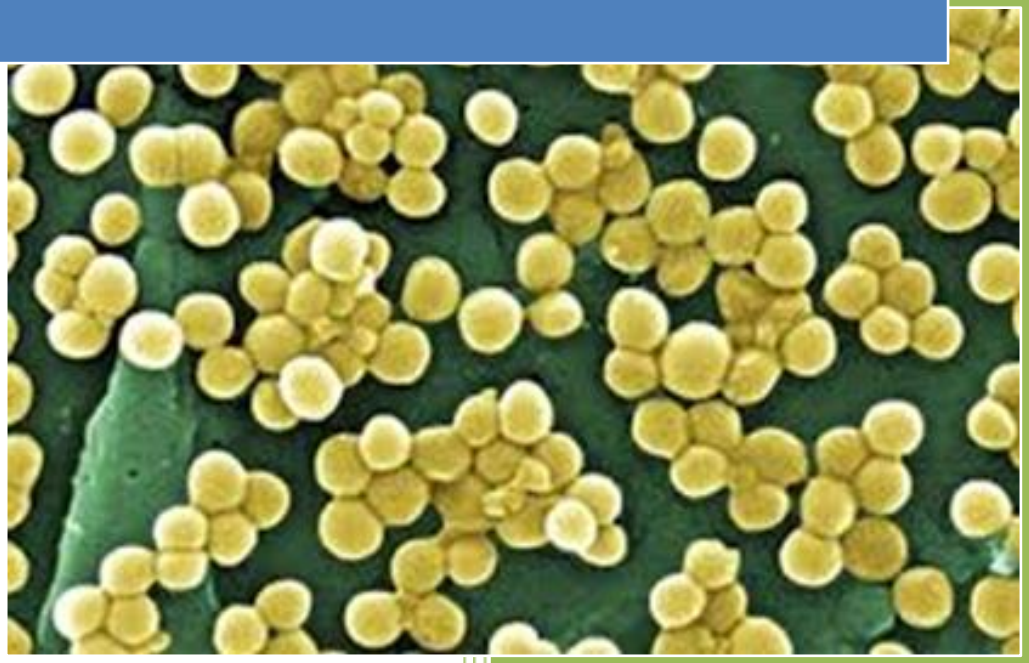
2013

Healthcare-associated Infections in Utah



Utah Department of Health

Division of Disease Control and Prevention

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Healthcare-associated Infections in Utah

2013

Annual Report

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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 want to feel safe and assured that we are doing everything possible 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 2013 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 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 many 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
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Executive Summary

Healthcare-associated infections (HAIs) are infections that are acquired while patients are receiving treatment for another condition in a healthcare setting. Utah state regulation requires the Utah Department of Health (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 2013 infection rates compared to national baseline data.

For long-term acute care facilities, inpatient rehabilitation facilities and dialysis facilities: baseline Utah data. As 2013 was the first year long-term acute care and inpatient rehabilitation facilities provided CLABSI and CAUTI data to NHSN, there is currently insufficient data to establish a national comparison for these facilities.

