

Template for State Healthcare Associated Infections Plans

In response to the increasing concerns about the public health impact of healthcare-associated infections (HAIs), the US Department of Health and Human Services (HHS) 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 Omnibus 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) has drafted a template to assist state planning efforts in the prevention of HAIs.

This template will help to ensure progress towards national prevention targets as described in the HHS Action Plan, wherein CDC is leading the implementation of recommendations on National Prevention Targets and Metrics and the implementation of priority prevention recommendations, while allowing flexibility to tailor the plan to each state's specific needs.

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.

The current template targets the following areas:

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

Framework and Funding for Prevention of HAIs

CDC's framework for the prevention of HAIs 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, leverage CDC's National Health Care Safety Network to assess progress and support the dissemination of HHS evidence-based practices within healthcare facilities, and pursue state-based collaborative implementation strategies. In addition, the Center for Medicaid 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.

Template for developing HAI plan

The following template provides choices for developing or enhancing state HAI prevention activities in the four areas identified above. 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). This can serve as the state's HAI plan for submission. If your state has an existing plan, you may choose to incorporate that plan into the template below or submit the existing plan in place of the template provided.

For each section, please choose elements which best support current activities or planned activities. 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.

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		Target Dates for Implementation
Level I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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))	1/25/2010
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ii. Identify specific HAI prevention targets consistent with HHS priorities	3/15/2010
			<i>Other activities or descriptions (not required):</i> The Florida HAI Advisory Board will have representation from Agency for Health Care Administration (AHCA), Florida Hospital Association (FHA), Florida Professionals in Infection Control (FPIC), Florida Medical Quality Assurance Inc. (FMQAI) the Florida Medicare Quality Improvement Organization, and Association for Professionals in Infection Control and Epidemiology (APIC), and other interested parties. Activities defined by this steering group will build on the existing infrastructure and capacity of HAI prevention collaboratives in the state.	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Establish an HAI surveillance prevention and control program	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	i. Designate a State HAI Prevention Coordinator	1/28/2010
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	Staff development on-going; hiring completed by 3/1/2010
			<i>Other activities or descriptions (not required):</i>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	On-going
			<i>Other activities or descriptions (not required):</i>	
			o Florida currently requires that any disease outbreak, including those that are HAI, be reported and investigated. County health departments provide assistance to local providers or healthcare facilities identifying HAI clusters or outbreaks; state-level assistance is also available to the providers and county health departments.	
			o The Florida Bureau of Laboratories (BOL) currently provides PFGE	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			<p>and other molecular typing for outbreaks of HAIs under investigation within the state (though antimicrobial resistance testing is not available). Current BOL testing capacity will be maintained, though expanding would be difficult without a dedicated on-going funding source.</p> <ul style="list-style-type: none"> ○ HL7 messaging for reportable laboratory results is currently implemented in the Bureau of Epidemiology (BOE). Data is received into FDOH surveillance applications via HL7 messaging from the state public health laboratory. All laboratory results from the state public health laboratory are received electronically except for pulse field gel electrophoresis (PFGE) results. FDOH is able to receive HL7 messages from any state or national laboratory and currently receives data from several large commercial laboratories (LabCorp, Quest, Mayo) and selected hospital systems. Electronic laboratory reporting (ELR) for reportable disease surveillance is required by state law, Florida Administrative Code, 64D-3. ELR is in the process of being implemented statewide and receipt of ELR data from new sources will continue to expand over the next two years. Additionally, Florida will build capacity to utilize these messages in Merlin (Florida’s statewide electronic surveillance database) for antimicrobial resistance results. 	
Level II	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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)	On-going
			<p><i>Other activities or descriptions (not required):</i> To build on the existing strength and capacity of HAI prevention, efforts will be coordinated between FDOH and other state agencies including those with regulatory authority (AHCA) and experience working with HAI surveillance and prevention efforts such as FMQAI.</p>	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>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 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.</p>	On-going
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ FDOH currently participates in several national workgroups related to the development of national reporting standards for surveillance case and laboratory reporting (for example participation in the national CSTE ELR calls, the case report standardization workgroup, and CSTE Surveillance-Informatics Steering Committee (SISC) Public Health Informatics Subcommittee (PHIS)) ○ During the first year of the project, electronic means of HAI data collection will be evaluated. ○ This will focus primarily on the ability to send electronic laboratory data through HL7 messaging standards directly to both the state HAI surveillance system and FDOH for reportable disease surveillance. ○ The integration of electronic laboratory data, as well as pertinent pieces of the hospital ADT (admission, discharge and transfer) records, will reduce burdensome data entry requirements on hospital 	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			<p>infection preventionists.</p> <ul style="list-style-type: none"> ○ Currently, Florida receives electronic laboratory reports for reportable diseases from some of the largest laboratories in the state; however, Florida does not receive reports for non-reportable organisms frequently associated with HAI and cannot distinguish which results are healthcare-associated and which are not. FDOH has ELR HL7 data reporting standards. These are provided to all potential reporting facilities at the time of enrollment. FDOH standards align with national standards such as LOINC and SNOMEND. FDOH has also actively participated in the national case report standardization work group. 	
<p>Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.</p>				

