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# CDC's Portfolio to Detect Healthcare-associated Infections and Protect Patients and Communities

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Chairman Harkin, Ranking Member Alexander, members of the Committee, thank you for the opportunity to speak to you today about CDC's activities to prevent healthcare-associated infections (HAIs). CDC works 24-7 to save lives and protect people from harm. CDC has prioritized the prevention of healthcare-associated infections as one of the agency's Winnable Battles -- public health priorities with large-scale impact on health and with known, effective strategies to address them.

Before I begin, I want to extend my sympathies to the millions of patients affected by healthcare-associated infections. No patient should be harmed by healthcare. We must always remember the patients who become debilitated and die from these infections, as well as their families. CDC's ultimate goal is the elimination of healthcare-associated infections.

The Nation has made significant progress in reducing the incidence of some HAIs, as reported by CDC this week. Notably, CDC data indicate that over the last 4 years, central-line associated bloodstream infections were reduced by 44 percent and surgical-site infections by 20 percent.[1] Last week, CDC also published new data on dramatic declines in invasive (life-threatening) MRSA infections. This study estimated that over 30,000 fewer invasive MRSA infections occurred in hospital and non-hospital settings in 2011 compared with 2005, and over 9,000 fewer deaths occurred among individuals hospitalized with MRSA.[2] The study also showed a 54 percent decline in serious MRSA infections occurring among hospitalized patients between 2005 and 2011.[3]

CDC has also estimated long-term national declines in CLABSIs. In a recently released paper, CDC authors estimated that between 1990 and 2010, between 104,000 and 198,000 CLABSIs were prevented among critical care patients in the United States.[4] These findings suggest that technical innovations and dissemination of evidence-based CLABSI prevention practices recommended by CDC have been effective on a national scale.

[1] CDC will be presenting these current numbers at the upcoming HHS Action Plan meeting on September 26, 2013
[2] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[3] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[4] CLABSI Vital Signs MMWR: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6008a4.htm?s_cid=mm6008a4_w

CDC's portfolio of activities is critical to improving the capacity of healthcare facilities and states to detect HAIs and protect patients and communities. We know we must continue and expand on these efforts and are pleased to have the opportunity to discuss them with you today.

Healthcare-associated Infections and Related Antibiotic Resistance

Healthcare-associated infections are infections that patients acquire while receiving care. They include a variety of infections ranging from those related to specialized intensive care procedures like mechanical ventilation, to infections caused by lapses in basic safe practices, like re-using disposable syringes or inappropriate cleaning of equipment. The most common types of healthcare-associated infections are central-line associated blood stream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), surgical-site infections (SSIs), gastrointestinal illnesses like *Clostridium difficile (C. difficile*), and pneumonias. HAIs are associated with increased mortality and greater cost of care, and can occur in any healthcare setting -- hospitals, long-term acute care, dialysis clinics, ambulatory surgical centers, nursing homes/skilled nursing facilities, and even doctors' offices. In the worst cases, HAIs can lead to sepsis, a dangerous body-wide inflammation that can result in organ failure and death. Primary prevention of HAIs stops a root-cause of sepsis.

CDC data indicate that approximately 1 in 20 hospitalized patients develop HAIs and over 1 million infections occur each year across healthcare settings. In hospitals alone, HAIs result in billions of dollars of excess healthcare costs and contribute to the deaths of thousands of patients every year.[5] HAIs are caused by a wide range of pathogens. Infections from pathogens resistant to standard antibiotic treatment are now too common, and some pathogens have even become resistant to all types or classes of antibiotics. CDC estimates that 1 in 5 HAIs show some form of drug resistance making treatment more difficult for the patients and frequently more expensive.[6] Patients with these resistant infections are more likely to die, and survivors have significantly longer hospital stays, delayed recuperation, and more long-term disability. The loss of effective antibiotics can make even common infections dangerous and undermines our ability to fight infections and manage the infectious complications common in vulnerable patients with chronic conditions.

[5]The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention: http://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf.

