New Mexico Healthcare-associated Infections Report

Summer 2012

Prepared by:

New Mexico Healthcare-associated Infections Advisory Committee

August 10, 2012

This document and further New Mexico healthcare-associated infection information can be found at www.nmhealth.org/HAI

SUSANA MARTINEZ, GOVERNOR

STATE OF NEW MEXICO DEPARTMENT OF HEALTH
CARING FOR NEW MEXICO

CATHERINE D. TORRES, M.D., CABINET SECRETARY

August 10, 2012

A message from the New Mexico Secretary of Health

The New Mexico Department of Health recognizes the importance of monitoring and preventing healthcare-associated infections in New Mexico. The ongoing cooperation and collaboration of the numerous partners addressing prevention of these infections is appreciated.

This New Mexico Healthcare-associated Infections Report includes progress through 2011 to reduce central line-associated bloodstream infections, improve healthcare personnel influenza vaccination rates, and expand the number and type of participating healthcare facilities in a broader range of surveillance and prevention activities. This initiative continues to develop in line with national priorities and state needs.

I would like to take this opportunity to thank those contributing to this ongoing effort to improve patient safety throughout New Mexico.

Sincerely,

Catherine D. Torres, M.D.
Cabinet Secretary

NEW MEXICO CENTENNIAL 1912-2012

Office of the Secretary
1190 St. Francis Drive, N4100 • P.O. Box 26110 Santa Fe, New Mexico • 87502-6110
(505) 827-2613 • FAX: (505) 827-2530 • http://www.nmhealth.org

Table of Contents

Executive Summary....2
Introduction....4
Background....4
Healthcare-associated Infections....4
National Activities....5
New Mexico Healthcare-associated Infections Initiative....8
New Mexico Healthcare-associated Infections Surveillance Results....12
Results of Central Line-associated Bloodstream Infection Surveillance....12
Results of New Mexico Healthcare Personnel Influenza Vaccination Surveillance....16
Results of *Clostridium difficile* Infection Surveillance....20
Prevention of Healthcare-associated Infections in New Mexico....20
Central Line-associated Bloodstream Infections Collaborative....21
Healthcare Personnel Influenza Vaccination Reporting Group....21
Healthcare-associated Infections Awareness Conference....21
Clostridium difficile Infection (CDI) Prevention Project....22
Conclusions....23
Appendices....24
Appendix A: Standardized Infection Ratio....24
Appendix B: Participating Facilities....27
Appendix C: New Mexico Healthcare-associated Infections Advisory Committee 2011 Voting Members and New Mexico Department of Health (NMDOH) Staffs....28
Appendix D: Special Projects....29
Appendix E: Central Line-associated Bloodstream Infection Surveillance....34
Appendix F: Facility-specific Reports....36
Appendix G: Consumer Healthcare-associated Infections Prevention Information....49
Appendix H: Healthcare Personnel Influenza Vaccination Surveillance....55
Appendix I: *Clostridium difficile* Infection (CDI) Surveillance....56
Appendix J: Acronyms....57
Appendix K: Glossary....58
References....60

Table of Figures

Figure 1. NM adult and pediatric ICU CLABSI SIRs for calendar years 2009 through 2011 with comparison to the NHSN reference population for 2006 through 2008 and Healthy People 2020 goal....15
Figure 2. NM facility-specific HCP employee influenza vaccination rates for the 2010-2011 and 2011-2012 seasons with NM statewide aggregate and national goals....19

Table of Tables

Table 1. CLABSI SIRs for all adult and pediatric ICUs and non-ICUs in NMDOH Reporting Group facilities with at least 4 months of data entered in NHSN, January 1, 2011 through December 31, 2011....13
Table 2. Three years of CLABSI SIRs for adult and pediatric ICUs in NMDOH Reporting Group facilities with at least 4 months of data entered in NHSN for calendar years 2009 through 2011....14
Table 3. Healthcare personnel employee category: Influenza vaccination rates for NM facilities participating in HCP influenza vaccination data submission, 2008 through 2012....17
Table 4. The number of facilities and units in NMDOH Reporting Group submitting CDI LabID Event data to NHSN for at least 4 months by CDC-defined location types (i.e., hospital unit type), January 1, 2011 through December 31, 2011....20

Executive Summary

Healthcare-associated infections are acquired by patients in healthcare settings during the course of receiving treatment for other conditions. Many healthcare-associated infections are preventable through proven practices. They have been recognized by the Centers for Disease Control and Prevention as a top “winnable battle” in public health and as a priority for improving the quality of healthcare and patient safety. New Mexico (NM) continues its initiative to monitor and prevent healthcare-associated infections and to make findings known to the public. This is the fourth NM public report and the second that includes facility-specific data.

The NM Healthcare-associated Infections Advisory Committee is comprised of stakeholders including consumers, the Association for Professionals in Infection Control and Epidemiology NM, the NM Hospital Association, NM hospitals, *HealthInsight* New Mexico (the state healthcare quality improvement organization), local representation from the Society for Healthcare Epidemiology of America and the NM Department of Health. The Committee developed the NM Healthcare-associated Infections Prevention Plan that guides surveillance and prevention of healthcare-associated infections, submission of data at state and national levels, and reports to the public.

The NM healthcare-associated infections initiative monitors central line-associated bloodstream infections because they can carry great risk to patients and also because hospitals can employ proven practices to prevent these infections. NM also monitors influenza vaccination rates of healthcare personnel because those personnel are a potential source of influenza to their patients; improvement of vaccination rates in healthcare personnel helps improve patient safety. Surveillance for and prevention of *Clostridium difficile* infection began in late 2010. *Clostridium difficile* infection causes diarrheal illness that can be healthcare-associated and very serious: it is linked to 14,000 American deaths each year. Those most at risk are older adults who take antibiotics and receive medical care.

In 2011 there were 38 acute and long-term acute care facilities in NM voluntarily participating in healthcare-associated infections monitoring, prevention activities, and/or special research projects. As of late February 2012, it became mandatory for all acute care facilities to submit specified data for central line-associated bloodstream infections and laboratory-identified *Clostridium difficile* infection.

The following is a summary of the key findings presented in this report:

- Central line-associated bloodstream infection surveillance methods and collaborative prevention efforts have improved in NM. The NM 2011 state aggregate standardized infection ratio of 0.47 met the 2014-15 national target ratio of 0.50. Facility-specific outcomes for hospitals that met specified criteria are included in this report.

- The NM aggregate healthcare personnel influenza vaccination rate for the 2011-2012 influenza season was 79.3% which exceeded the national Healthy People 2014-2015 interim goal of 70%. The NM rate of 79.3% for 2011-2012 also represented an increase compared with the NM 2010-2011 influenza season rate of 60.4%. Facility-specific rates are included in this report.

- New Mexico is laying the groundwork for *Clostridium difficile* infection surveillance and reporting. Twenty-two units in 15 hospitals reported laboratory-identified *Clostridium difficile* infection events during calendar year 2011 from both intensive care units and non-intensive care location types in their facilities. Currently there is no nationally endorsed measure for *Clostridium difficile* infection and no national *Clostridium difficile* infection benchmark is available for comparison purposes.

The NM Healthcare-associated Infections Advisory Committee remains committed to guiding collection of data and prevention of healthcare-associated infections, and reporting findings to the public. New Mexico healthcare facilities continually demonstrate a commitment to patient safety within their facilities and also collaborate to share best practices for surveillance and prevention of healthcare-associated infections for the entire state. This report includes findings from voluntarily submitted data from calendar year 2011. In early 2012, select healthcare-associated infections became reportable to the NM Department of Health per the NM Administrative Code. Moving forward, this report will include information on both healthcare-associated infections that are mandated to be reported and others that will be voluntarily reported.

Introduction

There is increasing public awareness and available information about patient safety which includes healthcare-associated infections (HAIs). The New Mexico (NM) Healthcare-associated Infections Advisory Committee, formed in 2008 and facilitated by the New Mexico Department of Health (NMDOH), has worked with an expanding number of healthcare facilities and personnel to identify and prevent HAIs.

The NMDOH HAI Program is publicly reporting both NM aggregate and facility-specific HAI data in a manner intended to be understandable and useful for the public. Since NM healthcare facilities vary in size and services, it is important that data are gathered and analyzed accurately and presented appropriately. The goal of this report is to bring residents of NM up to date on the work being done in the state to eliminate preventable HAIs and to reduce patient harm. Public health work incorporates surveillance (including tracking disease) and prevention (including patient education and improving quality of healthcare). This report addresses these elements by informing the public about HAIs in general, what the healthcare system is doing to prevent HAIs and how the public can partner in their own care to minimize risks to their health. References and appendices are included for those who may want more detail or background. Information can also be found at http://www.nmhealth.org/hai.

Background

Healthcare-associated Infections

HAIs are caused by a wide variety of common and unusual bacteria, fungi, viruses, and toxins encountered during the course of receiving medical care. These infectious agents can come from the patient themselves such as from their skin, nose, mouth, gastrointestinal tract, or vagina where microorganisms are normally found or from non-patient sources such as healthcare personnel, visitors, patient care equipment, medical devices, or the healthcare environment.

Medical advances have brought lifesaving care to patients in need, yet many of these advances come with a risk of HAI. HAIs are leading causes of death in the United States (US) and account for an estimated 1.7 million infections and 99,000 associated deaths each year.[1] One source estimates that the direct hospital costs for HAIs are between $35.7 billion and $45 billion annually after adjusting to 2007 dollars or $25,903 per HAI.[2]

Surveillance for HAI is conducted to monitor successes in HAI prevention and control. Public health surveillance is the ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, and is closely integrated with the timely dissemination of these data to those responsible for prevention and control.

Monitoring and preventing HAI are areas of focus around the world, including throughout the US. The World Health Organization (WHO) has been involved in multiple studies and prevention efforts and national surveillance systems have been developed in several countries.

A recent indicator of the US commitment to reducing HAI is the April 2011 announcement of the Partnership for Patients. The Partnership for Patients is a public-

private partnership to improve the quality, safety, and affordability of healthcare for all Americans. The US Department of Health and Human Services (HHS) is working with a wide variety of public and private partners to achieve the two core goals of this partnership: keeping patients from getting injured or sicker while in the healthcare system; and helping patients heal without complication by improving transitions from acute care hospitals to other care settings, such as home or a skilled nursing facility.

National Activities

Surveillance Efforts

With national focus on the importance of HAI, surveillance is key to defining the magnitude of the problem, understanding trends, and monitoring progress in reducing and eliminating these infections. Significant progress is being made in the US toward nationwide HAI surveillance through the cooperation of federal regulatory agencies, state health departments, healthcare stakeholders, and an informed and active public.

In 2010, the HHS Centers for Medicare and Medicaid Services (CMS) took a major step in recognizing the importance of surveillance and prevention of HAI for reduction of healthcare costs. They released a final rule (CMS 1498) July 30, 2010 under the Hospital Inpatient Prospective Payment Systems to provide financial incentives for HAI data submission to CMS. In order to earn full reimbursement for patient care, hospitals that care for Medicare patients were required to submit data on central line-associated bloodstream infections (CLABSI) that occur in intensive care units (ICUs) beginning January 1, 2011. In addition, data submission by acute healthcare facilities for select surgical site infections (SSI) (i.e., infections following colon surgeries and abdominal hysterectomies) and catheter-associated urinary tract infections (CAUTI) began January 1, 2012. CMS will release this information, and subsequent HAI information, to consumers on the Hospital Compare website (http://hospitalcompare.hhs.gov/) and also will use these data to determine part of hospitals' reimbursement beginning fiscal year 2013. *Clostridium difficile* infection (CDI), methicillin-resistant *Staphylococcus aureus* (MRSA), and healthcare personnel (HCP) influenza vaccination data submission are proposed for inclusion beginning January 1, 2013. CMS plans to add HAI indicators to this system annually.

The mechanism supported by Centers for Disease Control and Prevention (CDC) for collection of data on HAI is the National Healthcare Safety Network (NHSN), a secure web-based electronic data repository. NHSN enables healthcare facilities to collect and use HAI surveillance data. This system includes the following advantages: 1) use of standardized definitions for all HAIs; 2) built-in analytic tools; 3) user training and support; 4) ability to benchmark HAI rates specific to facility and unit type; and 5) built-in data quality checks. As of May 2012, CDC had enrolled over 9000 healthcare facilities in NHSN and that number continues to rise. NHSN is being used by states with mandatory HAI reporting, those with voluntary HAI data submission policies, and also as the mechanism to submit HAI data to CMS. Availability of this electronic system eliminates the need for individual states to design and support their own systems.

As of August 2011, 33 states and the District of Columbia had enacted laws pertaining to HAI prevention and reporting (http://haifocus.com/state-resources-2/us-state-and-territorial-healthcare-associated-infection-laws/). Of the states with HAI laws only two (Arkansas and New Mexico) at that time allowed for voluntary submission of HAI data. The remaining states had mandatory HAI data submission requirements. This left 17 states with no HAI law. In February 2012, NMDOH updated the Notifiable Diseases or

Conditions list (7.4.3.13 New Mexico Administrative Code) to mandate hospital data submission on CLABSI and CDI events. For states adding or changing HAI legislation, the Association of State and Territorial Health Officials (ASTHO) released a policy toolkit in March 2011 (www.astho.org/Display/AssetDisplay.aspx?id=6787). A member of the NM HAI Advisory Committee participated on the panel of experts during the development and review of this toolkit.

In March of 2012, the CDC Division of Healthcare Quality Promotion (DHQP) published the national "Healthcare-associated Infections Standardized Infection Ratio Report for July through December 2010."[3] This report included data submitted to NHSN by facilities in states with mandatory CLABSI, CAUTI, and/ or SSI data submission requirements. The national standardized infection ratio (SIR) data, which included all non-neonatal ICUs reporting CLABSI data to NHSN continuously during 2010, were included in this report.

The 2012 CDC DHQP report presented state-specific data from 49 states and the District of Columbia with mandatory or voluntary CLABSI data submission and compared them to overall national data. The SIR (Appendix A) was used to compare the state-specific data with the overall national data. The SIR represents the observed number of infections divided by the predicted number of infections. The predicted data were based on NHSN CLABSI data reported during 2006-2008 from all participating US hospitals (national reference population). The report also provided information on aggregate CAUTI data from 47 states and the District of Columbia and aggregate SSI data from 45 states and the District of Columbia. The data indicated that there were fewer CLABSI (32%), CAUTI (6%), and SSI (8%) than predicted based on the case-mix of patients and locations that were monitored.

These CDC DHQP reports provide a national baseline measurement to guide state prevention activities to fulfill the HHS Action Plan to Prevent Healthcare-associated Infections.[1] The Action Plan includes a five-year goal to reduce CLABSI by 50%, as well as reduction goals for four additional HAIs (i.e.; CAUTI, SSI, CDI, MRSA). Data from NHSN, the same data used for the DHQP reports and for tracking progress toward these goals, can also help identify institutional problems and are used to monitor infection rates over time to help evaluate implementation of best infection prevention practices and innovative approaches.

Prevention Efforts

Surveillance data are most effective when used to drive prevention efforts and focus application of best practice measures. A number of national efforts, some governmental and some private, are creating structures for implementing broad-based and infection-specific HAI prevention initiatives. Best practice measure implementation has been shown to reduce, and even eliminate, some preventable HAIs.

US HHS Action Plan

In 2009, the US HHS unveiled the above-mentioned HHS Action Plan that established a set of five-year national prevention targets to reduce, and possibly eliminate, five specific HAIs.

