Kentucky State and Regional
Infection Prevention and Epidemiology Program (K-STRIPE)
Healthcare Associated Infections Prevention Plan

Introduction:

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) developed an Action Plan to Prevent Healthcare-Associated Infections (HHS Action Plan), http://www.hhs.gov/ophs/initiatives/hai/actionplan/index.html. The HHS Action Plan included recommendations for surveillance, research, communication and metrics for measuring progress towards national goals. Three overarching priorities were 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.

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.

Template for Prevention of HAIs

In a concurrent development, the 2009 Omnibus bill required states receiving Preventive Health and Health Services Block Grant funds to certify that they would submit a plan to reduce HAIs to the Secretary of HHS not later than January 1, 2010. In order to assist states in responding within the short timeline required by that language and to facilitate coordination with national HAI prevention efforts, the Centers for Disease Control and Prevention (CDC) drafted a template to assist state planning efforts in the prevention of HAIs.

Kentucky's use of 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 Kentucky's specific needs.

The CDC and HHS HAI Prevention Plan 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.

In 2009, states were encouraged to apply for these ARRA grant funds for HAI Prevention. Grant applications could request funds for three different activities. Activity A was for the basic staffing and coordination to draft the State HAI Prevention Plan and establish the state's capacity to develop an HAI prevention program. In general, Activity A was aimed for state health departments that had little or no current activity or expertise on HAI prevention or reporting. Activity B aimed to increase healthcare facility participation in National Healthcare Safety Network (NHSN) and use NHSN to establish baseline HAI data for the state. Activity C aimed to support prevention collaboratives in the state to undertake prevention activities or initiatives. The Kentucky Department for Public Health (KDPH) developed a plan to organize, staff, and implement the Kentucky State and Regional Infection Prevention and Epidemiology Program (K-STRIPE) and applied for grant funds for all three of these grant Activities. KDPH was awarded $276,125 for HAI prevention activities from Sept 1, 2009 through Dec 31, 2011 and was only funded for Activity A in the proposed K-STRIPE HAI Prevention Plan.

Kentucky (K-STRIPE) Template for Developing a HAI Prevention Plan

Planning assumptions for K-STRIPE:

- Kentucky is one of the states in the nation that does not presently have a mandatory public reporting requirement for HAIs. Therefore, individual HAIs are not reportable to public health officials in Kentucky. Outbreaks of HAIs are reportable in Kentucky, as all outbreaks are reportable.
- Prior to the 2009 award of ARRA grant funds, KDPH did not have any full-time staff or any specifically authorized and appropriated state funding, or any federal or private grant funding, or any other existing resources dedicated to the control and prevention of HAIs.
- KDPH has ongoing working relationships with several Kentucky organizations that have HAI prevention expertise, including the Kentucky Hospital Association, the University of Louisville, and the University of Kentucky.
- KDPH and partners demonstrated the ability to convene a multidisciplinary MRSA Advisory Committee in 2007 and to successfully accomplish HAI prevention activities for the *Kentucky MRSA Collaborative*.
- The Kentucky Department for Public Health does not regulate hospitals or long term care facilities (LTCFs). Hospitals and most LTCFs are regulated by the Office of Inspector General in the Cabinet for Health and Family Services.
- There are 120 acute care hospitals in Kentucky. These facilities have a total of 17,577 beds. Bed sizes range from 15 to 955. Fifty Kentucky hospitals have 100 beds or more; 31 hospitals have 50 to 99 beds, eight hospitals have bed sizes between 30 and 49, and 31 hospitals have less than 30 beds.
- Eight hospital systems have multiple healthcare facilities in Kentucky. These eight systems have 8,309 beds or 47% of all hospital beds in Kentucky.
- There are 22 hospitals in Kentucky that presently are participating in NHSN.
- There are 426 licensed LTCFs in Kentucky. These facilities have a total of 30,044 beds. LTCF bed sizes range from 1 to 420. There are 118 LTCFs with 101 beds or more that collectively have 16,051 beds or 53% of all LTCF beds.

The details in the following adaptation of the CDC HAI Plan template list some choices for developing or enhancing Kentucky's HAI prevention activities in the four areas identified above. This plan is a work in progress as of the submission date to HHS. KDPH's plan to target different levels of HAI prevention efforts has been indicated by checking appropriate boxes in the CDC HAI Plan template. Level I indicates basic elements to begin HAI prevention efforts, Level II for intermediate and Level III more mature efforts. Most Level 1 activities for K-STRIPE can be achieved with Kentucky's ARRA grant funding for Activity A. Implementation of most Level II and Level II activities would be contingent upon additional staffing and resources becoming available in 2010 or 2011.

For each section below, KDPH selected elements which best support current activities or planned activities. Current activities are those in which Kentucky is presently engaged and includes activities that are scheduled to begin using currently available resources. Planned activities represent future directions that Kentucky would like to move in to meet currently unmet needs, contingent on available resources and competing priorities.