[6] National Burden of Invasive Methicillin-Resistant Staphylococcus *aureus* Infections, United States, 2011

Antibiotic resistance is one of our most serious health threats and one of CDC's most significant concerns related to healthcare-associated infections. Resistance is not just a problem for the infected patient. When infections are not cured because they are resistant to the drugs we use, those infections persist and spread to others. Last week, CDC released a landmark report that presented a first-ever U.S. snapshot of the burden and threats posed by the antibiotic-resistant pathogens having the most impact on human health; these include healthcare-associated infections.[7] Two of the three infections prioritized as urgent in the report are primarily healthcare related -- carbapenem-resistant *Enterobacteriaceae* (CRE) and *C. difficile*. CDC's report describes critical steps needed to address antibiotic resistance, including: improving antibiotic prescribing, preventing transmission of infections through infection control and environmental cleaning, and monitoring the spread of resistant pathogens. The following are just a few of the most urgent and serious HAI pathogens, affected by antibiotic resistance and inappropriate antibiotic use:

- ***C. difficile*** is a life-threatening diarrheal infection associated with antibiotic use that causes or extends nearly 250,000 hospitalizations and at least 14,000 deaths every year in the United States and over $1 billion in excess medical costs annually.[8][9] *C. difficile* infections can be prevented. Early results from hospital prevention projects show 20 percent fewer *C. difficile* infections in less than two years when recommended infection-prevention and control measures are followed and more than 50 percent fewer infections when rigorous antibiotic stewardship programs are implemented.[10]
- **CRE** are hard-to-treat bacteria that are on the rise among patients in medical facilities, with over 9,000 estimated cases nationwide.[11] CRE have become resistant to all or nearly all the antibiotics we have today. Almost half of hospital patients who get bloodstream infections from CRE bacteria die from the infection.[12] By following CDC guidelines in the CRE toolkit,[13]

[7] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[8] CDI Vital Signs: http://www.cdc.gov/VitalSigns/pdf/2012-03-vitalsigns.pdf
[9] CDC will be releasing new estimates on the burden of *Clostridium difficile* in the coming months.
[10] http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1179745282388 and J Antimicrob Chemother 2012; 67 Suppl 1: i51–i63
[11] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[12] CRE Vital Signs: http://www.cdc.gov/VitalSigns/pdf/2013-03-vitalsigns.pdf
[13] CRE Toolkit: http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html

we can halt CRE infections before they become widespread in hospitals and other medical facilities.

- **Extended-spectrum penicillin and cephalosporin-resistant Enterobacteriaceae** cause nearly *26*,000 (or 19 percent) of healthcare-associated Enterobacteriaceae infections.[14] Patients with bloodstream infections caused by an ESBL-containing Enterobacteriaceae are about 57 percent more likely to die than those with bloodstream infections caused by a non ESBL-containing strain.[15] ESBL bacteria are the predecessors to CRE and can also be prevented by following the CDC guidelines in the CRE toolkit.
- ***Pseudomonas aeruginosa*** causes an estimated 51,000 healthcare-associated infections in the United States each year. More than 6,000 (or 13 percent) of these are multidrug-resistant, meaning that several classes of antibiotics no longer cure these infections.[16] Infection-control and appropriate use of contact precautions are important for the prevention of *Pseudomonas aeruginosa*.
- **Vancomycin-resistant Enterococci (VRE)** are resistant to vancomycin, an antibiotic of last resort, leaving few or no treatment options among very sick patients in hospitals and other healthcare settings. Approximately 20,000 (or 30 percent) of the healthcare-associated infections caused by *Enterococcus* each year are vancomycin-resistant.[17] Appropriate use of contact precautions and effective environmental cleaning reduces the transmission of VRE.
- **Methicillin-resistant *Staphylococcus aureus (*MRSA)** remains one of the most common causes of healthcare-associated infections despite significant progress in its prevention across healthcare settings.[18] Recent studies have shown that the use of a pathogen-killing soap and nasal ointment can potentially further prevent the spread of MRSA.
- ***Acinetobacter*** is a type of gram-negative bacteria that is a cause of pneumonia or bloodstream infections among critically ill patients. About 63 percent of *Acinetobacter* is considered multidrug-resistant, meaning at least three different classes of antibiotics no longer cure *Acinetobacter* infections.[19] Appropriate use of contact precautions and effective environmental cleaning reduces the transmission of VRE.

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[14] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[15] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[16] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[17] Antibiotic Resistant Threats in the United States, 2013; http://www.cdc.gov/drugresistance/threat-report-2013/
[18] National Burden of Invasive Methicillin-Resistant Staphylococcus *aureus* Infections, United States, 2011
[19] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/

- ***Candida*** is a fungal pathogen that is the fourth most common cause of healthcare-associated bloodstream infections in the United States.[20] In some hospitals it is the most common cause. Some *Candida* strains are increasingly resistant to first-line and second-line antifungal treatment agents. Appropriate stewardship for antifungal medications reduces the development of *Candida* resistance.

