
Healthcare-Associated Infections in Utah, 2017



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Division of Disease Control and Prevention

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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 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 2017 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. This year's report will feature calculations using two standard methods, one from NHSN and the other from CMS. This will allow readers to easily compare Utah's situation to reports from each of these agencies.

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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. The Utah Department of Health (UDOH) 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. Data also does not reflect variabilities of patient acuity experienced in different facility settings. This report contains the following data:

- All infections for which Centers for Medicare and Medicaid Services (CMS) requires facilities to report to the National Healthcare Safety Network (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
 - Dialysis infection events
- 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 to national baseline data.

Numbers of HAIs reported by Utah facilities during 2017 showed some changes compared to the previous year's data. Hysterectomy SSIs increased in the state of Utah. However, MRSA, Colon SSIs, CAUTIs bacteremia infections decreased from 2016.

Compared to national baseline data, patients in Utah facilities that reported 2017 HAI data to NHSN experienced:

- 40% fewer CLABSI
- 1% fewer CAUTI
- 32% more surgical site infections within 30 days of colon surgery
- 17% more surgical site infections within 30 days of abdominal hysterectomy
- 10% more *C. difficile* infections
- 51% fewer MRSA bacteremia 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 (e.g., ambulatory surgical centers and end-stage renal disease facilities), and long-term care facilities (e.g., 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. Based on the 2014 National and State Healthcare-Associated Infections Progress Report, most infections have decreased compared to the national baseline. Despite progress, more action is needed at every level of public health and healthcare to eliminate infections that commonly threaten hospital patients.¹ These infections cost the U.S. healthcare 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 U.S.

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. 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 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 CMS required acute healthcare facilities to report specific HAI data to the 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.

Facilities in Utah submit data about specific healthcare-associated infections (HAIs) to the NHSN, a secure, online tracking system used by hospitals and other healthcare facilities. The Utah data are reported to NHSN by each facility that is required to report HAIs to CMS. More than 17,000 hospitals and other healthcare facilities nationwide report data to NHSN. This information is then used for summarizing HAI data at the national level and for care improvement by facilities, states, regions, quality groups, and national public health agencies, including CDC.

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.

Interpreting HAI data

What does the SIR mean?

SIR Value	Interpretation
Less than 1	There were fewer infections reported in Utah in 2017 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 2017 compared to the national baseline data.
More than 1	There were more infections reported in Utah in 2017 compared to the national baseline data, indicating there has been an increase in infections.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Below is an overall SIR summary of 2017 HAI data reported by Utah facilities compared to national baseline data.

- **Catheter-associated Urinary Tract Infections (CAUTI)**
 - CAUTI – intensive care settings in acute care facilities
 - CAUTI – non-intensive care settings in acute care facilities
 - CAUTI – inpatient rehabilitation settings in acute care facilities
 - CAUTI – long-term acute care facilities
- ▼ **Central Line-associated Blood Stream Infections (CLABSI)**
 - ▼ CLABSI – intensive care settings in acute care facilities
 - ▼ CLABSI – non-intensive care settings in acute care facilities
 - CLABSI – newborn intensive care settings in acute care facilities
 - CLABSI – long-term acute care facilities
- ▲ **Surgical site infection associated with colon surgery**
- **Surgical site infection associated with abdominal hysterectomy**
- ▲ ***Clostridium difficile* (facility onset) in acute care facilities**
- ▼ **Methicillin resistant *Staphylococcus aureus* (MRSA) bacteremia**

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** due to:⁹

- Insertion of multiple catheters
- Use of specific catheters associated with substantial risk
- Catheters frequently placed in emergency circumstances
- Catheters accessed repeatedly each day
- Need for catheters for extended periods of time



The non-inflation adjusted cost of **CLABSIs** varies from
\$3,700 to \$39,000
per episode

A Look at CLABSIs in Utah, 2017

31 adult and pediatric ICU-related CLABSIs in acute care facilities

▼ **48% fewer** CLABSIs in Utah acute care facilities compared to the national baseline

17 newborn-ICU related CLABSIs in acute care facilities

● The number of CLABSIs in Utah's newborn-ICUs was **NOT statistically different** compared to the national baseline

12 CLABSIs in long-term acute care facilities

● The number of CLABSIs in Utah's long-term acute care facilities was **NOT statistically different** compared to the national baseline

34 non-ICU-related CLABSIs in Utah acute care facilities

▼ **41% fewer** CLABSIs in Utah acute care facilities compared to the national baseline

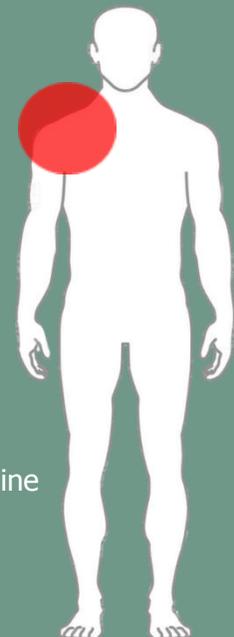


Figure 1. Central line-associated bloodstream infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS	Hospital	SIR	CMS
State of Utah	▼	▼	State of Utah	▼	▼
Alta View Hospital	*	*	Mountain Point Medical Center	\	\
American Fork Hospital	*	*	Mountain View Hospital	*	*
Ashley Regional Medical Center	*	*	Mountain West Medical Center	*	*
Castleview Hospital	*	*	Ogden Regional Medical Center	●	●
Davis Hospital and Medical Center	●	●	Park City Medical Center	*	*
Cedar City Hospital	*	*	Primary Children's Hospital	▲	▲
Dixie Regional Medical Center	●	●	Riverton Hospital	*	*
Intermountain Medical Center	●	●	Salt Lake Regional Medical Center	●	●
Jordan Valley Medical Center	*	*	St. Mark's Hospital	●	●
Jordan Valley Medical Center West Valley Campus	*	*	Timpanogos Regional Hospital	*	*
Lakeview Hospital	\	\	Uintah Basin Medical Center	*	*
LDS Hospital	●	●	University Hospital	▼	▼
Logan Regional Hospital	*	*	Utah Valley Regional Medical Center	▼	▼
McKay Dee Hospital	●	●			

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 2. Central line-associated bloodstream infections in newborn intensive care units in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
State of Utah	●	●
Ashley Regional Medical Center	*	*
Davis Hospital and Medical Center	\	\
Dixie Regional Medical Center	*	*
Intermountain Medical Center	●	●
Jordan Valley Medical Center	*	*
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.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 3. Central line-associated bloodstream infections in long-term acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
State of Utah	●	●
Landmark Hospital	●	●
Promise Hospital	▼	▼
Specialty Hospital of Utah	●	●
Utah Valley Specialty Hospital	●	●

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 4. Central-line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS	Hospital	SIR	CMS
State of Utah	▼	▼	State of Utah	▼	▼
Alta View Hospital	*	*	Logan Regional Hospital	*	*
American Fork Hospital	*	*	Lone Peak Hospital	*	*
Ashley Regional Medical Center	*	*	McKay Dee Hospital	*	*
Bear River Valley Hospital	*	*	Mountain Point Medical Center	*	*
Beaver Valley Hospital	*	*	Mountain View Hospital	*	*
Brigham City Community Hospital	*	*	Mountain West Medical Center	*	*
Cache Valley Specialty Hospital	\	\	Ogden Regional Medical Center	●	●
Castleview Hospital	*	*	Park City Medical Center	*	*
Cedar City Hospital	*	*	Primary Children's Hospital	●	●
Davis Hospital and Medical Center	*	*	Riverton Hospital	*	*
Delta Community Hospital	*	*	Salt Lake Regional Medical Center	*	*
Dixie Regional Medical Center	●	●	Sanpete Valley Hospital	*	*
Fillmore Community Hospital	*	*	Sevier Valley Hospital	*	*
Garfield Memorial Hospital	*	*	St. Mark's Hospital	●	●
Heber Valley Hospital	*		Timpanogos Regional Hospital	*	*
Intermountain Medical Center	▼	▼	Uintah Basin Medical Center	*	*
Jordan Valley Medical Center	*	*	University Hospital	●	●
Jordan Valley Medical Center West Valley Campus	*	*	Utah Valley Regional Medical Center	▼	▼
Lakeview Hospital	*	*			
LDS Hospital	●	●			

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

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 in 2017 were reported by:

- Long-term acute care facilities for all inpatients
- Acute care facilities for all admitted to an adult, pediatric or neonatal intensive care unit
- Acute care facilities for all admitted to an adult or pediatric medical, surgical or medical/surgical wards



According to the Centers for Disease Control and Prevention

75%

of UTIs acquired in hospitals are associated with urinary catheters

Between

15-25%



of hospital patients receive a urinary catheter at some point in their stay

A Look at CAUTIs in Utah, 2017

79 ICU-related CAUTIs in acute care facilities

 The number of CAUTIs in Utah's ICUs was **NOT statistically different** compared to the national baseline

8 CAUTIs in inpatient rehabilitation facilities (IRFs)

 The number of CAUTIs in Utah's IRFs was **NOT statistically different** compared to the national baseline

20 CAUTIs in long-term acute care facilities (LTAC)

 The number of CAUTIs in Utah's LTACs was **NOT statistically different** compared to the national baseline

51 CAUTIs in inpatient non-intensive care locations in acute care facilities

 The number of CAUTIs in Utah's acute care facilities was **NOT statistically different** compared to the national baseline

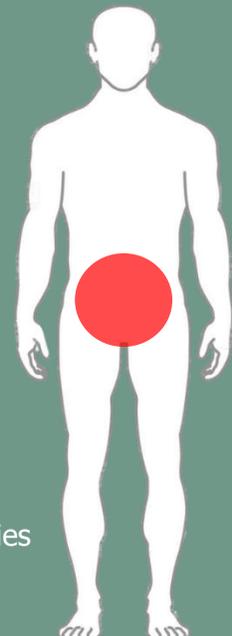


Figure 5. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS	Hospital	SIR	CMS
State of Utah	●	●	State of Utah	●	●
Alta View Hospital	*	*	Mountain Point Medical Center	\	\
American Fork Hospital	\	\	Mountain View Hospital	\	\
Ashley Regional Medical Center	*	*	Mountain West Medical Center	*	*
Castleview Hospital	*	*	Ogden Regional Medical Center	▲	▲
Cedar City Hospital	*	*	Park City Medical Center	\	\
Davis Hospital and Medical Center	●	●	Primary Children's Hospital	●	●
Dixie Regional Medical Center	●	●	Riverton Hospital	*	*
Intermountain Medical Center	●	●	Salt Lake Regional Medical Center	●	●
Jordan Valley Medical Center	*	*	St. Mark's Hospital	●	●
Jordan Valley Medical Center West Valley Campus	\	\	Timpanogos Regional Hospital	●	●
Lakeview Hospital	*	*	Uintah Basin Medical Center	*	*
LDS Hospital	●	●	University Hospital	●	●
Logan Regional Hospital	*	*	Utah Valley Regional Medical Center	●	●
McKay Dee Hospital	●	●			

