New Mexico Healthcare-associated Infections Annual Report

Prepared by:

New Mexico Healthcare-associated Infections Advisory Committee

August 2013

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

Healthcare-associated Infections Program
Infectious Disease Epidemiology Bureau
Epidemiology and Response Division
New Mexico Department of Health

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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. New Mexico (NM) continues its initiative to monitor and prevent healthcare-associated infections and to make findings known to the public. This is the fifth NM public report and the third that includes facility-specific data.

The NM Healthcare-associated Infections Advisory Committee (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 oversees the NM Healthcare-associated Infections Prevention Plan and 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 Program 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. New Mexico 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 in NM began in late 2010. *Clostridium difficile* infection causes diarrheal illness that can be healthcare-associated and very serious: it is linked to approximately 14,000 American deaths each year. Those most at risk are older adults who take antibiotics and receive medical care.

In 2012, 43 healthcare facilities in NM participated in healthcare-associated infections monitoring, prevention activities, and/or special research projects described in this report.

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 continued to improve in NM. The NM 2012 state aggregate standardized infection ratio of 0.54 is close to the 2014-15 national target ratio of 0.50 and 46% less than predicted, based on the case-mix of patients and type of hospital units that were monitored nationally. New Mexico hospital-specific data are included in this report.
- The NM aggregate healthcare personnel influenza vaccination rate for the 2012-2013 flu season was 77.4% which exceeded the national Healthy People 2014-2015 interim goal of 70%. Facility-specific rates are included in this report.

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 collaborate to share best practices for surveillance and prevention of healthcare-associated infections for the entire state. This report includes both NM mandated and voluntarily submitted findings from calendar year 2012.

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 a continually expanding number of healthcare facilities and personnel to identify and prevent HAIs.

The NMDOH HAI Advisory Committee is publicly reporting both NM aggregate and facility-specific HAI data in a manner intended to be understandable and useful for the public. The goal of this report is to bring residents of NM up to date on the work being done in the state to conduct surveillance for and eliminate preventable HAIs and to reduce patient harm. This report provides an overview of HAIs in general, what the healthcare system is doing to prevent HAIs, and how the public can participate in their own care to minimize risks to their health. This report also provides information about current NM HAI surveillance data. 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] A 2009 report estimated that the direct hospital costs for HAIs are between $35.7 billion and $45 billion annually 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 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.

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.

In 2010, the US Department of Health and Human Services (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. 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 (ICU) beginning January 1, 2011. In addition, data submission by acute care hospitals 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 is releasing this information, and subsequent HAI information, to consumers on the Hospital Compare website (http://hospitalcompare.hhs.gov/) and will use these data to calculate hospitals' reimbursement beginning fiscal year 2013. *Clostridium difficile* infection (CDI), methicillin-resistant *Staphylococcus aureus* (MRSA), and healthcare personnel (HCP) influenza vaccination data submission are reportable to CMS as of January 1, 2013. CMS plans to add HAI indicators to this system annually.

In addition to new indicators, new types of facilities are being added to CMS HAI reporting requirements. In 2012, outpatient dialysis facilities, long term care hospitals, and inpatient rehabilitation facilities also came under CMS requirements for reporting particular HAIs.

The mechanism supported by the 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 December 1, 2012, CDC had enrolled 11,319 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 for healthcare facilities to submit HAI data to CMS. Availability of this electronic system eliminates the need for individual states to design and support their own systems.

In June of 2012, the Council of State and Territorial Epidemiologists (CSTE) passed a position statement recommending that CLABSI be reported to public health agencies nationwide using NHSN. Nationwide standardized surveillance for CLABSI would enhance facility-specific quality improvement initiatives, while providing valuable information for public health planning and prevention activities.

In February of 2013, the CDC Division of Healthcare Quality Promotion (DHQP) published the national "2011 National and State Healthcare-Associated Infection Standardized Infection Ratio Report."[3] This report included data submitted to NHSN by facilities in states with mandatory CLABSI, CAUTI, and/ or SSI data submission requirements. The 2013 CDC DHQP report presented state-specific data from all 50 states, Washington, D.C., and Puerto Rico, and compared them to overall national data. The standardized infection ratio (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 is based on NHSN CLABSI data reported during 2006-2008 from all participating US hospitals (national reference population). This report also provided information on aggregate CAUTI data from the same areas and aggregate SSI data from 48 states and the District of Columbia. The data indicated that nationally there were 41% fewer CLABSI, 7% fewer CAUTI, and 17% fewer SSI 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 infection prevention best 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, have created structures for implementing both broad-based and infection-specific HAI prevention initiatives. Best practice measure implementation has been shown to reduce, and even eliminate, some preventable HAIs. For example, the Pittsburgh Regional Health Initiative was able to show a 68% decrease in CLABSIs across 66 ICUs through promotion of best practices related to barrier precautions during central line insertion, skin cleansing, central line insertion sites, insertion-site dressing practices, and appropriate timing of central line removal.[4] In addition, the Michigan Keystone Project implemented an evidence-based intervention in ICUs in Michigan which resulted in a 66% reduction in CLABSIs that was sustained throughout an 18-month study period.[5]

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.

US HHS continues to build upon strategies for HAI prevention. Phase 2 and Phase 3 of the Action Plan address the outpatient environment (i.e., ambulatory surgery centers and end-stage renal disease facilities), influenza vaccination of healthcare personnel, and long-term care facilities. The chapters addressing Phase 2 and Phase 3 have been released and can be found at http://www.hhs.gov/ash/initiatives/hai/actionplan/.

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). Healthy People 2020 also has set a healthcare personnel influenza vaccination rate goal of 90%.

Partnership for Patients

In March 2011, the US HHS released the National Strategy for Quality Improvement in Health Care (the National Quality Strategy) which serves as a framework to improve the delivery of healthcare services and advance patient health in the US population.

One of the first major initiatives launched by HHS as part of the National Quality Strategy was the Partnership for Patients (PfP), a nationwide public-private partnership established to provide support to clinicians, hospitals, and communities to reduce readmissions by

improving quality of care in the hospital and during patient transitions from the hospital to other settings.

The two goals of the PfP are to:

- Keep hospitalized patients from becoming injured or more seriously ill. Reduce preventable hospital acquired conditions by 40 percent by the end of 2013.
- Help patients heal without complications. By the end of 2013, reduce hospital readmissions by 20 percent within 30 days of discharge.

The CMS Innovation Center designated $500 million for the PfP Initiative. In December 2011, CMS awarded $218 million, via two-year contracts extendable by one year at CMS' discretion, to 26 state, regional, and national hospital system organizations to serve as Hospital Engagement Networks (HENs). The HEN organizations were chosen based on a selective competitive acquisition process, and are believed to be those best suited to help the PfP achieve its goals.

The work being done as part of this project is about accelerating healthcare improvement nationally and must be driven by leadership. Patients are benefiting from the spread and implementation of best practices learned by members of this initiative. Similarly, the dramatic reduction of harm and readmissions will impact the citizens of the US for years to come and set a course for ongoing infrastructure and culture for continuous improvement.

Achieving the Partnership for Patients' objectives would mean approximately 1.8 million fewer injuries to patients in the hospital, saving over 60,000 lives over three years, and more than an additional 1.6 million patients recovering from illness without suffering a preventable complication requiring re-hospitalization.

