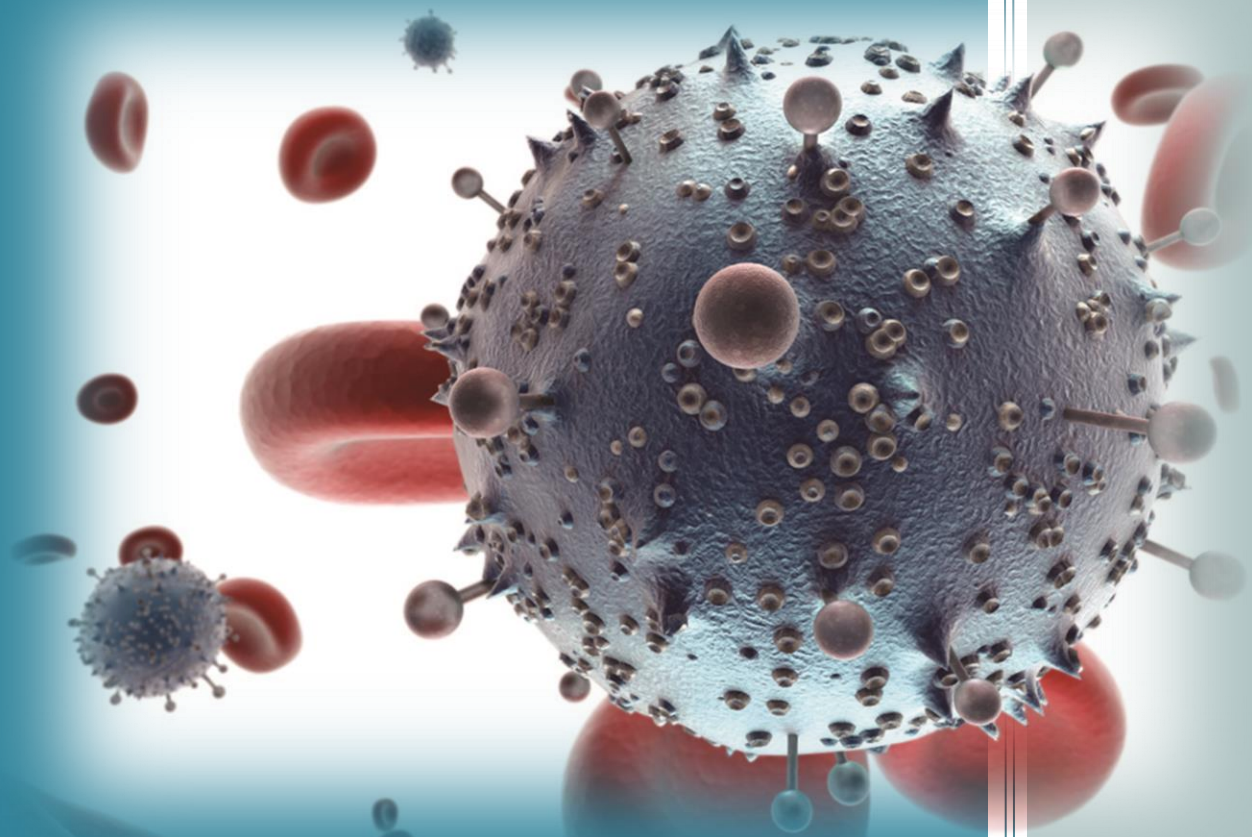


2014

Healthcare-associated Infections in Utah



Utah Department of Health
Division of Disease Control and Prevention

Published October 2015

Acknowledgements

2014

**Annual
Report**

Prepared by
Rebecca L. Ward
Division of Disease Control and Prevention
Bureau of Epidemiology
Utah Department of Health

Special thanks to the following individuals for their subject matter expertise, data resources, editing and consultations.

Utah Department of Health

Executive Director's Office
Robert T. Rolfs, MD

State Epidemiologist
Allyn K. Nakashima, MD

Healthcare-Associated Infections Prevention Program
Felicia Alvarez
Britt Brinton
Louise Eutropius
Jordan Pyper
Karen Singson
Sherry Varley

Communicable Disease Investigation and Response Program
Melissa Stevens Dimond

Utah Hospitals

Chief Executive Officers
Infection Preventionists
Chief Medical Officers
Chief Nursing Officers
Quality Improvement Directors

Suggested Citation: Utah Department of Health. *Healthcare-Associated Infections in Utah, 2014 Annual Report*. Salt Lake City, UT: Utah Department of Health; October 2015.
http://health.utah.gov/epi/diseases/HAI/surveillance/2014_HAI_Report.pdf

FOREWORD

Healthcare-associated infections (HAIs) are a major, yet often preventable, threat to patient safety. The Utah Department of Health's (UDOH) HAI Prevention and Control Program is committed to helping Utah patients receive the best and safest care. Implementing statewide HAI prevention efforts is an essential part of a comprehensive patient safety program. Publicly releasing HAI data is an important step in creating transparency for healthcare safety and quality in Utah.

Patients have a right to feel safe and assured that public health is working to eliminate infections. Thanks to all the healthcare professionals and facilities in Utah who work tirelessly to realize this goal. Two of the keys to elimination of HAIs are 1) the accurate collection of data to assess prevention impact, and 2) the dissemination of results to healthcare providers and consumers. Conscientious efforts in data reporting contribute toward meeting HAI prevention efforts and control needs.

This 2014 Annual Healthcare Associated Infections Report was developed in collaboration with the Utah Healthcare Infection Prevention (UHIP) Governance Committee, a multi-disciplinary panel of state leaders in patient safety, infectious diseases, and infection control. It provides an update on previous HAI reports detailing Utah's progress toward the goal of reducing and, ultimately, eliminating HAIs.

This report will allow Utahns to compare HAIs among licensed hospitals in Utah. The data in this report are self-reported to the National Healthcare Safety Network (NHSN) by each facility required to report HAIs by the Centers for Medicare and Medicaid Services (CMS). The UDOH analyzes the data, using proven statistical methods, to provide comparison information.

Validation of these data by UDOH is limited. Additional validation is needed to better understand any inconsistent data and to improve the quality of HAI surveillance. Despite these limitations, Utah's results for preventing HAIs are encouraging and; as additional data are collected, more specific results will be possible, allowing for increased HAI surveillance and prevention efforts.



Allyn K. Nakashima, MD
State Epidemiologist
Utah Department of Health

Table of Contents

Acknowledgments	ii
Foreword	iii
Executive Summary	vii
Key Findings	viii
Introduction	1
How are Utah HAI Data Collected?	3
Interpreting HAI Data	
Calculating Standardized Infection Ratios.....	4
What does the SIR Mean	4
Calculating Rates	5
Central Line-associated Bloodstream Infections (CLABSIs)	6
Catheter-associated Urinary Tract Infections (CAUTIs)	10
Surgical Site Infections (SSIs)	14
<i>Clostridium difficile</i> Infections	18
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Bacteremia	20
Dialysis Infection Events	22
Data Quality Validation	
Background	23
Procedure.....	23
Validation Key Findings.....	23
Conclusions	24
Healthcare-associated Infections by Hospitals Reporting to NHSN	25

Table of Contents

Appendices

Appendix A: Understanding CLABSI and CAUTI Standardized Infection Ratio Data in Acute Care Facilities with Intensive Care Units (ICUs)	61
Appendix B: Understanding SSI Data in Acute Care Facilities	66
Appendix C: Understanding <i>Clostridium difficile</i> and MRSA Bacteremia Data in Acute Care Facilities	70
Appendix D: Understanding CAUTI and CLABSI Rates in Long-term Acute Care Facilities with Intensive Care Units and Wards or Inpatient Rehabilitation Facilities	74
Appendix E: Definitions	78

References	81
-------------------------	----

List of Figures

Figure 1. Central line-associated bloodstream infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014	8
Figure 2. Central line-associated bloodstream infections in acute care facilities with newborn intensive care units, Utah, 2014.....	9
Figure 3. Central line-associated bloodstream infections in long-term acute care facilities, Utah, 2014.....	9
Figure 4. Catheter-associated urinary tract infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014	12
Figure 5. Catheter-associated urinary tract infections in rehabilitation facilities, Utah, 2014	13
Figure 6. Catheter-associated urinary tract infections in long-term acute care facilities, Utah, 2014	13
Figure 7. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2014	15
Figure 8. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2014	17
Figure 9. <i>C. difficile</i> infections in acute care facilities, Utah, 2014	19

Table of Contents

Figure 10. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2014.....21

List of Tables

Table 1. Central line-associated bloodstream infections in acute care facilities with adult and pediatric intensive care units, Utah, 201463

Table 2. Central line-associated bloodstream infections in acute care facilities with newborn intensive care units, Utah, 2014.....64

Table 3. Catheter-associated urinary tract infections in acute care facilities with adult and pediatric intensive care units, Utah, 201465

Table 4. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 201468

Table 5. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 201469

Table 6. *C. difficile* infections in acute care facilities, Utah, 201472

Table 7. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 201473

Table 8. Central-line associated bloodstream infections in long-term acute care facilities with intensive care units and wards, Utah, 201476

Table 9. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 201476

Table 10. Catheter-associated urinary tract infections in inpatient rehabilitation facilities, Utah, 2014.....77



Executive Summary

Healthcare-associated infections (HAIs) are infections that are acquired while patients are receiving treatment for another condition in a healthcare setting. The Utah Department of Health works with community partners to monitor and prevent these infections because they are an important threat to patient safety. Because of the concerns with these deadly and costly HAIs, Utah state regulation requires the UDOH to collect data on HAIs and report this data to the public on an annual basis. Validation of these data by UDOH is limited. This report contains the following data:

- All infections for which Centers for Medicare and Medicaid Services (CMS) requires reporting to NHSN:
 - Central line-associated bloodstream infections (CLABSIs)
 - Catheter-associated urinary tract infections (CAUTIs)
 - Surgical site infections (SSIs) – exclusive to colon surgeries and abdominal hysterectomy surgeries
 - *Clostridium difficile* (*C. difficile*) infections
 - Methicillin Resistant *Staphylococcus aureus* (MRSA) bacteremia infections.
- Self-reported data to the National Healthcare Safety Network (NHSN) by each Utah facility that is required to report HAIs by the Centers for Medicare and Medicaid Services (CMS).
- Identified facilities, as required by [the Utah Health Code, Title 26, Chapter 6, Section 31](#).
- A comparison of data in acute care facilities, long-term acute care facilities and inpatient rehabilitation facilities.
- For acute care facilities: a comparison of 2014 infection rates compared to national baseline data.

The Utah Department of Health works with community partners to monitor and prevent these infections because they are an important threat to patient safety.

