

Template for State Healthcare Associated Infections Plans

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

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

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

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

Initial emphasis for HAI prevention may focus on acute care, inpatient settings, yet the need for prevention activities for outpatient settings is recognized. State health departments are increasingly challenged by the needs to identify, respond to, and prevent HAI across the continuum of settings where healthcare is currently delivered. The public health model's population based perspective places health departments in a unique and important role in this area, particularly given shifts in healthcare delivery from acute care settings to ambulatory and long term care settings. In the non-hospital setting, infection control and oversight have been lacking and outbreaks –which can have a wide-ranging and substantial impact on affected communities–, are increasingly reported. At the same time, trends toward mandatory reporting of HAIs from hospitals reflect increased demand for accountability from the public.

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The current template targets the following areas:

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

Framework and Funding for Prevention of HAIs

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

Support for HAI prevention has been enhanced through the American Recovery and Reinvestment Act (ARRA). Congress allocated \$40 million through CDC to support state health department efforts to prevent HAIs by enhancing state capacity for HAI prevention, leverage CDC's National Health Care Safety Network to assess progress and support the dissemination of HHS evidence-based practices within healthcare facilities, and pursue state-based collaborative implementation strategies. In addition, the Center for Medicaid Services (CMS) will support expansion of State Survey Agency inspection capability of Ambulatory Surgery Centers nationwide through \$10 million of ARRA funds. This template is intended to support the high level of reporting and accountability required of ARRA recipients.

Template for developing HAI plan

The following template provides choices for developing or enhancing state HAI prevention activities in the four areas identified above. States can choose to target different levels of HAI prevention efforts indicated by checking appropriate boxes. (Level I indicates basic elements to begin HAI prevention efforts, Level II for intermediate and Level III more mature efforts). This can serve as the state's HAI plan for submission. If your state has an existing plan, you may choose to incorporate that plan into the template below or submit the existing plan in place of the template provided.

For each section, please choose elements which best support current activities or planned activities. Current activities are those in which the state is presently engaged and includes activities that are scheduled to begin using currently available resources. Planned

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activities represent future directions the state would like to move in to meet currently unmet needs, contingent on available resources and competing priorities. A section for additional activities is included to accommodate plans beyond the principal categories.

1. Develop or Enhance HAI program infrastructure

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

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

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council	12/2/2009
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> i. Collaborate with local and regional partners (e.g., state hospital associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians and networks of acute care hospitals and long term care facilities (LTCFs)) ii. Identify specific HAI prevention targets consistent with HHS priorities 	12/2/2009
	<p>Note: no funding is currently available to host meetings or provide for travel expenses to GHAC members</p>		<p><i>Other activities or descriptions (not required):</i> Georgia has met with stakeholders in the past to establish a preference for use of National Healthcare Safety Network (NHSN) definitions and infrastructure should HAI reporting be required in Georgia. A stakeholders' meeting was held on 12/2/2009 to discuss composition of a planned HAI Advisory Council, choice of initial surveillance priorities, metrics and targets, existing and needed prevention collaboratives, and possible reporting and communications plans. The Georgia Department of Community Health (DCH) will appoint a multi-disciplinary panel (the "Georgia Healthcare-Associated Infections Advisory Council", or "GHAC") comprised of not less than 14 individuals</p>	

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			<p>to assist the state in devising methods for healthcare facilities to track and report the occurrence of HAIs, to identify goals, and to prioritize activities likely to reduce HAIs in Georgia. The GHAC will advise Department of Community Health (DCH) HAI prevention program staff (including the Healthcare Facility Regulation Division, Survey/Certification Unit and the Epidemiology Program of the Division of Public Health). The GHAC will include at least 9 persons with experience and knowledge of hospital epidemiology, statistical and research methods, infection control, patient safety and quality (including 3 or more hospital epidemiologist physicians and 6 or more experienced infection preventionists), who will be selected to represent a diversity of healthcare settings (urban and rural hospitals, large and small hospitals, North and South Georgia, specialty hospitals such as pediatrics, teaching hospitals, long-term acute care (LTAC) facilities, ambulatory surgical centers, long-term care facilities, and who are members of professional organizations with expertise in HAIs, such as The Association of Professionals in Infection Control and Hospital Epidemiology (APIC), the Georgia Infection Prevention Network (GIPN), the Society for Healthcare Epidemiology of America (SHEA), and the Infectious Diseases Society of America (IDSA). The GHAC will also include a doctoral-level laboratory specialist, representative(s) of the Georgia Hospital Association, a senior hospital executive, a patient advocate/consumer, representatives of the Georgia Emerging Infections Program, an academic institution, and a communications specialist. A subcommittee will be formed to address potential funding opportunities (from product vendors, foundations, insurance providers), but funders will not be specifically invited as Council members. The GHAC will meet quarterly by teleconference and at least once annually in person to discuss progress and plans to achieve targeted surveillance and HAI reduction goals.</p>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>2. Establish an HAI surveillance prevention and control program Designate a State HAI Prevention Coordinator</p>	<p>12/2/2009</p>

