



# Healthcare-Associated Infections Annual Report

July 2019



**COLORADO**  
Department of Public  
Health & Environment

[colorado.gov/cdphe/hai](http://colorado.gov/cdphe/hai)

# Executive summary

## Key findings

This report shows infection data in certain types of Colorado health care facilities compared to national baselines for selected infections. The report compares the incidence of healthcare-associated infections at Colorado facilities to the predicted number of infections and shows whether facility was the “same,” “better” or “worse” than the national baseline for most categories of infection.

- Of the infections facilities reported for 2018, Colorado is the same or better in all categories except one.
- Colorado was worse than the national standard for local access site infection rates in dialysis facilities, although these rates are not adjusted for risk.
- Access-related bloodstream infections in dialysis facilities improved in 2018 to “better” than the national baseline.
- The statewide surgical site infection counts following inpatient abdominal hysterectomies and inpatient colon surgeries performed in hospitals for adult patients were better than the national baseline counts; all other surgical site infections were the same as the national baseline.
- The statewide central line-associated bloodstream infection counts in acute care hospitals, pediatric and adult critical care units, adult and pediatric wards, and long-term acute care hospitals were better than the national baseline.
- The statewide *Clostridioides difficile* (*C. diff*) counts acquired in hospitals were better than the national baseline, continuing a positive trend that began in 2017.
- More information about healthcare-associated infections is on the department’s [HAI web page](#).

Healthcare-associated infections (HAIs) are infections that patients get while being treated for other conditions in a hospital or other healthcare setting. HAIs can devastate patients and families. People who have them may need more medicines and treatments, and they may not be able to work. This can cause financial stress. HAIs can cause pain, suffering and death.<sup>1</sup> This report contains data that Colorado healthcare facilities report to the Colorado Department of Public Health and Environment. It includes infections associated with surgeries, central lines, and dialysis treatment. It also includes *Clostridioides difficile* (*C. diff*) infections, caused by a kind of bacteria found in healthcare settings and the community.

This report does not have information on all HAIs, but people can use it as one sign of healthcare quality. People can look at the number procedures performed to see volume for each facility. Health-care facilities can use this data to target their infection prevention efforts.

The department works to reduce HAIs in Colorado through:

- Tracking and publishing HAI data.
- Guiding and assisting facilities on best practices for infection control.
- Validating HAI data.
- Observing facility practices.
- Working with partners on patient safety.

**Table 1: Healthcare-Associated Infections Summary Table – Colorado, 2018**

Healthcare-Associated Infection Type	No. of Facilities Reporting Data	No. of Facilities <i>Better</i> than National Benchmark	No. of Facilities <i>Same as</i> National Benchmark	No. of Facilities <i>Worse</i> than National Benchmark	No. of Facilities for which Data Are Suppressed	Comparison: Colorado to National Benchmark
<b>Central Line-Associated Bloodstream Infections by Facility/Unit Type</b>						
Acute Care Hospitals	50	6	23	0	21	Better
Adult and Pediatric Critical Care	41	3	21	0	17	Better
Adult and Pediatric Wards	50	4	21	0	25	Better
Inpatient Rehabilitation Wards*	14	0	0	0	14	Same
Neonatal Critical Care Units	21	0	7	0	14	Same
Critical Access Hospitals	5	0	0	0	5	Suppressed <sup>1</sup>
Inpatient Rehabilitation Facilities	6	0	0	0	6	Same
Long-Term Acute Care Hospitals	7	1	5	0	1	Better
<b><i>Clostridioides difficile</i> Infections- Hospital Onset</b>						
Acute Care Hospitals	50	15	27	0	8	Better
Inpatient Rehabilitation Facilities	6	1	4	0	1	Better
Long-Term Acute Care Hospitals	7	3	4	0	0	Better
<b>Dialysis Related Infections by Infection Type</b>						
Access-Related Bloodstream	79	1	74	2	2	Better
Local Vascular Access	79	3	62	12	2	Worse
<b>Surgical Site Infections in Acute Care Hospitals Among Adults by Procedure Type</b>						
Abdominal Hysterectomy	48	1	22	0	25	Better
Breast Surgery	48	1	16	3	28	Same
Colon Surgery	48	5	31	3	9	Better
Hip Replacement	49	2	29	1	17	Same
Knee Replacement	49	0	27	4	18	Same
<b>Surgical Site Infections in Critical Access Hospitals Among Adults by Procedure Type</b>						
Abdominal Hysterectomy	19	0	0	0	19	Suppressed <sup>1</sup>
Breast Surgery	19	0	0	0	19	Suppressed <sup>1</sup>
Colon Surgery	17	0	1	0	16	Same
Hip Replacement	18	0	0	0	18	Same

Healthcare-Associated Infection Type	No. of Facilities Reporting Data	No. of Facilities <i>Better</i> than National Benchmark	No. of Facilities <i>Same as</i> National Benchmark	No. of Facilities <i>Worse</i> than National Benchmark	No. of Facilities for which Data Are Suppressed	Comparison: Colorado to National Benchmark
Knee Replacement	19	0	0	0	19	Suppressed <sup>1</sup>
<b>Surgical Site Infections in Ambulatory Surgery Centers Among Adults by Procedure Type</b>						
Abdominal Hysterectomy	5	---	---	---	3	--- <sup>2</sup>
Breast Surgery	34	0	7	0	27	Same
Hernia	39	0	2	0	37	Same
Hip Replacement	18	---	---	---	---	--- <sup>2</sup>
Knee Replacement	18	0	0	0	18	Suppressed <sup>1</sup>
Vaginal Hysterectomy	4	---	---	---	3	--- <sup>2</sup>

<sup>1</sup> Calculation of comparison is not available due to data suppression. Data is suppressed if one of the following conditions is met: procedure count is less than 20, less than 50 central line days are reported, or the predicted number of infections is less than one.

<sup>2</sup> ---: national comparison models are not available at the time of this report.

# About this report

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**Authorizing Statute:** Section 25-3-601, C.R.S.

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Correction: July 25, 2019.

2018 data for Brighton Dialysis and DaVita, Commerce City were updated in Tables 21 and 22.

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**Additional information:**

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This report fulfills reporting requirements set forth in the disclosure law and is the twelfth annual report published by the department. The report presents information about HAI reporting requirements, processes and limitations; functions of implementing the disclosure law; and HAI data submitted by Colorado healthcare facilities on central line-associated bloodstream infections (CLABSIs), *Clostridioides difficile* infections, dialysis-related infections, and surgical site infections (SSIs). HAI data presented in this report are for the period Jan. 1, 2016 through Dec. 31, 2018.

# Contents

Executive summary	2
Healthcare-Associated Infections in Colorado Summary Table	3
About this report	5
Introduction	7
Healthcare-associated infections disclosure law	8
Participating facilities	11
Data format and cautions	12
Colorado state-level data	14
Aggregate central line-associated bloodstream infection data	15
Aggregate <i>Clostridioides difficile</i> data	16
Aggregate dialysis infection data	17
Aggregate surgical site infection data	18
Colorado facility-specific data	22
<b>Central line-associated blood stream infections</b>	23
Acute care hospitals	24
Acute care hospitals by location type	29
Critical access hospitals	35
Inpatient rehabilitation facilities and inpatient rehabilitation wards in acute care hospitals	37
Long-term acute care hospitals	40
<b><i>Clostridioides difficile</i> infections</b>	42
Acute care hospitals	43
Inpatient rehabilitation facilities	47
Long-term acute care hospitals	49
<b>Dialysis-related infections</b>	51
<b>Surgical site infections</b>	61
Breast surgeries	62
Colon surgeries	75
Hernia surgeries	84
Hip surgeries	87
Hysterectomies	98
Knee surgeries	110
References	121
Appendix A: Glossary	122
Appendix B: Standardized infection ratios and rates	125
Appendix C: Facility types	127

# Introduction

Healthcare-associated infections (HAIs) are infections that patients acquire during treatment for other conditions within a health care setting. HAIs included in this report include infections associated with surgeries, central lines, and dialysis treatment, as well as a type of bacteria found in healthcare settings, *Clostridioides difficile*. HAIs can be devastating to patients and families. They can cause significant financial burden due to additional treatments, procedures, and lost wages. HAIs can cause pain, suffering and death.<sup>1</sup> Recognizing the seriousness of HAIs, Colorado passed the HAI Disclosure Law in 2006, which was revised and updated in 2016 (Section 25-3-601, C.R.S.).<sup>2</sup> Administrative changes in 2016 included a change in reporting timeframe from fiscal to calendar year, and a change in the annual report submission date to the Colorado General Assembly from January 15 to July 15 of each year. Changes in 2016 also included a change to the definition of healthcare facility to include “all state licensed or certified facilities submitting data to the National Healthcare Safety Network (NHSN)”.<sup>3</sup> This definition currently includes hospitals, long-term acute care hospitals, hospital units, inpatient rehabilitation facilities, ambulatory surgery centers, and dialysis facilities. It also may include additional facility types as they report to NHSN. These facility types are required to report designated HAI data as a condition of state licensure. Catheter-associated urinary tract infections and methicillin-resistant *Staphylococcus aureus* are reported per Board of Health requirements and are not included in this report.

The disclosure law mandates certain healthcare facilities report their HAI data through NHSN, a national web-based surveillance and reporting system managed by the Centers for Disease Control and Prevention (CDC). The use of NHSN improves the validity of reported HAI data because facilities must use standard definitions and reporting rules. Reporting consistency allows us to compare Colorado facility HAI data to a national baseline to be more easily understood by healthcare facilities and the public.

The report presents information about HAI reporting requirements, processes, and limitations; functions of implementing the disclosure law; and HAI data submitted by Colorado healthcare facilities on selected surgical site infections (SSI), central line-associated bloodstream infections (CLABSI), *Clostridioides difficile* and dialysis-related infections. All data presented in this report were submitted for patients receiving treatment or having procedures during the 2016, 2017, and 2018 calendar years. A glossary of terms is available in Appendix A.

# Healthcare-associated infections disclosure law

Implementing Colorado’s healthcare-associated infections (HAI) Disclosure Law involves four main functions, as described below:

1. Appointment of an HAI advisory committee.
2. Selection of conditions to be reported.
3. Oversight of data entered into the National Healthcare Safety Network (NHSN).
4. Public reporting of results by facility.

## Appointment and coordination of an HAI advisory committee

### Committee members

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Advisory Committee Chair  
HCA/Health One

**Ann Kokish, NHA**  
Advisory Committee Co-Chair  
Colorado Health Care Association

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Colorado’s HAI disclosure law requires the department’s executive director to appoint an 11-member HAI advisory committee, the Colorado HAI Advisory Committee, with the following composition:

- One representative from an urban hospital.
- One representative from a rural hospital
- One board-certified or board-eligible physician licensed in Colorado who is affiliated with a Colorado hospital or medical school and an active member of a national organization specializing in healthcare epidemiology or infection control
- Four infection control practitioners (one from a stand-alone ambulatory surgery center, one certified in infection control and epidemiology, one from a long-term care setting, and one other healthcare professional).
- One medical statistician or clinical microbiologist with an advanced degree.
- One representative from a health consumer organization; one representative from a health insurer; and one purchaser of health insurance.

The mission of the committee is to provide oversight of

legislatively mandated HAI reporting to ensure accountability and improvement of patient healthcare through education, validation of data, and review of reporting requirements and surveillance practices. The goals of the committee are to:

- Provide guidance in selecting HAI reporting metrics.
- Evaluate relevancy and accuracy of reporting requirements.
- Provide input on outreach activities, validation of data, and other HAI-related projects as needed.
- Provide guidance regarding the annual report and other reports developed for consumers and healthcare personnel.
- Promote safe healthcare for Colorado citizens.



## Selection of clinical metrics

The current HAI reporting metrics include infections related to central lines, surgeries and outpatient dialysis treatment, as well as *Clostridioides difficile* (*C. difficile*). Central line-associated bloodstream infections (CLABSIs) are associated with the presence of central lines in patients. A central line is an intravascular catheter (tube in a vein) that terminates at or close to the heart or in one of the great vessels (e.g., aorta, superior vena cava). Central lines, which may be temporary or permanent, are used to infuse fluids and medications, withdraw blood, or monitor fluid volume in patients. The surgeries for which surgical site infections (SSIs) are reported were selected based on their high volume and risk for infection. Dialysis-related infections include bloodstream infections and localized infections of the vascular access site. Dialysis is a method for removing waste products and fluid from a patient’s blood when the kidneys are failing. Because of frequent hospitalizations and weakened immune systems, dialysis patients are at high risk for infection. *C. difficile* infection is a diarrheal disease that generally occurs in patients exposed to healthcare and antibiotics. **Table 2** lists the current reporting metrics for this report.

In selecting metrics, the following factors were considered:<sup>4</sup>

- Impact - extent to which the infection affects the patient or family (disability, mortality and economic costs).
- Improvability - extent to which reporting infection improves practice to prevent the infection.
- Frequency - how often the infection occurs.
- Feasibility - ability for the data to be collected with minimal burden on the facilities.
- Functionality - extent to which the intended audience (patients, care providers and hospital administrators) can understand and apply the results.