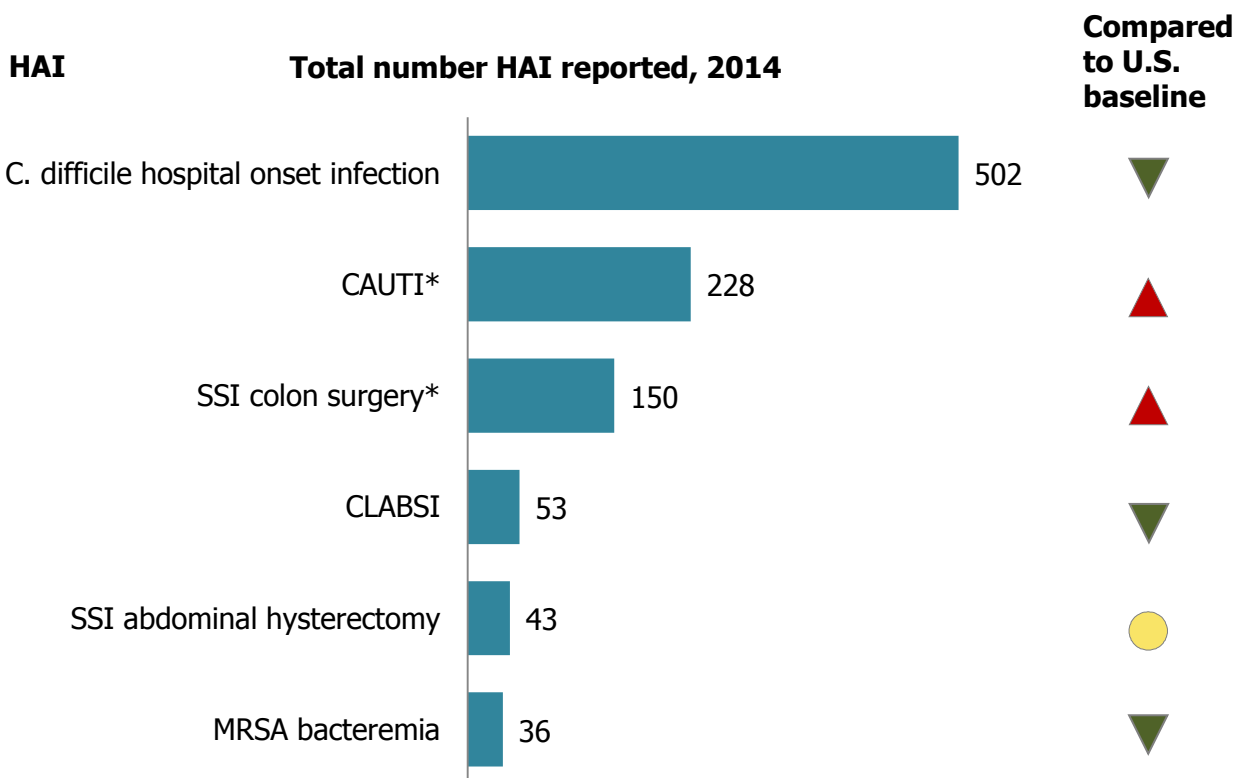
Key Findings

The Utah data are self-reported to NHSN by each facility that is required to report HAIs by CMS. Data are complete at the time of report generation. Validation of these data by UDOH is limited. Validation results indicate variability among the acute care facilities performing catheter-associated urinary tract infection (CAUTI) surveillance has decreased as compared to validation findings in previous years, suggesting a continued need for a robust validation program to improve accuracy in all HAI reporting.

Throughout this report, the following symbols are used to show the comparison of HAIs reported in Utah to national baseline data:

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline

Below is a summary of 2014 HAI data reported by Utah facilities, including data from adult, pediatric and newborn intensive care units (ICUs), long-term acute care (LTACs), and inpatient rehabilitation facilities (IRFs).



*Refer to sections on CAUTI and SSI colon surgery for strategies to reduce these infections.

Introduction

Healthcare-associated infections, or HAIs, are infections that people acquire while they are receiving treatment for another condition in a healthcare setting. HAIs can be acquired anywhere healthcare is delivered, including inpatient acute care hospitals, outpatient settings such as ambulatory surgical centers and end-stage renal disease facilities, and long-term care facilities such as nursing homes and rehabilitation centers. HAIs may be caused by any infectious agent, including bacteria, fungi, and viruses, as well as other less common types of pathogens.

HAIs are a significant cause of morbidity and mortality. On any given day, about 1 in every 25 hospital patients has at least one healthcare-associated infection. There were an estimated 722,000 HAIs in U.S. acute care hospitals in 2011. About 75,000 hospital patients with HAIs died during their hospitalizations. More than half of all HAIs occurred outside of the intensive care unit.¹ These infections cost the U.S. health care system billions of dollars each year and lead to the loss of tens of thousands of lives. In addition, HAIs can have devastating emotional, financial and medical consequences.²

Infections may occur as a result of complications following a surgical procedure, known as a surgical site infection (SSI), or when staff fail to closely follow infection control practices such as hand washing. Patients receiving medical care and taking antibiotics for long periods of time may be more susceptible to HAIs such as *C. difficile* infections. These infections now rival methicillin-resistant *Staphylococcus aureus* (MRSA) as the most common organism to cause HAIs in the United States.

HAIs may also be caused by the use of various types of invasive devices, such as a central line or urinary catheter when patients are ill. The use of such devices can harm patients' natural defenses against germs and the longer these devices are in place, the greater the risk of infection.³ Types of HAIs associated with devices include central line-associated bloodstream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), or infections associated with the usage of ventilators. CLABSIs, CAUTIs, and ventilator-associated pneumonia account for roughly two-thirds of all HAIs.⁴

Patients who undergo dialysis or "hemodialysis" treatment (a treatment for patients with inadequate kidney function) also have an increased risk for an HAI. They are at high risk because this artificial process of getting rid of waste and unwanted water in the body requires frequent use of catheters or insertion of needles to access the bloodstream. Hemodialysis patients also have weakened immune systems, which increase their risk for infection. They also require frequent hospitalizations and surgery where they might acquire an infection.⁵

Another common HAI is caused by the bacteria *C. difficile*. Most *C. difficile* infections are connected with receiving medical care and taking antibiotics for long periods of time.⁶ Half of all hospital patients with *C. difficile* infections have the infection when admitted and may spread it within the facility.⁷ The most dangerous source of spread to others is patients with diarrhea.

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium that is resistant to many antibiotics and common in healthcare facilities. In the community, most MRSA infections are skin infections. In medical facilities, MRSA causes life-threatening bloodstream (or bacteremia) infections, pneumonia and surgical site infections. MRSA bacteremia infections reported by Utah acute care facilities are included in this report.

How are Utah HAI data collected?

Identifying HAIs requires an organized approach involving several different types of activity. It is important to determine whether infections are healthcare-associated or already present upon facility admission. Due to the concerns about deadly and costly HAIs, state regulation ([Rule 386-705, Epidemiology, Healthcare-Associated Infection](#)) requires the Utah Department of Health (UDOH) to collect and report data on HAIs.

Since 2008, acute care hospitals with intensive care units have submitted data directly to the UDOH for the annual HAI report; however, reporting facilities were not identified by name. In 2011, the Centers for Medicare and Medicaid Services (CMS) required acute healthcare facilities to report specific HAI data to the [National Healthcare Safety Network \(NHSN\)](#) for payment reimbursement. In 2012, [Utah Health Code Title 26, Chapter 6, Section 31, Public Reporting of Healthcare Associated Infections](#), was passed requiring the UDOH to: a) access and analyze facility-specific NHSN data required by CMS; b) publish an annual HAI report for the public in which facilities are identified by name; and c) conduct validation activities.

For an HAI to be publicly reported in Utah under Title 26, Chapter 6, Section 31, an HAI must meet CMS's specific reporting measures required for reporting to NHSN. The UDOH works with NHSN and other partners to monitor and prevent these infections because they are a significant threat to patient safety.

Facilities in Utah submit data about specific healthcare-associated infections (HAIs) to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN), a secure, online tracking system used by hospitals and other healthcare facilities. The Utah data are self-reported to NHSN by each facility that is required to report HAIs to CMS.

Interpreting HAI Data

Calculating Standardized Infection Ratios (SIRs)

The standardized infection ratio (SIR) is a summary statistic developed by NHSN used to track HAI prevention progress over time. Progress is measured at the national, state, local or facility level.

The SIR compares the *total* number of HAI events in a healthcare facility to the *predicted* number of HAI events, based on "standard population" data. For purposes of this report, the standard population data are HAI data reported nationally by thousands of facilities using NHSN. Facilities with small numbers of patients may not have enough HAI events to reliably compare to the standard population. SIRs for these facilities are not included. SIRs are also not included for dialysis facilities because a national baseline has not yet been established.

What does the SIR mean?

SIR Value	Interpretation
Less than 1	There were fewer infections reported in Utah in 2014 compared to the national baseline data, indicating progress has been made in preventing infections.
Equal to 1	There were about the same number of infections reported in Utah in 2014 compared to the national baseline data, indicating no progress has been made.
More than 1	There were more infections reported in Utah in 2014 compared to the national baseline data, indicating there has been an increase in infections.

A confidence interval (CI) is provided if an SIR was estimated for a given healthcare facility. The CI describes the uncertainty associated with the SIR estimate. Facilities with more device days or that perform more procedures will have narrower CIs, which means there is less doubt associated with the accuracy of their SIRs compared to facilities performing fewer procedures. This is because there is more information about a facility's performance with additional procedures. A 95% CI means that an SIR 95 times out of 100, the true value would be expected to fall within the range shown. When 1.0 is not included in the CI, this means that the SIR is "statistically significant." That is, there is sufficient information to conclusively state that the SIR is either more or less than the national baseline.

Actual values calculated for the SIR, along with confidence intervals, are found in Tables 1-10 in the Appendix.

Figures 1-10 summarize the SIR data, taking into account whether the SIR is meaningful statistically, using these icons:

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

Calculating Rates

When information for estimating a predicted number of events is not available, raw incidence rates are provided. An incidence rate is a summary measure developed by NHSN to track HAIs at the national, state, local or facility level over time, and describes how frequently HAIs occur within a specific period. This rate is calculated by taking the number of HAI events, dividing it by the total number of device days, and multiplying that by the desired time frame. Because healthcare facilities vary in size and patient mix, incidence rates should not be directly compared to others. A larger facility that treats more severe illnesses will naturally have a higher incidence rate, and consequently, is not indicative of the quality of care relative to other facilities. Overall incidence rates for the state are not given in this report, as NHSN does not provide these and they would not be comparable to other states.

Central Line-Associated Bloodstream Infections (CLABSIs)

A CLABSI is a serious infection that occurs when germs (usually bacteria) enter the bloodstream through an invasive device called a central line catheter. A catheter is a tube placed in a large vein in the neck, chest, or groin that ends at, or close to, the heart to give medication or fluids, collect blood for medical tests or monitor blood flow.



The risk of CLABSI in ICU patients is high. Reasons include the frequent insertion of multiple catheters, the use of specific types of catheters that are almost exclusively inserted in ICU patients and associated with substantial risk (e.g., pulmonary artery catheters with catheter introducers), and the fact that catheters are frequently placed in emergency circumstances, repeatedly accessed each day, and often needed for extended periods of time. Additionally, CLABSIs increase the length and cost of hospital stays. The non-inflation-adjusted attributable cost of CLABSIs varies from \$3,700 to \$39,000 per episode.⁹

CLABSI data for 2014 were reported by long-term acute care facilities and acute care facilities with intensive care units (ICUs). ICU types include trauma, respiratory, cardiac, medical, burn, pediatric, surgical, neonatal and neurosurgical.

In 2014, 38 adult and pediatric ICU-related CLABSIs were reported in Utah acute care facilities and associated with 48,183 central line catheter days. Compared to the national rate, patients in Utah acute care facilities had 61 percent fewer CLABSIs in 2014 than would have been predicted. Twenty-six acute care facilities met the criteria for required CLABSI reporting. Of these 26, ten facilities had infection rates not significantly different from what was expected nationally; of the remaining facilities, four facilities had significantly fewer infections compared to what was expected nationally. Twelve acute care facilities did not have enough central line catheter days to provide an accurate assessment of their performance ([Figure 1](#)).

Thirteen newborn ICU-related CLABSIs were reported in Utah acute care facilities and associated with 16,538 central line catheter days. Compared to the national rate, infants in Utah newborn intensive care areas from acute care facilities (NICUs) had 63 percent fewer CLABSIs in 2014 than would have been predicted. Thirteen NICUs met the criteria for required CLABSI reporting. Of these thirteen, four NICUs had infection rates not significantly different from what was expected nationally; of the remaining facilities, two facilities had significantly fewer infections compared to what was expected nationally. Seven NICUs did not have enough central line catheter days to provide an accurate assessment of their performance ([Figure 2](#)).

Two CLABSIs were reported in Utah long-term acute care facilities (LTAC) and associated with 13,519 central line catheter days. Compared to the national rate, patients in Utah LTACs had 84 percent fewer CLABSIs in 2014 than would have been predicted. Three LTACs met the criteria for required CLABSI reporting. Of these three, two LTACs had significantly fewer CLABSIs compared to what was expected nationally, and the remaining LTAC had infection rates not significantly different than what was expected nationally ([Figure 3](#)).