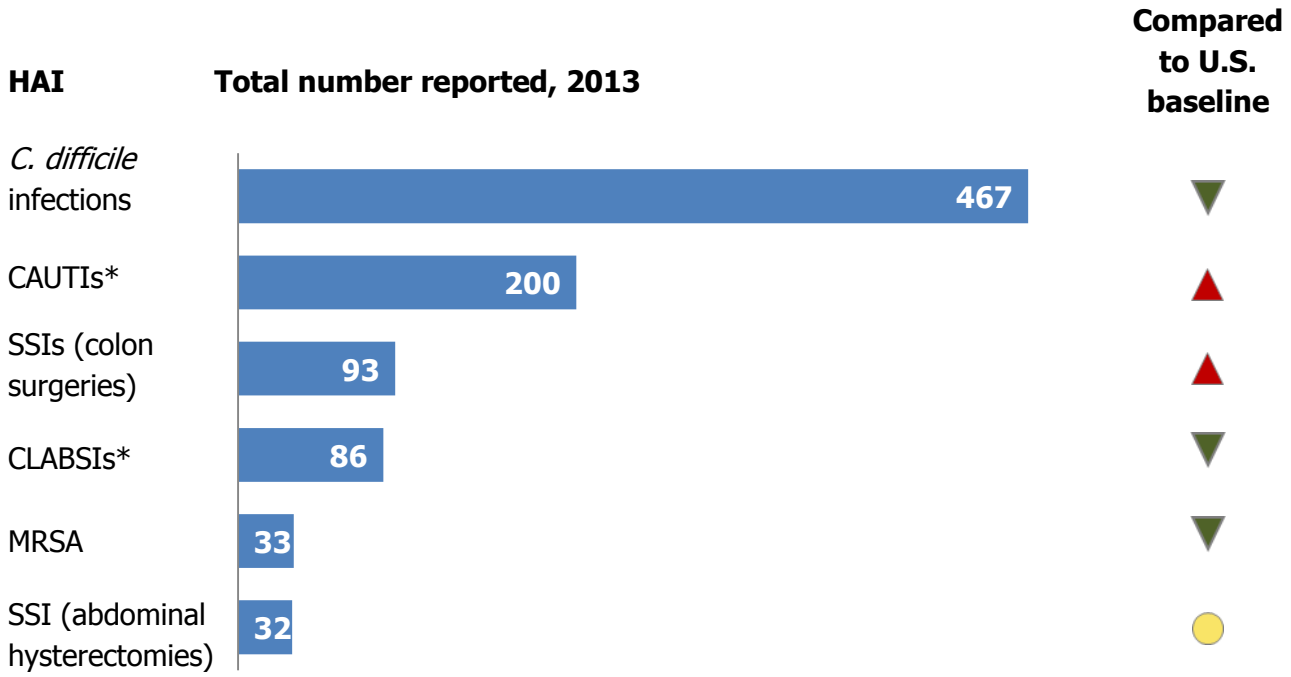
Key Findings

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 there is wide variability among the facilities performing catheter-associated urinary tract infection (CAUTI) surveillance, and there is a 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 2013 HAI data reported by Utah acute care facilities and a comparison of Utah data to the national baseline.



*Reported by acute care facilities with intensive care units (ICUs).

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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 like 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 if infections are healthcare-associated or already present upon facility admission. Because of 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 long-term acute care facilities or 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 2013 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 2013 compared to the national baseline data, indicating no progress has been made.
More than 1	There were more infections reported in Utah in 2013 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 1-9 in the Appendix.

Figures 1-6 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)

Acute Care Facilities

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 2013 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 2013, 86 ICU-related CLABSIs were reported in Utah acute care facilities and associated with 62,270 central line catheter days (Table 1). Compared to the national rate, patients in Utah facilities had 34 percent fewer CLABSIs in 2013 than would have been predicted. Twenty-five facilities met the criteria for required CLABSI reporting. Of these 25, 12 facilities had infection rates not significantly different from what was expected nationally; of the remaining facilities, one facility had significantly fewer infections, and no facilities had significantly higher infections compared to what was expected nationally. Eleven facilities did not have enough central line catheter days to provide an accurate assessment of their performance and one facility had incomplete data at the time of reporting (Figure 1).

Figure 1. Central line-associated bloodstream infections in acute care facilities with intensive care units, Utah, 2013[+]

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 (includes Pioneer Valley Hospital)	●
Lakeview Hospital	●
LDS Hospital	●
Logan Regional Hospital	--
McKay-Dee Hospital	●
Mountain View Hospital	--
Mountain West Medical Center	--
Ogden Regional Medical Center	●
Primary Children's Medical Center	●
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

CLABSI data from 2008 through 2013 in Utah acute care facilities ranged from a rate of 1.0 to 2.2 per 1,000 central line days with an average rate of 1.6. The information is pertinent because it identifies the current trend for CLABSIs within ICUs in the state of Utah. Recognition of the infection burden is necessary to promote proven interventions and prevention strategies.

Long-term Acute Care Facilities

In 2013, three CLABSIs were reported in Utah long-term acute care facilities with intensive care units and wards and associated with 13,558 central line catheter days (Table 7). Because 2013 was the first year long-term acute care facilities provided CLABSI data to NHSN, there is currently insufficient data to establish a national comparison. As more data become available, recognition of the infection burden can be determined to promote proven interventions and prevention strategies.

Catheter-Associated Urinary Tract Infections (CAUTIs)

Acute Care Facilities

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 2013 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, neonatal and neurosurgical. LTAC and IRF data include ICUs and wards.

In 2013, 200 ICU-related CAUTIs were reported in Utah acute care facilities and associated with 55,067 catheter days (Table 2). Compared to the national rate, none of the Utah facilities had fewer CAUTIs in 2013 than would have been predicted. Twenty-five facilities met the criteria for required CAUTI reporting. Of these 25, 11 facilities had CAUTI rates not significantly different from expected national rates; four facilities had significantly higher infections compared to what was expected nationally. Nine facilities did not have enough catheter days to provide an accurate assessment of their performance and one facility had incomplete data at the time of reporting (Figure 2).

Figure 2. Catheter-associated urinary tract infections in acute care facilities with intensive care units, Utah, 2013[+]

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 (includes Pioneer Valley Hospital)	○
Lakeview Hospital	○
LDS Hospital	○
Logan Regional Hospital	○
McKay-Dee Hospital	▲
Mountain View Hospital	--
Mountain West Medical Center	--
Ogden Regional Medical Center	○
Primary Children's Medical Center	○
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

Long-term Acute Care Facilities

In 2013, six CAUTIs were reported in Utah long-term acute care facilities with intensive care units and wards and associated with 8,141 catheter days (Table 8). Because 2013 was the first year long-term acute care facilities provided CAUTI data to NHSN, there is currently insufficient data to establish a national comparison. As more data become available, recognition of the infection burden can be determined to promote proven interventions and prevention strategies.

