

Kansas Healthcare-associated Infections State Plan





DEPARTMENT OF HEALTH
AND ENVIRONMENT

Mark Parkinson, Governor
Roderick L. Bremby, Secretary

www.kdheks.gov

March 22, 2010

Dear Colleague,

Healthcare-Associated Infections (HAIs) remain a major cause of morbidity, mortality, and excess medical cost in the United States. An estimated five to 10% of all hospital admissions are complicated by HAIs. Approximately 1.7 million infections and nearly 100,000 deaths attributable to HAI occur each year. The financial burden of HAIs has been estimated at \$33 billion annually, a staggering figure at a time when our economy is suffering and demands on the health care system are increasing.

In an effort to address this important issue, the Kansas Department of Health and Environment (KDHE) is working collaboratively with a multidisciplinary advisory group of experts in epidemiology, infection control, clinical medicine and hospital administration. This team, brought together by State Epidemiologist D. Charles Hunt, has developed the Kansas Healthcare-associated Infections State Plan, which we are pleased to present at this time.

We sincerely thank the members of the advisory group for their time, expertise, and thoughtful feedback. We look forward to continuing our work together to reduce the impact of healthcare-associated infections in Kansas.

Sincerely,

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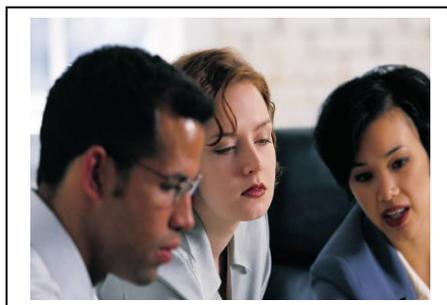
Kansas Healthcare-Associated Infections

State Plan Summary



Healthcare-Associated Infections (HAIs) are a major cause of morbidity, mortality, and excess cost in the U.S. According to the Centers for Disease Control and Prevention (CDC), in 2002 HAIs accounted for an estimated 1.7 million infections and 99,000 deaths. HAIs occur in all settings of care, placing vulnerable populations at higher risk of complications. The financial burden of HAIs has been estimated at \$33 billion annually, a staggering figure in an economy with rising healthcare needs and diminishing reserve. To address this issue, it is critical for states to develop a sustainable infrastructure that supports surveillance, reporting and improvement by healthcare providers. Assisting hospitals with tracking, reporting, and subsequent reduction of HAIs within their facilities is an important first step to global reduction of the negative impact of HAIs on patients, their families, and the healthcare system. Since the initial report in 2002, rigorous research and development of effective HAI reduction strategies have increased the momentum for global action to address this issue.

Kansas has had limited coordinated activity related to the reduction of HAIs. Kansas is one of the remaining approximately 30 states that do not currently have mandatory reporting of HAI surveillance data. Many



Kansas hospitals, ambulatory surgical centers, skilled facilities and other healthcare facilities have broadened their surveillance efforts to encompass some type of effort regarding HAIs due to the increasing regulatory and accreditation focus on infection prevention. Most healthcare providers have developed internal HAI surveillance methods and some have established an infection prevention program. Despite these efforts, a high level analysis of all Kansas Medicare data in the final quarter of 2008 shows approximately 0.5% or 160 claims totaling an estimated \$8.8 million dollars were spent treating

infections from an indwelling urinary catheter, a central venous catheter, or treating a postoperative surgical wound infection. Although provider collected data and analysis would provide more meaningful information on this topic, these figures clearly represent an opportunity to enhance patient quality of life as well as reduce the healthcare resource utilization burden. However, no statewide effort has existed to comprehensively support providers in their effort from initial development of surveillance methods through reporting, obtaining comparison data for analysis, and development of action plans to prevent HAIs. Based on these figures and apparent lack of support infrastructure, development of a HAI surveillance and prevention program in Kansas is a high priority.

Also a national priority, the 2009 federal Omnibus bill required 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 (HHS) not later than January 1, 2010. To assist states in responding to the short timeline required, CDC developed a template consistent with the HHS Action Plan to Prevent Healthcare-associated Infections. States were encouraged to use this template to help ensure consistency across states.