Figure 1. Central line-associated bloodstream infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014⁺

Hospital	CLABSIs
State of Utah	▼
Alta View Hospital	--
American Fork Hospital	--
Ashley Regional Medical Center	--
Cache Valley Specialty Hospital	--
Castleview Hospital	--
Davis Hospital and Medical Center	●
Dixie Regional Hospital	●
Intermountain Medical Center	▼
Jordan Valley Hospital	●
Jordan Valley Hospital West Valley Campus	●
Lakeview Hospital	--
LDS Hospital	●
Logan Regional Hospital	--
McKay-Dee Hospital	●
Mountain View Hospital	--
Mountain West Medical Center	--
Ogden Regional Medical Center	●
Primary Children's Hospital	▼
Riverton Hospital	--
Salt Lake Regional Medical Center	●
St. Mark's Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	--
University Health Care (includes Huntsman Cancer Institute)	▼
Utah Valley Regional Medical Center	▼
Valley View Medical Center	--

⁺Source: NHSN data

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population
- ** Data incomplete at the time of reporting

Figure 2. Central line-associated bloodstream infections in acute care facilities with newborn intensive care units, Utah, 2014⁺

Hospital	CLABSIs
State of Utah	▼
Ashley Regional Medical Center	--
Davis Hospital and Medical Center	--
Dixie Regional Hospital	--
Intermountain Medical Center	●
Jordan Valley Hospital	--
Logan Regional Hospital	--
McKay-Dee Hospital	●
Ogden Regional Medical Center	--
Primary Children's Hospital	●
St. Mark's Hospital	●
Timpanogos Regional Hospital	--
University Hospital	▼
Utah Valley Regional Medical Center	▼

⁺Source: NHSN data

Figure 3. Central line-associated bloodstream infections in long-term acute care facilities, Utah, 2014⁺

Hospital	CLABSIs
State of Utah	▼
Promise Hospital	▼
South Davis Community Hospital	●
Utah Valley Specialty Hospital	▼

⁺Source: NHSN data

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population

Catheter-Associated Urinary Tract Infections (CAUTIs)

A urinary tract infection (UTI) is an infection that can happen anywhere along the urinary tract, including the kidneys, ureters, urinary bladder, and the urethra. A UTI that occurs in a patient or resident with a catheter is known as a catheter-associated UTI (CAUTI).



CAUTI data for 2014 were reported by acute care facilities with intensive care units (ICU), long-term acute care facilities (LTAC) and inpatient rehabilitation facilities (IRF). Acute care ICU types include trauma, respiratory, cardiac, medical, burn, pediatric, surgical and neurosurgical. LTAC and IRF data include ICUs and wards.

In 2014, 187 ICU-related CAUTIs were reported in Utah acute care facilities and associated with 57,660 catheter days. Compared to the national rate, none of Utah's acute care facilities had fewer CAUTIs in 2014 than would have been predicted. Twenty-six facilities met the criteria for required CAUTI reporting. Of these 26, 15 acute care facilities had CAUTI rates not significantly different from expected national rates; two facilities had significantly higher infections compared to what was expected nationally. Nine acute care facilities did not have enough catheter days to provide an accurate assessment of their performance ([Figure 4](#)).



















Thirty-two CAUTIs were reported in Utah inpatient rehabilitation facilities (IRFs) and associated with 4,655 catheter days. Compared to the national rate, none of Utah's IRFs had fewer CAUTIs in 2014 than would have been predicted. Eleven IRFs met the criteria for required CAUTI reporting. Of these 11, one IRF had CAUTI rates not significantly different from expected national rates; four IRFs had significantly higher infections compared to what was expected nationally. Six IRFs did not have enough catheter days to provide an accurate assessment of their performance ([Figure 5](#)).

Nine CAUTIs were reported in Utah long-term acute care facilities (LTACs) and associated with 8,961 catheter days. Compared to the national rate, one of Utah's LTACs had fewer CAUTIs in 2014 than would have been predicted. Three facilities met the criteria for required CAUTI reporting. Two LTACs had CAUTI rates not significantly different to what was expected nationally ([Figure 6](#)).

The selection of healthcare-associated infection validation activities are guided by the UHIP GC. Because Utah healthcare facilities continue to have higher numbers of catheter-associated urinary tract infections than expected, CAUTIs have been targeted for validation. UDOH continues to work with healthcare facilities to implement prevention strategies for reducing CAUTI infections. Many facilities throughout the state are implementing strategies to prevent CAUTI. The UDOH Healthcare-Associated Infections Prevention Program performed validation

audits of 2014 CAUTI submitted by eleven acute care facilities. Most of these facilities implemented CAUTI prevention strategies during 2014. All of these facilities evaluated patient's clinical need for a urinary catheter at least daily. Ninety-one percent of these facilities provided education regarding CAUTI prevention to their healthcare workers, including non-nursing staff, such as technicians, orderlies, and physical therapists. At least a third (36%) of audited facilities implemented other CAUTI prevention strategies, that included participation of facility healthcare workers on a CAUTI reduction team; only allowing insertion of urinary catheters by health care workers deemed competent to perform this task; utilizing a nurse-driven urinary catheter removal protocol; reporting facility CAUTI rates to facility administrators and care providers; and investigating the root cause for each CAUTI.

Figure 4. Catheter-associated urinary tract infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014⁺

Hospital	CAUTIs
State of Utah	
Alta View Hospital	--
American Fork Hospital	--
Ashley Regional Medical Center	--
Cache Valley Specialty Hospital	--
Castleview Hospital	--
Davis Hospital and Medical Center	
Dixie Regional Hospital	
Intermountain Medical Center	
Jordan Valley Hospital	
Jordan Valley Hospital West Valley Campus	
Lakeview Hospital	
LDS Hospital	
Logan Regional Hospital	
McKay-Dee Hospital	
Mountain View Hospital	
Mountain West Medical Center	--
Ogden Regional Medical Center	
Primary Children's Hospital	
Riverton Hospital	--
Salt Lake Regional Medical Center	
St. Mark's Hospital	
Timpanogos Regional Hospital	
Uintah Basin Medical Center	--
University Health Care (includes Huntsman Cancer Institute)	
Utah Valley Regional Medical Center	
Valley View Medical Center	--

⁺Source: NHSN data














-  Statistically **FEWER** infections than national baseline
-  Not statistically different from national baseline
-  Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population

Figure 5. Catheter-associated urinary tract infections in rehabilitation facilities, Utah, 2014⁺




Hospital	CAUTIs
State of Utah	
Davis Hospital and Medical Center	--
Dixie Regional Medical Center	
Health South Rehabilitation Hospital of Utah	
Intermountain Medical Center	
Jordan Valley Hospital	--
McKay Dee Hospital	--
Northern Utah Rehabilitation Hospital	--
Salt Lake Regional Medical Center	--
St. Mark's Hospital	--
University Hospital	
Utah Valley Regional Medical Center	

⁺Source: NHSN data

Figure 6. Catheter-associated urinary tract infections in long-term acute care facilities, Utah, 2014⁺

Hospital	CAUTIs
State of Utah	
Promise Hospital	
South Davis Community Hospital	
Utah Valley Specialty Hospital	

⁺Source: NHSN data

-  Statistically **FEWER** infections than national baseline
-  Not statistically different from national baseline
-  Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population

Surgical Site Infections (SSIs)

A surgical site infection is an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections are the most common and most costly HAI in the United States (160,000-300,000 SSIs per year).¹⁰ The two SSI types required for reporting in Utah are those following colon surgeries and abdominal hysterectomy surgeries.

Colon Surgeries



























Colon surgery is an operation performed on the large intestine. The colon (the large bowel or large intestine) is the tube-like part of the digestive tract that stores stool and pushes it out from the body. Colon surgery is often the main treatment for earlier stage colon cancers. It is also performed to repair damage to the colon or treat diseases such as diverticulitis and inflammatory bowel disease.

Colon surgical data for 2014 were reported only by acute care facilities.

In 2014, 150 SSIs associated with colon surgeries were reported in Utah and associated with 2,060 colon surgeries. Compared to the national rate, one Utah facility had fewer SSIs associated with colon surgeries in 2014 than would have been predicted. Thirty-two facilities met the criteria for required reporting of SSIs associated with colon surgeries. Of these 32, 17 facilities had infection rates not statistically significant from what was expected nationally; four facilities had significantly higher infection rates. Ten facilities did not have enough data to provide an accurate assessment of their performance ([Figure 7](#)).

The selection of healthcare-associated infection validation activities are guided by the UHIP GC. Because colon surgeries continue to have higher than expected infections in Utah, colon surgeries may be targeted for validations in the future. UDOH continues to work with healthcare facilities to implement prevention strategies for reducing surgical site infections associated with colon surgeries by disseminating evidence based recommended practices. The UDOH HAI Program continues to provide educational opportunities with regard to correctly applying NHSN definitions when performing colon surgical site infection surveillance.

Figure 7. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2014⁺

Hospital	Colon SSIs	
State of Utah		
Alta View Hospital		
American Fork Hospital		
Ashley Regional Medical Center	--	
Bear River Valley Hospital	--	
Brigham City Community Hospital	--	
Cache Valley Specialty Hospital	--	
Castleview Hospital		
Davis Hospital and Medical Center		
Dixie Regional Hospital		
Garfield Memorial Hospital	*	
Intermountain Medical Center		 Statistically FEWER infections than national baseline
Jordan Valley Hospital		 Not statistically different from national baseline
Jordan Valley Hospital West Valley Campus		 Statistically MORE infections than national baseline
Lakeview Hospital		
LDS Hospital		
Logan Regional Hospital		
Lone Peak Hospital	--	-- Facilities had insufficient data to reliably compare their data to the standard population
McKay-Dee Hospital		
Mountain View Hospital		
Mountain West Medical Center	--	* Not required to report to CMS
Ogden Regional Medical Center		
Orem Community Hospital	*	
Park City Medical Center	--	
Primary Children's Hospital		
Riverton Hospital		
Salt Lake Regional Medical Center		
Sevier Valley Medical Center	--	
Shriners Hospitals for Children	*	
St. Mark's Hospital		
The Orthopedic Specialty Hospital (TOSH)	*	
Timpanogos Regional Hospital		
Uintah Basin Medical Center	--	
University Hospital (includes Huntsman Cancer Institute)		
Utah Valley Regional Medical Center		
Valley View Medical Center		
Veterans Administration Hospital	*	

⁺Source: NHSN data












Abdominal Hysterectomy Surgeries


An abdominal hysterectomy is a surgical procedure in which the uterus is detached from the body through an abdominal incision. This operation is most commonly used when the uterus is enlarged, the ovaries and fallopian tubes are being removed, or when disease has spread to the pelvic cavity as in endometriosis or cancer. The most common complications following a hysterectomy are fever and infection.


Abdominal hysterectomy surgical data for 2014 were reported only by acute care facilities.


In 2014, 43 SSIs associated with abdominal hysterectomies were reported in Utah and associated with 2,859 abdominal hysterectomy surgeries. Compared to the national rate, two of the Utah facilities had fewer SSIs associated with abdominal hysterectomies in 2014 than would have been predicted. Thirty-one facilities met the criteria for required reporting of SSIs associated with abdominal hysterectomies. Of these 31, seven facilities had infection rates not statistically significant from what was expected nationally; one facility had significantly higher infections compared to what was expected nationally. Two facilities had significantly fewer infections than what was expected nationally. Twenty-one facilities did not have enough data to provide an accurate assessment of their performance ([Figure 8](#)).

