Kentucky Healthcare-Associated Infection Prevention Plan

In response to the increasing concerns about the public health impact of healthcare-associated infections (HAIs), the US Department of Health and Human Services (HHS) has developed an Action Plan to help prevent Healthcare-associated Infections. The HHS Action Plan includes recommendations for surveillance, research, communication, and metrics for measuring progress toward national goals. Three overarching priorities have been identified:

- Progress toward 5-year national prevention targets (e.g., 50-70% reduction in bloodstream infections);
- Improve use and quality of the metrics and supporting systems needed to assess progress towards meeting the targets; and
- Prioritization and broad implementation of current evidence-based prevention recommendations

Background

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

This template helps to ensure progress toward national prevention targets as described in the HHS Action Plan. CDC is leading the implementation of recommendations on national prevention targets and metrics and states should tailor the plan to their state-specific needs.

Initial emphasis for HAI prevention focused on acute care, inpatient settings, and then expanded to outpatient settings. The public health model of population-based healthcare delivery places health departments in a unique and important role in this area, particularly given shifts in healthcare delivery from acute care settings to ambulatory and long term care settings. In non-hospital settings, infection control and oversight have been lacking which have resulted in outbreaks which can have a wide-ranging and substantial impact on affected communities. At the same time, trends toward mandatory reporting of HAIs from hospitals reflect increased demand for accountability from the public.

The State HAI Action Plan template targets the following areas:

1. Enhance HAI Program Infrastructure
2. Surveillance, Detection, Reporting, and Response
3. Prevention
4. Evaluation, Oversight, and Communication
5. Infection Control Assessment and Response
6. Targeted Healthcare Infection Prevention Programs

Framework and Funding for Prevention of HAIs

CDC's framework for the prevention of HAIs builds on a coordinated effort of federal, state, and partner organizations and is based on a collaborative public health approach that includes surveillance, outbreak response, infection control, research, training, education, and systematic implementation of prevention practices. Legislation in support of HAI prevention provides a unique opportunity to strengthen existing state capacity for prevention efforts.

Template for developing HAI plan

The following template provides choices for enhancing state HAI prevention activities in the six areas identified above. For each section, please choose elements which best support current activities or planned activities. Current activities are those in which the state is presently engaged and includes activities that are scheduled to begin using currently available resources. Planned activities represent future directions the state would like to move in to meet currently unmet needs, contingent on available resources and competing priorities. A section for additional activities is included to accommodate plans beyond the principal categories.

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

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1. Enhance HAI program infrastructure

Successful HAI prevention requires close integration and collaboration with state and local infection prevention activities and systems. Consistency and compatibility of HAI data collected across facilities will allow for greater success in reaching state and national goals. Please select areas for development or enhancement of state HAI surveillance, prevention, and control efforts.

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

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council i. Collaborate with local and regional partners (e.g., state hospital associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians, and networks of acute care hospitals and long term care facilities).	
☒	☐	ii. Include hospital preparedness partners (e.g., hospital/healthcare coalitions funded through the ASPR Hospital Preparedness Program). Additional representation from accrediting and/or licensing agency with surveyor authority is ideal. iii. Engage HAI advisory committee in potential roles and activities to improve antibiotic use in the state (antibiotic stewardship) iv. Engage HAI advisory committee in activities to increase health department's access to data and subsequently use those data in prevention efforts	October 1, 2015
☒	☐	iv. Identify specific HAI prevention targets consistent with HHS priorities	

