2018

Healthcare-Associated Infections in Utah

Utah Department of Health
Division of Disease Control and Prevention
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UTAH DEPARTMENT OF HEALTH

Acknowledgements

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Foreward

Healthcare-associated infections (HAIs) are a major, yet often preventable, threat to patient safety. The Utah Department of Health's (UDOH) Healthcare-Associated Infections/Antimicrobial Resistance (HAI/AR) 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 2018 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. The UHIP Governance Committee has agreed to utilize CMS calculations for this years report.

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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
    - *Clostridioides 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 aggregate data.

Numbers of HAIs reported by Utah facilities during 2018 showed some significant changes compared to the previous year's data. *C. difficile* infections showed significant decreases in the state of Utah. In 2017, Utah facilities reported 600 facility onset *C. difficile* infections compared to 2018 Utah facilities reported 348 facility onset *C. difficile* 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 aggregate data. 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 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 observed than predicted, based on the national aggregate data.
Equal to 1	There were about the same number of infections observed as predicted, based on the national aggregate data.
More than 1	There were more infections observed than predicted, based on the national aggregate data.

To enforce a minimum precision criterion, SIRs are only calculated when the number of predicted infections is greater than 1.0. This rule was instituted by NHSN to avoid the calculation and interpretation of statistically imprecise SIRs, which typically have extreme values.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Below is an overall SIR summary of 2018 HAI data reported by Utah facilities compared to national aggregate 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**
- ▼ ***Clostridioides difficile* (facility onset)**
- ▼ **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, 2018

32 adult and pediatric ICU-related CLABSIs in acute care facilities
The number of CLABSIs in Utah acute care facilities was **50% fewer** compared to the national aggregate data

12 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 aggregate data

29 non-ICU-related CLABSIs in Utah acute care facilities
The number of CLABSIs in Utah acute care facilities was **32% fewer** compared to the national aggregate data

10 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 aggregate data

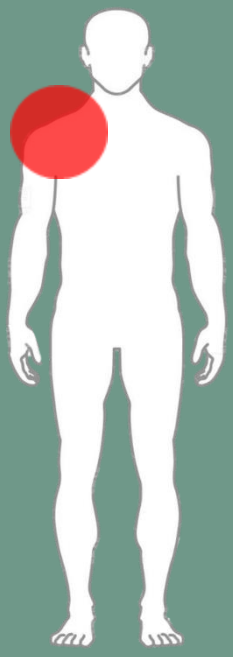

Figure 1. Central line-associated bloodstream infections in adult and pediatric intensive care units in acute care facilities, Utah, 2018[+]

Hospital	SIR
State of Utah	▼
Alta View Hospital	*
American Fork Hospital	*
Ashley Regional Medical Center	*
Castleview Hospital	*
Davis Hospital and Medical Center	/
Cedar City Hospital	/
Dixie Regional 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	*

Hospital	SIR
State of Utah	▼
McKay Dee Hospital	●
Mountain Point Medical Center	*
Mountain View Hospital	*
Mountain West Medical Center	*
Ogden Regional Medical Center	●
Park City Medical Center	*
Primary Children's Hospital	●
Riverton Hospital	*
Salt Lake Regional Medical Center	●
St. Mark's Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	*
University Hospital	▼
Utah Valley Regional Medical Center	●

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 2. Central line-associated bloodstream infections in newborn intensive care units in acute care facilities, Utah, 2018[+]

Hospital	SIR
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 aggregate data

▲ Statistically **MORE** infections than the national aggregate data

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* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

○ **NOT** statistically different from the national aggregate data

Figure 3. Central line-associated bloodstream infections in long-term acute care facilities, Utah, 2018[+]

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

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 4. Central-line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018+

Hospital	SIR
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	*
Central Valley Medical Center	*
Davis Hospital and Medical Center	*
Delta Community Hospital	*
Dixie Regional Medical Center	●
Fillmore Community Hospital	*
Garfield Memorial Hospital	*
Heber Valley Hospital	*
Intermountain Medical Center	●
Jordan Valley Medical Center	*
Jordan Valley Medical Center West Valley Campus	*

Hospital	SIR
State of Utah	▼
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	/
Park City Medical Center	*
Primary Children's Hospital	●
Riverton Hospital	*
Salt Lake Regional Medical Center	/
Sanpete Valley Hospital	*
Sevier Valley Hospital	*
St. Mark's Hospital	●
Timpanogos Regional Hospital	*
Uintah Basin Medical Center	*
University Hospital	●
Utah Valley Regional Medical Center	●

+Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

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 2018 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 patients receive a urinary catheter at some point in their stay

A Look at CAUTIs in Utah, 2018

66 ICU-related CAUTIs in acute care facilities
The number of CAUTIs in Utah's ICUs was **NOT statistically different** compared to the national aggregate data

43 CAUTIs in inpatient non-intensive care locations in acute care facilities
The number of CAUTIs in Uah's acute care facilities was **NOT statistically different** compared to the national aggregate data

12 CAUTIs in inpatient rehabilitation facilities (IRFs)
The number of CAUTIs in Utah's IRFs was **NOT statistically different** compared to the national aggregate data

14 CAUTIs in long-term acute care facilities (LTAC)
The number of CAUTIs in Utah's LTACs was **NOT statistically different** compared to the national aggregate data

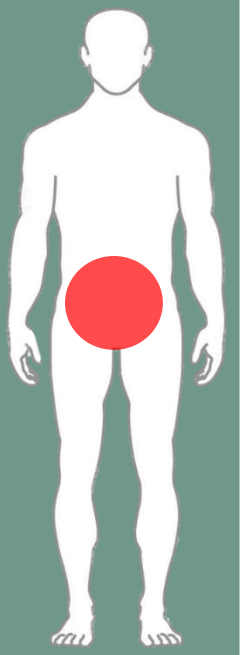

Figure 5. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2018[+]

Hospital	SIR
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	●
Intermountain Medical Center	●
Jordan Valley Medical Center	*
Jordan Valley Medical Center West Valley Campus	*
Lakeview Hospital	*
LDS Hospital	●
Logan Regional Hospital	*
Lone Peak Hospital	*