Figure 8. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2014⁺

Hospital	Abdominal hysterectomy SSIs
State of Utah	
Alta View Hospital	
American Fork Hospital	--
Ashley Regional Medical Center	--
Bear River Valley Hospital	--
Brigham City Community Hospital	--
Cache Valley Specialty Hospital	--
Castleview Hospital	--
Davis Hospital and Medical Center	--
Dixie Regional Medical Center	--
Garfield Memorial Hospital	*
Intermountain Medical Center	
Jordan Valley Hospital	--
Jordan Valley Hospital West Valley Campus	--
Lakeview Hospital	--
LDS Hospital	
Logan Regional Hospital	--
Lone Peak Hospital	--
McKay-Dee Hospital	
Mountain View Hospital	--
Mountain West Medical Center	--
Ogden Regional Medical Center	
Orem Community Hospital	--
Park City Medical Center	--
Primary Children's Hospital	--
Riverton Hospital	
Salt Lake Regional Medical Center	--
Sevier Valley Medical Center	--
Shriners Hospitals for Children	*
St. Mark's Hospital	
The Orthopedic Specialty Hospital (TOSH)	*
Timpanogos Regional Hospital	
Uintah Basin Medical Center	--
University Hospital (includes Huntsman Cancer Institute)	
Utah Valley Regional Medical Center	
Valley View Medical Center	--
Veterans Administration Hospital	*

 Statistically **FEWER** infections than national baseline

 Not statistically different from national baseline

 Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

⁺Source: NHSN data

***C. difficile* Infections**

Most cases of *C. difficile* infections occur in patients taking antibiotics. The elderly and people with certain medical problems have the greatest chance of acquiring *C. difficile*. *C. difficile* 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. difficile* infections can spread from person to person on contaminated equipment and on the hands of doctors, nurses, other healthcare providers and visitors.



C. difficile causes at least 250,000 hospitalizations and 14,000 deaths every year, and was recently categorized by CDC as an urgent threat to patient safety.⁷

In 2014, 502 hospital onset *C. difficile* infections were reported in Utah acute care facilities. Compared to the national rate, five of the Utah facilities had fewer *C. difficile* infections in 2014 than would have been predicted. Thirty-five facilities met the criteria for required reporting of *C. difficile* infections. Of these thirty-five, 25 facilities had infection rates not statistically significant from what was expected nationally. One facility had significantly higher infections compared to what was expected nationally. Four facilities did not have enough data to provide an accurate assessment of their performance ([Figure 9](#)).

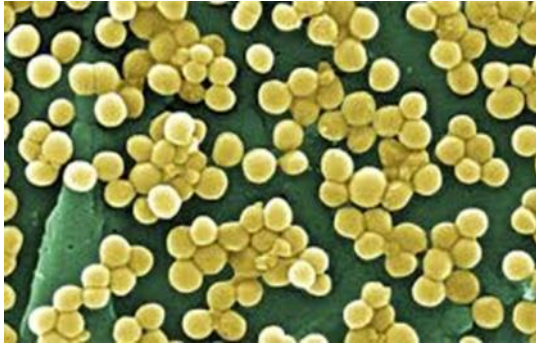
Figure 9. *C. difficile* infections in acute care facilities, Utah, 2014⁺

Hospital	<i>C. difficile</i>
State of Utah	▼
Alta View Hospital	●
American Fork Hospital	●
Ashley Regional Medical Center	●
Bear River Valley Hospital	--
Beaver Valley Hospital	--
Brigham City Community Hospital	●
Cache Valley Specialty Hospital	--
Castleview Hospital	●
Davis Hospital and Medical Center	●
Dixie Regional Medical Center	▼
Garfield Memorial Hospital	--
Intermountain Medical Center	▼
Jordan Valley Hospital	●
Jordan Valley Hospital West Valley Campus	●
Lakeview Hospital	●
LDS Hospital	●
Logan Regional Hospital	▼
Lone Peak Hospital	●
McKay-Dee Hospital	▼
Mountain View Hospital	●
Mountain West Medical Center	●
Ogden Regional Medical Center	●
Orem Community Hospital	●
Park City Medical Center	●
Primary Children's Hospital	●
Riverton Hospital	▼
Salt Lake Regional Medical Center	▲
Sevier Valley Medical Center	●
Shriners Hospitals for Children	*
St. Mark's Hospital	●
The Orthopedic Specialty Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	●
University Health Care (includes Huntsman Cancer Institute)	●
Utah Valley Regional Medical Center	●
Valley View Medical Center	●
Veterans Administration Hospital	*

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population
- * Not required to report to CMS

⁺Source: NHSN data

Methicillin-resistant *Staphylococcus aureus* (MRSA) Bacteremia Infections














MRSA is usually spread by direct contact with an infected wound or from contaminated hands, usually those of health care providers. Bacteremia occurs when bacteria enter the bloodstream. This may occur through a wound or infection, or through a surgical procedure or injection. Bacteremia may cause no symptoms and resolve without treatment, or it may produce fever and other symptoms of infection. In some cases, bacteremia leads to septic shock, a potentially life-threatening condition.

Some studies comparing patients with Methicillin-sensitive *Staphylococcus aureus* (MSSA) bacteremia to those with MRSA bacteremia have reported nearly twice the mortality rate, significantly longer hospital stays, and significantly higher median hospital costs for MRSA.¹¹

In 2014, 36 MRSA bacteremia infections were reported in Utah. Compared to the national rate, one of the Utah facilities had fewer MRSA bacteremia infections in 2014 than would have been predicted. Thirty-five facilities met the criteria for required reporting of MRSA bacteremia infections. Of these 35, nine facilities had infection rates not statistically significant from what was expected nationally. Twenty-five facilities did not have enough data to provide an accurate assessment of their performance. ([Figure 10](#)).

Figure 10. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2014⁺

Hospital	MRSA	
State of Utah		Statistically FEWER infections than national baseline
Alta View Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
American Fork Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Ashley Regional Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Bear River Valley Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Beaver Valley Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Brigham City Community Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Cache Valley Specialty Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Castleview Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Davis Hospital and Medical Center		Not statistically different from national rate
Dixie Regional Medical Center		Not statistically different from national rate
Garfield Memorial Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Intermountain Medical Center		Not statistically different from national rate
Jordan Valley Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Jordan Valley Hospital West Valley Campus	--	Facilities had insufficient data to reliably compare their data to the standard population
Lakeview Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
LDS Hospital		Not statistically different from national rate
Logan Regional Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Lone Peak Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
McKay-Dee Hospital		Not statistically different from national rate
Mountain View Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Mountain West Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Ogden Regional Medical Center		Not statistically different from national rate
Orem Community Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Park City Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Primary Children's Hospital		Not statistically different from national rate
Riverton Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Salt Lake Regional Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Sevier Valley Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Shriners Hospitals for Children	*	Not required to report to CMS
St. Mark's Hospital		Not statistically different from national rate
The Orthopedic Specialty Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Timpanogos Regional Hospital	--	Facilities had insufficient data to reliably compare their data to the standard population
Uintah Basin Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
University Hospital (includes Huntsman Cancer Institute)		Statistically FEWER infections than national baseline
Utah Valley Regional Medical Center		Not statistically different from national rate
Valley View Medical Center	--	Facilities had insufficient data to reliably compare their data to the standard population
Veteran Administration Hospital	*	Not required to report to CMS

⁺Source: NHSN data

Dialysis Infection Events

The kidneys perform several critical functions. They clean blood, remove excess fluid from the body, and produce hormones needed for other important bodily functions. When the kidneys are unable to perform these functions, they can fail, resulting in the need for hemodialysis, the process of filtering the waste products collected in the blood. Bloodstream and other types of infections are a leading cause of death among hemodialysis patients, second only to vascular disease.

Dialysis facilities are required to report the number of patients requiring initiation of intravenous antimicrobial therapy, the number of patients with laboratory results indicating infection in their bloodstream, and patients with signs and symptoms of vascular access infections (i.e., redness, swelling and/or pus), as well as an estimated number of patients at risk for these events.

In 2014, 37 outpatient dialysis facilities in Utah met the criteria for required reporting. There are currently insufficient data to establish a national comparison. When there is sufficient information that can be deemed reliable, it will be contained in future reports.

Data Quality Validation

Background

Validation audits were completed during 2015 based upon recommendations made by the Utah Healthcare Infection Prevention Governance Committee. The focus of the validation was to determine how NHSN CAUTI standards were interpreted and applied to data collection. The validations, conducted by UDOH HAI Prevention Program staff, were performed in 11 facilities throughout Utah. These facilities were randomly selected based on their 2014 CAUTI rates being higher or lower than the expected range of events for their facility type when compared to the national NHSN benchmark.

Validation activities are intended to compare reported information with audit findings and outcomes to enhance accuracy and completeness of CAUTI reporting. A standardized validation method was chosen to serve as a test of proficiency in surveillance methods and accuracy in case findings. A targeted sample of medical records of adult patients who had positive urine cultures during their 2014 ICU stay were validated; this approach was one of several recommended by the NHSN.

Procedure

A full day on-site medical record audit was conducted at targeted facilities May through July 2015. An interview with infection prevention and control staff preceded the audit to determine surveillance methodology, risk adjustment variables such as appropriate patient care location mapping, modifications to/implementation of electronic medical record systems and ability to track candidate CAUTI events. In each facility, a sample size of up to 20 NHSN reported CAUTI cases were reviewed. Additionally, 30 charts of patients with positive urine cultures during their ICU stay were reviewed to determine if any reportable infections were missed. A standardized audit tool developed by the CDC was used. Results of the validation findings were reviewed with the facility to provide immediate onsite education to improve HAI surveillance and reporting. Facilities were expected to correct data in NHSN based on validation findings.

Validation Key Findings

The accuracy and completeness of HAI surveillance and reporting can be calculated. These findings include sensitivity, specificity, and positive predictive value (PPV). Sensitivity answers the question, "How likely are patients with an infection accurately identified as having an infection?" Specificity answers the question, "How likely are patients without an infection accurately identified as not having an infection?" The PPV is the proportion of HAIs reported that met the surveillance criteria accurately.

UDOH auditors reviewed 276 positive urine cultures for CAUTI validation from 11 facilities. From these urine cultures, auditors identified 155 CAUTIs meeting 2014 NHSN criteria. These CAUTI matched CAUTI events that facilities had identified and reported. The positive predictive value reveals that the surveillance performed in these 11 facilities identified CAUTIs meeting the NHSN CAUTI surveillance criteria 100% of the time.

For the other 121 positive urine cultures identified as not meeting CAUTI surveillance criteria reviewed in these 11 facilities, the auditors identified five additional CAUTIs. The calculated sensitivity reveals that routine surveillance identified 94% of the CAUTIs occurring. The calculated specificity reveals surveillance accurately “ruled out” CAUTIs 99% of the time.

It should be noted that results from these 11 facilities may not be generalized to all facilities in the state. Also, because the audit sample was targeted and unweighted, aggregate findings are not necessarily indicative of NHSN data quality throughout the state.

Conclusions

Validation results indicate that variability among audited facilities performing CAUTI surveillance has narrowed, as compared to previous year CAUTI validation findings.

Overall, UDOH auditors were very well received by the 11 facilities, and several healthcare systems invited the auditors to conduct validations for additional HAIs. Due to lack of resources and staffing, current validation activities are limited in scope and these requests could not be accommodated. Most infection preventionists from the 11 audited facilities expressed appreciation for data validation and education that occurred during the on-site visit to their facility. Eighty-two percent of audited infection preventionists had received education regarding 2014 CAUTI NHSN surveillance definitions available from the CDC or UDOH HAI Program. Surveillance challenges, as expressed by audited infection preventionists, included competing time demands resulting in limited time dedicated for surveillance activities, and difficulty accessing clinical data points. Audited facilities averaged 0.67 of an infection preventionist per 100 acute hospital beds. Thirty-six percent of the eleven audited facilities are served by an infection preventionist certified by the Certification Board of Infection Control and Epidemiology, Inc.

Validation results demonstrate the need for a robust validation program to improve accuracy in all HAI reporting. It is important to determine whether infections are healthcare-associated or already present upon facility admission in order to implement appropriate infection prevention measures. Accurate HAI data supports facilities’ efforts to implement effective infection prevention strategies.