To further support these state efforts, funding for HAI prevention has been enhanced through the American Recovery and Reinvestment Act (ARRA). In February 2009, Congress allocated \$40 million through CDC to support state health department efforts to prevent HAIs by enhancing state capacity for

HAI prevention, leveraging CDC’s National Health Care Safety Network to assess progress, supporting the dissemination of evidence-based practices within healthcare facilities, and pursuing state-based collaborative implementation strategies. In September, 2009 Kansas received funding as a supplement to its Epidemiology and Laboratory Capacity for Infectious Disease (ELC) cooperative agreement to develop a statewide plan of action for the prevention of healthcare associated infections. The contents of the Kansas plan, which was submitted to HHS by December 31, 2009, were developed by the Kansas Department of Health and Environment, Bureau of Surveillance and Epidemiology (KDHE-BSE) with input from an Advisory Group comprised of representatives from various stakeholder groups.

State Plan Organization

CDC’s framework for the prevention of HAIs builds on a coordinated effort of federal, state and partner organizations. Recent legislation in support of HAI prevention provides a unique opportunity to strengthen and expand state capacity for prevention efforts. The framework for planned activities and each state plan is based on a collaborative public health approach that includes surveillance, outbreak response, research, training and education, and systematic implementation of prevention practices. The development of the plan and rollout of the program in Kansas has been funded initially through the American Recovery and Reinvestment Act (ARRA). Future state and local funding will be necessary to sustain future activities once ARRA funding ceases to support the program.



Following a template provided by the CDC, the Kansas Plan is comprised of four major HAI activity areas: State Program Infrastructure; Surveillance, Detection, Reporting and Response; Prevention; and Evaluation and Communications. A summary of the plan details for each of these topics is outlined in the subsequent text, followed by specific Work Plan objectives, activities, target dates, and current status.

It is important to note that the state plans submitted to HHS should be considered working documents. While the plan template included options for descriptions of implementation of various activities and target dates, states were advised that these plans were intended to be flexible as states further developed the details and implemented components of their plans. The summary of the plan that follows has been updated to reflect recent program activity. The original plan submitted to HHS is included as an attachment.

State Program Infrastructure

HAI Advisory Group Members	
Kansas Hospital Association (KHA)	Kansas Medical Society (KMS)
KHA/KMS Collaborative	Kansas Foundation for Medical Care
APIC Kansas City Chapter	APIC Wichita Chapter
APIC Heart of America Chapter	Via Christi Health
Shawnee Mission Medical Center	University of Kansas Medical Center
KDHE Bureau of Local & Rural Health	KDHE Bureau of Childcare and Health Facilities

The ARRA cooperative agreement directs that there be improved coordination among government agencies or organizations that share responsibility for assuring or overseeing HAI surveillance, prevention and control. State HAI Program Director and Epidemiologist positions have been established within the KDHE-BSE to oversee the program activities. Additionally, as previously mentioned, the KDHE-BSE has convened a core group of stakeholders to identify priorities and assist in coordination of HAI Plan activities in Kansas. The goal of this collaboration is to ensure that future work is practical for applicable providers, collaborative in nature to support providers, and not duplicative of other sources to address HAI surveillance and prevention. The Advisory Group met during the plan development, giving

valuable input on provider participation, barriers, and necessary support as well as assisting with measurement selection for the final plan document.

The Kansas state plan calls for advisory group members to support HAI activities by providing input and disseminating information regarding state HAI activities. As members of the advisory group, the state APIC chapters will also reach out to and encourage all providers in their region to become chapter members and stay become involved in the HAI statewide plan initiatives.

To facilitate use of standards-based formats by healthcare facilities for electronic reporting of HAI data, it was recommended that Kansas facilities will report their healthcare associated infections via the National Healthcare Safety Network (NHSN) database to ensure reliable, consistent, and comparable data. Additional details about the NHSN are available at <http://www.cdc.gov/nhsn/>. The initial focus will be on hospitals with at least 100 staffed beds, but the participation of all hospitals would be welcomed. The HAI Program Director will work with participating providers to establish KDHE as the group administrator and facilitate providers joining the group. Technical assistance will be provided with obtaining and installing the necessary digital certificates, use of the NHSN system, and other issues as needed.

