC DPH more ability to analyze surveillance data in real-time. The system is new, however, and the reporting and analysis functionality is still under development.* • *Use of NHSN will also help us analyze HAI surveillance data.* • *The NC Division of Public Health worked with hospitals and the NC Hospital Association to install a public health surveillance system called Investigative Monitoring Capability in the larger facilities electing to be so equipped. It allows authorized public health officials to review the Electronic Health Record of patients of interest, usually identified through the syndromic surveillance system NC DETECT. IMC could be leveraged to have a role in HAI surveillance.*	
	☐	☒	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	*December 2011* Ongoing
			Refer to Section 1Develop or Enhance HAI program infrastructure 3i for information concerning HAI Advisory Sub-Group addressing laboratory issues. Of note, currently VISA/VRSA infections are reportable in NC.	

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)
				December 2011
				Ongoing

			Refer to Section 2 Surveillance, Detection, Reporting and Response 1i for information concerning HAI Advisory Sub-Group addressing outbreak issues. NC DPH does use the NC Health Alert Network (HAN) System to report outbreaks rapidly. NC HAN has approximately 900 active users. Local/state health department staff is the primary users, but 81 of NC's 124 hospitals (161 users) also are users of this secure system.	

	☒ ☐ ☒ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐	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
			   v. Surgical Site Infections (SSI)
			   vi. Ventilator-associated Pneumonia (VAP)
				September 2009
				Completed