Hospital	SIR
State of Utah	●
McKay Dee Hospital	●
Mountain Point Medical Center	*
Mountain View Hospital	*
Mountain West Medical Center	/
Ogden Regional Medical Center	●
Park City Medical Center	*
Primary Children's Hospital	●
Riverton Hospital	*
Salt Lake Regional Medical Center	●
St. Mark's Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	*
University Hospital	●
Utah Valley Regional Medical Center	●

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 6. Catheter-associated urinary tract infections in in-patient rehabilitation facilities, Utah, 2018[+]

Hospital	SIR
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 aggregate data

▲ Statistically **MORE** infections than the national aggregate data

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* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 7. Catheter-associated urinary tract infections in long-term acute care facilities, Utah, 2018[+]

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

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 8. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018[+]

Hospital	SIR
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	*
Central Valley Medical Center	*
Davis Hospital and Medical Center	*
Delta Community Hospital	*
Dixie Regional Medical Center	○
Fillmore Community Hospital	*
Garfield Memorial Hospital	*
Heber Valley Hospital	/
Intermountain Medical Center	○
Jordan Valley Medical Center	*
Jordan Valley Medical Center West Valley Campus	*

Hospital	SIR
State of Utah	○
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	○
Park City Medical Center	*
Primary Children's Hospital	/
Riverton Hospital	*
Salt Lake Regional Medical Center	*
Sanpete Valley Hospital	*
Sevier Valley Hospital	*
St. Mark's Hospital	○
Timpanogos Regional Hospital	*
Uintah Basin Medical Center	*
University Hospital	○
Utah Valley Regional Medical Center	○

[+]Source: NHSN data.

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○ **NOT** statistically different from the national aggregate data

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.

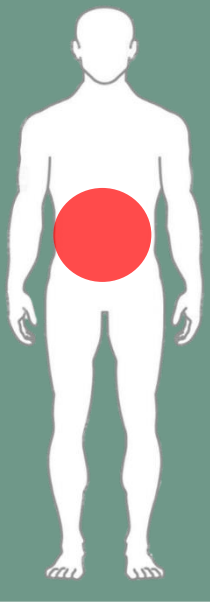
A Look at SSIs in Utah, 2018

63 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 aggregate data

2,249 colon surgeries performed

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



13 SSIs associated with abdominal hysterectomies reported in Utah

49% fewer abdominal hysterectomy SSIs in Utah compared to the national aggregate data

3,033 abdominal hysterectomy surgeries performed

37 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, 2018+

Hospital	SIR
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	/
Central Valley Medical Center	*
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	●

Hospital	SIR
State of Utah	●
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	*
Primary Children's Hospital	*
Riverton Hospital	●
Salt Lake Regional Medical Center	*
Sanpete Valley Hospital	*
Sevier Valley Hospital	*
St. Mark's Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	*
University Hospital	●
Utah Valley Regional Medical Center	●

+Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Figure 10. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2018[+]

Hospital	SIR
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	*
Central Valley Medical Center	*
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	●

Hospital	SIR
State of Utah	●
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	*
Primary Children's Hospital	*
Riverton Hospital	●
Salt Lake Regional Medical Center	*
Sanpete Valley Hospital	*
Sevier Valley Hospital	*
St. Mark's Hospital	●
Timpanogos Regional Hospital	●
Uintah Basin Medical Center	*
University Hospital	●
Utah Valley Regional Medical Center	●

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

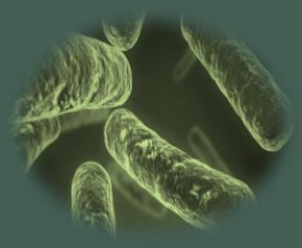
* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

Clostridioides 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.

HAZARD LEVEL URGENT

A Look at *C. difficile* in Utah, 2018

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

27% fewer *C. difficile* infections in Utah healthcare facilities compared to the national aggregate data

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

8 of Utah's facilities had significantly fewer infections compared to the national aggregate data

0 of Utah's facilities had significantly more infections compared to the national aggregate data

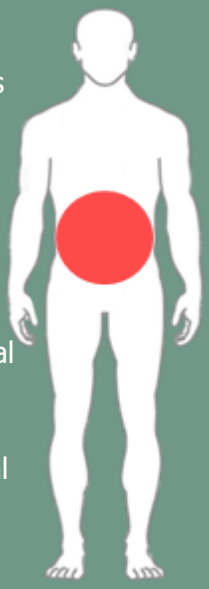


Figure 11. *C. difficile* infections in acute care facilities, Utah, 2018[+]

Hospital	SIR
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	●
Central Valley Medical Center	*
Davis Hospital and Medical Center	●
Dixie Regional Medical Center	▼
Delta Community Medical Center	*
Filmore	*
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
State of Utah	▼
Lone Peak Hospital	●
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	/
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	●

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

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 S*taphylococcus 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, 2018

33 MRSA bacteremia infections were reported

▼ **44% fewer** MRSA bacteremia infections in Utah acute care facilities compared to the national aggregate data

47 facilities met the criteria for required MRSA bacteremia infections

35 facilities had **ZERO infections** in 2018

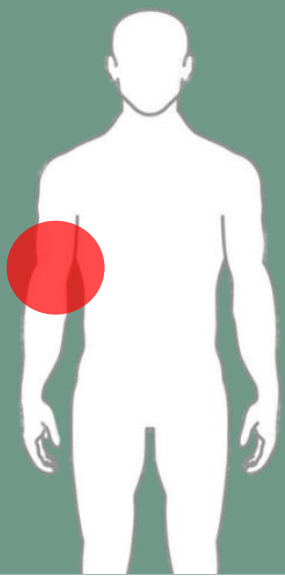


Figure 12. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2018+

Hospital	SIR
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	*
Central Valley Medical Center	*
Davis Hospital and Medical Center	/
Delta Community Medical Center	*
Dixie Regional Medical Center	▼
Fillmore Community Center 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	/

Hospital	SIR
State of Utah	▼
Lone Peak Hospital	*
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 aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

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 vasdcular access infections (redness, swelling, and/or pus)

A Look at Dialysis Infections in Utah, 2018

98 dialysis infection events were reported

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

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

4 of Utah's facilities had significantly fewer infections compared to the national aggregate data

2 of Utah's facilities had significantly more infections compared to the national aggregate data