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	12/2/2009
		ii.	<p><i>Other activities or descriptions (not required):</i> Georgia has received ARRA grant funding to support the salary of an HAI Program Manager (TBH) for 26 months (until December 2011). Hiring is in process. Existing Division of Public Health (DPH) staff in the Acute Diseases Epidemiology Section who will also be supporting HAI activities includes an epidemiologist with experience using NHSN, a Certified Infection Preventionist, and two Infectious Diseases Physicians. Additional ARRA grant funding in Georgia was provided to the Emerging Infections Program, who will extend the state's ability to build a NHSN users' network, provide opportunities for NHSN training, and conduct needs assessment and prevention research activities statewide.</p>	
	<input type="checkbox"/>	<input type="checkbox"/>	<p>3. Integrate laboratory activities with HAI surveillance, prevention and control efforts.</p> <p style="padding-left: 40px;">i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, HL7 messaging of laboratory results)</p>	
			<p><i>Other activities or descriptions (not required):</i> Resources are not currently available to support enhanced capacity at state-based laboratories for MDRO antimicrobial-susceptibility testing, HAI bacterial strain typing, environmental testing in healthcare settings, or HL7 messaging for HAI pathogens. Plans are to request assistance from CDC laboratories for such activities when needed, unless a need for services increases.</p>	
Level II	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Improve coordination among government agencies or organizations	12/2/2009

4.

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			that share responsibility for assuring or overseeing HAI surveillance, prevention and control (e.g., State Survey agencies, Communicable Disease Control, state licensing boards)	
			<p><i>Other activities or descriptions (not required):</i> Cooperation is standard operating procedure between authorities in the DCH Healthcare Facility Regulation Division (the state survey agency and licensing board for hospitals, ambulatory surgical centers and long-term care facilities) and the DCH Division of Public Health when facility-based outbreaks occur. However, establishing the GHAC provides an opportunity to work together proactively.</p>	
	<input type="checkbox"/>	<input type="checkbox"/>	<p>5. Facilitate use of standards-based formats (e.g., Clinical Document Architecture, electronic messages) by healthcare facilities for purposes of electronic reporting of HAI data. Providing technical assistance or other incentives for implementations of standards-based reporting can help develop capacity for HAI surveillance and other types of public health surveillance, such as for conditions deemed reportable to state and local health agencies using electronic laboratory reporting (ELR). Facilitating use of standards-based solutions for external reporting also can strengthen relationships between healthcare facilities and regional nodes of healthcare information, such as Regional Health Information Organizations (RHIOs) and Health Information Exchanges (HIEs). These relationships, in turn, can yield broader benefits for public health by consolidating electronic reporting through regional nodes.</p>	
			<p><i>Other activities or descriptions (not required):</i> Resources to provide technical assistance or incentives for software implementation are not available in the Division of Public Health, however, as we build an NHSN users' group, when encouraging facilities to enroll in NHSN and begin reporting, the availability of newly developed electronic interfaces between multiple software vendors and NHSN will be highlighted.</p>	

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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)

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

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

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Level I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Improve HAI outbreak detection and investigation Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments	January 2010
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs.	TBD
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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	July 2010
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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)	July 2010
		<i>Other activities or descriptions (not required):</i> Most HAIs are not notifiable in Georgia, and so reporting of HAI outbreaks requires recognition and notification of disease clusters or unusual cases by healthcare providers. All outbreaks are notifiable in Georgia, but small clusters of HAIs may not be recognized as requiring reporting because facilities are accustomed to dealing with HAI problems internally rather than seeking input from public health. Therefore, outreach to providers and ICPs will include clarification that reporting is encouraged even if assistance is not requested for HAI clusters, outbreaks, or unusual cases of disease. District epidemiologists will be encouraged to consult with state HAI prevention program staff if HAIs are reported to them.		