Inpatient Rehabilitation Facilities

In 2013, 29 CAUTIs were reported in Utah inpatient rehabilitation facilities and associated with 4,902 catheter days (Table 9). Because 2013 was the first year inpatient rehabilitation facilities provided CAUTI data to NHSN, there is currently insufficient data to establish a national comparison. As more data become available, recognition of the infection burden can be determined to promote proven interventions and prevention strategies.

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, rectum, anus and/or the perianal area. 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 2013 were reported only by acute care facilities.

In 2013, 93 SSIs associated with colon surgeries were reported in Utah and associated with 1,996 colon surgeries (Table 3). Compared to the national rate, none of the Utah facilities had fewer SSIs associated with colon surgeries in 2013 than would have been predicted. Thirty facilities met the criteria for required reporting of SSIs associated with colon surgeries. Of these 30, 12 facilities had infection rates not statistically significant from what was expected nationally; four facilities had significantly higher infection rates. Fourteen facilities did not have enough data to provide an accurate assessment of their performance (Figure 3).

Figure 3. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2013[+]

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	▲
Jordan Valley Hospital (includes Pioneer Valley Hospital)	●
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 Medical Center	--
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 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

Abdominal Hysterectomy Surgeries

An abdominal hysterectomy is a surgical procedure in which the uterus is removed through an incision in the lower abdomen. 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 2013 were reported only by acute care facilities.

In 2013, 32 SSIs associated with abdominal hysterectomies were reported in Utah and associated with 2,529 abdominal hysterectomy surgeries (Table 4). Compared to the national rate, none of the Utah facilities had fewer SSIs associated with abdominal hysterectomies in 2013 than would have been predicted. Thirty facilities met the criteria for required reporting of SSIs associated with abdominal hysterectomies. Of these 30, seven facilities had infection rates not statistically significant from what was expected nationally; two facilities had significantly higher infections compared to what is expected nationally. Twenty-one facilities did not have enough data to provide an accurate assessment of their performance (Figure 4).

Figure 4. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2013[+]

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 Medical Center (includes Pioneer Valley Hospital)	--
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 Medical Center	--
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 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

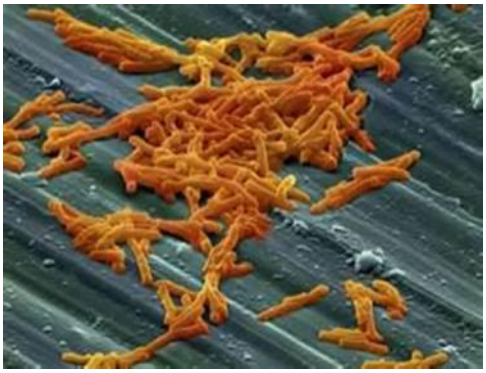
▲ Statistically **MORE** infections than national baseline

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

* Not required to report to CMS

[+]Source: NHSN data

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 2013, 467 *C. difficile* infections were reported in Utah acute care facilities (Table 5). Compared to the national rate, three of the Utah facilities had fewer *C. difficile* infections in 2013 than would have been predicted. Thirty-three facilities met the criteria for required reporting of *C. difficile* infections. Of these 33, 26 facilities had infection rates not statistically significant from what was expected nationally. Four facilities did not have enough data to provide an accurate assessment of their performance (Figure 5).

Figure 5. *C. difficile* infections in acute care facilities, Utah, 2013+

Hospital	*C. difficile*
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 (includes Pioneer Valley Hospital)	●
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

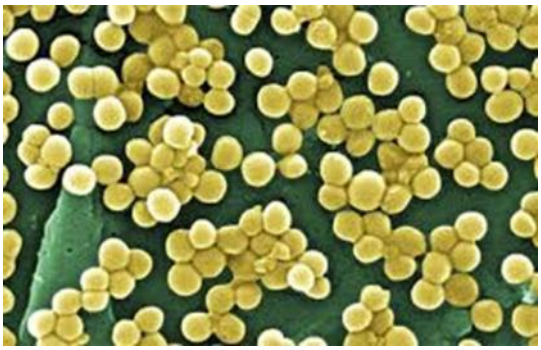
▲ Statistically **MORE** infections than national baseline

-- 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 healthcare 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 2013, 33 MRSA bacteremia infections were reported in Utah (Table 6). Compared to the national rate, none of the Utah facilities had fewer MRSA bacteremia infections in 2013 than would have been predicted. Thirty-three facilities met the criteria for required reporting of MRSA bacteremia infections. Of these 33, 11 facilities had infection rates not statistically significant from what was expected nationally. Twenty-two facilities did not have enough data to provide an accurate assessment of their performance. (Figure 6).

Figure 6. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2013+

Hospital	MRSA
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 (includes Pioneer Valley Hospital)	●
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 Medical Center	●
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	--
Veteran Administration Hospital	*

▼ Statistically **FEWER** infections than national baseline

● Not statistically different from national rate

▲ Statistically **MORE** infections than national baselilne

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

* 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 antibiotic therapy, the number of patients with laboratory results indicating infection in their bloodstream, and patients with signs and symptoms of catheter access infections (i.e., redness and/or pus).