**Table 2: Colorado Healthcare-Associated Infection Reporting Metrics**

Facility Type	Reported HAI	Reporting Hospital Unit(s)
Acute Care Hospitals	<ul style="list-style-type: none"> <li>• Breast Surgical Site Infections (SSIs)</li> <li>• Colon SSIs</li> <li>• Hip Replacement SSIs</li> <li>• Knee Replacement SSIs</li> <li>• Abdominal Hysterectomy SSIs</li> </ul>	Inpatient and Outpatient Operating Rooms
	<ul style="list-style-type: none"> <li>• Central Line-Associated Bloodstream Infections (CLABSIs)*</li> </ul>	Adult and Pediatric Critical Care Units, and Medical, Surgical, and Medical-Surgical Wards
		Neonatal Critical Care Units Level II/III and III Inpatient Rehabilitation Wards
	<ul style="list-style-type: none"> <li>• <i>Clostridioides difficile</i> infections**</li> </ul>	Facility-Wide Inpatient
Critical Access Hospitals	<ul style="list-style-type: none"> <li>• CLABSIs</li> </ul>	Adult Critical Care Units
	<ul style="list-style-type: none"> <li>• Breast SSIs</li> <li>• Colon SSIs</li> <li>• Hip and Knee Replacement SSIs</li> <li>• Abdominal Hysterectomy SSIs</li> </ul>	Inpatient and Outpatient Operating Rooms
Inpatient Rehabilitation Facilities and Long-Term Acute Care Hospitals	<ul style="list-style-type: none"> <li>• CLABSIs</li> </ul>	Adult and Pediatric Critical Care Units Adult and Pediatric Wards

Facility Type	Reported HAI	Reporting Hospital Unit(s)
		(Inpatient Rehabilitation Facilities)
	<ul style="list-style-type: none"> <li>• <i>Clostridioides difficile</i> infections**</li> </ul>	Facility-Wide Inpatient
Ambulatory Surgery Centers	<ul style="list-style-type: none"> <li>• Breast SSIs</li> <li>• Hernia Repair SSIs</li> <li>• Hip and Knee Replacement SSIs</li> <li>• Abdominal Hysterectomy SSIs</li> <li>• Vaginal Hysterectomy SSIs</li> </ul>	Not Applicable
Outpatient Dialysis Facilities	<ul style="list-style-type: none"> <li>• Dialysis Events</li> </ul>	Not Applicable

\*Stand-alone children’s hospitals report neonatal critical care data only.

\*\*Excluding critical access hospitals (defined in Appendix C glossary) and stand-alone children’s hospitals.

## Oversight and validation of data

Colorado’s health care facilities grant the department access to data entered into NHSN, allowing the department to monitor, analyze and produce public reports. NHSN maintains stringent policies and rules to ensure data security, integrity, confidentiality and data sharing in strict accordance to federal laws.

Colorado’s HAI disclosure law requires health care facilities to report HAI data on a quarterly basis, and the department provides guidance and technical assistance to ensure the timely and accurate reporting of data. The department also performs systematic monitoring and selected validation of the HAI data submitted, which allows for the identification and correction of incomplete and incorrectly entered data. The department has completed data validation studies for abdominal hysterectomies in acute care hospitals (2016), central line-associated bloodstream infections in long-term acute care hospitals and inpatient rehabilitation facilities (2018), and dialysis-related infections (2018) in the past three years.

The HAI disclosure law also specifies requirements for health care facility employees who collect and report HAI data. These individuals must be certified in infection control and epidemiology<sup>5</sup> or become certified within six months after becoming eligible to take the certification test as recommended by the Certification Board of Infection Control and Epidemiology, Inc., or its successor. These certification requirements do not apply to staff in hospitals with 50 or fewer beds, dialysis facilities, ambulatory surgery centers, or long-term care facilities.

# Participating facilities

In 2018, 50 acute care hospitals, 29 critical access hospitals, one pediatric hospital, seven long-term acute care hospitals, seven inpatient rehabilitation facilities, 62 ambulatory surgery centers, and 79 dialysis facilities reported healthcare-associated infection (HAI) data into the National Healthcare Safety Network (NHSN) accessible to the department. **Table 3** shows the number of hospitals that report central line-associated bloodstream infections (CLABSIs) by type of critical care unit, and **Table 4** lists reportable surgical procedures and the numbers of hospitals and ambulatory surgery centers that report them.

**Table 3: Healthcare Facilities & Units Reporting Central Line-Associated Bloodstream Infections – Colorado, 2018**

Unit/Type of Facility	No. of Facilities
Adult and Pediatric Critical Care in Acute Care Hospitals	41
Level II/III Neonatal Critical Care in Acute Care Hospitals	21
Wards in Acute Care Hospitals	50
Inpatient Rehabilitation Facilities	6
Inpatient Rehabilitation Wards in Acute Care Hospitals	16
Long-Term Acute Care Hospitals	7

Data source: National Healthcare Safety Network (NHSN) Database

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment

**Table 4: Healthcare Facilities Reporting Surgical Procedures by Procedure Type – Colorado, 2018**

Procedure Type	No. of Acute Care Hospitals	No. of Critical Access Hospitals	No. of Ambulatory Surgery Centers	No. of Facilities (Total)
Abdominal Hysterectomy	48	19	5	72
Breast Surgery	48	19	34	102
Colon Surgery	48	17	---	65
Hernia	---	---	39	39
Hip Replacement	49	18	18	85
Knee Replacement	49	19	18	86
Vaginal Hysterectomy	---	---	4	4

--- Facility types does not report these procedures.

Data source: National Healthcare Safety Network (NHSN) Database

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment

# Data format and cautions

## Using these data

Consult with providers, facilities, insurers, reputable websites, and family and friends when making health care decisions. These data can be another indicator of health care quality. When using these data, keep in mind:

- Facilities that treat more severely ill patients may have higher infection rates regardless of their prevention efforts.
- It can be challenging to apply definitions and criteria to patients with complicated medical histories.
- Facilities find infections in different ways, and some are better equipped, so higher infection rates may be based on better surveillance practices, not poorer infection control practices.

Data presented in this report include surgical site infections (SSIs), central- line-associated bloodstream infections (CLABSIs), dialysis-related infections, and *Clostridioides difficile* (*C. difficile*) in patients receiving medical care between Jan. 1, 2016 and Dec. 31, 2018. Two forms of healthcare-associated infection (HAI) data are presented: infection counts or rates that combine all Colorado facilities (aggregate data) and infection counts or rates for each individual facility (facility-specific data). The report further classifies HAI data by procedure and/or device so facilities can readily identify areas in need of process improvements and target infection prevention efforts.

Facility-specific data tables include the facility name and city, and for each facility, the number of infections and, depending on the type of infection, the number of surgeries (for SSIs), patient line days (for CLABSIs), patient-months (for dialysis-related infections), and patient-days (for *C. difficile*). Patient-months is a measure of the number of patients multiplied by the number of months of care; for example, if five patients each received two months of care, the number of patient-months is 10. Patient-days is a similar measure multiplying the number of patients by the number of days they were present in the facility.

**National comparisons.** National comparisons are shown for conditions and facility types when available through NHSN. National comparisons using standardized infection ratios (SIRs) uses the facility's observed and expected number of infections, denominator size, and a statistical test of difference. The statistical test of difference, known as the Poisson test, calculates the magnitude of difference between a facility's observed and predicted number of infections. This is described in greater detail in Appendix B.

- If the difference is statistically significant and the SIR is less than one, the facility has significantly fewer HAI than expected and is designated as “better” than the national baseline.
- If there is no significant difference between the facility's observed and predicted number of infections, the facility is designated as “same” as the national baseline.
- If the difference is statistically significant and the SIR is greater than one, the facility has significantly more infections than predicted and is designated as “worse” than the national baseline.

National comparisons using rates are used for dialysis events. For each event type, the rates are ranked, and a statistical test is applied to calculate what is known as a p-value. This is described in detail in Appendix B.

- If the p-value is less than 0.05 and the percentile is low, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as “better.”

- If the p-value is greater than or equal to 0.05, and regardless of the percentile ranking, the difference between the facility's rate and the NHSN aggregate rate is not statistically significant, and the facility's infection rate is designated as "same."
- If the p-value is less than 0.05 and the percentile is high, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as "worse."

## Considerations and Limitations

The department and the Colorado HAI Advisory Committee recommend caution when drawing conclusions from these data for multiple reasons. For one, direct comparisons between facilities may not provide the most accurate assessment because infection rates are influenced by the types of patients treated. Facilities that treat higher volumes of severely ill patients may have higher infection rates regardless of their prevention efforts. While the NHSN system provides the best risk adjustment possible to account for this at present by using the SIR, there always will be patient risk factors that cannot be measured (e.g., individual ability to heal, smoking cessation days, severe suppression of the immune system) that contribute to infection risk. Additionally, a calculated SIR is not available for all conditions, and therefore additional caution should be applied when interpreting a comparison of rates, which are not adjusted for risk.

Second, NHSN surveillance manuals are developed by CDC subject matter experts. Although the definitions and criteria are updated each year, they can be challenging to apply to patients with complicated medical histories. Additionally, facilities use different surveillance techniques to find infections. Some infection preventionists have more resources for surveillance, and may find and report more infections than other facilities. In those cases, higher infection rates may be based on better surveillance practices rather than poor infection control practices. It is noteworthy that ambulatory surgery centers traditionally report lower numbers of SSIs than hospitals, which may be due, in part, to reduced opportunity to conduct post-surgical follow-up with patients and surgeons.

Finally, report users should note that the data presented are self-reported by each facility and, although data validation studies have been completed in the last three years for selected CLABSIs, SSIs, and dialysis-related infections, validation is not performed on every infection, nor on every condition reported each year. We recommend conclusions regarding health care quality be made in conjunction with other quality indicators. Consumers should consult with doctors, health care facilities, health insurance carriers, health care websites from reputable sources (e.g., Hospital Compare, Colorado Hospital Report Card, Leap Frog), and with their families and friends before deciding where to receive care. Ideally, facilities will use the data in this report to target and improve infection prevention efforts, and consumers will use the data to make better-informed health care decisions.



## Colorado State-Level Data

# Aggregate central line-associated bloodstream infection data

Colorado CLABSIs are better than the national baseline in 2018 for every facility and unit type except rehabilitation wards in acute care hospitals and inpatient rehabilitation facilities. Statewide, CLABSIs in neonatal critical care units have improved over three years from worse in 2016 to better in 2018.

Central line-associated bloodstream infections (CLABSIs) are associated with specific intravascular catheters used to infuse fluids or medications, withdraw blood, or monitor fluid volume in patients. Table 6 shows the statewide aggregate number of CLABSIs in acute care hospitals; among specific acute care hospital locations including critical care units, neonatal critical care units, and wards; critical access hospitals; inpatient rehabilitation facilities and inpatient rehabilitation wards in acute care hospitals; and long-term acute care hospitals in Colorado for the 2016, 2017, and 2018 calendar years.

**Table 6: Central Line-Associated Bloodstream Infections in Healthcare Facilities by Facility/Unit Type – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility/Unit Type	2016				2017				2018			
	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Acute Care Hospitals*	228,660	149	0.7	Better	227,542	139	0.6	Better	228,005	135	0.6	Better
Adult Critical Care^^	110,609	93	0.9	Same	106,749	81	0.8	Better	104,943	77	0.7	Better
Neonatal Critical Care+	19,161	37	1.7	Worse	18,712	27	1.2	Same	16,964	5	0.2	Better
Wards**	108,702	55	0.6	Better	109,364	58	0.6	Better	114,644	45	0.4	Better
Critical Access Hospitals	152	0	***	***	190	0	***	***	188	0	***	***
Rehabilitation Wards*	5,223	1	0.4	Same	4,833	3	1.3	Same	4,694	0	0	Same
Inpatient Rehabilitation Facility	9,849	2	0.4	Same	8,600	1	0.2	Better	8,396	1	0.2	Same
Long-Term Acute Care Hospital	34,098	25	0.7	Better	31,009	20	0.6	Better	27,155	20	0.7	Better

\*Excludes rehabilitation wards. Includes critical care, wards, and neonatal critical care.

^Excludes neonatal critical care units.

\*\*In acute care hospitals.

\*\*\* Data is suppressed because the predicted number of infections was less than one.

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

# Aggregate *Clostridioides difficile* data

*C.difficile* counts in all health care facility types have improved and are better than the national baseline in 2018.

*Clostridioides difficile* (*C. difficile*) is a spore-forming bacterium that can cause symptoms ranging from bloating, diarrhea, fever and abdominal pain to life-threatening colon inflammation, sepsis and death. **Table 7** shows statewide aggregate data for hospital-onset *C. difficile* in Colorado acute care hospitals, inpatient rehabilitation facilities, and long-term acute care hospitals for the 2016, 2017, and 2018 calendar years.

**Table 7: *Clostridioides difficile* in Health Care Facilities by Facility Type— Colorado, Jan. 1, 2016 - Dec. 31, 2018**

	2016				2017				2018			
	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
Acute Care Hospitals	1,577,927	1,317	1.0	Same	1,609,405	1,166	0.9	Better	1,634,044	1,043	0.9	Better
Inpatient Rehabilitation Facilities	52,128	13	0.7	Same	50,247	14	0.8	Same	53,153	8	0.4	Better
Long-Term Acute Care Hospitals	81,451	63	0.8	Better	82,854	72	1.0	Same	79,994	56	0.7	Better

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.



# Aggregate dialysis infection data

For the last three years, Colorado local access infection rates in dialysis facilities have been worse than the national rates. Access-related bloodstream infection rates have improved, and Colorado rates are better than the national rates in 2018.