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 6. Catheter-associated urinary tract infections in in-patient rehabilitation facilities, Utah, 2017⁺

Hospital	SIR	CMS
State of Utah	●	●
Davis Hospital and Medical Center	*	*
Dixie Regional Medical Center	*	*
Health South Rehabilitation Hospital of Utah	*	*
Intermountain Medical Center	*	*
Jordan Valley Medical Center	\	\
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.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 7. Catheter-associated urinary tract infections in long-term acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
State of Utah	●	●
Landmark Hospital	●	●
Promise Hospital	●	●
Specialty Hospital of Utah	●	●
Utah Valley Specialty Hospital	●	●

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Figure 8. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS	Hospital	SIR	CMS
State of Utah	●	●	State of Utah	●	●
Alta View Hospital	*	*	LDS Hospital	●	●
American Fork Hospital	\	\	Logan Regional Hospital	*	*
Ashley Regional Medical Center	*	*	Lone Peak Hospital	*	*
Bear River Valley Hospital	*	*	McKay-Dee Hospital	\	\
Beaver Valley Hospital	*	*	Mountain Point Medical Center	*	*
Brigham City Community Hospital	*	*	Mountain View Hospital	●	●
Cache Valley Specialty Hospital	*	*	Mountain West Medical Center	*	*
Castleview Hospital	\	\	Ogden Regional Medical Center	●	●
Cedar City Hospital	*	*	Park City Medical Center	*	*
Davis Hospital and Medical Center	●	●	Primary Children's Hospital	●	●
Delta Community Hospital	*	*	Riverton Hospital	*	*
Dixie Regional Medical Center	●	●	Salt Lake Regional Medical Center	*	*
Fillmore Community Hospital	*	*	Sanpete Valley Hospital	*	*
Garfield Memorial Hospital	\	\	Sevier Valley Hospital	*	*
Heber Valley Hospital	*	*	St. Mark's Hospital	▼	▼
Intermountain Medical Center	▲	▲	Timpanogos Regional Hospital	\	\
Jordan Valley Medical Center	●	●	Uintah Basin Medical Center	*	*
Jordan Valley Medical Center West Valley Campus	*	*	University Hospital	●	●
Lakeview Hospital	●	\	Utah Valley Regional Medical Center	●	●

⁺Source: NHSN data.

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- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Surgical Site Infections (SSIs)



A surgical site infection is an infection that occurs after surgery in part of the body |where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material.



SSIs are the most common and most costly HAI in the U.S., which accounts for **31%** of all HAIs in hospitalized patients.¹⁰



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 performed for treatment of colon cancer, to repair colon damage, or treat disease such as diverticulitis and inflammatory bowel disease.



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.

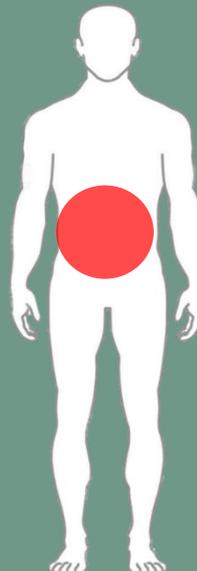
A Look at SSIs in Utah, 2017

135 SSIs associated with colon surgeries reported in Utah

 The number of colon SSIs in Utah acute care facilities was **NOT statistically different** from the national baseline

2,406 colon surgeries performed

31 facilities met the criteria for required reporting of SSIs associated with colon surgeries



56 SSIs associated with abdominal hysterectomies reported in Utah

 **57%** more abdominal hysterectomy SSIs in Utah compared to the national baseline

3,027 abdominal hysterectomy surgeries performed

31 facilities met the criteria for required reporting of SSIs associated with abdominal hysterectomies

Figure 9. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
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	\	\
Cedar City Hospital	▲	▲
Davis Hospital and Medical Center	●	●
Dixie Regional Medical Center	●	●
Heber Valley Medical Center	*	*
Intermountain Medical Center	▲	▲
Jordan Valley Medical Center	*	*
Jordan Valley Medical Center West Valley Campus	\	\
Lakeview Hospital	\	\
LDS Hospital	●	●
Logan Regional Hospital	●	●
Lone Peak Hospital	*	*
McKay-Dee Hospital	●	●
Mountain Point Medical Center	*	*
Mountain View Hospital	*	*
Mountain West Medical Center	*	*
Ogden Regional Medical Center	●	●
Orem Community Hospital	*	*
Park City Hospital	\	\
Primary Children's Hospital	*	*
Riverton Hospital	▲	▲
Salt Lake Regional Medical Center	\	\
Sanpete Valley Hospital	*	*
Sevier Valley Hospital	*	*
St. Mark's Hospital	●	●
Timpanogos Regional Hospital	\	\
University Hospital	▲	▲
Utah Valley Regional Medical Center	▼	▼

▼ Statistically **FEWER** infections than the national baseline

▲ Statistically **MORE** infections than the national baseline

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017

● **NOT** statistically different from the national baseline

⁺Source: NHSN data.

Figure 10. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
State of Utah		
Alta View Hospital	*	*
American Fork Hospital	\	*
Ashley Regional Medical Center	*	*
Castleview Hospital	*	*
Cedar City Hospital	*	*
Davis Hospital and Medical Center		*
Dixie Regional Medical Center	*	*
Heber Valley Hospital	*	*
Intermountain Medical Center		
Jordan Valley Medical Center	*	*
Jordan Valley Medical Center West Valley Campus	*	*
Lakeview Hospital	*	*
LDS Hospital		
Logan Regional Hospital		\
Lone Peak Hospital	\	*
McKay-Dee Hospital		
Mountain Point Medical Center	*	*
Mountain View Hospital	\	*
 Mountain West Medical Center	*	*
Ogden Regional Medical Center		\
Orem Community Hospital	\	\
Park City Medical Center	*	*
Riverton Hospital		
Salt Lake Regional Medical Center	*	*
Sanpete Valley Hospital	*	*
Sevier Valley Medical Center	*	*
St. Mark's Hospital		
Timpanogos Regional Hospital		
Uintah Basin Medical Center	*	*
University Hospital		
Utah Valley Regional Medical Center		

 Statistically **FEWER** infections than the national baseline

 Statistically **MORE** infections than the national baseline

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017

NOT statistically different from the national baseline

⁺Source: NHSN data.

Clostridium difficile Infections (CDIs)



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
15,000
deaths every year.⁷



The Centers for Disease Control and Prevention has classified *C. difficile* as an **urgent drug-related threat** to patients in the U.S.



A Look at *C. difficile* in Utah, 2017

600 hospital-onset *C. difficile* infections were reported in acute care facilities

▲ 10% more *C. difficile* infections in Utah acute care facilities compared to the national baseline

48 facilities met the criteria for reporting *C. difficile* infections

2 of Utah's facilities had significantly fewer infections compared to what was expected nationally

5 of Utah's facilities had significantly more infections compared to what was expected nationally

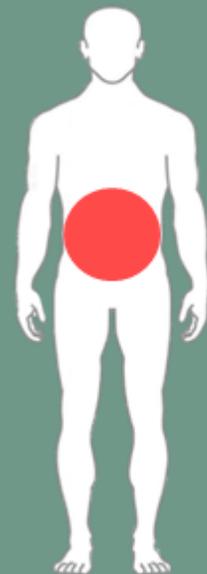


Figure 11. *C. difficile* infections in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
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	●	●
Cedar City Hospital	●	●
Davis Hospital and Medical Center	●	●
Dixie Regional Medical Center	●	●
Garfield Memorial Hospital	\	\
Health South Rehabilitation Hospital of Utah	●	●
Heber Valley Hospital	*	*
Intermountain Medical Center	●	●
Jordan Valley Medical Center	●	●
Jordan Valley Medical Center West Valley Campus	▲	▲
Lakeview Hospital	●	●
Landmark Hospital	●	●
LDS Hospital	▲	▲
Logan Regional Hospital	●	●
Lone Peak Hospital	●	●
McKay Dee Hospital	▼	▼

⁺Source: NHSN data.

Hospital	SIR	CMS
State of Utah	▲	▲
Mountain Point Medical Center	●	●
Mountain View Hospital	●	●
Mountain West Medical Center	●	●
Northern Utah Rehabilitation Hospital	●	●
Ogden Regional Medical Center	●	●
Orem Community Hospital	●	●
Park City Medical Center	●	●
Primary Children's Hospital	▲	▲
Promise Hospital of Salt Lake	▼	▼
Riverton Hospital	●	●
Salt Lake Regional Medical Center	●	●
Sanpete Valley Hospital	\	\
Sevier Valley Hospital	*	*
Shriners	*	*
South Davis Community Hospital	●	●
St. Mark's Hospital	●	●
The Orthopedic Specialty Hospital	*	*
Timpanogos Regional Hospital	●	●
Uintah Basin Medical Center	●	●
University Hospital	▲	▲
Utah Valley Regional Medical Center	▲	▲
Utah Valley Specialty Hospital	●	●

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Methicillin-resistant *Staphylococcal 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

The Centers for Disease Control and Prevention has classified MRSA as an **urgent drug-related threat** to patients in the U.S.



A Look at MRSA Bacteremia in Utah, 2017

27 MRSA bacteremia infections were reported

▼ **51% fewer** MRSA bacteremia infections in Utah acute care facilities compared to the national baseline

47 facilities met the criteria for required MRSA bacteremia infections

32 facilities had infections **NOT statistically different** from what was expected nationally

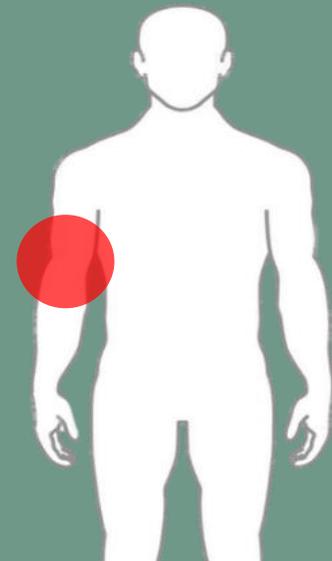


Figure 12. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2017⁺

Hospital	SIR	CMS
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	*	*
Cedar City Hospital	*	*
Davis Hospital and Medical Center	*	*
Dixie Regional Medical Center	●	●
Garfield Memorial Hospital	*	*
Health South Rehabilitation Hospital of Utah	*	*
Heber Valley Hospital	*	*
Intermountain Medical Center	▼	▼
Jordan Valley Medical Center	\	\
Jordan Valley Medical Center West Valley Campus	\	\
Lakeview Hospital	*	*
Landmark Hospital	*	*
LDS Hospital	●	●
Logan Regional Hospital	*	*
Lone Peak Hospital	*	*

Hospital	SIR	CMS
State of Utah	▼	▼
McKay Dee Hospital	●	▼
Mountain Point Medical Center	\	\
Mountain View Hospital	*	*
Mountain West Medical Center	*	*
Northern Utah Rehabilitation Hospital	*	*
Ogden Regional Medical Center	●	●
Orem Community Hospital	*	*
Park City Medical Center	*	*
Primary Children's Hospital	●	●
Promise Hospital of Salt Lake	●	●
Riverton Hospital	\	\
Salt Lake Regional Medical Center	*	*
Sanpete Valley Hospital	*	*
Sevier Valley Hospital	*	*
South Davis Community Hospital	●	●
St. Mark's Hospital	●	●
The Orthopedic Specialty Hospital	*	*
Timpanogos Regional Hospital	*	*
Uintah Basin Medical Center	*	*
University Hospital	●	●
Utah Valley Regional Medical Center	●	●
Utah Valley Specialty Hospital	●	●

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Dialysis Infection Events



The kidneys perform several critical functions:

- Clean blood
- Remove excess fluid from the body
- Produce hormones needed for important bodily functions

When the kidneys are unable to perform these functions, they can fail, resulting in the need for hemodialysis.