Recent Successes & CDC's Detect and Protect Portfolio

Despite the significant burden of HAIs in the United States and the growth of antibiotic resistant pathogens, most HAIs are preventable. Many of the recent HAI prevention successes reflect activities identified in the National Action Plan for the Prevention of Health Care Associated Infections which was developed under the coordination of the HHS Office of the Assistant Secretary. These include innovations in tracking HAIs and drug resistant pathogens and targeting problem areas with effective prevention strategies. CDC, working with CMS, AHRQ, and other agencies in the U.S. Department of Health and Human Services (HHS), has taken a lead role in addressing the important public health challenge by implementing strategies to detect HAIs and protect patients from them.

In an analysis currently undergoing peer review, CDC experts performed an historical economic model to measure the net economic benefits of preventing CLABSIs in Medicare and Medicaid patients in critical care units from 1990 to 2008 using the cost perspective of the Federal Government as a third party payer. The estimated net economic benefits ranged from $756 million to $1.9 billion with the corresponding net benefits per case averted ranging from $16,550 to $24,060.[21] The per-dollar rate of return on CDC investments ranged from $4.54 to $23.45.[22]

Using multiple detect-and-protect strategies, CDC's world-class experts target HAIs and the drug resistant pathogens that can cause them, including:

- monitoring HAIs and evaluating their risk factors, establishing benchmarks and targets, and tracking prevention progress towards those goals;

[20] Antibiotic Resistant Threats in the United States, 2013: http://www.cdc.gov/drugresistance/threat-report-2013/
[21] Pending publication, unpublished data currently under peer review
[22] Pending publication, unpublished data currently under peer review

- detecting and responding to emerging and urgent threats through outbreak investigation and laboratory science;
- developing guidelines for HAI prevention and filling gaps in knowledge through applied research;
- implementing prevention strategies with Federal and state partners.

Tracking HAIs and HAI Prevention Progress

CDC's National Healthcare Safety Network (NHSN) is the Nation's most widely used healthcare-associated infection tracking system. NHSN provides facilities[23], states, regions, Federal partners such as the Centers for Medicare & Medicaid Services (CMS), and the Nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate healthcare-associated infections. NHSN currently serves more than 12,000 medical facilities tracking HAIs.[24] Participation is expected to continue to grow.

CDC provides the standard national measures for HAIs as well as analytic tools that enable each facility to assess its progress and identify where additional efforts are needed. While ensuring data security, integrity, and confidentiality, NHSN gives healthcare facilities the ability to see their data in real-time and share that information with clinicians and facility leadership, as well as with other facilities (*e.g.,* a multihospital system) and partners such as state and local health departments or CMS quality improvement organizations. To limit burden on facilities and leverage efficiencies across government, NHSN serves as the conduit for facilities to comply with CMS infection reporting requirements (see figure 1). NHSN data are analyzed by CDC and others to direct actions for HAI prevention. Local, state, and national HAI trends are used to identify problems and areas of concern that need intervention, and to measure progress in HAI reduction against national, state, and local prevention goals.

NHSN provides facilities with data collection and reporting capabilities needed to:

[23] Current participants include acute care hospitals, long-term acute care hospitals, psychiatric hospitals, rehabilitation hospitals, outpatient dialysis centers, ambulatory surgery centers, and nursing homes, with hospitals and dialysis facilities representing the majority of facilities reporting data.
[24] NHSN: http://www.cdc.gov/nhsn/about.html

- identify infection prevention problems [25];
- benchmark progress of infection prevention efforts;
- comply with state and Federal public-reporting mandates, and;
- ultimately drive national progress toward elimination of HAIs.

Patients can use NHSN data posted publicly on HHS's Hospital Compare website.[26] Patients are encouraged to visit the website to see how their local facilities are doing and discuss concerns with their healthcare providers.