Dialysis infection data is presented for two types of infections. An access-related bloodstream infection (ARB) is the presence of bacteria in the blood, identified by a positive blood culture, with the source of the bacteria identified as the vascular access site or uncertain site (where needles for dialysis are inserted). A local access infection (LAI) is the presence of pus, redness, or swelling of the vascular access site without bacteria identified in the blood. Table 8 shows statewide aggregate data for ARBs and LAIs in Colorado outpatient dialysis facilities for the 2016, 2017, and 2018 calendar years. Risk adjustment using the SIR is not available for dialysis data, so unadjusted rates are presented.

**Table 8: Dialysis-Related Infections in Outpatient Dialysis Facilities – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Infection Type	2016				2017				2018			
	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
Access-Related Bloodstream	43,396	202	0.5	Worse	44,857	227	0.5	Worse	46,118	147	0.3	Better
Local Vascular Access	43,396	314	0.7	Worse	44,857	338	0.8	Worse	46,118	276	0.6	Worse

Rates are per 100 patient-months. NOTE: These rates are not adjusted for risk.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Data include the following access types: fistula, graft, tunneled central line, and non-tunneled central line.

Data source: National Healthcare Safety Network (NHSN) Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

# Aggregate surgical site infection data

In 2018, statewide SSIs following abdominal hysterectomies and colon surgeries in acute care hospitals for adult patients were lower (statistically better) compared to the national baseline.

Surgical site infections (SSIs) are infections directly related to a surgical procedure. **Tables 9, 10, 11, and 12** show the statewide aggregate number of SSIs for reportable procedures for the 2016, 2017, and 2018 calendar years. SSI data are presented for acute care hospitals, critical access hospitals and ambulatory surgical centers. This is the first year that SSIs in pediatric patients (age <18 on date of surgery) were no longer reportable; pediatric SSIs are not included in this report.

**Acute Care Hospitals (Table 9).** In 2018, SSIs in Colorado acute care hospitals were better when compared to the national baseline for abdominal hysterectomies and colon surgeries for adults undergoing surgeries as inpatients. Statewide, SSIs among inpatient surgeries following breast surgeries, hip replacements, and knee replacements were the same as the national baseline in 2018. Among outpatient surgeries following abdominal hysterectomies, breast surgeries, and knee replacements, SSIs were the same as the national baseline; no conclusions can be drawn from outpatient colon surgeries or hip replacements due to data suppression. Data was suppressed because the number of procedures was less than 20 or the predicted number of infections was less than one.

**Critical Access Hospitals (Table 10).** In 2018, statewide SSI rates in Colorado critical access hospitals were the same as the national baseline for colon surgeries, hip replacements, and knee replacements. SIRs were not calculated for breast surgeries or abdominal hysterectomies due to data suppression.

**Ambulatory surgery centers (Tables 11 and 12).** National comparisons are now available for outpatient procedures at ambulatory surgery centers using the outpatient procedure component within NHSN. At the time of this report, these national comparisons were only available for breast surgeries, hernia surgeries, and knee replacements (Table 11). From 2016-2018, Colorado SSIs following breast and hernia surgeries were the same as the national baseline; no comparison can be drawn between SSIs following knee replacements and the national baseline due to data suppression. Data was suppressed because the number of procedures was less than 20 or the predicted number of infections was less than one.

Abdominal and vaginal hysterectomy and hip replacement rates are presented in Table 12; no comparisons with national data are available.

**Table 9: Surgical Site Infections in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Patient Type and Procedure	2016				2017				2018			
	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
<b>Inpatient Surgeries</b>												
Abdominal Hysterectomy	5,360	68	0.9	Same	5,670	53	0.7	Better	5,402	49	0.7	Better
Breast Surgery	3,713	43	0.8	Same	4,209	64	1.0	Same	4,358	66	1.0	Same
Colon Surgery	4,934	224	1.0	Same	5,319	248	1.0	Same	5,113	223	0.9	Better
Hip Replacement	10,537	105	1.0	Same	11,095	104	1.0	Same	11,679	107	1.0	Same
Knee Replacement	16,098	101	1.1	Same	17,124	97	1.0	Same	17,281	110	1.1	Same
<b>Outpatient Surgeries</b>												
Abdominal Hysterectomy	2,103	11	1.1	Same	1,554	11	1.4	Same	1,847	9	1.0	Same
Breast Surgery	7,346	52	1.3	Same	7,712	34	0.8	Same	7,962	35	0.7	Same
Colon Surgery	56	1	***	***	39	0	***	***	47	0	***	***
Hip Replacement	110	0	***	***	121	2	***	***	267	2	***	***
Knee Replacement	176	0	***	***	231	5	4.6	Worse	688	4	1.0	Same

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one for the procedure/year combination or there were fewer than 20 procedures of this type in this year.

Data source: National Healthcare Safety Network (NHSN) Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 10: Surgical Site Infections in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Patient Type and Procedure	2016				2017				2018			
	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
<b>Inpatient Surgeries</b>												
Abdominal Hysterectomy	43	0	***	***	47	0	***	***	43	1	***	***
Breast Surgery	29	0	***	***	38	0	***	***	32	1	***	***
Colon Surgery	79	1	0.3	Same	59	1	0.4	Same	52	1	0.5	Same
Hip Replacement	162	0	0	Same	207	2	1.1	Same	231	0	0	Same
Knee Replacement	386	1	0.4	Same	423	7	2.8	Worse	431	1	0.4	Same
<b>Outpatient Surgeries</b>												
Abdominal Hysterectomy	7	***	***	***	1	***	***	***	1	***	***	***
Breast Surgery	91	0	***	***	91	1	***	***	101	0	***	***
Colon Surgery	2	***	***	***	2	***	***	***	1	***	***	***
Hip Replacement	3	***	***	***	1	***	***	***	2	***	***	***
Knee Replacement	5	***	***	***	5	***	***	***	10	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one for the procedure/year combination or there were fewer than 20 procedures of this type in this year.

Data source: National Healthcare Safety Network (NHSN) Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 11: Surgical Site Infections in Ambulatory Surgery Centers^ – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Procedure	2016				2017				2018			
	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
<b>Outpatient Surgeries</b>												
Breast Surgery	5,772	11	0.7	Same	6,396	12	0.7	Same	5,903	10	0.6	Same
Hernia Surgery	5,390	7	0.6	Same	5,495	7	0.6	Same	4,884	8	0.8	Same
Knee Replacement	837	1	***	***	1,141	2	***	***	1,397	3	***	***

^based on new outpatient procedure model for ambulatory surgery centers. Not available for other procedure types at time of the report.

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one for the procedure/year combination or there were fewer than 20 procedures of this type in this year.

Data source: National Healthcare Safety Network (NHSN) Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 12: Rates of Surgical Site Infections in Ambulatory Surgery Centers – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Procedure Type	2016			2017			2018		
	No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate
<b>Outpatient Surgeries</b>									
Abdominal Hysterectomy	78	0	0	56	0	0	85	1	1.2
Hip Replacement	298	3	1.0	466	1	0.2	692	1	0.1
Vaginal Hysterectomy	79	0	0	46	0	0	66	0	0

Rates are per 100 procedures. NOTE: These rates are not adjusted for risk.

Data include adults and pediatric patients.

Data source: National Healthcare Safety Network (NHSN) Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

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## Colorado Facility-Specific Data

# Central line-associated bloodstream infections

## Overview

Central line-associated bloodstream infections (CLABSIs) are infections in the blood associated with specific intravascular catheters or central lines. A central line is an intravascular catheter (tube in a vein or artery) that terminates at or close to the heart or in one of the great vessels (e.g., aorta, superior vena cava). A peripheral line is a similar tube in a vein or artery that does not enter a great vessel, is a smaller diameter tube, and is typically used for shorter periods of intravenous access. Both central lines and peripheral lines can be used to infuse fluids or medications, withdraw blood, or monitor fluid volume in patients. Central lines are typically placed when intravenous access is needed for longer time, larger volumes of fluids, or access for dialysis is needed. An umbilical catheter (a tube placed in the umbilical cord) is a central vascular catheter inserted through the umbilical artery or vein, typically used for infants. Central lines can be either permanent or temporary. Permanent lines are those that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled.

All patients with central lines are at risk for CLABSIs. However, certain groups are at higher risk for infection: the elderly, neonates, dialysis patients, patients with weak immune systems (e.g., cancer patients, transplant patients), patients with diabetes, and patients with burn injuries.<sup>9-11</sup>

Based on the high incidence and potential severity of CLABSIs, in 2017 Colorado's HAI Advisory Committee recommended the addition of acute care hospital wards to Colorado reporting requirements for acute care hospitals (critical access hospitals and stand-alone children's hospitals exempt) for data collected since 2015; in 2018 the committee recommended inclusion of this data in the annual report. This is the first year that ward data is presented in the annual report.

Colorado requires that all adult and pediatric critical care units (CCUs) and selected wards (medical, surgical, medical/surgical, and rehabilitation) within acute care hospitals; neonatal critical care units (levels II/III, III, and IV); long-term acute care hospitals; and inpatient rehabilitation facilities report CLABSI data into NHSN. Critical access hospitals report critical care unit data only; stand-alone children's hospitals report neonatal critical care unit data only.

Tables included in this section are divided by facility type: **Table 13** shows acute care hospital CLABSI data with units combined; **Table 14** shows acute care hospital CLABSI data with location types (CCUs, wards, and neonatal critical care units) separated; **Table 15** shows critical access hospital CCUs; **Table 16** shows inpatient rehabilitation facilities; and **Table 17** shows long-term acute care hospitals. All tables list reporting facilities, cities, number of central line days per year, number of CLABSI infections, standardized infection ratios (SIRs), and comparisons to national infection rates. The number of central line days is the total number of days a central line was in place for patients in the unit during the reporting period (for example, if three patients each had a central line for 10 days, the number of central line days is 30). Additional details are listed in Appendix B.

The three categories summarizing how a Colorado facility compares to the national infection baseline for that unit are:

- Statistically lower infections than the national baseline (better).
- Statistically similar infections as the national baseline (same).

- Statistically higher infections than the national baseline (worse).

## Limitations

CDPHE does not perform data validation studies on every infection nor every condition reported yearly. One inpatient rehabilitation facility did not have their data available at the time of the report. For additional limitations, please see “Data format and cautions” section on page 9.

## Central line-associated infections in acute care hospitals

In 2018, central line-associated bloodstream infections among acute care hospitals were 40% lower in Colorado (statistically better) compared to the national baseline. Central line-associated bloodstream infections counts were better than the national baseline among critical care units, neonatal critical care units, and wards in 2018.

## Overview

Acute care hospitals report CLABSI data for the following locations for adults and children: critical care units (CCUs) including medical, surgical, and medical surgical; neonatal critical care units (NCCUs); wards including medical, surgical, and medical-surgical; and rehabilitation wards within the same four walls as the facility. Data presented in this section includes CCUs, NCCUs, and wards; rehabilitation wards are presented in the section “Inpatient rehabilitation facilities and inpatient rehabilitation wards in hospitals.”

CCUs provide intensive medical care for adults and children. Hospitals classify their CCUs by the type of patients cared for in the unit.<sup>3</sup>

NCCUs provide intensive medical care for premature and ill newborn babies. Neonatal care is classified into four levels of care, levels I-IV. Level I and II units care for healthy newborns; they are not required to report healthcare-associated infections (HAIs). Colorado requires level II/III combined, level III, and level IV units to report CLABSI data. The designation between level III and level II/III is defined by the National Healthcare Safety Network (NHSN) reporting guidelines.<sup>3</sup> If a hospital unit does not separate infants receiving level II care from those receiving level III care, that NCCU is reported as a level II/III. Level III NCCU provides personnel and equipment to ensure continuous life support and comprehensive care for extremely high-risk newborns with complex critical conditions. In this report, level IV NCCUs are included within level III or level II/III, as per NHSN location mapping.

Hospital wards are groups of rooms forming a division of a hospital, usually shared by patients who need a similar kind of care. Acute care hospitals are required to report CLABSIs from medical, surgical, and medical/surgical wards.

All location types report central line data by facility type, central line type, and location type. This differentiation enables fairer comparisons between health care facilities by accounting for differences in care and patients’ risk for infection that affect infection rates.

## Results

Forty-nine acute care hospitals reported CLABSI data in 2018. **Table 13** shows facility data for CLABSI attributed to CCUs, NCCUs, and wards combined into a single analysis (excluding inpatient rehabilitation wards). In 2018, six acute care hospitals had CLABSI



counts lower (statistically better) than the national baseline. Statewide, CLABSI counts were 40% lower (statistically better) than the national baseline in 2018 (**Table 6**).

**Table 14** shows facility-specific data for CLABSIs by unit type (CCUs, NCCUs, and wards) in acute care hospitals during the 2016, 2017 and 2018 calendar years. Seventy-three CCUs in 45 Colorado acute care hospitals reported 99,702 central line days in 2018. In 2018, two hospital CCUs had CLABSI counts better than the national baseline and all others had counts similar to the national baseline. Twenty hospitals with a total of 21 NCCUs, including 17 level III and four level II/III NCCUs, reported 13,658 central line days in 2018; five hospitals reported zero CLABSIs in NCCUs. Statewide CLABSI counts in NCCUs was the same as the national baseline in 2018 (**Table 6**). Seventy-seven adult wards in 46 Colorado acute care hospitals reported 113,446 central line days in 2018. In 2018, four hospitals ward locations had CLABSI counts better than the national baseline and all others had counts similar to the national baseline.