These planned activities will have full-time efforts after hiring of a HAI Prevention Program Manager and after formation of the K-STRIPE Advisory Board for HAI Prevention. Some additional activities may be included to accommodate plans beyond the principal categories.

1. Develop or Enhance HAI Prevention program infrastructure for Kentucky

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. The check boxes below with an "X" were selected to indicate areas for development or enhancement of Kentucky HAI surveillance, prevention and control efforts.

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

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I			1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council (i.e. K-STRIPE Advisory Board)	By 31 Dec 2010
	☐	☒	i. Collaborate with local and regional partners (e.g., Kentucky Hospital Association and other state healthcare associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians and networks of acute care hospitals and long term care facilities (LTCFs))	By 31 Dec 2010
	☐	☒	ii. Identify specific HAI prevention targets consistent with HHS priorities	By 31 Dec 2010
			Other activities or descriptions (not required):	

Table 1: State infrastructure planning for HAI surveillance, prevention and control in Kentucky.				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)	☐	☒	2. Establish an HAI surveillance prevention and control program (i.e. K-STRIPE)	By 31 Dec 2010
	☐	☒	i. Designate a State HAI Prevention Coordinator who will also be the KDPH HAI Prevention Program Manager	By 31 Dec 2010
	☐	☒	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)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
			3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	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)	By 31 Dec 2011 contingent upon additional staffing and resources becoming available

Table 1: State infrastructure planning for HAI surveillance, prevention and control in Kentucky.				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)			*Other activities or descriptions (not required):*	
Level II	☐	☒	4. Improve coordination among government agencies or organizations that share responsibility for assuring or overseeing HAI surveillance, prevention and control (e.g., Cabinet for Health and Family Services Offices of Inspector General and other State Survey agencies, Communicable Disease Control, and Kentucky licensing boards)	By 31 Dec 2010
			Other activities or descriptions (not required):	

Table 1: State infrastructure planning for HAI surveillance, prevention and control in Kentucky.				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont)	☐	☐	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.	
			Other activities or descriptions (not required):	

Table 1: State infrastructure planning for HAI surveillance, prevention and control in Kentucky.				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

2. HAI Surveillance, Detection, Reporting, and Response for Kentucky

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. 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.

Healthy People 2020 Proposes Two Objectives to Address Healthcare-Associated Infections, http://www.hhs.gov/ophs/initiatives/hai/actionplan/index.html

"Healthy People provides science-based, 10-year national objectives for promoting health and preventing disease. Since 1979, Healthy People has set and monitored national health objectives to meet a broad range of health needs, encourage collaborations across sectors, guide individuals toward making informed health decisions, and measure the impact of our prevention activity. . . In 2010, the Healthy People 2020 objectives will be released along with guidance for achieving the new 10-year targets.

For the first time, Healthy People includes Healthcare-Associated Infections as a topic area. This includes proposing two new objectives on healthcare-associated infections:

- Reduce central line–associated bloodstream infections
- Reduce the incidence of invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections"

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

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.

The check boxes below with an "X" were selected to indicate items to include in the K-STRIPE HAI Prevention Plan at the planning levels desired.

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
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, Kentucky state legislature, and providers across the healthcare continuum to improve outbreak reporting to KDPH	By 31 Dec 2010
	☐	☒	ii. Establish protocols and provide training for state and local health department staffs to investigate outbreaks, clusters or unusual cases of HAIs.	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	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)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)			*Other activities or descriptions (not required):*	
	☐	☒	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues. (Note that the Kentucky Department for Public Health Division of Laboratory Services (i.e. the State Public Health Laboratory) does not presently perform antibiotic susceptibility testing for bacterial isolates.)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	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, and state healthcare facility licensing boards)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)			4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan (Note: Selection of two priority prevention targets for surveillance will be done after establishment of statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council (i.e. K-STRIPE Advisory Board). Targets for surveillance of HAIs may be different for acute care settings and for Long Term Care Facilities.)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available.
	☐	☐	i. Central Line-associated Bloodstream Infections (CLABSI)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available. Additional emphasis may occur if reducing CLABSIs becomes a final Health People 2020 objective for HAIs.
	☐	☐	ii. *Clostridium difficile* Infections (CDI)	
	☐	☐	iii. Catheter-associated Urinary Tract Infections (CAUTI)	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)	☐	☐	iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections	By 31 Dec 2011, contingent upon additional staffing and resources becoming available. Additional emphasis may occur if reducing MRSA infections becomes a final Health People 2020 objective for HAIs.
	☐	☐	v. Surgical Site Infections (SSI)	
	☐	☐	vi. Ventilator-associated Pneumonia (VAP)	
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)			5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1).	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	ii. Establish baseline measurements for prevention targets	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)	☐	☒	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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
	☐	☒	7. Develop tailored reports of data analyses for state or region prepared by state personnel	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
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	
	☐	☐	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 shortcomings detected	
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level III (Cont.)	☐	☐	9. Develop preparedness plans for improved response to HAI i. Define processes and tiered response criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks	
			Other activities or descriptions (not required):	
	☐	☒	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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level III (Cont.)			11. Adopt integration and interoperability standards for HAI information systems and data sources	
	☐	☐	i. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in 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.	
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level III (Cont.)	☐	☒	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 (e.g. aggregate HAI data) (Note: Individual HAIs are presently not reportable to public health officials in Kentucky. Outbreaks of HAIs are reportable in Kentucky, as all outbreaks are reportable.)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available. Such reporting would also be contingent upon legislative changes to require reporting of HAIs.
			Other activities or descriptions (not required):	