Kansas Work Plan Objectives

Element	Implementation Activities	Target Date	Status
Establish state HAI Advisory Group	Advisory group members are asked to support HAI activities by providing input in the identification of priorities to help guide patient safety initiatives and disseminating information regarding state HAI activities. As members of the advisory group, the state APIC chapters will also reach out to and encourage all providers in their region to become chapter members and become involved in the HAI statewide plan initiatives.	October, 2009	✓ Completed
	Identify specific HAI prevention targets.	October, 2009	✓ Completed
Establish a state HAI surveillance, prevention, and control program	Establish HAI Program Director position within KDHE to oversee the program activities.	January, 2010	In progress
	Establish Epidemiologist position within KDHE.	February, 2010	In progress
Integrate laboratory activities with HAI surveillance, prevention, and control efforts	Conduct assessment of current capability of laboratory systems throughout the state to confirm emerging resistance in HAI pathogens and perform typing where appropriate.	December, 2010	Not started
	Incorporate HL7 messaging of laboratory results as technology becomes available.	To be determined	Not started
Improve coordination among government agencies or organizations that share responsibility for HAI	Advisory Group membership to include KDHE Health Facilities Program, Bureau of Local and Rural Health, and Bureau of Surveillance and Epidemiology.	October, 2009	✓ Completed / Ongoing activity
	Explore opportunities to integrate HAI program activities into other KDHE and external partner projects to decrease duplication of efforts and requirements.	To be determined	In progress

Element	Implementation Activities	Target Date	Status
Facilitate use of standards-based formats by healthcare facilities for purposes of electronic reporting of HAI data	Participating Kansas facilities will report their HAI data via the NHSN. A statewide group will be established in NHSN for participating Kansas providers. Technical assistance will be provided to assist providers in obtaining and installing the necessary digital certificates and use of the NHSN reporting system.	April, 2010 group established Start recruitment by April 15, 2010	Not started

Surveillance, Detection, Reporting and Response

Complete data regarding KS HAI occurrence and prevention is not currently available. To identify priorities for which quality improvement efforts can be focused and providers supported by KDHE staff, more complete data from many providers are necessary to represent the Kansas population and provider community. Mandatory HAI reporting is not currently on the legislative policy agenda for KDHE, nor is it supported by the Advisory Group as a first round intervention to increase provider HAI reporting in the near term.

To accomplish the goal of a more complete data set for development of support and activities, facilities will be asked to voluntarily use the NHSN database and select **two** of the following priority prevention targets. The following measures were recommended by the Advisory Group after lengthy discussion regarding facility size and consideration of the amount of resources involved to participate and submit data to NHSN. Four measures were chosen to allow all hospitals to participate and not limit participation only to those with ICU beds. Full measure specifications, background, and five year HHS targets and can be found at the following link: <http://www.hhs.gov/ophs/initiatives/hai/infection.html>.

Metric	Original HAI Elimination Metric	National Baseline Established (State Baselines Established)	National 5-Year Prevention Target	Target Date	Care Unit/ Setting
CLABSI ¹	CLABSIs per 1000 device days by ICU and other locations	2006-2008 (proposed 2009, in consultation with states)	Reduce the CLABSI standardized infection ratio (SIR) by at least 50% from baseline or to zero in ICU and other locations	2010	ICU (excluding PICU or NICU) – either Medical or Surgical or combination ICU
CAUTI ²	# of symptomatic UTI per 1,000 urinary catheter days	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	2010	ICU (excluding PICU or NICU) – either Medical or Surgical or combination ICU
C diff ³	Case rate per patient days: administrative/discharge data for IDC-9 CM coded <i>Clostridium difficile</i> Infections	2008 (proposed 2008, in consultation with states)	At least 30% reduction in hospitalizations with <i>C. difficile</i> per 1000 patient discharges.	2010	Medical or surgical, non-ICU unit
SSI ⁴	Deep incision and organ space infection rates using NHSN definitions (SCIP procedures)	2006-2008 (proposed 2009, in consultation with states)	Reduce the admission and readmission SSI SIR by at least 25% from baseline or to zero	2012	TBD

¹Central Line-associated Bloodstream Infections (CLABSI) ² Catheter-associated Urinary Tract Infections (CAUTI) ³ *Clostridium difficile* Infections (CDI)

⁴Surgical Site Infections (SSI)

As previously discussed, participating hospitals will report the selected metrics in the table above through the NHSN. Provider support for collection and reporting provided by KDHE to assist hospitals in this effort will include:

- Individual site visits to assist with enrollment, training and first data abstraction and submission
- Training materials, tools and resources
- Technical and clinical expertise assistance for any HAI or NHSN related issues
- Communication methods for timely information dissemination (ex. Website tools, emails, newsletters)
- Assistance with monthly data submission monitoring and follow-up

KDHE will also develop a mechanism of reporting aggregate level data online, special reports and other publications. The feasibility of developing a reporting mechanism making risk-adjusted data available that enables state agencies to make comparisons between hospitals will be assessed. At this time, facility-specific public reporting is not a recommendation of the Advisory Group; however, there is consensus that this should be considered as a long-range goal and the group will continue to discuss the issue.