New Mexico Healthcare-associated Infections Initiative

Structure

The NM HAI Advisory Committee guides the monitoring and implementation of 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 Committee, which has been meeting regularly since February 2008, 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 (IPs) and physicians with infection control expertise from large urban and smaller rural settings)
- *HealthInsight* New Mexico
- Local representative of Society for Healthcare Epidemiology of America (SHEA)
- New Mexico Department of Health (NMDOH)

The NM HAI Prevention Plan (Plan) reflects national recommendations, including the HHS Action Plan to Prevent Healthcare-associated Infections, which are adapted to the needs and capacity of the NM healthcare system. Experience from other states, scientific literature, and discussions with experts informed the original Plan and the periodic review and updates.

The NM HAI Advisory Committee uses NHSN as a mechanism to collect HAI surveillance data. A feature in NHSN, known as conferring rights, permits facilities to share data with NMDOH which allows for public reporting without duplication of work for healthcare facilities.

Infection preventionists 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

In 2012, 31 states and the District of Columbia, including NM, had laws or regulations requiring healthcare facilities to report HAI data to NHSN. Amendments in 2012 to the Notifiable Diseases or Conditions in New Mexico Administrative Code included the addition of reporting of two healthcare associated infections (CLABSI and CDI) by acute care hospitals. CLABSI reporting was effective immediately and CDI reporting began in alignment with the CMS reporting requirement of January 2013. Prior to this, all HAI reporting in NM was voluntary. Facilities are being encouraged to continue voluntary HCP influenza vaccination reporting and to begin voluntary MRSA reporting. This data can be submitted to NMDOH through NHSN without duplicative reporting processes at the facility.

Healthcare safety indicators, including HAI, are being tracked through a number of additional efforts in NM, including through work by individual facilities. Many facilities have formal in-house quality improvement processes in place which are driven by findings from their surveillance data. Additionally, facilities may participate in focused and/or broad prevention programs similar to the collaboratives conducted in previous years under the NM HAI Program. Key to these facility-specific and more broad-based prevention programs

is the collection of data which can show both the potential for risk and the presence of HAIs. Projects in place in NM during 2012 are further discussed in the Prevention section below.

NM facilities are participants in a number of programs that publicly report on HAI data, beyond what is included in this report, as well as on other quality measures. Examples of these programs and the websites where data is presented include Hospital Compare (http://www.medicare.gov/hospitalcompare/), VA Hospital Compare (http://www.hospitalcompare.va.gov/), and Dialysis Facility Compare (http://www.medicare.gov/Dialysisfacilitycompare/). Additional information may also be available through a request directly to a facility's quality department.

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 often coordinates the activity of HAI learning collaboratives and prevention initiatives related to the indicators selected by the NM HAI Advisory Committee. The type and number of projects in any particular year is influenced by available resources. In the last two years, federal funding for HAI prevention efforts has been distributed among a broader group of recipients. In NM, those recipients are represented on the HAI Advisory Committee which has allowed for continued coordination of surveillance, training and prevention efforts to maximize the ability of facilities to take advantage of these opportunities, thereby increasing the potential for positive impact on health outcomes in NM.

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 B.

New Mexico Aggregate CLABSI Data

A total of 66 ICU and non-ICU units at 33 facilities submitted CLABSI data for at least four months from January 1 through December 31, 2012 (Table 1). These 66 units reported 68 CLABSI events and a total of 69,442 central line days (total number of days a central line is in place for patients in a specified hospital unit). The SIR calculated for the 66 units was 0.54 (95% confidence interval [CI] 0.42–0.68) which is not statistically significantly different from the 2011 NM aggregate of 0.47. Statistical significance throughout this report is determined by a p-value less than or equal to 0.05: a p-value represents the probability that an observed difference between groups did not occur by chance alone. Overall, 46% fewer CLABSI events were observed during the reporting period as compared to CLABSI events predicted based on national reference data.

During calendar year 2012, 33 ICUs from 28 facilities reported at least four months of data. These units reported 40 CLABSI events and a combined total of 42,154 central line days. These data were used to calculate an ICU SIR of 0.51 (95% CI 0.36–0.69*)* which is statistically significantly better than the national reference data, but is not statistically significantly different from the previous two years in NM (Table 2 and Figure 1). The

calculated SIR of 0.51 for 2012 indicates that the 33 ICUs together observed 49% fewer CLABSI than predicted based on national reference data.

During calendar year 2012, 33 non-ICU units from 16 facilities reported at least four months of data. These units reported 28 CLABSI events and a combined total of 27,288 central line days. The non-ICU SIR was 0.58 (95% CI 0.33–0.71) which was better than the national reference data and was not statistically significantly different from the previous year in New Mexico (Table 3 and Figure 2). The calculated SIR of 0.58 indicates that the 33 non-ICU units together observed 42% fewer CLABSI than predicted.

Overall, CLABSI surveillance methods and prevention initiatives have improved in NM. More units are now submitting CLABSI data and CLABSI SIRs remain similar to the HHS 2014-2015 national target SIR of 0.50. While the SIR in NM is better than the national reference data and close to the 2014-2015 national target, the NM SIR does not yet meet the Healthy People 2020 SIR target of 0.25. A few NM facilities are showing success in attaining the 2020 CLABSI target and are sharing their lessons learned with other facilities. Examples of prevention efforts being targeted include:

- Focusing on improving central line maintenance practices throughout the facility, similar to the way insertion practice improvement and checklists resulted in early reduction in CLABSIs in ICUs
- Using improved central line-associated supplies (e.g., alcohol-impregnated caps) and standardization of supplies (e.g., one type of needleless connector in a facility)
- Streamlining processes to allow for easier auditing of compliance (e.g., routine dressing changes on the same evening every week, marking all intravenous tubing with the date and time it was last changed)
- Implementing daily bathing of ICU patients with chlorhexidine

Table 1. CLABSI SIRs for all adult and pediatric ICUs and non-ICUs in NMDOH Reporting Group facilities, January 1, 2012 – December 31, 2012

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	33	66	68	126.98	0.54	0.42–0.68	★ Better
ICU	28	33	40	78.51	0.51	0.36–0.69	★ Better
Non-ICU	16	33	28	48.48	0.58	0.38–0.84	★ Better

CLABSI = central line-associated bloodstream infection
NHSN = National Healthcare Safety Network
NC = not calculated
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. If the confidence interval was greater than 1.0 the categorization would be “worse,” however there are none to report.
[Note: The SIR is a summary statistic used to compare the HAI experience of a particular group to a reference population (i.e., NHSN national 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.]
These abbreviations and footnotes are identical for Tables 1 through 6.