In 2013, 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 2014 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 six facilities. These facilities were randomly selected based on their 2013 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 2013 ICU stay were validated; this approach was one of several recommended by the NHSN.

Procedure

During May and June 2014, a full day on-site medical record audit was conducted at targeted facilities. 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 197 positive urine cultures for CAUTI validation from six facilities. The auditors found 26 disparities. The facilities had identified and reported a total of 51 CAUTIs. Auditors determined only 33 should have been reported. Eighteen did not meet surveillance

criteria. The PPV reveals that the surveillance performed in these six facilities identified CAUTIs meeting the NHSN CAUTI surveillance criteria only 65% of the time.

For the other 146 positive urine cultures reviewed in these six facilities identified as not meeting CAUTI surveillance criteria, the auditors identified eight additional CAUTIs. The calculated sensitivity reveals that routine surveillance identified only 81% of the CAUTIs occurring. The calculated specificity reveals surveillance accurately "ruled out" CAUTIs 89% of the time.

It should be noted that results from these six 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 there is wide variability among the six facilities performing CAUTI surveillance. Discussing discordant findings may lead to improving the quality of HAI surveillance. Challenges for infection preventionists included the interpretation of CAUTI surveillance criteria. This may be due to lack of education, experience subjectivity, and/or inappropriate case finding. Additional constraints may be limited time dedicated for surveillance activities and difficulty accessing clinical data points.

Overall, UDOH auditors were very well received by the six 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.

Validation results demonstrate the need for a robust validation program to improve accuracy in all HAI reporting. It is important to determine if infections are healthcare-associated or already present upon facility admission in order to implement appropriate infection prevention measures.

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, 2013

	Number of HAI device days	Number of HAI device events	Predicted number of HAI device events	Standardized Infection Ratio	95% Confidence Interval
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 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 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 intensive care units, Utah, 2013[+]

	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	**62,270**	**86**	**130.07**	**0.66**	**0.53 - 0.81**
Alta View Hospital	258	0	0.39	N/A[±]	N/A[±]
American Fork Hospital	522	0	0.78	N/A[±]	N/A[±]
Ashley Regional Medical Center	62	0	0.08	N/A[±]	N/A[±]
Cache Valley Specialty Hospital	8	0	0.01	N/A[±]	N/A[±]
Castleview Hospital	8	0	0.01	N/A[±]	N/A[±]
Davis Hospital and Medical Center	1,030	3	1.63	1.84	0.47 - 5.01
Dixie Regional Medical Center	2,581	1	3.94	0.25	0.01 - 1.25
Intermountain Medical Center	11,654	9	25.80	0.35	0.17 - 0.64
Jordan Valley Medical Center*	1,771	1	2.57	0.39	0.02 - 1.92
Lakeview Hospital	680	0	1.02	0	0 - 2.94
LDS Hospital	1,575	2	2.36	0.85	0.14 - 2.80
Logan Regional Hospital	364	0	0.65	N/A[±]	N/A[±]
McKay Dee Hospital	2,993	2	5.26	0.38	0.06 - 1.26
Mountain View Hospital	564	0	0.85	N/A[±]	N/A[±]
Mountain West Medical Center	166	0	0.32	N/A[±]	N/A[±]
Ogden Regional Medical Center	1,416	0	2.15	0	0 - 1.39
Primary Children's Medical Center	10,561	20	25.35	0.79	0.50 - 1.20
Riverton Hospital	93	0	0.14	N/A[±]	N/A[±]
Salt Lake Regional Medical Center	1,837	6	2.76	2.18	0.88 - 4.53
St. Mark's Hospital***	–	–	–	–	–
Timpanogos Regional Hospital	1,807	1	2.84	0.35	0.02 - 1.74
Uintah Basin Medical Center	24	0	.04	N/A[±]	N/A[±]
University Health Care**	11,525	25	31.43	0.80	0.53 - 1.16
Utah Valley Regional Medical Center	10,509	16	19.21	0.83	0.49 - 1.32
Valley View Medical Center	262	0	0.50	N/A[±]	N/A[±]

[+]Source: NHSN data.
[*]Includes Pioneer Valley Hospital.
[**]Includes Huntsman Cancer Institute.
[***]Data incomplete at the time of reporting
[‡]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.