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		Other activities or descriptions: • Kentucky-State Regional Infection Prevention and Epidemiology (K-STRIPE) is the multi-disciplinary advisory group for the Healthcare-Associated Infection (HAI) Prevention Program. • K-STRIPE has incorporated Emergency Preparedness representation into the advisory group and the Office of Inspector General (OIG) is represented. • K-STRIPE maintains a working group that addresses the education needs of Infection Preventionists in Kentucky and plans the annual IP Boot Camp. • K-STRIPE is forming sub-committees i.e. Long-Term Care, other areas to bring in subject matter experts and stakeholders into the advisory group. • An HAI reporting mandate was added into the Reportable Disease Surveillance Regulation, 902 KAR 2:020 in 2015 and as the program builds epidemiology capacity will have the capacity to use data for prevention efforts.	
☒ ☒	☐ ☐	2. Establish an HAI surveillance prevention and control program i. Designate a State HAI Prevention Coordinator ii. Develop dedicated, trained HAI staff with at least one FTE (or contracted equivalent) to oversee HAI activities areas (Integration, Collaboration, and Capacity Building; Reporting, Detection, Response, and Surveillance; Prevention; Evaluation, Oversight, Communication, and Infection Control)	
		Other activities or descriptions: Staff include: • HAI Coordinator - Andrea Flinchum, MPH, BSN, CIC	

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		• IP Nurse - Lynn Roser, MSN, BSN, CIC • IP Nurse - Kimberly Daniels, RN • Technical Graduate Assistant – Gabriella Hodges MPH (c) • Infectious Disease Director – Dr. Robert Brawley, MD, MPH, FSHEA • IP Nurse - TBH • Epidemiologist – TBH • Epidemiologist - TBH	
☒	☐	3. Integrate laboratory activities with HAI surveillance, prevention, and control efforts. i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, HL7 messaging of laboratory results)	
		Other activities or descriptions: The Division of Laboratory Services (DLS) at the Kentucky Department for Public Health (KDPH) has the ability to perform pulse field gel electrophoresis (PFGE) on select pathogens. This technology is used as an aid in outbreak investigation. With additional funding, DLS will acquire Checkpoint-CPE PCR assay to identify Carbapenem producing organisms. DLS has stored approximately 100 Carbapenem Resistant Enterobacteriacea (CRE) isolates and using the Checkpoint-CPE PCR assay will be able to build a library of CRE for Kentucky to understand the burden of CRE and more importantly, the most commonly seen mechanisms of resistance in Kentucky.	

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	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: The Office of Inspector General is an active member of K-STRIPE.	
☐	☒	5. Facilitate use of standards-based formats (e.g., Clinical Document Architecture, electronic messages) by healthcare facilities for purposes of electronic reporting of HAI data. Providing technical assistance or other incentives for implementations of standards-based reporting can help develop capacity for HAI surveillance and other types of public health surveillance, such as for conditions deemed reportable to state and local health agencies using electronic laboratory reporting (ELR). Facilitating use of standards-based solutions for external reporting also can strengthen relationships between healthcare facilities and regional nodes of healthcare information, such as Regional Health Information Organizations. (RHIOs) and Health Information Exchanges (HIEs). These relationships, in turn, can yield broader benefits for public health by consolidating electronic reporting through regional nodes.	October 1, 2016
		Other activities or descriptions: Reportable disease surveillance regulation updated February 2015 requiring all licensed healthcare facilities to report certain antibiotic resistant organisms electronically via laboratory feed. The laboratory feed will be transmitted via	

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		the Kentucky Health Information Exchange (KHIE). The deadline for connecting to KHIE is October 1, 2016.	

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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)

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.

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

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	1. Improve HAI outbreak detection and investigation i. Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak	

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

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		reporting to state health departments	
☒	☐	ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters, or unusual cases of HAIs.	
☒	☐	iii. Develop mechanisms to protect facility/provider/patient identity when investigating incidents and potential outbreaks during the initial evaluation phase, where possible, to promote reporting of outbreaks	
☐	☒	iv. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs)	October 1, 2016
		Other activities or descriptions: I. 902 KAR 2:020 Reportable Disease Surveillance regulation passed 2/21/15 includes: • Definition of an outbreak • Reporting forms • Clearly delineated notification standards and requirements that include HAIs and antibiotic resistant organisms of public health interest. II. EPI Rapid Response Training (ERRT) and certification is conducted each year with 4 hours of continuing education for maintaining certification and is attended by regional epidemiologists, local health department nurses, environmentalists and health department directors. III. Outbreaks are issued a unique numeric identifier for correspondence, identifying laboratory results and reporting. Protected health information (PHI) is sent in secure formats.	