**Table 13: Central Line-Associated Bloodstream Infections in Acute Care Hospitals Excluding Inpatient Rehabilitation Wards  
Colorado, Jan. 1, 2016-Dec. 31, 2018**

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	All Wards and CCUs	1	***	***	***	0	***	***	***	2	***	***	***
Avista Adventist Hospital	Louisville	All Wards and CCUs	914	0	***	***	805	0	***	***	826	2	***	***
Banner Fort Collins Medical Center	Fort Collins	All Wards and CCUs	172	0	***	***	239	0	***	***	230	0	***	***
Boulder Community Hospital, Foothills	Boulder	All Wards and CCUs	5,735	0	0	Better	5,773	1	0.3	Same	5,414	4	1.1	Same
Castle Rock Adventist Hospital	Castle Rock	All Wards and CCUs	1,286	2	***	***	960	2	***	***	750	0	***	***
Colorado Plains Medical Center	Fort Morgan	All Wards and CCUs	89	0	***	***	69	0	***	***	54	0	***	***
Community Hospital	Grand Junction	All Wards and CCUs	1,050	1	***	***	933	0	***	***	663	1	***	***
Delta County Memorial Hospital	Delta	All Wards and CCUs	232	0	***	***	383	0	***	***	513	0	***	***
Denver Health Medical Center	Denver	All Wards and CCUs	12,267	19	1.4	Same	10,313	10	0.9	Same	10,229	11	1	Same
Exempla Good Samaritan Medical Center	Lafayette	All Wards and CCUs	4,216	4	1.4	Same	4,811	5	1.5	Same	4,985	2	0.6	Same
Exempla St. Joseph Hospital	Denver	All Wards and CCUs	8,594	4	0.4	Same	9,265	5	0.5	Same	8,458	4	0.4	Same
Littleton Adventist Hospital	Littleton	All Wards and CCUs	4,254	3	0.8	Same	3,295	5	1.7	Same	3,081	1	0.4	Same
Longmont United Hospital	Longmont	All Wards and CCUs	4,100	0	0	Same	4,043	1	0.3	Same	2,809	4	1.9	Same
Longs Peak Hospital	Longmont	All Wards and CCUs	---	---	---	---	26	0	***	***	1,706	1	1.0	Same
Lutheran Medical Center	Wheat Ridge	All Wards and CCUs	6,154	1	0.2	Better	6,603	3	0.6	Same	5,742	0	0	Better
McKee Medical Center	Loveland	All Wards and CCUs	1,497	1	0.9	Same	1,380	0	***	***	618	0	***	***
Medical Center of the Rockies	Loveland	All Wards and CCUs	10,005	4	0.5	Same	10,358	2	0.2	Better	12,768	0	0	Better
Memorial Health System	Colorado Springs	All Wards and CCUs	15,811	6	0.4	Better	16,069	7	0.5	Better	14,653	10	0.6	Same
Memorial Hospital North	Colorado Springs	All Wards and CCUs	1,629	1	1.0	Same	1,848	0	0	Same	1,808	0	0	Same

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Mercy Regional Medical Center	Durango	All Wards and CCUs	1,837	1	0.9	Same	1,347	2	***	***	2,081	2	1.5	Same
Montrose Memorial Hospital	Montrose	All Wards and CCUs	806	0	***	***	836	0	***	***	649	0	***	***
National Jewish Health	Denver	All Wards and CCUs	0	***	***	***	0	***	***	***	35	***	***	***
North Colorado Medical Center	Greeley	All Wards and CCUs	7,263	4	0.7	Same	7,022	4	0.7	Same	5,790	4	0.9	Same
North Suburban Medical Center	Thornton	All Wards and CCUs	3,243	0	0	Same	2,912	3	1.5	Same	2,685	2	1.1	Same
Ortho Colorado	Lakewood	All Wards and CCUs	35	***	***	***	28	***	***	***	53	0	***	***
Parker Adventist Hospital	Parker	All Wards and CCUs	3,642	2	0.8	Same	3,297	2	0.9	Same	2,927	5	1.9	Same
Parkview Medical Center	Pueblo	All Wards and CCUs	8,039	10	1.2	Same	6,661	12	1.7	Same	6,548	5	0.7	Same
Penrose St. Francis Health Services	Colorado Springs	All Wards and CCUs	7,729	2	0.3	Better	7,879	4	0.5	Same	7,077	6	0.8	Same
Platte Valley Medical Center	Brighton	All Wards and CCUs	1,131	0	***	***	1,192	0	***	***	902	0	***	***
Porter Adventist Hospital	Denver	All Wards and CCUs	7,251	0	0	Better	8,138	4	0.6	Same	6,789	7	1.3	Same
Poudre Valley Health System	Fort Collins	All Wards and CCUs	5,281	0	0	Better	5,542	0	0	Better	9,418	1	0.1	Better
Presbyterian St. Luke's Medical Center	Denver	All Wards and CCUs	13,177	13	0.8	Same	10,327	6	0.5	Better	11,169	12	0.9	Same
Rose Medical Center	Denver	All Wards and CCUs	3,492	6	1.6	Same	4,297	5	1.1	Same	3,929	1	0.2	Same
Sky Ridge Medical Center	Lone Tree	All Wards and CCUs	4,850	1	0.2	Better	4,997	2	0.4	Same	5,315	2	0.4	Same
St. Anthony Hospital	Lakewood	All Wards and CCUs	14,227	8	0.7	Same	13,335	6	0.5	Same	13,262	7	0.5	Better
St. Anthony North Health Campus	Westminster	All Wards and CCUs	3,154	3	1.0	Same	2,850	2	0.8	Same	4,169	3	0.8	Same
St. Anthony Summit Medical Center	Frisco	All Wards and CCUs	124	0	***	***	112	0	***	***	92	0	***	***
St. Francis Medical Center	Colorado Springs	All Wards and CCUs	3,062	3	0.9	Same	3,226	3	0.9	Same	2,902	4	1.1	Same
St. Mary Corwin Medical Center	Pueblo	All Wards and CCUs	2,613	2	0.9	Same	2,757	8	3.4	Worse	665	2	***	***
St. Mary's Hospital	Grand Junction	All Wards and CCUs	8,707	4	0.5	Same	7,645	6	0.8	Same	6,433	3	0.4	Same
St. Thomas More Hospital	Canon City	All Wards and CCUs	707	1	***	***	568	2	***	***	535	0	***	***

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Sterling Regional Medical Center	Sterling	All Wards and CCUs	283	0	***	***	230	0	***	***	140	0	***	***
Swedish Medical Center	Englewood	All Wards and CCUs	8,859	11	1.0	Same	8,344	7	0.7	Same	8,105	3	0.3	Better
The Medical Center of Aurora	Aurora	All Wards and CCUs	9,848	3	0.3	Better	10,212	2	0.2	Better	11,064	6	0.5	Same
UCHealth Broomfield Hospital	Broomfield	All Wards and CCUs	0	***	***	***	10	***	***	***	20	0	***	***
UCHealth Grandview Hospital	Colorado Springs	All Wards and CCUs	---	---	---	---	0	***	***	***	10	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	All Wards and CCUs	285	0	***	***	251	0	***	***	130	0	***	***
University of Colorado Hospital	Aurora	All Wards and CCUs	29,424	29	0.9	Same	33,973	18	0.5	Better	36,778	20	0.5	Better
Vail Valley Medical Center	Vail	All Wards and CCUs	454	0	***	***	470	0	***	***	409	0	***	***
Valley View Hospital	Glenwood Springs	All Wards and CCUs	778	0	***	***	853	0	***	***	968	0	***	***

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Abbreviations: CCUs= critical care units (adult and pediatric medical, surgical, medical-surgical). Wards=all adult and pediatric medical, surgical, and medical-surgical wards.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility/unit combination had fewer than 50 central line days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment

Table 14: Central Line-Associated Bloodstream Infections in Acute Care Hospitals by Location Type – Colorado, Jan. 1, 2016-Dec. 31, 2018

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	Wards	1	***	***	***	0	***	***	***	2	***	***	***
Avista Adventist Hospital	Louisville	Critical Care	393	0	***	***	388	0	***	***	371	1	***	***
		Neonatal Critical Care	85	0	***	***	42	***	***	***	81	1	***	***
		Wards	436	0	***	***	375	0	***	***	374	0	***	***
Banner Fort Collins Medical Center	Fort Collins	Wards	172	0	***	***	239	0	***	***	230	0	***	***
Boulder Community Hospital, Foothills	Boulder	Critical Care	2,315	0	0	Same	2,433	1	0.5	Same	2,184	0	0	Same
		Wards	3,420	0	0	Same	3,340	0	0	Same	3,230	4	1.9	Same
Castle Rock Adventist Hospital	Castle Rock	Critical Care	585	2	***	***	375	1	***	***	362	0	***	***
		Neonatal Critical Care	6	***	***	***	0	***	***	***	3	***	***	***
		Wards	695	0	***	***	585	1	***	***	385	0	***	***
Colorado Plains Medical Center	Fort Morgan	Critical Care	20	***	***	***	14	***	***	***	17	***	***	***
		Wards	69	0	***	***	55	0	***	***	37	***	***	***
Community Hospital	Grand Junction	Critical Care	595	1	***	***	476	0	***	***	411	1	***	***
		Wards	455	0	***	***	457	0	***	***	252	0	***	***
Delta County Memorial Hospital	Delta	Critical Care	232	0	***	***	259	0	***	***	275	0	***	***
		Wards	---	---	---	---	124	0	***	***	238	0	***	***
Denver Health Medical Center	Denver	Critical Care	4,594	9	1.5	Same	3,473	6	1.3	Same	3,712	7	1.5	Same
		Neonatal Critical Care	1,043	3	***	***	714	0	***	***	845	1	0.9	Same
		Wards	6,630	7	1.1	Same	6,126	4	0.7	Same	5,857	3	0.5	Same
Exempla Good Samaritan Medical Center	Lafayette	Critical Care	1,339	3	3	Same	1,441	3	2.8	Same	1,606	1	0.8	Same
		Wards	2,877	1	0.5	Same	3,370	2	0.9	Same	3,379	1	0.5	Same

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Exempla St. Joseph Hospital	Denver	Critical Care	3,444	2	0.5	Same	3,727	1	0.2	Same	3,338	1	0.3	Same
		Neonatal Critical Care	1,069	1	0.6	Same	1,458	1	0.4	Same	1,455	3	1.5	Same
		Wards	4,081	1	0.3	Same	4,080	3	0.8	Same	3,665	0	0	Better
Littleton Adventist Hospital	Littleton	Critical Care	2,363	0	0	Same	2,305	3	1.5	Same	2,171	1	0.5	Same
		Neonatal Critical Care	137	1	***	***	88	0	***	***	159	0	***	***
		Wards	1,754	2	1.5	Same	902	2	***	***	751	0	***	***
Longmont United Hospital	Longmont	Critical Care	2,547	0	0	Same	2,606	1	0.5	Same	2,360	4	2.2	Same
		Neonatal Critical Care	11	***	***	***	10	***	***	***	2	***	***	***
		Wards	1,542	0	0	Same	1,427	0	***	***	447	0	***	***
Longs Peak Hospital	Longmont	Critical Care	---	---	---	---	7	0	***	***	502	0	***	***
		Wards	---	---	---	---	19	0	***	***	1,204	1	***	***
Lutheran Medical Center	Wheat Ridge	Critical Care	3,739	0	0	Better	3,774	2	0.6	Same	2,958	0	0	Same
		Neonatal Critical Care	151	1	***	***	142	0	***	***	137	0	***	***
		Wards	2,264	0	0	Same	2,687	1	0.5	Same	2,647	0	0	Same
McKee Medical Center	Loveland	Critical Care	775	1	***	***	478	0	***	***	---	---	---	---
		Wards	722	0	***	***	902	0	***	***	618	0	***	***
Medical Center of the Rockies	Loveland	Critical Care	4,012	2	0.6	Same	4,013	0	0	Better	4,135	0	0	Better
		Wards	5,993	2	0.4	Same	6,345	2	0.4	Same	8,633	0	0	Better
Memorial Health System	Colorado Springs	Critical Care	5,797	1	0.2	Better	5,965	3	0.6	Same	6,322	5	0.7	Same
		Neonatal Critical Care	1,965	2	0.7	Same	2,277	2	0.6	Same	2,249	2	0.6	Same
		Wards	8,049	3	0.5	Same	7,827	2	0.3	Same	6,082	3	0.5	Same