Kansas Work Plan Objectives

Element	Implementation Activities	Target Date	Status
Improve HAI outbreak detection and investigation	Work with partners including CSTE (Council of State and Territorial Epidemiologist), CDC (Centers for Disease Control and Prevention), state legislatures, and providers across the healthcare continuum to improve endemic and outbreak reporting to state health departments.	December, 2009	Ongoing activity
	Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs. The current established Kansas infectious disease investigation guidelines will be the standard template utilized for development of guidelines to be used for HAI.	May, 2010	Not started
	Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in healthcare settings.	May, 2010	Not started
Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues	The Program Director will conduct an assessment of the current capabilities and capacities of the local and regional reference laboratories. Additional funding would be required for the state laboratory to perform confirmation testing for the purpose of quality control or providing technical assistance for difficult to identify organisms.	December, 2010	Not started
Improve communication of HAI outbreaks and infection control breaches	Increase awareness of current requirements, guidelines, and practices for outbreaks of infectious diseases.	Ongoing activity	Ongoing activity
	Future efforts may focus on enhancing website resources or increasing direct notification and collaboration with state survey agencies, licensing boards, the QIO, and other governmental partners.		

Element	Implementation Activities	Target Date	Status
Adopt national standards for data and technology to track HAI	Develop metrics to measure progress towards national goals.	October, 2009	✓ Completed
	Establish baseline measurements for prevention targets utilizing NHSN surveillance definitions and methods.	6 months after facilities begin reporting data to NHSN	Not started
Develop state surveillance training competencies	Conduct local training for appropriate use of NHSN surveillance system including facility and group enrollment, data collection, management, and analysis. Include training to promote data consistency (e.g., counting line days). Establish a KS NHSN user group to support participating providers.	June, 2010 start conducting training	In progress
Develop tailored reports of data analyses for state or region prepared by state personnel	Epidemiologist will develop reports when data are available.	6 months after facilities begin reporting data to NHSN	Not started
Validate data entered into HAI surveillance to measure accuracy and reliability of HAI data collection	The epidemiologist will develop a validation plan identifying methodology and sampling criteria. The following will be considered: Evaluate acceptability of provider simplified HAI collection methodology; conduct record review for validation process; explore feasibility of systematic confirmatory testing of select pathogens.	December, 2010	Not started
Develop preparedness plans for improved response to HAI	Define processes and tiered response criteria to handle increased reports of serious infection control breaches, suspect cases/clusters, and outbreaks. The current established Kansas infectious disease investigation guidelines will be the standard template utilized for development of guidelines to be used for HAI clusters and revised to fit the hospital setting using NHSN benchmarks, tools and national guidelines.	December, 2010	Not started
Adopt integration and interoperability standards for HAI information systems and data sources	Improve overall use of surveillance data to identify and prevent HAI outbreaks in healthcare settings across the spectrum of inpatient and outpatient healthcare settings. The epidemiologist will develop reports using provider data and disseminate them as feedback. These reports will also be used to generate articles and material for distribution to providers and consumers.	To be determined	Not started
	Promote definitional alignment and data element standardization needed to link HAI data across the nation.	To be determined	Not started
Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and	Develop a mechanism of reporting aggregate level data online via a KDHE website.	December, 2011	Not started



Element	Implementation Activities	Target Date	Status
increase timeliness, efficiency, comprehensiveness, and reliability of the data			

Prevention

In an effort to support hospitals in the prevention of HAIs, the plan states that Kansas will support the use of the HICPAC (<http://www.cdc.gov/ncidod/dhqp/guidelines.html>) recommendations for urinary catheter use, aseptic urinary catheter insertion and maintenance, aseptic insertion and appropriate maintenance of vascular catheters. Additional activities to support hospitals in prevention of HAIs will be coordinated and developed with assistance requested from Advisory Group members, with input from hospitals, as tools and resources necessary to assist them are identified. Additionally, general information as well as resources developed for prevention of HAIs will be posted to the KDHE website once dedicated pages are developed for program activities.