In late September 2010, The US HHS Steering Committee for the Prevention of Healthcare-Associated Infections hosted the meeting Progress Toward Eliminating Healthcare-Associated Infections. The purpose of the meeting was to review progress toward achieving the five-year targets in the HHS Action Plan to Prevent Healthcare-Associated Infections by increasing adherence to specific recommended prevention practices and reducing the incidence of specific HAIs.

A summary of the progress through September 2010 showed:

- Marked improvement in infection rates for CLABSI, healthcare-associated invasive MRSA infections, and SSIs, all of which constitute timely progress toward the five-year targets
- Improvement in compliance with all five Surgical Care Improvement Project (SCIP) process measures to reduce the risk of surgical site infections

For other measures, such as healthcare facility-onset of CDI, baseline data have been collected and are being analyzed. US HHS continues to build upon strategies for HAI prevention. A revised action plan to address HAI prevention in long-term care facilities was released for public comments in June 2012.

Healthy People 2020

Healthy People 2020 provides ten-year national objectives to improve the health of Americans. The objectives are developed using a multi-year process that includes input from a wide variety of individuals and organizations. HAI objectives were newly added to the Healthy People objectives. State programs are striving to meet the HAI objectives by 2020. The HAI objectives are to reduce CLABSI to an SIR of 0.25 from the national baseline of 1.0 reported during 2006-2008 (75% reduction) and to reduce invasive MRSA infections to 6.56 infections per 100,000 persons from a baseline rate of 26.24 infections per 100,000 persons in 2007-2008 (75% reduction).

Comprehensive Unit-based Safety Program

A prime prevention strategy is the Comprehensive Unit-based Safety Program (CUSP), a collaborative effort that started among the Johns Hopkins University Quality and Safety Research Group, the Health Research and Educational Trust, and the Michigan Health and Hospital Association Keystone Center for Patient Safety and Quality. CUSP used a comprehensive approach that included: promoting a culture of patient safety; improving communication among ICU staff teams; and using a checklist to promote implementation of practices based on guidelines from CDC.

The primary CUSP goals are to: 1) eliminate or reduce CLABSI rates to no more than one infection per 1,000 catheter days at the end of two years; and 2) to improve and strengthen the overall safety culture on hospital units. CDC continues to support the nationwide implementation of CUSP. At last report, there were active CUSP projects in 43 states, including NM. The CUSP initiative is also expanding into CAUTI prevention with a goal to reduce mean CAUTI rates by 25% across US hospitals.

State and Hospital Level HAI Prevention Efforts

A complementary approach to CUSP being used by many states, including NM, is the formation of learning collaboratives. Collaboratives bring together professionals in settings where members interact by sharing experiences and knowledge to search for comprehension, significance, and solutions. HAI prevention collaboratives focus on identification and implementation of best practices, including sharing of technical knowledge and processes, related to a specific HAI indicator. While specific HAI prevention outcomes can be difficult to quantify, anecdotal evidence from learning collaboratives shows that this particular strategy provides professional development and networking opportunities and further builds momentum toward overcoming barriers to HAI prevention.

A number of hospitals in NM have broad quality improvement programs that address hospital culture, patient safety, continuous staff training, and monitoring of outcomes. An example, implemented by several of these hospitals, is Six Sigma, a business management strategy to improve quality by identifying and removing the causes of errors and minimizing variability in processes.

National Impact of Prevention

Evidence-based interventions, such as CUSP, have been successful in preventing and reducing HAIs. According to the March 2011 issue of CDC Vitalsigns, "new data show that 58% fewer bloodstream infections occurred in hospital ICU patients with central lines in 2009 than in 2001." This fact sheet (www.cdc.gov/VitalSigns/pdf/2011-03-vitalsigns.pdf) goes on to state that "Overall, the decrease in infections saved up to 27,000 lives …" and "In 2009 alone, reducing infections saved about 3,000-6,000 lives and about $414 million in extra medical costs compared with 2001."

New Mexico Healthcare-associated Infections Initiative

History

A task force charged with studying the feasibility of conducting surveillance for HAIs in NM was formed under House Joint Memorial 67 in 2007. The NM HAI Advisory Committee formed in 2008 to implement a voluntary HAI surveillance pilot. The pilot included six hospitals conducting surveillance for two HAI indicators from July 1, 2008 through May 31, 2009. The full pilot report can be found at: http://nmhealth.org/hai/documents/HAIPilotReport_Final_August2009a.pdf

In 2009 The Hospital-Acquired Infection Act, NMSA §§ 24-29-1 to 24-29-6 (2009) was enacted which formalized the NM HAI Advisory Committee and its role, while keeping HAI data submission voluntary. The Committee is facilitated by NMDOH and is currently working toward its goals related to public reporting and prevention of HAI. NMDOH was awarded American Recovery and Reinvestment Act of 2009 (ARRA) funds for surveillance and prevention of HAI. These funds allowed for development of a comprehensive HAI initiative. The NM HAI Prevention Plan, submitted to the US HHS in January 2010, provides for standardized HAI data submission and for implementation of best practices to prevent HAI in NM healthcare facilities.

Since the 2008 pilot, the number of inpatient acute care facilities voluntarily submitting HAI data has continually increased. This group is referred to as the NMDOH Reporting Group. Prevention learning collaboratives have been well received by a variety of healthcare facilities including acute care hospitals, and long-term care, rehabilitative, behavioral health, and drug treatment facilities. A list of acute and long-term care facilities participating in either learning collaboratives or voluntary reporting during 2011 is in Appendix B. A public report was issued in December 2010 and the NMDOH HAI website was launched at that time. Another public report, which included the first facility-identified data, was issued in July 2011. The NM HAI Advisory Committee members remain committed to seeing NM healthcare facilities support strong HAI prevention measures and eliminate preventable HAIs.

Structure

The NM HAI Advisory Committee helps guide the NM HAI Prevention Plan to create an ongoing, sustainable statewide program of HAI data submission, surveillance, prevention, and public reporting. This guidance falls within the following areas:

- Establishing objectives, definitions, criteria, and standards for HAI data submission
- Selecting HAI indicator(s) for surveillance and public reporting
- Recruiting healthcare facilities
- Supporting data collection through NHSN or other state-specific data collection systems
- Evaluating HAI surveillance and quality of data collected
- Providing and/or identifying training resources for the prevention and control of HAIs
- Public reporting

The NM HAI Advisory Committee (current members listed in Appendix C) has been meeting monthly since February 2008. The Committee includes representatives from:

- Consumers
- Association for Professionals in Infection Control and Epidemiology (APIC) New Mexico
- New Mexico Hospital Association (NMHA)
- New Mexico hospitals (including infection preventionists and physicians with infection control expertise from large urban and smaller rural settings)
- *HealthInsight* New Mexico (formerly New Mexico Medical Review Association [NMMRA])
- Local representative of Society for Healthcare Epidemiology of America (SHEA)
- New Mexico Department of Health (NMDOH)

The NM HAI Prevention Plan reflects national recommendations, including the HHS Action Plan to Prevent Healthcare-associated Infections, which were adapted to the needs and capacity of the NM healthcare system. Experience from other states, scientific literature, and discussions with experts further inform the Plan.

The NM HAI Advisory Committee recommended the use of NHSN as a mechanism to collect HAI surveillance data beginning in 2008. A feature in NHSN, known as conferring rights, permits data sharing with NMDOH which allows for public reporting without duplication of work by healthcare facilities.

Infection preventionists (IPs) are professionals specially trained in monitoring and preventing infections in healthcare facilities: in NM, they play a key role in establishing their facilities in NHSN, implementing data collection systems, following surveillance definition guidelines, and championing implementation of best practice prevention measures. As the number of HAIs being tracked and the complexity of data requirements increases, many facilities are seeing the need to provide IPs with broad facility support including enhanced information technology resources. In order to eliminate preventable HAIs, strong leadership, development of a facility-wide focus, and dedication of adequate infection prevention resources are all required.

Surveillance

The House Joint Memorial 67 Task Force studied the feasibility of conducting surveillance for HAI in NM. Two HAI indicators for the NM pilot were chosen based on their significant impact on patients' health and also because hospitals can improve on those outcomes. The two indicators were CLABSIs in adult ICUs and influenza vaccination rates of HCP. Influenza vaccination of HCP is crucial because it protects these personnel and, therefore, their vulnerable patients from influenza which can cause severe illness and even death. Despite this knowledge, many HCP do not protect themselves and their patients through influenza vaccination. CLABSIs are monitored by many states because patients can become very sick, have prolonged hospital stays, and even die from their infections. In addition, these infections can lead to additional and unnecessary expenses for patients and for the healthcare system. A central line is a vascular infusion device that terminates at or close to the heart in one of the great vessels and is used for infusion (e.g., medications), withdrawal of blood, or hemodynamic monitoring. A CLABSI is a primary bloodstream infection in a patient who had a central line in place at the time of, or within the 48 hour period before, onset of the event (i.e., symptoms or positive blood culture). CLABSI surveillance through NHSN also has objective, accurate, and consistent definitions that allow for standardized data submission and analysis.

The six hospitals that participated in the pilot have submitted CLABSI data to NHSN since July 2008 from nine adult ICUs. Starting January 2010, five new hospitals began to monitor CLABSI in NHSN resulting in seven additional ICUs submitting data during the second data collection year. The additional units included both pediatric and adult ICUs. The number of hospitals and ICUs submitting data on CLABSI nearly doubled from nine ICUs in six hospitals in the 2008-2009 pilot year to 16 ICUs in 11 hospitals during the second data collection period, May 1, 2009 – April 30, 2010.

The third NM voluntary data collection year (May 1, 2010 – April 30, 2011) ended with 16 facilities submitting NHSN data from 37 patient care units. During this reporting period, the NM HAI Advisory Committee added two HAI indicators. The first was to expand outside ICUs to submit data on CLABSI in non-ICU inpatient units. Then, in November 2010, facilities were encouraged to begin submitting data on CDI. NM also participated in a pilot project with CDC on HCP influenza vaccination reporting which, for the 2010-2011 influenza season, incorporated long-term care facilities, dialysis and ambulatory surgery centers, and physician practices, in addition to hospitals.

In 2011 it was determined that continuing the May to April data reporting period was no longer appropriate. It did not allow for convenient comparison to other national data, most of which was reported on calendar years, nor did it align with internal healthcare facility reporting which was also based on calendar years. The NM HAI 2012 Report therefore presents data and activities from calendar year 2011. For more accurate comparison to previous findings, all previous NM data were recalculated based on calendar years resulting in data reports for 2009, 2010 and 2011.

Special Projects/HAI Emerging Infections Program

The Emerging Infections Program (EIP) is a population-based network of CDC and ten state health departments (CA, CO, CT, GA, MD, MN, NM, NY, OR, TN) and their partners (e.g., IPs, academic centers, and other federal agencies) that serves as a national resource for surveillance, prevention, and control of emerging infectious diseases. There are a number of activities conducted by EIP, including Healthcare-associated Infections Community Interface (HAIC) projects. There are three current

HAIC projects in which NM is participating: 1) HAI and Antimicrobial Use Prevalence Survey; 2) NHSN Denominator Simplification Project; and 3) population-based CDI surveillance.

In addition to the above-mentioned national EIP projects, NM EIP conducted a project to validate CLABSI data voluntarily submitted to NHSN by NM facilities.

For details on these special projects, see Appendix D.

Prevention

Statewide NMDOH HAI reduction efforts are guided by the NM HAI Prevention Plan which, in addition to standardizing data submission, provides for implementation of best practices to prevent HAI in NM healthcare facilities. *HealthInsight* New Mexico coordinates the activity of HAI learning collaboratives and prevention initiatives related to the indicators selected by the NM HAI Advisory Committee.

The NM healthcare community has a strong record of working collaboratively to improve health outcomes: New Mexico Influenza Vaccine Consortium, New Mexico Prescription Improvement Collaborative, and Surgical Infection Prevention Collaborative are examples. Concurrent with the beginning of the NM HAI surveillance pilot, in May 2008, *HealthInsight* New Mexico engaged 16 facilities in a 14-month prevention collaborative to reduce MRSA infections. Self-reported data at the end of the collaborative showed a 48% reduction in hospital-onset MRSA bloodstream infections. This success helped encourage facilities to continue working with *HealthInsight* New Mexico and the NM HAI initiative on additional prevention strategies.

In accordance with the NM HAI Prevention Plan, a year-long CLABSI prevention collaborative focused on CLABSI detection and prevention was completed in early 2011. A statewide CDI prevention collaborative, incorporating infection control staffs plus environmental services, pharmacies, laboratories, and other necessary hospital staffs, began in March 2011. A work group on HCP influenza vaccination has operated seasonally to support improvements in vaccination campaigns and update facilities on national reporting expectations.

New Mexico Healthcare-associated Infections Surveillance Results

Results of Central Line-associated Bloodstream Infection Surveillance

For background information on central line-associated bloodstream infection (CLABSI) surveillance, see Appendix E.

New Mexico Aggregate CLABSI Data

A total of 51 ICU and non-ICU units at 20 facilities submitted CLABSI data for at least four months from January 1 through December 31, 2011 (Table 1). These 51 units reported 60 CLABSI events and a total of 70,976 central line days. The SIR calculated for the 51 units was 0.47. Overall, 53% fewer CLABSI events were observed during the reporting period compared to the national reference data.

During calendar year 2011, 24 ICUs reported at least four months of data. These units reported 32 CLABSI events and a combined total of 37,862 central line days. These data were used to calculate an ICU SIR of 0.45 (95% confidence interval [CI] 0.31-0.63*)* which is not statistically significantly different from the previous two years in NM (depicted both in Table 2 and Figure 1). While the ICU SIR in NM is better than the national reference data, the NM ICU SIR does not yet meet the Healthy People 2020 SIR target of 0.25. The calculated SIR of 0.45 for 2011 indicates that the 24 ICUs together observed 55% fewer CLABSI than predicted.

During calendar year 2011, 27 non-ICUs reported at least four months of data. These units reported 28 CLABSI events and a combined total of 33,084 central line days. The non-ICU SIR was 0.49 (95% CI 0.33-0.71) which was better than the national reference data. The calculated SIR of 0.49 indicates that the 27 non-ICU units together observed 51% fewer CLABSI than predicted.

The state aggregate ICU and non-ICU CLABSI SIRs for 2011 were both better than the national aggregate CLABSI SIR. As previously mentioned, NM is now reporting calendar year data and comparisons. Data that were presented in previous reports were for 12 month periods between May and April. For comparative purposes going forward, those data have been recalculated for actual calendar years.

Overall, CLABSI surveillance methods and collaborative prevention efforts have improved in NM. More units are now submitting CLABSI data and CLABSI SIRs remain lower than the HHS 2014-15 national target SIR of 0.50 as well as the NHSN reference population. Reporting units have adopted practices to prevent CLABSIs. The state aggregate ICU-only CLABSI SIR for 2011 was no different from the NM CLABSI SIR calculated for the prior two years.

Table 1. CLABSI SIRs for all adult and pediatric ICUs and non-ICUs in NMDOH Reporting Group facilities with at least 4 months of data entered in NHSN, January 1, 2011 through December 31, 2011

Unit type	Number of facilities submitting data	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	New Mexico aggregate SIR	95% confidence interval†	Comparison between NM aggregate SIR and NHSN SIR (1.0)‡
All	20	51	60	128.81	0.47	0.36–0.60	Better
ICU	17	24	32	71.53	0.45	0.31–0.63	Better
Non-ICU	14	27	28	57.29	0.49	0.33–0.71	Better

CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICUs = intensive care units
SIRs = standardized infection ratios

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

† The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

‡ Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

[Note: The SIR is a summary statistic used to compare the HAI experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population. This "predicted" number is calculated by multiplying the national CLABSI rate from the reference population by the observed number of central line-days for each location type. The SIR is a ratio and is typically compared to one. An SIR less than one indicates that the number of observed HAI events is fewer than the number predicted. An SIR equal to one indicates the number of observed events is the same as the number predicted, and an SIR greater than one indicates the number of observed events is greater than predicted. See Appendix A for more information.]