			HAI Advisory Group has selected Central Line-associated Bloodstream Infections (CLABSI) and Catheter-associated Urinary Tract Infections (CAUTI) as the priority prevention targets for surveillance in North Carolina. This allows NC DPH, the NC Quality	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Center, and SPICE to review data from two prevention collaboratives.	
	☐ ☐	☒ ☒	5. Adopt national standards for data and technology to track HAIs (e.g., NHSN). 　　i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1). 　　ii. Establish baseline measurements for prevention targets	*December 2011* **Completed**
			NC DPH and its partners have chosen the following metrics to measure progress towards the national goals: 　• *CAUTI 2 (# of symptomatic UTI per 1000 urinary catheter days)* 　• *CLABSI 1 (CLABSI per 1000 device days by ICUs)* *The HAI Advisory Group's stated goals for NC are aligned with the national targets for CAUTI and CLABSI.* *As of October 2010 - The NC Quality Center has determined the collaboratives baseline CAUTI rate to be 4.11 per 1,000 catheter days [Apr-Jun 2010]. A 25% reduction would result in a target of 3.08. This should be obtained while maintaining or lowering the catheter utilization ratio (catheter days/total patient days).*	
	☒	☐	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	*December 2011* **Ongoing**
			SPICE provides technical assistance to hospital staff that wish to use NHSN as a reporting platform for ARRA funded HAI activities. SPICE provides information on NHSN to participants in their Infection Control Training Programs. They have also developed a webinar that was made available to all Infection Preventionists in the state on August 30, 2010. The webinar is in 2 parts: Getting Started in NHSN – The Enrollment Process and NHSN Enrollment Administrative Set-up. Rebroadcast of the Webinar is available through the SPICE website.	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			The NC Quality Center will continue to support training for its own voluntary secure surveillance system (NC System for Hospital Infection Measurement, NC SHIM) and will assist in training staff in hospitals that transition to NHSN. *Routine training calls and web based educational programs are available to participants selecting NHSN, thus relieving NC from having to develop and hold NHSN continuing education sessions.*	
	☒	☐	7. Develop tailored reports of data analyses for state or region prepared by state personnel	*December 2011* Ongoing
			NC DPH has hired a PH Epidemiologist to specifically address reporting. Meaningful, tailored reports will be the greatest challenge for state personnel. These reports must inform consumers and assist healthcare providers and government agencies to effect positive change through prevention and control activities without evoking concerns about inappropriate or unfair comparisons. CDC researchers and industry analysts will assist the PH Epidemiologist. A HAI Sub-Group on Reporting of Surveillance Data has been formed and will help to determine what types of metrics will be presented in tailored reports (risk stratification will also be looked at by the sub-group).	
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	*January 2010 through December 2011* Ongoing
	☒	☐	i. Develop a validation plan	
	☐	☒	ii. Pilot test validation methods in a sample of healthcare facilities	
	☐	☒	iii. Modify validation plan and methods in accordance with findings from pilot project	
	☐	☒	iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance	
	☐	☒	v. Analyze and report validation findings	
	☐	☒	vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			shortcomings detected	
			SPICE is currently conducting validation studies on CLABSI and CAUTI data entered into NHSN by NC hospitals. Specifically, staff is determining the sensitivity and specificity of the data provided to NHSN.	
			To ensure that the NHSN definitions are appropriately applied IPs hired to perform validation duties have received intensive training which includes didactics and chart review at UNC Health Care/UNC.	
			The following methods are being used to achieve the above aims:	
			HAIs to be evaluated: CLABSI, CA-symptomatic UTI	
			Sites: 23 participating NHSN hospitals	
			Time frame: 2 years (sampling frame, each hospital sampled 4x). Study will begin 1 January 2010 and end 31 December 2011.	
			Age: Only adult patients will be evaluated (i.e., age >18 years of age)	
			Hospital sampling: Hospitals will be sampled during a six month period of time for infections in the previous 6 months	
			Selection of Cases (patients reported to NHSN and/or IC Committee meeting NHSN criteria):	
			1. Once list is provided (by facility IP) of all patients with reported CA-UTI, randomly select up to 25 (if that number is available and if there is a total of $\geq$50 patients at this facility with a positive culture); randomly select up to 20 (if that number is available and if there is a total of <50 patients at this facility with a positive culture). Limit only to inpatients >18 years of age.	
			2. Once list is provided (by facility IP) of all patients with reported CLA-BSI, randomly select up to 25 (if that number is available and if there is a total of $\geq$50 patients at this facility with a positive culture); randomly select up to 20 (if that number is available and if there is a total of <50 patients at this facility with a positive culture). Limit only to inpatients >18 years of age.	
			3. Denominator data: note the TOTAL number of cases (CAUTI, CL-BSI) on the selection list.	
			Selection of Controls (patients with a positive culture):	