To understand patterns of infections and how drug resistant-pathogens move through communities, and to build the evidence base of best practices to prevent spread, CDC relies upon its Emerging Infections Program (EIP).[27] The 10-state EIP network consists of partnerships between state health departments and university collaborators that provide critical evaluation of the epidemiology and public health impact of HAIs, the burden of emerging drug-resistant infections, and identification of new populations-at-risk for healthcare-associated infections. The EIP is currently working on new estimates of the overall burden of HAIs nationwide and providing updated information on the most commonly used antimicrobials and treatment indications. The network has begun plans to perform a large scale assessment of antibiotic use appropriateness and to test what interventions can be used to improve antibiotic prescribing and thereby reduce drug resistance and improve patient outcomes.

The National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination (National Action Plan), developed under the leadership of the Office of the Assistant Secretary, sets specific targets based on NHSN, EIP, and other data systems for monitoring and preventing HAIs nationally and represents a national blueprint for promoting HAI prevention.[28] CDC has collaborated closely with HHS's Assistant Secretary for Health, the Agency for Healthcare Research and Quality (AHRQ), CMS, and other Federal agencies to implement the National Action Plan and expand its impact to additional healthcare settings.

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[25] In addition, NHSN allows healthcare facilities to track blood safety errors, antibiotic use, and important healthcare process measures such as healthcare personnel influenza vaccine status and infection control adherence rates.
[26] http://www.medicare.gov/hospitalcompare.
[27] EIP- HAI projects: http://www.cdc.gov/hai/eip/
[28] *National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination*: http://www.hhs.gov/ash/initiatives/hai/actionplan/index.html.

Outbreak Investigation and Response and Laboratory Science

CDC serves as a national and global leader in the investigation and control of HAI outbreaks. On a daily basis, CDC responds to inquiries from facilities and states about unexplained illness and/or death related to product, device, or environmental contamination and lapses in basic infection control or injection safety. CDC deploys experts including healthcare epidemiologists, infectious disease physicians, and laboratory scientists to assess healthcare settings, collect and analyze data, evaluate practices, and perform microbiologic testing in response to a newly recognized outbreak or problem. Through its investigations, CDC identifies and controls problems, develops new prevention strategies, and works with partner agencies such as CMS and the Food and Drug Administration (FDA) to implement policy changes. Some of our Nation's most significant healthcare problems are first identified through outbreak investigations conducted by CDC and its state partners, including last year's nationwide response to an outbreak of fungal meningitis and other infections related to a compounded medication associated with the New England Compounding Center (NECC). With 750 cases and 64 deaths reported to CDC to date, affected patients continue to suffer from these infections and the burden of treating them.

Outbreaks demonstrate the essential role that public health plays in keeping our country safe from infectious disease threats. Our national public health capacity is disseminated to state and local responders who work in partnership with CDC. Outbreak responses require skilled, trained public health personnel in state and local agencies capable of responding to outbreaks in a range of healthcare settings including hospitals, nursing homes, dialysis facilities, and doctor's offices. CDC support to state infectious disease programs is critical to local outbreak response capacity.

Outbreaks also highlight the importance of CDC's infectious disease laboratories to rapidly respond to and characterize unexplained death and illness. CDC has multiple laboratories that provide outbreak response capacity for HAIs. CDC's drug-susceptibility laboratory serves as a World Health Organization (WHO) collaborating center for antibiotic resistance, providing worldwide reference capacity, conducting strain typing and additional molecular characterization of antibiotic resistant pathogens, and detecting novel and emerging antibiotic

resistance in health care-associated bacteria. CDC's environmental microbiology laboratory maintains unique capacities to sample environments to identify contamination, determine routes of transmission, and isolate the cause of outbreaks of unknown etiology.

Advances in laboratory technologies such as high-throughput genome sequencing, along with improved capabilities in the field of bioinformatics, stand to revolutionize our ability to control infectious diseases including HAIs, enabling faster, more accurate, and cost-effective ways of preventing, detecting, and responding to known, emerging, and resistant pathogens. To help CDC gain the capacity to keep pace with this rapidly changing field, the President's FY 2014 Budget proposes an Advanced Molecular Detection initiative[29] that would equip CDC's scientists and laboratories with two powerful technologies -- molecular sequencing and bioinformatics -- to help solve complex disease mysteries. Modernizing CDC's infectious disease laboratories and building its bioinformatics capacities are essential to ensure that the expanding use of these new technologies brings strong benefits for public health. With these new tools, disease detectives can solve more health mysteries and solve them faster.