Kansas Work Plan Objectives

Element	Implementation Activities	Target Dates	Status
Implement HICPAC (Hospital Infection Control Practices Advisory Committee) recommendations for at least 2 prevention targets specified by the state multidisciplinary group	Use of Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendations for urinary catheter use, aseptic urinary catheter insertion and maintenance, aseptic insertion and appropriate maintenance of vascular catheters will be promoted. Provider educational materials will be developed and distributed. Conduct an assessment to determine hospitals' use of HICPAC recommendations across the state. The survey will include questions regarding barriers to implementation.	September, 2010	Not started

Evaluation and Communications

As stated previously, Kansas plans to disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public via the KDHE website. Information will also be distributed through the Advisory Group, articles, published reports, media releases and other avenues.

The Advisory Group and other partners as identified by the Advisory Group will be utilized to provide input in the identification of priorities to help guide patient safety initiatives and research aimed at reducing HAIs in Kansas in the future.

Kansas Work Plan Objectives

Element	Implementation Activities	Target Date	Status
Conduct needs assessment	Establish evaluation activity to measure progress	To be determined	Not started

Element	Implementation Activities	Target Date	Status
and/or evaluation of the state HAI program to learn how to increase impact	towards targets.		
	Establish systems for refining approaches based on data gathered.	To be determined	Not started
Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders needs	<p>Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public. Information will be distributed via a KDHE website, the Advisory Group and other avenues.</p> <p>KDHE will present the plan at the KHA Infection Prevention Meeting on March 25, 2010 and the State Network Council meeting on May 6, 2010. Advisory Group members will distribute the document to their membership on March 22, 2010.</p>	March, 2010	Not started
Provide consumers access to useful healthcare quality measures	State aggregate data will be provided and posted on a KDHE website.	To be determined	Not started
Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	KDHE will utilize input from the Advisory Group including members of hospitals, the hospital association (KHA) and the Kansas Healthcare Collaborative, along with other partners as identified by the Advisory Group to identify priorities.	To be determined	Not started

For additional information regarding the Kansas HAI plan, please contact:

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 Bureau of Surveillance and Epidemiology
 1000 SW Jackson St., Suite 210
 Topeka, KS 66612-1274
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Appendix: Original Kansas Healthcare-associated Infections Plan Submitted to the
U.S. Department of Health and Human Services



Kansas Healthcare Associated Infections Plan

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

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	X	<input type="checkbox"/>	1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council	
	X	<input type="checkbox"/>	<ul style="list-style-type: none"> 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)) ii. Identify specific HAI prevention targets consistent with HHS priorities 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • The state advisory group currently consists of representatives from the three state APIC chapters, Kansas Hospital Association, Kansas Medical Society, Kansas Foundation for Medical Care, Kansas Department of Health and Environment (Bureau of Local and Rural Health, Bureau of Child Care and Health Facilities, and Bureau of Surveillance & Epidemiology), Shawnee Mission Medical Center, University of Kansas Hospital, and the Via Christi Health System. The following entities will be brought in as activation of the plan occurs: <ul style="list-style-type: none"> ○ Long term care – Kansas Department on Aging, Kansas Health Care Association (KHCA), Kansas Association of Homes and Services for the Aging (KAHSA) ○ Other Allied Health Groups – laboratories, respiratory therapy associations 	October, 2009

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"> ○ Consumers – Kansas Consumer Coalition and a representative affected by HAI ○ Long-term Acute Care Hospitals (LTACs) ○ Rehabilitation Hospitals ○ Ambulatory Surgery Centers ○ Home Health – Kansas Home Care Association (KHCA) ○ Hospital Administrators ○ Hospital Based Dialysis centers <p>See Section 2, #4 for the prevention targets that have been identified by the Advisory Group.</p>	
	<p>X</p> <p>X</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	<p>2. Establish an HAI surveillance prevention and control program</p> <ul style="list-style-type: none"> i. Designate a State HAI Prevention Coordinator 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) 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ● Currently, Charles Hunt, MPH, Principal Investigator (PI), State Epidemiologist and Director, Bureau of Surveillance and Epidemiology - Program and funding oversight, leadership, resource allocation, integration, collaboration and capacity building and coordination between state officials, contractors and stakeholders. Charles Hunt has been identified as the State HAI Prevention Coordinator until a Program Director is hired. The following new positions will be filled: <ul style="list-style-type: none"> ○ New Position-Program Director - Operational management of the program, coordinates program communications, manages 	<p>HAI Program Director</p>