Table 2. CLABSI SIRs for adult and pediatric ICUs in NMDOH Reporting Group facilities, 2009 – 2012

Calendar Year	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)‡
2009	6	10	23	53.05	0.43	0.28–0.65	★ Better
2010	11	16	27	61.49	0.44	0.29–0.64	★ Better
2011	17	24	32	71.53	0.45	0.31–0.63	★ Better
2012	28	33	40	78.51	0.51	0.36–0.69	★ Better

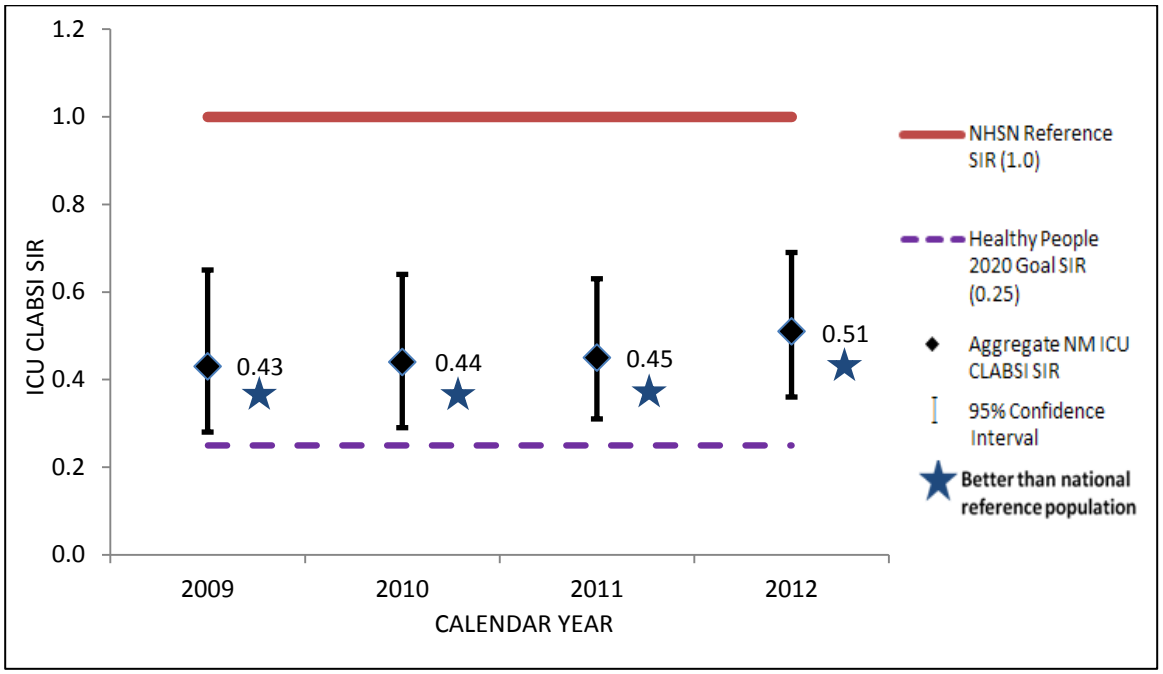
See abbreviations and footnotes at the end of Table 1.

Table 3. CLABSI SIRs for non-ICUs in NMDOH Reporting Group facilities, 2011 – 2012

Calendar Year	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)‡
2011	14	27	28	57.29	0.49	0.33–0.71	★ Better
2012	16	33	28	48.48	0.58	0.38–0.84	★ Better

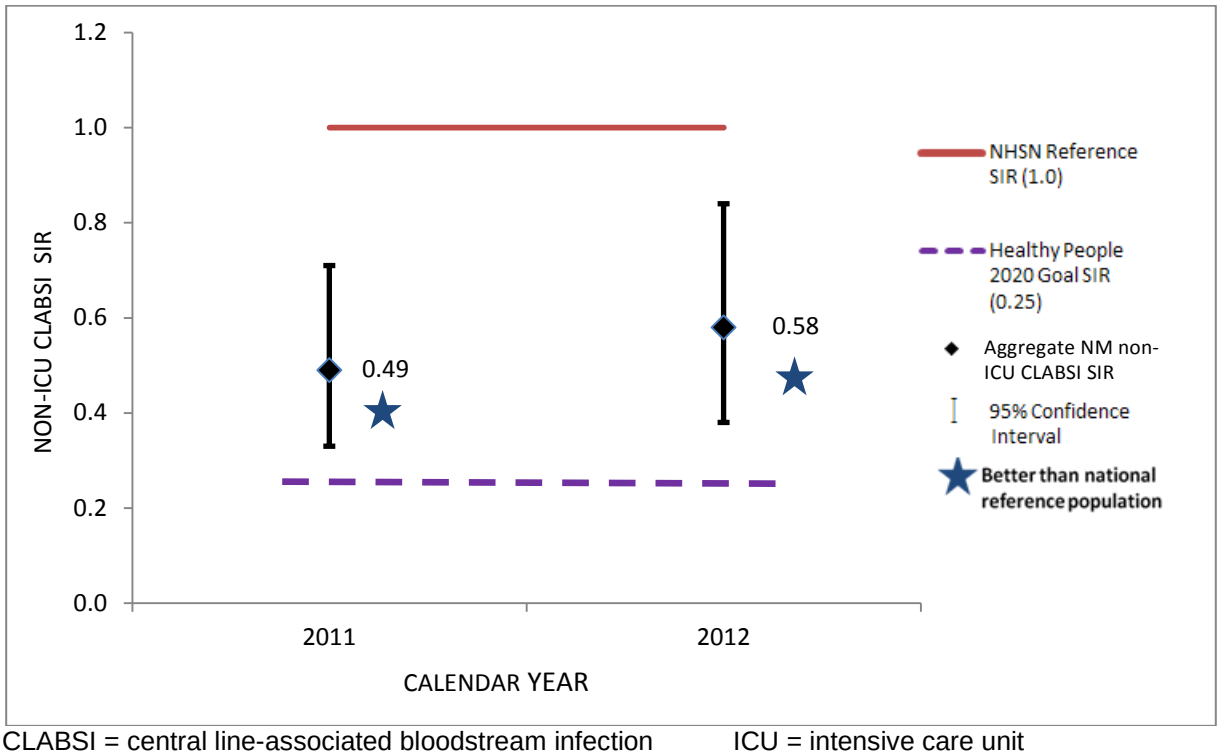
See abbreviations and footnotes at the end of Table 1.

Figure 1. NM adult and pediatric ICU CLABSI SIRs for calendar years 2009 – 2012 with comparison to the NHSN reference population for 2006 – 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

Figure 2. NM non-ICU CLABSI SIRs for calendar years 2011 and 2012 with comparison to the NHSN reference population for 2006 – 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 CLABSI Data

Facility-specific reports are presented for facilities included in the aggregate CLABSI data. All facilities are single hospitals with the exception of Presbyterian Healthcare Services which includes Presbyterian Hospital, Presbyterian Kaseman Hospital, and Rust Medical Center. While the aggregate NM CLABSI data is consistently "better" than the national reference SIR, most facility-level comparisons with the national SIR were statistically "no different" because of small numbers of observed and predicted infections at the individual NM facilities.

Several facilities had less than one predicted infection, based on the type of unit they were reporting and the 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. Facilities without SIRs are listed after the facility-specific SIR ICU CLABSI and non-ICU CLABSI tables (Table 4 and Table 5, respectively) in order to recognize that they met reporting expectations.

Some NM healthcare facilities have been voluntarily submitting data for several years (Table 6) while other facilities began submitting data to NMDOH in 2012 under the new HAI section of the Notifiable Diseases and Conditions in New Mexico Administrative Code.