			1. IP will request from lab a list of all patients with a positive urine culture ($\geq$10^3 CFU/mL, criteria includes: date of admission, location of surveillance) obtained during the previous 6 months (i.e., Phase I = 7/1/09-12/31/09) and	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			exclude patients with a positive culture obtained in ED. Limit only to inpatients >18 years of age. 2. *IP will request from lab a list of all patients with a positive blood culture (criteria includes: date of admission, location of surveillance) obtained during the previous 6 months (i.e., Phase I = 7/1/09-12/31/09) and exclude patients with a positive culture obtained in ED. Limit only to inpatients >18 years of age.* 3. *Once this list of positive urine cultures is obtained, randomly select up to 25 (if that number is available and if there is a total of >50 patients at this facility with a positive culture); randomly select up to 20 (if that number is available and if there is a total of <50 patients at this facility with a positive culture; even if there are <30 cases). Limit only to inpatients >18 years of age.* *NOTE: Controls should be selected ONLY from those units where surveillance is being done.* 4. *Once this list of positive blood cultures is obtained, randomly select up to 25 (if that number is available and if there is a total of >50 patients at this facility with a positive culture); randomly select up to 20 (if that number is available and if there is a total of <50 patients at this facility with a positive culture; even if there are <30 cases). Limit only to inpatients >18 years of age.* *NOTE: Controls should be selected ONLY from those units where surveillance is being done.* 5. *Denominator data: note the TOTAL number of controls (CAUTI, CL-BSI) on the selection list.* *Selection of charts for abstraction (Abstraction List CA-UTI; Abstraction List CLA-BSI)* *NOTE: the number of charts to be listed on the Abstraction List will depend on the number of patients with a positive culture (<50: 40 charts on abstraction list, >50: 50 charts on abstraction list).* 1. *Once the 2 selection lists (cases and controls) for each site are completed by randomization, eliminate any duplicate charts, unless the duplicate charts have different dates of culture* or admission.* 2. *Create the abstraction list by mixing the 2 selection lists. If there are less than 20 cases, add more controls so that the abstraction list has at least 30 total charts.* 3. *On the final abstraction list (electronic and hard copy), please note which charts were from the reported cases*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			(place an X in the column "Cases"). This information needs to be noted in the data but will be deleted in the lists sent to the blinded chart abstractors. 4. *The total number of cases and positive cultures for each site (denominator data) should be recorded on the Abstraction list.* *Data collected during the validation study will be analyzed to determine if healthcare facilities are using the correct CDC definitions for CLABSI and CAUTI and if all pertinent information is being entered into NSHN. This analysis will be used to determine if additional education is needed for the Infection Preventionist concerning definition use and appropriate entering of data.* *The state HAI team in collaboration with NC SPICE will review the results from this project once available and determine a future plan for data validation system.*	
	☐	☒	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	*December 2011* **Ongoing**
			As exemplified in several recent hepatitis outbreaks in health institutions associated with unsafe injection or blood glucose monitoring practices, response to HAI is multifaceted. *The North Carolina Division of Public Health and the North Carolina Division of Health Services Regulation are working to define parameters for interagency notification regarding infection control breaches (e.g., syringe reuse) and suspect cases/clusters, and to clarify roles and responsibilities for investigation, response, and communication.* *The NC Health Alert Network (NC HAN) also provides a mechanism for statewide secure notification of outbreaks. It is widely used among state, regional, and local public health users, but hospitals also review and contribute.* *Discussion has been opened with Dr. Lana Deyneka (Epidemiologist supervising the Public Health Epidemiologist Program) to determine*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			the future role of hospital-based public health epidemiologists in reporting of healthcare-associated infection outbreaks. *The HAI Advisory Group developed a sub-group to discuss this issue and how to best address outbreak reporting in the state of North Carolina. The sub-group determined that outbreaks of communicable disease occurring in a hospital that could be transmitted outside the hospital and impact the public health of the community should be made a part of mandatory reporting.*	
	☒	☐	10. Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control practice in non-hospital settings, and to set standards for continuing education and training	*December 2011* **Ongoing**
			NC DPH has addressed this issue in the past by providing testimony to the NC Medical Board and has worked closely with the NC Board of Pharmacy in situations involving individual practitioners and outbreaks of communicable disease. *The Epidemiology Section of the NC Division of Public Health and the North Carolina Division of Health Services Regulation worked together during 2008-09 to do enhanced surveys of ambulatory surgical centers. Additional training in infection prevention practices was obtained for the surveyors through SPICE. Long Term Care surveyors and hospital surveyors have also received training in infection prevention practices and what they should be looking for when they enter a facility. Because of this collaboration and the findings of the investigation of an outbreak of Hepatitis C in an outpatient facility changes were made to the Administrative Code rule 10A NCAC 41A .0206 Infection Prevention – Health Care Settings, including in particular Safe Injection Practices among practices that should be covered in a required course on Infection Control. This rule includes other requirements such as implementing a written infection control policy in each health care organization performing invasive procedures, educating staff in infection prevention procedures, and designating one on-site staff member to direct infection prevention activities in each non-contiguous facility.*	
			11. Adopt integration and interoperability standards for HAI information systems and data sources	*December 2011* **Ongoing**