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* 1988;10:164-90.

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

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation	
Level I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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	On-going	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs	6/15/2010	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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	6/1/2010	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	On-going	
				<i>Other activities or descriptions (not required):</i> ○ Florida currently provides technical and resource assistance to partners including providers and county health departments to help identify, investigate, and report HAI clusters and outbreaks. . Note: In Florida most hospital HAI outbreak investigations are initiated by hospital staff.	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			<p>FDOH, including its County Health Departments, will work to better support this activity but under the current structure and funding level will never be able to take over and lead investigations of all such outbreaks.</p> <ul style="list-style-type: none"> ○ Florida plans to develop formal protocols to document these processes and procedures so that providers and county health departments can work more independently and efficiently to monitor and report HAI clusters and outbreaks. ○ Florida currently utilizes a case review process to ensure that select reportable diseases (including acute hepatitis B and C, VISA, VRSA and <i>Staphylococcus aureus</i> community associated mortality cases) are reviewed by a state subject matter expert. This individual case review allows for centralized assessment of risk factors, which can effectively identify HAI outbreaks or transmission in healthcare settings. ○ FDOH is reviewing options for collecting the type of HAI surveillance information included in NHSN. A decision about the use of NHSN or an alternative state HAI surveillance system will be made by 3/1/2010. A pilot year of clinical (not administrative) data collection will take place during 2010 before the selected state HAI surveillance system is implemented broadly. NHSN or its alternative may assist in detection of outbreaks, particularly of MDRO. 	
	☒	☐	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	On-going
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ Florida currently requires that any disease outbreak, including HAI, be reported and investigated. County health departments provide assistance to local providers or 	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			<p>healthcare facilities identifying HAI clusters or outbreaks; state-level assistance is also available to the providers and county health departments.</p> <ul style="list-style-type: none"> ○ The Florida Bureau of Laboratories (BOL) currently provides PFGE and other molecular typing for outbreaks of HAIs under investigation within the state (though antimicrobial resistance testing is not available). Current BOL testing capacity will be maintained, though expanding would be difficult without a dedicated on-going funding source. ○ HL7 messaging for reportable laboratory results is currently implemented in the Bureau of Epidemiology (BOE). Data is received into FDOH surveillance applications via HL7 messaging from the state public health laboratory. All laboratory results from the state public health laboratory are received electronically except for pulsed field gel electrophoresis (PFGE) results. FDOH is able to receive HL7 messages from any state or national laboratory and currently receives data from several large commercial laboratories (LabCorp, Quest, Mayo) and selected hospital systems. Electronic laboratory reporting (ELR) for reportable disease surveillance is required by state law, Florida Administrative Code, 64D-3. ELR is in the process of being implemented statewide and receipt of ELR data from new sources will continue to expand over the next two years. Additionally, Florida will build capacity to utilize these messages in Merlin (Florida’s statewide electronic surveillance database) for antimicrobial resistance results. 	
Level II			3. Improve communication of HAI outbreaks and infection control breaches	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC	11/25/2010
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	10/1/2010
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ FDOH currently manages the FDENS and EpiCom systems, which provide a secure, moderated, web-based means to communicate with providers, county health departments, and other partners about outbreaks or breaches of interest occurring around the state. These systems function as the state's health alert network, and provide a conduit for information between various groups with a need to know about HAI investigations. ○ Additionally, Merlin (Florida's statewide electronic surveillance database) is equipped with an Outbreak Module, allowing users statewide to store data regarding outbreaks centrally. The Merlin Outbreak Module is utilized for investigating and documenting outbreaks of both reportable and non-reportable diseases occurring across the state. This module is tightly integrated with the Merlin reportable disease module ensuring that all outbreaks associated with HAIs of reportable diseases will be efficiently reported. Merlin also interfaces with EpiCom which enables all users of the Merlin system to view EpiCom messages from within the Merlin interface. 	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			<ul style="list-style-type: none"> ○ In the next two years, Florida plans to develop protocols that outline the standard reporting criteria including number, size, and type of HAI outbreaks that should be reported, as well as guidelines on how to use the available communication platforms. 	
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan</p> <ul style="list-style-type: none"> i. Central Line-associated Bloodstream Infections (CLABSI) ii. <i>Clostridium difficile</i> Infections (CDI) iii. Catheter-associated Urinary Tract Infections (CAUTI) iv. Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Infections v. Surgical Site Infections (SSI) vi. Ventilator-associated Pneumonia (VAP) 	<p>4/1/2010</p> <p>4/1/2010</p> <p>4/1/2010</p>
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ The Florida Department of Health (DOH) will ensure that at least the following three will be addressed: CLABSI, MRSA and CDI. Regional surveillance collaboratives will also be empowered to tackle other HHS prevention targets as they see the needs within their institutions and regions. The Florida HAI advisory board will guide the final selection of HHS priorities to be addressed including exploring addressing SSI. 	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).</p> <ul style="list-style-type: none"> i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1). 	<p>7/15/2010</p>