Table 4. 2012 ICU CLABSI facility-specific SIRs for all facilities for which NHSN predicted one or more CLABSI

Facility	Number of units in SIR calculation	Number of CLABSIs observed in the facility	Number of CLABSIs predicted by NHSN calculation*	Facility ICU-only SIR	95% confidence interval†	Comparison between facility ICU SIR and NHSN SIR (1.0)‡
CHRISTUS St. Vincent Regional Medical Center	1	0	3.68	0.00	NC–1.00	No different
Eastern New Mexico Medical Center	1	3	1.38	2.17	0.45–6.35	No different
Gerald Champion Regional Medical Center	1	0	1.20	0.00	NC–3.08	No different
Heart Hospital of NM at Lovelace Medical Center	1	3	4.38	0.69	0.14–2.00	No different
Lovelace Medical Center	1	4	7.05	0.57	0.16–1.45	No different
Memorial Medical Center	1	2	7.09	0.28	0.03–1.02	No different
Mountain View Regional Medical Center	1	1	4.60	0.22	0.01–1.21	No different
Presbyterian Healthcare Services	3	7	12.60	0.56	0.22–1.15	No different
San Juan Regional Medical Center	1	2	2.63	0.76	0.09–2.75	No different
University of NM Hospital	4	18	28.33	0.64	0.38–1.00	No different

See abbreviations and footnotes at the end of Table 1.

The following hospitals have met reporting expectations and provided ICU CLABSI data to NMDOH. In each of these facilities the NHSN calculated number of predicted CLABSI infections for each unit reported was less than one; therefore, no SIR can be calculated and comparison to NHSN SIR cannot be provided. Some hospitals do not have an ICU and therefore the facility name would not be expected to be seen in this list or the chart above.

Alta Vista Regional Hospital, Carlsbad Medical Center, Cibola General Hospital, Gila Regional Medical Center, Holy Cross Hospital, Lea Regional Medical Center, Lincoln County Medical Center, Los Alamos Medical Center, Lovelace Westside Hospital, Lovelace Women's Hospital, Mimbres Memorial Hospital, Miners' Colfax Medical Center, Northern Navajo Medical Center, Plains Regional Medical Center, Presbyterian Espanola Hospital, Rehoboth McKinley Christian Health Care Services, Roosevelt General Hospital, Roswell Regional Hospital

Table 5. 2012 Non-ICU CLABSI facility-specific SIRs for all facilities for which NHSN predicted one or more CLABSI

Facility	Number of units in SIR calculation	Number of CLABSIs observed in the facility	Number of CLABSIs predicted by NHSN calculation*	Facility non-ICU SIR	95% confidence interval†	Comparison between facility non-ICU SIR and NHSN SIR (1.0)‡
Gerald Champion Regional Medical Center	1	0	1.08	0.00	NC–3.41	No different
Plains Regional Medical Center	4	1	1.51	0.66	0.02–3.68	No different
Presbyterian Espanola Hospital	1	0	1.30	0.00	NC–2.83	No different
San Juan Regional Medical Center	1	0	2.38	0.00	NC–1.55	No different
University of NM Hospital	13	25	39.86	0.63	0.41–0.93	Better

See abbreviations and footnotes at the end of Table 1.

The following hospitals have provided non-ICU CLABSI data to NMDOH. The NHSN calculated number of predicted CLABSI infections for each unit reported was less than one; therefore, no SIR can be calculated and comparison to NHSN SIR cannot be provided.

Carlsbad Regional Medical Center, Dr. Dan C. Trigg Memorial Hospital, Eastern New Mexico Medical Center, Guadalupe County Hospital, Lea Regional Medical Center, Lovelace Westside Hospital, Lovelace Women's Hospital, Nor Lea General Hospital, Roosevelt General Hospital, Sierra Vista Hospital, Socorro General Hospital

Non-ICU CLABSI data has been considered part of voluntary reporting in NM. As of January 2014, CMS will require reporting from all medical wards, surgical wards and medical/surgical wards. At that time NMDOH will expect facilities to confer rights for NMDOH to access data from NHSN for these non-ICU wards.

Table 6. CLABSI data for facilities with multiple-year ICU reporting to NMDOH (i.e., reported voluntarily prior to 2012), with or without SIRs

Facility	Number of units in SIR calculation	Number of CLABSIs observed in the facility	Number of CLABSIs predicted by NHSN calculation*	Facility ICU-only SIR	95% confidence interval†	Comparison between facility ICU SIR and NHSN SIR (1.0)‡
Gerald Champion Regional Medical Center 2012	1	0	1.20	0.00	NC–3.08	No different
Gerald Champion 2011	1	0	1.04	0.00	NC–3.54	No different
Gerald Champion 2010	1	1	1.30	0.77	0.02–4.29	No different
Heart Hospital of NM at Lovelace Medical Center 2012	1	3	4.38	0.69	0.14–2.00	No different
Heart 2011	1	2	3.60	0.56	0.07–2.01	No different
Heart 2010	1	1	3.51	0.29	0.01–1.59	No different
Holy Cross Hospital 2012	1	0	0.58	NC		NA
Holy Cross 2011	1	1	0.51	NC		NA
Holy Cross 2010	1	0	0.59	NC		NA
Lovelace Medical Center 2012	1	4	7.05	0.57	0.16–1.45	No different
Lovelace Medical 2011	3	2	8.48	0.24	0.03–0.85	Better
Lovelace Westside Hospital 2012	1	0	0.48	NC		NA
Lovelace Westside 2011	1	0	0.45	NC		NA
Lovelace Westside 2010	1	0	0.58	NC		NA
Lovelace Women's Hospital 2012	1	0	0.65	NC		NA
Lovelace Women's 2011	1	0	0.95	NC		NA
Lovelace Women's 2010	1	1	1.10	0.91	0.02–5.09	No different
Memorial Medical Center 2012	1	2	7.09	0.28	0.03–1.02	No different
Memorial Medical 2011	1	1	7.53	0.13	0.00–0.74	Better
Memorial Medical 2010	1	2	6.78	0.30	0.04–1.07	No different

Facility	Number of units in SIR calculation	Number of CLABSIs observed in the facility	Number of CLABSIs predicted by NHSN calculation*	Facility ICU-only SIR	95% confidence interval†	Comparison between facility ICU SIR and NHSN SIR (1.0)‡
Plains Regional Medical Center 2012	1	0	0.46	NC		NA
Plains 2011	1	0	0.40	NC		NA
Plains 2010	1	0	0.35	NC		NA
Presbyterian Healthcare Services 2012	3	7	12.60	0.56	0.22–1.15	No different
Presbyterian 2011	3	15	14.07	1.07	0.60–1.76	No different
Presbyterian 2010	3	11	14.26	0.77	0.39–1.38	No different
Rehoboth McKinley Christian Health Care Services	1	0	0.29	NC		NA
Rehoboth 2011	1	0	0.48	NC		NA
Rehoboth 2010	1	0	0.48	NC		NA
San Juan Regional Medical Center 2012	1	2	2.63	0.76	0.09–2.75	No different
San Juan 2011	1	2	2.59	0.77	0.09–2.79	No different
San Juan 2010	1	2	2.36	0.85	0.10–3.07	No different
University of NM Hospital 2012	4	18	28.33	0.64	0.38–1.00	No different
University 2011	4	8	29.44	0.27	0.12–0.54	Better
University 2010	4	9	30.19	0.30	0.14–0.57	Better

NA = not applicable because a facility SIR could not be calculated
See additional abbreviations and footnotes at the end of Table 1.

Organisms Related to CLABSI

Along with submitting data on the number of CLABSI events, facilities enter data into NHSN on types of microorganisms associated with CLABSIs (Table 7). This data can be used to monitor trends in microorganisms causing infections and can help identify emergence of drug-resistant pathogens.