[1]Number of central line days: the total number of days that a patient has a central line.
[2]Number of central line-associated bloodstream infection events: the total number of central line-associated bloodstream infections reported per year.
[3]Predicted 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.
[4]Standardized 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.
[5]Confidence 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. Catheter-associated urinary tract infections in acute care facilities with intensive care units, Utah, 2013[+]

	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	**55,067**	**200**	**119**	**1.68**	**1.46 - 1.93**
Alta View Hospital	477	0	0.62	N/A[‡]	N/A[‡]
American Fork Hospital	616	1	0.80	N/A[‡]	N/A[‡]
Ashley Regional Medical Center	185	0	0.24	N/A[‡]	N/A[‡]
Cache Valley Specialty Hospital	9	0	0.01	N/A[‡]	N/A[‡]
Castleview Hospital	144	0	0.19	N/A[‡]	N/A[‡]
Davis Hospital and Medical Center	1,333	2	1.73	1.15	0.19 - 3.81
Dixie Regional Medical Center	2,958	2	3.55	0.56	0.09 - 1.86
Intermountain Medical Center	13,659	62	39.01	1.59	1.23 - 2.02
Jordan Valley Medical Center*	2,274	3	2.84	1.06	0.27 - 2.88
Lakeview Hospital	958	0	1.25	0	0 - 2.41
LDS Hospital	1,782	4	2.14	1.87	0.59 - 4.51
Logan Regional Hospital	680	1	1.36	0.74	0.04 - 3.63
McKay Dee Hospital	2,991	15	3.59	4.18	2.43 - 6.74
Mountain View Hospital	660	1	0.86	N/A[‡]	N/A[‡]
Mountain West Medical Center	286	1	0.57	N/A[‡]	N/A[‡]
Ogden Regional Medical Center	880	1	1.14	0.87	0.04 - 4.31
Primary Children's Medical Center	1,539	5	4.25	1.18	0.43 - 2.61
Riverton Hospital	237	0	0.31	N/A[‡]	N/A[‡]
Salt Lake Regional Medical Center	1,840	2	2.21	0.91	0.15 - 2.99
St. Mark's Hospital***	–	–	–	–	–
Timpanogos Regional Hospital	802	0	1.60	0	0 - 1.87
Uintah Basin Medical Center	101	0	0.13	N/A[‡]	N/A[‡]
University Health Care**	11,397	60	35.69	1.68	1.29 - 2.15
Utah Valley Regional Medical Center	8,728	40	13.84	2.89	2.09 - 3.90
Valley View Medical Center	531	0	1.06	0	0 - 2.82

[+]Source: NHSN data.
[*]Includes Pioneer Valley Hospital.
[**]Includes Huntsman Cancer Institute.
[***]Data incomplete at the time of reporting
[‡]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.

[1]Number of catheter days: the total number of days that a patient has a urinary catheter.
[2]Number of CAUTI events: the total number of catheter-associated urinary tract infections reported per year.
[3]Predicted number of CAUTI events: the number of catheter-associated urinary tract infections anticipated to occur based on historical data of comparable ICUs.
[4]Standardized 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.
[5]Confidence 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, 2013

	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 3. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2013+

	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	**1,996**	**93**	**63.08**	**1.47**	**1.20 - 1.80**
Alta View Hospital	39	3	1.07	2.80	0.71 - 7.61
American Fork Hospital	69	2	1.88	1.06	0.18 - 3.52
Ashley Regional Medical Center	3	0	0.08	N/A±	N/A±
Bear River Valley Hospital	1	0	0.03	N/A±	N/A±
Brigham City Community Hospital	22	0	0.70	N/A±	N/A±
Cache Valley Specialty Hospital	4	0	0.13	N/A±	N/A±
Castleview Hospital	17	1	0.49	N/A±	N/A±
Davis Hospital and Medical Center	57	0	1.60	0	0 - 1.87
Dixie Regional Medical Center	160	2	5.33	0.38	0.06 - 1.24
Garfield Memorial Hospital	*	*	*	*	*
Intermountain Medical Center	223	15	7.09	2.12	1.23 - 3.41
Jordan Valley Medical Center#	38	3	1.16	2.58	0.66 - 7.01
Lakeview Hospital	25	0	0.74	N/A±	N/A±
LDS Hospital	188	13	6.04	2.15	1.20 - 3.59
Logan Regional Hospital	42	4	1.21	3.30	1.05 - 7.97
Lone Peak Hospital	*	*	*	*	*
McKay Dee Hospital	177	13	5.46	2.38	1.32 - 3.97
Mountain View Hospital	23	2	0.71	N/A±	N/A±
Mountain West Medical Center	8	0	0.24	N/A±	N/A±
Ogden Regional Medical Center	79	3	2.76	1.09	0.28 - 2.97
Orem Community Hospital	0	0	0	N/A±	N/A±
Park City Medical Center	12	0	0.35	N/A±	N/A±
Primary Children's Medical Center	7	0	0.41	N/A±	N/A±
Riverton Hospital	35	3	1.15	2.62	0.67 - 7.13
Salt Lake Regional Medical Center	20	1	0.58	N/A±	N/A±
Sevier Valley Medical Center	10	0	0.27	N/A±	N/A±
Shriners Hospitals for Children	*	*	*	*	*
St. Mark's Hospital	202	8	6.34	1.26	0.59 - 2.40
The Orthopedic Specialty Hospital	*	*	*	*	*
Timpanogos Regional Hospital	57	0	1.72	0	0 - 1.75
Uintah Basin Medical Center	14	0	0.41	N/A±	N/A±
University Health Care§	244	12	7.84	1.53	0.83 - 2.60
Utah Valley Regional Medical Center	181	8	6.12	1.31	0.61 - 2.48
Valley View Medical Center	39	0	1.20	0	0 - 2.49
Veterans Administration Hospital	*	*	*	*	*

