## 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 |
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| **Level I** | X<br>X | ☐<br>☐ | 1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council<br>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))<br>ii. Identify specific HAI prevention targets consistent with HHS priorities | |
| | | | *Other activities or descriptions (not required):*<br>• 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:<br>○ Long term care – Kansas Department on Aging, Kansas Health Care Association (KHCA), Kansas Association of Homes and Services for the Aging (KAHSA)<br>○ 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 |
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| | | | ○ Consumers – Kansas Consumer Coalition and a representative affected by HAI<br>○ Long-term Acute Care Hospitals (LTACs)<br>○ Rehabilitation Hospitals<br>○ Ambulatory Surgery Centers<br>○ Home Health – Kansas Home Care Association (KHCA)<br>○ Hospital Administrators<br>○ Hospital Based Dialysis centers<br>See Section 2, #4 for the prevention targets that have been identified by the Advisory Group. | |
| | X<br>X | ☐<br>☐ | 2. Establish an HAI surveillance prevention and control program<br>i. Designate a State HAI Prevention Coordinator<br>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) | |
| | | | *Other activities or descriptions (not required):*<br>• 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:<br>○ New Position-Program Director - Operational management of the program, coordinates program communications, manages | HAI Program Director |

| Planning Level | Check Items Underway | Check Items Planned | Items Planned for Implementation (or currently underway) | Target Dates for Implementation |
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| | | | contracted services, coordinates Advisory Group activities, reporting, evaluation, communication, tracks measures, and reports programmatic and fiscal activities.<br>○ 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.<br>• Contracted services – Clinical and NHSN expertise to provide KDHE staff training and assistance. | appointment: January, 2010<br><br>Epidemiologist appointment: February, 2010 |
| | ☐ | X | 3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.<br>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) | |
| | | | *Other activities or descriptions (not required):*<br>• 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 |
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| | | | improve and assist with coordination of communication.<br>• HL7 messaging of laboratory results will be incorporated as the technology becomes available from the CDC. | As available |
| **Level II** | ☐ | 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) | |
| | | | *Other activities or descriptions (not required):*<br>• 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.<br>• 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.<br>• The state QIO, Kansas Foundation for Medical Care, is also a member providing expertise and resources developed through their 9SOW CMS contract. | Ongoing |
| | X | ☐ | 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 |
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| | | | 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):*<br>• 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. | April 1, 2010 |
| Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities. | | | | |

## 2. Surveillance, Detection, Reporting, and Response

Timely and accurate monitoring remains necessary to gauge progress towards 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 | ☐ | 1. Improve HAI outbreak detection and investigation<br>i. Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments | |
| | ☐ | X | ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs. | |
| | ☐ | 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 | |
| | ☐ | 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) | |
| | | | *Other activities or descriptions (not required):*<br>• 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.<br>The State HAI Prevention Coordinator and Project Director will:<br>o Join the ongoing CSTE workgroup calls<br>o Participate in HAI webinar/conference calls for ELC HAI Recovery Act grantees<br>o Participate in HAI training opportunities<br>• 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 |
|---|---|---|---|---|
| | | | 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.<br>• See ii. Above. These guidelines provide information regarding how to protect workers.<br>• 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. | |
| | ☐ | X | 2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues. | |
| | | | *Other activities or descriptions (not required):*<br>• 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.<br>• The Kansas Program Director will conduct an assessment of the current capabilities and capacities | July 2011 |

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| **Level II** | X<br><br>X | ☐<br><br>☐ | 3. Improve communication of HAI outbreaks and infection control breaches<br>i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC<br>ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards) | |
| | | | *Other activities or descriptions (not required):*<br>• The current definition of an outbreak is two or more epidemiologically related cases.<br>• 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. | Ongoing<br><br>April 2010 |

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| | ☐<br>☐<br>☐<br>☐<br>☐<br>☐ | X<br>X<br>X<br>☐<br>X<br>☐ | 4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan<br>i. Central Line-associated Bloodstream Infections (CLABSI)<br>ii. *Clostridium difficile* Infections (CDI)<br>iii. Catheter-associated Urinary Tract Infections (CAUTI)<br>iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections<br>v. Surgical Site Infections (SSI)<br>vi. Ventilator-associated Pneumonia (VAP) | <br>2010<br>2010<br>2010<br><br>2012<br> |
| | | | *Other activities or descriptions (not required):*<br><br>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):<br><br>CLABSI 1 – ICU (excluding PICU or NICU)<br>• Collect in either the medical/surgical, medical or surgical ICU<br>• Will more intensively recruit those facilities with 100 beds or greater to participate in this measure.<br>CAUTI 2 – ICU (excluding PICU or NICU)<br>• Collect in either the medical/surgical, medical or surgical ICU<br>• Will more intensively recruit those facilities with 100 beds or greater to participate in this measure.<br>C diff 1 –<br>• Collect in a medical or surgical, non-ICU unit<br>○ This measure allows smaller facilities without an ICU to participate in the initial data collection | <br><br><br>CLABSI 1: 2010<br><br><br><br>CAUTI 2: 2010<br><br><br><br>C diff 1: 2010 |
| | X<br><br>☐ | ☐<br><br>X | 5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).<br>i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1).<br>ii. Establish baseline measurements for prevention targets | |