Guidelines for Prevention and Researching Gaps in Knowledge

Information CDC learns from outbreaks not only serves to control the immediate problem, but also has a direct impact on future HAI prevention nationwide. Experience from outbreak investigations contributes to refinement of infection control guidelines and improvements in HAI tracking. CDC, working with the Healthcare Infection Control Practices Advisory Committee (HICPAC), develops evidence-based guidelines for HAI prevention. CDC's infection control guidelines set the standard of care for HAI prevention in the United States and are the basis of HAI prevention checklists.

CDC's experts also work to improve upon HAI prevention guidelines by filling critical gaps in knowledge. Through a cooperative agreement, CDC works with a network of academic partners, called the Prevention Epicenters, to address gaps in the evidence base related to the prevention of HAIs, antibiotic resistance, and other adverse events associated with healthcare. This unique forum enables academic leaders in healthcare epidemiology to partner directly with each other and with CDC experts to conduct innovative research designed to fill knowledge gaps that are

[29] http://www.cdc.gov/amd/.

most important to public health. Because the Prevention Epicenters work together, there is an emphasis on multicenter collaborative research projects, many of which would not be possible for a single academic center.

For example, the recent REDUCE MRSA Trial,[30] a collaboration of CDC, its network of Prevention Epicenters, and AHRQ, tested three MRSA-prevention strategies. The study results found compelling evidence that one of the interventions – the use of a pathogen-killing soap and nasal ointment on all intensive-care unit (ICU) patients – reduced bloodstream infections by up to 44 percent and significantly reduced the presence MRSA and other pathogens in ICUs. A total of 74 adult ICUs and 74,256 patients were part of the study, making it the largest study on this topic and we believe that the results are already impacting practice and improving care in hospitals across the country.

Implementing Prevention Strategies with Federal and State Partners

NHSN and CDC HAI prevention guidelines are used by all Federal agencies working on HAI prevention and are the basis for most state HAI prevention initiatives. CDC's NHSN data is used to measure the progress of the HHS Partnership for Patients initiative, for AHRQ's Comprehensive Unit-Based Safety Program, and to support targeted prevention activities for CMS Quality Improvement Organizations. CDC also develops tools to translate what we know works to prevent HAIs (CDC and HICPAC guidelines) into practice.[31] For example, CDC is improving basic infection control practices through collaborations with CMS to expand survey and oversight capacity of non-acute healthcare settings. CDC and CMS worked together to develop a new tool that state inspectors are using to ensure the quality of care in ambulatory surgical centers (ASCs)[32]. CDC is working with CMS to expand incorporation of basic infection control content into CMS interpretive guidance for their conditions of coverage for outpatient settings. CDC continues to work with CMS to develop similar tools for use in acute care and other healthcare settings. CDC also develops tools to help facilities prevent the spread of drug

[30] http://www.nejm.org/doi/pdf/10.1056/NEJMoa1207290.

[31] CDC HICPAC Guidelines: http://www.cdc.gov/hicpac/

[32] In a 2008 federal survey of ASCs, 68 percent of 68 surveyed centers had noncompliance with the infection control requirements in the Medicare ASC health and safety standards. CMS has found infection control problems in ASCs to be both common and egregious, ranging from failure to clean equipment between patients and re-use of single-dose vials of medication for multiple patients.

resistant infections. In 2012, CDC released the CRE Toolkit[33] to provide education for doctors and nurses, hospitals, long-term acute care hospitals, nursing homes, and health departments. It gives step-by-step instructions for facilities treating patients with CRE infections and for those not yet affected by it.

Through funding under the Prevention and Public Health Fund, CDC also supports HAI coordinators[34] at all 50 state health departments. These coordinators use data from CDC's National Healthcare Safety Network to help target HAI prevention efforts locally, leveraging ongoing HAI projects and collaborating with local partners to avoid duplication. For example, the HAI coordinator at the Tennessee State Health Department collaborated with the local quality improvement organization (QIO) supported by CMS to target *C. difficile* prevention. This collaboration leveraged the complementary expertise of the organizations: the QIO recruited a group of interested and motivated facilities and is providing them with support on performance improvement, while the Tennessee State Health Department has provided those facilities with specific training on how to prevent and monitor *C. difficile* infections. The Tennessee State Health Department is also analyzing data on *C. difficile* infections being submitted to the CDC's NHSN to help both the facilities and the QIO monitor their progress and drive quality improvement.