Hemodialysis is 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:

Number of patients requiring initiation of intravenous antimicrobial therapy

Number of patients with laboratory results indicating infection in their bloodstream

Number of patients with signs and symptoms of vascular access infections (redness, swelling, and/or pus)

A Look at Dialysis Infections in Utah, 2017

118 dialysis infection events were reported



The number of dialysis infections in Utah was **NOT statistically different** compared to the national baseline

37 facilities met the criteria for required reporting of dialysis infection events

3 of Utah's facilities had significantly fewer infections compared to what was expected nationally

4 of Utah's facilities had significantly more infections compared to what was expected nationally

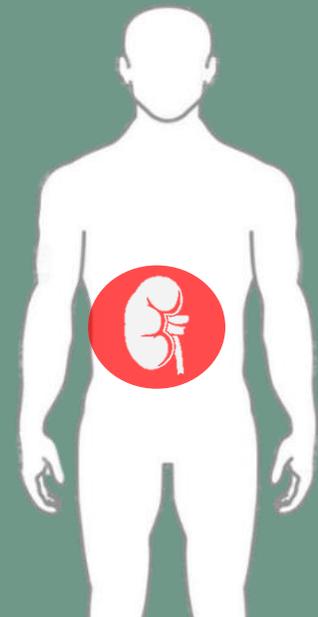


Figure 13. Dialysis event bloodstream infections, Utah, 2017⁺

Facility	SIR	Facility	SIR
State of Utah	●	State of Utah	●
American Fork Dialysis Center	●	Pleasant View Dialysis Center	●
Blue Mountain Hospital Dialysis Center	●	Primary Children’s Dialysis Center	●
Bonneville Dialysis Center	●	Provo Dialysis	●
Castleview Dialysis Center	●	Sevier Valley Dialysis	●
Farmington Bay Dialysis Center	●	South Mountain Dialysis	▼
Hurricane Dialysis	●	South Valley Dialysis Center	●
Intermountain Medical Center Dialysis Center	●	Tooele Valley Dialysis	●
Iron Mission Dialysis Center	●	UBMC Dialysis Roosevelt	●
Kolff Dialysis Center	●	Uintah Basin Medical Center Dialysis Vernal	●
Lakeside Dialysis Center	●	University of Utah Dialysis Program Dixie Dialysis	●
Liberty Dialysis Layton	●	Utah Dialysis Center	●
Liberty Dialysis St. George	●	Utah Valley Dialysis Center	▲
Liberty Dialysis West Jordan	●	Wasatch Artificial Kidney Center	▼
Logan Regional Dialysis Center	●	Weber Valley Dialysis	*
Lone Peak Dialysis	▲	West Bountiful Dialysis	\
Mark Lindsay Dialysis Center	●	West Valley Dialysis Clinic	●
Oquirrh Artificial Kidney Center	●	Woods Cross Dialysis	▲
Payson Regional Dialysis	▲		

⁺Source: NHSN data.

- ▼ Statistically **FEWER** infections than the national baseline
- ▲ Statistically **MORE** infections than the national baseline
- \ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017
- * Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2017
- **NOT** statistically different from the national baseline

Data quality validation

Background

The UDOH is required under Utah Title 26-6-31, Public Reporting of Healthcare-Associated Infections, to validate data reported to NHSN. Guidance from the CDC helped to guide the selection of infection types for validation of 2017 NHSN data. This guidance included the use of results of targeted assessment for prevention (TAP) reports to prioritize activities, an increased focus on antimicrobial resistance and activities directed towards *C. difficile* prevention, and a change in focus of prevention efforts to target networks among healthcare facilities, not specific facility types. This information led UDOH to perform validation of CAUTIs and *C. difficile* infection (CDI) LabID events.

The focus of these validation activities was to determine how NHSN CAUTI and CDI LabID event surveillance definitions were interpreted and applied to data collection. The validations were performed by the UDOH Healthcare-Associated Infections and Antimicrobial Resistance Program at 13 healthcare facilities throughout the state. Facilities were chosen based on an NHSN targeted selection process from the NHSN External Validation Guidance and Toolkit for 2017. The facility selection process prioritized validation of facilities where HAIs were most expected. This method compared facilities' SIR and cumulative attributable difference (CAD) scores to help identify those facilities with high risk of HAIs, and also those facilities whose scores showed that they were performing well in their practices to prevent infection.

Validation activities are intended to compare reported information in NHSN with UDOH audit findings and outcomes to enhance accuracy and completeness of CAUTI and CDI LabID reporting. A standardized validation method, as guided by NHSN, was chosen to serve as a test of proficiency in surveillance methods and accuracy in case findings.

Procedure

An on-site medical record audit was conducted at the chosen healthcare facilities. Each visit started with an interview of at least one member of the infection prevention staff to learn about surveillance methodology, data collection, and personnel training and education on applying NHSN criteria. CDC TAP Facility Assessment Tools for CAUTI and CDI were also utilized at each facility to determine current prevention practices and make recommendations based upon the responses. In each facility, up to 10 charts of patients who were determined to have a CAUTI in 2017 were reviewed to determine if they correctly met the CAUTI criteria, and up to 30 charts of patients who had a positive urine culture (a urine culture with no more than two species of organisms identified, at least one of which is a bacterium with $>10^5$ CFU/mL), but were not classified as a CAUTI, were also reviewed to determine if any reportable infections were missed. Additionally, up to 30 charts of patients with a positive laboratory test result for *C. difficile* toxin A and/or B, or a toxin-producing *C. difficile* organism detected by culture or other laboratory means, were reviewed to ensure all reportable CDI LabID were reported to NHSN in 2017. 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

UDOH auditors reviewed

184 urine cultures and **199** toxin-positive *C. difficile* tests

Auditors used CAUTI and CDI LabID event criteria from the 2017 NSHN Patient Safety Component Manual

CAUTI

13 CAUTIs identified by auditors

13 CAUTIs reported by healthcare facilities

ZERO CAUTIs were reported by facilities that did not meet the NSHN criteria

ZERO additional CAUTIs were identified by auditors

CDI

198 reportable CDI identified by auditors

190 CDI reported by healthcare facilities

8 additional CDIs identified by auditors

Prevention and Success Stories from Validation Facilities

- Many facilities are applying diagnostic stewardship principles for *C. difficile* testing
- All facilities were collecting catheter days data according to NHSN guidance
- Facilities are taking multidisciplinary team approaches to prevention activities
- Facilities are working to incorporate prevention activities into daily patient care
- Infection preventionists serve as key members of their antimicrobial stewardship teams

Sensitivity and Specificity

Sensitivity

Answers the question, "How likely are patients with an infection accurately identified as having an infection?"

Routine surveillance performed by these facilities identified
100% of the CAUTIs occurring
96% of the reportable CDIs occurring

Specificity

Answers the question, "How likely are patients without an infection accurately identified as not having an infection?"

The calculated specificity reveals surveillance accurately "ruled out"
CAUTIs **100%** of the time
Non-reportable CDIs **100%** of the time

Positive Predictive Value (PPV)

Represents the proportion of HAIs reported that met the surveillance criteria accurately

The PPV reveals that surveillance identified
CAUTIs met NHSN surveillance criteria **100%** of the time
Reportable CDIs met NHSN surveillance criteria **100%** of the time

Conclusions

Validation results indicate that the number of CAUTIs generally as accurate as reported surveillance data prior to validation activities. However, the number of CDI LabID events was higher than initially indicated by reported surveillance data before validation activities took place.

Most infection preventionists at the validated facilities were able to correctly determine which patients met the CAUTI definition and apply the definition appropriately. When performing CAUTI validation, the criteria used to meet the definition included: a urine culture with no more than two species of organisms identified, at least one of which is a bacterium with >10⁵ CFU/mL; an indwelling urinary catheter that had been in place for greater than two days on the date of event, and appropriate signs and symptoms that were present at the appropriate time during the infection window period. If no signs or symptoms were present but all other criteria were met, then a blood specimen with at least one matching bacterium to the bacterium in the urine specimen could be used to meet criteria for a CAUTI. The main issues identified were not with CAUTI identification, but with non-standardized charting of catheter placement and removal as well as NHSN UTI symptom criteria (e.g., temperature >38.0° C)

When performing validation of CDI LabID events, a specific set of criteria must be followed that are different than criteria followed for other healthcare-associated infection types. There was some confusion among infection preventionists about reporting of CDI LabID events. Some facilities mistakenly classified toxin-positive *C. difficile* tests collected within the first two days of admission as present on admission (POA); however, the POA classification does not apply to LabID events. These events within the first two days of admission would be categorized by NHSN as community-onset (CO) events, and events reported to NHSN with this classification will be included in the facility's risk adjusted SIR. Excluding these events from NHSN reporting can lead to a falsely increased SIR because the model to calculate the SIR has not been risk-adjusted based on the number of CO events reported. All facilities were correctly applying the 14-day rule as it applies to the same and different units. The 14-day rule determines if a positive CDI test is a duplicate test. A duplicate *C. difficile*-positive test is defined as any *C. difficile*-toxin positive lab result from the same patient and locations, following a previous *C. difficile* toxin-positive lab result within the past two weeks (14 days). Healthcare facilities do not need to report these events to NHSN, as they will be excluded from calculations of CDI LabID rates and SIRs.