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			<p>Establishing protocols for investigation of a variety of HAI outbreaks will be a later priority in Georgia, because past experience suggests that these have been uncommon (one or two per year) and that each outbreak may require a somewhat different approach, although in general, all public health staff are trained in using the well-established "ten steps of outbreak investigations". We have drafted a protocol for outbreaks of group A streptococcal infections in long-term care facilities, and are gathering useful tools for facility surveys and environment of care investigations. Instead of developing protocols, consultation with state health department, who will then consult with CDC or survey agency staff will be recommended in the event of HAI outbreaks, and survey tools will be crafted to include elements from nationally recognized (e.g.: HICPAC) infection control guidelines. If the number of recognized HAI outbreaks reaches a level where a generalized approach can be recommended, protocols may then be developed at the state and formal training provided to district level staff.</p> <p>State legal and legislative affairs staff have been included in Georgia HAI Reduction Plan discussions, and are exploring mechanisms to protect HAI data from discoverability for civil action when facilities are reporting HAIs for public health surveillance purposes, such as through NHSN, and data are made available to the state health department and/or Emerging Infections Program users' group. Under consideration are data-use agreements, changes in legislative rules, or reporting through hospital peer-review committees.</p> <p>Because few specific HAIs are notifiable in Georgia, surveillance data provides limited opportunity to identify and prevent HAI transmission in healthcare settings. <i>S. aureus</i></p>	

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			infection with reduced susceptibility to vancomycin (VISA/VRSA) is the only multidrug-resistant organism (MDRO) that is currently notifiable, and it is rare. Acute hepatitis A, B, or C and legionellosis present other potential scenarios for HAI recognition under current notifiable disease rules. Improving capture of searchable, facility-based exposures during the incubation period for patients with these conditions is planned to improve use of surveillance data for disease reduction.	
	<input type="checkbox"/>	<input type="checkbox"/>	Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues	
		2.	<i>Other activities or descriptions (not required):</i> Resources are not currently available to support enhanced capacity at state-based laboratories for antimicrobial-susceptibility testing, strain typing, or environmental testing. Existing plans are to request assistance from CDC laboratories for such activities when needed.	
Level II	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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	Existing 12/2/2009
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards)	Existing 12/2/2009
			<i>Other activities or descriptions (not required):</i> All outbreaks in Georgia are catalogued and data is managed in the State Electronic Notifiable Disease Surveillance System (SendSS), Outbreak Management System (OMS). This secure, web-based system is accessible to all of our District	

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			<p>Epidemiologists and captures all outbreak data, including line lists of cases, contacts, laboratory testing results (including molecular testing), exposures, relationships and other parameters. OMS was also used as the central data warehouse during the pandemic H1N1 response in Georgia. OMS requires standardized reporting criteria, and includes methods for creating electronic surveys for investigations, questionnaires, graphics, and reports. With appropriate personnel resources, OMS may be customized to include an HAI module as well.</p> <p>Only public health personnel can enter data into OMS, so this system requires facilities to report outbreaks to public health. OMS requires standardized reporting criteria, and includes methods for including survey tools, questionnaires, graphics, reports, and references. With new and dedicated personnel resources focused on HAIs, OMS may be organized to specifically address HAI outbreak issues.</p> <p>Notification of facility-based outbreaks is routine between DCH Healthcare Facility Regulation and Public Health Epidemiology staff. Depending on the situation/outbreak, HFR and Public Health Epidemiology conduct either independent or concurrent investigations with one agency in the lead.</p>	
	<p style="text-align: center;"><input checked="" type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/>*8-County Atlanta area only through EIP</p>	<p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p>	<p>4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan</p> <p style="padding-left: 40px;">Central Line-associated Bloodstream Infections (CLABSI)</p> <p style="padding-left: 40px;"><i>Clostridium difficile</i> Infections (CDI)</p>	<p>January-July 2010 (voluntary, statewide)</p> <p>January 2010 (EIP)</p>

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	<input type="checkbox"/> <input type="checkbox"/> *8-County Atlanta area only through EIP <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> iii. <input type="checkbox"/> iv.	<p>Catheter-associated Urinary Tract Infections (CAUTI) Methicillin-resistant Staphylococcus aureus (MRSA) Infections</p> <p>Surgical Site Infections (SSI)</p> <p>Ventilator-associated Pneumonia (VAP)</p>	<p>2007-2008 (EIP)</p> <p>January-July 2010 (voluntary, selected SSIs, statewide)</p>
		<p>v.</p> <p>vi.</p>	<p><i>Other activities or descriptions (not required):</i> Proposed statewide HAI surveillance plan for CLABSIs and SSIs:</p> <p>a) In January 2010, all GA acute-care hospitals with an annual average daily census of at least 25 inpatients will be INVITED by the Georgia Department of Community Health, Division of Public Health to enroll in the CDC's NHSN surveillance system within 180 days in order to unify reporting systems and to benchmark against a national standard. The reporting facilities must meet data reporting timeframes as required by NHSN and will utilize standard methods including health care acquired case-finding techniques, CDC infection definitions and other relevant terms, and NHSN software for data collection and reporting. EIP recruitment of GA facilities to enroll in NHSN will also begin in January 2010, with a goal of having 10 facilities committed by Mar 1 and 20 facilities by May 1.</p> <p>b) The first priority for state surveillance in NHSN will be CLABSIs and the second priority will be selected SSIs.</p>	