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Memorial Hospital North	Colorado Springs	Critical Care	726	1	***	***	517	0	***	***	---	---	---	---
		Wards	903	0	***	***	1,331	0	***	***	1,808	0	0	Same
Mercy Regional Medical Center	Durango	Critical Care	1,073	1	***	***	1,025	1	***	***	1,408	2	***	***
		Wards	764	0	***	***	322	1	***	***	673	0	***	***
Montrose Memorial Hospital	Montrose	Critical Care	322	0	***	***	275	0	***	***	282	0	***	***
		Wards	484	0	***	***	561	0	***	***	367	0	***	***
National Jewish Health	Denver	Wards	0	***	***	***	0	***	***	***	35	***	***	***
North Colorado Medical Center	Greeley	Critical Care	1,904	1	0.6	Same	2,308	2	0.9	Same	1,964	1	0.6	Same
		Wards	5,359	3	0.7	Same	4,714	2	0.6	Same	3,826	3	1	Same
North Suburban Medical Center	Thornton	Critical Care	1,694	0	0	Same	1,218	1	***	***	1,085	2	***	***
		Wards	1,549	0	0	Same	1,694	2	1.8	Same	1,600	0	0	Same
Ortho Colorado	Lakewood	Wards	35	***	***	***	28	***	***	***	53	0	***	***
Parker Adventist Hospital	Parker	Critical Care	1,868	1	0.7	Same	1,571	1	0.8	Same	1,317	3	2.3	Same
		Neonatal Critical Care	27	***	***	***	107	0	***	***	16	***	***	***
		Wards	1,747	1	0.9	Same	1,619	1	0.9	Same	1,594	2	1.5	Same
Parkview Medical Center	Pueblo	Critical Care	3,985	5	1.1	Same	3,470	10	2.6	Worse	3,634	2	0.5	Same
		Wards	4,054	5	1.3	Same	3,191	2	0.6	Same	2,914	3	1.1	Same
Penrose St. Francis Health Services	Colorado Springs	Critical Care	3,756	1	0.3	Same	4,084	2	0.5	Same	3,542	2	0.5	Same
		Wards	3,973	1	0.3	Same	3,795	2	0.6	Same	3,535	4	1.2	Same
Platte Valley Medical Center	Brighton	Critical Care	1,131	0	***	***	1,157	0	***	***	---	---	---	---
		Wards	---	---	---	---	35	***	***	***	902	0	***	***
Porter Adventist Hospital	Denver	Critical Care	3,906	0	0	Better	4,623	1	0.2	Same	4,090	5	1.4	Same
		Wards	3,345	0	0	Same	3,515	3	1.1	Same	2,699	2	1	Same

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Poudre Valley Health System	Fort Collins	Critical Care	1,491	0	0	Same	1,596	0	0	Same	1,635	0	0	Same
		Neonatal Critical Care	653	0	***	***	793	0	***	***	800	0	***	***
		Wards	3,137	0	0	Same	3,153	0	0	Same	6,983	1	0.1	Better
Presbyterian St. Luke's Medical Center	Denver	Critical Care	5,254	4	0.6	Same	4,399	4	0.7	Same	4,273	7	1.3	Same
		Neonatal Critical Care	3,977	2	0.3	Same	3,518	0	0	Better	4,562	4	0.6	Same
		Wards	3,946	7	1.8	Same	2,410	2	0.8	Same	2,334	1	0.4	Same
Rose Medical Center	Denver	Critical Care	1,372	4	2.6	Same	1,823	4	1.9	Same	1,547	0	0	Same
		Neonatal Critical Care	175	0	***	***	224	0	***	***	196	0	***	***
		Wards	1,945	2	1.1	Same	2,250	1	0.5	Same	2,186	1	0.5	Same
Sky Ridge Medical Center	Lone Tree	Critical Care	2,123	0	0	Same	2,049	1	0.4	Same	2,157	1	0.4	Same
		Neonatal Critical Care	80	0	***	***	134	0	***	***	120	0	***	***
		Wards	2,647	1	0.4	Same	2,814	1	0.4	Same	3,038	1	0.3	Same
St. Anthony Hospital	Lakewood	Critical Care	7,770	5	0.7	Same	7,201	3	0.5	Same	6,477	4	0.5	Same
		Wards	6,457	3	0.6	Same	6,134	3	0.7	Same	6,785	3	0.5	Same
St. Anthony North Health Campus	Westminster	Critical Care	1,621	0	0	Same	1,311	0	0	Same	1,865	2	1.1	Same
		Wards	1,533	3	2.3	Same	1,539	2	1.5	Same	2,304	1	0.5	Same
St. Anthony Summit Medical Center	Frisco	Critical Care	14	***	***	***	---	---	---	---	---	---	---	---
		Wards	110	0	***	***	112	0	***	***	92	0	***	***
St. Francis Medical Center	Colorado Springs	Critical Care	554	0	***	***	754	0	***	***	737	1	***	***
		Neonatal Critical Care	1,441	1	0.5	Same	1,100	0	0	Same	901	2	1.3	Same
		Wards	1,067	2	***	***	1,372	3	2.9	Same	1,264	1	0.8	Same



Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
St. Mary Corwin Medical Center	Pueblo	Critical Care	1,841	2	1.2	Same	1,979	6	3.5	Worse	484	2	***	***
		Neonatal Critical Care	7	***	***	***	5	***	***	***	---	---	---	---
		Wards	765	0	***	***	773	2	***	***	181	0	***	***
St. Mary's Hospital	Grand Junction	Critical Care	4,742	2	0.4	Same	3,736	0	0	Better	3,136	2	0.6	Same
		Neonatal Critical Care	455	1	***	***	486	1	***	***	603	1	***	***
		Wards	3,510	1	0.3	Same	3,423	5	1.7	Same	2,694	0	0	Same
St. Thomas More Hospital	Canon City	Critical Care	71	1	***	***	152	0	***	***	172	0	***	***
		Wards	636	0	***	***	416	2	***	***	363	0	***	***
Sterling Regional Medical Center	Sterling	Critical Care	93	0	***	***	81	0	***	***	59	0	***	***
		Wards	190	0	***	***	149	0	***	***	81	0	***	***
Swedish Medical Center	Englewood	Critical Care	5,104	11	1.5	Same	4,107	3	0.5	Same	4,491	0	0	Better
		Neonatal Critical Care	151	0	***	***	109	0	***	***	120	1	***	***
		Wards	3,604	0	0	Better	4,128	4	1	Same	3,494	2	0.6	Same
The Medical Center of Aurora	Aurora	Critical Care	4,127	1	0.2	Same	4,293	2	0.5	Same	4,449	3	0.6	Same
		Neonatal Critical Care	29	***	***	***	33	***	***	***	49	***	***	***
		Wards	5,692	2	0.4	Same	5,886	0	0	Better	6,566	3	0.5	Same
UCHealth Broomfield Hospital	Broomfield	Wards	0	***	***	***	10	***	***	***	20	0	***	***
UCHealth Grandview Hospital	Colorado Springs	Critical Care	---	---	---	---	0	***	***	***	0	***	***	***
		Wards	---	---	---	---	---	---	---	---	10	***	***	***

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
UCHealth Yampa Valley Medical Center	Steamboat Springs	Critical Care	42	***	***	***	35	***	***	***	50	0	***	***
		Neonatal Critical Care	11	***	***	***	7	***	***	***	0	***	***	***
		Wards	232	0	***	***	209	0	***	***	80	0	***	***
University of Colorado Hospital	Aurora	Critical Care	16,904	20	1.0	Same	19,149	15	0.7	Same	19,484	13	0.6	Better
		Neonatal Critical Care	1,736	1	0.4	Same	1,588	0	0	Same	1,360	2	0.9	Same
		Wards	10,784	8	0.8	Same	13,236	3	0.2	Better	15,934	5	0.3	Better
Vail Valley Medical Center	Vail	Critical Care	95	0	***	***	104	0	***	***	78	0	***	***
		Wards	359	0	***	***	366	0	***	***	331	0	***	***
Valley View Hospital	Glenwood Springs	Critical Care	282	0	***	***	284	0	***	***	341	0	***	***
		Wards	496	0	***	***	569	0	***	***	627	0	***	***

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility/unit combination had fewer than 50 central line days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Critical care are all adult and pediatric intensive care units.

Neonatal critical care units includes all levels II/III combined, III, and IV intensive care units for neonates.

Wards includes all adult and pediatric medical, surgical, and medical-surgical wards.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Central line-associated infections in critical access hospitals

National comparisons cannot be made for central line-associated bloodstream infections in Colorado critical care units in critical access hospitals for 2016-2018.

### Overview

Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. A detailed explanation of Centers for Medicare and Medicaid Services (CMS) and Colorado guidelines for facility classification, including critical access hospitals, are in Appendix C. Critical access hospitals are required to report CLABSIs that occur in critical care units (CCUs).

### Results

**Table 15** shows facility-specific data for CLABSIs attributed to CCUs in critical access hospitals during the 2016, 2017, and 2018 calendar years.

Five critical care units in five Colorado critical access hospitals reported 188 central line days in 2018. In the last three years, there have been no infections reported in critical access hospitals. Statewide comparisons to national baseline cannot be made due to data suppression (**Table 6**). Data is suppressed because either the predicted number of infections is less than one or there are less than 50 central line days reported.

**Table 15: Central Line-Associated Bloodstream Infections in Critical Care Units in Critical Access Hospitals – Colorado, Jan. 1, 2016-Dec. 31, 2018**

Facility Name, City, Unit Type			2016				2017				2018			
			No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	MICU/SICU	58	***	***	***	68	0	***	***	65	0	***	***
Aspen Valley Hospital	Aspen	MICU/SICU	18	***	***	***	13	***	***	***	15	***	***	***
Heart of the Rockies Regional Medical Center	Salida	MICU/SICU	22	***	***	***	79	0	***	***	55	0	***	***
Southwest Memorial Hospital	Cortez	MICU/SICU	54	0	***	***	30	***	***	***	53	0	***	***
The Memorial Hospital at Craig	Craig	MICU/SICU	0	***	***	***	---	---	---	---	---	---	---	---

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Abbreviations: MICU/SICU=medical/surgical critical care.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility/unit combination had fewer than 50 central line days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment

# Central line-associated infections in inpatient rehabilitation facilities and inpatient rehabilitation wards in acute care hospitals

Statewide in 2018, central line-associated bloodstream infections in inpatient rehabilitation facilities and inpatient rehabilitation wards in acute care hospitals were the same as the national baseline.

## Overview

Inpatient rehabilitation facilities and inpatient rehabilitation wards in hospitals care for patients who have lost function due to acute or chronic pain, musculoskeletal problems, stroke, brain or spinal cord dysfunction, catastrophic events resulting in complete or partial paralysis or need rehabilitation for other reasons. The goal for these areas is to evaluate, treat and restore optimal functioning of the patients physically and mentally.

Inpatient rehabilitation facilities and inpatient rehabilitation wards within acute care hospitals report infection data for patients with either permanent or temporary central lines. Permanent lines are those that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled, and their infection rates can be higher than permanent lines.

## Results

**Table 16** shows facility specific data for CLABSIs in inpatient rehabilitation facilities and inpatient rehabilitation wards in hospitals during the 2016, 2017, and 2018 calendar years.

Fourteen inpatient rehabilitation wards within acute care hospitals reported 4,694 central line days and no facilities reported a CLABSI when excluding data suppression. No national comparisons could be calculated for any of the inpatient rehabilitation wards within acute care hospitals due to the predicted number of infections being less than one or less than 50 central line days reported. The statewide CLABSI infection count was the same as the national baseline in 2018 for inpatient rehabilitation wards within acute care hospitals (**Table 6**).

Six inpatient rehabilitation facilities reported 3,662 central line days in 2018 and no facilities reported a CLABSI when excluding data suppression. No national comparisons could be calculated for any of the inpatient rehabilitation facilities due to the predicted number of infections being less than one or less than 50 central line days reported. The statewide CLABSI infection count was the same as the national baseline in 2018 for inpatient rehabilitation facilities (**Table 6**).

**Table 16: Central Line-Associated Bloodstream Infections in Rehabilitation Wards within Acute Care Hospitals and Inpatient Rehabilitation Facilities  
Colorado, Jan. 1, 2016-De. 31, 2018**

Facility Name, City		2016				2017				2018			
		No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
<b>Rehabilitation Wards within Acute Care Hospitals</b>													
Boulder Community Hospital	Boulder	336	0	***	***	223	0	***	***	178	0	***	***
Denver Health Medical Center	Denver	110	0	***	***	217	0	***	***	201	0	***	***
Littleton Adventist Hospital	Littleton	369	0	***	***	302	0	***	***	286	0	***	***
Medical Center of the Rockies	Loveland	533	0	***	***	418	0	***	***	156	0	***	***
Memorial Health System	Colorado Springs	494	0	***	***	494	0	***	***	286	0	***	***
Montrose Memorial Hospital	Montrose	121	0	***	***	129	0	***	***	36	***	***	***
Parkview Medical Center	Pueblo	79	0	***	***	102	0	***	***	116	0	***	***
Penrose St. Francis Health Services	Colorado Springs	628	0	***	***	373	0	***	***	---	---	---	---
Porter Adventist Hospital	Denver	402	0	***	***	425	3	***	***	396	0	***	***
Poudre Valley Health System	Fort Collins	---	---	---	---	---	---	---	---	239	0	***	***
St. Anthony Hospital	Lakewood	490	0	***	***	400	0	***	***	468	0	***	***
St. Francis Medical Center	Colorado Springs	---	---	---	---	---	---	---	---	347	0	***	***
St. Mary Corwin Medical Center	Pueblo	153	0	***	***	---	---	---	---	---	---	---	---
St. Mary's Hospital	Grand Junction	193	0	***	***	538	0	***	***	476	0	***	***
Swedish Medical Center	Englewood	411	0	***	***	295	0	***	***	473	0	***	***
University of Colorado Hospital	Aurora	904	1	***	***	917	0	***	***	1,036	0	***	***
<b>Inpatient Rehabilitation Facilities</b>													
Encompass Health Rehabilitation Hospital of Colorado Springs	Colorado Springs	637	0	***	***	679	0	***	***	540	0	***	***
Encompass Health Rehabilitation Hospital of Littleton	Littleton	386	0	***	***	555	0	***	***	687	0	***	***
Northern Colorado Rehabilitation Hospital	Johnstown	1,270	0	***	***	981	0	***	***	678	0	***	***

Facility Name, City		2016				2017				2018			
		No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Spalding Rehabilitation Hospital	Aurora	631	0	***	***	699	0	***	***	678	0	***	***
Spalding Rehabilitation Hospital at Presbyterian-St. Luke's	Denver	986	0	***	***	1,036	0	***	***	979	0	***	***
Vibra Rehabilitation Hospital of Denver^	Thornton	---	---	---	---	---	---	---	---	100	0	***	***

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

^Facility opened mid-year.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 central line days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Central line-associated infections in long-term acute care hospitals

The number of central line-associated bloodstream infections in Colorado among long-term acute care hospitals was 30percent lower (statistically better) than the national baseline in 2018.