Table 2. Three years of CLABSI SIRs for adult and pediatric ICUs in NMDOH Reporting Group facilities with at least 4 months of data entered in NHSN for calendar years 2009 through 2011

Calendar year	Number of facilities submitting data	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	NM aggregate SIR (95% confidence interval[†])	Comparison between NM aggregate SIR and NHSN SIR (1.0)[‡]
January – December 2009[§]	6	10	23	53.05	0.43 (0.28–0.65)	★ Better
January – December 2010[§]	11	16	27	61.49	0.44 (0.29–0.64)	★ Better
January – December 2011	17	24	32	71.53	0.45 (0.31–0.63)	★ Better

CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICUs = intensive care units
SIRs = standardized infection ratios

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

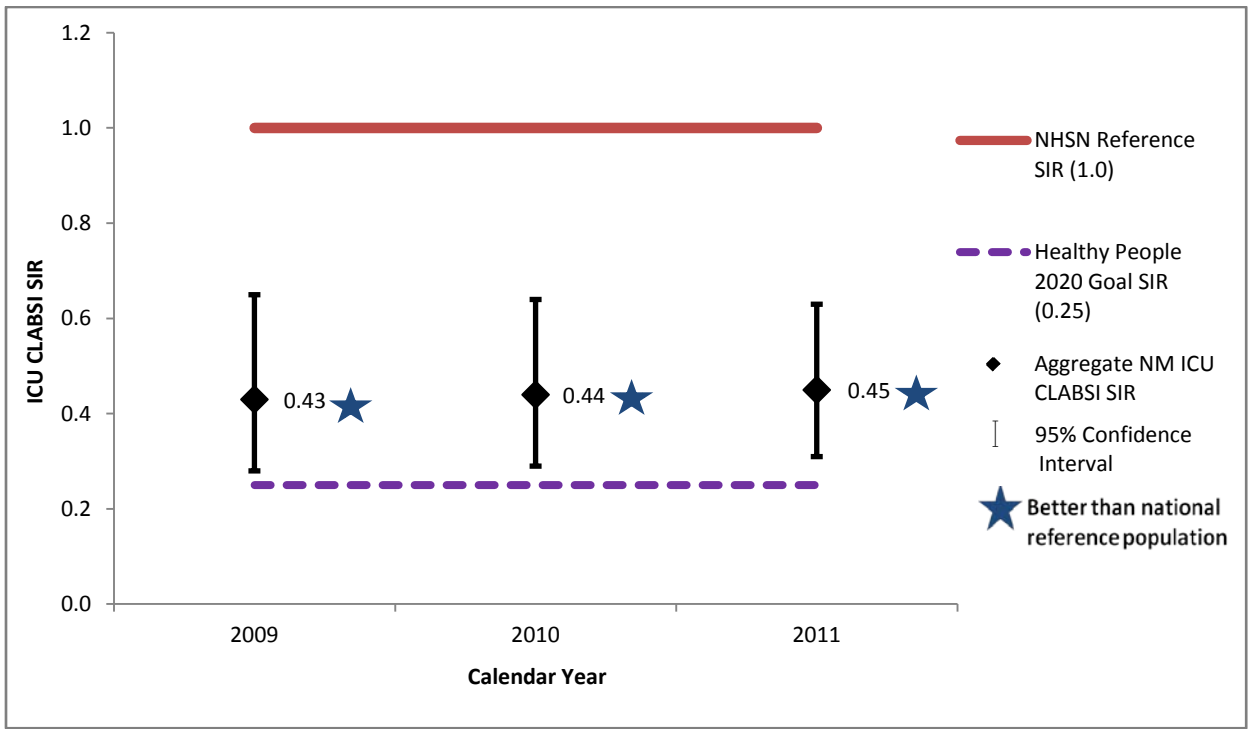
[†]The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

[‡]Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

[§]Data validation was conducted on CLABSI events that occurred during November 2009 – March 2010, resulting in a change to the data that had been reported previously.

[Note: The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population. This "predicted" number is calculated by multiplying the national CLABSI rate from the reference population by the observed number of central line-days for each location type. The SIR is a ratio and is typically compared to one. An SIR less than one indicates that the number of observed HAI events is fewer than the number predicted. An SIR equal to one indicates the number of observed events is the same as the number predicted, and an SIR greater than one indicates the number of observed events is greater than predicted. See Appendix A for more information.]

Figure 1. NM adult and pediatric ICU CLABSI SIRs for calendar years 2009 through 2011 with comparison to the NHSN reference population for 2006 through 2008 and Healthy People 2020 goal



CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICU = intensive care unit
SIRs = standardized infection ratios

NM Healthcare Facility-specific ICU CLABSI Data

Facility-specific reports are presented in Appendix F for a subset of the facilities included in the aggregate data. These are NM healthcare facilities that have been voluntarily submitting data for more than one full year. This criterion of one year allows for development and implementation of adequate surveillance systems and time to learn correct application of surveillance definitions prior to facility-specific reporting. Only ICU CLABSI data submission has met this criterion. Each facility-specific page includes two components: 1) ICU SIR table which shows the facility SIR and comparison to the NHSN reference population with additional information, including the number of infections during the time period; and 2) highlights from the facility staffs on their current HAI prevention measures. If this is the second year that facility-specific CLABSI data has been released for a facility, the SIR table will show two years of data.

Several facilities had less than one predicted infection, based on the type of unit they were reporting and their number of central line days. In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data. The SIR table indicates when this is the case.

Limitations of CLABSI Data

One limitation of using the NHSN pooled mean as a reference for comparison purposes is that it is based on national 2006-2008 CLABSI data whereas the NM CLABSI SIRs reported here are from 2009-2011. This is a limitation because factors

that have changed over time, such as improvements in CLABSI prevention and outcomes, may have also changed the national mean.

Data submitted to NHSN have been only partially validated and, therefore, there is limited assurance of consistent case finding and accurate application of surveillance definitions. For more information on CLABSI validation, see Appendix D.

For prevention information on CLABSI, see Appendix G.

Results of New Mexico Healthcare Personnel Influenza Vaccination Surveillance

For background information on healthcare personnel (HCP) influenza vaccination surveillance, see Appendix H.

Data was collected for 25 healthcare facilities during the 2011-2012 influenza vaccination season. The influenza vaccination season is generally considered to be from the time that season's vaccine is available (often in August) through March of the following year. Data is reported here for the employee category only (i.e., individuals paid directly by the healthcare facility) because those data are more reliable and complete, based on facility-reported difficulty collecting data for other personnel categories, and is more directly comparable to previous influenza vaccination reporting in NM.

The total number of healthcare employees receiving influenza vaccination for the 2011-2012 season was 19,740 of 24,896 HCP directly employed by 25 facilities (Table 3). The statewide HAI-reporting aggregate rate was 79.3% of employees vaccinated. The 25 participating facilities included six long-term care and behavioral health facilities in addition to 19 acute care hospitals.

The NM aggregate HCP influenza vaccination employee rate for 2011-2012 (79.3%) increased from the 2010-2011 NM rate (60.4%). The rate of 79.3% also exceeded the HHS Healthy People 2014-2015 interim goal of 70%.

Table 3. Healthcare personnel employee category: Influenza vaccination rates for NM facilities participating in HCP influenza vaccination data submission, 2008 through 2012

Influenza season	Number of facilities submitting HCP influenza vaccination data	Aggregate number of employees vaccinated between 8/1 – 3/31 of the reporting season	Aggregate number of employees who worked at the facility between 10/1 – 3/31 of the reporting season	Aggregate NM influenza vaccination rate for the reporting season	HHS Healthy People 2014-2015 interim HCP influenza vaccination rate goal	HHS Healthy People 2020 HCP influenza vaccination rate goal
2008-2009*	6	9,717	17,783	54.6%	NA	NA
2009-2010*	25	14,832	24,624	60.2%	NA	NA
2010-2011	24	14,856	24,564	60.4%	70.0 %	NA
2011-2012	25[†]	19,740	24,896	79.3%	70.0%	90.0%

HCP = healthcare personnel HHS = Department for Health and Human Services
NA = not applicable at the time

*Numbers of personnel vaccinated and total personnel include all employees plus medical staff with privileges (physicians and midlevel providers) and medical residents regardless of employment status.

[†]Lovelace Medical Center and Heart Hospital of New Mexico are counted separately in the 2010-2011 facility count and as one facility in the 2011-2012 count when their staffs were merged.

The HHS Healthy People 2020 goal, and the HCP influenza reporting expectations which are part of CMS pay-for-reporting requirements in 2013, are based on a target rate for influenza vaccination of all healthcare personnel, not just employees. The NM reporting to date has focused on employee vaccination rates while facilities develop reliable systems for collection of vaccination status of non-employees (e.g., physicians seeing patients in the hospital but not employed by the hospital, students, and volunteers). Based on numbers that were acknowledged as having limitations, but that were the best the facilities could gather at the time, the HCP influenza vaccination rate for employees, licensed independent providers, volunteers, and students for the 25 voluntarily reporting facilities during the 2011-2012 influenza vaccination season was 65.3% compared with the employee-only rate of 79.3%. This is likely an underestimate as many of these personnel may have been vaccinated elsewhere but facilities are just developing systems for collecting that information. The next two influenza seasons should show a marked improvement in facilities' ability to track total personnel numbers and vaccination status.

The increase in employee vaccination rates can be attributed to changes in individual facility policies and practices. A number of facilities modified their personnel policies in 2011 to mandate participation in influenza vaccination (which required either vaccination or an active declination) and/or implemented requirements that personnel who had not received influenza vaccination wear masks in patient areas. Others implemented the use of stickers on personnel badges or buttons to indicate whether or not the employee had been vaccinated.

Facility-specific Rates

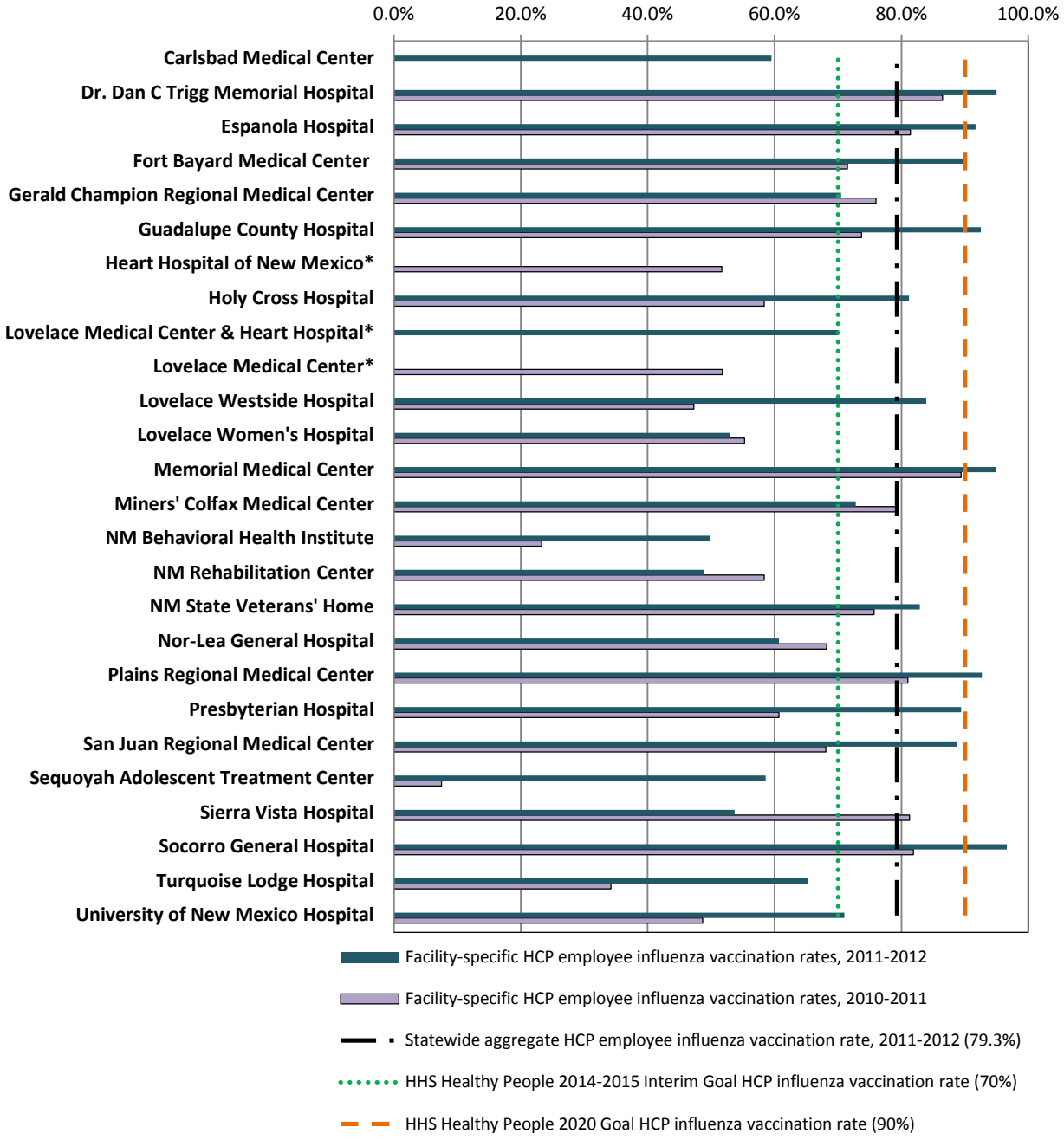
Twelve facilities reported more employees vaccinated than the reported statewide aggregate rate (Figure 2). Seven of those 12 facilities were able to meet or exceed the HHS Healthy People 2020 Goal of 90% vaccinated in the employee category. Only six facilities fell below the previous NM state aggregate rate of 60% of employees vaccinated.

Limitations

The NM HCP influenza vaccination data has limitations. There is not currently a standardized method for collection of HCP influenza vaccination data and therefore no consistent national benchmark for comparison purposes. This will begin to change as NHSN reporting begins to be phased in January 2013. As was noted, the 2010-2011 and 2011-2012 reported rates are only for those HCP employed directly by the facility (i.e., receive a paycheck from the facility) whereas previous reports (2008-2009 and 2009-2010) included physicians and mid-level providers who may or may not have been employed by the facility. Some facilities had extended vacancies in employee health staffs and other internal resource limitations during the season.

For prevention information on HCP influenza vaccination, see Appendix G.

Figure 2. NM facility-specific HCP employee influenza vaccination rates for the 2010-2011 and 2011-2012 seasons with NM statewide aggregate and national goals



HCP = healthcare personnel HHS = Department of Health and Human Services

* Lovelace Medical Center and Heart Hospital of New Mexico reported as one facility for the 2011-2012 season

Results of *Clostridium difficile* Infection Surveillance

For background information on *Clostridium difficile* infection (CDI), see Appendix I.

CDI surveillance is relatively new at the state and national levels. The baseline period selected by NHSN for calculating a national facility-wide SIR is 2009-2010; however, NHSN has not yet calculated and released this SIR. Voluntary NM data submission using NHSN began in November 2010 and provided a learning opportunity as hospitals had previously only collected CDI data internally, using non-standardized definitions. The introduction of an NHSN definition, which is algorithm based, was a departure from previous methods of data collection. Twenty-two units in 15 hospitals reported CDI laboratory-identified (LabID) events for at least four months of calendar year 2011 (Table 4). Both ICU and non-ICU location types are participating in CDI surveillance. Because there is not yet a national comparison figure to guide interpretation of performance, no aggregate data are presented in this report.