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒	☐	i. 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) 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.	
			NC DPH uses the North Carolina Electronic Disease Surveillance System (NC EDSS), a secure, robust electronic, web-based and PHIN-compliant reporting system, for surveillance and reporting. This system was designed to have interoperability with all CDC reporting databases, including TB, NETSS, E-HARS, and STD-MIS. *The subcommittee on laboratory surveillance discussed possibilities for integration of laboratory reporting systems to a more centralized system (i.e. NC EDSS).* *At the end of the ARRA funded activities, NC DPH hopes to have a better understanding of how best to standardize data elements across the nation.*	
			12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data	*December 2011* **Ongoing**
	☐	☒	i. Report HAI data to the public	
			The HAI Advisory Group has chosen NHSN as the reporting platform and would like to see the surveillance systems that hospitals are using or will be using in the future compatible with NHSN so that data can be downloaded from the hospital system into NHSN. This will keep the infection prevention staff from having to enter data more than once. NHSN was aware that their system did not allow a lot of the surveillance systems now available nationally to download and they have just recently made improvements that will allow such downloads.	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			Reporting of Surveillance Data Sub-Group met on September 13, 2010 and made the following suggestion to the HAI Advisory Group for consideration: • *Change in general reporting by medical facilities in General statute 130A-137 from "may" to "shall" report communicable diseases.* ▪ *Change to 10A NCAC 41, 41A .0101 in making both outbreaks of communicable disease and CLABSI HAIs reportable.* ▪ *Change to 10A NCAC 41, 41A .0102 in making outbreaks reportable to local health departments and HAIs reportable to CDC through NHSN.* ▪ *Plan to add an HAI website through the DPH website where community members, healthcare providers and organization can access data on HAI in North Carolina.* ▪ *Emphasized the importance of making HAI information "consumer friendly", importance not to display complex statistical analysis which may mislead public understanding.* ▪ *Work with a consumer working panel to ensure HAI information meets the goal of consumer friendly.* ▪ *Reconsidering the CAUTI reporting objective and instead following the lead of CMS and requiring SSI as next HAI reporting goal.*	
	☐	☒	13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.	*December 2011* **Ongoing**
			Risk adjustment of reported rates will be the primary responsibility of the state HAI epidemiologist. The Sub-Group on Reporting of Surveillance Data in collaboration with external advisors will serve in an advisory role to promote adjusted rates.	
	☐	☒	14. Enhance surveillance and detection of HAIs in nonhospital settings	*December 2011* **Ongoing**
			Per the 5 year plan towards HAI elimination in North Carolina, Long Term Care Facilities, Dialysis Centers, and other healthcare facilities will be contacted to determine if there are any infection prevention collaboratives in process or planned for the future. If not, NC-DPH with the NC Quality Center and SPICE will investigate what would be necessary in order for said collaboratives to be started. Several tool kits from the NC Quality Center are on line and can be used by	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			anyone wanting to start a collaborative. In order for the Quality Center to assist with setting up and running a collaborative, further assets and resources would be necessary. *The North Carolina Division of Health Services may be able to assist in setting a collaborative for Nursing Homes. Resources are available from "Monitoring Penalties" that has been set aside to be used to help improve the quality of care and quality of life in Medicare Certified Nursing Homes of which is the vast majority of North Carolina Nursing Homes. The North Carolina Division of Health Services and the NC Quality Center will work together to determine if a collaborative can be set up.*	