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ii. Establish baseline measurements for prevention targets	12/1/2010
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ Current Florida law (F.S. 395.3025) inhibits hospital participation in NHSN. Florida statute states that hospitals cannot give identifiable patient records to anyone without the patient's consent, except in certain situations. One exception is that records may be released to FDOH for the purpose of epidemiological investigations whereas CDC is not mentioned. Also, those who have access to the individual hospital medical records under this statute, including FDOH, are forbidden from giving them to others. FDOH will seek to have the law changed in the 2010 legislative session. ○ FDOH is reviewing options for collecting the type of HAI surveillance information included in NHSN. A decision about the use of NHSN or an alternative state HAI surveillance system will be made by 3/1/2010. A pilot year of clinical (not administrative) data collection of will take place during 2010 before the selected state HAI surveillance system is implemented broadly. 	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>6. Develop state surveillance training competencies</p> <p style="padding-left: 40px;">i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis</p>	On-going after a state HAI system is selected
			<i>Other activities or descriptions (not required):</i>	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. Develop tailored reports of data analyses for state or region prepared by state personnel	1/31/2011
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ The state HAI and antimicrobial resistance epidemiologist will lead the HAI state data analysis effort and will oversee the HAI surveillance report production. ○ Regional and central HAI staff will work with regional collaboratives and individual hospitals on analyzing the data provided through NHSN and help hospital staff learn how to use the data to drive and evaluate prevention efforts in their facilities. ○ The HAI epidemiologist will coordinate with the CDC surveillance group and participate in the state users call for NHSN. ○ The HAI epidemiologist will become familiar with the HHS Action plan metrics and 5-year national prevention targets, and will incorporate these metrics, as well as standardized infection ratios (SIR) into Florida's reports. 	
Level III	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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	On-going
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	i. Develop a validation plan	9/15/2010
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ii. Pilot test validation methods in a sample of healthcare facilities	1/1/2011
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	iii. Modify validation plan and methods in accordance with findings from pilot project	3/15/2011
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	iv. Implement validation plan and methods in	5/15/2011