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, 2017

	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

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 facility populations 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 a 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 adult and pediatric intensive care units in acute care facilities, Utah, 2017⁺

	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	52,506	31	59.8	0.52	0.36 – 0.73
Alta View Hospital	89	0	0.06	*	*
American Fork Hospital	602	0	0.4	*	*
Ashley Regional Medical Center	94	0	0.06	*	*
Castleview Hospital	25	0	0.02	*	*
Cedar City Hospital	270	0	0.18	*	*
Davis Hospital & Medical Center	1,278	0	1.12	0.00	0.00 – 2.68
Dixie Regional Medical Center	3,135	1	2.72	0.37	0.02 – 1.81
Intermountain Medical Center	9,734	5	10.98	0.46	0.17 – 1.01
Jordan Valley Medical Center	490	0	0.37	*	*
Jordan Valley Medical Center West Valley Campus	561	0	0.42	*	*
Lakeview Hospital	550	1	0.41	\	\
LDS Hospital	1,195	1	1.2	0.83	0.04 – 4.1
Logan Regional Hospital	296	0	0.22	*	*
McKay Dee Hospital	2,583	1	2.6	0.38	0.02 – 1.9
Mountain Point Medical Center	97	1	0.07	\	\
Mountain View Hospital	772	0	0.68	*	*
Mountain West Medical Center	57	0	0.04	*	*
Ogden Regional Medical Center	1,619	2	1.22	1.64	0.27 – 5.42
Primary Children's Hospital	4,164	13	6.92	1.88	1.05 – 3.13
Riverton Hospital	129	0	0.1	*	*
Salt Lake Regional Medical Center	1,698	0	1.49	0.00	0.00 – 2.02
St. Mark's Hospital	2,156	0	2.17	0.00	0.00 – 1.38
Timpanogos Regional Hospital	1,097	0	0.83	*	*
Uintah Basin Medical Center	96	0	0.06	*	*
University Hospital [§]	13,188	6	18.9	0.32	0.13 – 0.66
Utah Valley Regional Medical Center	6,467	0	6.51	0.00	0.00 – 0.46

⁺Source: NHSN data.

See footnotes on page 38.

Table 1a. Central line-associated bloodstream infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017+ (CMS)

	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	52,506	31	59.8	0.52	0.36 – 0.73
Alta View Hospital	89	0	0.06	*	*
American Fork Hospital	602	0	0.4	*	*
Ashley Regional Medical Center	94	0	0.06	*	*
Castleview Hospital	25	0	0.02	*	*
Cedar City Hospital	270	0	0.18	*	*
Davis Hospital & Medical Center	1,278	0	1.12	0.00	0.00 – 2.68
Dixie Regional Medical Center	3,135	1	2.72	0.37	0.02 – 1.81
Intermountain Medical Center	9,734	5	10.98	0.46	0.17 – 1.01
Jordan Valley Medical Center	490	0	0.37	*	*
Jordan Valley Medical Center West Valley Campus	561	0	0.42	*	*
Lakeview Hospital	550	1	0.41	\	\
LDS Hospital	1,195	1	1.2	0.83	0.04 – 4.1
Logan Regional Hospital	296	0	0.22	*	*
McKay Dee Hospital	2,583	1	2.6	0.38	0.02 – 1.9
Mountain Point Medical Center	97	1	0.07	\	\
Mountain View Hospital	772	0	0.68	*	*
Mountain West Medical Center	57	0	0.04	*	*
Ogden Regional Medical Center	1,619	2	1.22	1.64	0.27 – 5.42
Primary Children's Hospital	4,164	13	6.92	1.88	1.05 – 3.13
Riverton Hospital	129	0	0.1	*	*
Salt Lake Regional Medical Center	1,698	0	1.49	0.00	0.00 – 2.02
St. Mark's Hospital	2,156	0	2.17	0.00	0.00 – 1.38
Timpanogos Regional Hospital	1,097	0	0.83	*	*
Uintah Basin Medical Center	96	0	0.06	*	*
University Hospital [§]	13,188	6	18.9	0.32	0.13 – 0.66
Utah Valley Regional Medical Center	6,467	0	6.51	0.00	0.00 – 0.46

⁺Source: NHSN data.

See footnotes on page 38.

Table 2. Central line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017⁺

	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	60,462	34	57.46	0.59	0.42 – 0.82
Alta View Hospital	152	0	0.09	*	*
American Fork Hospital	725	0	0.42	*	*
Ashley Regional Medical Center	75	0	0.04	*	*
Bear River Valley Hospital	18	0	0.01	*	*
Beaver Valley Hospital	12	0	0.003	*	*
Brigham City Community Hospital	17	0	0.01	*	*
Cache Valley Hospital	139	1	0.08	\	\
Castleview Hospital	254	0	0.15	*	*
Cedar City Hospital	641	0	0.37	*	*
Davis Hospital & Medical Center	518	0	0.36	*	*
Delta Community Hospital	60	0	0.02	*	*
Dixie Regional Medical Center	3,706	1	2.78	0.36	0.02 – 1.77
Fillmore Community Hospital	141	0	0.04	*	*
Garfield Memorial Hospital	56	0	0.02	*	*
Heber Valley Medical Center	42	0	0.01	*	*
Intermountain Medical Center	11,217	4	10.94	0.37	0.12 – 0.88
Jordan Valley Medical Center	640	0	0.42	*	*
Jordan Valley Medical Center West Valley Campus	442	0	0.29	*	*
Lakeview Hospital	815	0	0.53	*	*
LDS Hospital	1,732	1	1.51	0.66	0.03 – 3.27
Logan Regional Hospital	536	0	0.35	*	*
Lone Peak Hospital	97	0	0.06	*	*
McKay Dee Hospital	600	0	0.52	*	*
Mountain Point Medical Center	190	0	0.11	*	*
Mountain View Hospital	563	0	0.42	*	*
Mountain West Medical Center	94	0	0.05	*	*
Ogden Regional Medical Center	2,150	0	1.42	0.00	0.00 – 2.11
Park City Medical Center	87	0	0.05	*	*
Primary Children's Hospital	12,739	13	16.18	0.8	0.45 – 1.34
Riverton Hospital	315	0	0.21	*	*
Salt Lake Regional Medical Center	226	0	0.17	*	*
Sanpete Valley Hospital	115	0	0.03	*	*
Sevier Valley Hospital	122	0	0.07	*	*
St. Mark's Hospital	4,675	3	4.31	0.7	0.18 – 1.89
Timpanogos Regional Hospital	680	0	0.44	*	*
Uintah Basin Medical Center	207	0	0.12	*	*
University Hospital [§]	11,574	11	11.28	0.97	0.51 – 1.69
Utah Valley Regional Medical Center	4,057	0	3.53	0.00	0.00 – 0.85

⁺Source: NHSN data.

See footnotes on page 38.

Table 2a. Central line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017+ (CMS)

	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	60,036	34	57.27	0.59	0.42 – 0.82
Alta View Hospital	152	0	0.09	*	*
American Fork Hospital	725	0	0.42	*	*
Ashley Regional Medical Center	75	0	0.04	*	*
Bear River Valley Hospital	18	0	0.01	*	*
Beaver Valley Hospital	12	0	0.003	*	*
Brigham City Community Hospital	17	0	0.01	*	*
Cache Valley Hospital	139	1	0.08	\	\
Castleview Hospital	254	0	0.15	*	*
Cedar City Hospital	641	0	0.37	*	*
Davis Hospital & Medical Center	518	0	0.39	*	*
Delta Community Hospital	60	0	0.02	*	*
Dixie Regional Medical Center	3,706	1	2.78	0.36	0.02 – 1.78
Fillmore Community Hospital	141	0	0.04	*	*
Garfield Memorial Hospital	56	0	0.02	*	*
Heber Valley Medical Center	42	0	0.01	*	*
Intermountain Medical Center	11,217	4	10.94	0.37	0.12 – 0.88
Jordan Valley Medical Center	640	0	0.42	*	*
Jordan Valley Medical Center West Valley Campus	442	0	0.29	*	*
Lakeview Hospital	815	0	0.53	*	*
LDS Hospital	1,732	1	1.51	0.66	0.03 – 3.27
Logan Regional Hospital	536	0	0.35	*	*
Lone Peak Hospital	97	0	0.06	*	*
McKay Dee Hospital	600	0	0.52	*	*
Mountain Point Medical Center	190	0	0.11	*	*
Mountain View Hospital	563	0	0.42	*	*
Mountain West Medical Center	94	0	0.05	*	*
Ogden Regional Medical Center	2,150	0	1.42	0.00	0.00 – 2.11
Park City Medical Center	87	0	0.05	*	*
Primary Children's Hospital	12,739	13	16.11	0.8	0.45 – 1.34
Riverton Hospital	315	0	0.21	*	*
Salt Lake Regional Medical Center	226	0	0.17	*	*
Sanpete Valley Hospital	115	0	0.03	*	*
Sevier Valley Hospital	122	0	0.07	*	*
St. Mark's Hospital	4,675	3	4.31	0.7	0.18 – 1.89
Timpanogos Regional Hospital	680	0	0.44	*	*
Uintah Basin Medical Center	207	0	0.12	*	*
University Hospital [§]	11,574	11	11.28	0.97	0.51 – 1.69
Utah Valley Regional Medical Center	4,057	0	3.53	0.00	0.00 – 0.85

[†]Source: NHSN data. See footnotes on page 38.

Table 3. Central line-associated bloodstream infections in newborn intensive care units in acute care facilities, Utah, 2017⁺

	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	16,669	17	22.28	0.76	0.46 – 1.2
Ashley Regional Medical Center	11	0	0.01	*	*
Davis Hospital & Medical Center	155	1	0.2	\	\
Dixie Regional Medical Center	386	0	0.45	*	*
Intermountain Medical Center	2,052	3	2.98	1.01	0.26 – 2.74
Jordan Valley Medical Center	388	0	0.35	*	*
Logan Regional Hospital	146	0	0.11	*	*
McKay Dee Hospital	648	1	1.01	0.99	0.05 – 4.89
Ogden Regional Medical Center	285	0	0.37	*	*
Primary Children's Hospital	6,627	8	9.36	0.85	0.4 – 1.62
St. Mark's Hospital	497	2	0.49	\	\
Timpanogos Regional Hospital	574	1	0.48	\	\
University Hospital [§]	1,832	0	2.55	0.00	0.00 – 1.18
Utah Valley Regional Medical Center	3,068	1	3.93	0.25	0.01 – 1.25

⁺Source: NHSN data.
See footnotes on page 39.

Table 4. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017⁺

	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	57,570	79	77.04	1.03	0.82 – 1.27
Alta View Hospital	204	0	0.11	*	*
American Fork Hospital	533	1	0.39	\	\
Ashley Regional Medical Center	174	0	0.1	*	*
Castleview Hospital	148	0	0.08	*	*
Cedar City Hospital	328	0	0.18	*	*
Davis Hospital & Medical Center	1,903	1	1.94	0.51	0.03 – 2.54
Dixie Regional Medical Center	3,553	2	3.18	0.63	0.11 – 2.08
Intermountain Medical Center	10,732	22	17.57	1.25	0.8 – 1.86
Jordan Valley Medical Center	777	0	0.57	*	*
Jordan Valley Medical Center West Valley Campus	1,101	2	0.81	\	\
Lakeview Hospital	757	0	0.56	*	*
LDS Hospital	1,309	2	1.34	1.5	0.25 – 4.94
Logan Regional Hospital	621	0	0.46	*	*
McKay Dee Hospital	2,581	5	2.64	1.9	0.69 – 4.2
Mountain Point Medical Center	233	1	0.13	\	\
Mountain View Hospital	1,073	2	0.89	\	\
Mountain West Medical Center	128	0	0.07	*	*
Ogden Regional Medical Center	1,914	5	1.4	3.57	1.31 – 7.92
Park City Medical Center	146	1	0.08	\	\
Primary Children's Hospital	2,241	4	3.54	1.13	0.36 – 2.72
Riverton Hospital	182	0	0.14	*	*
Salt Lake Regional Medical Center	1,643	0	1.37	0.00	0.00 – 2.19
St. Mark's Hospital	3,101	1	3.17	0.32	0.02 – 1.56
Timpanogos Regional Hospital	1,366	0	1.05	0.00	0.00 – 2.86
Uintah Basin Medical Center	161	0	0.09	*	*
University Hospital [§]	13,919	23	28.29	0.81	0.53 – 1.2
Utah Valley Regional Medical Center	6,742	7	6.89	1.02	0.44 – 2.01

⁺Source: NHSN data.