Table 4. The number of facilities and units in NMDOH Reporting Group submitting CDI LabID Event data to NHSN for at least 4 months by CDC-defined location types (i.e., hospital unit type), January 1, 2011 through December 31, 2011

Unit type	Number of facilities submitting CDI data	Number of units submitting CDI data
All	15	22
ICU	7	7
Non-ICU	11	15

CDI = *Clostridium difficile* infection
CDC = Centers for Disease Control and Prevention
ICU = intensive care unit
LabID = laboratory-identified
NHSN = National Healthcare Safety Network

Limitations

Currently there is no nationally endorsed measure for CDI and states are reporting CDI results in disparate ways. No NHSN CDI benchmark has been published for comparison. NHSN reporting for CMS purposes, which begins in January 2013, requires facility-wide reporting whereas NM has only collected data on individual units to date. When a full year of facility-wide CDI data is available, there will be more understanding of the significance of CDI in NM healthcare facilities.

For prevention information on CDI, see Appendix G.

Prevention of Healthcare-associated Infections in New Mexico

In addition to collecting surveillance data on CLABSI and CDI events and on HCP influenza vaccination from the facilities participating in the NMDOH HAI Reporting Group, the NMDOH HAI Program works closely with *HealthInsight* New Mexico and healthcare facilities to support prevention improvement. Training on HAI prevention is available to all NM healthcare facilities whether or not they are part of voluntary data submission. When facilities combine surveillance with prevention efforts they are best able to identify areas for improvement while directing training and practice resources to areas of potential need and probable impact.

Central Line-associated Bloodstream Infections Collaborative

The year-long CLABSI Prevention Collaborative helped participating healthcare facilities work together to expand and enhance surveillance methods and best practices, educate patients and providers, share knowledge, and ultimately decrease the rate of CLABSIs in both ICU and non-ICU settings. The Collaborative, which ended in early 2011, tracked changes in prevention practices among participating facilities and also measured adherence to key processes for HAI prevention. An example of a key process that was measured included the number of facilities achieving 100% use of checklists for central line insertion. The use of checklists has been shown to reduce CLABSI events by helping to ensure that HAI prevention steps are taken during the process of inserting a central line (e.g., hand hygiene prior to the procedure). The use of checklists during central line insertion increased from 16% to 40% over the course of the Collaborative. The Collaborative also assessed six key process interventions (e.g., providing an observer for each central line insertion, providing a kit for every central line insertion). At the beginning of the Collaborative, less than 33% of participating facilities had all six of these process interventions in place. By the end of the one-year Collaborative, all six were in place or being implemented in over 93% of the facilities.

Healthcare Personnel Influenza Vaccination Reporting Group

Four sites, including NM, collaborated with CDC nationally to pilot a standardized HCP influenza vaccination reporting measure during the 2010-2011 influenza season. Staffs at NMDOH worked closely during the beginning of the 2011-2012 influenza season to help facilities improve HCP vaccination rates and also improve their ability to collect data on specified groups of HCP per the proposed reporting measure. NMDOH staffs provided on-site support, evidence-based best practice information, vaccination campaign materials, and ongoing consultation to support facility improvement, focusing especially on those facilities with the lowest rates for the prior season.

Once the final national endorsement of the piloted reporting measure occurred in May 2012, staffs began to reach out to hospitals not participating in voluntary reporting to assist them in preparing for January 2013 CMS reporting. Facilities were provided sample reporting forms, personnel category definitions, and vaccination status definitions which will be incorporated in NHSN beginning in September 2012.

Healthcare-associated Infections Awareness Conference

The second Annual NM HAI Awareness Conference was held August 12, 2011; the purpose of the conference was to promote awareness of HAIs and the work of the NM HAI Advisory Committee. The NM HAI initiative aligns with the national HHS five-year plan to reduce HAIs.

The conference provided an avenue to support and cultivate the HAI work and relationships within and outside the state. The conference drew 94 infection preventionists, nurses, quality improvement staffs, and environmental program staffs from 40 facilities statewide, including hospitals and nursing homes. There was also representation from partners in HAI prevention including the NMDOH HAI Program, *HealthInsight* New Mexico, the New Mexico Hospital Association, and CDC. Sessions at the conference included updates from the local and national level given by NMDOH and CDC staffs, presentations on supporting high-quality care for patients, and a

workshop on how to prevent CDI.

Clostridium difficile Infection (CDI) Prevention Project

The next HAI prevention project focused on healthcare-associated CDI which has continued to increase nationally in both incidence (i.e., the number of newly diagnosed cases during a specific time period) and virulence (i.e., a measure of the severity of the disease a microorganism is capable of causing). The goal of this project was to decrease the number of new cases of healthcare-associated CDI in participating NM hospitals by 30% over a two-year period and to include all appropriate settings as resources allow. The initial training and data collection occurred during 2011. Prevention training and data review will resume in late 2012-2013 through CMS funding to *HealthInsight* New Mexico to improve individual patient care. Because of the complexity of CDI, this intervention will take time and expands beyond infection control to include others such as environmental and pharmacy services. The infection reduction goals will be achieved by: a) improving adherence to recommended practices for CDI prevention including hand hygiene and contact precautions; b) improving the surveillance of CDI within facilities; c) educating nursing staff to recognize such infections and follow the correct protocols; d) educating environmental services to use best practices; e) promoting antimicrobial stewardship within the facility; and f) improving the diagnosis and treatment of the infection.

Using an approach that starts with the patient and expands to incorporate all of the factors impacting CDI prevention, appropriate educational modules were delivered to each relevant group of HCP (i.e., nursing, environmental services, pharmacy, lab, clinicians) using web-enabled conferences and customizable materials. This training began in spring 2011 and included surveillance definitions and prevention methods. A face-to-face learning workshop for over 60 participants from 31 hospitals and nursing homes was held in August**.** A series of teleconferences, webinars, and presentations to facilities followed, as well as dissemination of educational modules and customizable materials. Thirteen facilities committed to participate in all aspects of the collaborative and each submitted baseline data. A sub-group of four facilities participated in an antimicrobial stewardship training, a key component of CDI prevention, using a real-time distance learning program sponsored by the University of New Mexico. Based on this experience, the antimicrobial stewardship training has been modified and will be offered to a second group of facilities in late 2012.

Because of the increase in incidence and virulence of CDI, prevention and management involves all healthcare settings, especially acute care and long-term care. In the fall of 2011, introductory training was provided to nursing homes statewide on CDI surveillance and prevention. Facilities participated in a series of presentations, teleconferences, and webinars on the topic of CAUTI and CDI prevention and best practices. *HealthInsight* New Mexico collected baseline prevalence data from nearly half of the state's nursing homes on number of urinary tract infections (UTIs) and CDIs during a six month period in 2011. This information helped the NM HAI initiative to understand the capacity and feasibility of collecting and reporting these data for nursing homes which will inform future training and prevention initiatives in NM.

Conclusions

The NM HAI initiative includes numerous individuals and organizations that are committed to the reduction and, wherever possible, the elimination of HAIs. The key findings in this report include CLABSI SIRs at the state and facility levels that were better than national reference data and HCP personnel influenza vaccination rates that were about the same as national reference goals and that have improved over time. While these findings are encouraging, the NM HAI Advisory Committee and partner healthcare facilities will continue to follow progress in the state as best practices are implemented for monitoring and preventing HAIs in order to improve the health status of the NM population. The NM HAI initiative has grown over time. Collaboration among healthcare facilities and with partner entities, such as the NM HAI Advisory Committee and its component organizations, is exceptionally strong. This has served the NM HAI initiative well as evidenced by outcomes. HAI surveillance and prevention projects will continue in NM. Research to understand the broad issues at the state and national levels will evolve and stakeholders will continue to provide input that will influence state and national goals and objectives related to HAI prevention.

Appendices

Appendix A: Standardized Infection Ratio

Background on the SIR

The standardized infection ratio (SIR) is a summary statistic used to compare the HAI experience of a particular group to a reference population. This comparison provides a predicted or expected number of infections for any particular hospital or unit within that hospital by looking at the experience of a large number of similar hospitals and inpatient units nationally. SIR is similar to standardized mortality ratio (SMR) which compares the number of observed deaths to the number of expected deaths.

An SIR allows facilities and/or units to compare the number of observed HAI events (which in this case is infections reported to NHSN from their facility) to the number of predicted HAI events. The number of predicted events is calculated based on the reference population. When using SIR to report CLABSI data, the reference population is the NHSN 2006-2008 pooled mean for the comparable facility or unit type. The calculation is risk-adjusted (i.e., based on location type, such as adult intensive care unit) and allows results for individual units to be combined (i.e., into a facility aggregate) without further risk adjustment. An SIR can also be used at a state level to calculate a state-wide SIR based on reporting units and their varying risk categories.

Using the SIR to Compare Data

SIRs can be calculated at a facility or unit level. SIRs can track trends over time in single units or large groups and will also reflect changes in risk over time.

Interpreting the SIR

The SIR is a ratio and is compared to one. A SIR less than one indicates that the number of observed HAI events is fewer than the number predicted. An SIR equal to one indicates that the number of observed events is the same as the number predicted, and an SIR greater than one indicates the number of observed events is greater than predicted. In this case, the predicted number is calculated from the risk-adjusted NHSN 2006-2008 pooled mean multiplied by the unit's actual number of central line days.

Benefits of the SIR

A benefit of using the SIR is that when combining units into a facility SIR, or facilities into a state SIR, patient mix and other risk factors are incorporated in the calculation. Another benefit of the SIR is that the historical pooled mean (2006-2008) used as the reference population predates the widespread implementation of evidence-based CLABSI prevention measures. One is therefore a baseline against which progress can be measured.

Limitations to the SIR

The reference population is based on data submitted nationally to NHSN from 2006-2008 which is not the same time period as the observed events included in this NM report. NHSN data is not available for real-time comparison.

SIR calculations are not meant to be compared against each other or ranked. SIRs are only valid when compared to one (the reference population) or internally (in order to trend over time for a specific unit, a facility or a state aggregate).

Understanding the Relationship between HAI Rate and SIR Comparison Metrics[3]

CLABSI Risk Adjustment

Historically, NHSN has published CLABSI rates based on the number of CLABSIs per 1,000 central line-days by type of ICU and other locations. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally, or even for an individual healthcare facility across multiple patient care locations. For instance, when comparing CLABSI rates, there may be 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 changes over time. This raises the need for a way to combine CLABSI rate data across location types to communicate the status of HAI incidence and prevention success to hospital staff, public health officials, and potentially consumers.

An SIR is identical in concept to an SMR 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

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

95%CI = (0.628,0.989)

*defined as the number of CLABSIs per 1,000 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 a “predicted” number using the CLABSI rates from the standard population. This “predicted” number, which can also be understood as a prediction or projection, is calculated by multiplying the national CLABSI rate from the standard population by the observed number of central line days for each stratum. 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-percent reduction in CLABSIs overall for the nation, region, or facility.

The SIR concept and calculation is completely based on the underlying CLABSI rate data that exist across a potentially large group of strata. In the above example, many more rows of data for each patient location could be added for any facility, and rows of data for all facilities in any state. Always though, the type of patient location is mapped to the appropriate type of patient location from the standard population to maintain the

risk adjustment (the patient locations are defined in the annual NHSN report). Thus, the SIR provides a single metric for performing comparisons rather than attempting to perform multiple comparisons across many strata utilizing rates, which makes the task cumbersome. For instance, if a hospital has 10-15 different patient locations, it can be very difficult to get a sense of whether the overall performance is better or worse than desired; summarizing these data at the state level, where 30-40 different location types may be present, would be impossible. 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 CLABSIs outlined in the HHS Action Plan to Reduce HAIs (www.hhs.gov/ash/initiatives/hai/actionplan/index.html) uses 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-percent reduction goal was met. There are statistical methods that allow for calculation of CIs, hypothesis testing, and graphical presentation using this HAI summary comparison metric called the SIR.

Appendix B: Participating Facilities

Acute and long-term acute care healthcare facilities voluntarily reporting HAI data to NMDOH and/or participating in New Mexico HAI Program prevention activities

	Facility	CLABSI and/or CDI reporting prior to 1/2012	HCP vaccination reporting for more than one flu season	CLABSI Collaborative 2010 – 2011	CDI Prevention Project 2011
1	Alta Vista Regional Hospital			X	
2	CHRISTUS St. Vincent Regional Medical Center			X	
3	Cibola General Hospital				X
4	Dr. Dan C. Trigg Memorial Hospital	X	X	X	X
5	Espanola Hospital	X	X		
6	Fort Bayard Medical Center		X		
7	Gallup Indian Medical Center			X	
8	Gerald Champion Regional Medical Center	X	X	X	X
9	Guadalupe County Hospital	X	X		
10	Healthsouth Rehabilitation Hospital			X	
11	Heart Hospital of New Mexico at Lovelace Medical Center	X	X	X	
12	Holy Cross Hospital	X	X	X	
13	Kindred Hospital - Albuquerque			X	
14	Lincoln County Medical Center	X			
15	Los Alamos Medical Center	X			
16	Lovelace Medical Center	X	X	X	X
17	Lovelace Rehabilitation Hospital			X	
18	Lovelace Westside Hospital	X	X	X	
19	Lovelace Women's Hospital	X	X	X	
20	Memorial Medical Center	X	X	X	X
21	Miners' Colfax Medical Center	X	X		
22	Mountain View Regional Medical Center			X	X
23	New Mexico Behavioral Health Institute		X		
24	New Mexico Rehabilitation Center		X		
25	New Mexico State Veterans' Home		X		
26	Nor-Lea General Hospital	X	X	X	X
27	Plains Regional Medical Center	X	X	X	X
28	Presbyterian Hospital	X	X	X	X
29	Raymond G. Murphy VA Medical Center			X	
30	Rehoboth McKinley Christian Health Care Services	X			
31	Roosevelt General Hospital	X		X	X
32	San Juan Regional Medical Center	X	X	X	X
33	Sequoyah Adolescent Treatment Center		X		
34	Sierra Vista Hospital	X	X	X	X
35	Socorro General Hospital	X	X	X	
36	Specialty Hospital of Albuquerque			X	
37	Turquoise Lodge Hospital		X		
38	University of New Mexico Hospital	X	X	X	X

Appendix C: New Mexico Healthcare-associated Infections Advisory Committee 2011 Voting Members and New Mexico Department of Health (NMDOH) Staffs

Representation	Voting Member
NMDOH HAI Prevention Coordinator, Advisory Committee Facilitator	
NMDOH HAI Prevention Program Manager	
HealthInsight New Mexico	√
New Mexico Hospital Association	√
Division of Health Improvement, NMDOH	√
Large/Urban Facility Infection Preventionist	√
Hospital Epidemiologist/Academic	√
Infection Preventionist/Epidemiologist, NMDOH	√
Public Information Officer, NMDOH	
Small/Rural Facility Infection Preventionist	√
New Mexico Association of Professionals in Infection Control and Epidemiology (APIC) Representative	√
Consumer	√
Society for Healthcare Epidemiology of America (SHEA) representative	√
HAI Medical Epidemiologist, NMDOH	

Appendix D: Special Projects

Phase 3 Healthcare-associated Infections (HAIs) and Antimicrobial Use Prevalence Survey

While HAI surveillance is often conducted for specific HAIs at both the state and national levels, there is limited data on overall prevalence of HAIs and antimicrobial use in the US. The objectives of the HAIs and Antimicrobial Use Prevalence Survey are to: 1) estimate HAI prevalence among inpatients in acute healthcare facilities (i.e., hospitals); 2) determine distribution of HAIs by pathogen and major infection site; and 3) to estimate prevalence and describe the rationale for antimicrobial use in acute healthcare facilities. There are three phases to this project: 1) single-city pilot, 2009; 2) limited roll-out, 2010; and 3) full-scale survey, 2011. New Mexico was one of the ten Emerging Infections Program (EIP) sites to participate in Phase 2 and Phase 3.