Healthcare-associated Infections by Hospitals Reporting to NHSN



Alta View Hospital

Location: Salt Lake County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy ●

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

American Fork Hospital

Location: Utah County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Ashley Regional Medical Center

Location: Uintah County

CAUTI

Intensive care --

CLABSI

Intensive care --

Newborn intensive care --

C. difficile infection

Hospital onset 

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery --

 Statistically **FEWER** infections than national baseline

 Not statistically different from national baseline

 Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Bear River Valley Hospital

Location: Box Elder County

C. difficile infection

Hospital onset --

MRSA bacteremia

SSI --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Beaver Valley Hospital

Location: Beaver County

C. difficile infection

Hospital onset --

MRSA bacteremia --

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population
- * Not required to report to CMS

Source: NHSN

Brigham City Community Hospital

Location: Box Elder County

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

Colon surgery --

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population
- * Not required to report to CMS

Source: NHSN

Cache Valley Hospital

Location: Cache County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset --

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Castleview Hospital

Location: Carbon County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Davis Hospital and Medical Center

Location: Davis County

CAUTI

Intensive care	●
Inpatient rehabilitation	--

CLABSI

Intensive care	●
Newborn intensive care	--

C. difficile infection

Hospital onset	●
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	--
Colon surgery	●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Dixie Regional Medical Center

Location: Washington County

CAUTI

Intensive care	●
Inpatient rehabilitation	●

CLABSI

Intensive care	●
Newborn intensive care	--

C. difficile infection

Hospital onset	▼
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	--
Colon surgery	●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Garfield Memorial Hospital

Location: Garfield County

C. difficile infection

Hospital onset --

MRSA bacteremia --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Intermountain Medical Center

Location: Salt Lake County

CAUTI

Intensive care	▲
Inpatient rehabilitation	▲

CLABSI

Intensive care	▼
Newborn intensive care	●

C. difficile infection

Hospital onset	▼
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	●
Colon surgery	●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Jordan Valley Medical Center

Location: Salt Lake County

CAUTI

Intensive care ●

Inpatient rehabilitation --

CLABSI

Intensive care ●

Newborn intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Jordan Valley Medical Center West Valley Campus

Location: Salt Lake County

CAUTI

Intensive care ●

CLABSI

Intensive care ●

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ▲

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Lakeview Hospital

Location: Davis County

CAUTI

Intensive care ●

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

LDS Hospital

Location: Salt Lake County

CAUTI

Intensive care ●

CLABSI

Intensive care ●

C. difficile infection

Hospital onset ●

MRSA bacteremia

●

SSI

Abdominal hysterectomy ▲

Colon surgery ▲

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Logan Regional Hospital

Location: Cache County

CAUTI

Intensive care ●

CLABSI

Intensive care --

Newborn intensive care --

C. difficile infection

Hospital onset ▼

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Lone Peak Hospital

Location: Salt Lake County

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

McKay Dee Hospital

Location: Weber County

CAUTI

Intensive care	▲
Inpatient rehabilitation	--

CLABSI

Intensive care	●
Newborn intensive care	●

C. difficile infection

Hospital onset	▼
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	●
Colon surgery	▲

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Mountain View Hospital

Location: Utah County

CAUTI

Intensive care ●

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Mountain West Medical Center

Location: Tooele County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Ogden Regional Medical Center

Location: Weber County

CAUTI

Intensive care ●

CLABSI

Intensive care ●

Newborn intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

●

SSI

Abdominal hysterectomy ▼

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Orem Community Hospital

Location: Utah County

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Park City Medical Center

Location: Summit County

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Primary Children’s Hospital

Location: Salt Lake County

CAUTI

Intensive care ●

CLABSI

Intensive care ▼

Newborn intensive care ●

C. difficile infection

Hospital onset ●

MRSA bacteremia

●

SSI

Abdominal hysterectomy --

Colon surgery ▼

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Riverton Hospital

Location: Salt Lake County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ▼

MRSA bacteremia

--

SSI

Abdominal hysterectomy ●

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Salt Lake Regional Medical Center

Location: Salt Lake County

CAUTI

Intensive care	●
Inpatient rehabilitation	--

CLABSI

Intensive care	●
----------------	---

C. difficile infection

Hospital onset	▲
----------------	---

MRSA bacteremia

--

SSI

Abdominal hysterectomy	--
Colon surgery	●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Sevier Valley Medical Center

Location: Sevier County

C. difficile infection

Hospital onset ●

MRSA bacteremia --

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

St. Mark's Hospital

Location: Salt Lake County

CAUTI

Intensive care	●
Inpatient rehabilitation	--

CLABSI

Intensive care	●
Newborn intensive care	●

C. difficile infection

Hospital onset	●
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	▼
Colon surgery	●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

The Orthopedic Specialty Hospital

Location: Salt Lake County

C. difficile infection

Hospital onset



MRSA bacteremia

--

- ▼ Statistically **FEWER** infections than national baseline
- Not statistically different from national baseline
- ▲ Statistically **MORE** infections than national baseline
- Facilities had insufficient data to reliably compare their data to the standard population
- * Not required to report to CMS

Source: NHSN

Timpanogos Regional Hospital

Location: Utah County

CAUTI

Intensive care ●

CLABSI

Intensive care ●

Newborn intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy ●

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Uintah Basin Medical Center

Location: Duchesne County


CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset 

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery --

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

University Hospital

Includes Huntsman Cancer Institute

Location: Salt Lake County

CAUTI

Intensive care	●
Inpatient rehabilitation	▲

CLABSI

Intensive care	▼
Newborn intensive care	▼

C. difficile infection

Hospital onset	●
----------------	---

MRSA bacteremia



SSI

Abdominal hysterectomy	●
Colon surgery	▲

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Utah Valley Regional Medical Center

Location: Utah County

CAUTI

Intensive care 

Inpatient rehabilitation 

CLABSI

Intensive care 

Newborn intensive care 

C. difficile infection

Hospital onset 

MRSA bacteremia 

SSI

Abdominal hysterectomy 

Colon surgery 

 Statistically **FEWER** infections than national baseline

 Not statistically different from national baseline

 Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Valley View Medical Center

Location: Salt Lake County

CAUTI

Intensive care --

CLABSI

Intensive care --

C. difficile infection

Hospital onset ●

MRSA bacteremia

--

SSI

Abdominal hysterectomy --

Colon surgery ●

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national baseline

▲ Statistically **MORE** infections than national baseline

-- Facilities had insufficient data to reliably compare their data to the standard population

* Not required to report to CMS

Source: NHSN

Appendix A

Understanding CLABSI and CAUTI Standardized Infection Ratio Data in Acute Care Facilities with Intensive Care Units

The device infection event tables depict specific device-associated infections (central line-associated bloodstream infections [CLABSI] or catheter-associated urinary tract infections [CAUTI]) reported by acute care facilities within their intensive care units.

To understand the HAI report, it is important to know the meaning of each of the data elements in the table. Below is an example of a fictitious hospital's data. Each column is numbered and provides an explanation of each data element and its result.

Table A. Device infection events in acute care facilities with intensive care units, Utah, 2014

	Number of HAI device days ¹	Number of HAI device events ²	Predicted number of HAI device events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	#	#	#	#	#
Facility A	5,817	8	13	.62	0.26-1.21
1	2	3	4	5	6

1. Acute care facilities (hospitals) with intensive care units (ICU) are listed here by name (Facility A).
2. For each reporting facility listed, patients in ICUs with central line catheters/urinary catheters (devices) are identified every day. A device count is performed at the same time each day. Each patient with one or more central line catheters at the time the count is performed is counted as having one device day. Each patient with a urinary catheter at the time the count is performed is counted as having one device day. For example, a patient with one or more central line catheters and one urinary catheter would be counted as having one central line day and one urinary catheter day. The number of device days in this column (5,817) represents the total number of specific device days for all patients who were in Facility A's intensive care unit(s) during the year.
3. When a patient develops an HAI device-associated infection while having a device in place or within one day after removal of the device, the infection is considered a device-associated HAI if it meets the criteria set forth by NHSN. The number of HAI events in this column (8) represents the total number of specific HAIs identified in patients in Facility A's intensive care units during the year.
4. The predicted number of HAI device events is adjusted to allow facilities to be more fairly compared. Risk adjustments account for differences in patient populations in terms of severity of illness and other factors that may affect the risk of developing an HAI. A facility that uses many devices on very sick patients would be predicted to have a higher device infection rate than a facility that uses fewer devices and has healthier patients. The predicted number of HAI device events for Facility A, based on comparison to a national HAI benchmark of similar hospitals, is calculated as 13.

5. The standardized infection ratio (SIR) is a summary measure developed by NHSN to track HAIs at the national, state, local or facility level over time. The SIR compares the *total* number of HAI device events for Facility A (8) to the *predicted* number of HAI device events (13), based on “standard population” data. For purposes of this report, the standard population is HAI data reported nationally by thousands of facilities using NHSN. The SIR for Facility A, based on comparison to a national HAI benchmark of facilities that are similar to Facility A, is calculated as 0.62. Facilities with a predicted number of HAI events less than one do not have enough device day data to reliably compare their data to the standard population. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.
6. A confidence interval (CI) will be provided if an SIR was estimated for a given healthcare facility. A CI describes the uncertainty associated with the SIR estimate. Facilities with more device days will have a narrower CI, which means there is less doubt associated with the accuracy of the SIR compared to facilities with fewer device days. This is because there is more information about a facility's performance with additional device days. A 95% CI means that 95 times out of 100, the true value would be expected to fall within the range shown.

Table 1. Central line-associated bloodstream infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014[†]

	Number of central line days ¹	Number of CLABSI events ²	Predicted number of CLABSI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	48,183	38	97.06	0.39	0.28-0.53
Alta View Hospital	221	1	0.33	N/A±	N/A±
American Fork Hospital	656	0	0.98	N/A±	N/A±
Ashley Regional Medical Center	39	0	0.06	N/A±	N/A±
Cache Valley Hospital	13	0	0.02	N/A±	N/A±
Castleview Hospital	19	0	0.03	N/A±	N/A±
Davis Hospital & Medical Center	860	2	1.29	1.55	0.26 - 5.12
Dixie Regional Medical Center	3,280	1	4.92	0.20	0.01 - 1.00
Intermountain Medical Center	8,844	10	20.27	0.49	0.25 - 0.88
Jordan Valley Hospital	831	0	1.25	0.00	0 - 2.40
Jordan Valley Hospital West Valley Campus	800	0	1.20	0.00	0 - 2.50
Lakeview Hospital	513	0	0.77	N/A±	N/A±
LDS Hospital	1,296	0	1.94	0.00	0 - 1.54
Logan Regional Hospital	400	0	0.76	N/A±	N/A±
McKay Dee Hospital	2,121	4	3.18	1.26	0.40 - 3.03
Mountain View Hospital	632	0	0.95	N/A±	N/A±
Mountain West Medical Center	78	0	0.15	N/A±	N/A±
Ogden Regional Medical Center	1,492	1	2.24	0.45	0.02 - 2.20
Primary Children's Hospital	3,318	3	10.51	0.29	0.07 - 0.78
Riverton Hospital	65	0	0.10	N/A±	N/A±
Salt Lake Regional Medical Center	1,781	2	2.67	0.75	0.13 - 2.47
St. Mark's Hospital	2,162	2	3.24	0.62	0.10 - 2.04
Timpanogos Regional Hospital	815	1	1.55	0.65	0.03 - 3.19
Uintah Basin Medical Center	64	0	0.10	N/A±	N/A±
University Hospital [§]	9,956	11	25.55	0.43	0.23 - 0.75
Utah Valley Regional Medical Center	7,713	0	12.60	0.00	0 - 0.24
Valley View Medical Center	214	0	0.41	N/A±	N/A±

[†]Source: NHSN data.

[§]Includes Huntsman Cancer Institute.

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of central line days: The total number of days that a patient has a central line.

²Number of CLABSI events: The total number of central line-associated bloodstream infections reported per year.

³Predicted number of central line-associated bloodstream infection events: The number of central line-associated bloodstream infection events anticipated to occur based on historical data of comparable ICUs.