See footnotes on page 39.

Table 4a. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017⁺ (CMS)

	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	57,570	79	77.04	1.03	0.82 – 1.27
Alta View Hospital	204	0	0.11	*	*
American Fork Hospital	533	1	0.39	\	\
Ashley Regional Medical Center	174	0	0.1	*	*
Castleview Hospital	148	0	0.08	*	*
Cedar City Hospital	328	0	0.18	*	*
Davis Hospital & Medical Center	1,903	1	1.94	0.51	0.03 – 2.54
Dixie Regional Medical Center	3,553	2	3.18	0.63	0.11 – 2.08
Intermountain Medical Center	10,732	22	17.57	1.25	0.8 – 1.86
Jordan Valley Medical Center	777	0	0.57	*	*
Jordan Valley Medical Center West Valley Campus	1,101	2	0.81	\	\
Lakeview Hospital	757	0	0.56	*	*
LDS Hospital	1,309	2	1.34	1.5	0.25 – 4.94
Logan Regional Hospital	621	0	0.46	*	*
McKay Dee Hospital	2,581	5	2.64	1.9	0.69 – 4.2
Mountain Point Medical Center	233	1	0.13	\	\
Mountain View Hospital	1,073	2	0.89	\	\
Mountain West Medical Center	128	0	0.07	*	*
Ogden Regional Medical Center	1,914	5	1.4	3.57	1.31 – 7.92
Park City Medical Center	146	1	0.08	\	\
Primary Children's Hospital	2,241	4	3.54	1.13	0.36 – 2.72
Riverton Hospital	182	0	0.14	*	*
Salt Lake Regional Medical Center	1,643	0	1.37	0.00	0.00 – 2.19
St. Mark's Hospital	3,101	1	3.17	0.32	0.02 – 1.56
Timpanogos Regional Hospital	1,366	0	1.05	0.00	0.00 – 2.86
Uintah Basin Medical Center	161	0	0.09	*	*
University Hospital [§]	13,919	23	28.29	0.81	0.53 – 1.2
Utah Valley Regional Medical Center	6,742	7	6.89	1.02	0.44 – 2.01

⁺Source: NHSN data.

See footnotes on page 39.

Table 5. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017⁺

	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	64,560	51	57.12	0.89	0.67 – 1.16
Alta View Hospital	598	0	0.29	*	*
American Fork Hospital	903	1	0.58	\	\
Ashley Regional Medical Center	326	0	0.16	*	*
Bear River Valley Hospital	158	0	0.08	*	*
Beaver Valley Hospital	97	0	0.06	*	*
Brigham City Community Hospital	488	0	0.22	*	*
Cache Valley Hospital	300	0	0.12	*	*
Castleview Hospital	1,138	1	0.56	\	\
Cedar City Hospital	558	0	0.27	*	*
Davis Hospital & Medical Center	1,118	0	1.07	0.00	0.00 – 2.81
Delta Community Hospital	215	0	0.14	*	*
Dixie Regional Medical Center	3,547	5	2.99	1.67	0.61 – 3.71
Fillmore Community Hospital	114	0	0.07	*	*
Garfield Memorial Hospital	134	1	0.09	\	\
Heber Valley Medical Center	230	0	0.15	*	*
Intermountain Medical Center	9,920	24	11.89	2.02	1.32 – 2.96
Jordan Valley Medical Center	1,814	0	1.18	0.00	0.00 – 2.54
Jordan Valley Medical Center West Valley Campus	974	0	0.66	*	*
Lakeview Hospital	1,951	1	1.31	0.76	0.04 – 3.77
LDS Hospital	1,741	2	1.64	1.22	0.2 – 4.03
Logan Regional Hospital	1,376	0	0.94	*	*
Lone Peak Hospital	675	0	0.25	*	*
McKay Dee Hospital	431	1	0.44	\	\
Mountain Point Medical Center	463	0	0.23	*	*
Mountain View Hospital	1,969	1	1.1	0.91	0.05 – 4.49
Mountain West Medical Center	693	0	0.27	*	*
Ogden Regional Medical Center	4,669	2	2.89	0.69	0.12 – 2.29
Park City Hospital	278	0	0.14	*	*
Primary Children's Hospital	1,098	0	1.13	0.00	0.00 – 2.66
Riverton Hospital	821	0	0.54	*	*
Salt Lake Regional Medical Center	338	0	0.25	*	*
Sanpete Valley Hospital	107	0	0.07	*	*
Sevier Valley Hospital	584	0	0.29	*	*
St. Mark's Hospital	10,100	0	10.14	0.00	0.00 – 0.3
Timpanogos Regional Hospital	1,637	2	0.78	\	\
Uintah Basin Medical Center	696	0	0.34	*	*
University Hospital [§]	8,361	7	10.19	0.69	0.3 – 1.36
Utah Valley Regional Medical Center	3,616	1	3.45	0.29	0.01 – 1.43

⁺Source: NHSN data.

See footnotes on page 40.

Table 5a. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017⁺

	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	63,655	50	57.34	0.87	0.65 – 1.14
Alta View Hospital	598	0	0.29	*	*
American Fork Hospital	903	1	0.58	\	\
Ashley Regional Medical Center	326	0	0.16	*	*
Bear River Valley Hospital	158	0	0.08	*	*
Beaver Valley Hospital	97	0	0.06	*	*
Brigham City Community Hospital	488	0	0.24	*	*
Cache Valley Hospital	300	0	0.14	*	*
Castleview Hospital	1,138	1	0.56	\	\
Cedar City Hospital	558	0	0.27	*	*
Davis Hospital & Medical Center	1,118	0	1.07	0.00	0.00 – 2.81
Delta Community Hospital	215	0	0.14	*	*
Dixie Regional Medical Center	3,547	5	2.99	1.67	0.61 – 3.71
Fillmore Community Hospital	114	0	0.07	*	*
Garfield Memorial Hospital	134	1	0.09	\	\
Heber Valley Medical Center	230	0	0.15	*	*
Intermountain Medical Center	9,920	24	11.89	2.02	1.32 – 2.96
Jordan Valley Medical Center	1,813	0	1.18	0.00	0.00 – 2.54
Jordan Valley Medical Center West Valley Campus	974	0	0.66	*	*
Lakeview Hospital	1,951	1	1.33	0.75	0.04 – 3.7
LDS Hospital	1,741	2	1.64	1.22	0.2 – 4.03
Logan Regional Hospital	1,376	0	0.94	*	*
Lone Peak Hospital	675	0	0.31	*	*
McKay Dee Hospital	431	1	0.44	\	\
Mountain Point Medical Center	463	0	0.23	*	*
Mountain View Hospital	1,969	1	1.23	0.81	0.04 – 3.4
Mountain West Medical Center	693	0	0.32	*	*
Ogden Regional Medical Center	4,669	2	3.2	0.62	0.12 – 2.07
Park City Medical Center	278	0	0.14	*	*
Primary Children's Hospital	1,098	0	1.13	0.00	0.00 – 2.66
Riverton Hospital	821	0	0.54	*	*
Salt Lake Regional Medical Center	338	0	0.25	*	*
Sanpete Valley Hospital	107	0	0.07	*	*
Sevier Valley Hospital	584	0	0.29	*	*
St. Mark's Hospital	10,100	0	10.14	0.00	0.00 – 0.3
Timpanogos Regional Hospital	1,637	2	0.99	\	\
Uintah Basin Medical Center	696	0	0.34	*	*
University Hospital [§]	8,361	7	10.19	0.69	0.3 – 1.36
Utah Valley Regional Medical Center	3,616	1	3.45	0.29	0.02 – 1.43

⁺Source: NHSN data.

See footnotes on page 40.

Footnotes

Tables 1, 1a. Central line-associated bloodstream infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017

- [§] 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.
- [\] Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.
- ^{*} Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

- 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 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.

Tables 2, 2a. Central line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017

- [§] 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.
- [\] Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.
- ^{*} Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

- 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 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 non-ICU locations.
- ⁴ Standardized Infection Ratio: Compares the total number of central line-associated bloodstream infection events in a hospital's non-ICU locations to a national benchmark. Rates are adjusted based on the type and size of a hospital or non-ICU locations.
- 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 3. Central line-associated bloodstream infections in newborn intensive care units in acute care facilities, Utah, 2017

§ 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN, in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2017.

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 newborn ICUs.

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

Tables 4, 4a. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2017

§ 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN, in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2017.

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.

Tables 5, 5a. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2017

§ 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN, in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2017.

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 non-ICU locations.

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 non-ICU locations.

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, 2017

	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 a 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 6. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2017⁺

	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	2,406	135	114.00	1.18	1.00 – 1.4
Alta View Hospital	31	2	1.17	1.7	0.29 – 5.63
American Fork Hospital	46	2	1.63	1.23	0.21 – 4.06
Ashley Regional Medical Center	17	2	0.66	\	\
Bear River Valley Hospital	4	0	0.16	*	*
Brigham City Community Hospital	13	0	0.73	*	*
Cache Valley Hospital	1	0	0.04	*	*
Castlevue Hospital	11	2	0.53	\	\
Cedar City Hospital	44	8	2.09	3.84	1.78 – 7.28
Davis Hospital and Medical Center	49	1	1.78	0.56	0.03 – 2.77
Dixie Regional Medical Center	171	10	6.72	1.49	0.76 – 2.65
Intermountain Medical Center	248	21	14.31	1.47	0.93 – 2.2
Jordan Valley Medical Center	32	0	1.56	0.00	0.00 – 1.92
Jordan Valley Medical Center West Valley Campus	27	2	1.13	1.77	0.3 – 5.86
Lakeview Hospital	34	1	1.18	0.84	0.04 – 4.17
LDS Hospital	215	7	8.78	0.8	0.35 – 1.58
Logan Regional Medical Center	43	3	1.74	1.73	0.44 – 4.7
Lone Peak Hospital	12	0	0.42	*	*
McKay Dee Hospital	193	10	7.76	1.29	0.65 – 2.3
Mountain Point Medical Center	11	1	0.46	\	\
Mountain View Hospital	24	1	1.05	0.95	0.05 – 4.69
Mountain West Medical Center	8	0	0.26	*	*
Ogden Regional Medical Center	60	4	2.62	1.53	0.49 – 3.68
Park City Medical Center	12	2	0.39	\	\
Primary Children's Hospital	112	2	5.4	0.37	0.06 – 1.22
Riverton Hospital	62	7	2.48	2.83	1.24 – 5.59
Salt Lake Regional Medical Center	26	1	0.85	\	\
Sanpete Valley Hospital	1	0	0.04	*	*
Sevier Valley Hospital	10	0	0.43	*	*
St. Mark's Hospital	187	2	6.53	0.31	0.05 – 1.01
Timpanogos Regional Hospital	27	2	1.41	1.42	0.24 – 4.68
University Hospital [§]	502	40	31.35	1.28	0.92 – 1.72
Utah Valley Regional Medical Center	173	2	8.36	0.24	0.04 – 0.79

⁺Source: NHSN data.