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. Please select areas for development or enhancement of state HAI prevention efforts.

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. *CLABSI and CAUTI have been chosen as the 2 HICPAC recommended prevention targets for North Carolina.*	*01 Sept 2009* **Completed**
	☐	☒	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	*31 Dec 2011* **Completed**
			CLABSI and CAUTI collaborative have been established by the NC Quality Center. The Quality Center has the expertise to consult, advise, and coach inpatient healthcare facilities involved in the collaboratives.	
	☒	☐	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	*31 Mar 2010* **Completed**

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	☒	☐	control, and collaborative coordination ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices	
	☒	☐	iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress	
			The NC Quality Center a recognized leader in managing successful HAI collaborative, working with NC DPH and SPICE, has established a Catheter-associated Urinary Tract Infection prevention collaborative. The collaborative currently has 21 hospitals participating. Work continues to include more hospitals with the focus on Critical Access Hospitals – goal is to have at least 25 hospitals participate. Multiple teleconferences, phone consultations, and webinars have been provided and will continue to be provided to help guide the participating hospital in the collaborative process. Data has started to flow into the Quality Center from the CAUTI Collaborative -- first data entry date was April 15, 2010.	
	☒	☐	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	*December 2011* **Completed**
			SPICE offers courses leading to certification as an Infection Preventionist (IPs) as well as continuing education courses for designated staff in outpatient healthcare settings. *SPICE offers courses to meet the requirements of the North Carolina Infection Control law 10A NCAC 41A.0206 for hospitals and long-term care facilities. SPICE has developed the curriculum for .0206 Infection Control courses for healthcare workers in the Dental, Home Health and Hospice, and Out-Patient Settings.* *National and State APIC provides in person and webinars for IPs.* *IP Certification requires retesting every five years.* *IP Certification is written into many job descriptions and is highly recommended by The Joint Commission and other such agencies.* *SPICE and the Quality Center currently work with hospitals and other*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			healthcare facilities to bring the very best in Infection Prevention education to their staff. *HAI Advisory Group indicated no further training competencies are needed at this time.*	
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	*December 2011* **Completed**
	☒	☐	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	
			The HAI Advisory Group recommends supporting regulatory agencies that are already in place and are guiding and promoting Infection Prevention in our Healthcare Facilities rather than developing more standards at this time. *The Epidemiology section of the NC Divivion of Public Health and the North Carolina Division of Health Services worked together in 2008-09 to do enhanced surveys of ambulatory surgical centers. Additional training in infection prevention practices was obtained for the surveyors through SPICE. Long Term Care surveyors have also received training in infection prevention practices.* *Hospital surveyors have received additional training in infection prevention practices and what they should be looking for when they*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			enter a facility. *Section 10A of the North Carolina Administrative Code 41A .0206 Infection Prevention – Health Care Settings was recently amended to state that in order to prevent transmission of HIV, hepatitis B, hepatitis C and other bloodborne pathogens, each health care organization that performs invasive procedures shall implement a written infection control policy and shall designate one on-site staff member in each non-contiguous facility to direct these activities. Some of the more unusual "Health care organizations" included are podiatrist offices; local health departments; community health centers; ambulatory surgical facilities; urgent care centers; Emergency Medical Service (EMS) agencies; pharmacies where a health practitioner offers clinical services; or any other organization that provides clinical care.*	
	☒	☐	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 2011* **Completed**
			The NC Quality Center, working with NC DPH and SPICE, has established a Catheter-associated Urinary Tract Infection prevention collaborative. The collaborative currently has 21 hospitals participating. Work continues to include more hospitals with an emphasis on Critical Access Hospitals – goal is to have at least 25 hospitals participate.	
	☐	☒	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	*December 2011* **Ongoing**
			Per the 5 year plan towards eliminating HAI in North Carolina, Long Term Care Facilities, Dialysis Centers, and other healthcare facilities will be contacted to determine if there are any infection prevention collaboratives in process or planned for the future. If not, NC-DPH with the NC Quality Center and SPICE will investigate what would be necessary in order for said collaboratives to be started. Several tool kits from the NC Quality Center are on line and can be used by anyone wanting to start a collaborative. In order for the Quality Center to assist with setting up and running a collaborative, further assets and resources would be necessary. *The North Carolina Division of Health Services may be able to assist in setting a collaborative for Nursing Homes. Resources are available from*	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			"Monitoring Penalties" that have been set aside to be used to help improve the quality of care and quality of life in Medicare Certified Nursing Homes of which is the vast majority of North Carolina Nursing Homes. The North Carolina Division of Health Services and the NC Quality Center will work together to determine if a collaborative can be set up.	

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. Please select areas for development or enhancement of state HAI prevention efforts.

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	*December 2011* **Future Activity**
			NC DPH will consider contracting with an external evaluator like the NC Institute for Public Health to conduct an evaluation of the state HAI program. NC DPH is currently working with the Institute which is conducting extended, multi-year evaluation for three Public Health systems.	
	☐	☒	2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders needs Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public	*December 2011* **Future Activity**
			Under the direction of the State Epidemiologist and the State HAI Coordinator, a communication plan will be developed detailing the state's priorities. The first step will be distribution of this document in narrative format to members of the State HAI Advisory Group.	
Level II	☐	☒	3. Provide consumers access to useful healthcare quality measures	*December 2011* **Future Activity**

			The format for distributing useful healthcare quality data will be discussed and developed by the Reporting of Surveillance Data Sub-Group and reported to the State HAI Advisory Group for approval.	
Level III	☐	☒	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	*December 2011* **Future Activity**
			The State HAI Advisory Group has chosen CLABSI and CAUTI as the first two HHS (HICPAC) target priorities for North Carolina. *CLABSI in ICUs will be the first HAI to required mandatory reporting.*	