+Source: NHSN data.
#Includes Pioneer Valley Hospital.
§Includes Huntsman Cancer Institute.
‡SIR estimates are not reliable when the expected number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.
*Not required to report to CMS.
[1]Number of colon surgeries: the total number of colon surgeries reported per year.
[2]Number of colon events: the total number of SSI infections associated with colon surgeries reported per year.
[3]Predicted 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.
[4]Standardized 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.
[5]Confidence 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 4. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2013+

	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	**2,529**	**32**	**23.32**	**1.37**	**0.96 – 1.91**
Alta View Hospital	55	0	0.53	N/A‡	N/A‡
American Fork Hospital	92	3	0.68	N/A‡	N/A‡
Ashley Regional Medical Center	22	0	0.18	N/A‡	N/A‡
Bear River Valley Hospital	0	0	0	N/A‡	N/A‡
Brigham City Community Hospital	34	0	0.43	N/A‡	N/A‡
Cache Valley Specialty Hospital	2	0	0.03	N/A‡	N/A‡
Castleview Hospital	9	0	0.08	N/A‡	N/A‡
Davis Hospital and Medical Center	235	0	1.86	0	0 - 1.61
Dixie Regional Medical Center	43	0	0.36	N/A‡	N/A‡
Garfield Memorial Hospital	*	*	*	*	*
Intermountain Medical Center	243	3	2.18	1.38	0.35 - 3.75
Jordan Valley Medical Center#	53	2	0.35	N/A‡	N/A‡
Lakeview Hospital	29	0	0.34	N/A‡	N/A‡
LDS Hospital	197	6	1.86	3.22	1.31 - 6.71
Logan Regional Hospital	42	0	0.45	N/A‡	N/A‡
Lone Peak Hospital	*	*	*	*	*
McKay Dee Hospital	159	2	1.54	1.30	0.22 - 4.29
Mountain View Hospital	36	0	0.36	N/A‡	N/A‡
Mountain West Medical Center	16	1	0.16	N/A‡	N/A‡
Ogden Regional Medical Center	189	0	2.41	0	0 - 1.24
Orem Community Hospital	22	1	0.17	N/A‡	N/A‡
Park City Medical Center	18	1	0.13	N/A‡	N/A‡
Primary Children's Medical Center	0	0	0	N/A‡	N/A‡
Riverton Hospital	193	2	1.77	1.13	0.19 - 3.74
Salt Lake Regional Medical Center	32	1	0.26	N/A‡	N/A‡
Sevier Valley Medical Center	8	0	0.05	N/A‡	N/A‡
Shriners Hospitals for Children	*	*	*	*	*
St. Mark's Hospital	166	5	1.51	3.31	1.21 - 7.34
The Orthopedic Specialty Hospital	*	*	*	*	*
Timpanogos Regional Hospital	110	0	0.87	N/A‡	N/A‡
Uintah Basin Medical Center	19	0	0.18	N/A‡	N/A‡
University Health Care§	272	4	2.55	1.57	0.50 - 3.78
Utah Valley Regional Medical Center	207	1	1.80	0.56	0.03 - 2.74
Valley View Medical Center	26	0	0.23	N/A‡	N/A‡
Veterans Administration Hospital	*	*	*	*	*

+Source: NHSN data.
#Includes Pioneer Valley Hospital.
§Includes Huntsman Cancer Institute.
‡SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.
*Not required to report to CMS.
[1]Number of abdominal hysterectomies: the total number of abdominal hysterectomies reported per year.
[2]Number of abdominal hyst events: the total number of SSI infections associated with abdominal hysterectomies reported per year.
[3]Predicted number of abdominal hyst events: the number of abdominal hysterectomies anticipated to occur based on historical data of comparable acute care facilities.
[4]Standardized 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.
[5]Confidence 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, 2013

	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 5. *C. difficile* infections in acute care facilities, Utah, 2013[+]