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>contracted services, coordinates Advisory Group activities, reporting, evaluation, communication, tracks measures, and reports programmatic and fiscal activities.</p> <ul style="list-style-type: none"> ○ New Position-Epidemiologist - The position will provide epidemiologic support to the Healthcare Associated Infections program. This includes: conducting literature reviews, identifying, merging and analyzing existing data sources; planning and implementing new data collection strategies; analyzing and interpreting these data to measure the burden of HAI and their risk factors in Kansas; interpreting and applying epidemiologic information for development and implementation of effective preventive strategies; working within the Bureau, Division, and state to improve access, quality and utility of state health data systems; and developing appropriate application for funding to sustain and expand the state’s capacity to monitor and reduce healthcare associated infections. ● Contracted services – Clinical and NHSN expertise to provide KDHE staff training and assistance. 	<p>appointment: January, 2010</p> <p>Epidemiologist appointment: February, 2010</p>
	□	X	<p>3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.</p> <ul style="list-style-type: none"> 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) 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> ● The Kansas Program Director will conduct an assessment of the current capability of laboratory systems for emerging pathogens to identify what the needs are with regard to training, staffing or funding. This process will assist in identifying what is needed to 	December, 2010

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>improve and assist with coordination of communication.</p> <ul style="list-style-type: none"> HL7 messaging of laboratory results will be incorporated as the technology becomes available from the CDC. 	As available
Level II	<input type="checkbox"/>	X	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)	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> The Advisory Group membership includes the KDHE Bureau of Child Care and Health Facilities (the state survey and certification program) as well as the Bureau of Local and Rural Health. Kansas is currently one of a few states chosen to pilot a new, more intensified, survey process focusing on Infection Prevention in Ambulatory Surgery Centers. We plan to explore opportunities to build HAI into other state health department projects. HAI has been identified as a focus for the Kansas Healthcare Collaborative which is a joint effort between the Kansas Hospital Association and the Kansas Medical Society. As members the state APIC chapters will reach out to and encourage the smaller providers who are not currently actively participating to join their chapters. All Advisory Group members will support HAI activities by providing input and disseminating information regarding state HAI activities. The state QIO, Kansas Foundation for Medical Care, is also a member providing expertise and resources developed through their 9SOW CMS contract. 	Ongoing
	X	<input type="checkbox"/>	5. Facilitate use of standards-based formats (e.g., Clinical Document	

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>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>	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • Kansas facilities will report their healthcare associated infections via the NHSN database. A statewide group will be established for Kansas and the Program Director will work with participating providers to establish KDHE as the group administrator and facilitate providers joining the group. Technical assistance will be provided to assist providers in obtaining and installing the necessary digital certificates and use of the NHSN system for reporting. 	<p>April 1, 2010</p>
<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)

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

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.

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

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	X	<input type="checkbox"/>	1. Improve HAI outbreak detection and investigation	
	<input type="checkbox"/>	X	i. Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments	
	<input type="checkbox"/>	X	ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs.	
	<input type="checkbox"/>	X	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	
	<input type="checkbox"/>	X	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)	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • Mandatory HAI reporting is not currently on the legislative policy agenda for KDHE. However, there are ongoing discussions about the feasibility among stakeholders, and this may be considered as a future activity. <ul style="list-style-type: none"> The State HAI Prevention Coordinator and Project Director will: <ul style="list-style-type: none"> ○ Join the ongoing CSTE workgroup calls ○ Participate in HAI webinar/conference calls for ELC HAI Recovery Act grantees ○ Participate in HAI training opportunities • Kansas currently has approximately 55 standardized infectious disease investigation guidelines (DIG). These documents will become the standard template that will be utilized for the development of 	December 31, 2009 for all activities

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>guidelines that will be used for HAI clusters. These guidelines are readily available to providers via www.kdheks.gov under the Bureau of Surveillance & Epidemiology. The guidelines include investigation contact forms, public notices and provider letters, etc.</p> <ul style="list-style-type: none"> • See ii. Above. These guidelines provide information regarding how to protect workers. • The epidemiologist will use provider data to develop reports which will be disseminated to providers as feedback. These reports will also be used to generate articles and material for distribution to providers and consumers. 	
	<input type="checkbox"/>	X	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • The capabilities and capacities of local and regional reference laboratories need to be assessed. Additional funding would be required for the state laboratory to perform confirmation testing for the purpose of quality control or providing technical assistance for difficult to identify organisms. • The Kansas Program Director will conduct an assessment of the current capabilities and capacities 	July 2011