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level III (Cont.)	☐	☒	13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals. (Note: Individual HAIs are presently not reportable to public health officials in Kentucky. Outbreaks of HAIs are reportable in Kentucky, as all outbreaks are reportable.)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available. Such reporting would also be contingent upon legislative changes to require reporting of HAIs.
			Other activities or descriptions (not required):	
	☐	☒	14. Enhance surveillance and detection of HAIs in nonhospital settings (Note: Individual HAIs are presently not reportable to public health officials in Kentucky. Outbreaks of HAIs are reportable in Kentucky, as all outbreaks are reportable.)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available. Such reporting would also be contingent upon legislative changes to require reporting of HAIs.

Table 2: State planning for surveillance, detection, reporting, and response for HAIs in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
			Other activities or descriptions (not required):	
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 of HAIs in Kentucky

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.

The check boxes below with an "X" were selected to indicate areas for development or enhancement of state HAI prevention efforts in Kentucky.

Table 3: State planning for HAI prevention activities in Kentucky

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.	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)	☐	☒	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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
			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)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)	☐	☒	i. Identify staff trained in project coordination, infection control, and collaborative coordination	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)	☐	☒	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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
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	By 31 Dec 2011, contingent upon additional staffing and resources becoming available.

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)	☐	☒	ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☒	iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
	☐	☐	iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered or work with healthcare partners to establish best practices to ensure adherence	
			Other activities or descriptions (not required):	

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level II (Cont.)	☐	☐	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)	
			Other activities or descriptions (not required):	
	☐	☒	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 3: State planning for HAI prevention activities in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

4. Evaluation and Communications for HAIs in Kentucky

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.

The check boxes below with an "X" were selected to indicate areas for development or enhancement of state HAI prevention efforts in Kentucky.

Table 4: State HAI communication and evaluation planning in Kentucky

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	By Dec 2010
	☐	☒	i. Establish evaluation activity to measure progress towards targets and	By Dec 2010
	☐	☒	ii. Establish systems for refining approaches based on data gathered	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	

Table 4: State HAI communication and evaluation planning in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level I (Cont.)	☐	☒	2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders needs i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public	By 31 Dec 2011, contingent upon additional staffing and resources becoming available By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
Level II	☐	☐	3. Provide consumers access to useful healthcare quality measures	
			Other activities or descriptions (not required):	

Table 4: State HAI communication and evaluation planning in Kentucky				
Planning Level	**Check Items Underway**	**Check Items Planned**	**Items Planned for Implementation (or currently underway)**	**Target Dates for Implementation**
Level III	☐	☒	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	By 31 Dec 2011, contingent upon additional staffing and resources becoming available
			Other activities or descriptions (not required):	
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

Appendix 1

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

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

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. Kentucky will select items or add additional items for state planning efforts after formation of a K-STRIPE Advisory Board for HAI Prevention.

Appendix 1, Table 1: HHS HAI Action Plan Metrics

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 CD-9 CM coded *Clostridium difficile* Infections	Hospitalizations with *C. difficile* per 1000 patient discharges	Hospital discharge data	2008 (proposed 2008, in consultation with states)	At least 30% reduction in hospitalizations with *C. difficile* per 1000 patient discharges	AHRQ	No
3b. C diff 2 (new)		*C. difficile* SIR	CDC NHSN MDRO/CDAD Module LabID‡	2009-2010	Reduce the facility-wide healthcare facility-onset *C. difficile* LabID event SIR by at least 30% from baseline or to zero	CDC	No

Appendix 1, Table 1: HHS HAI Action Plan Metrics

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

Appendix 1, Table 1: HHS HAI Action Plan Metrics

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?
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

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170+58}{100000\times\left(\frac{2}{1000}\right)+58{,}000\times\left(\frac{1.5}{1000}\right)} = \frac{228}{200+87} = \frac{228}{287} = 0.79$$

95%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

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315+210+111}{12600\times\left(\frac{3.0}{100}\right)+7000\times\left(\frac{5.0}{100}\right)+7400\times\left(\frac{1.7}{100}\right)} = \frac{636}{378+350+125.8} = \frac{636}{853.8} = 0.74$$

95%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.

	Observed HAIs			**Expected HAIs**		
HAI Metric	**#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

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{228+636}{287+853.8} = \frac{864}{1140.8} = 0.76$$ 95%CI = (0.673,0.849)

† SSI, surgical site infection