Each state randomly selected and recruited facilities to participate in a single day survey during May – August 2011. Twenty facilities in New Mexico participated in this survey. Institutional Review Board (IRB) approval was obtained at the state level as well as from the participating facilities as needed. Eligible patients for the survey included acute care inpatients of any age in randomly selected beds on the morning of the survey. Facilities randomly sampled up to 100 patient records, depending on the size of the facility. For those patients determined to be on antimicrobials on the survey date or day prior to the survey date, detailed medical record reviews were conducted to determine the rationale for antimicrobial use and if there was any evidence of HAIs based on National Healthcare Safety Network (NHSN) definitions (with the exception of the definition used for *Clostridium difficile* infection). All data was entered into a web-based, password protected data management system designed by the Centers for Disease Control and Prevention (CDC) for this project. Data submitted to CDC did not contain any unique patient identifiers (e.g., patient name). CDC is in the process of performing aggregated data analysis across acute healthcare facilities in all ten EIP sites to generate prevalence estimates of HAIs and antimicrobial use. Analysis of aggregated data across all participating facilities in New Mexico was performed using SAS, version 9.3 (SAS Institute, Cary, North Carolina).

In New Mexico, a total of 892 patient records were surveyed. Demographic characteristics of patients whose records were surveyed included the following: mean age 52.6 years (median 58.0 years, range 0-96 years), 53.5% female, 46.5% male, 44.3% White, 39.0% Hispanic, 9.4% American Indian, 1.8% Black, 0.6% Asian/Native Hawaiian/Pacific Islander. Among the 892 patient records surveyed, 24.4% had urinary catheters, 17.8% had a central line, and 3.6% were receiving mechanical ventilation on the survey day. Among the patient records surveyed, 443 patients (49.7%, 95% CI 46.4-52.9) were reported to be on or scheduled for antimicrobials on the survey day or day prior to the survey day. Upon detailed medical record review, it was determined that 433 patients (48.5%, 95% CI 45.3-51.8) actually did receive antimicrobials on the survey day or day prior to the survey day. A total of 768 antimicrobials were being administered among the 433 patients (includes same antimicrobial given by different routes of administration) for an average of 1.8 antimicrobials per person (median 2.0, range 1-8). The documented rationale for use of these 433 antimicrobials was as follows: treatment of active infection (81.9%), surgical prophylaxis (13.7%), medical prophylaxis (2.1%), non-infectious reason (0.5%), and lack of documentation of rationale (2.9%). The most common therapeutic sites documented for treatment of active infections included: lower respiratory tract (33.2%), urinary tract (20.0%), skin

and soft tissue (16.9%), gastrointestinal tract (12.7%), and bloodstream infections (12.6%). The top five antimicrobials being administered were: vancomycin (11.8%), cefazolin (11.6%), ceftriaxone (10.2%), piperacillin/tazobactam (9.6%), and ciprofloxacin (7.6%). Among the patients surveyed, the New Mexico EIP HAI staff determined that 25 HAIs were present in 22 patients (2.5%, 95% CI 1.6-3.7). The most common HAIs were urinary tract infection (28.0%) and pneumonia (24.0%). Among the HAIs attributable to a facility location, 43.5% were attributable to critical care locations and 56.5% were attributable to ward locations.

The information from the Phase 3 HAIs and Antimicrobial Use Prevalence Survey provides a snapshot of the prevalence of all HAIs across participating facilities in New Mexico which can supplement the smaller subset of HAIs being tracked at the state and national levels through NHSN. In addition, this survey methodology can be used to follow trends in HAIs and antimicrobial use patterns and data can be used to inform policy decisions and highlight targets for prevention efforts.

Evaluation and validation of a simplified method to collect denominator data for device-associated infection surveillance

Collection of denominator data is an essential part of HAI surveillance in order to calculate infection rates. However, denominator data collection is often time intensive and can consume human resources that could be utilized for other infection prevention efforts. The objectives of the NHSN Denominator Simplification Project are to: 1) evaluate use of a simple, less labor intensive method for estimating device-days denominator data; 2) determine if denominator sampling methods can be successfully implemented; and 3) determine if denominator sampling methods can generate valid estimates of device-days. The expected benefits of this project are to validate sampling methodology which could then contribute to reduction in HAI surveillance data collection burden, increased HAI surveillance participation, and improve denominator data reliability and accuracy.

This project has two phases: 1) retrospective data collection; and 2) prospective data collection. The data collection for this project does not involve collection of any unique patient identifiers or confidential patient information and therefore is not considered to be human subjects research. Participating facilities must be enrolled in NHSN and conducting central line-associated bloodstream infections (CLABSI) surveillance. The retrospective phase involved facility infection preventionists (IPs) providing 6-12 consecutive months of monthly device-days (i.e., central line) denominator worksheets. This data is being used by CDC to retrospectively assess the feasibility of using sampling methods to obtain estimates of central line-days in both intensive care unit (ICU) and non- ICU settings. The data collection for the retrospective phase was completed in the fall of 2010. Five facilities in New Mexico participated in this phase.

The prospective phase involved facility staffs continuing to collect denominator data using their usual methods during January-December 2011 while also conducting independent sampling (one day per week) of denominator data from the same inpatient units. In New Mexico, eight facilities collected data in 11 units for the prospective phase. This phase will allow for assessment of the feasibility of implementing the use of sampling methods to collect patient-days and central line-days denominator data. In addition, this phase will provide data to compare estimates of central line-days derived from data collected using sampling methodology against data collected using current denominator data collection practices. This comparison will determine if estimates of central line-days and CLABSI rates generated are suitable for the purposes of

conducting HAI surveillance and submitting data to NHSN. Data analysis is in progress by CDC staffs.

New Mexico Phase 1 and 2 central line-associated bloodstream infection data validation project

Background and Objectives

While data validation is a key element to assure quality, accuracy, and reliability of public reports, limited data validation efforts have been in place in New Mexico due to lack of resources. Previous validation had been conducted prospectively by a NMDOH contractor Infection Preventionist (IP) credentialed with Certification in Infection Control (CIC). This work included providing consultation when determining central line-associated bloodstream infections (CLABSI) events, reviewing all CLABSI events entered into NHSN, and data logic checks. The objective of the Phase 1 and 2 CLABSI data validation project was to determine if adult intensive care unit (ICU) CLABSI events in New Mexico were properly ascertained, defined, and reported to the National Healthcare Safety Network (NHSN).

Phase 1 Methods and Findings

During the Phase 1 CLABSI data validation project, NMDOH conducted retrospective medical record reviews on individuals determined to have had both a positive blood culture result and an ICU stay during November 2009 – March 2010 at six New Mexico hospitals. Hospitals eligible for inclusion in Phase 1 included those that participated in the CLABSI data submission pilot that began in 2008. Medical record reviews were conducted independently by two reviewers using a standardized data collection instrument. Reviewers were blinded both to each other's findings and to NHSN data. ICU CLABSI event determinations were compared between NMDOH reviewers and with NHSN data. Discordant case determinations were reviewed by two NMDOH medical epidemiologists in collaboration with hospital IPs to reach final determinations. All definitions used for determining the presence of an HAI were based on the Centers for Disease Control and Prevention (CDC) NHSN Patient Safety Component Manual Identifying HAIs. [(1)]

Initially, 118 individuals were identified for medical record review based on matching of the ICU and laboratory line-lists provided by the six hospitals. Among these, 111 individuals (94.1%) were determined by NMDOH reviewers to not be ICU CLABSI cases. Seven CLABSI events were identified among the NMDOH reviewers. Data submitted to NHSN revealed eight ICU CLABSI cases, five of which had not been identified for medical record review due to lack of inclusion on either the ICU or laboratory line-lists. The three remaining events in NHSN had been determined not be ICU CLABSI events by NMDOH reviewers.

After including the five additional cases from NHSN, a final total of 123 individuals underwent medical record review. Among these, there were 15 individuals for whom there were discordant CLABSI findings between data entered into NHSN and NMDOH reviewer findings. These 15 cases underwent collaborative review by two NMDOH medical epidemiologists and hospital IPs. At the conclusion of the review process, final determinations revealed that four additional ICU CLABSI events should have been entered into NHSN. These four cases were not originally entered into NHSN due to a difference in interpretation of NHSN definitions in two cases and due to hospital systems issues that resulted in facility IPs not having been alerted to the positive blood cultures in two additional cases. Events have been updated in NHSN by pertinent

facilities to reflect these additional cases. Final case determinations for all 123 individuals as compared to NHSN data resulted in a sensitivity of 66.7%, specificity of 100%, positive predictive value of 100%, and negative predictive value of 96.5% for ICU CLABSI surveillance across the six participating hospitals.

Phase 2 Methods and Findings

Retrospective medical record reviews were conducted for individuals with positive blood cultures who were being cared for in adult ICUs of 12 New Mexico hospitals during May 2011-July 2011. Hospitals were eligible for inclusion if they were submitting ICU CLABSI data to NMDOH via NHSN as of April 2011. All definitions used for determining the presence of a HAI were based on the CDC NHSN Patient Safety Component Manual Identifying HAIs. (1) Medical record reviews were conducted independently by three single reviewers using a standardized data collection instrument. The reviewers were blinded to NHSN data. In addition, medical record reviews were conducted by a group of four reviewers on a random 20% sample of all records being reviewed.

Based on initial matching of laboratory and ICU line-lists provided by participating hospitals, medical record reviews were conducted on 109 individuals. Among the 109 individual medical records reviewed, 102 (93.6%) patients were determined by NMDOH reviewers to not have had an ICU CLABSI event. Seven ICU CLABSI events were identified. Among the 21 sampled medical records reviewed during the group review, only one ICU CLABSI was identified. Among the sampled records, there was complete agreement (100%) with the group review determinations and the individual review determinations.

After individual and group review comparisons were complete, NHSN data was reviewed. Six ICU CLABSI events had been entered into NHSN by the 12 hospitals for events occurring during May 2011-July 2011. Although seven ICU CLABSI events were identified by NMDOH reviewers, none of these cases had been entered into NHSN. The six cases that had been entered into NHSN had not been identified for review by NMDOH due to lack of inclusion on the laboratory or ICU admission line-lists.

After including the six additional cases from NHSN, a final total of 115 individuals underwent medical record review. Among these, there were 13 individuals for whom there were discordant CLABSI findings between data entered into NHSN and NMDOH reviewer findings. These 13 individuals underwent collaborative medical record review by two NMDOH medical epidemiologists and hospital IPs. The six cases originally in NHSN were determined to be CLABSI events. There were three discordant potential cases that were determined not to be CLABSI events. There were four discordant potential cases that were determined to be CLABSI events that should have been entered into NHSN. These four cases were not originally entered into NHSN due to a difference in interpretation of NHSN definitions in one case and due to hospital systems issues that resulted in facility IPs not being alerted to the positive blood cultures in two cases or not completing case reviews for unclear reasons in one case. Events have been updated in NHSN by pertinent facilities to reflect these additional cases. These findings resulted in a sensitivity of 60.0%, specificity of 100.0%, positive predictive value of 100.0%, and negative predictive value of 96.3% for CLABSI surveillance across the 12 facilities.

Limitations

Limitations of this project include that a relatively short time period of evaluation (i.e., five months in Phase 1 and three months in Phase 2) was employed and, therefore, a small number of CLABSI events were identified. Also, this project was conducted voluntarily with hospitals and these facilities might not be representative of the entire state with regard to experience with CLABSI prevention, surveillance, and reporting.

Conclusions

This project validated adult ICU CLABSI data submitted to NHSN. The overall sensitivity, specificity, positive and negative predictive values for adult ICU CLABSI surveillance were similar in Phase 1 and Phase 2 despite differences in number of participating hospitals and timeframes validated. The reasons uncovered for discordant CLABSI event determinations between NMDOH reviewers and hospital IP staff were similar in both phases with hospital systems issues and differences in interpretation/application of NHSN definitions being the most common sources of discordance.

CLABSI surveillance is complex and this validation project provided an opportunity to collaboratively assess and provide education on NHSN HAI definitions, surveillance processes, and use of NHSN, while improving NHSN data accuracy. In addition, the project provided the opportunity to build and strengthen relationships between New Mexico EIP HAIC and IPs and hospital staffs. There is need for ongoing quality improvement processes and validation to ensure quality, accuracy, and reliability of surveillance efforts and NHSN data. The lessons learned from this project will be used to inform future validation and education efforts.

References

1. Horan, TC, Andrus M, Dudeck MA. CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control* 2008; 36 (5):309-32. Accessed February 2, 2012 at http://www.cdc.gov/nhsn/pdfs/pscmanual/17pscnosinfdef_current.pdf

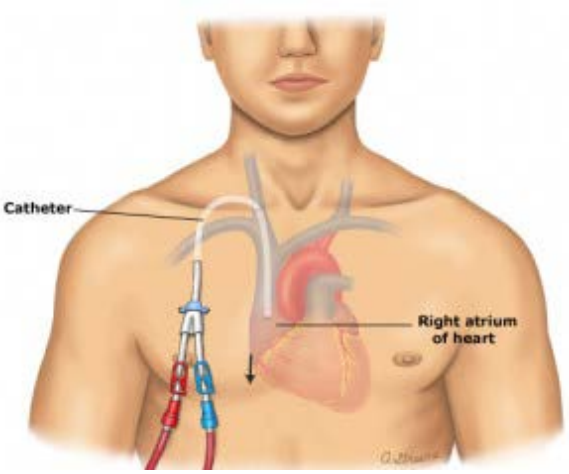
Appendix E: Central Line-associated Bloodstream Infection (CLABSI) Surveillance

Background

A CLABSI is a primary bloodstream infection in a patient who had a central line in place at the time of, or within the 48 hour period before, onset of the event.

A central line is a vascular infusion device /catheter that terminates at or close to the heart in one of the great vessels and is used for infusion (e.g., medications), withdrawal of blood, or hemodynamic monitoring. CLABSIs were selected for NM surveillance because of their significant impact on patients' health and also because hospitals can influence these outcomes. CLABSIs can cause patients to become very sick, have prolonged hospital stays, and even die. These infections can lead to high costs for patients and the healthcare system. Evidence-based best practices exist for CLABSI prevention and have shown significant impact on infections in recent years.

Diagram of central line



Acute healthcare facilities in NM that are voluntarily submitting CLABSI data do so by entering both monthly denominator data (i.e., central line days) and specific numerator data (i.e., CLABSI event data) into NHSN. For each reporting unit, facilities collect the number of patient days, the number of central line days, and the number of CLABSI events. The central line days are counted at the same time each day. Each patient with one or more central lines at the time the count is performed is considered one central line day. A CLABSI event refers to a bloodstream infection occurring in a patient with a central line in place and meeting a number of additional criteria which assess relation to other infection sources. A CLABSI event reported in NHSN meets specific surveillance definitions which are designed to be applied in a standardized fashion for all cases. At times the surveillance determination may differ from the clinical determination about the cause or type of infection being treated.