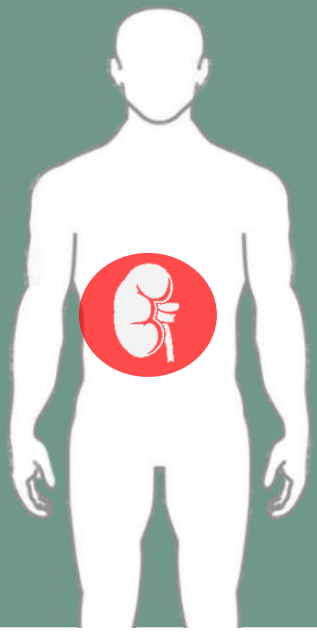


Figure 13. Dialysis event bloodstream infections, Utah, 2018[+]

Facility	SIR
State of Utah	●
American Fork Dialysis Center	●
Blue Mountain Hospital Dialysis Center	●
Bonneville Dialysis Center	●
Castleview Dialysis Center	●
Farmington Bay Dialysis Center	●
Hurricane Dialysis	●
Intermountain Medical Center Dialysis Center	●
Iron Mission Dialysis Center	●
Kolff Dialysis Center	▼
Lakeside Dialysis Center	●
Liberty Dialysis Layton	●
Liberty Dialysis Ogden	●
Liberty Dialysis St. George	●
Liberty Dialysis West Jordan	●
Logan Regional Dialysis Center	●
Lone Peak Dialysis	▲
Mark Lindsay Dialysis Center	●
Oquirrh Artificial Kidney Center	●

Facility	SIR
State of Utah	●
Payson Regional Dialysis	●
Pleasant View Dialysis Center	●
Primary Children's Dialysis Center	●
Provo Dialysis	●
Sevier Valley Dialysis	●
South Mountain Dialysis	▼
South Valley Dialysis Center	▼
Tooele Valley Dialysis	●
UBMC Dialysis Roosevelt	●
Uintah Basin Medical Center Dialysis Vernal	●
University of Utah Dialysis Program Dixie Dialysis	●
Utah Dialysis Center	●
Utah Valley Dialysis Center	▲
Wasatch Artificial Kidney Center	▼
Weber Valley Dialysis	*
West Bountiful Dialysis	/
West Valley Dialysis Clinic	●
Woods Cross Dialysis	●

[+]Source: NHSN data.

▼ Statistically **FEWER** infections than the national aggregate data

▲ Statistically **MORE** infections than the national aggregate data

/ Predicted to have less than one infection for the year, but had one or more infections, as defined by NHSN in 2018

* Predicted to have less than one infection for the year, and had **ZERO** infections, as defined by NHSN in 2018

● **NOT** statistically different from the national aggregate data

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 2018 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 CLABSIs and *C. difficile* infection (CDI) LabID events.

The focus of these validation activities was to determine how NHSN CLABSI 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 2018. 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 CLABSI 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 or CLABSI 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 30 charts were reviewed, including charts of patients identified by the facility as having a CLABSI event and charts of patients who had a positive blood culture but were not identified as having a CLABSI, 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 2018. 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

296 blood cultures and **160** toxin-positive *C. difficile* tests

Auditors used CLABSI and CDI LabID event criteria from the 2018 NSHN Patient Safety Component Manual

CLABSI

- **25** CLABSIs identified by auditors
- **25** CLABSIs reported by healthcare facilities
- **ZERO** CLABSIs were reported by facilities that did not meet the NSHN criteria
- **ZERO** additional CLABSIs were identified by auditors

CDI

- **56** hospital-onset CDIs identified by auditors
- **56** hospital-onset CDIs reported by healthcare facilities
- **ZERO** additional hospital-onset CDIs were 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 central-line 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

Conclusions

Validation results indicate that the number of CLABSIs and CDI LabID events is generally accurate as reported surveillance data prior to validation activities.

Infection preventionists at the validated facilities were able to correctly determine which patients met the CLABSI definition and apply the definition appropriately. When performing CLABSI validation, a central line must be present for greater than two calendar days, bacterial or fungal pathogens are present in a blood culture and/or presence of one of the following signs or symptoms, fever, chills or hypotension. For complete CLABSI definitions, refer to https://www.cdc.gov/nhsn/pdfs/checklists/2018/lcbi-checklist-508.pdf.

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.

The validation site visit provides an opportunity for collaboration and education. The HAI/AR Program would like to extend our appreciation to the facilties chosen for a validation visit.

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, 2018

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

1. Acute care facilities (hospitals) with intensive care units (ICU) are listed here by name (Facility A).
2. For each reporting facility listed, patients in ICUs with central line catheters/urinary catheters (devices) are identified every day. A device count is performed at the same time each day. Each patient with one or more central line catheters at the time the count is performed is counted as having one device day. Each patient with a urinary catheter at the time the count is performed is counted as having one device day. For example, a patient with one or more central line catheters and one urinary catheter would be counted as having one central line day and one urinary catheter day. The number of device days in this column (5,817) represents the total number of specific device days for all patients who were in Facility A's intensive care unit(s) during the year.
3. When a patient develops an HAI device-associated infection while having a device in place or within one day after removal of the device, the infection is considered a device-associated HAI if it meets the criteria set forth by NHSN. The number of HAI events in this column (8) represents the total number of specific HAIs identified in patients in Facility A's intensive care units during the year.
4. The predicted number of HAI device events is adjusted to allow facilities to be more fairly compared. Risk adjustments account for differences in 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, 2018+

	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	**53,744**	**32**	**63.74**	**0.50**	**0.35-0.70**
Alta View Hospital	95	0	0.06	*	*
American Fork Hospital	536	0	0.36	*	*
Ashley Regional Medical Center	68	0	0.05	*	*
Castleview Hospital	38	0	0.03	*	*
Cedar City Hospital	237	1	0.16	/	/
Davis Hospital & Medical Center	1,178	1	0.89	/	/
Dixie Regional Medical Center	2,540	1	2.20	0.45	0.02-2.24
Intermountain Medical Center	10,242	4	11.56	0.35	0.11-0.83
Jordan Valley Medical Center	565	0	0.43	*	*
Jordan Valley Medical Center West Valley Campus	525	0	0.40	*	*
Lakeview Hospital	547	0	0.41	*	*
LDS Hospital	1,460	2	1.47	1.36	0.23-4.49
Logan Regional Hospital	314	0	0.24	*	*
Lone Peak Hospital	5	0	0.00	*	*
McKay Dee Hospital	2,205	1	2.22	0.45	0.02-2.22
Mountain Point Medical Center	176	0	0.12	*	*
Mountain View Hospital	367	0	0.32	*	*
Mountain West Medical Center	92	0	0.06	*	*
Ogden Regional Medical Center	1,672	2	1.26	1.59	0.27-5.25
Park City Medical Center	34	0	0.02	*	*
Primary Children's Hospital	4,778	8	7.94	1.01	0.47-1.91
Riverton Hospital	105	0	0.08	*	*
Salt Lake Regional Medical Center	1,767	0	1.73	0.00	0.00-1.73
St. Mark's Hospital	2,223	1	2.24	0.45	0.02-2.20
Timpanogos Regional Hospital	1,356	0	1.02	0.00	0.00-2.93
Uintah Basin Medical Center	99	0	0.07	*	*
University Hospital§	14,170	9	22.02	0.41	0.20-0.75
Utah Valley Regional Medical Center	6,350	2	6.40	0.31	0.05-1.03