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			<p>Beginning as soon as feasible (during the first year of NHSN participation), facilities will be ASKED to participate in the NHSN Device-Associated Module reporting a) Central Line-associated Bloodstream Infections (CLABSIs), stratified by ICU and other locations, PLUS the NHSN Procedure-Associated Module for Surgical Site Infections (SSI) for <u>one or more</u> of the following: hip prosthesis (HPRO), knee prosthesis (KPRO), and/or abdominal hysterectomy (HYST) infections, following all NHSN-required definitions and procedures for risk stratification.</p> <p>For facilities that are unable to report CLABSIs to NHSN, participation in the CUSP—Stop BSI Collaborative, which includes reporting of CLABSIs using NHSN definitions, will be encouraged. The state will ask the CUSP--Stop BSI Collaborative to share data with the DCH Division of Public Health by adding Public Health to data use agreements.</p> <p>Facilities willing and able to do so will also be encouraged to consider reporting Central Line Insertion Practices (CLIP) through the NHSN Device-Associated Module and to report additional SSI(s) or other modules that are of importance and interest to their facility.</p> <p>Reporting may be discontinuous and location-specific as desired by each facility, as long as it meets NHSN standards for minimum data collection (at least one measure for 6 of 12 months), with preference for CLABSI for at least 3 months and SSI for at least 3 months.</p> <p>c) After they have completed the process of NHSN enrollment, facilities will be asked to join the NHSN Group “Georgia State NHSN Users’ Group” or “GSNUG”, which will include administrative rights for Georgia Emerging Infections Program</p>	

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			<p>Staff as agents of the State. Although reporting to NHSN will include patient identifiers (coded or names based), access to NHSN data will be granted to GSNUG without patient identifiers, and will including annual hospital survey information, monthly NHSN reporting plans, and up-to-date contact information for infection control and NHSN reporting program personnel. The following will be sent to each facility by email:</p> <ul style="list-style-type: none"> • Name of NHSN Group (“GSNUG”) • Group ID (from NHSN) • Joining Password • Instructions about joining GSNUG and conferring rights to the GSNUG <p>d) Facility-specific infection-related Surgical Care Improvement Project (SCIP) measures (SCIP INF 1-6) will be monitored by the state through the CMS Hospital-Compare website.</p> <p>e) The GHAC will be asked to decide whether and when to add Long-Term Acute Care (LTAC), Ambulatory Surgical Centers (ASC), Long-Term Care Facilities (LTCF), and other types of healthcare facilities to the surveillance system, and whether and when additional surveillance modules may be added or substituted as priorities for statewide surveillance.</p> <p>Proposed Regional HAI surveillance plan for MRSA and CDAD:</p> <p>The Georgia Emerging Infections Program (GA EIP) collects information on incident cases of invasive MRSA in 31 acute-care and long term acute-care hospitals in the 8-county metro Atlanta area (Health District 3), and determines which are HAIs. The EIP MRSA surveillance system has established baseline MRSA HAI data during 2007-2008 which can be used to assess</p>	

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			<p>progress toward 5-year reduction goals. Annual reports including aggregate data for publication on the DCH website will be requested from the EIP regarding progress toward the 5-year target for HA-MRSA infections.</p> <p>The Georgia Emerging Infections Program is also beginning surveillance for CDAD in the 8-county metro Atlanta area (Health District 3) in 2009-2010. Annual reports including aggregate data will be requested for publication on the DCH website from the EIP regarding progress toward the 5-year target for HA-CDAD infections.</p>	
	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>	<p>5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).</p> <ul style="list-style-type: none"> i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1). ii. Establish baseline measurements for prevention targets 	<p>July 2010</p> <p>January 2011</p>
	<p>Note: Proposed surveillance activities will require continued funding, and training or validation will require increased funding.</p>		<p><i>Other activities or descriptions (not required):</i></p> <p>Facilities will be asked to adopt NHSN methodology as above, to notify the state, and to share certain data elements through the GSNUG. Facilities will report data on CLABSIs and selected SSIs. All facilities that have reported NHSN data for at least 3 months by January 2011 will be included in baseline measurements. Annual assessments and a 5-year measurement will then be planned until January 2016, given continued resources for this program.</p> <p>Working with GA EIP partners, we will gather facility-specific bed-days and location information to calculate 8-county Atlanta area-wide mean incidence rates for invasive HA-MRSA, beginning in 2007-2008 and then annually until the 5-year target</p>	