See footnotes on page 47.

Table 6a. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2017⁺ (CMS)

	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	2278	84	63.5	1.32	1.06 - 1.63
Alta View Hospital	31	1	0.82	\	\
American Fork Hospital	46	1	1.14	0.88	0.04 - 4.32
Ashley Regional Medical Center	17	2	0.37	\	\
Bear River Valley Hospital	0	0	0	*	*
Brigham City Community Hospital	13	0	0.4	*	*
Cache Valley Hospital	1	0	0.02	*	*
Castleview Hospital	11	1	0.31	\	\
Cedar City Hospital	44	4	1.2	3.39	1.08 - 8.18
Davis Hospital and Medical Center	48	1	1.32	0.76	0.04 - 3.73
Dixie Regional Medical Center	171	6	4.34	1.38	0.56 - 2.88
Intermountain Medical Center	243	13	6.77	0.031	1.07 - 3.2
Jordan Valley Medical Center	32	0	0.96	*	*
Jordan Valley Medical Center West Valley Campus	27	2	0.93	\	\
Lakeview Hospital	34	1	0.92	\	\
LDS Hospital	211	5	5.56	0.9	0.33 - 1.99
Logan Regional Medical Center	42	1	1.02	0.99	0.05 - 4.86
Lone Peak Hospital	12	0	0.33	*	*
McKay Dee Hospital	192	4	5.19	0.77	0.25 - 1.86
Mountain Point Medical Center	11	0	0.3	*	*
Mountain View Hospital	24	0	0.6	*	*
Mountain West Medical Center	8	0	0.23	*	*
Ogden Regional Medical Center	60	2	1.72	1.17	0.2 - 3.85
Park City Medical Center	12	1	0.25	\	\
Primary Children's Hospital	3	0	0.17	*	*
Riverton Hospital	62	7	1.75	4	1.75 - 7.91
Salt Lake Regional Medical Center	26	1	.069	\	\
Sanpete Valley Hospital	1	0	0.03	*	*
Sevier Valley Hospital	10	0	0.25	*	*
St. Mark's Hospital	187	1	4.72	0.21	0.01 - 1.05
Timpanogos Regional Hospital	27	2	0.79	\	\
University Hospital [§]	497	27	15.28	1.77	1.19 - 2.54
Utah Valley Regional Medical Center	171	1	5.11	0.2	0.01 - 0.10

⁺Source: NHSN data.

See footnotes on page 47.

Table 7. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2017⁺

	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	3,027	56	35.65	1.57	1.2 – 2.03
Alta View Hospital	39	0	0.6	*	*
American Fork Hospital	107	1	0.91	\	\
Ashley Regional Medical Center	42	0	0.32	*	*
Cache Valley Hospital	2	0	0.03	*	*
Castleview Hospital	3	0	0.05	*	*
Cedar City Hospital	20	0	0.27	*	*
Davis Hospital & Medical Center	92	0	1.09	0.00	0.00 – 2.76
Dixie Regional Medical Center	47	0	0.43	*	*
Heber Valley Medical Center	9	0	0.12	*	*
Intermountain Medical Center	315	5	3.17	1.58	0.58 – 3.49
Jordan Valley Medical Center	34	0	0.49	*	*
Jordan Valley Medical Center West Valley Campus	6	0	0.12	*	*
Lakeview Hospital	6	0	0.08	*	*
LDS Hospital	268	6	2.99	2.01	0.81 – 4.18
Logan Regional Hospital	115	3	1.18	2.55	0.65 – 6.95
Lone Peak Hospital	10	1	0.14	\	\
McKay Dee Hospital	124	3	1.31	2.3	0.58 – 6.25
Mountain Point Medical Center	2	0	0.02	*	*
Mountain View Hospital	45	1	0.76	\	\
Mountain West Medical Center	4	0	0.07	*	*
Ogden Regional Medical Center	100	2	1.28	1.56	0.26 – 5.15
Orem Community Hospital	16	1	0.2	\	\
Park City Medical Center	1	0	0.01	*	*
Riverton Hospital	162	1	1.66	0.6	0.03 – 2.97
Salt Lake Regional Medical Center	54	0	0.67	*	*
Sevier Valley Hospital	7	1	0.11	\	\
St. Mark's Hospital	511	4	4.98	0.8	0.26 – 1.94
Timpanogos Regional Medical Center	146	1	2.01	0.5	0.02 – 2.46
Uintah Basin Medical Center	30	0	0.47	*	*
University Health Care Hospitals and Clinics [§]	381	23	6.44	3.57	2.32 – 5.28
Utah Valley Regional Medical Center	327	3	3.67	0.82	0.21 – 2.23

⁺Source: NHSN data.
See footnotes on page 47.

Table 7a. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2017+ (CMS)

	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	3025	29	24.89	1.17	0.8 – 1.65
Alta View Hospital	38	0	0.31	*	*
American Fork Hospital	107	0	0.76	*	*
Ashley Regional Medical Center	42	0	0.33	*	*
Cache Valley Hospital	2	0	0.01	*	*
Castleview Hospital	3	0	0.02	*	*
Cedar City Hospital	20	0	0.16	*	*
Davis Hospital & Medical Center	92	0	0.73	*	*
Dixie Regional Medical Center	47	0	0.4	*	*
Heber Valley Medical Center	9	0	0.07	*	*
Intermountain Medical Center	315	4	2.53	1.58	0.5 – 3.82
Jordan Valley Medical Center	34	0	0.27	*	*
Jordan Valley Medical Center West Valley Campus	6	0	0.06	*	*
Lakeview Hospital	6	0	0.05	*	*
LDS Hospital	268	2	2.13	0.94	0.16 – 3.1
Logan Regional Hospital	115	1	0.97	\	\
Lone Peak Hospital	10	0	0.08	*	*
McKay Dee Hospital	124	2	1.04	1.93	0.32 – 6.38
Mountain Point Medical Center	2	0	0.01	*	*
Mountain View Hospital	45	0	0.36	*	*
Mountain West Medical Center	4	0	0.03	*	*
Ogden Regional Medical Center	100	1	0.99	\	\
Orem Community Hospital	16	1	0.12	\	\
Park City Medical Center	1	0	0.01	*	*
Riverton Hospital	162	1	1.3	0.77	0.04 – 3.81
Salt Lake Regional Medical Center	54	0	0.49	*	*
Sevier Valley Hospital	7	0	0.05	*	*
St. Mark's Hospital	511	4	4.03	0.99	0.32 – 2.4
Timpanogos Regional Medical Center	146	1	1.23	0.81	0.04 – 3.98
Uintah Basin Medical Center	30	0	0.23	*	*
University Health Care Hospitals and Clinics ^s	381	10	3.30	3.03	1.54 – 5.4
Utah Valley Regional Medical Center	326	2	2.82	0.71	0.12 – 2.35

^sSource: NHSN data.
See footnotes on page 47.

Footnotes

Tables 6, 6a. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2017

[§]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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN, in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2017.

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.

Tables 7, 7a. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2017

[§]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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN, in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2017.

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, 2017

	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 a 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 8. *C. difficile* infections in acute care facilities, Utah, 2017+

	Number of patient days ¹	Number of hospital onset <i>C. difficile</i> events ²	Predicted number of hospital onset <i>C. difficile</i> events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	810,139	600	546.29	1.1	1.01 – 1.19
Alta View Hospital	8,292	2	2.37	0.84	0.14 – 2.78
American Fork Hospital	15,218	12	7.88	1.52	0.83 – 2.59
Ashley Regional Medical Center	4,022	0	1.95	0.00	0.00 – 1.53
Bear River Valley Hospital	1,160	0	0.4	*	*
Beaver Valley Hospital	1,002	0	0.28	*	*
Brigham City Community Hospital	2,640	1	0.99	\	\
Cache Valley Hospital	1,961	1	0.58	\	\
Castleview Hospital	4,018	4	2.05	1.95	0.62 – 4.71
Cedar City Hospital	8,006	3	3.6	0.83	0.21 – 2.27
Davis Hospital & Medical Center	18,360	18	13.14	1.37	0.84 – 2.12
Dixie Regional Medical Center	53,393	37	36.52	1.01	0.72 – 1.38
Fillmore Community Medical Center	592	1	0.13	\	\
Garfield Memorial Hospital	1,326	1	0.39	\	\
HealthSouth Rehabilitation Hospital of Utah	9,930	0	2.59	0.00	0.00 – 1.16
Heber Valley Medical Center	1,943	0	0.66	*	*
Intermountain Medical Center	109,849	91	84.87	1.07	0.87 – 1.31
Jordan Valley Medical Center	1,5802	11	14.35	0.77	0.4 – 1.33
Jordan Valley Medical Center West Valley Campus	8,487	19	6.06	3.13	1.94 – 4.8
Lakeview Hospital	12,764	7	7.01	1.00	0.44 – 1.97
Landmark Hospital	5,533	8	4.18	1.91	0.89 – 3.63
LDS Hospital	31,777	34	21.59	1.58	1.11 – 2.18
Logan Regional Hospital	16,395	11	11.86	0.93	0.49 – 1.61
Lone Peak Hospital	4,187	3	1.42	2.11	0.54 – 5.73
McKay Dee Hospital	47,831	15	32.18	0.47	0.27 – 0.75
Mountain Point Medical Center	3,649	0	1.88	0.00	0.00 – 1.6
Mountain View Hospital	10,723	1	4.17	0.24	0.01 – 1.18
Mountain West Medical Center	4,064	0	1.2	0.00	0.00 – 2.5
Northern Utah Rehabilitation Hospital	5,795	1	2.48	0.4	0.02 – 1.99
Ogden Regional Medical Center	25,289	16	17.16	0.93	0.55 – 1.48
Orem Community Hospital	3,639	0	1.37	0.00	0.00 – 2.18
Park City Hospital	5,111	2	1.28	1.56	0.26 – 5.14
Primary Children's Hospital	56,770	42	26.15	1.61	1.17 – 2.15
Promise Hospital of Salt Lake	11,894	3	13.21	0.23	0.06 – 0.62
Riverton Hospital	14,261	3	4.42	0.68	0.17 – 1.85
Salt Lake Regional Medical Center	10,866	9	6.66	1.35	0.66 – 2.48
Sanpete Valley Hospital	16,55	1	0.45	\	\
Sevier Valley Hospital	2,606	0	0.75	*	*
Shriners Hospital for Children	1,278	0	0.2	*	*
South Davis Community Hospital	4,938	2	5.69	0.35	0.06 – 1.16
St. Mark's Hospital	45,562	43	45.11	0.95	0.7 – 1.27
The Orthopedic Specialty Hospital	4,590	0		*	*

Table 8 continued

	Number of patient days ¹	Number of hospital onset <i>C. difficile</i> events ²	Predicted number of hospital onset <i>C. difficile</i> events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
Timpanogos Regional Medical Center	10,835	8	7.27	1.1	0.51 – 2.09
Uintah Basin Medical Center	7,378	0	2.25	0.00	0.00 – 1.33
University Hospital [§]	124,084	128	98.35	1.3	1.09 – 1.54
Utah Valley Regional Medical Center	60,835	56	40.81	1.37	1.05 – 1.77
Utah Valley Specialty Hospital	9,058	6	7.47	0.8	0.33 – 1.67

[†]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 healthcare facilities with a predicted number less than one.