Level II	X	<input type="checkbox"/>	<p>3. Improve communication of HAI outbreaks and infection control breaches</p> <p>i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC</p> <p>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)</p>	
	X	<input type="checkbox"/>		
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • The current definition of an outbreak is two or more epidemiologically related cases. • Currently healthcare providers, hospitals, and laboratories have available a toll-free KDHE hotline number to report suspected or confirmed cases of HAI or outbreaks to KDHE. In addition every hospital and ambulatory surgery center is required to have a log of all HAIs. Hospitals and ambulatory surgery centers also use the established Kansas risk management state reporting requirements quarterly to report to KDHE those HAIs that have been investigated and assigned a standard of care determination through the provider risk management process. These data are not aggregated for dissemination to other partners. However, state reportable communicable diseases and suspected and confirmed outbreak reports are available to partners and the public via the KDHE website. Trends or patterns of HAIs identified through quality reviews by the QIO are currently reported to the state survey agency as appropriate. Future efforts may focus on enhancing website resources or increasing direct notification and collaboration with state survey agencies, licensing boards, the QIO, and other governmental partners. 	<p>Ongoing</p> <p>April 2010</p>

	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	X X X <input type="checkbox"/> X <input type="checkbox"/>	4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan <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 Staphylococcus aureus (MRSA) Infections v. Surgical Site Infections (SSI) vi. Ventilator-associated Pneumonia (VAP) 	2010 2010 2010 2012
			<p><i>Other activities or descriptions (not required):</i></p> <p>Kansas plans to ask facilities to begin participating and select 2 of the following 3 measures depending on facility size and capacity (ICU or no ICU):</p> <p>CLABSI 1 – ICU (excluding PICU or NICU)</p> <ul style="list-style-type: none"> • Collect in either the medical/surgical, medical or surgical ICU • Will more intensively recruit those facilities with 100 beds or greater to participate in this measure. <p>CAUTI 2 – ICU (excluding PICU or NICU)</p> <ul style="list-style-type: none"> • Collect in either the medical/surgical, medical or surgical ICU • Will more intensively recruit those facilities with 100 beds or greater to participate in this measure. <p>C diff 1 –</p> <ul style="list-style-type: none"> • Collect in a medical or surgical, non-ICU unit <ul style="list-style-type: none"> ○ This measure allows smaller facilities without an ICU to participate in the initial data collection 	CLABSI 1: 2010 CAUTI 2: 2010 C diff 1: 2010
	X <input type="checkbox"/>	<input type="checkbox"/> X	5. Adopt national standards for data and technology to track HAIs (e.g., NHSN). <ul style="list-style-type: none"> i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1). ii. Establish baseline measurements for prevention targets 	

		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> The metrics identified in section 4 above will be reported by Kansas facilities via the NHSN. We plan to have an identified baseline established for each of the metrics by 4/1/10. 	April 1, 2010
<input type="checkbox"/>	X	<p>6. Develop state surveillance training competencies</p> <p>i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis</p>	
		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> Assemble or develop tools, resources, and training materials for use on site visits with providers. Provide individualized site visits with each provider to assist with enrollment, training, and first data abstraction and submission (2 visits per site). Assist providers with any HAI or NHSN related issues providing clinical and technical expertise. Develop communication method for timely information dissemination to participating facilities (ex. Website tools, emails, newsletter info.) Develop NHSN, HAI quick resource guide to assist with most frequent or problematic technical or clinical issues. Complete monthly data submission monitoring and follow-up. 	April 1, 2010
<input type="checkbox"/>	X	<p>7. Develop tailored reports of data analyses for state or region prepared by state personnel</p>	6 months after facilities begin reporting data to NHSN
		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> Epidemiologist will develop reports when data are available. 	