+Source: NHSN data.
See footnotes on page 33.

Table 2. Central line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018+

	Number of central line days[1]	Number of CLABSI events[2]	Predicted number of CLABSI events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**48,110**	**29**	**42.83**	**0.68**	**0.46-0.96**
Alta View Hospital	137	0	0.08	*	*
American Fork Hospital	648	0	0.38	*	*
Ashley Regional Medical Center	83	0	0.05	*	*
Bear River Valley Hospital	42	0	0.02	*	*
Beaver Valley Hospital	59	0	0.02	*	*
Brigham City Community Hospital	89	0	0.05	*	*
Cache Valley Hospital	81	0	0.05	*	*
Castleview Hospital	178	0	0.10	*	*
Cedar City Hospital	520	0	0.30	*	*
Central Valley Medical Center	402	0	0.11	*	*
Davis Hospital & Medical Center	279	0	0.18	*	*
Delta Community Hospital	119	0	0.03	*	*
Dixie Regional Medical Center	3,207	0	2.40	0.00	0.00-1.25
Fillmore Community Hospital	106	0	0.03	*	*
Garfield Memorial Hospital	80	0	0.02	*	*
Heber Valley Medical Center	65	0	0.02	*	*
Intermountain Medical Center	11,313	6	11.03	0.54	0.22-1.13
Jordan Valley Medical Center	273	0	0.18	*	*
Jordan Valley Medical Center West Valley Campus	318	0	0.21	*	*
Lakeview Hospital	277	0	0.18	*	*
LDS Hospital	1,793	1	1.56	0.64	0.03-3.16
Logan Regional Hospital	669	1	0.44	/	/
Lone Peak Hospital	78	0	0.05	*	*
McKay Dee Hospital	782	0	0.68	*	*
Mountain Point Medical Center	130	0	0.08	*	*
Mountain View Hospital	277	0	0.21	*	*
Mountain West Medical Center	64	0	0.04	*	*
Ogden Regional Medical Center	1,521	1	0.99	/	/
Park City Medical Center	83	0	0.05	*	*
Primary Children's Hospital	4,516	6	5.14	1.17	0.47-2.43
Riverton Hospital	390	0	0.25	*	*
Salt Lake Regional Medical Center	116	1	0.10	/	/
Sanpete Valley Hospital	104	0	0.03	*	*
Sevier Valley Hospital	148	0	0.09	*	*
St. Mark's Hospital	1,822	1	1.59	0.63	0.03-3.11
Timpanogos Regional Hospital	957	0	0.62	*	*
Uintah Basin Medical Center	157	0	0.09	*	*
University Hospital§	12,125	11	11.82	0.93	0.49-1.62
Utah Valley Regional Medical Center	4,102	1	3.57	0.28	0.01-1.38

+Source: NHSN data.

See footnotes on page 33.

Table 3. Central line-associated bloodstream infections in newborn intensive care units in acute care facilities, Utah, 2018+

	Number of central line days[1]	Number of CLABSI events[2]	Predicted number of CLABSI events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**13,808**	**12**	**17.02**	**0.71**	**0.46 – 1.20**
Ashley Regional Medical Center	7	0	0.00	*	*
Davis Hospital & Medical Center	94	0	0.09	*	*
Dixie Regional Medical Center	408	0	0.51	*	*
Intermountain Medical Center	1,391	1	1.92	0.52	0.03-2.57
Jordan Valley Medical Center	368	0	0.31	*	*
Logan Regional Hospital	171	0	0.12	*	*
McKay Dee Hospital	613	1	0.80	/	/
Ogden Regional Medical Center	174	0	0.23	*	*
Primary Children's Hospital	4,820	8	6.04	1.33	0.62-2.52
St. Mark's Hospital	589	1	0.69	/	/
Timpanogos Regional Hospital	589	0	0.64	*	*
University Hospital§	1,521	0	2.14	0.00	0.00-1.40
Utah Valley Regional Medical Center	3,063	1	3.53	0.28	0.01-1.40

+Source: NHSN data.

See footnotes on page 34.

Table 4. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2018+

	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	**57,457**	**66**	**77.96**	**0.85**	**0.66-1.07**
Alta View Hospital	192	1	0.11	/	/
American Fork Hospital	475	1	0.35	/	/
Ashley Regional Medical Center	211	0	0.12	*	*
Castleview Hospital	122	0	0.07	*	*
Cedar City Hospital	319	0	0.18	*	*
Davis Hospital & Medical Center	1,762	2	1.58	1.27	0.21-4.19
Dixie Regional Medical Center	3,419	3	3.06	0.98	0.25-2.67
Intermountain Medical Center	11,144	12	18.65	0.64	0.35-1.09
Jordan Valley Medical Center	875	0	0.64	*	*
Jordan Valley Medical Center West Valley Campus	926	0	0.68	*	*
Lakeview Hospital	646	0	0.48	*	*
LDS Hospital	1,325	0	1.35	0.00	0.00-2.21
Logan Regional Hospital	560	0	0.42	*	*
Lone Peak Hospital	32	0	0.02	*	*
McKay Dee Hospital	2,534	2	2.59	0.77	0.13-2.55
Mountain Point Medical Center	403	0	0.22	*	*
Mountain View Hospital	641	0	0.53	*	*
Mountain West Medical Center	163	1	0.09	/	/
Ogden Regional Medical Center	1,929	1	1.41	0.71	0.04-3.50
Park City Medical Center	106	0	0.06	*	*
Primary Children's Hospital	2,354	5	3.78	1.32	0.48-2.93
Riverton Hospital	183	0	0.14	*	*
Salt Lake Regional Medical Center	1,533	0	1.63	0.00	0.00-1.84
St. Mark's Hospital	2,910	3	2.97	1.01	0.26-2.75
Timpanogos Regional Hospital	1,450	1	1.11	0.90	0.05-4.45
Uintah Basin Medical Center	172	0	0.09	*	*
University Hospital§	14,717	29	29.15	0.99	0.68-1.41
Utah Valley Regional Medical Center	6,354	5	6.49	0.77	0.28-1.71

+Source: NHSN data.
See footnotes on page 34.