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		Outbreaks are reported to the public in aggregate and not by individual facilities.	
☒	☐	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	December 31, 2016
		Other activities or descriptions: DLS is currently in the process of acquiring additional technology for mechanism testing and to support PFGE analysis. • Microarray PCR • Whole genome sequencer for PFGE	
☒ ☒	☐ ☐	3. Improve communication of HAI outbreaks and infection control breaches i. Develop standard reporting criteria including, number, size, and type of HAI outbreak for health departments and CDC ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards)	
		Other activities or descriptions: I. Under the new reporting regulation, licensed healthcare	

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		facilities are required to report HAIs using a standard form; EPID 250 that was developed for this purpose. II. All outbreaks are issued unique numeric identifier that upon this issuance and then an alert is generated to a list serv that includes the Office of Inspector General.	
☒ ☒ ☒ ☐ ☒ ☒	☐ ☐ ☐ ☒ ☐ ☐	4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan i. Central Line-associated Bloodstream Infections (CLABSI) ii. *Clostridium difficile* Infections (CDI) iii. Catheter-associated Urinary Tract Infections (CAUTI) iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections v. Surgical Site Infections (SSI) vi. Ventilator-associated Pneumonia (VAP)	October 1, 2016
		Other activities or descriptions: K-STRIPE members; the Kentucky Hospital Association (KHA) and Qsource, QIO (quality improvement organization) for Kentucky in collaboration with the HAI Program have formed a Kentucky Prevention Program that bundles member prevention programs together in order to effectively address priority prevention targets as an all-encompassing program. This approach eliminates duplication of efforts and allows for better use of resources.	
☒	☐	5. Adopt national standards for data and technology to track HAIs (e.g., NHSN). i. Develop metrics to measure progress towards national goals (align with targeted	

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☐	☒	state goals). (See Appendix 1). ii. Establish baseline measurements for prevention targets	March 31, 12016
		Other activities or descriptions: Metrics used to measure state progress directly aligns with national goals.	
☒	☐	6. Develop state surveillance training competencies i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis	
		Other activities or descriptions: Yearly state Infection Prevention Boot Camp to be held on March 8,9 and 10, 2016 in Lexington, KY Infection prevention simulation scenarios currently under development by partners and K-STRIPE members at the University of Louisville.	
☐	☒	7. Develop tailored reports of data analyses for state or region prepared by state personnel	January 1, 2016
		Other activities or descriptions:	
☐	☒	8. Validate data entered into HAI surveillance (e.g., through	December 1, 2015

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒ ☐ ☐ ☐ ☐ ☐	☐ ☒ ☒ ☒ ☒ ☒	healthcare records review, parallel database comparison) to measure accuracy and reliability of HAI data collection i. Develop a validation plan ii. Pilot test validation methods in a sample of healthcare facilities iii. Modify validation plan and methods in accordance with findings from pilot project iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance v. Analyze and report validation findings vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected	– January 1, 2017
		Other activities or descriptions:	
☐	☒	9. Develop preparedness plans for improved response to HAI i. Define processes and tiered response criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks	March 31, 2016
		Other activities or descriptions:	
☐	☒	10. Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control	March 31, 2016

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		practice in non-hospital settings and set standards for continuing education and training	
		Other activities or descriptions:	
☐ ☒	☒ ☐	11. Adopt integration and interoperability standards for HAI information systems and data sources i. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs) across the spectrum of inpatient and outpatient healthcare settings ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation.	
		Other activities or descriptions: The Reportable Disease Surveillance regulation directly aligns with the CDC/National Notifiable Diseases Surveillance System (NNDSS).	
		12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the	