Level III	<input type="checkbox"/>	<input 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	
	<input type="checkbox"/>	X	<ul style="list-style-type: none"> 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 	
	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>		
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • The epidemiologist will develop a validation plan identifying a methodology and sampling criteria. • The following will be considered: <ul style="list-style-type: none"> ○ Evaluate acceptability of provider simplified HAI collection methodology. ○ Conduct record review for validation process. ○ Explore feasibility of systematic confirmatory testing of select pathogens. 	December 31, 2010 for all activities
	X	<input type="checkbox"/>	9. Develop preparedness plans for improved response to HAI	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • Kansas currently has approximately 55 infectious disease investigation guidelines. These documents will become the standard template that will be utilized for the development of guidelines that will be used for HAI clusters. These guidelines are readily available to providers via www.kdheks.gov under the Bureau 	December 2010

		of Surveillance & Epidemiology. The guidelines include investigation contact forms, public notices and provider letters, etc.	
<input type="checkbox"/>	X	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	
		<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	
<input type="checkbox"/>	X	11. Adopt integration and interoperability standards for HAI information systems and data sources <ul style="list-style-type: none"> 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 	
<input type="checkbox"/>	X	<ul style="list-style-type: none"> Promote definitional alignment and data element standardization needed to link HAI data across the nation. 	
		<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> This function will be performed by the epidemiologist using provider data to develop reports which will be disseminated to providers as feedback. These reports will also be used to generate articles and material for distribution to providers and consumers. Work on data element standardization is deferred for development when the capability is developed nationally. Kansas will join at that time and follow national standards. 	December 2010
<input type="checkbox"/>	X	12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data <ol style="list-style-type: none"> Report HAI data to the public 	

		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> We plan to develop a mechanism of reporting aggregate level data online via either the Kansas Information for Communities (KIC), an online interactive query system currently used for statistics on cancer, mortality, births, deaths, etc. (see http://kic.kdhe.state.ks.us/kic/), special reports, and other publications. 	December 2011
	<input type="checkbox"/>	<input type="checkbox"/>	13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.
		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> The feasibility of this will be assessed to develop a reporting mechanism to provide comparison data to the facilities and use by the state agencies. At this time facility-specific public reporting is currently not a recommendation of the Advisory Group however, there is consensus that this will be a long range goal and we will continue to discuss this issue. 	
	<input type="checkbox"/>	<input type="checkbox"/>	14. Enhance surveillance and detection of HAIs in nonhospital settings
		<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	
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"/>	X	1. Implement HICPAC recommendations. i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group.	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> Plan to promote use of the HICPAC recommendations for urinary catheter use, aseptic urinary catheter insertion and maintenance, aseptic insertion and appropriate maintenance of vascular catheters. Will develop and distribute educational materials for providers. 	September 2010
	<input type="checkbox"/>	<input type="checkbox"/>	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	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	

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"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>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)</p> <ul style="list-style-type: none"> i. Identify staff trained in project coordination, infection control, and collaborative coordination ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress 	
			<p><i>Other activities or descriptions (not required):</i></p> <ul style="list-style-type: none"> • This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	
	<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 is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	

Level II	<input type="checkbox"/>	<input type="checkbox"/>	5. Implement strategies for compliance to promote adherence to HICPAC recommendations <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 prevent HAIs iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered or work with healthcare partners to establish best practices to ensure adherence 	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> • This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	
	<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> <ul style="list-style-type: none"> • This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 	
	<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> <ul style="list-style-type: none"> • This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. 		
Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.				

4. Evaluation and Communications

Program evaluation is an essential organizational practice in public health. Continuous evaluation and communication of practice findings integrates science as a basis for decision-making and action for the prevention of HAIs. Evaluation and communication allows for learning and ongoing improvement to occur. Routine, practical evaluations can inform strategies for the prevention and control of HAIs. 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	<input type="checkbox"/>	X	1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact i. Establish evaluation activity to measure progress towards targets and	
	<input type="checkbox"/>	X	ii. Establish systems for refining approaches based on data gathered	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> To be determined as the program develops. Kansas has developed a comprehensive workplan to assist in structured coordination of activities with defined timeframes. 	
	<input type="checkbox"/>	X	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	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> Kansas plans to provide information via a website as well as distribute information through the Advisory Group, articles, published reports, media releases, and other avenues. 	December 2010

Level II	<input type="checkbox"/>	X	3. Provide consumers access to useful healthcare quality measures	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> Aggregate data will be provided and posted on a website, comparison reports may be developed as funding allows and the program matures. 	To be determined
Level III	<input type="checkbox"/>	X	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	
			<i>Other activities or descriptions (not required):</i> <ul style="list-style-type: none"> Identification of priorities is to be determined. Plan to utilize input from the Advisory Group and association with the Healthcare Collaborative and other partners as identified by the Advisory Group. 	To be determined
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)

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?	KS Selected Metric
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*	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 [†]	No
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	Yes
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	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?	KS Selected Metric
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*	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	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	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 [¶]	No
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	No

* 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