Table 5. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018+

	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	**45,159**	**43**	**41.94**	**1.03**	**0.75-1.37**
Alta View Hospital	599	0	0.29	*	*
American Fork Hospital	839	0	0.55	*	*
Ashley Regional Medical Center	312	0	0.15	*	*
Bear River Valley Hospital	158	0	0.08	*	*
Beaver Valley Hospital	116	0	0.08	*	*
Brigham City Community Hospital	204	0	0.10	*	*
Cache Valley Hospital	199	0	0.11	*	*
Castleview Hospital	892	1	0.44	/	/
Cedar City Hospital	515	0	0.25	*	*
Central Valley Medical Center	382	0	0.25	*	*
Davis Hospital & Medical Center	766	0	0.63	*	*
Delta Community Hospital	191	0	0.12	*	*
Dixie Regional Medical Center	2,955	2	2.48	0.81	0.14-2.66
Fillmore Community Hospital	129	0	0.08	*	*
Garfield Memorial Hospital	110	0	0.07	*	*
Heber Valley Medical Center	194	1	0.13	/	/
Intermountain Medical Center	8,912	14	10.72	1.31	0.74-2.14
Jordan Valley Medical Center	585	0	0.38	*	*
Jordan Valley Medical Center West Valley Campus	751	0	0.50	*	*
Lakeview Hospital	580	1	0.38	/	/
LDS Hospital	1,785	3	1.68	1.78	0.45-4.85
Logan Regional Hospital	1,199	0	0.82	*	*
Lone Peak Hospital	335	0	0.16	*	*
McKay Dee Hospital	509	0	0.51	*	*
Mountain Point Medical Center	285	0	0.14	*	*
Mountain View Hospital	413	0	0.31	*	*
Mountain West Medical Center	372	0	0.18	*	*
Ogden Regional Medical Center	1,840	0	1.25	0.00	0.00-2.39
Park City Hospital	306	0	0.15	*	*
Primary Children's Hospital	567	1	0.51	/	/
Riverton Hospital	643	0	0.42	*	*
Salt Lake Regional Medical Center	216	0	0.21	*	*
Sanpete Valley Hospital	128	0	0.08	*	*
Sevier Valley Hospital	489	0	0.24	*	*
St. Mark's Hospital	3,030	3	2.76	1.09	0.28-2.95
Timpanogos Regional Hospital	1,169	0	0.81	*	*
Uintah Basin Medical Center	419	0	0.21	*	*
University Hospital§	8,359	16	10.16	1.57	0.93-2.50
Utah Valley Regional Medical Center	3,706	1	3.54	0.28	0.01-1.39

+Source: NHSN data.

See footnotes on page 35.

Footnotes

Table 1. Central line-associated bloodstream infections in adult and pediatric intensive care units in acute care facilities, Utah, 2018

§ 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 2018.

***** Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2018.

[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.

Table 2. Central line-associated bloodstream infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018

§ 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 2018.

***** Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2018.

[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, 2018

§ 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 2018.

***** Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2018.

[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.

Table 4. Catheter-associated urinary tract infections in adult and pediatric intensive care units in acute care facilities, Utah, 2018

§ 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 2018.

***** Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2018.

[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.

Table 5. Catheter-associated urinary tract infections in inpatient non-intensive care locations in acute care facilities, Utah, 2018

§ 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 2018.

***** Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2018.

[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.

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, 2018

	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, 2018+

	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	**2,249**	**63**	**62.36**	**1.01**	**0.78-1.28**
Alta View Hospital	23	1	0.58	/	/
American Fork Hospital	41	1	0.97	/	/
Ashley Regional Medical Center	8	0	0.20	*	*
Bear River Valley Hospital	1	0	0.02	*	*
Beaver Valley Hospital	-	0	0.00	*	*
Brigham City Community Hospital	9	0	0.21	*	*
Cache Valley Hospital	2	0	0.06	*	*
Castleview Hospital	24	0	0.59	*	*
Cedar City Hospital	32	1	0.78	/	/
Central Valley Medical Center	-	0	0.00	*	*
Davis Hospital and Medical Center	50	1	1.33	0.75	0.04-3.71
Dixie Regional Medical Center	181	8	4.47	1.79	0.83-3.40
Heber Valley Medical Center	3	0	0.09	*	*
Intermountain Medical Center	248	5	7.28	0.69	0.25-1.52
Jordan Valley Medical Center	36	1	0.91	/	/
Jordan Valley Medical Center West Valley Campus	19	0	0.56	*	*
Lakeview Hospital	43	1	1.09	0.92	0.05-4.52
LDS Hospital	201	5	5.36	0.93	0.34-2.07
Logan Regional Medical Center	45	0	1.10	0.00	0.00-2.73
Lone Peak Hospital	14	0	0.34	*	*
McKay Dee Hospital	186	4	5.09	0.79	0.25-1.89
Mountain Point Medical Center	6	0	0.17	*	*
Mountain View Hospital	7	0	0.19	*	*
Mountain West Medical Center	3	1	0.08	/	/
Ogden Regional Medical Center	66	4	1.95	2.05	0.65-4.95
Orem Community Hospital	-	0	0.00	*	*
Park City Medical Center	10	0	0.24	*	*
Primary Children's Hospital	5	0	0.25	*	*
Riverton Hospital	44	1	1.09	0.92	0.05-4.52
Salt Lake Regional Medical Center	14	0	0.33	*	*
Sanpete Valley Hospital	2	0	0.07	*	*
Sevier Valley Hospital	15	0	0.32	*	*
St. Mark's Hospital	239	7	6.28	1.11	0.49-2.20
Timpanogos Regional Hospital	38	0	1.07	0.00	0.00-2.81
Uintah Basin Medical Center	-	0	0.00	*	*
University Hospital§	466	19	14.28	1.33	0.82-2.04
Utah Valley Regional Medical Center	168	3	5.01	0.60	0.15-1.63

+Source: NHSN data.
See footnotes on page 40.