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			<p>can be assessed. Facility-specific Standardized Infection Ratios (SIR)s can then be calculated, allowing facilities to compare their rates against regional and national benchmarks.</p> <p>Working with GA EIP partners, we will gather facility-specific bed-days and location information to calculate 8-county Atlanta area-wide mean incidence rates for HA-CDAD, beginning in 2010 and then annually until the 5-year target can be assessed. Facility-specific Standardized Infection Ratios (SIR)s can then be calculated, allowing facilities to compare their rates against regional and national benchmarks.</p> <p>Finally, a point prevalence survey of HAIs is planned through GA EIP HAI activities, to be piloted in 2010 and implemented in a statewide sample of hospitals in 2011. This survey will provide information essential for prioritizing HAI prevention efforts that is currently lacking. Given resources, consideration should be given to repeating this survey in 2016 to assess progress toward interval goals.</p>	
	<input checked="" type="checkbox"/> *Some training will be provided with EIP resources	<input checked="" type="checkbox"/>	<p>6. Develop state surveillance training competencies Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis</p>	<p>During 2010</p>
	<p>Additional resources would be prioritized for this activity.</p>		<p><i>Other activities or descriptions (not required):</i> Minimal resources are currently available for training, but we hope to provide technical support to new NHSN users and training in selected modules for group participants using existing combined EIP and ELC (state health department) resources. Additional resources will be sought to add NHSN training activities to the annual GIPN conference.</p>	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>7. Develop tailored reports of data analyses for state or region</p>	<p>Internal Reports</p>

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			prepared by state personnel	and Feedback to Facilities During 2011
	Funding for an HAI epidemiologist will be necessary when data analysis and reporting become necessary.		<p><i>Other activities or descriptions (not required):</i> As mentioned above, public reporting of facility-specific data is not mandated in Georgia, and the purpose of HAI surveillance (for now) is to standardize data collection and assist facilities in assessing their performance and progress for self-improvement, with public health assistance if warranted. Reporting of aggregate HAI (CLABSI and SSI, MRSA and C. diff) rates, including longitudinal trends is planned and will be made available on the DCH Division of Public Health Website. Facility-specific calculation of HAI SIRs will be possible for reporter feedback, allowing facilities to assess their performance against a state standard.</p> <p>If public reporting is mandated, the GHAC will meet with stakeholders to address plans for public reporting.</p>	
Level III	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> 8. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ii.	Validate data entered into HAI surveillance (e.g., through healthcare records review, parallel database comparison) to measure accuracy and reliability of HAI data collection <ul style="list-style-type: none"> i. Develop a validation plan Pilot test validation methods in a sample of healthcare facilities iii. Modify validation plan and methods in accordance with findings from pilot project Implement validation plan and methods in all healthcare facilities participating in HAI surveillance 	

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	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<p>v. Analyze and report validation findings Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected</p>	
	<p>Significant resources would be required to provide validation of case reports.</p> <p>vi.</p>		<p><i>Other activities or descriptions (not required):</i> Validation should be considered at two levels; self-evaluation for persons learning to use NHSN definitions, and external validation to provide accountability for uniform standards of reporting.</p> <p>We believe that CDC should consider developing case-based training modules for NHSN users so that they can self-evaluate the way they classify cases. If these were available, they could be offered by CDC as a CME/CNE-type test for “credit” or “certification” in a given NHSN module.</p> <p>In order to externally validate NHSN-reported HAI data in GA, significant additional resources would be necessary. It would be beneficial to train and compensate one or more ICP surveyors to provide periodic validation site visits to enhance accuracy and accountability for reported data if resources were made available.</p>	
	<input type="checkbox"/>	<input type="checkbox"/>	<p>9. Develop preparedness plans for improved response to HAI</p> <p>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</p>	
			<p><i>Other activities or descriptions (not required):</i> Closer collaboration between DPH Acute Disease Epidemiology Section staff and Healthcare Facility Regulation Division Staff may make this feasible given additional resources. However,</p>	