	Number of patient days[1]	Number of *C. diff* events[2]	Predicted number of *C. diff* events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**801,038**	**467**	**556.40**	**0.84**	**0.77 - 0.92**
Alta View Hospital	9,828	3	5.35	0.56	0.14 - 1.53
American Fork Hospital	16,424	5	7.76	0.64	0.24 - 1.43
Ashley Regional Medical Center	3,835	0	1.76	0	0 - 1.71
Bear River Valley Hospital	807	0	0.60	N/A[±]	N/A[±]
Beaver Valley Hospital	795	0	0.39	N/A[±]	N/A[±]
Brigham City Community Hospital	2,475	0	1.15	0	0 - 2.60
Cache Valley Specialty Hospital	1,978	1	1.08	0.93	0.05 - 4.57
Castleview Hospital	4,965	2	2.92	0.69	0.12 - 2.26
Davis Hospital and Medical Center	20,924	7	10.61	0.66	0.29 - 1.31
Dixie Regional Medical Center	46,456	21	24.25	0.87	0.55 - 1.30
Garfield Memorial Hospital	651	0	0.32	N/A[±]	N/A[±]
Intermountain Medical Center	105,295	81	78.57	1.03	0.82 - 1.28
Jordan Valley Medical Center[#]	24,240	22	17.73	1.24	0.80 - 1.85
Lakeview Hospital	16,949	15	11.72	1.28	0.74 - 2.06
LDS Hospital	44,844	32	29.25	1.09	0.76 - 1.53
Logan Regional Hospital	17,630	4	9.37	0.43	0.14 - 1.03
Lone Peak Hospital	*	*	*	*	*
McKay Dee Hospital	76,587	15	47.61	0.32	0.18 - 0.51
Mountain View Hospital	9,494	4	5.10	0.79	0.25 - 1.89
Mountain West Medical Center	4,398	2	1.95	1.03	0.17 - 3.39
Ogden Regional Medical Center	21,966	1	11.04	0.09	0.01 - 0.45
Orem Community Hospital	2,701	0	1.18	0	0 - 2.54
Park City Medical Center	2,307	2	1.07	1.87	0.31 - 6.17
Primary Children's Hospital	52,551	45	46.49	0.97	0.72 - 1.28
Riverton Hospital	12,068	6	5.83	1.03	0.42 - 2.14
Salt Lake Regional Medical Center	21,056	15	13.83	1.08	0.63 - 1.75
Sevier Valley Medical Center	1,843	0	0.88	N/A[±]	N/A[±]
Shriners Hospitals for Children	*	*	*	*	*
St. Mark's Hospital	52,062	38	41.66	0.91	0.66 - 1.24
The Orthopedic Specialty Hospital	5,239	0	2.33	0	0 - 1.287
Timpanogos Regional Hospital	12,143	4	7.51	0.53	0.17 - 1.29
Uintah Basin Medical Center	4,946	1	2.89	0.35	0.02 - 1.71
University Health Care[§]	123,545	111	114.48	0.97	0.80 - 1.16
Utah Valley Regional Medical Center	73,663	28	46.68	0.60	0.41 - 0.86
Valley View Medical Center	6,373	2	3.07	0.65	0.11 - 2.15
Veterans Administration Hospital	*	*	*	*	*

[+]Source: NHSN data
[#]Includes Pioneer Valley Hospital.
[§]Includes Huntsman Cancer Institute.
[‡]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.
*Not required to report to CMS.

[1]Number of patient days: the total number of days that patients stay at a facility per year
[2]Number of *C. diff* events: the total number of *C diff* infections reported per year..
[3]Predicted number of *C. diff* events: the number of *C. diff* infections anticipated to occur based on historical data of comparable ICUs.
[4]Standardized 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.
[5]Confidence 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 6. Methicillin-resistant *Staphylococcus aureus bacteremia* in acute care facilities, Utah, 2013[+]

	Number of patient days[1]	Number of MRSA events[2]	Predicted number of MRSA events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**979,069**	**33**	**54.70**	**0.60**	**0.42 - 0.84**
Alta View Hospital	13,304	0	0.48	N/A[±]	N/A[±]
American Fork Hospital	23,778	0	0.87	N/A[±]	N/A[±]
Ashley Regional Medical Center	4,987	0	0.21	N/A[±]	N/A[±]
Bear River Valley Hospital	978	0	0.04	N/A[±]	N/A[±]
Beaver Valley Hospital	1,135	0	0.04	N/A[±]	N/A[±]
Brigham City Community Hospital	2,475	0	0.09	N/A[±]	N/A[±]
Cache Valley Specialty Hospital	1,978	0	0.07	N/A[±]	N/A[±]
Castleview Hospital	5,334	0	0.19	N/A[±]	N/A[±]
Davis Hospital and Medical Center	26,253	2	1.00	2.00	0.34 - 6.60
Dixie Regional Medical Center	52,516	1	2.08	0.48	0.02 - 2.37
Garfield Memorial Hospital	717	0	0.03	N/A[±]	N/A[±]
Intermountain Medical Center	127,320	6	11.76	0.51	0.21 - 1.06
Jordan Valley Medical Center[#]	32,592	3	1.56	1.93	0.49 - 5.24
Lakeview Hospital	17,876	0	0.99	N/A[±]	N/A[±]
LDS Hospital	50,343	1	1.98	0.51	0.03 - 2.50
Logan Regional Hospital	23,757	0	0.99	N/A[±]	N/A[±]
Lone Peak Hospital	*	*	*	*	*
McKay Dee Hospital	92,013	1	3.99	0.25	0.01 - 1.24
Mountain View Hospital	10,972	0	0.45	N/A[±]	N/A[±]
Mountain West Medical Center	4,751	0	0.22	N/A[±]	N/A[±]
Ogden Regional Medical Center	24,589	2	1.07	1.87	0.31 - 6.18
Orem Community Hospital	5,350	0	0.19	N/A[±]	N/A[±]
Park City Medical Center	4,694	0	0.17	N/A[±]	N/A[±]
Primary Children's Hospital	67,008	3	3.55	0.85	0.22 - 2.30
Riverton Hospital	17,311	0	0.64	N/A[±]	N/A[±]
Salt Lake Regional Medical Center	21,156	0	0.76	N/A[±]	N/A[±]
Sevier Valley Medical Center	2,185	0	0.08	N/A[±]	N/A[±]
Shriners Hospitals for Children	*	*	*	*	*
St. Mark's Hospital	63,736	3	2.90	1.03	0.26 - 2.82
The Orthopedic Specialty Hospital	5,239	0	0.19	N/A[±]	N/A[±]
Timpanogos Regional Hospital	19,951	0	0.71	N/A[±]	N/A[±]
Uintah Basin Medical Center	5,344	0	0.23	N/A[±]	N/A[±]
University Health Care[§]	146,482	9	12.96	0.70	0.34 - 1.28
Utah Valley Regional Medical Center	95,020	2	3.84	0.52	0.09 - 1.72
Valley View Medical Center	7,925	0	0.37	N/A[±]	N/A[±]
Veterans Administration Hospital	*	*	*	*	*