Table 7: Microorganisms associated with central line-associated bloodstream infections for 2012 in New Mexico

Microorganisms	Number of Isolates	Percent of Infections
Enterococci (VRE)	18 (4)	24.3 (5.4)
Coagulase-negative staphylococci	9	12.2
Klebsiella spp.	8	10.8

Microorganisms	Number of Isolates	Percent of Infections
Staphylococcus aureus	7	9.5
(MSSA)	(6)	(8.1)
(MRSA)	(1)	(1.4)
Streptococci	7	9.5
Pseudomonas spp.	6	8.1
Enterobacter spp.	6	8.1
Escherichia spp.	5	6.8
Other	5	6.8
Yeast	3	4.1
Total	**74**	**100.0**

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 2009-2012. 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. Despite this limitation, the NHSN pooled mean is the standard against which all facilities and states are compared.

While there are numerous internal validation checks built into NHSN, all data submitted to NHSN have not been verified by ongoing and/or complete external validation (e.g., independent external case review).

For consumer prevention information on CLABSI, see Appendix C.

Clostridium difficile Infection Surveillance

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

Clostridium difficile infection surveillance is evolving at the state and national levels. The baseline period selected by NHSN for calculating a national facility-wide CDI SIR is 2009-2010. Transition to facility-wide laboratory-identified reporting in NM began late in 2012 and was required of acute care hospitals for CMS reporting as of January 2013. NMDOH will then have access to CDI NHSN hospital data through the requirements in Notifiable Diseases and Conditions in New Mexico Administrative Code, similar to CLABSI data.

Voluntary NM CDI 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. This initial data was collected on a unit-specific basis by a limited number of facilities. The introduction of the laboratory-identified (LabID) NHSN CDI definition, which is algorithm based, was a departure from previous methods of data collection. January 2013 CMS requirements are for facility-wide CDI data reporting and will provide more meaningful information on the presence of this infection in a facility.

Population-based CDI surveillance is being conducted by NM Emerging Infections Program in conjunction with CDC and partner states. See the Special Projects/HAI section of this report for more information.

For consumer prevention information on CDI, see Appendix C.

Results of New Mexico Healthcare Personnel Influenza Vaccination Surveillance

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

Data was voluntarily submitted by 31 healthcare facilities during the 2012-2013 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 currently most reliable and complete, based on facility-reported difficulty collecting data for other personnel categories, and is more directly comparable to previous HCP influenza vaccination reporting in NM. Facility-specific rates are available for only 24 of the 31 facilities (Figure 3) but all 31 are included in the aggregate rate. The seven unidentified facilities voluntarily reported their rates to NMDOH for the first time during the 2012-2013 flu season. Consistent with previous facility-identified public reporting, facilities are given one year of reporting before their data is shared publicly. This criterion allows for development and implementation of adequate surveillance systems and time to learn correct application of surveillance definitions prior to facility-specific public reporting.

The total number of healthcare employees receiving influenza vaccination for the 2012-2013 season was 21,944 of 28,350 HCP directly employed by the 31 facilities (Table 8). The statewide HCP influenza vaccination aggregate rate was 77.4% of employees vaccinated. The 31 participating facilities included five long-term care and behavioral health facilities in addition to 26 acute care hospitals.

The NM aggregate HCP influenza vaccination employee rate for 2012-2013 (77.4%) dropped slightly from the 2011-2012 NM rate (79.3%). The rate of 77.4% exceeds the HHS Healthy People 2014-2015 interim goal of 70% but is statistically significantly lower than the 2011-2012 NM rate. Statistical significance throughout this report is determined by a p-value less than or equal to 0.05: a p-value represents the probability that an observed difference between groups did not occur by chance alone. The lower rate may be related to the addition of facilities with less prior tracking and reporting experience.

In subsequent NM HAI reports, the expectation is to move to the current national definition for HCP influenza vaccination reporting and report the vaccination rate for a broader group of healthcare personnel. Beginning in 2012-2013, facilities were required by CMS to submit data on the vaccination status of employees plus licensed independent providers, and students and volunteers in their facilities. Many NM facilities began this expanded data submission as part of a pilot in 2011-2012 and continued in 2012-2013. While the previously noted employees-only NM aggregate vaccination rate dropped two percentage points from 2011-2012 to 2012-2013, the vaccination rate for healthcare personnel for the three combined CMS-defined categories went from 65% to 72% during the same time period. Better systems for accurately identifying the denominator of non-employed individuals and tracking their vaccination status were necessary for all facilities and have greatly improved. Going forward, this national definition of HCP will be used for NM aggregate and facility-specific reporting.

Table 8. Healthcare personnel employee category: influenza vaccination rates for NM facilities participating in HCP influenza vaccination data submission, 2008 – 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 employee 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%
2012-2013	31	21,944	28,350	77.4%	70.0%	90.0%

HCP = healthcare personnel HHS = US Department of Health and Human Services
NA = not applicable at the time
*Numbers of personnel vaccinated and total personnel include all employees plus all medical staff with privileges (physicians and advanced practice providers) and medical residents regardless of employment status.
†Lovelace Medical Center and Heart Hospital of New Mexico are counted separately prior to 2011-2012 and as one facility in the 2011-2012 and 2012-2013 counts after their staffs were merged.

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 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 use stickers on personnel badges or buttons to indicate whether or not employees have been vaccinated.

Facility-specific Rates

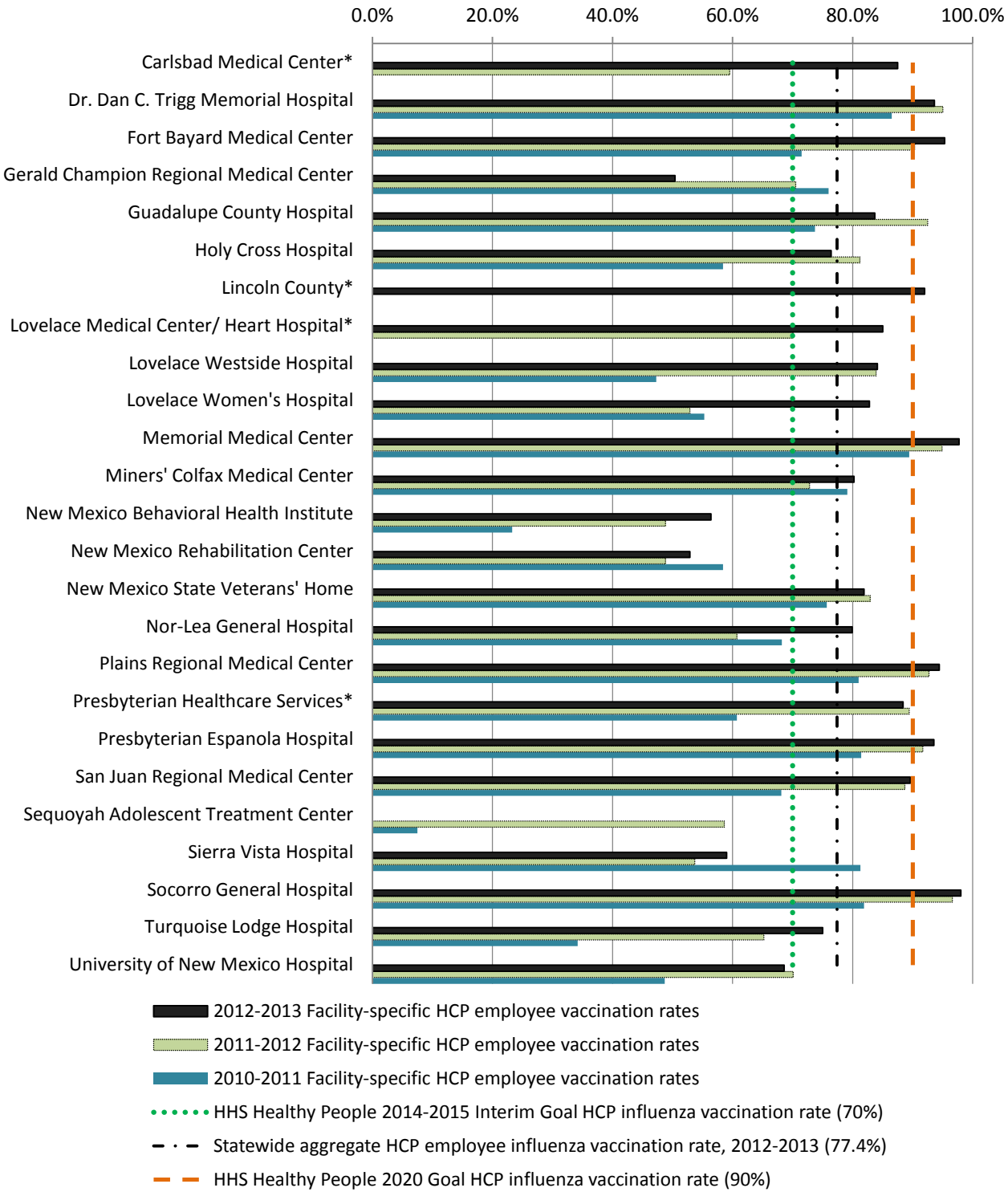
Nineteen facilities exceeded the HHS Healthy People interim goal of 70% influenza vaccination. Seven of those facilities were able to meet or exceed the Healthy People 2020 goal of 90% vaccinated in the employee category.