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			this is not an immediate priority given current staffing levels. Serious infection control breaches reported to public health, such as syringe reuse, are already reported to regulatory agencies.	
	<input type="checkbox"/>	<input type="checkbox"/>	10. Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control practice in non-hospital settings, and to set standards for continuing education and training	
			<i>Other activities or descriptions (not required):</i> Our initial focus will be to enhance surveillance and performance of regulated (especially acute-care) facilities, however, DPH Acute Disease Epidemiology Section staff have investigated multiple outbreaks in medical office-based settings, perhaps because of poor oversight. Limited options for regulatory action exist under current law, beyond reporting to state practitioner licensing boards, Medicare, and/or Medicaid. This will eventually be a topic for discussion at the GHAC.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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	During 2010
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation.	December 2009
			<i>Other activities or descriptions (not required):</i> <i>Staphylococcus aureus</i> infection with reduced susceptibility to vancomycin (VISA/VRSA) is the only multidrug-resistant	July 2010

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>organism (MDRO) that is currently notifiable in GA. Acute hepatitis A, B and C and legionellosis are other potential HAIs reportable under current notifiable disease rules. Improving capture of facility-based exposures during the incubation period for patients with acute hepatitis or legionellosis is planned to improve use of surveillance data to detect HAI outbreaks.</p> <p>Promoting use of NHSN and NHSN definitions will promote definitional alignment and data element standardization needed to link HAI data across the nation.</p>	
	<p>X</p> <p><input type="checkbox"/></p>	<p>X</p> <p><input type="checkbox"/></p>	<p>12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data</p> <p>Report HAI data to the public (Not applicable)</p>	<p>N/A</p>
	<p>Neither resources nor technical support to facilitate electronic reporting from healthcare facilities to NHSN is available in GA.</p> <p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><i>Other activities or descriptions (not required):</i> Information about the state HAI Plan, surveillance activities, and aggregate reports of HAIs will be made available on the DCH/DPH website. Public reporting at the facility level is not currently planned in GA.</p>	<p>State plan, surveillance activities July 2010, reports later</p>
	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p>13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.</p>	
	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><i>Other activities or descriptions (not required):</i> NHSN reporting will allow risk adjustment of HAI data. To encourage hospitals to report to NHSN for quality improvement and state public health surveillance purposes, DCH Public Health Epidemiology will continue to work with DCH legal to identify a mechanism to protect facility identities from legal discovery, unless or until public reporting of HAIs is mandated.</p>	
	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p>14. Enhance surveillance and detection of HAIs in nonhospital</p>	

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			settings	
			<i>Other activities or descriptions (not required):</i> Public Health relies on passive surveillance for reports of HAIs from non-hospital settings. However, electronic laboratory reporting via daily HL7 downloads from commercial laboratories for notifiable conditions is in development through SendSS and will enhance timely capture of reported cases.	
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
	☒	☒	1. Implement HICPAC recommendations. i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group.	12/2/2009
Level I	This is an area where additional resources would be useful in order to achieve targets.		<p><i>Other activities or descriptions (not required):</i></p> <p><u>1) Prevention of CLABSI:</u> Two measures will be used to enhance implementation of HICPAC (and SHEA/IDSA) guidelines for prevention of CLABSI;</p> <p>a) We plan to expand enrollment of facilities statewide into the Comprehensive Unit-Based Safety Program (CUSP)--Stop BSI Collaborative. This existing collaborative is coordinated in Georgia through the Georgia Hospital Association and currently has 23 facilities using the system for at least one unit within the facility. Facilities that already participate in the CUSP--Stop BSI Collaborative will be asked to consider expansion to new locations within the facility, and new facilities will be enrolled. The CUSP--Stop BSI Collaborative includes many HICPAC guidelines and the</p>	

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p>CLIP checklist, and has recently added central line maintenance to its program. Data are not yet available in Georgia to demonstrate impact from this Collaborative, but if it succeeds as anticipated, it may become easier to convince facilities to expand this system.</p> <p>b) Facilities that agree to join NHSN will be asked to consider reporting CLIP through the NHSN device-associated module, with a 5-year target of 100% compliance.</p> <p><u>2) Prevention of SSI:</u> The Georgia Medical Care Foundation (and CMS-QIO) provides programmatic support for implementation of HICPAC guidelines for prevention of SSIs. Georgia hospitals report compliance with SCIP measures through the federal CMS website "Hospital Compare". The Georgia Medical Care Foundation targets hospitals with suboptimal performance, providing training, tools, and on-site support to develop and implement protocols, review performance data and provide support on the evidence based guidelines, and support for data abstraction and submission. It is possible that by joining NHSN, facilities will also find ways to further improve compliance with SCIP measures in order improve performance against national or statewide benchmarks.</p>	
	☒	☐	<p>2. Establish prevention working group under the state HAI advisory council to coordinate state HAI collaboratives Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaboratives</p>	12/2/2009
		i.	<p><i>Other activities or descriptions (not required):</i> We have identified a leader of this working group and will be seeking additional participation and resources for collaboratives. The leader is Denise Flook of the Georgia Hospital Association,</p>	