[¶]Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

^{*}Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

¹Number of patient days: The total number of days that patients stay at a facility per year. Patient days data for *C. difficile* infections excludes newborn nursery patient days data.

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

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

⁴Standardized Infection Ratio: Compares the total number of *C. difficile* 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 8a. *C. difficile* infections in acute care facilities, Utah, 2017+ (CMS)

	Number of patient days ¹	Number of hospital onset <i>C. difficile</i> events ²	Predicted number of hospital onset <i>C. difficile</i> events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	755,702	577	508.60	1.1	1.05 – 1.23
Alta View Hospital	8,292	2	2.37	0.84	0.14 – 2.78
American Fork Hospital	15,218	12	7.88	1.52	0.83 – 2.59
Ashley Regional Medical Center	4022	0	1.95	0.00	0.00 – 1.53
Bear River Valley Hospital	1,160	0	0.4	*	*
Beaver Valley Hospital	1,002	0	0.28	*	*
Brigham City Community Hospital	2,640	1	0.99	\	\
Cache Valley Hospital	1,961	1	0.58	\	\
Castleview Hospital	4,018	4	2.05	1.95	0.62 – 4.71
Cedar City Hospital	8,006	3	3.6	0.83	0.21 – 2.27
Davis Hospital & Medical Center	18,360	18	13.14	1.37	0.84 – 2.12
Dixie Regional Medical Center	53,393	37	36.52	1.01	0.72 – 1.38
Fillmore Community Medical Center	592	1	0.13	\	\
Garfield Memorial Hospital	1,326	1	0.39	\	\
HealthSouth Rehabilitation Hospital of Utah	9,930	0	2.59	0.00	0.00 – 1.16
Heber Valley Medical Center	1,943	0	0.66	*	*
Intermountain Medical Center	109,849	91	84.87	1.07	0.87 – 1.31
Jordan Valley Medical Center	15,802	11	14.35	0.77	0.4 – 1.33
Jordan Valley Medical Center West Valley Campus	8,487	19	6.07	3.13	1.94 – 4.8
Lakeview Hospital	12,764	7	7.01	1.00	0.44 – 1.97
Landmark Hospital	5,533	8	4.18	1.91	0.89 – 3.63
LDS Hospital	31,777	34	21.59	1.58	1.11 – 2.18
Logan Regional Hospital	16,395	11	11.86	0.93	0.49 – 1.61
Lone Peak Hospital	4,187	3	1.42	2.11	0.54 – 5.73
McKay Dee Hospital	47,831	15	32.18	0.47	0.27 – 0.75
Mountain Point Medical Center	3,649	0	1.88	0.00	0.00 – 1.6
Mountain View Hospital	10,723	1	4.17	0.24	0.01 – 1.18
Mountain West Medical Center	4,064	0	1.2	0.00	0.00 – 2.5
Northern Utah Rehabilitation Hospital	5,795	1	2.48	0.4	0.02 – 1.99
Ogden Regional Medical Center	25,289	16	17.16	0.93	0.55 – 1.48
Orem Community Hospital	3,639	0	1.37	0.00	0.00 – 2.18
Park City Hospital	5,111	2	1.28	1.56	0.26 – 5.14
Primary Children's Hospital	56,770	42	26.15	1.61	1.17 – 2.15
Promise Hospital of Salt Lake	11,894	3	13.21	0.23	0.06 – 0.62
Riverton Hospital	14,261	3	4.42	0.68	0.17 – 1.85
Salt Lake Regional Medical Center	10,866	9	6.66	1.35	0.66 – 2.48
Sanpete Valley Hospital	1,655	1	0.45	\	\
Sevier Valley Hospital	2,606	0	0.75	*	*
Shriners Hospital for Children	1,278	0	0.2	*	*
South Davis Community Hospital	4,938	2	5.69	0.35	0.06 – 1.16
St. Mark's Hospital	45,562	43	45.11	0.95	0.7 – 1.27
The Orthopedic Specialty Hospital	4,590	0	0.71	*	*

Table 8a continued

	Number of patient days ¹	Number of hospital onset <i>C. difficile</i> events ²	Predicted number of hospital onset <i>C. difficile</i> events ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
Timpanogos Regional Medical Center	10,835	8	7.27	1.1	0.51 – 2.09
Uintah Basin Medical Center	7,378	0	2.25	0.00	0.00 – 1.33
University Hospital [§]	124,084	128	98.35	1.3	1.09 – 1.54
Utah Valley Regional Hospital	60,835	56	40.81	1.37	1.05 – 1.77
Utah Valley Specialty Hospital	9,058	6	7.47	0.8	0.33 – 1.67

[†]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 healthcare facilities with a predicted number less than one.

[¶]Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

^{*}Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

¹Number of patient days: The total number of days that patients stay at a facility per year. Patient days data for *C. difficile* infections excludes newborn nursery patient days data.

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

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

⁴Standardized Infection Ratio: Compares the total number of *C. difficile* 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 9. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2017⁺

	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	991,990	27	54.82	0.49	0.33 – 0.71
Alta View Hospital	10,788	0	0.23	*	*
American Fork Hospital	22,940	0	0.77	*	*
Ashley Regional Medical Center	4,682	0	0.11	*	*
Bear River Valley Hospital	1,371	0	0.03	*	*
Beaver Valley Hospital	1,110	0	0.02	*	*
Brigham City Community Hospital	2,640	0	0.05	*	*
Cache Valley Hospital	2,140	0	0.05	*	*
Castleview Hospital	3,812	0	0.1	*	*
Central Valley Medical Center	22	0	0.01	*	*
Cedar City Hospital	9,603	0	0.2	*	*
Davis Hospital & Medical Center	22,105	0	0.7	*	*
Delta Community Medical Center	924	0	0.02	*	*
Dixie Regional Medical Center	62,198	0	2.21	0.00	0.00 – 1.36
Fillmore Community Medical Center	656	0	0.01	*	*
Garfield Memorial Hospital	1,403	0	0.03	*	*
HealthSouth Rehabilitation Hospital of Utah	9,930	0	0.19	*	*
Heber Valley Medical Center	2,268	0	0.05	*	*
Intermountain Medical Center	131,857	2	8.6	0.23	0.04 – 0.77
Jordan Valley Medical Center	22,775	2	0.78	\	\
Jordan Valley Medical Center West Valley Campus	10,146	1	0.43	\	\
Lakeview Hospital	13,836	0	0.58	*	*
Landmark Hospital	5,533	0	0.76	*	*
LDS Hospital	37,540	2	1.59	1.26	0.21 – 4.17
Logan Regional Hospital	22,264	0	0.73	*	*
Lone Peak Hospital	4,543	0	0.08	*	*
McKay Dee Hospital	61,768	0	3.56	0.00	0.00 – 0.93
Mountain Point Medical Center	5,447	1	0.17	\	\
Mountain View Hospital	11,899	0	0.38	*	*
Mountain West Medical Center	4,064	0	0.09	*	*
Northern Utah Rehabilitation Hospital	5,795	0	0.11	*	*
Ogden Regional Medical Center	33,555	1	1.26	0.79	0.04 – 3.92
Orem Community Hospital	5,133	0	0.09	*	*
Park City Hospital	5,842	0	0.11	*	*
Primary Children's Hospital	70,675	3	2.93	1.02	0.26 – 2.79
Promise Hospital of Salt Lake	11,894	1	1.75	0.57	0.03 – 2.82

Table 9 continued

	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
Riverton Hospital	19,774	1	0.37	\	\
Salt Lake Regional Medical Center	12,300	0	0.38	*	*
Sanpete Valley Hospital	1,921	0	0.04	*	*
Sevier Valley Hospital	2,611	0	0.05	*	*
South Davis Community Hospital	4,938	0	1.28	0.00	0.00 – 2.34
St. Mark's Hospital	55,945	2	2.52	0.79	0.13 – 2.62
The Orthopedic Specialty Hospital	4,590	0	0.05	*	*
Timpanogos Regional Medical Center	17,652	0	0.79	*	*
Uintah Basin Medical Center	7,378	0	0.16	*	*
University Hospital [§]	145,923	9	14.2	0.63	0.31 – 1.16
Utah Valley Regional Medical Center	86,742	2	5.55	0.36	0.06 – 1.19
Utah Valley Specialty Hospital	9,058	0	1.01	0.00	0.00 – 2.97

[†]Source: NHSN data.

[§]Includes Huntsman Cancer Institute.

¹SIR 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

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.