Limitations

The NM HCP influenza vaccination data has limitations. As was noted, the 2010-2011 through 2012-2013 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. One facility reported difficulty obtaining sufficient vaccine.

For consumer prevention information on HCP influenza vaccination, see Appendix C.

Figure 3. NM facility-specific HCP employee influenza vaccination rates for the 2010-2011, 2011-2012, and 2012-2013 seasons, current NM statewide aggregate rate, and national goals



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

* Lovelace Medical Center and Heart Hospital of New Mexico reported as separate facilities prior to the 2011-2012 season, Carlsbad Medical Center began voluntary reporting in 2011-2012 and Lincoln County Hospital in 2012-2013. Presbyterian Healthcare Services includes Presbyterian Hospital, Rust Medical Center, and Presbyterian Kaseman Hospital.

Prevention of Healthcare-associated Infections in New Mexico

In addition to collecting surveillance data on CLABSI and CDI events and HCP influenza vaccination rates, the NMDOH HAI Program works closely with the NM HAI Advisory Committee, particularly *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 required or 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 greatest impact.

During 2012, three prevention projects tied to national initiatives were open to NM healthcare facilities. These projects, plus a community-based prevention project, ongoing peer-to-peer training calls, and the NM annual HAI conference are described here.

Learning and Action Networks

HealthInsight New Mexico, as the CMS-identified quality improvement organization (QIO) in NM, is leading a Learning and Action Network to address healthcare-associated infections as part of the improving individual care section of the national CMS work priorities. Beginning in August 2011, the QIO has engaged NM hospitals in activities to reduce CAUTIs, continue the reporting and reduction of CLABSIs, report and reduce CDI, and introduce SSI prevention. For example, as part of the requirements for success in this scope of work, participating hospitals are expected to contribute to reducing CDI by carrying out stewardship of antibiotic prescribing within their facility. A series of remote learning presentations were developed and offered to all hospitals on this topic and 62 pharmacists and clinicians from 20 facilities attended at least one of the 14 sessions. Other goals for the Learning and Action Network include reducing the rate of urinary catheter use and improving the tracking and monitoring of hand hygiene adherence.

The Learning and Action Network for healthcare-associated infections will continue to work with hospitals until the summer of 2014.

Partnership for Patients

CMS funded 26 organizations to serve as Hospital Engagement Networks (HENs) around the country, as previously detailed on page 6 of this report. Four of these networks – Indian Health Service, Intermountain Health Care, Life Point Hospitals, and the NM Hospital Association through the American Hospital Association's Health Research & Educational Trust (HRET) – are working with NM hospitals (Table 9). Though there may be variations in approach, trainings, and data collection, each network is charged with bringing about rapid improvements in quality of patient care. These improvement efforts are focused on the following 11 clinical topic areas which significantly impact patient safety and quality of care.

- Adverse drug events
- Catheter-associated urinary tract infections
- Central line-associated blood stream infections
- Injuries from falls and immobility
- Obstetrical adverse events
- Pressure ulcers
- Surgical site infections

- Venous thromboembolism
- Ventilator-associated pneumonia
- Preventable readmissions
- Early elective delivery

By improving care in these specific areas, the networks are expected to reduce preventable hospital acquired conditions by 40 percent and reduce hospital readmissions by 20 percent within 30 days of discharge by the end of 2013.

End-stage Renal Disease Network

The work of the Intermountain End Stage Renal Disease (ESRD) Network (Network #15) with outpatient dialysis centers is similar to the relationship of *HealthInsight* New Mexico with hospitals. Network #15 is a federally mandated, nonprofit corporation that contracts with CMS to implement the ESRD Network program in its six-state area including New Mexico. The mission of Network #15 is to facilitate the improvement of quality of care provided to ESRD patients, including the prevention of HAIs. Network #15 is also charged with the collection and validation of information about, and treatment of persons with ESRD.

The NM HAI Advisory Committee communicates regularly with Network #15 to avoid duplication of efforts and to coordinate prevention initiatives.

Prevention of *Clostridium difficile* Infection Across the Spectrum of Healthcare – Northwest NM

Because of the increase in incidence and virulence of CDI, improvements in prevention and disease management are important in all healthcare settings, especially acute care and long-term care. Building on the 2011 CDI Prevention Project conducted with hospitals statewide, NMDOH launched a multi-facility initiative in 2012 to reduce CDI and promote antibiotic stewardship in the greater Farmington and Shiprock area. The collaborative was designed to involve hospitals, dialysis centers, long-term care facilities, outpatient providers, clinical laboratories, and pharmacies in order to address the impact of CDI across the spectrum of care.

This one-year project began with stakeholder meetings to describe the project and gain input on who the key participants would be and what best practice information could benefit the community. Potential sources for infection and hospitalization data were identified and partnerships developed to collect the data in a way that could be compared across settings and for different time periods. Facilities and providers were recruited to the project. Trainings began in November 2012 and the project continued through July 2013 covering topics such as standardization of testing and treatment, appropriate isolation precautions, best practices for environmental services, and antimicrobial stewardship. A report on outcomes and lessons learned will be included in next year's NM HAI Report.

Quarterly Reporting Group Calls

The NM HAI Program staffs coordinate and lead quarterly calls among facilities submitting HAI data to NMDOH through NHSN. These calls often focus on changes in definitions for identifying HAIs and also on changes in reporting criteria and regulations at both state and national levels.