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
	<input type="checkbox"/>	<input type="checkbox"/>	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	
	<input type="checkbox"/>	<input type="checkbox"/>	ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs	
	<input type="checkbox"/>	<input type="checkbox"/>	iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data	
	<input type="checkbox"/>	<input type="checkbox"/>	iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered or work with healthcare partners to establish best practices to ensure adherence	
			<i>Other activities or descriptions (not required):</i> Significant resources would be needed to add capacity for surveyors in the DCH Healthcare Facility Regulation Division, Survey/Certification Unit, as this unit is currently understaffed.	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6. Enhance prevention infrastructure by increasing joint collaboratives with at least 20 hospitals (i.e. this may require a multi-state or regional collaborative in low population density regions)	2009
			<i>Other activities or descriptions (not required):</i> In Georgia, the CUSP—Stop BSI Collaborative is coordinated by Denise Flook of the Georgia Hospital Association, with support from national collaborators. Twenty-three (23) Georgia hospitals are participating. Additional resources are needed for additional collaboratives and partners in other healthcare settings.	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	TBD

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Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
			<p><i>Other activities or descriptions (not required):</i> There is a specific interest in Georgia in the development of a collaborative for HAI prevention and control activities for Long-Term Care Facilities. LTCF HAI prevention activities will be prioritized as more resources become available.</p>	
<p>Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.</p>				

4. Evaluation and Communications

Program evaluation is an essential organizational practice in public health. Continuous evaluation and communication of practice findings integrates science as a basis for decision-making and action for the prevention of HAIs. Evaluation and communication allows for learning and ongoing improvement to occur. Routine, practical evaluations can inform strategies for the prevention and control of HAIs. Please select areas for development or enhancement of state HAI prevention efforts.

Table 4: State HAI communication and evaluation planning

Planning Level	Check Items Underway	Check Items Planned	Items Planned for Implementation (or currently underway)	Target Dates for Implementation
Level I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact	2010-2011
	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> i. Establish evaluation activity to measure progress towards targets and ii. Establish systems for refining approaches based on data gathered 	2010-2011
			<p><i>Other activities or descriptions (not required):</i></p> <p>The Georgia Emerging Infections Program (EIP) will be piloting and later conducting a point prevalence survey of all NHSN infections hospital-wide at a representative sample of acute care facilities in Georgia beginning in 2010. This will provide valuable quantitative information on types and locations of infections to prioritize future prevention efforts.</p> <p>A State/EIP NHSN users group will be used to establish baseline and interval measures on NHSN modules CLABSI 1, CLIP, and selected SSIs. SCIP measures will be assessed through the federal CMS Hospital Compare Website.</p> <p>The GA EIP will be asked to provide data on serial annual rates of HA-MRSA (MRSA 1) for the 8-county metro Atlanta area, beginning with the baseline years of 2007-2008.</p>	

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		<p>The GA EIP will be asked to provide information on serial annual rates of laboratory-confirmed and HA-CDAD in the 8-county metro Atlanta area, beginning with the baseline year of 2010. These will be supplemented with identification of CDAD rates using hospital discharge data, when available.</p> <p>Data will be presented in aggregate and de-identified formats to stakeholders including the GHAC and at conferences such as the Georgia Emerging Infections Conference, Georgia Hospital Association Conference, GIPN conference, and APIC chapters.</p> <p>The GHAC will be asked to address modifications to the prevention program based on data results.</p>		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>2. Develop and implement a communication plan about the state’s HAI program and progress to meet public and private stakeholders needs</p> <p>Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public</p>	<p>2010</p> <p>2010</p>
		i.	<p><i>Other activities or descriptions (not required):</i> The state will work with the GHAC and the DCH Office of Communications to discuss an overarching HAI communications strategy.</p> <p>Communications specialists will work with GA Collaboratives (such as CUSP-Stop BSI) to enhance outreach by emphasizing what works to prevent disease. “Prevention stories” will be required for ARRA reporting, and will be sought from facility-based stakeholders.</p> <p>If public reporting of HAIs is later mandated in Georgia, the GHAC will be asked whether special exemptions to reporting should be considered, such as CLABSIs for burn units and Level 1 trauma units/patients. A one-year planned pilot phase will be implemented before facility-level public reporting is required to</p>	

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			<p>assess the impact of these policies and to permit facilities to address shortcomings. Publicly reported data will be risk-adjusted (e.g. using a Standard Infection Ratio) or aggregate, and may allow for facilities to comment on efforts to correct substandard performance.</p>	
Level II	<input type="checkbox"/>	<input type="checkbox"/>	3. Provide consumers access to useful healthcare quality measures	
			<i>Other activities or descriptions (not required):</i>	
Level III	<input type="checkbox"/>	<input type="checkbox"/>	Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs	
	4.		<i>Other activities or descriptions (not required):</i>	
<p>Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.</p>				

Appendix 1.