Table 7. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2018+

	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	**3,033**	**13**	**25.70**	**0.51**	**0.28-0.84**
Alta View Hospital	38	0	0.35	*	*
American Fork Hospital	124	0	0.97	*	*
Ashley Regional Medical Center	35	0	0.30	*	*
Bear River Valley Hospital	-	0	0.00	*	*
Beaver Valley Hospital	-	0	0.00	*	*
Brigham City Community Hospital	-	0	0.00	*	*
Cache Valley Hospital	5	0	0.04	*	*
Castleview Hospital	8	0	0.06	*	*
Cedar City Hospital	16	0	0.13	*	*
Central Valley Medical Center	-	0	0.00	*	*
Davis Hospital & Medical Center	157	0	1.24	0.00	0.00-2.41
Dixie Regional Medical Center	47	0	0.45	*	*
Heber Valley Medical Center	29	0	0.27	*	*
Intermountain Medical Center	372	2	3.15	0.64	0.11-2.10
Jordan Valley Medical Center	9	1	0.06	/	/
Jordan Valley Medical Center West Valley Campus	3	0	0.02	*	*
Lakeview Hospital	9	0	0.09	*	*
LDS Hospital	225	1	1.83	0.55	0.03-2.70
Logan Regional Hospital	102	0	0.82	*	*
Lone Peak Hospital	17	0	0.15	*	*
McKay Dee Hospital	119	0	1.04	0.00	0.00-2.87
Mountain Point Medical Center	3	0	0.03	*	*
Mountain View Hospital	40	1	0.35	/	/
Mountain West Medical Center	-	0	0.00	*	*
Ogden Regional Medical Center	74	0	0.70	*	*
Orem Community Hospital	12	0	0.09	*	*
Park City Medical Center	5	0	0.04	*	*
Primary Children's Hospital	1	0	0.02	*	*
Riverton Hospital	166	3	1.42	2.11	0.54-5.74
Salt Lake Regional Medical Center	23	0	0.20	*	*
Sanpete Valley Hospital	-	0	0.00	*	*
Sevier Valley Hospital	14	0	0.13	*	*
St. Mark's Hospital	588	1	4.87	0.21	0.01-1.01
Timpanogos Regional Medical Center	133	0	1.04	0.00	0.00-2.89
Uintah Basin Medical Center	21	0	0.18	*	*
University Health Care Hospitals and Clinics§	368	3	3.38	0.89	0.23-2.42
Utah Valley Regional Medical Center	270	1	2.30	0.43	0.02-2.15

+Source: NHSN data.

See footnotes on page 40.

Footnotes

Table 6. Surgical site infections associated with colon surgeries in acute care facilities, Utah, 2018

§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 2018.

*Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2018.

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

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

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

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

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

Table 7. Surgical site infections associated with abdominal hysterectomy surgeries in acute care facilities, Utah, 2018

§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 2018.

*Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN, in 2018.

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

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

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

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

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

Appendix C

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

The tables depict *Clostridioides 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, 2018

	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, 2018+

	Number of patient days[1]	Number of hospital onset *C. difficile* events[2]	Predicted number of hospital onset *C. difficile* events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**808,279**	**348**	**479.84**	**0.73**	**0.65-0.80**
Alta View Hospital	8,564	0	2.37	0.00	0.00-1.27
American Fork Hospital	12,168	2	5.91	0.34	0.06-1.12
Ashley Regional Medical Center	4,182	1	3.04	0.33	0.02-1.62
Bear River Valley Hospital	1,196	0	0.45	*	*
Beaver Valley Hospital	899	0	0.20	*	*
Brigham City Community Hospital	2,492	0	0.57	*	*
Cache Valley Hospital	1,728	0	0.44	*	*
Castleview Hospital	3,960	0	2.72	0.00	0.00-1.10
Cedar City Hospital	7,464	1	3.44	0.29	0.01-1.43
Central Valley Medical Center	668	0	0.30	*	*
Davis Hospital & Medical Center	16,651	10	8.77	1.14	0.58-2.03
Delta Community Medical Center	848	0	0.19	*	*
Dixie Regional Medical Center	54,209	14	33.53	0.42	0.24-0.68
Fillmore Community Medical Center	540	0	0.17	*	*
Garfield Memorial Hospital	1,153	0	0.25	*	*
HealthSouth Rehabilitation Hospital of Utah	11,167	2	2.91	0.69	0.12-2.27
Heber Valley Medical Center	1,738	0	0.49	*	*
Intermountain Medical Center	107,270	59	78.34	0.75	0.58-0.96
Jordan Valley Medical Center	13,223	2	9.50	0.21	0.04-0.70
Jordan Valley Medical Center West Valley Campus	7,949	5	6.01	0.83	0.30-1.84
Lakeview Hospital	12,043	2	3.86	0.52	0.09-1.71
Landmark Hospital	5,024	4	4.48	0.89	0.28-2.15
LDS Hospital	29,515	19	18.77	1.01	0.63-1.55
Logan Regional Hospital	15,544	6	7.64	0.79	0.32-1.63
Lone Peak Hospital	4,155	0	1.34	0.00	0.00-2.23
McKay Dee Hospital	48,881	15	30.07	0.50	0.29-0.80
Mountain Point Medical Center	3,694	1	3.55	0.28	0.01-1.39
Mountain View Hospital	10,096	1	4.91	0.20	0.01-1.00
Mountain West Medical Center	3,459	1	0.76	/	/
Northern Utah Rehabilitation Hospital	6,281	0	2.05	0.00	0.00-1.46
Ogden Regional Medical Center	26,360	3	11.13	0.27	0.07-0.73
Orem Community Hospital	3,585	0	0.87	*	*
Park City Hospital	4,886	1	1.35	0.74	0.04-3.65
Primary Children's Hospital	60,746	22	23.37	0.94	0.61-1.40
Promise Hospital of Salt Lake	10,909	2	9.07	0.22	0.04-0.73
Riverton Hospital	14,613	3	4.50	0.67	0.17-1.82
Salt Lake Regional Medical Center	8,978	9	6.14	1.47	0.71-2.69
Sanpete Valley Hospital	1,347	0	0.53	*	*
Sevier Valley Hospital	2,490	1	0.61	/	/

Table 8 continued.