⁴Standardized Infection Ratio: Compares the total number of central line-associated bloodstream infection events in a hospital's ICU to a national benchmark. Rates are adjusted based on the type and size of a hospital or ICU.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 2. Central line-associated bloodstream infections in acute care facilities with newborn intensive care units, Utah, 2014⁺

	Number of central line days ¹	Number of CLABSI events ²	Predicted number of CLABSI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	16,538	13	34.74	0.37	0.21 - 0.62
Ashley Regional Medical Center	13	0	0.02	N/A±	N/A±
Davis Hospital & Medical Center	150	0	0.31	N/A±	N/A±
Dixie Regional Medical Center	393	0	0.77	N/A±	N/A±
Intermountain Medical Center	2,074	2	4.53	0.44	0.07 - 1.46
Jordan Valley Hospital	434	0	0.58	N/A±	N/A±
Logan Regional Hospital	109	0	0.14	N/A±	N/A±
McKay Dee Hospital	798	0	2.28	0.00	0 - 1.31
Ogden Regional Medical Center	212	0	0.34	N/A±	N/A±
Primary Children's Hospital	6,334	9	12.56	0.72	0.35 - 1.32
St. Mark's Hospital	836	2	1.83	1.09	0.18 - 3.60
Timpanogos Regional Hospital	571	0	0.83	N/A±	N/A±
University Hospital [§]	1,795	0	4.50	0.00	0 - 0.667
Utah Valley Regional Medical Center	2,819	0	6.06	0.00	0 - 0.49

⁺Source: NHSN data.

[§]Includes Huntsman Cancer Institute

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of central line days: The total number of days that a patient has a central line.

²Number of central line-associated bloodstream infection events: The total number of central line-associated bloodstream infections reported per year.

³Predicted number of central line-associated bloodstream infection events: The number of central line-associated bloodstream infection events anticipated to occur based on historical data of comparable ICUs.

⁴Standardized Infection Ratio: Compares the total number of central line-associated bloodstream infection events in a hospital's ICU to a national benchmark. Rates are adjusted based on the type and size of a hospital or ICU.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 3. Catheter-associated urinary tract infections in acute care facilities with adult and pediatric intensive care units, Utah, 2014⁺

	Number of catheter days ¹	Number of CAUTI events ²	Predicted number of CAUTI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval
State of Utah	57,660	187	115.80	1.62	1.40 - 1.86
Alta View Hospital	401	0	0.52	N/A±	N/A±
American Fork Hospital	636	0	0.83	N/A±	N/A±
Ashley Regional Medical Center	166	0	0.22	N/A±	N/A±
Cache Valley Hospital	12	0	0.02	N/A±	N/A±
Castleview Hospital	111	0	0.14	N/A±	N/A±
Davis Hospital & Medical Center	1,274	2	1.66	1.21	0.20 - 3.99
Dixie Regional Medical Center	4,146	4	4.98	0.80	0.26 - 1.94
Intermountain Medical Center	10,674	76	30.13	2.52	2.00 - 3.14
Jordan Valley Hospital	1,257	1	1.51	0.66	0.03 - 3.27
Jordan Valley Hospital West Valley Campus	1,421	0	1.85	0.00	0 - 1.62
Lakeview Hospital	794	3	1.03	2.91	0.74 - 7.91
LDS Hospital	1,615	5	1.94	2.58	0.95 - 5.72
Logan Regional Hospital	691	0	1.38	0.00	0 - 2.168
McKay Dee Hospital	2,968	9	3.56	2.53	1.23 - 4.64
Mountain View Hospital	818	2	1.06	1.88	0.32 - 6.21
Mountain West Medical Center	206	0	0.41	N/A±	N/A±
Ogden Regional Medical Center	1,401	4	1.82	2.20	0.70 - 5.30
Primary Children's Hospital	1,228	6	3.38	1.77	0.72 - 3.69
Riverton Hospital	180	0	0.23	N/A±	N/A±
Salt Lake Regional Medical Center	1,749	2	2.10	0.95	0.16 - 3.14
St. Mark's Hospital	3,511	6	4.21	1.42	0.58 - 2.96
Timpanogos Regional Hospital	724	1	1.45	0.69	0.04 - 3.41
Uintah Basin Medical Center	121	0	0.16	N/A±	N/A±
University Hospital [§]	12,122	44	36.19	1.22	0.90 - 1.62
Utah Valley Regional Medical Center	9,076	22	14.31	1.54	0.99 - 2.29
Valley View Medical Center	358	0	0.72	N/A±	N/A±

⁺Source: NHSN data.

[§]Includes Huntsman Cancer Institute.

^{*}SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of catheter days: The total number of days that a patient has a urinary catheter.

²Number of CAUTI events: The total number of catheter-associated urinary tract infections reported per year.

³Predicted number of CAUTI events: The number of catheter-associated urinary tract infections anticipated to occur based on historical data of comparable ICUs.

⁴Standardized Infection Ratio: Compares the total number of catheter-associated urinary tract infections in a hospital's ICU to a national benchmark. Rates are adjusted based on the type and size of a hospital or ICU.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Appendix B

Understanding Surgical Site Infection (SSI) Data in Acute Care Facilities

SSI events depict infections associated with specific surgical procedures, colon and abdominal hysterectomy surgeries, reported by acute care facilities.

In order to understand the HAI report, it is important to know what each of the table's data elements mean. Below is an example of a fictitious hospital's data. Each column is numbered and provides an explanation of each data element and its result.

Table B. Surgical site infection events in acute care facilities, Utah, 2014

	Number of surgical procedures	Number of SSI events	Predicted number of SSI events	Standardized Infection Ratio	95% Confidence Interval
State of Utah	#	#	#	#	#
Facility B	5,817	8	13	.62	0.26-1.21
1	2	3	4	5	6

1. Only acute care facilities (hospitals) performing colon and abdominal hysterectomy surgical procedures are listed here by name (Facility B).
2. For each reporting facility listed, the number listed (5,817) is the total number of colon/abdominal hysterectomy surgical procedures performed.
3. The number of SSI events in this column (8) represents the total number of colon/abdominal hysterectomy surgical site infections (SSIs) identified in patients who met the criteria set by NHSN who were in Facility B during the reporting period.
4. The predicted number of SSI events is adjusted to allow facilities to be more fairly compared. Risk adjustments account for differences in patient populations in terms of severity of illness and other factors that may affect the risk of developing an HAI. A facility that performs many procedures on very sick patients would be predicted to have a higher SSI rate than a hospital that performs fewer procedures and has healthier patients. The predicted number of SSI events for Facility B, based on comparison to a national HAI benchmark of similar facilities, is calculated as 13.
5. The standardized infection ratio (SIR) is a summary measure developed by NHSN to track HAIs at the national, state, local or facility level over time. The SIR compares the *total* number of SSI events for Facility B (8) to the *predicted* number of SSI events (13) based on "standard population" data. For purposes of this report, the standard population is HAI data reported nationally by thousands of facilities using NHSN. The SIR for Facility B, based on comparison to a national HAI benchmark of facilities that are similar to Facility B, is calculated as 0.62. Facilities with a predicted number of HAI events less than one do not have enough data to reliably compare their data to the standard population. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.

6. A confidence interval (CI) will be provided if an SIR was estimated for a given facility. A CI describes the uncertainty associated with the SIR estimate. Facilities performing more procedures will have a narrower CI, which means there is less doubt associated with the accuracy of the SIR compared to facilities performing fewer procedures. This is because there is more information about a facility's performance with additional procedures. A 95% CI means that 95 times out of 100, the true value would be expected to fall within the range shown.

Table 4. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2014⁺

	Number of colon surgeries ¹	Number of colon events ²	Predicted number of colon events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	2,060	150	118.88	1.26	1.07 - 1.48
Alta View Hospital	31	2	1.68	1.19	0.20 - 3.93
American Fork Hospital	50	5	2.74	1.83	0.67 - 4.05
Ashley Regional Medical Center	9	1	0.47	N/A±	N/A±
Bear River Valley Hospital	5	0	0.30	N/A±	N/A±
Brigham City Community Hospital	14	0	0.85	N/A±	N/A±
Cache Valley Hospital	5	0	0.28	N/A±	N/A±
Castleview Hospital	22	2	1.53	1.31	0.22 - 4.33
Davis Hospital and Medical Center	36	0	1.65	0.00	0 - 1.81
Dixie Regional Medical Center	151	5	8.82	0.57	0.21 - 1.26
Garfield Memorial Hospital	*	*	*	*	*
Intermountain Medical Center	227	16	12.32	1.30	0.77 - 2.06
Jordan Valley Hospital	32	5	1.88	2.66	0.98 - 5.90
Jordan Valley Hospital West Valley Campus	25	5	1.39	3.59	1.32 - 7.96
Lakeview Hospital	22	1	1.16	0.86	0.04 - 4.26
LDS Hospital	179	20	9.35	2.14	1.34 - 3.24
Logan Regional Medical Center	37	3	1.85	1.62	0.41 - 4.42
Lone Peak Hospital	10	0	0.53	N/A±	N/A±
McKay Dee Hospital	147	14	6.89	2.03	1.16 - 3.33
Mountain View Hospital	22	3	1.26	2.39	0.61 - 6.51
Mountain West Medical Center	1	0	0.06	N/A±	N/A±
Ogden Regional Medical Center	75	5	4.34	1.15	0.42 - 2.56
Orem Community Hospital	*	*	*	*	*
Park City Medical Center	8	0	0.44	N/A±	N/A±
Primary Children's Hospital	113	2	6.69	0.30	0.05 - 0.99
Riverton Hospital	42	5	2.41	2.07	0.76 - 4.59
Salt Lake Regional Medical Center	21	1	1.07	0.94	0.05 - 4.62
Sevier Valley Hospital	11	0	0.56	N/A±	N/A±
Shriners Hospitals for Children	*	*	*	N/A±*	N/A±*
St. Mark's Hospital	238	7	11.33	0.62	0.27 - 1.22
The Orthopedic Specialty Hospital	*	*	*	*	*
Timpanogos Regional Hospital	27	2	1.61	1.24	0.21 - 4.10
Uintah Basin Medical Center	6	0	0.39	N/A±	N/A±
University Hospital [§]	294	37	23.61	1.57	1.12 - 2.14
Utah Valley Regional Medical Center	157	8	8.88	0.90	0.42 - 1.71
Valley View Medical Center	43	1	2.56	0.39	0.02 - 1.93
Veterans Administration Hospital	*	*	*	*	*

⁺Source: NHSN data.

[§]Includes Huntsman Cancer Institute.

[‡]SIR estimates are not reliable when the expected number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

*Not required to report to CMS.

¹Number of colon surgeries: The total number of colon surgeries reported per year.

²Number of colon events: The total number of SSI infections associated with colon surgeries reported per year.

³Predicted number of colon events: The number of SSI infections associated with colon surgeries anticipated to occur based on historical data of comparable acute care facilities.

⁴Standardized Infection Ratio: Compares the total number of colon surgeries in a hospital's ICU to a national benchmark. Rates are adjusted based on the type and size of a hospital or ICU.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 5. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2014⁺

	Number of abdominal hyst ¹	Number of abdominal hyst events ²	Predicted number of abdominal hyst events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	2,859	43	49.46	0.87	0.64 - 1.16
Alta View Hospital	54	1	1.08	0.92	0.05 - 4.56
American Fork Hospital	66	1	0.92	N/A±	N/A±
Ashley Regional Medical Center	43	2	0.54	N/A±	N/A±
Brigham City Community Hospital	17	0	0.54	N/A±	N/A±
Cache Valley Hospital	3	0	0.03	N/A±	N/A±
Castleview Hospital	7	0	0.17	N/A±	N/A±
Davis Hospital & Medical Center	49	0	0.75	N/A±	N/A±
Dixie Regional Medical Center	52	0	0.89	N/A±	N/A±
Intermountain Medical Center	317	8	6.16	1.30	0.60 - 2.47
Jordan Valley Hospital	30	0	0.54	N/A±	N/A±
Jordan Valley Hospital West Valley Campus	3	0	0.05	N/A±	N/A±
Lakeview Hospital	9	0	0.18	N/A±	N/A±
LDS Hospital	251	10	4.58	2.19	1.11 - 3.89
Logan Regional Hospital	40	1	0.50	N/A±	N/A±
Lone Peak Hospital	21	0	0.31	N/A±	N/A±
McKay Dee Hospital	186	2	2.88	0.69	0.12 - 2.29
Mountain View Hospital	46	1	0.85	N/A±	N/A±
Mountain West Medical Center	22	1	0.28	N/A±	N/A±
Ogden Regional Medical Center	206	0	4.63	0.00	0 - 0.65
Orem Community Hospital	26	2	0.31	N/A±	N/A±
Park City Medical Center	14	0	0.13	N/A±	N/A±
Primary Children's Medical Center	1	0	0.01	N/A±	N/A±
Riverton Hospital	231	0	2.93	0.00	0 - 1.02
Salt Lake Regional Medical Center	43	1	0.79	N/A±	N/A±
Sevier Valley Hospital	7	0	0.12	N/A±	N/A±
St. Mark's Hospital	318	1	5.65	0.18	0.01 - 0.87
Timpanogos Regional Medical Center	121	0	2.12	0.00	0 - 1.41
Uintah Basin Medical Center	18	0	0.28	N/A±	N/A±
University Hospital [§]	352	7	6.04	1.16	0.51 - 2.29
Utah Valley Regional Medical Center	261	5	4.50	1.11	0.41 - 2.46
Valley View Medical Center	45	0	0.71	N/A±	N/A±
Veterans Administration Hospital	*	*	*	*	*

⁺Source: NHSN data.