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

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

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

Stakeholder feedback and revisions to the original draft Metrics

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

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

To address concerns regarding validity, HHS is providing funding, utilizing Recovery Act of 2009 funds, to CDC to support states in

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validating NHSN-related measures and to support reporting on HHS metrics through NHSN. Also, most of the reporting metrics outlined here have already been endorsed by NQF and for population-based national measures on MRSA and *C. difficile*, work to develop hospital level measures will be conducted in the next year utilizing HHS support to CDC through funds available in the Recovery Act.

Finally, to address concerns regarding flexibility in accommodating new measures, reviewing progress on current measures, and incorporating new sources of measure data (e.g., electronic data, administrative data) or new measures, HHS and its constituent agencies will commit to an annual review and update of the HHS Action Plan Targets and Metrics.

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

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

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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?
3b. C diff 2 (new)		<i>C. difficile</i> SIR	CDC NHSN MDRO/CDAD Module LabID [‡]	2009-2010	Reduce the facility-wide healthcare facility-onset <i>C. difficile</i> LabID event SIR by at least 30% from baseline or to zero	CDC	No
4. CAUTI 2	# of symptomatic UTI per 1,000 urinary catheter days	CAUTI SIR	CDC NHSN Device-Associated Module	2009 for ICUs and other locations 2009 for other hospital units (proposed 2009, in consultation with states)	Reduce the CAUTI SIR by at least 25% from baseline or to zero in ICU and other locations	CDC	Yes*
5a. MRSA 1	Incidence rate (number per 100,000 persons) of invasive MRSA infections	MRSA Incidence rate	CDC EIP/ABCs	2007-2008 (for non-EIP states, MRSA metric to be developed in collaboration with EIP states)	At least a 50% reduction in incidence of healthcare-associated invasive MRSA infections (2011-2012)	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	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	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?
	procedures)				baseline or to zero		
7. SCIP 1 (formerly SSI 2)	Adherence to SCIP/NQF infection process measures	SCIP Adherence percentage	CMS SCIP	To be determined by CMS	At least 95% adherence to process measures to prevent surgical site infections	CMS	Yes

* NHSN SIR metric is derived from NQF-endorsed metric data

† NHSN does not collect information on daily review of line necessity, which is part of the NQF

‡ LabID, events reported through laboratory detection methods that produce proxy measures for infection surveillance

§ Inclusion of SSI events detected on admission and readmission reduces potential bias introduced by variability in post-discharge surveillance efforts

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

Understanding the Relationship between HAI Rate and SIR Comparison Metrics

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

A standardized infection ratio (SIR) is identical in concept to a standardized mortality ratio and can be used as an indirect standardization method for summarizing HAI experience across any number of stratified groups of data. To illustrate the method for calculating an SIR and understand how it could be used as an HAI comparison metric, the following example data are displayed below:

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

*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.

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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
$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315 + 210 + 111}{12600 \times \left(\frac{3.0}{100}\right) + 7000 \times \left(\frac{5.0}{100}\right) + 7400 \left(\frac{1.7}{100}\right)} = \frac{636}{378 + 350 + 125.8} = \frac{636}{853.8} = 0.74$ <p style="text-align: right;">95% CI = (0.649, 0.851)</p>							

[†] 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

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population. Once again, these data can reflect the national picture at the 5-year mark and the SIR can serve as metric that summarizes the SSI experience into a single comparison.

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

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

HAI Metric	Observed HAIs			Expected HAIs		
	#CLABSI	#SSI [†]	#Combined HAI	#CLABSI	#SSI [†]	#Combined HAI
CLABSI 1	228					
SSI 1						
Combined HAI			228 + 636 = 864			287+853.8 = 1140.8
$SIR = \frac{\text{observed}}{\text{expected}} = \frac{228 + 636}{287 + 853.8} = \frac{864}{1140.8} = 0.76$						

[†] SSI, surgical site infection

95% CI = (0.673,0.849)