	Number of patient days[1]	Number of hospital onset *C. difficile* events[2]	Predicted number of hospital onset *C. difficile* events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
Shriners Hospital for Children	974	0	0.15	*	*
South Davis Community Hospital	5,012	8	7.08	1.13	0.52-2.14
St. Mark's Hospital	44,716	17	20.27	0.84	0.50-1.32
The Orthopedic Specialty Hospital	3,846	0	0.58	*	*
Timpanogos Regional Medical Center	11,976	0	5.29	0.00	0.00-0.57
Uintah Basin Medical Center	5,111	3	2.52	1.19	0.30-3.25
University Hospital[§]	137,766	91	101.00	0.90	0.73-1.10
Utah Valley Regional Medical Center	59,834	39	42.19	0.92	0.67-1.25
Utah Valley Specialty Hospital	8,369	4	6.16	0.65	0.21-1.57

[+]Source: NHSN data.

[§]Includes Huntsman Cancer Institute.
[I]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 2018.
*Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2018.

[1]Number 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.
[2]Number of *C. difficile* events: The total number of *C difficile* infections reported per year.
[3]Predicted number of *C. difficile* events: The number of *C. difficile* infections anticipated to occur based on historical data of comparable ICUs.
[4]Standardized 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.
[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 9. Methicillin-resistant *Staphylococcus aureus* bacteremia in acute care facilities, Utah, 2018+

	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	**972,306**	**33**	**59.35**	**0.56**	**0.39-0.77**
Alta View Hospital	10,917	0	0.22	*	*
American Fork Hospital	16,941	0	0.54	*	*
Ashley Regional Medical Center	4,811	0	0.17	*	*
Bear River Valley Hospital	1,396	0	0.02	*	*
Beaver Valley Hospital	990	0	0.02	*	*
Brigham City Community Hospital	2,492	0	0.05	*	*
Cache Valley Hospital	1,904	0	0.04	*	*
Castleview Hospital	4,338	0	0.15	*	*
Central Valley Medical Center	670	0	0.01	*	*
Cedar City Hospital	9,057	0	0.22	*	*
Davis Hospital & Medical Center	19,238	2	0.85	/	/
Delta Community Medical Center	1,022	0	0.02	*	*
Dixie Regional Medical Center	62,383	0	3.57	0.00	0.00-0.84
Fillmore Community Medical Center	619	0	0.01	*	*
Garfield Memorial Hospital	1,192	0	0.02	*	*
HealthSouth Rehabilitation Hospital of Utah	8,325	0	0.16	*	*
Heber Valley Medical Center	2,033	0	0.04	*	*
Intermountain Medical Center	135,157	7	11.13	0.63	0.28-1.24
Jordan Valley Medical Center	19,582	1	0.84	/	/
Jordan Valley Medical Center West Valley Campus	9,155	1	0.35	/	/
Lakeview Hospital	13,021	1	0.55	/	/
Landmark Hospital	3,587	0	0.61	*	*
LDS Hospital	35,362	2	1.63	1.23	0.21-4.06
Logan Regional Hospital	21,130	1	0.72	/	/
Lone Peak Hospital	4,531	0	0.08	*	*
McKay Dee Hospital	62,684	0	2.77	0.00	0.00-1.08
Mountain Point Medical Center	4,745	0	0.18	*	*
Mountain View Hospital	11,168	0	0.33	*	*
Mountain West Medical Center	3,459	0	0.08	*	*
Northern Utah Rehabilitation Hospital	4,679	0	0.09	*	*
Ogden Regional Medical Center	32,863	1	1.15	0.87	0.04-4.29
Orem Community Hospital	4,577	0	0.09	*	*
Park City Hospital	5,534	0	0.10	*	*
Primary Children's Hospital	73,568	0	2.91	0	0.00-1.03
Promise Hospital of Salt Lake	8,130	0	1.13	0	0.00-2.64

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	20,921	0	0.40	*	*
Salt Lake Regional Medical Center	10,246	0	0.37	*	*
Sanpete Valley Hospital	1,898	0	0.04	*	*
Sevier Valley Hospital	2,584	0	0.05	*	*
South Davis Community Hospital	3,667	0	0.99	*	*
St. Mark's Hospital	54,327	2	3.10	0.64	0.11-2.13
The Orthopedic Specialty Hospital	3,846	0	0.04	*	*
Timpanogos Regional Medical Center	19,416	2	0.85	/	/
Uintah Basin Medical Center	5,111	0	0.10	*	*
University Hospital§	160,741	10	17.50	0.57	0.29-1.02
Utah Valley Regional Medical Center	81,910	3	4.30	0.70	0.18-1.90
Utah Valley Specialty Hospital	6,379	0	0.73	*	*

+Source: NHSN data.

§Includes Huntsman Cancer Institute.
ISIR 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 2018.
*Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2018.

[1]Number of patient days: The total number of days that patients stay at a facility per year.
[2]Number of MRSA events: The total number of MRSA bacteremia infections reported per year.
[3]Predicted number of MRSA events: The amount of MRSA bacteremia infections anticipated to occur based on historical data of comparable facilities.
[4]Standardized Infection Ratio: Compares the total number of MRSA bacteremia in a facility to a national benchmark. Rates are adjusted based on the type and size of the facility.
[5]Confidence interval: A 95% confidence interval means that if the sampling of rates was repeated over more periods of time, 95 times out of 100, the true value would be expected to fall within the range shown.

Appendix D

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

The device infection event tables depict specific device-associated infections (central line-associated bloodstream infections [CLABSI], catheter-associated urinary tract infections [CAUTI]), reported by long-term acute care facilities (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, 2018

	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, 2018+

	Number of central line days[1]	Number of CLABSI events[2]	Predicted number of CLABSI events[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**13,880**	**10**	**12.93**	**0.77**	**0.39-1.38**
Landmark Hospital	1,976	0	2.07	0.00	0.00-1.45
Promise Hospital	5,497	3	5.88	0.51	0.13-1.39
South Davis Community Hospital	1,755	5	1.19	4.19	1.54-9.29
Utah Valley Specialty Hospital	4,652	2	3.80	0.53	0.09-1.74

+Source: NHSN data.