Each call also includes discussion time for facilities to share successes and challenges in reducing HAIs and implementing specific prevention best practices. This peer-to-peer

sharing is identified by infection preventionists as an important part of their ongoing continuing education and, as a result, their facilities' process improvement.

Healthcare-associated Infections Awareness Conference

The third Annual NM HAI Awareness Conference was held August 24, 2012; the purpose of the conference was to promote awareness of HAIs and the work of the NM HAI Advisory Committee as well as provide learning opportunities on reducing healthcare-associated infections. The NM HAI prevention initiatives align with the national HHS five-year plan to reduce HAIs and NM updates are provided at this conference.

The 2012 conference was a full day event with 56 infection preventionists, nurses, quality improvement, and environmental cleaning staff in attendance from over 30 facilities. The conference provided information for attendees on HAI outcomes, improvement and change ideas, success stories from communities and an opportunity to support and cultivate the HAI work and relationships within and outside the state. There was also representation from partners in HAI prevention including NMDOH, *HealthInsight* New Mexico, the New Mexico Hospital Association, and APIC NM.

Prevention Partners in 2012

Table 9 reflects a snapshot of involvement of NM facilities in the HAI surveillance and prevention projects directed through the NM HAI Advisory Committee work during 2012. This is by no means a complete list of everything being done in the state and does not reflect the internal quality improvement efforts of each institution or other non-NM HAI efforts in which they may be involved.

Table 9. NM healthcare facilities participating in 2012 HAI surveillance and prevention projects

Facility	CLABSI and/or CDI reporting to NMDOH through NHSN	HCP influenza vaccination reporting	CDI Prevention Project 2011-2012	*Health-Insight* Learning & Action Network	Hospital Engagement Network
Advanced Care Hospital of Southern NM					NMHA
Alta Vista Regional Hospital	X			X	NMHA
Carlsbad Medical Center	X	X		X	NMHA
CHRISTUS St. Vincent Regional Medical. Center	X			X	NMHA
Cibola General Hospital	X		X		NMHA
Dr. Dan C. Trigg Memorial Hospital	X	X	X	X	Intrmtn
Eastern New Mexico Medical Center	X				NMHA
Fort Bayard Medical Center		X			
Gallup Indian Medical Center				X	IHS

Facility	CLABSI and/or CDI reporting to NMDOH through NHSN	HCP influenza vaccination reporting	CDI Prevention Project 2011-2012	*Health-Insight* Learning & Action Network	Hospital Engagement Network
Gerald Champion Regional Medical Center	X	X	X	X	NMHA
Gila Regional Medical Center	X				
Guadalupe County Hospital	X	X		X	NMHA
Healthsouth Rehabilitation Hospital					NMHA
Heart Hospital of New Mexico at Lovelace Medical Center	X	X			
Holy Cross Hospital	X	X		X	NMHA
Lea Regional Medical Center	X			X	NMHA
Lincoln County Medical Center	X	X			Intrmtn
Los Alamos Medical Center	X				LifePt
Lovelace Medical Center	X	X	X	X	NMHA
Lovelace Regional Hospital - Roswell	X				
Lovelace Westside Hospital	X	X		X	NMHA
Lovelace Women's Hospital	X	X		X	NMHA
Mimbres Memorial Hospital	X			X	NMHA
Memorial Medical Center	X	X	X	X	LifePt
Miners' Colfax Medical Center	X	X		X	
Mountain View Regional Medical Center	X		X	X	NMHA
New Mexico Behavioral Health Institute		X			
New Mexico Rehabilitation Center		X			
New Mexico State Veterans' Home		X			
Nor-Lea General Hospital	X	X	X	X	NMHA
Northern Navajo Medical Center	X				IHS
Plains Regional Medical Center	X	X	X	X	Intrmtn
Presbyterian Espanola Hospital	X	X			Intrmtn
Presbyterian Healthcare Services	X	X	X	X	Intrmtn
Rehabilitation Hospital of Southern NM					NMHA
Rehoboth McKinley Christian Health Care Services	X				NMHA

Facility	CLABSI and/or CDI reporting to NMDOH through NHSN	HCP influenza vaccination reporting	CDI Prevention Project 2011-2012	*Health-Insight* Learning & Action Network	Hospital Engagement Network
Roosevelt General Hospital	X		X	X	NMHA
Roswell Regional Medical Center	X				
San Juan Regional Medical Center	X	X	X	X	NMHA
Sierra Vista Hospital	X	X	X	X	NMHA
Socorro General Hospital	X	X			Intrmtn
Turquoise Lodge Hospital		X			
University of New Mexico Hospital	X	X	X	X	

NMHA – New Mexico Hospital Association is leading this HEN
Intrmtn – Intermountain Healthcare is leading this HEN
LifePt – LifePoint Hospitals is leading this HEN
IHS – Indian Health Service is leading this HEN

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 national EIP projects, NM EIP conducted a project to validate CLABSI data voluntarily submitted to NHSN by NM facilities.

The following articles and posters, which address NM activities related to these projects, were submitted in 2012 for publication and presentation in 2013:

- The New Mexico Phase 1 Central Line-associated Bloodstream Infection Data Validation Project was published in the American Journal of Infection Control: Thompson DL, Makvandi M, Baumbach J. Validation of central line associated bloodstream infection data in a voluntary reporting state: New Mexico. *Am J Infect Control.* 2013 Feb;41(2):122-5.
- The New Mexico Phase 2 Central Line-associated Bloodstream Infection Data Validation Project was presented as a poster at Preventive Medicine 2013 in Phoenix, Arizona, February 21-22, 2013.
- New Mexico was a participating site for the Centers for Disease Control and Prevention (CDC) Emerging Infections Program (EIP) denominator simplification project which was published in Infection Control and Hospital Epidemiology: Thompson ND, Edwards JR, Bamberg W, Beldavs ZG, Dumyati G, Godine D, Maloney M, Kainer M, Ray S, Thompson D, Wilson L, Magill SS. Evaluating the accuracy of sampling to estimate central line-days: simplification of the national healthcare

safety network surveillance methods. *Infect Control Hosp Epidemiol.* 2013 Mar;34(3):221-8.

EIP Population-based CDI Surveillance

The CDC EIP network conducts active, population-based surveillance for a variety of pathogens. In 2011 through their EIP program, New Mexico joined other states and began surveillance in Bernalillo County for CDI. The goals of this surveillance are to:

- Determine the population-based incidence of community- and healthcare-associated CDI
- Characterize *Clostridium difficile (C. difficile)* strains in the population, especially strains from community-associated cases
- Describe the epidemiology of community- and healthcare-associated CDI

Currently, positive *C. difficile* laboratory tests in Bernalillo County residents are reported by the testing laboratory to the CDI program. Incident cases (the first positive test or a positive test >8 weeks after any prior positive tests) in adults and children one year of age or older are then followed up with a review of the medical record. Information is collected on healthcare exposures, clinical findings, underlying conditions, and medication history. Cases are classified into one of three categories:

- Healthcare Facility Onset (HCFO): positive test greater than three calendar days after admission to a healthcare facility
- Community-associated (CA): positive specimen collected in an outpatient clinic or within three calendar days after admission to a healthcare facility with no documented overnight stay in a healthcare facility within the previous 12 weeks
- Community-onset healthcare facility-associated (CO-HCFA): community-onset cases that had an overnight stay in a healthcare facility within the previous 12 weeks

Community-associated cases are selected for a voluntary telephone health interview. This interview collects detailed data regarding healthcare contacts, household contacts (including their healthcare exposures), travel history, animal exposures, and past medical history.