[§]Includes Huntsman Cancer Institute.

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

*Not required to report to CMS.

¹Number of abdominal hysterectomies: The total number of abdominal hysterectomies reported per year.

²Number of abdominal hyst events: The total number of SSI infections associated with abdominal hysterectomies reported per year.

³Predicted number of abdominal hyst events: The number of abdominal hysterectomies anticipated to occur based on historical data of comparable acute care facilities.

⁴Standardized Infection Ratio: Compares the total number of abdominal hysterectomies in a hospital's ICU to a national benchmark. Rates are adjusted based on the type and size of a hospital or ICU.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Appendix C

Understanding *C. difficile* and MRSA Bacteremia Data in Acute Care Facilities

The tables depict *Clostridium difficile* infections (CDI) and Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia infections reported by acute care facilities.

In order to understand the HAI report, it is important to know what each of the table's data elements mean. Below is an example of a fictitious hospital's data. Each column is numbered and provides an explanation of each data element and its result.

Table C. Bacterial infection events in acute care facilities, Utah, 2014

	Number of patient days	Number of infections	Predicted number of infections	Standardized Infection Ratio	95% Confidence Interval
State of Utah	#	#	#	#	#
Facility C	5,817	8	13	.62	0.26-1.21
1	2	3	4	5	6

1. Acute care facilities are listed here by name (Facility C).
2. For each reporting facility listed, the number listed (5,817) is the total number of days patients have stayed at that facility.
3. When a patient develops a CDI or MRSA bacteremia infection, the infection is considered an HAI if it meets the criteria set forth by NHSN. The number of HAI events in this column (8) represents the total number of specific HAIs identified in patients in Facility C during the year.
4. The predicted number of infections is adjusted to allow facilities to be more fairly compared. Risk adjustments account for differences in patient populations in terms of severity of illness and other factors that may affect the risk of developing an HAI. A facility that generally has more severely ill patients would be predicted to have a higher rate than a facility that has healthier patients. The predicted number of infections for Facility C, based on comparison to a national HAI benchmark of similar facilities, is calculated as 13.
5. The standardized infection ratio (SIR) is a summary measure developed by NHSN to track HAIs at the national, state, local or facility level over time. The SIR compares the *total* number of infections for Facility C (8) to the *predicted* number of infections (13), based on "standard population" data. For purposes of this report, the standard population is HAI data reported nationally by thousands of facilities using NHSN. The SIR for Facility C, based on comparison to a national HAI benchmark of facilities that are similar to Facility C, is calculated as 0.62. Facilities with a predicted number of HAI events less than one do not have enough data to reliably compare their data to the standard population. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.

6. A confidence interval (CI) will be provided if an SIR was estimated for a given facility. A CI describes the uncertainty associated with the SIR estimate. Facilities performing with more patient days will have a narrower CI, which means there is less doubt associated with the accuracy of the SIR compared to facilities performing fewer procedures. This is because there is more information about a facility's performance with additional patient days. A 95% CI means that 95 times out of 100, the true value would be expected to fall within the range shown.

Table 6. *C. difficile* infections in acute care facilities, Utah, 2014⁺

	Number of patient days ¹	Number of hospital onset <i>C. diff</i> events ²	Predicted number of hospital onset <i>C. diff</i> events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	835,462	502	605.00	0.83	0.76 - 0.91
Alta View Hospital	9,416	5	5.89	0.85	0.31 - 1.88
American Fork Hospital	15,282	12	7.31	1.64	0.89 - 2.79
Ashley Regional Medical Center	4,303	0	2.47	0.00	0 - 1.21
Bear River Valley Hospital	889	0	0.47	N/A±	N/A±
Beaver Valley Hospital	1,118	0	0.49	N/A±	N/A±
Brigham City Community Hospital	2,400	0	1.05	0.00	0 - 2.86
Cache Valley Hospital	1,548	1	0.70	N/A±	N/A±
Castleview Hospital	4,062	2	2.04	0.98	0.16 - 3.24
Davis Hospital & Medical Center	20,982	7	11.39	0.62	0.27 - 1.22
Dixie Regional Medical Center	56,752	18	36.61	0.49	0.30 - 0.76
Garfield Memorial Hospital	852	0	0.50	N/A±	N/A±
Intermountain Medical Center	109,308	83	104.95	0.79	0.63 - 0.98
Jordan Valley Hospital	16,471	15	11.94	1.26	0.73 - 2.03
Jordan Valley Hospital West Valley Campus	14,412	12	9.28	1.29	0.70 - 2.20
Lakeview Hospital	15,093	7	9.76	0.72	0.31 - 1.42
LDS Hospital	43,087	25	29.34	0.85	0.56 - 1.24
Logan Regional Hospital	18,635	4	11.91	0.34	0.11 - 0.81
Lone Peak Hospital	2,483	2	1.68	1.19	0.20 - 3.94
McKay Dee Hospital	76,577	29	58.69	0.49	0.34 - 0.70
Mountain View Hospital	9,262	3	4.30	0.70	0.18 - 1.90
Mountain West Medical Center	3,835	3	1.81	1.66	0.42 - 4.51
Ogden Regional Medical Center	24,361	9	12.97	0.69	0.34 - 1.27
Orem Community Hospital	2,675	0	1.13	0.00	0 - 2.66
Park City Medical Center	3,940	0	2.03	0.00	0 - 1.48
Primary Children's Medical Center	49,796	45	44.63	1.01	0.74 - 1.34
Riverton Hospital	12,384	2	7.30	0.27	0.05 - 0.91
Salt Lake Regional Medical Center	19,826	18	10.33	1.74	1.07 - 2.70
Sevier Valley Hospital	2,139	0	1.17	0.00	0 - 2.56
St. Mark's Hospital	54,938	48	42.68	1.13	0.84 - 1.48
The Orthopedic Specialty Hospital	5,448	1	3.03	0.33	0.02 - 1.63
Timpanogos Regional Medical Center	10,074	2	6.60	0.30	0.05 - 1.00
Uintah Basin Medical Center	6,238	1	3.43	0.29	0.02 - 1.44
University Hospital [§]	133,999	101	92.11	1.10	0.90 - 1.33
Utah Valley Regional Medical Center	75,889	46	60.68	0.76	0.56 - 1.00
Valley View Medical Center	6,988	1	4.35	0.23	0.01 - 1.13

⁺Source: NHSN data

[§]Includes Huntsman Cancer Institute.

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of patient days: The total number of days that patients stay at a facility per year.

²Number of *C. diff* events: The total number of *C. diff* infections reported per year.

³Predicted number of *C. diff* events: The number of *C. diff* infections anticipated to occur based on historical data of comparable ICUs.

⁴Standardized Infection Ratio: Compares the total number of *C. diff* infections in a facility to a national benchmark. Rates are adjusted based on the type and size of the facility.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 7. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2014⁺

	Number of patient days ¹	Number of MRSA bacteremia events ²	Predicted number of MRSA bacteremia events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	1,009,852	36	57.33	0.63	0.45 - 0.86
Alta View Hospital	12,796	0	0.46	N/A±	N/A±
American Fork Hospital	22,814	0	0.92	N/A±	N/A±
Ashley Regional Medical Center	5,208	0	0.19	N/A±	N/A±
Bear River Valley Hospital	1,081	0	0.04	N/A±	N/A±
Beaver Valley Hospital	1,218	0	0.04	N/A±	N/A±
Brigham City Community Hospital	2,400	0	0.09	N/A±	N/A±
Cache Valley Hospital	1,548	0	0.06	N/A±	N/A±
Castleview Hospital	4,743	0	0.20	N/A±	N/A±
Davis Hospital & Medical Center	26,426	1	1.10	0.91	0.05 - 4.49
Dixie Regional Medical Center	64,067	2	2.62	0.76	0.13 - 2.52
Garfield Memorial Hospital	910	0	0.03	N/A±	N/A±
Intermountain Medical Center	132,504	7	12.72	0.55	0.24 - 1.09
Jordan Valley Hospital	21,912	1	0.89	N/A±	N/A±
Jordan Valley Hospital West Valley Campus	15,211	0	0.72	N/A±	N/A±
Lakeview Hospital	16,206	0	0.68	N/A±	N/A±
LDS Hospital	49,154	1	2.29	0.44	0.02 - 2.15
Logan Regional Hospital	25,006	1	0.96	N/A±	N/A±
Lone Peak Hospital	3,857	0	0.14	N/A±	N/A±
McKay Dee Hospital	90,394	4	3.70	1.08	0.34 - 2.61
Mountain View Hospital	10,611	1	0.41	N/A±	N/A±
Mountain West Medical Center	4,242	0	0.15	N/A±	N/A±
Ogden Regional Medical Center	27,725	1	1.19	0.84	0.04 - 4.15
Orem Community Hospital	5,328	0	0.19	N/A±	N/A±
Park City Medical Center	4,395	0	0.16	N/A±	N/A±
Primary Children's Medical Center	63,383	2	3.25	0.62	0.10 - 2.03
Riverton Hospital	17,818	0	0.66	N/A±	N/A±
Salt Lake Regional Medical Center	21,055	0	0.75	N/A±	N/A±
Sevier Valley Hospital	2,500	0	0.09	N/A±	N/A±
St. Mark's Hospital	64,923	6	3.24	1.85	0.75 - 3.85
The Orthopedic Specialty Hospital	5,448	0	0.20	N/A±	N/A±
Timpanogos Regional Medical Center	18,695	0	0.67	N/A±	N/A±
Uintah Basin Medical Center	6,567	0	0.25	N/A±	N/A±
University Hospital [§]	155,236	5	13.86	0.36	0.13 - 0.80
Utah Valley Regional Medical Center	95,922	4	4.11	0.97	0.31 - 2.35
Valley View Medical Center	8,549	0	0.31	N/A±	N/A±

⁺Source: NHSN data

[§]Includes Huntsman Cancer Institute.

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of patient days: The total number of days that patients stay at a facility per year.

²Number of MRSA events: The total number of MRSA bacteremia infections reported per year.

³Predicted number of MRSA events: The amount of MRSA bacteremia infections anticipated to occur based on historical data of comparable facilities.

⁴Standardized Infection Ratio: Compares the total number of MRSA bacteremia in a facility to a national benchmark. Rates are adjusted based on the type and size of the facility.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Appendix D

Understanding CLABSI and CAUTI Rates in Long-term Acute Care Facilities with Intensive Care Units and Wards or Inpatient Rehabilitation Facilities

The device infection event tables depict specific device-associated infections (central line-associated bloodstream infections [CLABSI], catheter-associated urinary tract infections [CAUTI]), reported by long-term acute care facilities with intensive care units and inpatient rehabilitation facilities.

To understand the HAI report, it is important to know what each of the data elements in the table mean. Below is an example of fictitious data from a long-term acute care facility (LTAC) or inpatient rehabilitation facility (IRF). Each column is numbered and provides an explanation of each data element and its result.