### Overview

A long-term acute care hospital is a specialty care hospital that cares for patients with complex medical conditions requiring intense, specialized treatment for at least 25 days. These patients often transfer from critical care units in acute care and critical access hospitals. Patients in these facilities have a higher severity of illness often with multi-system complications posing a challenge for infection control.

Long-term acute care hospitals report infection data for patients with either permanent or temporary central lines. As previously noted, permanent lines are those that are tunneled and can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled. Permanent lines are commonly used in long-term acute care hospital patients and historically have had lower rates of infection than temporary lines.

### Results

**Table 17** shows facility specific data for CLABSIs in long-term acute care hospitals during the 2016, 2017, and 2018 calendar years.

Seven long-term acute care hospitals reported 24,280 central line days in 2018. One long-term acute care hospital had CLABSI counts better than the national baseline in 2018. For all three reporting years (2016-2018), statewide count of CLABSIs in long-term acute care hospitals was better than the national baseline (**Table 6**).



**Table 17: Central Line-Associated Bloodstream Infections in Long-Term Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison	No. of Central Line Days	No. of Infections	SIR	National Comparison
Colorado Acute Long Term Hospital	Denver	7,894	6	0.6	Same	7,467	2	0.2	Better	7,854	4	0.4	Better
Craig Hospital	Englewood	2,224	0	0	Same	1,621	1	***	***	1,520	1	***	***
Kindred Hospital Denver South	Denver	1,595	1	0.7	Same	2,032	1	0.5	Same	1,735	0	0	Same
Kindred Hospital Aurora	Aurora	2,346	1	0.4	Same	2,526	3	1.1	Same	2,307	3	1.1	Same
Kindred Hospital Denver	Denver	5,509	4	0.5	Same	5,678	3	0.4	Same	4,378	2	0.3	Same
Northern Colorado Long Term Acute Hospital	Johnstown	4,614	3	0.8	Same	3,966	4	1.2	Same	2,937	1	0.5	Same
Vibra Hospital of Denver	Thornton	4,096	1	0.2	Better	4,064	3	0.4	Same	3,549	4	0.6	Same

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 central line days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment

# *Clostridioides difficile* infections

## Overview

*Clostridioides difficile* (*C.difficile*) is found in both health care and community settings; prevention is a priority for public health. *C. difficile* is a spore-forming bacterium that can cause symptoms ranging from bloating, diarrhea, fever, and abdominal pain to life-threatening colon inflammation, sepsis and death. Risk factors for *C. difficile* infections include antibiotic exposure, proton pump inhibitors, gastrointestinal surgery/manipulation, advanced age, long length of stay in health care settings, immunocompromising conditions, and serious underlying diseases.<sup>13</sup> *C. difficile* also may be acquired outside of hospitals in the community, and exposures to other types of health care are also risk factors.<sup>14</sup> Although 94% of *C. difficile* infections are related to health care exposures, 75% of health care-associated *C. difficile* infections first show signs outside of hospitals.<sup>15</sup>

Based on the high incidence and potential severity of *C. difficile* infections, in 2015, Colorado’s HAI Advisory Committee recommended the addition of *C. difficile* to Colorado reporting requirements for acute care hospitals (critical access hospitals and stand-alone children’s hospitals are exempt) for data collected since 2013, and long-term acute care hospitals and inpatient rehabilitation facilities for data collected since 2015. Hospital-reported *C. difficile* data are classified as hospital-onset, community-onset, and community-onset healthcare facility-associated. Hospital-onset cases are laboratory-positive specimens collected more than three days after admission to the facility (i.e., on or after day four). Community-onset includes laboratory-identified specimens collected in an outpatient location or an inpatient location on days one, two or three after admission to the hospital. Community-onset healthcare facility-associated cases include specimens collected from patients discharged from the facility four or fewer weeks prior to the current date of stool specimen collection. Data from outpatient locations are not included in this definition. Only laboratory-identified hospital-onset cases are presented in this report. Each table below lists the facility’s name, city, number of patient days, number of *Clostridium difficile* infections, and the standardized infection ratio (SIR) per year. A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better).
- Statistically similar infections as the national baseline (same).
- Statistically higher infections than the national baseline (worse).

## Limitations

CDPHE does not perform data validation studies on every infection nor every condition reported yearly. Validation of *C. difficile* data was conducted in 2018 in long-term acute care hospitals and inpatient rehabilitation facilities. Additional information on previous validations of *C. difficile* data in health care facilities may be requested. For additional limitations, please see “Data format and cautions” section on page 9.

## *Clostridioides difficile* infections in acute care hospitals

Statewide since 2017, *Clostridioides difficile* in acute care hospitals has remained better than the national baseline.

### Overview

Acute care hospitals report community-onset, hospital-onset, and community-onset healthcare facility-associated *C. difficile* data for the emergency department, 24-hour observation units, and facility-wide inpatients. Critical access hospitals and stand-alone pediatric hospitals are exempt from reporting.

### Results

**Table 18** presents laboratory-identified *C. difficile* cases reported by acute care hospitals during the 2016, 2017, and 2018 calendar years.

Fifty acute care hospitals reported *C. difficile* cases in 2018; eight acute care hospitals had *C. difficile* case counts lower (statistically better) than the national baseline. One acute care hospital had a higher than expected number of *C. difficile* cases compared to the national baseline. In 2018, statewide *C. difficile* case counts in acute care hospitals were 10percent lower than the national baseline (**Table 7**).

**Table 18: *Clostridioides difficile* in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	0	***	***	***	0	***	***	***	1,768	0	***	***
Avista Adventist Hospital	Louisville	10,172	3	0.6	Same	11,654	1	0.1	Better	11,925	2	0.3	Same
Banner Fort Collins Medical Center	Fort Collins	2,791	0	0	Same	3,324	0	***	***	4,077	0	***	***
Boulder Community Hospital	Boulder	6,154	0	0	Same	6,054	0	0	Same	---	---	---	---
Boulder Community Hospital, Foothills	Boulder	27,819	19	1.1	Same	27,659	20	1.0	Same	26,907	20	1.1	Same
Castle Rock Adventist Hospital	Castle Rock	9,441	4	0.8	Same	8,801	2	0.4	Same	11,138	5	0.8	Same
Colorado Plains Medical Center	Fort Morgan	3,012	1	0.5	Same	2,833	0	0	Same	2,611	1	0.5	Same
Community Hospital	Grand Junction	9,158	10	1.6	Same	8,401	7	1.2	Same	7,396	4	0.7	Same
Delta County Memorial Hospital	Delta	1,089	2	***	***	4,850	2	0.7	Same	4,835	3	1.0	Same
Denver Health Medical Center	Denver	95,481	90	1.2	Same	98,519	64	0.8	Same	102,669	75	0.8	Same
Exempla Good Samaritan Medical Center	Lafayette	51,791	36	1.0	Same	48,632	21	0.7	Same	48,998	19	0.6	Better
Exempla St. Joseph Hospital	Denver	80,710	74	1.1	Same	80,276	48	0.6	Better	79,031	35	0.6	Better
Littleton Adventist Hospital	Littleton	35,284	27	1.0	Same	35,003	23	1.0	Same	38,759	25	0.9	Same
Longmont United Hospital	Longmont	23,536	12	0.7	Same	21,941	8	0.6	Same	17,730	9	0.8	Same
Longs Peak Hospital	Longmont	---	---	---	---	2,197	3	2.2	Same	10,009	7	0.9	Same
Lutheran Medical Center	Wheat Ridge	46,532	45	1.3	Same	47,445	19	0.5	Better	45,817	22	0.7	Same
McKee Medical Center	Loveland	13,064	3	0.4	Same	12,774	0	0	Better	12,758	4	1.0	Same
Medical Center of the Rockies	Loveland	40,984	50	1.4	Worse	43,620	40	1.2	Same	46,525	34	0.9	Same
Memorial Health System	Colorado Springs	69,144	56	0.8	Same	77,185	47	0.7	Better	83,638	42	0.7	Better
Memorial Hospital North	Colorado Springs	15,248	6	0.6	Same	15,980	3	0.3	Better	15,686	6	0.7	Same
Mercy Regional Medical Center	Durango	13,690	10	1.1	Same	15,260	12	1.3	Same	15,013	11	1.2	Same
Montrose Memorial Hospital	Montrose	7,896	3	0.6	Same	7,455	10	1.6	Same	6,913	3	0.4	Same
National Jewish Health	Denver	88	0	***	***	71	0	***	***	196	0	***	***
North Colorado Medical Center	Greeley	49,297	23	0.7	Same	53,434	11	0.4	Better	65,248	11	0.4	Better

Facility Name and City		2016				2017				2018			
		No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
North Suburban Medical Center	Thornton	27,236	27	1.2	Same	26,398	7	0.5	Better	26,827	12	0.7	Same
Ortho Colorado	Lakewood	5,330	0	***	***	5,928	1	***	***	5,404	0	***	***
Parker Adventist Hospital	Parker	28,410	22	1.3	Same	26,517	32	1.7	Worse	28,405	18	1.0	Same
Parkview Medical Center	Pueblo	72,678	59	1.0	Same	66,801	48	1.0	Same	68,304	49	1.1	Same
Penrose St. Francis Health Services	Colorado Springs	50,906	45	1.5	Worse	52,963	35	1.0	Same	53,295	37	1.0	Same
Platte Valley Medical Center	Brighton	10,023	3	0.8	Same	11,081	3	0.6	Same	11,355	5	1.3	Same
Porter Adventist Hospital	Denver	33,553	23	0.9	Same	35,522	26	1.2	Same	31,933	25	1.2	Same
Poudre Valley Health System	Fort Collins	48,970	31	0.8	Same	50,766	39	1.1	Same	52,525	26	0.7	Better
Presbyterian St. Luke's Medical Center	Denver	58,233	70	1.7	Worse	57,907	64	1.5	Worse	58,869	49	1.3	Same
Rose Medical Center	Denver	35,457	26	1.1	Same	36,857	21	0.8	Same	37,716	3	0.2	Better
Sky Ridge Medical Center	Lone Tree	50,551	41	1.0	Same	53,323	32	0.7	Better	51,990	34	0.9	Same
St. Anthony Hospital	Lakewood	59,885	49	1.1	Same	53,989	57	1.6	Worse	56,070	45	1.1	Same
St. Anthony North Health Campus	Westminster	20,996	14	0.8	Same	18,676	14	0.9	Same	19,021	18	1.3	Same
St. Anthony Summit Medical Center	Frisco	3,141	0	0	Same	3,430	0	***	***	3,792	0	***	***
St. Francis Medical Center	Colorado Springs	27,393	7	0.5	Better	29,811	8	0.4	Better	23,635	8	0.5	Same
St. Mary Corwin Medical Center	Pueblo	23,641	14	1.0	Same	25,725	17	1.0	Same	12,647	10	1.9	Same
St. Mary's Hospital	Grand Junction	60,456	66	1.5	Worse	53,527	24	0.6	Better	64,134	27	0.6	Better
St. Thomas More Hospital	Canon City	5,741	2	1.6	Same	5,221	1	0.6	Same	5,438	1	0.7	Same
Sterling Regional Medical Center	Sterling	3,972	4	2.8	Same	4,046	2	2	Same	4,061	0	***	***
Swedish Medical Center	Englewood	89,995	84	1.1	Same	92,433	74	1.0	Same	89,134	50	0.8	Better
The Medical Center of Aurora	Aurora	57,793	43	0.7	Better	60,656	50	0.9	Same	57,706	39	0.8	Same
UCHealth Broomfield Hospital	Broomfield	221	0	***	***	350	0	***	***	1,267	0	***	***
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	554	0	***	***	1,108	0	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	4,679	6	1.7	Same	4,177	2	1.0	Same	3,345	0	0	Same
University of Colorado Hospital	Aurora	162,469	188	1.0	Same	173,893	256	1.3	Worse	180,563	233	1.2	Worse

Facility Name and City		2016				2017				2018			
		No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
Vail Valley Medical Center	Vail	6,245	4	1.8	Same	7,643	3	1.3	Same	6,826	3	1.2	Same
Valley View Hospital	Glenwood Springs	12,077	10	1.2	Same	11,475	5	0.5	Same	12,113	5	0.5	Same

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 patient days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## ***Clostridioides difficile* infections in inpatient rehabilitation facilities**

Statewide in 2018 the *Clostridioides difficile* count in inpatient rehabilitation facilities is better than the national baseline, an improvement from 2016 and 2017.

### **Overview**

Inpatient rehabilitation facilities report community-onset, hospital-onset, and community-onset healthcare facility-associated *C. difficile* data for all facility wide inpatients.

### **Results**

**Table 19** presents laboratory-identified *C. difficile* cases reported by inpatient rehabilitation facilities during the 2016, 2017, and 2018 calendar years.

Six inpatient rehabilitation facilities submitted *C. difficile* data into NHSN in 2018 for 106,306 patient-days. One inpatient rehabilitation facility had *C. difficile* counts better than the national baseline and the remaining for were the same, an improvement from last year. The statewide *C. difficile* count is better than the national baseline in 2018, an improvement from 2016 and 2017 (**Table 7**).