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<p>all healthcare facilities participating in HAI surveillance</p> <p>v. Analyze and report validation findings</p> <p>vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected</p>	<p>6/1/2011</p> <p>6/1/2011</p>
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ Hospital audits of select medical records will be conducted to assess compliance with reporting requirements. ○ On-site visits will be conducted by HAI Regional Epidemiologists. ○ Data submitted to the state HAI surveillance system for the first quarter of the demonstration phase will be used to select medical records for review. ○ Information extracted from chart reviews will be recorded in standardized electronic data collection tools. ○ Before a visit, HAI program staff will send a letter to the hospital to inform the facility of the scheduled audit visit, its purpose, and the evaluation components. The audits will be to: 1) determine the reliability and consistency of surveillance definitions; 2) evaluate current surveillance methods used to detect infections; 3) evaluate current risk adjustment methods and determine whether additional factors need to be considered; 4) evaluate intervention strategies designed to reduce or eliminate specific infections; 5) provide on-site education on definitions, surveillance mechanisms and NHSN use. 	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>9. Develop preparedness plans for improved response to HAI</p> <p>i. Define processes and tiered response</p>	<p>1/1/2011</p>

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
			criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ DOH has led and assisted in many HAI outbreak and infection control breach investigations due to agents including <i>Salmonella</i>, hepatitis B virus, hepatitis C virus, norovirus, <i>Staphylococcus aureus</i>, <i>Mycobacterium abscessus</i>, <i>A. baumannii</i>, and CRKP. ○ These investigations have resulted in more efficient responses and guidance documents for county health departments and healthcare facilities throughout the state that include comprehensive infection control recommendations. 	
	<input type="checkbox"/>	<input type="checkbox"/>	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	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ Florida currently requires that any disease outbreak, including HAI, be reported and investigated. Assistance for investigating and reporting these incidents is available at the state and local level; collaboration with professional licensing organizations is frequently a part of this process. ○ Florida will maintain the current capacity, however, the first priority of this project will be in acute-care facilities; non-hospital settings will not specifically be addressed until acute-care facility goals have been met. 	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. Adopt integration and interoperability standards for HAI information systems and data sources	
	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> 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 	On-going
	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation. 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ Florida currently utilizes a case review process to ensure that select reportable diseases (including acute hepatitis B, C, VRSA, VISA, and <i>Staphylococcus aureus</i> community associated deaths) are reviewed by a state subject matter expert. This individual case review allows for centralized assessment of risk factors, which can effectively identify HAI outbreaks or transmission in healthcare settings. ○ FDOH is familiar with the development of integrated and interoperable standards-based surveillance systems. FDOH has designed and developed the state reportable disease surveillance system, Merlin, the Merlin Outbreak Module, HL7 electronic laboratory messaging standards, and maintains a syndromic surveillance system, ESSENCE which now receives data from hospital emergency departments, the Poison Control Centers, the Merlin reportable disease database. 	

Planning Level	Check Items Underway	Check Items Planned		Target Dates for Implementation
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. 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	1/15/2011
			<i>Other activities or descriptions (not required):</i> The Agency for Healthcare Administration currently supports access to HAI data to the public through the Florida Compare Care website and Florida Health Finder. These systems provide information on HAI rates at the hospital level and are derived from Florida's hospital discharge data system using an algorithm developed by AHRQ.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.	1/15/2011
			-	
	<input type="checkbox"/>	<input type="checkbox"/>	14. Enhance surveillance and detection of HAIs in nonhospital settings	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ The first priority of Florida's HAI Plan is acute-care facilities; non-hospital settings will not specifically be addressed until acute-care facility goals have been met. 	
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. 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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1. Implement HICPAC recommendations. <ul style="list-style-type: none"> i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group. 	6/1/2010
	<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ The Florida HAI Advisory Board will provide the foundation for establishing regional HAI prevention collaboratives including final recommendations about the number and recommended participants. This group will build on the collaborations and projects that partners such as FHA, FMQAI, FPIC and the South Florida Hospital and Healthcare Association (SFHHA) already have underway. ○ Each regional HAI prevention collaborative will determine which of the HHS prevention targets they will address (FDOH will ensure that at least the following three will be addressed in the state: CLABSI, MRSA and CDI) and will also determine strategies for implementation of HICPAC recommendations for 			