All data collected through medical record review and health interviews are stored in a de-identified database at CDC. Additional details regarding the surveillance methodology can be found at http://www.cdc.gov/hai/eip/cdiff_techinfo.html.

From January 1, 2011- December 31, 2012, 2,443 incident *C. difficile* cases in residents of Bernalillo County were identified from over 100 healthcare providers. In addition, 397 duplicate (0-2 weeks after an incident episode) and 698 recurrent (2-8 weeks after an incident episode) episodes were identified. Slightly more than half (57%) of these cases were female. While adults over the age of 65 made up the majority of cases, young adults and children had a substantial burden of disease as well.

Just under half (47%) of CDI cases were classified as healthcare facility-associated, and over a third (36%) were confirmed community-associated cases. The remaining 17% were classified as community-onset healthcare facility-associated.

Forty percent were admitted to a hospital at the time of, or within a week after, their stool collection date; of those, a quarter were admitted due to their CDI.
Medication exposures (antibiotics, antacids, and immunosuppressives), which can put

individuals at risk for CDI, were assessed for the 14 days prior to stool collection for cases diagnosed in 2011, and for 12 weeks prior to stool collection for cases diagnosed in 2012. Half of the 2011 cases had exposure to antibiotics documented in the medical record and 56% of those diagnosed in 2012 had documented exposure to antibiotics. The most common antibiotic classes documented were cephalosporins, penicillins, fluoroquinolones, and metronidazole. A fifth (21%) of CA cases had documented exposure to a proton pump inhibitor (PPI) or Histamine 2 (H2) blocker (both also referred to as acid reducers), roughly half of the proportion seen in HCFO or CO-HCFA cases. PPI use had a statistically significant association with multiple episodes of CDI. A quarter of CA cases (27%) had been on immunosuppressive drugs.

Clostridium difficile infection can result in asymptomatic colonization or lead to a wide range of clinical outcomes, from mild diarrhea to fulminant colitis and even death. CDI has traditionally been associated with healthcare settings (i.e., hospitalization or residence in a long term care facility), but many cases occur in the community. New Mexico is participating as one of ten states to collect detailed information on people with CDI to better understand how to prevent and treat this infection.

Conclusions

The information detailed in this report represents the HAI surveillance and prevention work of numerous stakeholders and key partners including the members of the NM HAI Advisory Committee, healthcare facilities, individual infection control and quality improvement professionals, public health professionals, and consumers. Much of the work is the result of successful collaborations, both formal and informal, across facilities and communities.

The NM data indicate that, as a state, NM has fewer central line-associated bloodstream infections than the national reference population, and is meeting current national goals for CLABSI reduction and healthcare personnel influenza vaccination. Achieving the more ambitious Healthy People 2020 goals will require continued progress on the CLABSI and HCP influenza vaccination measures.

A critical area of focus in which everyone has a role is hand hygiene, the foundation of infection prevention. Healthcare personnel, patients, and families all have a responsibility to comply with hand hygiene guidelines and to promote compliance by others.

NM healthcare facilities take seriously the importance of eliminating all preventable HAIs and decreasing to the extent possible those that cannot be eliminated. The NM HAI Advisory Committee will continue to provide leadership and support for HAI surveillance and prevention efforts across the state to improve health outcomes for New Mexicans.

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. 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 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.

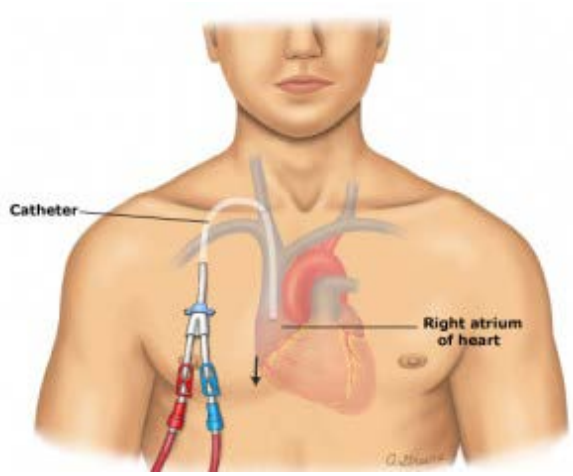
Appendix B: Central Line-associated Bloodstream Infection (CLABSI) Surveillance

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.[6,7] 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 C: 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 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.[8] 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 all visitors to perform hand hygiene. Do not be afraid to ask physicians, nurses, or others involved in care to wash their hands, particularly before accessing the central line. Follow healthcare provider instructions for keeping wounds clean and let caretakers 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 lines 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. Patients or visitors to a hospital, should wash hands often and avoid bringing in extra belongings in order to reduce clutter. Cluttered countertops may not be cleaned as often or as thoroughly as recommended. Healthcare personnel can also be reminded to wash their hands using soap and water before caring for patients. Practice responsible antimicrobial usage, taking only antimicrobials prescribed by the doctor until the treatment is complete, and don't pressure physicians to prescribe antibiotics. If visiting someone diagnosed with CDI, 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 vaccinated annually will help protect both 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)

"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.

Co-sponsored by:
SHEA The Society for Healthcare Epidemiology of America
IDSA
American Hospital Association
APIC
CDC Centers for Disease Control and Prevention
The Joint Commission

FAQs
(frequently asked questions)

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.

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SHEA The Society for Healthcare Epidemiology of America
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American Hospital Association
APIC Spreading knowledge. Preventing infection.
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The Joint Commission

Appendix D: *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.[9] One source estimated the attributable cost of CDI to be $2,454-$5,042 per case.[10] 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 in 2011 to address the multi-factorial issues associated with CDI.

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 surveillance screening which tests all patients for a pathogen.

Appendix E: 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.[11] 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.[12] 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.[13] Increased influenza vaccination rates are associated with decreased mortality in elderly patients (e.g., patients in long-term care settings) [14,15] and decreased HCP lost work time.[16,17]

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.[18]

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.[19]

Data Submission Process

Consistent with the 2011 – 2012 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., 2012 – 2013). 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 2012 – 2013 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, 2010 – 2011, and 2011-2012 influenza vaccination seasons.

Appendix F: Acronyms

AHRQ	Agency for Healthcare Research and Quality
APIC	Association for Professionals in Infection Control and Epidemiology
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
DHQP	Division of Healthcare Quality Promotion
EIP	Emerging Infections Program
HAI	Healthcare-associated infection
HAIC	Healthcare-associated Infections Community Interface
HEN	Hospital Engagement Network
HCP	Healthcare personnel
HHS	US Department of Health and Human Services
IP	Infection Preventionist
ICU	Intensive care unit
MRSA	Methicillin-resistant *Staphylococcus aureus*
NC	Not calculated
NHSN	National Healthcare Safety Network
NM	New Mexico
NMDOH	New Mexico Department of Health
NMHA	New Mexico Hospital Association
PfP	Partnership for Patients
QIO	Quality improvement organization
SHEA	Society for Hospital Epidemiology of America
SIR	Standardized infection ratio
SSI	Surgical site infection
TJC	The Joint Commission
US	United States
WHO	World Health Organization

Appendix G: 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.

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).

***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.

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.

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.

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.

p-value: The probability that an observed difference between groups did not occur by chance alone.

Pathogen: Any agent or microorganism that causes disease.

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.

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