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	data i. Report HAI data to the public	
		Other activities or descriptions: Through the updated Reportable Disease Surveillance regulation, electronic laboratory reporting is mandatory effective October 1, 2016 via connection to the KHIE system. Summary of yearly reports of antibiotic resistant organisms provided to the consumer advocate group Health Watch USA and other public entities as requested.	
☐	☒	13. Make available risk-adjusted HAI data that enable state agencies to make comparisons between hospitals.	December 31, 2017
		Other activities or descriptions:	
☐	☒	14. Enhance surveillance and detection of HAIs in nonhospital settings	June 1, 2016
		Other activities or descriptions:	

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3. Prevention

State implementation of HHS Healthcare Infection Control Practices Advisory Committee (HICPAC) recommendations is a critical step toward the elimination of HAIs. CDC and HICPAC have 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 for 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

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	1. Implement HICPAC recommendations i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group.	
		Other activities or descriptions: The Kentucky Prevention Program includes the hospital engagement network (HEN) program hosted by KHA utilizing subject matter experts in the HAI Prevention Program to provide education through webinars to the participating hospitals utilizing evidence based best practices e.g. HICPAC guidelines, APIC text and Society of Healthcare Epidemiology of America (SHEA) compendiums.	
☒	☐	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	

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		Other activities or descriptions: KHA, Qsource, KDPH HAI Program, University of Louisville Infectious Disease Division College of Medicine staff and Association for Professionals in Infection Control and Epidemiology (APIC) Kentucky chapter are members of the working group, subcommittee of K-STRIPE.	
☒ ☒ ☒	☐ ☐ ☐	3. Establish HAI collaboratives with at least 10 hospitals (this may require a multi-state or regional collaborative in low population density regions) 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 from standardized outcome data to track progress	
		Other activities or descriptions: A Kentucky Prevention Program, Kentucky- HEN program has 78 member hospitals signed up to work on 10 target prevention and quality targets. Expertise to run this program is pulled from all working group sub-committee members.	
☒	☐	4. Develop state HAI prevention training competencies i. Consider establishing requirements for education and training of healthcare professionals in HAI prevention (e.g., certification requirements, public education campaigns, and targeted provider education) or work with healthcare	

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		partners to establish best practices for training and certification	
		Other activities or descriptions: K-STRIPE education committee plans and executes the annual IP Boot Camp including content on infection prevention competencies. Certification in Infection Control and Epidemiology (CIC) is supported with funding obtained to reimburse successful first time test takers for testing fees up to $350.00. This is only available if the candidates' employer or other entities do not provide reimbursement. This is a strategy aimed at elevating the profession in Kentucky and increase the number of certified infection preventionists.	
☐ ☒ ☐ ☐	☒ ☐ ☒ ☒	5. Implement strategies for compliance to promote adherence to HICPAC recommendations i. Consider developing statutory or regulatory standards for healthcare infection control and prevention or work with healthcare partners to establish best practices to ensure adherence 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, enhance surveyor training and tools, and add sources and uses of infection control data iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered and work with healthcare partners to establish best practices to ensure adherence	June 1, 2016

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Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
		Other activities or descriptions: Infection prevention training is provided to state certified nursing assistants by the HAI Program in collaboration with the Office of Inspector General.	
☒	☐	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: The Kentucky Prevention Program includes the K-HEN program, hosted by KHA with 78 recruited hospitals.	
☐	☒	7. Establish collaborative(s) to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	January 1, 2016
		Other activities or descriptions:	

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4. Evaluation and Communication

Program evaluation is an essential organizational practice in public health. Continuous evaluation and communication of 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. 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

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☐ ☐	☒ ☒	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 toward targets and ii. Establish systems for refining approaches based on data gathered	August 1, 2016
		Other activities or descriptions (not required):	
☐	☒	2. Develop and implement a communication plan about the state's HAI program and about 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	March 31, 2016
		Other activities or description	

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☒	☐	3. Provide consumers access to useful healthcare quality measures i. Disseminate HAI data to the public	
		Other activities or descriptions:	
☒	☐	4. Guide patient safety initiatives i. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	
		Other activities or descriptions: The Kentucky Prevention Program was specifically designed to bundle K-STRIPE member prevention programs. By bundling prevention program activities, the HAI Program SMEs are consulted and utilized to provide input and knowledge. All data, performance measures, outcomes and deliverables for prevention programs are shared amongst program hosts/agencies.	