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| | | | *Other activities or descriptions (not required):*<br>• 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 |
| | ☐ | X | 6. Develop state surveillance training competencies<br>i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis | |
| | | | *Other activities or descriptions (not required):*<br>• Assemble or develop tools, resources, and training materials for use on site visits with providers.<br>• Provide individualized site visits with each provider to assist with enrollment, training, and first data abstraction and submission (2 visits per site).<br>• Assist providers with any HAI or NHSN related issues providing clinical and technical expertise.<br>• Develop communication method for timely information dissemination to participating facilities (ex. Website tools, emails, newsletter info.)<br>• Develop NHSN, HAI quick resource guide to assist with most frequent or problematic technical or clinical issues.<br>• Complete monthly data submission monitoring and follow-up. | April 1, 2010 |
| | ☐ | X | 7. Develop tailored reports of data analyses for state or region prepared by state personnel | 6 months after facilities begin reporting data to NHSN |
| | | | *Other activities or descriptions (not required):*<br>• Epidemiologist will develop reports when data are available. | |

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| **Level III** | ☐<br><br><br><br>☐<br>☐<br>☐<br><br>☐<br><br>☐<br>☐ | ☐<br><br><br><br>X<br>☐<br>☐<br><br>☐<br><br>☐<br>☐ | 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<br>i. Develop a validation plan<br>ii. Pilot test validation methods in a sample of healthcare facilities<br>iii. Modify validation plan and methods in accordance with findings from pilot project<br>iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance<br>v. Analyze and report validation findings<br>vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected | |
| | | | *Other activities or descriptions (not required):*<br>• The epidemiologist will develop a validation plan identifying a methodology and sampling criteria.<br>• The following will be considered:<br>○ Evaluate acceptability of provider simplified HAI collection methodology.<br>○ Conduct record review for validation process.<br>○ Explore feasibility of systematic confirmatory testing of select pathogens. | December 31, 2010 for all activities |
| | X | ☐ | 9. Develop preparedness plans for improved response to HAI<br>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):*<br>• 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 |

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| | | | of Surveillance & Epidemiology. The guidelines include investigation contact forms, public notices and provider letters, etc. | |
| | ☐ | 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 | |
| | | | *Other activities or descriptions (not required):*<br>• This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. | |
| | ☐<br><br>☐ | X<br><br>X | 11. Adopt integration and interoperability standards for HAI information systems and data sources<br>• 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<br>• Promote definitional alignment and data element standardization needed to link HAI data across the nation. | |
| | | | *Other activities or descriptions (not required):*<br>• 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.<br>• 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 |
| | ☐ | 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<br>i. Report HAI data to the public | |

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| | | *Other activities or descriptions (not required):*<br>• 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 |
| | ☐ | 13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals. | |
| | | *Other activities or descriptions (not required):*<br>• 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. | |
| | ☐ | 14. Enhance surveillance and detection of HAIs in nonhospital settings | |
| | | *Other activities or descriptions (not required):*<br>• 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 | ☐ | X | 1. Implement HICPAC recommendations.<br>i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group. | |
| | | | *Other activities or descriptions (not required):*<br>• 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 |
| | ☐ | ☐ | 2. Establish prevention working group under the state HAI advisory council to coordinate state HAI collaboratives<br>i. Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaboratives | |
| | | | *Other activities or descriptions (not required):*<br>• 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 |
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| | ☐<br>☐<br>☐ | ☐<br>☐<br>☐ | 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)<br>i. Identify staff trained in project coordination, infection control, and collaborative coordination<br>ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices<br>iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress | |
| | | | *Other activities or descriptions (not required):*<br>• This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. | |
| | ☐ | ☐ | 4. Develop state HAI prevention training competencies<br>i. Consider establishing requirements for education and training of healthcare professionals in HAI prevention (e.g., certification requirements, public education campaigns and targeted provider education) or work with healthcare partners to establish best practices for training and certification | |
| | | | *Other activities or descriptions (not required):*<br>• This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. | |

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| **Level II** | ☐<br>☐<br>☐<br>☐ | ☐<br>☐<br>☐<br>☐ | 5. Implement strategies for compliance to promote adherence to HICPAC recommendations<br>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<br>ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs<br>iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data<br>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):*<br>• This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. | |
| | ☐ | ☐ | 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):*<br>• This is currently beyond the scope of the Kansas plan; we will consider when the program is more mature and has established funding. | |
| | ☐ | ☐ | 7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis) | |
| | | | *Other activities or descriptions (not required):*<br>• 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** | ☐ | X | 1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact<br>i. Establish evaluation activity to measure progress towards targets and | |
| | ☐ | X | ii. Establish systems for refining approaches based on data gathered | |
| | | | *Other activities or descriptions (not required):*<br>• To be determined as the program develops. Kansas has developed a comprehensive workplan to assist in structured coordination of activities with defined timeframes. | |
| | ☐ | X | 2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders needs<br>i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public | |
| | | | *Other activities or descriptions (not required):*<br>• 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 |

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| **Level II** | ☐ | X | 3. Provide consumers access to useful healthcare quality measures | |
| | | | *Other activities or descriptions (not required):*<br>• 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** | ☐ | X | 4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs | |
| | | | *Other activities or descriptions (not required):*<br>• 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<br><br>(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<br><br>(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 *Clostridium difficile* Infections | Hospitalizations with *C. difficile* per 1000 patient discharges | Hospital discharge data | 2008<br><br>(proposed 2008, in consultation with states) | At least 30% reduction in hospitalizations with *C. difficile* per 1000 patient discharges | AHRQ | No | Yes |
| 3b. C diff 2<br><br>(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 | 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<br><br>2009 for other hospital units<br><br>(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<br><br>(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<br><br>(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<br><br>(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 |

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

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 |

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

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 |

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

† SSI, surgical site infection