NMDOH is able to view and analyze data in NHSN only for facilities that actively confer rights to the NMDOH HAI Reporting Group, a network of facilities submitting data for public reporting and prevention purposes. Facilities voluntarily submitting data for CLABSI and for CDI have allowed NMDOH access to this information for the specific purposes of surveillance and related public reporting.

Data submitted to NHSN for CLABSI by facilities that have conferred rights to NMDOH undergo a routine monthly review by NMDOH. All CLABSI events entered into NHSN are reviewed to determine appropriate application of NHSN CLABSI surveillance definitions. Facilities are encouraged to consult with NMDOH and NHSN personnel to review suspect CLABSI cases. Data quality checks are performed against the denominator data submitted. Wide fluctuations in those data can be an indication of errors because numbers of patient days and central line days are relatively similar from month to month. Patient days and central line days are also reviewed to ensure that the number of central line days do not exceed patient days. This is part of the prospective process of data validation (ensuring that information reported is accurate and true) which has been in place during the three years of CLABSI data submission to NHSN for NM public reporting.

Technical Explanations

In the NM HAIs 2010 Report, and in the previous pilot report, CLABSI information from facilities submitting data was reported as an aggregate rate of infections per 1,000 central line days. NM HAI Advisory Committee chose to report CLABSI data as an SIR in 2011 for consistency with CLABSI reporting nationally. Healthcare facilities providing CLABSI data to CMS as part of Inpatient Quality Reporting (IQR) for hospitals participating in Inpatient Prospective Payment Systems (IPPS) incentive program have their data publicly reported through Hospital Compare in the form of an SIR for each facility.

Risk adjustment of CLABSI data is a method used by NHSN to “level the playing field” when reporting patient outcomes.[4,5] It adjusts for potential differences in patient populations and their underlying risk of infection. The way in which NHSN allows for individual hospitals to compare their data with national outcomes is by establishing definitions for specific unit types. Hospitals use these definitions to classify their units in a standardized fashion thereby allowing comparison to national patient populations with similar risk levels. For example, adult ICU data is compared to data from other adult ICUs and pediatric ward data is compared to data from other pediatric wards.

Because data from all patients for all times at a given healthcare facility cannot be obtained (i.e., a hospital’s true population data), it is conventional to use statistical procedures to estimate various measurements. Ninety-five percent confidence intervals are used to describe the variability around an estimate. The confidence intervals (CIs) that are used in this public report provide the range within which the true value will fall 95% of the time. Confidence intervals use statistics to calculate upper and lower limits for the infection rates. This range indicates that the true value lies somewhere between the upper and lower limits.

Appendix F: Facility-specific Reports

Facility-specific reports are included on the next 12 pages.

Facility	Number of Acute Care Beds*	Page
Gerald Champion Regional Medical Center	123	Page 37
Heart Hospital of New Mexico at Lovelace Medical Center	55	Page 38
Holy Cross Hospital	47	Page 39
Lovelace Medical Center	263	Page 40
Lovelace Westside Hospital	80	Page 41
Lovelace Women's Hospital	120	Page 42
Memorial Medical Center	298	Page 43
Plains Regional Medical Center	106	Page 44
Presbyterian Hospital	453	Page 45
Rehoboth McKinley Christian Health Care Services	60	Page 46
San Juan Regional Medical Center	250	Page 47
University of New Mexico Hospital	528	Page 48

* Information courtesy of New Mexico Hospital Association, "Hospitals by Bed Type, January 2012" compiled from Hospital Operator's Licenses

Gerald Champion Regional Medical Center

(Acute care hospital in Alamogordo with 123 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	1	1	1.30	0.77	0.02–4.29	No different
2011	1	0	1.04	0.00	NC–3.54	No different

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Gerald Champion Regional Medical Center

- Community collaborative: multiple healthcare agencies working to promote inter-agency communication regarding infections; community education programs are presented to agencies and providers on infection control; current focus is on multi-drug resistant organisms (MDROs) and *Clostridium difficile* infection (CDI)
- Antimicrobial stewardship: program provides pocket reference cards on recommended best-practice treatment of conditions, education on antimicrobial usage and interventions by pharmacists to improve targeted treatment
- Staff education/updates: 1) proper gloving and hand hygiene, 2) transmission routes of pathogens, 3) culture techniques and cleaning practices
- CLABSI prevention: daily review to promote central line removal, thereby reducing the opportunity for central line infections; insertion checklist and line maintenance bundle compliance are monitored and enforced, use of disinfection line caps
- CDI: implementation of an improved laboratory test; patient isolation while awaiting test results; documentation aides that guide tracking and treatment
- Catheter-associated urinary tract infections (CAUTI): current participation in a NM prevention collaborative, enhanced review of catheter necessity
- Methicillin-resistant *Staphylococcus aureus* (MRSA): admission screening to promote prompt recognition of infection to prevent transmission

Heart Hospital of New Mexico at Lovelace Medical Center

(Acute care hospital in Albuquerque with 55 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	1	1	3.51	0.29	0.01–1.59	No different
2011	1	2	3.60	0.56	0.07–2.01	No different

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Heart Hospital of New Mexico at Lovelace Medical Center

In the process of aiming for zero CLABSI, the following steps have been taken:

- Continued implementation of the central line bundle with enhancements as indicated
- Use of checklists for insertion of central lines and monitoring for objective observers for checklist completion
- Use of full barrier coverage of the patient during insertion of the line
- Improvement of central line maintenance through use of a standard dressing change kit
- Pre-printed order sets include reminder for removal of central lines as soon as possible

Additional HAI are tracked internally, including methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* infections (CDI). The critical cooperation of surgeons, surgical staff, hospitalists and nurses, as well as leadership, strengthens the initiatives.

Holy Cross Hospital

(Acute care hospital in Taos with 47 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†
2010	1	0	0.59	In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data.
2011	1	1	0.51	

CDC = Centers for Disease Control and Prevention
CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICU = intensive care unit
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

Healthcare-associated infection (HAI) prevention highlights as reported by Holy Cross Hospital

- Participation in the patient safety program, Lifewings, which uses a team approach and empowers staff to speak up and stop any potentially unsafe act
- Participation in CLABSI bundle monitoring to ensure that current standards and evidence-based practices are implemented, including central line kits and checklists
- Quarterly HAI event review by hospital staff committees for compliance with accepted standards, any deviation reported and identification of possible solutions

Lovelace Medical Center

(Acute care hospital in Albuquerque with 263 licensed beds)

ICU CLABSI SIR, 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2011	3	2	8.48	0.24	0.03–0.85	★ Better

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Lovelace Medical Center

- Central Line Bundle Checklist is utilized by observer during insertion to document adherence with evidence based best central line insertion practice recommendations
- Central Line Bundle Checklist documentation compliance rates are reviewed by Infection Control Committee
- Central Line Bundle Checklist documentation compliance rates are shared with Peripherally Inserted Central Catheter (PICC) Team Director
- Central Line Bundle Checklist documentation compliance rates are shared with the Surgical Services Medical Director

Lovelace Westside Hospital

(Acute care hospital in Albuquerque with 80 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†
2010	1	0	0.58	In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data.
2011	1	0	0.45	

CDC = Centers for Disease Control and Prevention
CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICU = intensive care unit
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Lovelace Westside Hospital

HAI prevention initiatives:

- Initiated a "Gel In – Gel Out" hand washing campaign for staff and visitor education related to infection prevention; continued with hand washing surveillance
- Initiated an "Out of the Norm – Fill out the Form" program which empowers staff to speak up and report any potential infection related incident
- Improved isolation signage to include bilingual signs and pictorial aides to improve compliance and assist visitors and staff

CLABSI prevention initiatives:

- Tracking and trending high risk peripheral intravenous line placement and infiltrates to identify increased incidents that may potentiate the need for peripherally inserted central catheter (PICC) placement
- Performing root cause analysis on all CLABSIs to identify potential cause and develop corrective action as indicated

Lovelace Women's Hospital

(Acute care hospital in Albuquerque with 120 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU and NHSN SIR (1.0)§
2010	1	1	1.10	0.91	0.02–5.09	No different
2011	1	0	0.95	In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data.		

CDC = Centers for Disease Control and Prevention
CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICU = intensive care unit
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Lovelace Women's Hospital

Specific processes in place to prevent CLABSIs include:

- Incorporation of education regarding care of peripherally inserted central catheter (PICC) lines and central venous (CV) lines in annual nursing competencies to reinforce proper care and management of lines
- Implementation of a central line bundle of evidence-based interventions for patients with central lines, which begins with a checklist for all insertions
- Audit compliance with above referenced central line bundle in real time
- Evaluation and introduction of products to decrease infections
- Increased education on management and care of central lines for both patients and staff
- Continuing to monitor CLABSI rates throughout the institution, with a goal of reducing infections to zero

Memorial Medical Center

(Acute care hospital in Las Cruces with 298 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	1	2	6.78	0.30	0.04–1.07	No different
2011	1	1	7.53	0.13	0.00–0.74	Better

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Memorial Medical Center

- Hand hygiene: automated dispensers of alcohol based hand rub throughout the facility; education and observational audits of staff's hand hygiene practices
- CLABSI: continued participation in the national Comprehensive Unit-based Safety Program and with the NM HAI program; electronically capturing central line days on a daily report with weekly validation of this data; noting steady improvement of use and documentation of the central line insertion checklists; implementation of swab caps throughout the facility to reduce contamination of intravenous access sites
- *Clostridium difficile* infections (CDI): improved testing in place and education provided to medical staff on testing parameters; CDI patient rooms cleaned with bleach daily and at discharge; patients with CDI remain in contact isolation until discharged from the facility; staff education on signs and symptoms of CDI; contact precautions implemented by nursing when a patient develops diarrhea or is admitted with diarrhea; disposable stethoscopes for isolation rooms
- Catheter-associated urinary tract infections (CAUTI): participation with NM HAI Learning and Action Network to share best practices to reduce CAUTIs; electronic capture of catheter days on a daily report, weekly data validation
- Healthcare personnel influenza vaccination recognition by The Joint Commission for 2011-2012 at the highest level of participation

Plains Regional Medical Center

(Acute care hospital in Clovis with 106 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†
2010	1	0	0.35	In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data.
2011	1	0	0.40	

CDC = Centers for Disease Control and Prevention
CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

Healthcare-associated infection (HAI) prevention highlights as reported by Plains Regional Medical Center

During 2011, PRMC participated in the New Mexico *Clostridium difficile* (*C. diff*) Prevention Project which has resulted in:

- Education and monitoring tools for housekeeping managers
- On-site *C.diff* presentation and training for medical providers
- Online *C. diff* training module for nursing
- Improved laboratory testing techniques to identify *C. diff*
- Antibiotic stewardship training to improve appropriate use of antibiotics and reduce development of resistant organisms

Plains Regional Medical Center has incorporated training and monitoring for *C. diff* prevention into the quality of care plan which also addresses prevention of other HAIs.

Presbyterian Hospital

(Acute care hospital in Albuquerque with 453 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	3	11	14.26	0.77	0.39–1.38	No different
2011	3	15	14.07	1.07	0.60–1.76	No different

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by Presbyterian Hospital

- Monitoring of the use of the CLABSI bundle that includes a compliance checklist
- Introduction of new technology implemented for line maintenance (e.g., specialized dressings and central line access port protectors)
- Implementation of a peer review process to investigate an identified CLABSI when it occurs
- Monitoring of the electronic reporting system which provides access to data available on infection control indicators
- Rounding by infection control staff to verify line necessity and compliance with evidence-based clinical checklist practices during insertion and maintenance of central venous lines and urinary catheters
- Implementation of ultrasound-guided placement of peripherally inserted central catheters (PICC), done by providers
- Hotline "event notification" (via email to infection control) to internally report events warranting follow-up

Rehoboth McKinley Christian Health Care Services

(Acute care hospital in Gallup with 60 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†
2010	1	0	0.48	In alignment with reporting standards followed by NHSN and CDC, facilities with less than one predicted infection do not have an SIR calculated due to reduced reliability of data.
2011	1	0	0.48	

CDC = Centers for Disease Control and Prevention
CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
ICU = intensive care unit
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

Healthcare-associated infection (HAI) prevention highlights as reported by Rehoboth McKinley Christian Health Care Services

CLABSI

- Continued use of best practices for central line insertion and maintenance
- Continuing education for nursing staff

Catheter-associated urinary tract infections (CAUTI)

- Daily validation by charge nurses for continued need of urinary catheters
- Continuing education for nursing and ancillary staff

Ventilator-associated pneumonia (VAP)

- Nurse competencies on care of ventilated patients including nurse protocols
- Use of oral care kits that include chlorhexidine

San Juan Regional Medical Center

(Acute care hospital in Farmington with 250 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	1	2	2.36	0.85	0.10–3.07	No different
2011	1	2	2.59	0.77	0.09–2.79	No different

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by San Juan Regional Medical Center

- Catheter-associated urinary tract infections (CAUTI): incorporated daily assessment of continued catheter use into documentation and annual staff education; focus on decreasing catheter days
- CLABSI: incorporated daily needs assessment, annual education, and revised checklist; empowered staff members to "stop the line" if proper procedures are not being followed; participation in CLABSI Collaborative; addition of protective end cap product for safer line maintenance
- Surgical site infections (SSI): implemented and re-emphasized best practices (i.e., preoperative chlorhexidine bath for all surgeries, preoperative antibiotic timing)
- Ventilator-associated pneumonia (VAP): ongoing education and prevention efforts include early weaning, sedation vacation, head of bed up, and oral care
- *Clostridium difficile* infection (CDI): focus on antibiotic stewardship, soap and water hand wash, environmental cleaning, prompt identification and isolation

University of New Mexico Hospital

(Acute care hospital in Albuquerque with 528 licensed beds)

ICU CLABSI SIR, 2010 and 2011

Calendar Year	Number of units included in SIR calculation	Observed CLABSIs	NHSN calculated number of predicted CLABSIs*	Facility ICU-only SIR†	95% confidence interval‡	Comparison between facility ICU SIR and NHSN SIR (1.0)§
2010	4	9	30.19	0.30	0.14–0.57	★ Better
2011	4	8	29.44	0.27	0.12–0.54	★ Better

CLABSI = central line-associated bloodstream infection
ICU = intensive care unit
NHSN = National Healthcare Safety Network
SIR = standardized infection ratio

*Calculated from 2006 through 2008 NHSN CLABSI data for corresponding location type and facility central line days.

†The SIR is a summary statistic used to compare the healthcare-associated infection (HAI) experience of a particular group to a reference population (i.e., NHSN data 2006 through 2008). The SIR calculation is based on dividing the total number of observed CLABSI events by a "predicted" number of events using the CLABSI rates from the reference population.

‡ The confidence interval indicates that 95% of the time, the true value of the SIR lies somewhere between the upper and lower limits of this range. When the SIR is near zero or equal to zero, the lower bound of the 95% confidence interval is not calculated, therefore shown as "NC."

§Comparison to the NHSN SIR (i.e., the national reference population) is based on a 95% confidence interval. When the confidence interval includes 1.0 it is not considered statistically significant, therefore categorized as "no different" and indicated by a green square. When the confidence interval does not include 1.0 it is considered statistically significant. When the confidence interval is less than 1.0 the categorization is "better" than the national reference population, indicated by a blue star, and when the confidence interval is greater than 1.0 the categorization is "worse," indicated by an orange circle.