Table 9a. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2017⁺ (CMS)

	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	936,538	26	49.56	0.53	0.35 – 0.16
Alta View Hospital	10,788	0	0.23	*	*
American Fork Hospital	22,940	0	0.77	*	*
Ashley Regional Medical Center	4,682	0	0.11	*	*
Bear River Valley Hospital	1,371	0	0.03	*	*
Beaver Valley Hospital	1,110	0	0.02	*	*
Brigham City Community Hospital	2,640	0	0.05	*	*
Cache Valley Hospital	2,140	0	0.05	*	*
Castleview Hospital	3,812	0	0.1	*	*
Central Valley Medical Center	15	0	0	*	*
Cedar City Hospital	9,603	0	0.2	*	*
Davis Hospital & Medical Center	22,105	0	0.7	*	*
Delta Community Medical Center	924	0	0.02	*	*
Dixie Regional Medical Center	62,198	0	2.21	0.00	0.00 – 1.36
Fillmore Community Medical Center	656	0	0.01	*	*
Garfield Memorial Hospital	1,403	0	0.03	*	*
HealthSouth Rehabilitation Hospital of Utah	9,930	0	0.19	*	*
Heber Valley Medical Center	2,268	0	0.05	*	*
Intermountain Medical Center	131,857	2	8.6	0.23	0.04 – 0.77
Jordan Valley Medical Center	22,775	2	0.78	\	\
Jordan Valley Medical Center West Valley Campus	10,146	1	0.43	\	\
Lakeview Hospital	13,836	0	0.58	*	*
Landmark Hospital	5,533	0	0.76	*	*
LDS Hospital	37,540	2	1.59	1.26	0.21 – 4.17
Logan Regional Hospital	22,264	0	0.73	*	*
Lone Peak Hospital	4,543	0	0.08	*	*
McKay Dee Hospital	61,768	0	3.22	0.00	0.00 – 0.93
Mountain Point Medical Center	5,447	1	0.17	\	\
Mountain View Hospital	11,899	0	0.38	*	*
Mountain West Medical Center	4,064	0	0.09	*	*
Northern Utah Rehabilitation Hospital	5,795	0	0.11	*	*
Ogden Regional Medical Center	33,555	1	1.26	0.79	0.04 – 3.92
Orem Community Hospital	5,133	0	0.09	*	*
Park City Hospital	5,842	0	0.11	*	*
Primary Children's Hospital	70,675	3	2.93	1.02	0.26 – 2.79
Promise Hospital of Salt Lake	11,894	1	1.75	0.57	0.03 – 2.82

Table 9a continued

	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
Riverton Hospital	19,774	1	0.37	\	\
Salt Lake Regional Medical Center	12,300	0	0.38	*	*
Sanpete Valley Hospital	1,921	0	0.04	*	*
Sevier Valley Hospital	2,611	0	0.05	*	*
South Davis Community Hospital	4,938	0	1.28	0.00	0.00 – 2.34
St. Mark's Hospital	55,945	2	2.52	0.79	0.13 – 2.62
The Orthopedic Specialty Hospital	4,590	0	0.05	*	*
Timpanogos Regional Medical Center	17,652	0	0.79	*	*
Uintah Basin Medical Center	7,378	0	0.16	*	*
University Hospital [§]	145,923	9	14.2	0.63	0.31 – 1.16
Utah Valley Regional Medical Center	86,742	2	5.55	0.36	0.06 – 1.19
Utah Valley Specialty Hospital	9,058	0	1.01	0.00	0.00 – 2.97

[†]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 healthcare facilities with a predicted number less than one.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

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 (LTAC) with intensive care units (ICU) and inpatient rehabilitation facilities (IRF).

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 an LTAC or 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, 2017

	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 D	5,817	8	13	1.36	0.64-2.56
1	2	3	4	5	6

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 specific device days for all patients 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. 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 D, 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 D (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 D, based on comparison to a national HAI benchmark of facilities that are similar to Facility D, 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 a 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 10. Central-line associated bloodstream infections in long-term acute care facilities with intensive care units and wards, Utah, 2017⁺

	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	16,997	12	16.96	0.71	0.38 – 1.2
Landmark Hospital	2,667	1	2.33	0.43	0.02 – 2.11
Promise Hospital	7,231	2	8.14	0.25	0.04 – 0.81
South Davis Community Hospital	2,227	5	2.52	1.99	0.73 – 4.4
Utah Valley Specialty Hospital	4,872	4	3.98	1.01	0.32 – 2.43

⁺Source: NHSN data.

Table 10a. Central-line associated bloodstream infections in long-term acute care facilities with intensive care units and wards, Utah, 2017⁺ (CMS)

	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	16,997	12	16.96	0.71	0.38 – 1.2
Landmark Hospital	2,667	1	2.33	0.43	0.02 – 2.11
Promise Hospital	7,231	2	8.14	0.25	0.04 – 0.81
South Davis Community Hospital	2,227	5	2.52	1.99	0.73 – 4.4
Utah Valley Specialty Hospital	4,872	4	3.98	1.01	0.32 – 2.43

⁺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 11. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 2017⁺

	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	12,792	20	18.91	1.06	0.66 – 1.6
Landmark Hospital	2,413	6	2.98	2.02	0.82 – 4.19
Promise Hospital	4,883	3	8.02	0.37	0.1 – 1.02
South Davis Community Hospital	1,291	1	2.73	0.37	0.02 – 1.81
Utah Valley Specialty Hospital	4,205	10	5.18	1.93	0.98 – 3.44

⁺Source: NHSN data.

Table 11a. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 2017⁺ (CMS)

	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	12,792	20	18.91	1.06	0.66 – 1.6
Landmark Hospital	2,413	6	2.98	2.02	0.82 – 4.19
Promise Hospital	4,883	3	8.02	0.37	0.1 – 1.02
South Davis Community Hospital	1,291	1	2.73	0.37	0.02 – 1.81
Utah Valley Specialty Hospital	4,205	10	5.18	1.93	0.98 – 3.44

⁺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 12. Catheter-associated urinary tract infections in inpatient rehabilitation facilities, Utah, 2017⁺

	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	3,243	8	6.91	1.16	0.54 – 2.2
Davis Hospital and Medical Center	48	0	0.09	*	*
Dixie Regional Medical Center	125	0	0.34	*	*
Health South Rehabilitation Hospital of Utah	741	0	0.8	*	*
Intermountain Medical Center	194	0	0.53	*	*
Jordan Valley Hospital	130	1	0.25	\	\
McKay Dee Hospital	89	0	0.24	*	*
Northern Utah Rehabilitation Hospital	290	0	0.31	*	*
Salt Lake Regional Medical Center	122	2	0.25	\	\
St. Mark's Hospital	251	0	0.68	*	*
University Hospital [§]	582	4	1.59	2.52	0.8 – 6.08
Utah Valley Regional Medical Center	671	1	1.83	0.55	0.03 – 2.7

⁺Source: NHSN data.

Table 12a. Catheter-associated urinary tract infections in inpatient rehabilitation facilities, Utah, 2017⁺ (CMS)

	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	2212	8	5.8	1.38	0.64 – 2.62
Davis Hospital and Medical Center	48	0	0.09	*	*
Dixie Regional Medical Center	125	0	0.34	*	*
Health South Rehabilitation Hospital of Utah	741	0	0.8	*	*
Intermountain Medical Center	194	0	0.53	*	*
Jordan Valley Medical Center	130	1	0.25	\	\
McKay Dee Hospital	89	0	0.24	*	*
Northern Utah Rehabilitation Hospital	290	0	0.31	*	*
Salt Lake Regional Medical Center	122	2	0.25	\	\
St. Mark's Hospital	251	0	0.68	*	*
University Hospital [§]	582	4	1.59	2.52	0.8 – 6.08
Utah Valley Regional Medical Center	671	1	1.83	0.55	0.03 – 2.7

⁺Source: NHSN data.

⁵Includes Huntsman Cancer Institute.

¹SIR 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

* Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2017.

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.

Table 13. Dialysis event bloodstream infections, Utah, 2017⁺

	Number of patient months ¹	Number of Dialysis Event BST ²	Predicted number of Dialysis Event BST ³	Standardized Infection Ratio ⁴	95% Confidence Interval ⁵
State of Utah	19,772	118	118.37	1.00	0.83 – 1.19
American Fork Dialysis Center	214	0	2.28	0.00	0.00 – 1.32
Blue Mountain Hospital Dialysis Center	346	3	1.94	1.54	0.39 – 4.2
Bonneville Dialysis Center	635	5	4.01	1.25	0.49 – 2.77
Castlevue Dialysis Center	319	3	1.98	1.52	0.39 – 4.13
Farmington Bay Dialysis Center	355	0	1.98	0.00	0.00 – 1.51
Hurricane Dialysis	190	1	1.75	0.57	0.03 – 2.81
Intermountain Medical Center Dialysis Center	1,080	6	5.68	1.06	0.43 – 2.2
Iron Mission Dialysis Center	350	4	2.98	1.34	0.43 – 3.24
Kolff Dialysis Center	565	3	3.63	0.83	0.21 – 2.25
Lakeside Dialysis Center	338	3	2.39	1.25	0.32 – 3.41
Liberty Dialysis Layton	503	0	2.94	0.00	0.00 – 1.02
Liberty Dialysis St. George	769	4	4.93	0.81	0.26 – 1.96
Liberty Dialysis West Jordan	682	3	4.25	0.71	0.18 – 1.92
Logan Regional Dialysis Center	592	3	2.98	1.01	0.26 – 2.74
Lone Peak Dialysis	804	9	4.15	2.17	1.06 – 3.98
Mark Lindsay Dialysis Center	308	2	2.07	0.96	0.16 – 3.19
Oquirrh Artificial Kidney Center	1,104	7	5.29	1.32	0.58 – 2.62
Payson Regional Dialysis	420	7	2.44	2.87	1.25 – 5.67
Pleasant View Dialysis Center	559	0	3.27	0.00	0.00 – 0.92
Provo Dialysis	409	4	3.26	1.23	0.39 – 2.96
Primary Children’s Dialysis Center	80	1	1.04	0.96	0.05 – 4.72
Sevier Valley Dialysis	292	1	1.44	0.69	0.03 – 3.43
South Mountain Dialysis	593	0	3.75	0.00	0.00 – 0.8
South Valley Dialysis Center	481	2	3.09	0.65	0.11 – 2.14
Tooele Valley Dialysis	380	0	1.88	0.00	0.00 – 1.59
UBMC Dialysis Roosevelt	564	1	3.58	0.28	0.01 – 1.38
Uintah Basin Medical Center Dialysis Vernal	202	0	1.00	0.00	0.00 – 2.99
University of Utah Dialysis Program Dixie Dialysis	699	5	4.88	1.02	0.38 – 2.27
Utah Dialysis Center	819	1	4.43	0.26	0.01 – 1.11
Utah Valley Dialysis Center	1,419	23	6.31	3.64	2.37 – 5.38
Wasatch Artificial Kidney Center	1,127	1	6.75	0.15	0.01 – 0.73
Weber Valley Dialysis	204	0	0.91	*	*
West Bountiful Dialysis	157	3	0.67	\	\
West Valley Dialysis Clinic	1,098	2	6.39	0.31	0.05 – 1.06
Woods Cross Dialysis	425	6	2.36	2.54	1.03 – 5.29

⁺Source: NHSN data.

¹SIR 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.

\ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2017.

* Predicted to have less than one infection for the year, and did NOT have an infection, as defined by NHSN in 2017.

¹Number of patient months: The number of patient-months are equal to the summed number of patient-month denominators reported by the facility during the year. To calculate patient-months, facilities report the number of hemodialysis outpatients who were dialyzed in the facility on the first two working days of the month, using the *Denominators for Dialysis Event Surveillance* form. This count is used to estimate the number of patient-months that there is risk of a healthcare-associated infection.

²Number of dialysis event BSI: The total number of bloodstream infections that were reported per year.

³Predicted number of dialysis event BSI: The number of bloodstream infections anticipated to occur based on historical data of comparable dialysis facilities.

⁴Standardized Infection Ratio: Compares the total number of bloodstream infections in dialysis 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 U.S. 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 (e.g., 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 (LTAC)** - 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 U.S. 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 re-hospitalization.
- 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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