[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 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.
[4]Standardized Infection Ratio: Compares the total number of CLABSI events in long-term acute care facilities to a national benchmark.
[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 11. Catheter-associated urinary tract infections in long-term acute care facilities with intensive care units and wards, Utah, 2018+

	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	**10,459**	**14**	**15.15**	**0.92**	**0.53-1.51**
Landmark Hospital	1,607	4	1.98	2.02	0.64-4.87
Promise Hospital	3,958	4	6.31	0.63	0.20-1.53
South Davis Community Hospital	945	1	2.00	0.50	0.03-2.47
Utah Valley Specialty Hospital	3,949	5	4.87	1.03	0.38-2.28

+Source: NHSN data.

[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 long-term acute care facilities.
[4]Standardized Infection Ratio: Compares the total number of catheter-associated urinary tract infections in long-term acute care facilities to a national benchmark.
[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 12. Catheter-associated urinary tract infections in inpatient rehabilitation facilities, Utah, 2018+

	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	**3,369**	**12**	**7.05**	**1.70**	**0.92-2.89**
Davis Hospital and Medical Center	53	0	0.10	*	*
Dixie Regional Medical Center	181	0	0.49	*	*
Health South Rehabilitation Hospital of Utah	704	1	0.76	/	/
Intermountain Medical Center	178	2	0.48	/	/
Jordan Valley Hospital	85	1	0.16	/	/
McKay Dee Hospital	415	2	1.13	1.77	0.30-5.84
Northern Utah Rehabilitation Hospital	339	0	0.37	*	*
Salt Lake Regional Medical Center	31	1	0.06	/	/
St. Mark's Hospital	339	2	0.64	/	/
University Hospital§	620	3	1.69	1.78	0.45-4.83
Utah Valley Regional Medical Center	424	0	1.16	0.00	0.00-2.59

+Source: NHSN data.

§Includes Huntsman Cancer Institute.
ISIR 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 2018.
*Predicted to have less than one infection for the year, and reported ZERO infections, as defined by NHSN in 2018.

[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 inpatient rehabilitation facilities.
[4]Standardized Infection Ratio: Compares the total number of catheter-associated urinary tract infections in inpatient rehabilitation facilities to a national benchmark.
[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 13. Dialysis event bloodstream infections, Utah, 2018+

	Number of patient months[1]	Number of Dialysis Event BSI[2]	Predicted number of Dialysis Event BSI[3]	Standardized Infection Ratio[4]	95% Confidence Interval[5]
State of Utah	**19,202**	**98**	**116.62**	**0.84**	**0.69-1.02**
American Fork Dialysis Center	199	0	1.78	0.00	0.00-1.69
Blue Mountain Hospital Dialysis Center	376	4	2.09	1.91	0.61-4.61
Bonneville Dialysis Center	562	5	3.24	1.54	0.56-3.42
Castleview Dialysis Center	233	3	1.37	2.19	0.56-5.97
Farmington Bay Dialysis Center	391	0	1.91	0.00	0.00-1.57
Hurricane Dialysis	167	3	1.50	2.00	0.51-5.45
Intermountain Medical Center Dialysis Center	1,041	5	5.49	0.91	0.33-2.02
Iron Mission Dialysis Center	375	3	2.48	1.21	0.31-3.30
Kolff Dialysis Center	590	0	4.05	0.00	0.00-0.74
Lakeside Dialysis Center	346	5	3.26	1.53	0.56-3.40
Liberty Dialysis Layton	519	1	3.90	0.26	0.01-1.27
Liberty Dialysis Ogden	425	3	3.37	0.89	0.23-2.42
Liberty Dialysis St. George	765	2	4.37	0.46	0.08-1.51
Liberty Dialysis West Jordan	658	1	3.32	0.30	0.02-1.48
Logan Regional Dialysis Center	665	2	4.04	0.49	0.08-1.64
Lone Peak Dialysis	716	12	3.95	3.04	1.65-5.17
Mark Lindsay Dialysis Center	268	1	1.32	0.76	0.04-3.73
Oquirrh Artificial Kidney Center	1,173	3	6.08	0.49	0.13-1.34
Payson Regional Dialysis	444	1	2.76	0.36	0.02-1.79
Pleasant View Dialysis Center	526	2	3.40	0.59	0.10-1.95
Primary Children's Dialysis Center	64	3	1.14	2.64	0.67-7.19
Provo Dialysis	365	3	2.98	1.01	0.26-2.74
Sevier Valley Dialysis	322	0	1.69	0.00	0.00-1.77
South Mountain Dialysis	646	0	4.57	0.00	0.00-0.66
South Valley Dialysis Center	506	0	3.28	0.00	0.00-0.91
Tooele Valley Dialysis	305	0	1.50	0.00	0.00-2.00
UBMC Dialysis Roosevelt	627	3	4.38	0.69	0.17-1.87
Uintah Basin Medical Center Dialysis Vernal	205	1	1.30	0.77	0.04-3.79
University of Utah Dialysis Program Dixie Dialysis	727	3	5.16	0.58	0.15-1.58
Utah Dialysis Center	816	5	4.28	1.17	0.43-2.59
Utah Valley Dialysis Center	1,408	13	6.88	1.89	1.05-3.15
Wasatch Artificial Kidney Center	1,160	2	6.97	0.29	0.05-0.95
Weber Valley Dialysis	163	0	0.68	*	*
West Bountiful Dialysis	143	1	0.67	/	/
West Valley Dialysis Clinic	881	4	5.38	0.74	0.24-1.79
Woods Cross Dialysis	425	4	2.10	1.91	0.61-4.60

+Source: NHSN data.

[I]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 2018.
***** Predicted to have less than one infection for the year, and did NOT have an infection, as defined by NHSN in 2018.

[1]Number 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.
[2]Number of dialysis event BSI: The total number of bloodstream infections that were reported per year.
[3]Predicted number of dialysis event BSI: The number of bloodstream infections anticipated to occur based on historical data of comparable dialysis facilities.
[4]Standardized Infection Ratio: Compares the total number of bloodstream infections in dialysis facilities to a national benchmark.
[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 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. ***Clostridioides difficile*** - *Clostridioides 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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