[+]Source: NHSN data
[#]Includes Pioneer Valley Hospital.
[§*]Includes Huntsman Cancer Institute.
[‡]SIR estimates are not reliable when the predicted number is less than one. Consequently, SIRs are not provided for healthcare facilities with a predicted number less than one.
[*]Not required to report to CMS.
[1]Number of patient days: the total number of days that patients stay at a facility per year.
[2]Number of MRSA events: the total number of MRSA bacteremia infections reported per year.
[3]Predicted number of MRSA events: the amount of MRSA bacteremia infections anticipated to occur based on historical data of comparable ICUs.
[4]Standardized 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.
[5]Confidence 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, 2013

	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 in this column (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 7. Central-line associated bloodstream infections in long-term acute care facilities with intensive care units and wards, Utah, 2013+

	Number of central line days[1]	Number of CLABSI events[2]	CLABSI rate[3]	95% Confidence Interval[4]
State of Utah	13,558	3	N/A*	N/A*
Promise Hospital	5,237	1	0.19	0.01 - 0.94
South Davis Community Hospital	913	0	0	0 - 3.28
Utah Valley Specialty Hospital	7,408	2	0.27	0.05 - 0.89

+Source: NHSN data.
*Overall incidence rates and confidence intervals for the state are not given in this report as NHSN does not provide these and would not be comparable to other states.

[1]Number of central line days: the total number of days that a patient has a central line.
[2]Number of CLABSI events: the total number of central line-associated bloodstream infections reported per year.
[3]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. See page 33 for detailed information.
[4]Confidence 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 8. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 2013+

	Number of catheter days[1]	Number of CAUTI events[2]	CAUTI rate[3]	95% Confidence Interval[4]
State of Utah	8,141	6	N/A*	N/A*
Promise Hospital	2,841	0	0	0 - 1.05
South Davis Community Hospital	949	3	3.16	0.80 - 8.60
Utah Valley Specialty Hospital	4,351	3	0.69	0.18 - 1.88

+Source: NHSN data.
*Overall incidence rates and confidence intervals for the state are not given in this report as NHSN does not provide these and would not be comparable to other states.

[1]Number of catheter days: the total number of days that a patient has a urinary catheter.
[2]Number of CAUTI events: the total number of catheter-associated urinary tract infections reported per year.
[3]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. See page 33 for detailed information.
[4]Confidence 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 inpatient rehabilitation facilities, Utah, 2013+

	Number of catheter days[1]	Number of CAUTI events[2]	CAUTI rate[3§]	95% Confidence Interval[4§]
State of Utah	4,902	29	N/A*	N/A*
Davis Hospital and Medical Center	111	1	9.01	0.45 - 44.43
Dixie Regional Medical Center	613	2	3.26	0.55 - 10.78
HealthSouth Rehabilitation Hospital of Utah	699	5	7.15	2.62 - 15.86
Intermountain Medical Center	824	6	7.28	2.95 - 15.15
Jordan Valley Medical Center*	215	0	0	0 - 13.93
McKay Dee Hospital	233	2	8.58	1.44 - 28.36
Salt Lake Regional Medical Center	178	1	5.62	0.28 - 27.71
St. Mark's Hospital	333	0	0	0 - 9.00
University Health Care**	1,352	6	4.44	1.80 - 9.23
Utah Valley Regional Medical Center	344	6	17.44	7.07 - 36.28

+Source: NHSN data.
*Includes Pioneer Valley Hospital.
**Includes Huntsman Cancer Institute.
§Overall incidence rates and confidence intervals for the state are not given in this report as NHSN does not provide these and would not be comparable to other states.

[1]Number of catheter days: the total number of days that a patient has a urinary catheter.
[2]Number of CAUTI events: the total number of catheter-associated urinary tract infections reported per year.
[3]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. See page 33 for detailed information.
[4]Confidence 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 the 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 healthcare 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 healthcare 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.

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