**Table 18: *Clostridioides difficile* in Inpatient Rehabilitation Facilities– Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
Encompass Health Rehabilitation Hospital of Colorado Springs	Colorado Springs	14,969	0	0	Better	12,989	2	0.6	Same	12,620	3	0.7	Same
Encompass Health Rehabilitation Hospital of Littleton	Littleton	10,550	5	1.5	Same	10,334	8	2.3	Worse	11,272	1	0.2	Same
Northern Colorado Rehabilitation Hospital	Johnstown	12,633	2	0.4	Same	12,404	1	0.3	Same	12,896	0	0	Better
Spalding Rehabilitation Hospital	Aurora	10,031	3	0.7	Same	10,518	2	0.4	Same	9,689	2	0.5	Same
Spalding Rehabilitation Hospital at Presbyterian-St. Luke's Medical Center	Denver	3,945	3	1.8	Same	4,002	1	0.5	Same	4,569	2	1.1	Same
Vibra Rehabilitation Hospital of Denver^	Thornton	---	---	---	---	---	---	---	---	2,107	0	***	***

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 patient days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

^ Facility opened mid-year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.



## *Clostridioides difficile* infections in long-term acute care hospitals

Statewide in 2018, *C. difficile* in long-term acute care hospitals was 30percent lower (statistically better) than the national baseline, an improvement from 2017.

### Overview

Long-term acute care hospitals report community-onset, hospital-onset, and community-onset healthcare facility-associated *C. difficile* data for all facility wide inpatients.

### Results

Table 20 presents laboratory-identified *C. difficile* cases reported by long-term acute care hospitals during the 2016, 2017, and 2018 calendar years.

Seven long-term acute care hospitals submitted *C. difficile* data into NHSN in 2018 for 79,994 patient-days. Three long-term acute care hospitals had *C. difficile* counts better than the national baseline; all other long-term acute care hospitals were the same. In 2018, statewide *C. difficile* count was 30percent lower (statistically better) than the national baseline (Table 7).

**Table 20: *Clostridioides difficile* in Long-Term Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison	No. of Patient Days	No. of Infections	SIR	National Comparison
Colorado Acute Long Term Hospital	Denver	13,205	7	0.7	Same	13,406	11	1.2	Same	13,877	4	0.4	Better
Craig Hospital	Englewood	29,114	19	0.6	Better	29,061	13	0.5	Better	28,493	13	0.6	Better
Kindred Hospital - Denver South <sup>1</sup>	Denver	4,702	8	1.7	Same	6,430	10	1.7	Same	5,501	4	0.8	Same
Kindred Hospital - Aurora	Aurora	6,189	3	0.5	Same	7,482	4	0.5	Same	8,697	9	0.9	Same
Kindred Hospital - Denver	Denver	12,424	10	0.7	Same	12,018	26	1.9	Worse	9,588	20	1.5	Same
Northern Colorado Long Term Acute Hospital	Johnstown	6,114	9	1.7	Same	5,671	2	0.4	Same	5,900	3	0.8	Same
Vibra Hospital of Denver	Thornton	9,703	7	0.7	Same	8,786	6	0.8	Same	7,938	3	0.3	Better

<sup>1</sup>This facility closed at the end of 2018.

The standardized infection ratio (SIR) is the ratio of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 patient days in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

# Dialysis-related infections

Statewide in 2018 the rate of access-related bloodstream infections among dialysis facilities was better than the national rate. The statewide rates of local access infections among dialysis facilities have been worse than the national rate for three consecutive years (2016-2018).

## Overview

According to the National Institute of Diabetes and Digestive and Kidney Diseases, approximately 14 percent of the general population has chronic kidney disease in the United States since 2004. According to a 2015 report, 468,000 patients in the United States receive chronic dialysis treatment.<sup>12</sup>

Surveillance for dialysis-related infections in Colorado occurs within outpatient dialysis facilities only and excludes peritoneal and home dialysis. The outpatient dialysis facilities monitored may be dedicated stand-alone facilities, hospital-based, or affiliated units. The reporting of dialysis-related infections began in March 2010.

Dialysis facilities in Colorado monitor patients for three specific events that must be reported: 1) an outpatient start of an intravenous antibiotic, 2) a positive blood culture, or 3) pus, redness or increased swelling at the vascular access site. Data from these events are used to classify two types of dialysis-related infections: access-related bloodstream infections (ARBs) and local access infections (LAIs). An ARB, which poses more serious health implications and requires higher levels of care, is determined by the presence of a microorganism identified in a blood culture and identification of the source of infection as the vascular access site or is uncertain. An LAI is defined as the presence of pus, redness or swelling of the vascular access site without the presence of an ARB.

Each table below lists the dialysis facility's name, city, number of dialysis patients who were dialyzed on the first two working days of a month (patient-months), numbers and rates of ARBs and LAIs, and comparisons to the national rate. The infection rate used is the number of infections per 100 patient-months. It is important to note that this rate is not risk-adjusted. The three categories that indicate how a Colorado dialysis center's infection rates compare to national infection rates are:

- If the p-value is less than 0.05 and the percentile is low, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as "better";
- If the p-value is greater than or equal to 0.05, the difference between the facility's rate and the NHSN aggregate rate is not statistically significant, and the facility's infection rate is designated as "same";
- If the p-value is less than 0.05 and the percentile is high, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as "worse."

## Results

Tables 21 and 22 show the numbers and rates of ARBs and LAIs, respectively, for each outpatient dialysis facility in Colorado during the 2016, 2017, and 2018 calendar years.

Seventy-nine dialysis facilities submitted dialysis infection data into NHSN in 2018. Statewide in 2018 the ARB rate was better than the national rate (Table 8). In 2018 for ARBs, two facilities had rates worse than the national rate, one had a rate better than the

national rate, and all others were the same as the national rate (**Table 21**). For LAIs in 2018, three centers presented infection rates better than the national rate whereas twelve facilities had rates worse than the national rate (**Table 22**). The statewide LAI rates were worse than the national rate for all three reporting years (**Table 8**).

## Limitations

Infection rates are influenced by types of patients treated. There are patient risk factors that cannot be measured (e.g., severe suppression of the immune system) that contribute to infection risk. Unlike standardized infection ratios (SIRs) presented elsewhere in this report, rates in Tables 21 and 22 are not risk-adjusted. Caution should be applied when interpreting a comparison of rates. See Appendix C for a detailed discussion of SIRs and rates, as well as the section “Data format and cautions” on page 11. These findings, similar to all other findings in this report, should be considered in conjunction with clinicians, healthcare facilities, health insurance carriers, family, friends, and reputable health care websites prior to drawing conclusions regarding healthcare quality. Dialysis infections were validated in 2018; results are pending. Information on validations of dialysis infections in health care facilities may be requested.

**Table 21: Access-Related Bloodstream Infections in Outpatient Dialysis Facilities – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
American Renal Kidney Center of Arvada	Arvada	1,047	0	0	Better	1,090	7	0.6	Same	955	1	0.1	Same
Boulder Dialysis Center	Boulder	253	1	0.4	Same	282	2	0.7	Same	293	0	0	Same
Brighton Dialysis	Brighton	676	0	0	Same	696	9	1.3	Worse	603	1	0.4	Same
Children's Hospital Colorado Kidney Center	Aurora	73	3	4.1	Worse	88	2	2.3	Same	117	2	1.7	Same
Cortez Dialysis Center	Cortez	658	1	0.2	Same	629	4	0.6	Same	673	0	0	Same
DSI (U.S. Renal Care) - Pueblo	Pueblo	620	0	0	Same	659	4	0.6	Same	715	1	0.1	Same
DaVita, Alamosa	Alamosa	591	3	0.5	Same	629	3	0.5	Same	667	1	0.1	Same
DaVita, Arvada	Arvada	234	0	0	Same	284	0	0	Same	286	2	0.7	Same
DaVita, Aurora	Aurora	1,545	11	0.7	Same	1,580	9	0.6	Same	1,419	10	0.7	Same
DaVita, Belcaro	Denver	591	7	1.2	Worse	581	4	0.7	Same	542	3	0.6	Same
DaVita, Black Canyon	Montrose	322	0	0	Same	327	1	0.3	Same	330	1	0.3	Same
DaVita, Commerce City	Commerce City	515	1	0.2	Same	598	6	1.0	Worse	663	3	0.5	Same
DaVita, Denver	Denver	695	4	0.6	Same	729	3	0.4	Same	713	6	0.8	Same
DaVita, Durango	Denver	380	3	0.8	Same	364	0	0	Same	382	1	0.3	Same
DaVita, East Aurora	Aurora	1,097	11	1.0	Worse	1,191	5	0.4	Same	1,119	7	0.6	Same
DaVita, Englewood	Englewood	444	4	0.9	Same	453	0	0	Same	367	1	0.3	Same
DaVita, Greeley	Greeley	328	1	0.3	Same	423	3	0.7	Same	415	2	0.5	Same
DaVita, Lakewood	Lakewood	974	3	0.3	Same	948	4	0.4	Same	905	4	0.4	Same
DaVita, Lakewood Crossing	Lakewood	1,008	5	0.5	Same	841	0	0	Better	730	2	0.3	Same
DaVita, Littleton	Littleton	657	4	0.6	Same	684	4	0.6	Same	719	2	0.3	Same
DaVita, Lone Tree	Englewood	325	2	0.6	Same	298	2	0.7	Same	323	3	0.9	Same
DaVita, Longmont	Longmont	216	0	0	Same	200	5	2.5	Worse	190	1	0.5	Same
DaVita, Loveland Central	Loveland	256	1	0.4	Same	254	4	1.6	Worse	253	0	0	Same
DaVita, Lowry	Denver	1,034	5	0.5	Same	1,008	3	0.3	Same	1,042	2	0.2	Same
DaVita, Montbello	Denver	---	---	---	---	---	---	---	---	232	2	0.9	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
DaVita, North Colorado Springs	Colorado Springs	367	4	1.1	Same	394	2	0.5	Same	468	0	0	Same
DaVita, North Metro	Westminster	583	4	0.7	Same	625	0	0	Same	618	4	0.6	Same
DaVita, Northeastern Colorado	Sterling	422	0	0	Same	448	4	0.9	Same	522	0	0	Same
DaVita, Parker	Parker	589	1	0.2	Same	597	5	0.8	Same	630	4	0.6	Same
DaVita, Pikes Peak	Colorado Springs	1,070	9	0.8	Worse	1,084	5	0.5	Same	973	3	0.3	Same
DaVita, Printers Place	Colorado Springs	489	6	1.2	Worse	572	9	1.6	Worse	545	1	0.2	Same
DaVita, Red Hawk	Castle Rock	259	0	0	Same	253	1	0.4	Same	204	0	0	Same
DaVita, Sable	Aurora	1,082	5	0.5	Same	1,170	9	0.8	Same	1,214	4	0.3	Same
DaVita, South Denver	Denver	440	6	1.4	Worse	455	4	0.9	Same	575	2	0.3	Same
DaVita, Southwest Denver	Littleton	380	1	0.3	Same	381	3	0.8	Same	383	3	0.8	Same
DaVita, Thornton	Thornton	826	2	0.2	Same	637	5	0.8	Same	853	3	0.4	Same
DaVita, West Lakewood	Lakewood	308	4	1.3	Worse	403	4	1	Same	500	7	1.4	Worse
DaVita, Westminster	Westminster	338	2	0.6	Same	444	3	0.7	Same	272	0	0	Same
Denver Reception and Reception Center	Denver	237	0	0	Same	234	0	0	Same	171	0	0	Same
Dialysis Clinic Inc., Grand Junction	Grand Junction	348	0	0	Same	360	1	0.3	Same	385	0	0	Same
Dialysis Clinic Inc., Montrose	Montrose	382	0	0	Same	384	1	0.3	Same	389	2	0.5	Same
Fort Collins Dialysis	Fort Collins	4	***	***	***	24	***	***	***	78	0	0	Same
Fresenius Medical Care, Canon City	Canon City	400	2	0.5	Same	379	0	0	Same	392	0	0	Same
Fresenius Medical Care, Denver Central	Denver	588	2	0.3	Same	498	2	0.4	Same	163	0	0	Same
Fresenius Medical Care, East Denver	Aurora	1,190	6	0.5	Same	1,253	13	1.0	Worse	1,287	9	0.7	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
Fresenius Medical Care, Fort Collins	Fort Collins	886	2	0.2	Same	966	3	0.3	Same	917	2	0.2	Same
Fresenius Medical Care, Greeley	Greeley	1,010	3	0.3	Same	1,010	3	0.3	Same	1,015	1	0.1	Same
Fresenius Medical Care, La Junta	La Junta	437	2	0.5	Same	471	0	0	Same	450	0	0	Same
Fresenius Medical Care, Lamar	Lamar	268	1	0.4	Same	297	0	0	Same	286	0	0	Same
Fresenius Medical Care, Loveland	Loveland	473	2	0.4	Same	485	3	0.6	Same	565	0	0	Same
Fresenius Medical Care, North Greeley	Greeley	511	2	0.4	Same	511	0	0	Same	545	0	0	Same
Fresenius Medical Care, Pavilion	Denver	929	3	0.3	Same	1,049	6	0.6	Same	1,077	2	0.2	Same
Fresenius Medical Care, Pueblo	Pueblo	693	2	0.3	Same	642	2	0.3	Same	707	2	0.3	Same
Fresenius Medical Care, Pueblo South	Pueblo	991	3	0.3	Same	1,032	6	0.6	Same	1,015	1	0.1	Same
Fresenius Medical Care, Pueblo West	Pueblo	294	0	0	Same	329	1	0.3	Same	302	0	0	Same
Fresenius Medical Care, Rocky Mountain	Denver	828	3	0.4	Same	792	3	0.4	Same	971	3	0.3	Same
Fresenius Medical Care, South Denver	Denver	244	1	0.4	Same	346	4	1.2	Same	399	1	0.3	Same
Fresenius Medical Care, Stapleton	Denver	636	3	0.5	Same	630	1	0.2	Same	630	2	0.3	Same
Fresenius Medical Care, Walsenburg	Walsenburg	212	2	0.9	Same	222	1	0.5	Same	258	0	0	Same
Fresenius Medical Care, West Hampden	Englewood	170	0	0	Same	232	0	0	Same	461	2	0.4	Same
Grand Junction Dialysis Center	Grand Junction	651	5	0.8	Same	752	4	0.5	Same	878	4	0.5	Same
Heart of the Rockies Regional Dialysis Center	Salida	---	---	---	---	130	0	0	Same	154	0	0	Same
Kidney Center of Bear Creek	Lakewood	440	3	0.7	Same	572	3	0.5	Same	526	3	0.6	Same
Kidney Center of Frederick	Firestone	---	---	---	---	---	---	---	---	113	1	0.9	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
Kidney Center of Lafayette	Lafayette	692	3	0.4	Same	731	4	0.5	Same	717	1	0.1	Same
Kidney Center of Lakewood	Lakewood	806	5	0.6	Same	436	1	0.2	Same	761	3	0.4	Same
Kidney Center of Longmont	Longmont	891	8	0.9	Worse	824	3	0.4	Same	791	1	0.1	Same
Kidney Center of Northridge	Westminster	270	0	0	Same	350	2	0.6	Same	363	0	0	Same
Kidney Center of Westminster	Westminster	1,423	5	0.4	Same	1,429	5	0.3	Same	1,438	4	0.3	Same
Kidney Center of Wheat Ridge	Wheat Ridge	338	0	0	Same	531	4	0.8	Same	358	2	0.6	Same
Kidney Center of the Rockies	Avon	---	---	---	---	9	***	***	***	80	2	2.5	Worse
Kidney Center on Main	Longmont	321	1	0.3	Same	318	1	0.3	Same	311	2	0.6	Same
Liberty Dialysis, Colorado Springs Central	Colorado Springs	1,112	4	0.4	Same	1,099	3	0.3	Same	1,152	1	0.1	Same
Liberty Dialysis, Colorado Springs North	Colorado Springs	827	1	0.1	Same	863	1	0.1	Same	955	1	0.1	Same
Liberty Dialysis, Colorado Springs South	Colorado Springs	1,000	7	0.7	Same	1,015	2	0.2	Same	1,022	0	0	Better
Mesa County Dialysis	Grand Junction	237	1	0.4	Same	266	1	0.4	Same	295	1	0.3	Same
Parker Kidney Center	Parker	375	1	0.3	Same	458	0	0	Same	567	0	0	Same
Platte Valley Dialysis	Brighton	---	---	---	---	6	***	***	***	148	0	0	Same
Thornton Kidney Center	Thornton	590	5	0.8	Same	623	5	0.8	Same	608	5	0.8	Same