Future Directions

In moving HAI prevention forward, CDC is focused on making progress wherever HAIs are impacting patients. Drug-resistant HAIs and *C. difficile* continue to take a toll on patients nationwide and must be addressed. To accelerate improvement, CMS began requiring the reporting of *C. difficile* infections through CDC's NHSN last year. CDC is launching a new component of NHSN, developed with CMS and others, that will electronically measure, benchmark, and help facilities improve antibiotic use – a leading driver of both drug resistance and *C. difficile* infections. CDC is testing new interventions such as antibiotic timeouts and antibiotic stewardship protocols that we hope can make real contributions to prevention progress. With our state partners, CDC is also piloting regional "detect and protect"

[33] CRE Toolkit: http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html

[34] HAI coordinators were recently named White House Champions for Change: Marion Kainer (TN) and Erica Washington (LA): http://www.whitehouse.gov/champions .

collaboratives that are focused on preventing drug-resistant HAIs across communities by ensuring that hospitals, long-term acute care facilities, and nursing homes/skilled nursing facilities work cooperatively to limit the spread of dangerous pathogens within and across those facilities.[35]

For the prevention of CLABSIs, CDC is working with CMS to ensure that the prevention gains we have seen thus far in hospital intensive care units are carried over to general hospital wards, long-term acute care, and dialysis settings. CDC and CMS are also working to make improvements in the surveillance and prevention of catheter-associated urinary tract infections (CAUTI), which have increased over the past 2 years. CDC is refining the measurement and prevention science for HAI-related pneumonias and surgical-site infections, which represent a significant HAI burden. For all of these infection types, CDC and CMS are looking to prevent not only infections within a facility but also infections that move across facilities and cause unnecessary, costly readmissions.

Conclusion

Ensuring that appropriate infection control and antibiotic use practices are adhered to in all healthcare settings is a priority for CDC. Public health plays a pivotal role in ensuring a unified and integrated approach through systematic implementation of prevention practices, monitoring to detect problems, outbreak investigation and control, oversight, education, and research. Our work in HAI prevention illustrates the power of public health in action both to detect serious health problems and to lead state and Federal partners to implement targeted responses that will protect our Nation and its citizens from infectious disease threats. As we continue to work toward elimination of HAIs, new healthcare settings and changing technology will create new challenges and will require fast detection and innovative responses to prevent harm to the public. CDC continues to address challenges as they arise and ensure that patients are safe in every healthcare setting. We know how to protect patients from most HAIs; these infections can and must be prevented.

[35] Detect and Protect: http://www.cdc.gov/hai/pdfs/cre/CDC_DetectProtect.pdf

**Figure 1: Participation in CDC's National Healthcare Safety Network (NHSN) for CMS Value-Based Purchasing**

| Location | HAI Event | Reporting Start Date | CMS Reporting Program |
|---|---|---|---|
| ACUTE CARE HOSPITALS | CLABSI - ICU | 11-Jan | Hospital Inpatient Quality Reporting Program |
| | CAUTI - ICU | 12-Jan | |
| | SSI (COLO and HYST) | 12-Jan | |
| | MRSA Bacteremia | *13-Jan* | |
| | *C. difficile* LabID Event | *13-Jan* | |
| DIALYSIS FACILITIES | I.V. antimicrobial start, Positive blood culture, Signs of vascular access infection | 12-Jan | ESRD Quality Incentive Program |
| LONG TERM ACUTE CARE FACILITIES (LTAC) | CLABSI, CAUTI | 12-Oct | Long Term Care Hospital Quality Reporting Program |
| INPATIENT REHABILITATION FACILITIES (IRF) | CAUTI | 12-Oct | IRF Quality Reporting Program |
| AMBULATORY SURGICAL CENTERS (ASC) | *None at this time* | *13-Oct* | ASC Quality Reporting Program |
| NURSING HOMES/SKILLED NURSING FACILITIES^ | *None at this time* | *n/a* | *None at this time* |
| ALL FACILITIES | HCW Influenza Vaccination | *14-Oct*† | *All Reporting Programs*† |

†Acute Care Hospitals began reporting HCW Influenza Vaccination January 2013 as part of Hospital Inpatient Quality Reporting Program; all other facility types to begin in October 2014

^No information on proposed reporting in long term care/skilled nursing, but CDC's LTC component made available for use in August 2012.