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			these targets.	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2. Establish prevention working group under the state HAI advisory council to coordinate state HAI collaboratives <ul style="list-style-type: none"> i. Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaboratives 	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ The Florida HAI Advisory Board will provide the foundation for establishing regional HAI prevention collaboratives including final recommendations about the number and recommended participants. Partners such as FHA, FMQAI, FPIC and SFHHA will play a key role in this partnership as they have experience working with prevention collaboratives. In addition, in many metro areas there are existing functioning information prevention collaboratives in place facilitated by local APIC chapters. The establishment of regional prevention collaboratives will reinforce and strengthen these existing efforts. ○ The representatives of regional HAI prevention collaboratives will have an overarching understanding of their respective facility or agency's HAI-related activities as well as the inter-relationships. ○ Implementation of regional HAI prevention collaboratives will serve as the foundation for accomplishing tasks outlined by the Florida HAI Prevention Plan. 	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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) <ul style="list-style-type: none"> i. Identify staff trained in project coordination, infection control, and collaborative 	5/1/2010

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	coordination ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices	7/15/2010
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress	8/1/2010
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ The Florida HAI Advisory Board will provide the foundation for establishing regional HAI prevention collaboratives including final recommendations about the number and recommended participants; these regional collaboratives will meet monthly to facilitate regular communication. Four to 7 collaboratives are expected to be established in the major population centers. ○ The representatives of regional HAI prevention collaboratives will have an overarching understanding of their respective facility or agency’s HAI-related activities as well as the inter-relationships and will also have an in-depth knowledge of gaps in HAI data. ○ FDOH will issue a Request for Applications (RFA) from non-profit healthcare organizations to develop multidisciplinary and multiagency regional HAI prevention collaboratives, implement strategies with partners and evaluate strategies to reduce or eliminate targeted hospital-acquired infections. To be eligible, each applicant will obtain the collaboration and commitment of at least five participating hospitals. ○ The contractor will ensure established collaboratives can report effectively on key measures including alignment of collaborative goals with the State HAI Plan. The collaborative 	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>contractor will provide verification that the collaboratives formed will address key attributes including: multidisciplinary groups, staffed appropriately, utilize effective and multifaceted communication strategies and have outcome measurement systems.</p> <ul style="list-style-type: none"> ○ The collaborative process will consist of sharing of best practices through collaborative learning sessions/training workshops, web-based presentations and/or teleconference discussions, and use of a topic-specific email list serve. 	
	<input type="checkbox"/>	<input type="checkbox"/>	<p>4. Develop state HAI prevention training competencies</p> <ul style="list-style-type: none"> 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 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ○ This activity will be undertaken at the discretion of the individual regional prevention collaboratives. 	
Level II	<input type="checkbox"/>	<input type="checkbox"/>	<p>5. Implement strategies for compliance to promote adherence to HICPAC recommendations</p> <ul style="list-style-type: none"> 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 	On-going

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	<input type="checkbox"/>	<input type="checkbox"/>	prevent HAIs	
	<input type="checkbox"/>	<input type="checkbox"/>	iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data	
	<input type="checkbox"/>	<input type="checkbox"/>	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	
			<i>Other activities or descriptions (not required):</i> The Agency for Healthcare Administration licenses and regulates hospitals in Florida. As part of the FDOH CDC funded ARRA project, FDOH will strengthen our relationship with AHCA surveyors and regulators. For activities 5(iii) and 5 (iv), the scope of activity will depend on guidance from the Florida HAI Advisory Board.	
	<input type="checkbox"/>	<input type="checkbox"/>	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)	
			<i>Other activities or descriptions (not required):</i>	
	<input type="checkbox"/>	<input type="checkbox"/>	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	
			<i>Other activities or descriptions (not required):</i>	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<ul style="list-style-type: none"> ○ The first priority of Florida's HAI Plan is acute-care facilities; non-hospital settings will not specifically be addressed until acute-care facility goals have been met. 	
<p>Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.</p>				