Table D. Device infection events in long-term acute care facilities with intensive care units and wards or inpatient rehabilitation facilities, Utah, 2014

	Number of HAI device days	Number of HAI device events	Incidence rate per 1,000 device days	Confidence interval for HAI rate
State of Utah	#	#	#	#
Facility D	5,817	8	1.36	0.64-2.56
1	2	3	4	5

1. Long-term acute care facilities or inpatient rehabilitation facilities are listed here by name (Facility D).
2. For each reporting facility listed, patients with central line catheters/urinary catheters (devices) are identified every day. A device count is performed at the same time each day. Each patient with one or more central line catheters at the time the count is performed is counted as having one device day. Each patient with a urinary catheter at the time the count is performed is counted as having one device day. For example, a patient with one or more central line catheters and one urinary catheter would be counted as having one central line day and one urinary catheter day. The number of device days in this column (5,817) represents the total number of device days for patients with that specific device who were in Facility D during the year.
3. When a patient develops an HAI device-associated infection while having a device in place or within one day after removal of the device, the infection is considered a device-associated HAI if it meets the criteria set forth by NHSN. The number of HAI events (8) represents the total number of specific HAIs identified in patients in Facility D during the year.
4. An incidence rate is a summary measure developed by NHSN to track HAIs at the national, state, local or facility level over time, and describes how frequently HAIs occur within a specific period.

This rate is calculated by taking the number of device events (8), dividing it by the total number of device days (5,817), and multiplying that by the desired time frame (1,000 device days). A result of 1.36 communicates that 1.36 HAI events are occurring every 1,000 device days at Facility D.

5. A confidence interval (CI) describes the uncertainty associated with the incidence rate estimate. Facilities with more device days or more HAI events will have a narrower CI, which means there is less doubt associated with the accuracy of that rate compared to facilities with fewer device days or events. This is because there is more information about a facility's performance with additional device days. A 95% CI means that 95 times out of 100, the true value would be expected to fall within the range shown in the table.

Table 8. Central-line associated bloodstream infections in long-term acute care facilities with intensive care units and wards, Utah, 2014⁺

	Number of central line days ¹	Number of CLABSI events ²	Predicted number of CLABSI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	13,519	2	12.17	0.16	0.03 - 0.54
Promise Hospital	5,725	0	5.15	0.00	0 - 0.58
South Davis Community Hospital	1,338	2	1.20	1.66	0.28 - 5.49
Utah Valley Specialty Hospital	6,456	0	5.81	0.00	0 - 0.52

⁺Source: NHSN data.

¹Number of central line days: The total number of days that a patient has a central line.

²Number of CLABSI events: The total number of central line-associated bloodstream infections reported per year.

³Predicted number of CLABSI events: The number of central line-associated bloodstream infection events anticipated to occur based on historical data of comparable long-term acute care facilities.

⁴Standardized Infection Ratio: Compares the total number of CLABSI events in long-term acute care facilities to a national benchmark.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 9. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 2014⁺

	Number of catheter days ¹	Number of CAUTI events ²	Predicted number of CAUTI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	8,961	9	17.92	0.50	0.25 - 0.92
Promise Hospital	3,569	0	7.14	0.00	0 - 0.42
South Davis Community Hospital	1,005	3	2.01	1.49	0.38 - 4.06
Utah Valley Specialty Hospital	4,387	6	8.77	0.68	0.28 - 1.42

⁺Source: NHSN data.

¹Number of catheter days: The total number of days that a patient has a urinary catheter.

²Number of CAUTI events: The total number of catheter-associated urinary tract infections reported per year.

³Predicted number of CAUTI events: The number of catheter-associated urinary tract infections anticipated to occur based on historical data of comparable long-term acute care facilities.

⁴Standardized Infection Ratio: Compares the total number of catheter-associated urinary tract infections in long-term acute care facilities to a national benchmark.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Table 10. Catheter-associated urinary tract infections in inpatient rehabilitation facilities, Utah, 2014⁺

	Number of catheter days ¹	Number of CAUTI events ²	Predicted number of CAUTI events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	4,655	32	11.68	2.74	1.91 - 3.82
Davis Hospital and Medical Center	107	0	0.28	N/A±	N/A±
Dixie Regional Medical Center	589	2	1.53	1.31	0.22 - 4.32
Health South Rehabilitation Hospital of Utah	959	6	2.01	2.98	1.21 - 6.20
Intermountain Medical Center	449	5	1.17	4.28	1.57 - 9.49
Jordan Valley Hospital	374	0	0.97	N/A±	N/A±
McKay Dee Hospital	189	2	0.49	N/A±	N/A±
Northern Utah Rehabilitation Hospital	122	0	0.38	N/A±	N/A±
Salt Lake Regional Medical Center	112	0	0.29	N/A±	N/A±
St. Mark's Hospital	300	1	0.78	N/A±	N/A±
University Hospital [§]	869	11	2.26	4.87	2.56 - 8.46
Utah Valley Regional Medical Center	585	5	1.52	3.29	1.20 - 7.29

⁺Source: NHSN data.

[§]Includes Huntsman Cancer Institute

[†]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for health care facilities with a predicted number less than one.

¹Number of catheter days: The total number of days that a patient has a urinary catheter.

²Number of CAUTI events: The total number of catheter-associated urinary tract infections reported per year.

³Predicted number of CAUTI events: The number of catheter-associated urinary tract infections anticipated to occur based on historical data of comparable inpatient rehabilitation facilities.

⁴Standardized Infection Ratio: Compares the total number of catheter-associated urinary tract infections in inpatient rehabilitation facilities to a national benchmark.

⁵Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Appendix E

Definitions

- 1. Abdominal hysterectomy** - An abdominal hysterectomy is a surgical procedure in which the uterus is removed through an incision in the lower abdomen.
- 2. Acute care facility** - A hospital that provides inpatient medical care and other related services for surgery, acute medical conditions or injuries (usually for a short-term illness or condition).
- 3. Catheter-associated urinary tract infection (CAUTI)** - Infection involving any part of the urinary system, including urethra, bladder, ureters, and kidney that are caused by the insertion of a urinary catheter.
- 4. Central line** - A catheter (tube) placed in a large vein in the neck, chest, or groin that ends at, or close to, the heart to give medication or fluids, collect blood for medical tests or monitor blood flow.
- 5. Central line days (CLDs)** - Refers to the number of patients with a central line in place. Central line days are calculated by recording the number of patients who have a central line for each day of the month at the same time each day for a specific care location. At the end of the month, the sum of all days is recorded. For purposes of this report, the total is recorded as the sum of all days in a year. Patients having more than one central line in place at a given time are counted as having only one central line day.
- 6. Central line-associated bloodstream infection (CLABSI)** - A serious infection that occurs when germs (usually bacteria) that are not related to another infection enter the bloodstream through the central line catheter.
- 7. Centers for Medicare and Medicaid Services (CMS)** - A federal agency within the United States Department of Health and Human Services that administers Medicare, Medicaid, the State Children's Health Insurance Program, and sets health insurance portability standards.
- 8. Clostridium difficile** - *Clostridium difficile* is a germ that causes diarrhea. It is spread from person-to-person on contaminated equipment and on the hands of health care personnel and visitors. Most cases occur in patients taking antibiotics for long periods of time and in the elderly with certain medical problems.
- 9. Colon surgery** - Colon surgery is an operation performed on the large intestine, rectum, anus and/or the perianal area.
- 10. Confidence interval (CI)** - A statistical measure of the precision of a rate estimate. It is a plus-or-minus range around the infection rate reported. A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

- 11. Dialysis** - Kidney dialysis is a life-support treatment that uses a special machine to filter harmful wastes, salt, and excess fluid from the blood. This restores the blood to a normal, healthy balance. Dialysis replaces many of the kidney's important functions. Hemodialysis is when the blood is filtered using a dialyzer and dialysis machine.
- 12. Dialysis facility** - An outpatient facility where a medical procedure (dialysis) is administered to people with end-stage kidney disease.
- 13. Healthcare-associated infection (HAI)** - An infection that develops in a person who is cared for in any setting where healthcare is delivered (i.e., acute care hospital, skilled nursing facility, dialysis center, etc.) that was not developing or present at the time of admission to that health care setting.
- 14. Inpatient rehabilitation facilities (IRFs)** - IRFs are freestanding rehabilitation hospitals and rehabilitation units in acute care hospitals. They provide an intensive rehabilitation program and patients who are admitted must be able to tolerate three hours of intense rehabilitation services per day.
- 15. Intensive Care Unit (ICU)** - An area in the hospital where severely ill patients are closely monitored and receive advanced life support.
- 16. Long-term acute care facility** - A facility that provides a range of institutional healthcare programs and services, such as comprehensive rehabilitation, respiratory therapy, head trauma treatment, and pain management, outside the acute care hospital.
- 17. MRSA bacteremia** - An infection in the blood that is caused by the bacteria *Staphylococcus aureus* and is resistant to methicillin antibiotics.
- 18. National rate** - The national rate is determined by the NHSN as similar facilities and specific infection events are compared nationwide.
- 19. National Healthcare Safety Network (NHSN)** - The nation's most widely used healthcare-associated infection (HAI) tracking system. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate HAIs. The system is supported by the U.S. Centers for Disease Control and Prevention.
- 20. Standardized infection ratio (SIR)** - A statistic used to calculate, track and interpret the number of new HAIs. The SIR is determined by comparing the actual number of HAIs to the predicted number of HAIs for a specific group of patients admitted to a specific patient care unit.
- 21. Standard population** - The population against which each of its essential classes or groups can be compared. For purposes of this report, the standard population is the national HAI data reported by the thousands of United States facilities that use the NHSN system.

22. Surgical site infection (SSI) - A surgical site infection is an infection that occurs after surgery in the part of the body where the surgery took place. Many SSIs involve the skin only. Other SSIs are more serious and involve deep tissue or organs and usually result in prolonged or rehospitalization.

23. Utah Healthcare Infection Prevention Governance Committee (UHIP GC) - A multi-disciplinary panel of state leaders in patient safety, infectious diseases, and infection control. Membership is comprised of a broad base of care delivery groups across the state and organized under and staffed by the Utah Department of Health.

24. Urinary catheter - A flexible tube that is inserted through the urethra and into the bladder to drain urine from the bladder into a bag or container.

References

1. Magill SS, Edwards JR, Bamberg W, et al. [Multistate Point-Prevalence Survey of Health Care–Associated Infections](#). *N Engl J Med* 2014;370:1198-208. Accessed July 2014.
2. National Action Plan to Prevent Healthcare-Associated Infections: Road Map to Elimination. http://www.health.gov/hai/prevent_hai.asp#hai. Accessed July 2014.
3. How-to Guide: Prevent Central Line-Associated Bloodstream Infections. Cambridge, MA: Institute for Healthcare Improvement; 2012.
4. CDC. Healthcare-associated Infections. <http://www.cdc.gov/HAI/infectionTypes.html>. Accessed June 2015.
5. CDC. Dialysis. <http://www.cdc.gov/dialysis>. Accessed July 2015.
6. Strategies to Prevent *Clostridium difficile* Infections in Acute Care Hospitals: 2014 Update. <http://www.jstor.org/stable/10.1086/676023>. Accessed July 2015.
7. CDC. Vital Signs. Stopping *C. difficile* Infections. March 2012. <http://www.cdc.gov/vitalsigns/pdf/2012-03-vitalsigns.pdf> Accessed July 2015.
8. CDC. National Healthcare Safety Network (NHSN). <http://www.cdc.gov/nhsn/>. Accessed July 2015.
9. Strategies to Prevent Central Line–Associated Bloodstream Infections in Acute Care Hospitals: 2014 Update. <http://www.jstor.org/stable/10.1086/676533>. Accessed July 2015.
10. Strategies to Prevent Surgical Site Infections in Acute Care Hospitals: 2014 Update. <http://www.jstor.org/stable/10.1086/676022>. Accessed July 2015.
11. Strategies to Prevent Methicillin-Resistant *Staphylococcus aureus* Transmission and Infection in Acute Care Hospitals: 2014 Update. http://www.jstor.org/stable/10.1086/676534#full_text_tab_contents. Accessed July 2015.

**Utah Department of Health
Healthcare-Associated Infections
Prevention & Reporting Program**

P.O. Box 142104

Salt Lake City, UT 84114

<http://health.utah.gov/epi/diseases/HAI/index.html>

PH 801-538-6191 • FAX 801-538-9923