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Healthcare Infection Control and Response (Ebola-associated activities)

The techniques and practice on which infection control protocols are based form the backbone of infectious disease containment for pathogens that are otherwise amplified and accelerated in healthcare settings. Investments in a more robust infection control infrastructure will prevent many HAIs transmitted to, and among, patients and health care workers.

Table 5: Infection Control Assessment and Response

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒	☐	1. Create an inventory of all healthcare settings in state. List must include at least one infection control point of contact at the facility	October 1, 2015
☐	☒	2. Identify current regulatory/licensing oversight authorities for each healthcare facility and explore ways to expand oversight	March 31, 2016
		Other activities or descriptions: Utilizing the web-based Emergency Operations Center (Web-EOC) as the platform for enhancing healthcare setting inventories. Hospitals and long term care facilities are currently members of Web-EOC and information contained is expanded to include infection preventionist contact information, regulatory and licensing oversight, HAI data available and prevention program participation. Facilities are required to update this information yearly at a minimum.	
☒ ☒	☐ ☐	3. Assess readiness of Ebola-designated facilities within the state i. Use CDC readiness assessment tool and determine gaps in infection control	October 1, 2015

☐	☒	ii. Address gaps (mitigate gaps) iii. Conduct follow-up assessments	December 31, 2015
		Other activities or descriptions: All seven Ebola Assessment Hospitals (EAH) have received their initial site visit to determine gaps in the minimum capabilities required for EAH designation.	
☒ ☒ ☒	☐ ☐ ☐	4. Assess outbreak reporting and response in healthcare facilities i. Use standard assessment tool and determine gaps in outbreak reporting and response ii. Address gaps (mitigate gaps) iii. Track HAI outbreak response and outcome	October 1, 2015
		Other activities or descriptions:	

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Table 6: Targeted Healthcare Infection Prevention Programs

Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
☒ ☐ ☐	☐ ☒ ☒	1. Expand infection control assessments i. Expand assessments to other additional facilities and other healthcare settings and determine gaps in infection control ii. Address gaps (mitigate gaps) iii. Conduct follow-up assessments	October 1, 2015
		Other activities or descriptions: The HAI program is scheduling hospital visits initially, partnering with KHA for required visits for the K-HEN program. Regional epidemiologists in Kentucky that are responsible for outbreak reporting and investigation in long-term care and other healthcare settings are being trained on using the assessment tools and assisting the IPs in the HAI program to conduct the assessments in those settings.	
☐ ☒	☐ ☐	2. Increase infection control competency and practice in all healthcare settings through training i. Incorporate general infection control knowledge and practice assessments of competency into state licensing board requirements, credentialing, and continuing education requirements for clinical care providers (e.g., medical license, admitting privileges) and/or licensing/accreditation requirements for healthcare facilities. ii. Develop a sustainable training program based on CDC guidance and technical assistance to perform training, prioritizing on-site train-the-trainer programs in key domains of infection control, including the incorporation of hands on evaluations and competency assessments of best practices and a system to monitor ongoing compliance and competency.	October 1, 2015

		Other activities or descriptions:	
☒ ☐ ☒ ☒	☐ ☒ ☐ ☐	3. Enhance surveillance capacity to improve situational awareness, describe emerging threats, and target onsite assessments to implement prevention programs i. Build capacity to analyze data reported by facilities in a defined region to allow for a comprehensive assessment of potential healthcare-associated infection threats, and communicate results with healthcare facilities. ii. Work with CDC to guide analytic direction and identify facilities for prioritized assessments/response iii. Improve outbreak reporting capacity by developing an infrastructure that includes clear definitions of infectious threats of epidemiologic importance that are communicated to facilities iv. Implement a response plan to address potential emerging threats identified by using enhanced surveillance	October 1, 2015
		Other activities or descriptions:	

Appendix 1

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

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

Following the development of draft metrics as part of the HHS Action Plan in January 2009, HHS solicited comments from stakeholders for review.