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	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	i. Establish evaluation activity to measure progress towards targets and	8/1/2010
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ii. Establish systems for refining approaches based on data gathered	9/1/2010
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ FDOH will convene a multidisciplinary and multiagency HAI Advisory Board that will serve as a steering committee for state HAI activities and will include senior-level representatives from AHCA, FHA, FPIC, FMQAI, and APIC as well as individual leaders in the state in the field of HAI. ○ Before the first meeting of the HAI Advisory Board, a needs assessment will be conducted to document existing HAI activities above the internal hospital level and identify gaps. ○ As part of the needs assessment a comprehensive HAI prevention activities database will be created and will serve as an inventory to guide future plans for near-, mid-, and long-term integration of projects. 	
			2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private	

	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>stakeholders needs</p> <p>i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public</p>	On-going
			<i>Other activities or descriptions (not required):</i>	
Level II	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Provide consumers access to useful healthcare quality measures	On-going
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ The Agency for Healthcare Administration currently supports access to HAI data to the public through the Florida Compare Care website and Florida Health Finder. These systems provide information on HAI rates at the hospital level and are based on records in AHCA’s hospital discharge information systems, using an algorithm developed by AHRQ. ○ The HAI Advisory Board will provide guidance on the quarterly HHS prevention target report format, audience, and dissemination and the inclusion of state and regional data summaries. ○ All reports will be made available online, and may be distributed in other venues as well. 	
Level III	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	6/1/2010
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> ○ FDOH will convene a multidisciplinary and multiagency HAI Advisory Board that will serve as a steering committee for state HAI activities and will include senior-level representatives from AHCA, FHA, FPIC, FMQAI, and APIC as well as individual leaders in the state in the field of HAI. ○ The Florida HAI Advisory Board will explore a 	

		<p>multidisciplinary approach to preventing HAI and include components of policy development, surveillance, training/education, quality improvement, and enforcement.</p> <ul style="list-style-type: none"> ○ New partnerships will also be explored and furthered with Florida academic institutions in the state in the area of HAI surveillance such as the Emerging Pathogens Institute of the University of Florida, based in Gainesville. ○ Before the first meeting of the Board, a needs assessment will be conducted to document all existing HAI activities and identify gaps. As part of the needs assessment a comprehensive HAI prevention activities database will be created. This database will serve as an inventory to guide future plans for near-, mid-, and long-term integration of projects. 	
<p>Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.</p>			

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. Please select items or add additional items for state planning efforts.

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

Metric Number and Label	Original HAI Elimination Metric	HAI Comparison Metric	Measurement System	National Baseline Established (State Baselines Established)	National 5-Year Prevention Target	Coordinator of Measurement System	Is the metric NQF endorsed?
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 2009 for other hospital units (proposed 2009, in consultation with states)	Reduce the CAUTI SIR by at least 25% from baseline or to zero in ICU and other locations	CDC	Yes
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

* 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 NQF-endorsed metric includes deep wound and organ space SSIs only which are included the target.

Understanding the Relationship between HAI Rate and SIR Comparison Metrics

The Original HAI Elimination Metrics listed above are very useful for performing evaluations. Several of these metrics are based on the science employed in the NHSN. For example, metric #1 (CLABSI 1) for CLABSI events measures the number of CLABSI events per 1000 device (central line) days by ICU and other locations. While national aggregate CLABSI data are published in the annual NHSN Reports these rates must be stratified by types of locations to be risk-adjusted. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally or even for an individual healthcare facility. For instance, when comparing CLABSI rates, there may be quite a number of different types of locations for which a CLABSI rate could be reported. Given CLABSI rates among 15 different types of locations, one may observe many different combinations of patterns of temporal changes. This raises the need for a way to combine CLABSI rate data across location types.