Healthcare-associated infection (HAI) prevention highlights as reported by University of New Mexico Hospital

- CLABSI: CLABSI Elimination Committee review of insertion, maintenance, and care of central lines and related policies and procedures; implementation of quality audits and antiseptic line caps
- *Clostridium difficile* infection (CDI): quality monitoring of environmental cleaning; antimicrobial stewardship program to assure appropriate antimicrobial use
- Ventilator-associated infections: focused review with unit-specific interventions.
- Hand hygiene surveillance: ongoing surveillance plus on the spot and continuing education for staff and employees on the importance of hand hygiene
- NHSN HAI data submission: ongoing surveillance of ventilator-associated pneumonia (VAP), surgical site infections (SSI), CDI and CLABSI, plus all organisms isolated in defined HAIs

Appendix G: Consumer Healthcare-associated Infections Prevention Information

In addition to national and state level efforts to reduce and prevent HAIs, there are steps that everyone can take to decrease the risk of HAI. Patients and those near to them can educate themselves about HAIs and how to prevent them, including being a partner in their care by asking questions, practicing good hand hygiene and demanding it of others, using antibiotics appropriately, reviewing available data to find out what it means for their care, and becoming involved in opportunities to provide input to improve the quality of healthcare delivery.

Specific steps the public can take to prevent the possibility of getting an HAI:

1. **Educate Yourself**

   Numerous HAI resources are available to help anyone become an educated consumer of healthcare services.

   As a starting point, the CDC HAI website (http://www.cdc.gov/hai/index.html) is a resource for learning about the various types of infections and determining what can be done to remain infection free. CDC provides extensive information about the most common types of infections, pathogens associated with those infections, and resources for the prevention and elimination of HAIs.

   The NMDOH HAI website provides information about the consumer role in HAI prevention and links to resources at the Society for Healthcare Epidemiology (SHEA) and Institute for Healthcare Improvement (IHI) among others at http://nmhealth.org/HAI/public_reports.shtml.

2. **Become a Partner with your Provider**

   Know what questions to ask. The Agency for Healthcare Research and Quality (AHRQ) can help you get more involved with your healthcare provider by knowing the right questions to ask. Visit the AHRQ “Questions are the Answer” tool (http://www.ahrq.gov/questions/) to learn important questions to ask to make your healthcare experience a team effort between you and your provider.

   Be assertive about hand hygiene. Healthcare providers know about the importance of hand hygiene, but sometimes they may forget. Be a partner with your provider by asking your doctor or nurse to wash their hands or use an alcohol-based hand sanitizer. Don't be afraid to speak up. Visitors should also properly clean their hands when visiting a patient in the hospital or other healthcare facility.

   Know the signs and symptoms of infection. Depending on the type of care provided, it is important to know what signs and symptoms of infection to watch for. For example, if you are having a surgical procedure, ask your nurse or doctor how to properly care for the surgical wound. If your care calls for the use of a central line, become educated about precautions related to the central line as well as signs (e.g., redness or swelling of skin, fever) and symptoms (e.g., soreness at the central line site) of infection.

   Be smart about antimicrobials. It's important to learn about the proper uses of antimicrobials. "Antimicrobial" is a general term that refers to a group of drugs that includes antibiotics, antifungals, antiprotozoals and antivirals. Antibiotics will treat

bacterial infections, but they won't work against viral infections such as colds, influenza, many sore throats, and cough illnesses. The inappropriate use of antibiotics could be harmful to your health in certain situations and has led to the antibiotic resistance of bacteria that are sometimes called super bugs.

You can be smart about antibiotic use by talking with your healthcare provider about antibiotic resistance. If you are prescribed an antibiotic, take it exactly as your doctor or pharmacist tells you. Do not self-prescribe and don't pressure your provider to prescribe antibiotics. Learn more about antibiotic resistance and the proper use of antibiotics by visiting the CDC Get Smart: Know When Antibiotics Work homepage at http://www.cdc.gov/getsmart/index.html.

3. Practice Good Hand Hygiene

Keeping your hands clean by practicing proper hygiene is one of the most important ways to avoid getting sick and spreading germs that can make others sick. Many diseases and conditions are spread by individuals who simply don't wash their hands.

Practice hand hygiene by washing with soap and clean running water, continuously rubbing of your hands for a minimum of 20 seconds: you can time this by humming the "Happy Birthday" song twice. If your hands are not visibly soiled and soap and water are not available, use an alcohol-based hand sanitizer. CDC provides educational resources to help you learn how to wash your hands the right way and information on hand sanitizers at http://www.cdc.gov/handwashing/.

4. Review the Available Data

Numerous resources are available to find HAI data. This 2012 New Mexico Annual Report provides hospital-specific information about CLABSI. Other resources are available for finding information on publicly reported HAI data. A primary source for hospital data is Medicare Hospital Compare that can be accessed at http://www.hospitalcompare.hhs.gov.

Many states also provide state healthcare facility-specific data for various infection types. Although the format may vary, most states will offer HAI data through a state department of health website, an annual report, or a searchable database.

Interpreting the data: There are limitations to HAI data. As an example, when tracking changes in HAI rates, it is not unusual to find an increase in rates prior to improvement.[6] This increase has been attributed to improved tracking methods and application of HAI surveillance definitions which can lead to identification of previously untracked HAIs. When reviewing publicly reported HAI data, it is important to consider additional factors that might affect facility performance rates such as size, type of patients, level of care provided and other unique characteristics such as being a teaching hospital. HAI data collection methods and definitions are evolving and, as such, inconsistencies in results may be observed over time simply as a result of these changes. Data is just one of several indicators of what is happening in healthcare settings. Seeing that your providers are following prevention guidelines and discussing HAIs with them are additional steps to take.

5. Become Involved

Consider joining a patient advisory board at your local hospital or look for other opportunities to provide input on healthcare standards and access to quality care.

Infection-specific steps you can take

Central Line-associated Infections

If you or someone close to you is going to have a central line placed, ask if the healthcare facility uses a central line insertion checklist (i.e., catheter checklist to ensure adherence to infection prevention practices at the time of insertion of central venous catheters) and what other measures they have in place to prevent CLABSI. Encourage everyone visiting you to perform hand hygiene. Do not be afraid to ask physicians, nurses, or others involved in your care to wash their hands, particularly before accessing the central line. Follow healthcare provider instructions for keeping your wound clean and let your care takers know if the site becomes red or irritated or the bandages come off. Remember to ask people to wash their hands and wear gloves before accessing your line and ask visitors not to touch the line.

Clostridium difficile Infection

Preventing CDI is a group effort which involves a multidisciplinary team in the healthcare setting and you. As a patient or visitor to a hospital, you should wash your hands often and avoid bringing in extra belongings to reduce clutter. Cluttered countertops may not be cleaned as often or as thoroughly as recommended. Healthcare personnel should also be reminded to wash their hands using soap and water before caring for you or your loved one. Practice responsible antimicrobial usage, taking only antimicrobials prescribed by your doctor until you complete the treatment, and don't pressure physicians to prescribe antibiotics. If someone you know is diagnosed with CDI and you visit them in the hospital, be sure to follow any guidelines the facility recommends and wash your hands often.

Seasonal Influenza

A flu shot is the single best way to prevent seasonal influenza. Getting your vaccination annually will help protect you and your family. If you have a medical condition (e.g., asthma, diabetes, chronic obstructive pulmonary disease [COPD]) or a weakened immune system, discuss your flu shot with your provider. Good respiratory hygiene habits such as covering your coughs and sneezes, avoiding touching your mouth and eyes with your hands and frequent hand washing or use of alcohol hand gel can also minimize the transmission of respiratory viruses like influenza. If you feel ill, it is recommended that you stay home and reduce your contact with others. You can also ask your healthcare provider if they have gotten their flu shot.

General resources on HAI

Consumer information about HAIs, including those not addressed in this report, can be found through various online resources:

- New Mexico Department of Health, Healthcare-associated Infection (HAI) Definitions and Links at http://nmhealth.org/HAI/ResourcesLinks.shtml
- Centers for Disease Control and Prevention (CDC), Healthcare-associated Infections (HAIs) at http://www.cdc.gov/hai/
- US Department of Health and Human Services, Partnership for Patients at http://www.healthcare.gov/compare/partnership-for-patients/index.html
- Association for Professionals in Infection Control and Epidemiology, Educational Brochures at http://www.apic.org/For-Consumers/EducationalBrochures
- The Joint Commission, Speak Up: Five Things You Can Do to Prevent Infection at http://www.jointcommission.org/Speak_Up__Five_Things_You_Can_Do_To_Prevent_Infection/
- The Society for Healthcare Epidemiology of America, Patient Resources at http://www.shea-online.org/ForPatients.aspx

The CDC has additional resources for consumers about CLABSI and CDI:

- Central Line-associated Bloodstream Infections: Resources for Patients and Healthcare Providers at http://www.cdc.gov/HAI/bsi/CLABSI-resources.html
- Patients with Central Lines -- What You Need to Know to Avoid a Bloodstream Infection at http://www2c.cdc.gov/podcasts/player.asp?f=5692974
- FAQs about Catheter-associated Bloodstream Infections at http://www.cdc.gov/HAI/bsi/bsi.html
- Clostridium *difficile* Infection at http://www.cdc.gov/HAI/organisms/cdiff/Cdiff_infect.html
- Frequently Asked Questions about Clostridium *difficile* at http://www.cdc.gov/hai/organisms/cdiff/Cdiff-patient.html

The following two pages contain information for consumers on CLABSI and CDI.

FAQs
(frequently asked questions)

SHEA
The Society for Healthcare Epidemiology of America

"Catheter-Associated Bloodstream Infections"
(also known as "Central Line-Associated Bloodstream Infections")

What is a catheter-associated bloodstream infection?

A "central line" or "central catheter" is a tube that is placed into a patient's large vein, usually in the neck, chest, arm, or groin. The catheter is often used to draw blood, or give fluids or medications. It may be left in place for several weeks. A bloodstream infection can occur when bacteria or other germs travel down a "central line" and enter the blood. If you develop a catheter-associated blood-stream infection you may become ill with fevers and chills or the skin around the catheter may become sore and red.

Can a catheter-related bloodstream infection be treated?

A catheter-associated bloodstream infection is serious, but often can be successfully treated with antibiotics. The catheter might need to be removed if you develop an infection.

What are some of the things that hospitals are doing to prevent catheter-associated bloodstream infections?

To prevent catheter-associated bloodstream infections doctors and nurses will:

- Choose a vein where the catheter can be safely inserted and where the risk for infection is small.
- Clean their hands with soap and water or an alcohol-based hand rub before putting in the catheter.
- Wear a mask, cap, sterile gown, and sterile gloves when putting in the catheter to keep it sterile. The patient will be covered with a sterile sheet.
- Clean the patient's skin with an antiseptic cleanser before putting in the catheter.
- Clean their hands, wear gloves, and clean the catheter opening with an antiseptic solution before using the catheter to draw blood or give medications. Healthcare providers also clean their hands and wear gloves when changing the bandage that covers the area where the catheter enters the skin.
- Decide every day if the patient still needs to have the catheter. The catheter will be removed as soon as it is no longer needed.
- Carefully handle medications and fluids that are given through the catheter.

What can I do to help prevent a catheter-associated bloodstream infection?

- Ask your doctors and nurses to explain why you need the cath-eter and how long you will have it.
- Ask your doctors and nurses if they will be using all of the prevention methods discussed above.
- Make sure that all doctors and nurses caring for you clean their hands with soap and water or an alcohol-based hand rub before and after caring for you.

If you do not see your providers clean their hands, please ask them to do so.

- If the bandage comes off or becomes wet or dirty, tell your nurse or doctor immediately.
- Inform your nurse or doctor if the area around your catheter is sore or red.
- Do not let family and friends who visit touch the catheter or the tubing.
- Make sure family and friends clean their hands with soap and water or an alcohol-based hand rub before and after visiting you.

What do I need to do when I go home from the hospital?

Some patients are sent home from the hospital with a catheter in order to continue their treatment. If you go home with a catheter, your doctors and nurses will explain everything you need to know about taking care of your catheter.

- Make sure you understand how to care for the catheter before leaving the hospital. For example, ask for instructions on shower-ing or bathing with the catheter and how to change the catheter dressing.
- Make sure you know who to contact if you have questions or problems after you get home.
- Make sure you wash your hands with soap and water or an alcohol-based hand rub before handling your catheter.
- Watch for the signs and symptoms of catheter-associated blood-stream infection, such as soreness or redness at the catheter site or fever, and call your healthcare provider immediately if any occur.

If you have additional questions, please ask your doctor or nurse.

American Hospital Association
APIC Spreading knowledge. Preventing infection.
CDC Centers for Disease Control and Prevention
The Joint Commission

FAQs
(frequently asked questions)

SHEA
The Society for Healthcare Epidemiology of America

about

"Clostridium Difficile"

What is Clostridium difficile infection?

Clostridium difficile [pronounced Klo-STRID-ee-um dif-uh-SEEL], also known as "*C. diff*" [See-dif], is a germ that can cause diarrhea. Most cases of *C. diff* infection occur in patients taking antibiotics. The most common symptoms of a *C. diff* infection include:

Watery diarrhea
Fever
Loss of appetite
Nausea
Belly pain and tenderness

Who is most likely to get C. diff infection?

The elderly and people with certain medical problems have the greatest chance of getting *C. diff. C. diff* spores can live outside the human body for a very long time and may be found on things in the environment such as bed linens, bed rails, bathroom fixtures, and medical equipment. *C. diff* infection can spread from person-to-person on contaminated equipment and on the hands of doctors, nurses, other healthcare providers and visitors.

Can C. diff infection be treated?

Yes, there are antibiotics that can be used to treat *C. diff.* In some severe cases, a person might have to have surgery to remove the infected part of the intestines. This surgery is needed in only 1 or 2 out of every 100 persons with *C. diff.*

What are some of the things that hospitals are doing to prevent C. diff infections?

To prevent *C. diff.* infections, doctors, nurses, and other healthcare providers:

- Clean their hands before and after caring for every patient. This can prevent *C. diff* and other germs from being passed from one patient to another on their hands.
- Carefully clean hospital rooms and medical equipment that have been used for patients with *C. diff*.
- Use Contact Precautions to prevent *C. diff* from spreading to other patients. Contact Precautions mean:
  - Whenever possible, patients with *C. diff* will have a single room or share a room only with someone else who also has *C. diff*.
  - Healthcare providers will put on gloves and wear a gown over their clothing while taking care of patients with *C. diff*.
  - Visitors may also be asked to wear a gown and gloves.
  - When leaving the room, hospital providers and visitors remove their gown and gloves and clean their hands.
  - Patients on Contact Precautions are asked to stay in their hospital rooms as much as possible. They should not go to common areas, such as the gift shop or cafeteria. They can go to other areas of the hospital for treatments and tests.
- Only give patients antibiotics when it is necessary.

What can I do to help prevent C. diff infections?

- Make sure that all doctors, nurses, and other healthcare providers clean their hands before and after caring for you.

  If you do not see your providers clean their hands, please ask them to do so.

- Only take antibiotics as prescribed by your doctor.
- Be sure to clean your own hands often, especially after using the bathroom and before eating.

Can my friends and family get C. diff when they visit me?

C. diff infection usually does not occur in persons who are not taking antibiotics. Visitors are not likely to get *C. diff.* Still, to make it safer for visitors, they should:

- Clean their hands before they enter your room and as they leave your room
- Ask the nurse if they need to wear protective gowns and gloves when they visit you.

What do I need to do when I go home from the hospital?

Once you are back at home, you can return to your normal routine. Often, the diarrhea will be better or completely gone before you go home. This makes giving *C. diff* to other people much less likely. There are a few things you should do, however, to lower the chances of developing *C. diff* infection again or of spreading it to others.

- If you are given a prescription to treat *C. diff,* take the medicine exactly as prescribed by your doctor and pharmacist. Do not take half-doses or stop before you run out.
- Wash your hands often, especially after going to the bathroom and before preparing food.
- People who live with you should wash their hands often as well.
- If you develop more diarrhea after you get home, tell your doctor immediately.
- Your doctor may give you additional instructions.