Stakeholder feedback and revisions to the original draft Metrics

Comments on the initial draft metrics published as part of the HHS Action Plan in January 2009 were reviewed and incorporated into revised metrics. While comments ranged from high level strategic observations to technical measurement details, commenters encouraged established baselines, both at the national and local level, use of standardized definitions and methods, engagement with the National Quality Forum, raised concerns regarding the use of a national targets for payment or accreditation purposes and of the validity of proposed measures, and would like to have both a target rate and a percent reduction for all metrics. Furthermore, commenters emphasized the need for flexibility in the metrics, to accommodate advances in electronic reporting and information technology and for advances in prevention of HAIs, in particular ventilator-associated pneumonia.

To address comments received on the Action Plan Metrics and Targets, proposed metrics have been updated to include source of metric data, baselines, and which agency would coordinate the measure. To respond to the requests for percentage reduction in HAIs in addition to HAI rates, a new type of metric, the standardized infection ratio (SIR), is being proposed. Below is a detailed technical description of the SIR.

Below is a table of the revised metrics described in the HHS Action plan. Please select items or add additional items for state planning efforts.

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

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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?
5a. MRSA 1	Incidence rate (number per 100,000 persons) of invasive MRSA infections	MRSA Incidence rate	CDC EIP/ABCs	2007-2008 (for non-EIP states, MRSA metric to be developed in collaboration with EIP states)	At least a 50% reduction in incidence of healthcare-associated invasive MRSA infections	CDC	No
5b. MRSA 2 (new)		MRSA bacteremia SIR	CDC NHSN MDRO/CDAD Module LabID[‡]	2009-2010	Reduce the facility-wide healthcare facility-onset MRSA bacteremia LabID event SIR by at least 25% from baseline or to zero	CDC	No
6. SSI 1	Deep incision and organ space infection rates using NHSN definitions (SCIP procedures)	SSI SIR	CDC NHSN Procedure-Associated Module	2006-2008 (proposed 2009, in consultation with states)	Reduce the admission and readmission SSI[§] SIR by at least 25% from baseline or to zero	CDC	Yes[¶]
7. SCIP 1 (formerly SSI 2)	Adherence to SCIP/NQF infection process measures	SCIP Adherence percentage	CMS SCIP	To be determined by CMS	At least 95% adherence to process measures to prevent surgical site infections	CMS	Yes

[*] NHSN SIR metric is derived from NQF-endorsed metric data
[†] NHSN does not collect information on daily review of line necessity, which is part of the NQF
[‡] LabID, events reported through laboratory detection methods that produce proxy measures for infection surveillance
[§] Inclusion of SSI events detected on admission and readmission reduces potential bias introduced by variability in post-discharge surveillance efforts
[¶] The NQF-endorsed metric includes deep wound and organ space SSIs only which are included the target.

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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

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170+58}{100000\times\left(\frac{2}{1000}\right)+58{,}000\times\left(\frac{1.5}{1000}\right)} = \frac{228}{200+87} = \frac{228}{287} = 0.79 \qquad 95\%\text{CI} = (0.628, 0.989)$$

*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

DRAFT

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

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315+210+111}{12600\times\left(\frac{3.0}{100}\right)+7000\times\left(\frac{5.0}{100}\right)+7400\left(\frac{1.7}{100}\right)} = \frac{636}{378+350+125.8} = \frac{636}{853.8} = 0.74 \qquad 95\%\text{CI} = (0.649, 0.851)$$

DRAFT

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

† SSI (surgical site infection)

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