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 following example data are displayed below:

Risk Group Stratifier	Observed CLABSI Rates			NHSN CLABSI Rates for 2008 (Standard Population)		
Location Type	#CLABSI	#Central line-days	CLABSI rate*	#CLABSI	#Central line-days	CLABSI rate*
ICU	170	100,000	1.7	1200	600,000	2.0
WARD	58	58,000	1.0	600	400,000	1.5
$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170 + 58}{100000 \times \left(\frac{2}{1000}\right) + 58,000 \times \left(\frac{1.5}{1000}\right)} = \frac{228}{200 + 87} = \frac{228}{287} = 0.79 \quad 95\% \text{CI} = (0.628, 0.989)$						

* defined as the number of CLABSIs per 1000 central line-days

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

The SIR concept and calculation is completely based on the underlying CLABSI rate data that exist across a potentially large group of strata. Thus, the SIR provides a single metric for performing comparisons rather than attempting to perform multiple comparisons across many strata which makes the task

cumbersome. Given the underlying CLABSI rate data, one retains the option to perform comparisons within a particular set of strata where observed rates may differ significantly from the standard populations. These types of more detailed comparisons could be very useful and necessary for identifying areas for more focused prevention efforts.

The National 5-year prevention target for metric #1 could be implemented using the concept of an SIR equal to 0.25 as the goal. That is, an SIR value based on the observed CLABSI rate data at the 5-year mark could be calculated using NHSN CLABSI rate data stratified by location type as the baseline to assess whether the 75% reduction goal was met. There are statistical methods that allow for calculation of confidence intervals, hypothesis testing and graphical presentation using this HAI summary comparison metric called the SIR.

The SIR concept and calculation can be applied equitably to other HAI metrics list above. This is especially true for HAI metrics for which national data are available and reasonably precise using a measurement system such as the NHSN. The SIR calculation methods differ in the risk group stratification only. To better understand metric #6 (SSI 1) see the following example data and SIR calculation:

Risk Group Stratifiers		Observed SSI Rates			NHSN SSI Rates for 2008 (Standard Population)		
Procedure Code	Risk Index Category	#SSI [†]	#procedures	SSI rate [*]	#SSI [†]	#procedures	SSI rate [*]
CBGB	1	315	12,600	2.5	2100	70,000	3.0
CBGB	2,3	210	7000	3.0	1000	20,000	5.0
HPRO	1	111	7400	1.5	1020	60,000	1.7
$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315 + 210 + 111}{12600 \times \left(\frac{3.0}{100}\right) + 7000 \times \left(\frac{5.0}{100}\right) + 7400 \left(\frac{1.7}{100}\right)} = \frac{636}{378 + 350 + 125.8} = \frac{636}{853.8} = 0.74 \quad 95\% \text{CI} = (0.649, 0.851)$							

[†] SSI, surgical site infection

^{*} defined as the number of deep incision or organ space SSIs per 100 procedures

This example uses SSI rate data stratified by procedure and risk index category. Nevertheless, an SIR can be calculated using the same calculation process as for CLABSI data except using different risk group stratifiers for these example data. The SIR for this set of observed data is 0.74 which indicates there's a 26% reduction in the number of SSI events based on the baseline NHSN SSI rates as representing the standard population. Once again, these data can reflect the national picture at the 5-year mark and the SIR can serve as metric that summarizes the SSI experience into a single comparison.

There are clear advantages to reporting and comparing a single number for prevention assessment. However, since the SIR calculations are based on standard HAI rates among individual risk groups there is the ability to perform more detailed comparisons within any individual risk group should the need arise. Furthermore, the process for determining the best risk-adjustment for any HAI rate data is flexible and always based on more detailed risk factor analyses that provide ample scientific rigor supporting any SIR calculations. The extent to which any HAI rate data can be risk-adjusted is obviously related to the detail and volume of data that exist in a given measurement system.

In addition to the simplicity of the SIR concept and the advantages listed above, it's important to note another benefit of using an SIR comparison metric for HAI data. If there was need at any level of aggregation (national, regional, facility-wide, etc.) to combine the SIR values across mutually-exclusive data one could do so. The below table demonstrates how the example data from the previous two metric settings could be summarized.

HAI Metric	Observed HAIs			Expected HAIs		
	#CLABSI	#SSI [†]	#Combined HAI	#CLABSI	#SSI [†]	#Combined HAI
CLABSI 1	228			287		
SSI 1		636			853.8	
Combined HAI			228 + 636 = 864			287+853.8 = 1140.8
$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{228 + 636}{287 + 853.8} = \frac{864}{1140.8} = 0.76 \quad 95\% \text{CI} = (0.673, 0.849)$						

[†] SSI, surgical site infection