If you have questions, please ask your doctor or nurse.

Co-sponsored by: IDSA

Appendix H: Healthcare Personnel (HCP) Influenza Vaccination Surveillance

Background

Influenza vaccination of HCP was selected as a NM HAI indicator because it is a critical patient safety measure endorsed by CDC, The Joint Commission (TJC) and many professional organizations.[7] People infected with influenza can pass it to others even before they start to become ill. Therefore, asymptomatic HCP can transmit influenza to their patients. Healthcare facility-associated influenza outbreaks have been described in studies.[8] In past years, healthcare-associated influenza infections have been documented in healthcare settings and HCP have been implicated as the potential source of these infections.[9] Increased influenza vaccination rates are associated with decreased mortality in elderly patients (e.g., patients in long-term care settings) [10,11] and decreased HCP lost work time.[12,13]

HCP are aware that they should be vaccinated against influenza: in a survey of HCP conducted by CDC in March 2011, over 90% identified HCP as a group for whom influenza vaccine is recommended. Over half of respondents indicated that the chance of getting influenza if unvaccinated was very high or somewhat high.[14]

Methods to improve HCP influenza vaccination rates include education about vaccine safety and the ability of influenza vaccination to prevent influenza as well as other evidence-based approaches such as offering free or reduced-price vaccine to HCP at their workplace.[15]

Data Submission Process

Consistent with the 2010 – 2011 influenza season, NMDOH used the CDC-piloted data form that tracked HCP influenza vaccination in a variety of healthcare settings in four states. The influenza season is generally considered to span the fall of one year to the spring of the next (e.g., 2011 – 2012). CDC invited NM to extend the preparatory work with hospitals to be ready for CMS reporting in January 2013.

NM healthcare facilities submitting HCP influenza vaccination data for the 2011 – 2012 influenza season included acute care hospitals and NM state long-term care and rehabilitation facilities. The 24 facilities which had previously participated in public reporting of HCP influenza vaccination rates are included in the facility-specific data. To maintain continuity of previous data and acknowledge the barriers facilities have encountered while collecting HCP vaccination data in the new categories, the decision was made to publicly report facility-specific data only for the category most similar to the historically collected categories during the 2009 – 2010 and 2010 – 2011 influenza vaccination seasons.

Appendix I: *Clostridium difficile* Infection (CDI) Surveillance

Background

Clostridium difficile (*C. difficile*) is an anaerobic spore-forming bacillus which can cause a range of disease from asymptomatic carriage (i.e., when an individual carries a pathogen without symptoms) to mild diarrheal illness to colitis (i.e., inflammation of the colon), and even death. Illness from *C. difficile* most commonly affects older adults in hospitals or in long-term care facilities and typically occurs after use of antibiotic medications. In recent years, these infections have become more frequent, more severe and more difficult to treat.

C. difficile is spread via the fecal-oral route (i.e., when pathogens transmitted in fecal particles from one host are introduced into the oral cavity of another host) with spores surviving in the environment for many months. The spores are highly resistant to routine cleaning and disinfection. In healthcare settings two main sources of spores exist: infected or colonized (i.e., when microorganisms become established on a person) patients and contaminated inanimate objects. The incubation period (i.e., the time from exposure to an infectious agent until signs and symptoms of the disease appear) is unknown and patients who are colonized can be asymptomatic for weeks to months but may develop symptoms once exposed to antibiotics which kill off normal gastrointestinal flora (i.e., bacteria normally residing within the body) allowing the *C. difficile* to grow and cause disease.

CDI has been increasing in incidence (i.e., the number of newly diagnosed cases during a specific time period) and virulence (i.e., a measure of the severity of the disease a microorganism is capable of causing) over the last one to two decades, with an increase in mortality from 5.7 per million population in 1999 to 23.7 per million in 2004.[16] One source estimated the attributable cost of CDI to be $2,454-$5,042 per case.[17] Patients with *C. difficile* in one study experienced higher rates of readmission to the hospital within six months (52% versus 23% among patients without CDI) and longer hospital stays (2.8 days attributable to CDI). These patients were also more likely to be discharged to a long-term-care facility versus home or a non-healthcare setting when compared with non-*C. difficile* patients.

Due to the increasing burden of disease and in anticipation of new federal reporting requirements, the NM HAI Advisory Committee voted to include CDI reporting via NHSN and create a prevention collaborative to address the multi-factorial issues associated with CDI. CDI laboratory-identified (LabID) events were reported by 22 units in 15 hospitals for at least four months from November 2010 through December 2011.

Data Submission

A CDI LabID event is a proxy measure of multi drug-resistant organism (MDRO) infection, exposure, and healthcare acquisition. This relies exclusively on clinical microbiology data to identify events and patient admission/transfer information within the facility to categorize the laboratory result. The only labs included in LabID events are clinical specimens taken for treatment or diagnostic purposes, in contrast to active surveillance testing which screens all patients for a pathogen.

Appendix J: Acronyms

AHRQ	Agency for Healthcare Research and Quality
AMA	American Medical Association
APIC	Association for Professionals in Infection Control and Epidemiology
ARRA	American Recovery and Reinvestment Act
ASTHO	Association of State and Territorial Health Officials
CAUTI	Catheter-associated urinary tract infection
CI	Confidence interval
CDI	*Clostridium difficile* infection
CDC	Centers for Disease Control and Prevention
CLABSI	Central line-associated bloodstream infection
CMS	Centers for Medicare and Medicaid Services
CSTE	Council of State and Territorial Epidemiologists
CUSP	Comprehensive Unit-based Safety Program
DHQP	Division of Healthcare Quality Promotion
EIP	Emerging Infections Program
HAI	Healthcare-associated infection
HAIC	Healthcare-associated Infections Community Interface
HCP	Healthcare personnel
HHS	Department of Health and Human Services
IP	Infection Preventionist
ICU	Intensive care unit
MRSA	Methicillin-resistant *Staphylococcus aureus*
NHSN	National Healthcare Safety Network
NM	New Mexico
NMDOH	New Mexico Department of Health
NMHA	New Mexico Hospital Association
NMMRA	New Mexico Medical Review Association
NQF	National Quality Forum
SCIP	Surgical Care Improvement Project
SHEA	Society for Hospital Epidemiology of America
SIR	Standardized infection ratio
SSI	Surgical site infection
TJC	The Joint Commission
US	United States
UTI	Urinary tract infection
WHO	World Health Organization

Appendix K: Glossary

Antimicrobial stewardship: A program which seeks to optimize antimicrobial (e.g., antibiotic, antiviral) prescribing through selecting an appropriate drug and optimizing its dose and duration in order to cure an infection and improve individual patient care as well as reduce healthcare facility costs and slow the spread of antimicrobial resistance.

Bundle: A group of procedures related to insertion of a central line that include hand washing, insertion site sterilization, full body drape, use of hat, mask and sterile gown by HCP, and selection of optimal insertion site; also used in referring to other groups of processes that are most effective when "bundled" together in a particular order.

Asymptomatic carriage: The condition or state of carrying a pathogen (e.g., bacteria) within the body without causing an infection with symptoms.

Central line-associated bloodstream infection (CLABSI): A primary bloodstream infection (BSI) in a patient that had a central line or umbilical catheter in place at the time of, or within the 48-hour period before onset of the event (i.e., symptoms or positive blood culture).[18]

***Clostridium difficile* (also commonly called '*C. diff*' or *C. difficile*):** A bacterium that results in a gastrointestinal illness. Symptoms can range from diarrhea to life-threatening inflammation of the colon. *Clostridium difficile* infection (CDI) most commonly affects older adults in hospitals or long-term care facilities. Patients taking antibiotics are at risk of becoming infected with *C. difficile*. *C. difficile* is recognized as one of the most common causes of healthcare-associated diarrhea.

Colitis: An inflammatory condition of the colon (large intestine).

Colonize: When microorganisms become established on a host (e.g., person); these bacteria can then be spread to other parts of the body or to others.

Confidence interval (CI): A CI describes the range of values consistent with the actual data. CIs provide a measure of the level of precision (a wide CI reflects a large amount of variability or imprecision and a narrow CI reflects little variability and high precision) and significance of a result by providing lower (minimum) and upper (maximum) limits for the calculated result. The null hypothesis is a statistical hypothesis that states that there are no differences between observed and expected data: a CI that includes 1.0 is consistent with the null hypothesis. Conversely, a CI that does not include 1.0 indicates that the result is significant. For example, a CLABSI rate of 1.5 with a 95% CI of 0.8 – 2.0 indicates that 95% of the time the minimum CLABSI rate is 0.8 and the maximum CLABSI rate is 2.0; this result is not significant because the CI includes 1.0. On the other hand, a CLABSI rate of 1.5 with a 95% CI of 1.2 – 3.0 indicates that 95% of the time the minimum CLABSI rate is 1.2 and the maximum CLABSI rate is 3.0; this result is significant because the CI does not include 1.0.

Denominator: The lower portion of a fraction used to calculate a rate or ratio (e.g., for the fraction ¾, the denominator is 4). In a rate, the denominator can be the population at risk. When calculating CLABSI rates, the denominator is the total central line days for the hospital unit.

Fecal oral route: A route of disease transmission when pathogens in fecal particles from one host are introduced into the oral cavity of another potential host. The fecal particles are generally not visible. Transmission can occur by eating food that was contaminated by an infected person who did not wash their hands well after using the

bathroom, or by having contact with contaminated persons or objects and not washing your hands before touching your mouth or eyes.

Flora: The bacteria normally residing within the body (e.g., intestine).

Healthcare-associated infection (HAI): A localized or systemic condition that: a) results from an adverse reaction to the presence of an infectious agent or its toxin; and b) was not present or incubating at the time of admission to the healthcare facility.

Healthcare personnel: The entire population of healthcare workers working in healthcare settings regardless of clinical responsibility or patient contact.

Incidence: The number of newly diagnosed cases during a specific time period.

Incubation period: The time from exposure to an infectious agent until signs and symptoms of the disease appear.

Intensive care unit (ICU): A care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill. Care areas that provide step-down, intermediate care, specialty care or telemetry only are not ICUs. The type of ICU in NHSN is determined by the kind of patients cared for in that unit. That is, if 80% of patients are of a certain type (e.g., patients with trauma), then that ICU is designated as that type of unit (in this case, trauma ICU). When a unit houses roughly equal populations of medical and surgical patients, it is called a medical/surgical unit. [19]

Learning collaborative: A learning collaborative is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and engage in a common task where each individual depends on and is accountable to each other.

National Quality Forum (NQF): A nonprofit organization based in Washington, D.C. dedicated to improving the quality of health care in the United States. To that end, the NQF embodies a three-part mission -- to set goals for performance improvement, to endorse standards for measuring and reporting on performance, and to promote educational and outreach programs.

NMDOH HAI Reporting Group: New Mexico healthcare facilities voluntarily sharing HAI surveillance data with NMDOH.

Numerator: The upper part of a fraction used to calculate a rate or ratio (e.g., for the fraction ¾, the numerator is 3). In a rate, the numerator can be the number of people who have experienced an event while the denominator can be the total population at risk for the event. When calculating CLABSI rates, the numerator is the number of CLABSI events for the hospital unit.

Pathogen: Any agent or microorganism that causes disease.

Risk adjusted: A standardized method used to ensure that intrinsic and extrinsic risk factors for a healthcare-associated infection are considered in the calculation of healthcare-associated infection rates.

Surveillance: Ongoing, systematic collection, analysis, and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice.

Virulence: Severity of the disease that a microorganism is capable of causing.

References

[1] HHS Action Plan to Prevent Healthcare-Associated Infections. Tier 1 Action Plan (revised). Accessed on June 20, 2012 at http://www.hhs.gov/ash/initiatives/hai/actionplan/hhs_hai_action_plan_final_06222009.pdf

[2] The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention, R. Douglas Scott II, CDC, March 2009. Accessed on June 20, 2012 at http://www.cdc.gov/hai/pdfs/hai/Scott_CostPaper.pdf

[3] CDC. National Healthcare-associated Infections Standardized Infection Ratio Report, Using Data Reported to the National Healthcare Safety Network, July 2009 through December 2009. Accessed on June 20, 2012 at http://www.cdc.gov/HAI/pdfs/stateplans/SIR-2010_JunDec2009.pdf

[4] Jarvis WR, Edwards JR, Culver DH, Hughes JM, Horan T, Emori TG, Banerjee S, Tolson J, Henderson T, Gaynes RP, Martone WJ, National Nosocomial Infections Surveillance System. Nosocomial infection rates in adult and pediatric intensive care units in the United States. *Am J Med.* 1991 Sept; 91(3):S185-S191

[5] Tokars JI, Klevens M, Edwards JR, Horan T. Measurement of the Impact of Risk Adjustment for Central Line-Days on Interpretation of Central Line-Associated Bloodstream Infection Rates. *Infect Control Hosp Epidemiol.* 2007 Sept; 28(9):1025-1029

[6] Niedner MF, 2008 National Association of Children's Hospitals and Related Institutions Pediatric Intensive Care Unit Patient Care FOCUS Group. "The harder you look, the more you find: Catherer-associated bloodstream infection surveillance variability." Am J Infect Control 2010;38:585-95

[7] CDC. Prevention and control of influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2010. MMWR Recomm Rep 2010; 59(RR-8):1-62

[8] Stott DJ, Kerr G, Carman WF. Nosocomial transmission of influenza. *Occup Med* (Lond) 2002; 52:249–253

[9] Salgado CD, Giannetta ET, Hayden FG, et al. Preventing nosocomial influenza by improving the vaccine acceptance rate of clinicians. *Infect Control Hosp Epidemiol* 2004; 25:923-928

[10] Carman WF, Elder AG, Wallace LA, et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomized controlled trial. Lancet 2000; 355:93–97

[11] Potter J, Stott DJ, Roberts MA, et al. Influenza vaccination of healthcare workers in long-term-care hospitals reduces the mortality of elderly patients. J Infect Dis 1997; 175:1-6

[12] Saxen H, Virtanen M. Randomized, placebo-controlled double blind study on the efficacy of influenza immunization on absenteeism of health care workers. Pediatr Infect Dis J 1999; 18:779-783

[13] Wilde JA, McMillan JA, Serwint J, et al. Effectiveness of influenza vaccine in health care professionals. JAMA 1999; 281:908-913

[14] CDC. "Influenza vaccination coverage estimates from the March 2011 National Flu survey-United States, 2010-11 influenza season" accessed 25 May 2012 at http://www.cdc.gov/flu/pdf/professionals/vaccination/fluvacsurvey.pdf

[15] Talbot TR, Dellit TH, Hebden J, Sama D, Cuny J. Factors associated with increased healthcare worker influenza vaccination rates: Results from a national survey of university hospitals and medical centers. Infect Control Hosp Epidemiol 2010 May; 31(5):456-62

[16] Redelings MD, Sorvillo F, Mascola L. Increase in Clostridium difficile–related mortality rates, United States, 1999–2004. Emerg Infect Dis. 2007 13 (9):1417-9

[17] Dubberke ER, Reske KA, Olsen MA, McDonald LC, Fraser VJ. Short-and long-term attributable costs of Clostridium *difficile*-associated disease in nonsurgical patients. Clin Infect Dis. 2008; 46:497-504

[18] Accessed June 20, 2012 at http://www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf

[19] CDC, The National Healthcare Safety Network Manual: Patient Safety Component Protocol, January, 2008 accessed June 20, 2012 at http://www.cdc.gov/nhsn