Rates are per 100 patient-months. NOTE: These rates are not adjusted for risk.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Data include all access types.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 patient-months in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment



**Table 22: Local Vascular Access Infections in Outpatient Dialysis Facilities – Colorado, Jan. 1, 2016 - Dec. 31, 2018.**

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
American Renal Kidney Center of Arvada	Arvada	1,047	10	1.0	Worse	1,090	11	1.0	Worse	955	5	0.5	Same
Boulder Dialysis Center	Boulder	253	1	0.4	Same	282	6	2.1	Worse	293	5	1.7	Worse
Brighton Dialysis	Brighton	676	12	1.8	Worse	696	7	1.0	Same	603	7	1.2	Worse
Children's Hospital Colorado Kidney Center	Aurora	73	3	4.1	Worse	88	0	0	Same	117	4	3.4	Worse
Cortez Dialysis Center	Cortez	658	3	0.5	Same	629	6	1.0	Same	673	1	0.1	Same
DSI (U.S. Renal Care), Pueblo	Pueblo	620	5	0.8	Same	659	1	0.2	Same	715	0	0	Better
DaVita, Alamosa	Alamosa	591	5	0.8	Same	629	1	0.2	Same	667	2	0.3	Same
DaVita, Arvada	Arvada	234	1	0.4	Same	284	0	0	Same	286	3	1	Same
DaVita, Aurora	Aurora	1,545	17	1.1	Worse	1,580	14	0.9	Worse	1,419	10	0.7	Same
DaVita, Belcaro	Denver	591	3	0.5	Same	581	2	0.3	Same	542	8	1.5	Worse
DaVita, Black Canyon	Montrose	322	1	0.3	Same	327	2	0.6	Same	330	4	1.2	Same
DaVita, Commerce City	Commerce City	515	0	0	Same	598	1	0.2	Same	663	2	0.3	Same
DaVita, Denver	Denver	695	8	1.2	Worse	729	8	1.1	Worse	713	6	0.8	Same
DaVita, Durango	Denver	380	2	0.5	Same	364	1	0.3	Same	382	0	0	Same
DaVita, East Aurora	Aurora	1,097	17	1.5	Worse	1,191	8	0.7	Same	1,119	30	2.7	Worse
DaVita, Englewood	Englewood	444	0	0	Same	453	4	0.9	Same	367	3	0.8	Same
DaVita, Greeley	Greeley	328	5	1.5	Worse	423	3	0.7	Same	415	7	1.7	Worse
DaVita, Lakewood	Lakewood	974	6	0.6	Same	948	17	1.8	Worse	905	5	0.6	Same
DaVita, Lakewood Crossing	Lakewood	1,008	18	1.8	Worse	841	13	1.5	Worse	730	5	0.7	Same
DaVita, Littleton	Littleton	657	1	0.2	Same	684	3	0.4	Same	719	4	0.6	Same
DaVita, Lone Tree	Englewood	325	4	1.2	Same	298	1	0.3	Same	323	4	1.2	Same
DaVita, Longmont	Longmont	216	2	0.9	Same	200	1	0.5	Same	190	1	0.5	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
DaVita, Loveland Central	Loveland	256	1	0.4	Same	254	4	1.6	Worse	253	0	0	Same
DaVita, Lowry	Denver	1,034	4	0.4	Same	1,008	6	0.6	Same	1,042	7	0.7	Same
DaVita, Montbello	Denver	---	---	---	---	---	---	---	---	232	1	0.4	Same
DaVita, North Colorado Springs	Colorado Springs	367	3	0.8	Same	394	0	0	Same	468	4	0.9	Same
DaVita, North Metro	Westminster	583	4	0.7	Same	625	8	1.3	Worse	618	6	1.0	Same
DaVita, Northeastern Colorado	Sterling	422	8	1.9	Worse	448	5	1.1	Same	522	11	2.1	Worse
DaVita, Parker	Parker	589	10	1.7	Worse	597	4	0.7	Same	630	5	0.8	Same
DaVita, Pikes Peak	Colorado Springs	1,070	8	0.7	Same	1,084	4	0.4	Same	973	13	1.3	Worse
DaVita, Printers Place	Colorado Springs	489	3	0.6	Same	572	4	0.7	Same	545	1	0.2	Same
DaVita, Red Hawk	Castle Rock	259	4	1.5	Worse	253	7	2.8	Worse	204	0	0	Same
DaVita, Sable	Aurora	1,082	15	1.4	Worse	1,170	7	0.6	Same	1,214	6	0.5	Same
DaVita, South Denver	Denver	440	2	0.5	Same	455	4	0.9	Same	575	2	0.3	Same
DaVita, Southwest Denver	Littleton	380	3	0.8	Same	381	4	1.0	Same	383	2	0.5	Same
DaVita, Thornton	Thornton	826	8	1.0	Same	637	8	1.3	Worse	853	5	0.6	Same
DaVita, West Lakewood	Lakewood	308	7	2.3	Worse	403	6	1.5	Worse	500	7	1.4	Worse
DaVita, Westminster	Westminster	338	1	0.3	Same	444	2	0.5	Same	272	1	0.4	Same
Denver Reception and Reception Center	Denver	237	0	0	Same	234	0	0	Same	171	0	0	Same
Dialysis Clinic Inc., Grand Junction	Grand Junction	348	1	0.3	Same	360	4	1.1	Same	385	0	0	Same
Dialysis Clinic Inc., Montrose	Montrose	382	7	1.8		384	6	1.6		389	6	1.5	
Fort Collins Dialysis	Fort Collins	4	***	***	***	24	***	***	***	78	0	0	Same
Fresenius Medical Care, Canon City	Canon City	400	0	0	Same	379	1	0.3	Same	392	1	0.3	Same
Fresenius Medical Care, Denver Central	Denver	588	5	0.9	Same	498	1	0.2	Same	163	1	0.6	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
Fresenius Medical Care, East Denver	Aurora	1,190	6	0.5	Same	1,253	4	0.3	Same	1,287	14	1.1	Worse
Fresenius Medical Care, Fort Collins	Fort Collins	886	2	0.2	Same	966	13	1.3	Worse	917	8	0.9	Same
Fresenius Medical Care, Greeley	Greeley	1,010	0	0	Better	1,010	3	0.3	Same	1,015	1	0.1	Same
Fresenius Medical Care, La Junta	La Junta	437	0	0	Same	471	2	0.4	Same	450	0	0	Same
Fresenius Medical Care, Lamar	Lamar	268	0	0	Same	297	1	0.3	Same	286	1	0.3	Same
Fresenius Medical Care, Loveland	Loveland	473	0	0	Same	485	2	0.4	Same	565	1	0.2	Same
Fresenius Medical Care, North Greeley	Greeley	511	1	0.2	Same	511	1	0.2	Same	545	1	0.2	Same
Fresenius Medical Care, Pavilion	Denver	929	0	0	Better	1,049	5	0.5	Same	1,077	4	0.4	Same
Fresenius Medical Care, Pueblo	Pueblo	693	0	0	Better	642	1	0.2	Same	707	1	0.1	Same
Fresenius Medical Care, Pueblo South	Pueblo	991	4	0.4	Same	1,032	6	0.6	Same	1,015	2	0.2	Same
Fresenius Medical Care, Pueblo West	Pueblo	294	1	0.3	Same	329	1	0.3	Same	302	0	0	Same
Fresenius Medical Care, Rocky Mountain	Denver	828	2	0.2	Same	792	0	0	Better	971	3	0.3	Same
Fresenius Medical Care, South Denver	Denver	244	2	0.8	Same	346	6	1.7	Worse	399	1	0.3	Same
Fresenius Medical Care, Stapleton	Denver	636	0	0	Better	630	3	0.5	Same	630	1	0.2	Same
Fresenius Medical Care, Walsenburg	Walsenburg	212	3	1.4	Same	222	1	0.5	Same	258	1	0.4	Same
Fresenius Medical Care, West Hampden	Englewood	170	1	0.6	Same	232	4	1.7	Worse	461	1	0.2	Same
Grand Junction Dialysis Center	Grand Junction	651	5	0.8	Same	752	7	0.9	Same	878	3	0.3	Same
Heart of the Rockies Regional Dialysis Center	Salida	---	---	---	---	130	1	0.8	Same	154	0	0	Same
Kidney Center of Bear Creek	Lakewood	440	6	1.4	Worse	572	7	1.2	Worse	526	2	0.4	Same
Kidney Center of Frederick	Firestone	---	---	---	---	---	---	---	---	113	1	0.9	Same
Kidney Center of Lafayette	Lafayette	692	1	0.1	Same	731	2	0.3	Same	717	0	0	Better
Kidney Center of Lakewood	Lakewood	806	3	0.4	Same	436	6	1.4	Worse	761	3	0.4	Same

Facility Name and City		2016				2017				2018			
		No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison	No. of Patient-months	No. of Infections	Rate	National Comparison
Kidney Center of Longmont	Longmont	891	12	1.3	Worse	824	5	0.6	Same	791	2	0.3	Same
Kidney Center of Northridge	Westminster	270	1	0.4	Same	350	2	0.6	Same	363	2	0.6	Same
Kidney Center of Westminster	Westminster	1,423	8	0.6	Same	1,429	19	1.3	Worse	1,438	13	0.9	Worse
Kidney Center of Wheat Ridge	Wheat Ridge	338	2	0.6	Same	531	7	1.3	Worse	358	6	1.7	Worse
Kidney Center of the Rockies	Avon	---	---	---	---	9	***	***	***	80	0	0	Same
Kidney Center on Main	Longmont	321	2	0.6	Same	318	5	1.6	Worse	311	1	0.3	Same
Liberty Dialysis, Colorado Springs Central	Colorado Springs	1,112	0	0	Better	1,099	5	0.5	Same	1,152	3	0.3	Same
Liberty Dialysis, Colorado Springs North	Colorado Springs	827	3	0.4	Same	863	0	0	Better	955	0	0	Better
Liberty Dialysis, Colorado Springs South	Colorado Springs	1,000	15	1.5	Worse	1,015	3	0.3	Same	1,022	2	0.2	Same
Mesa County Dialysis	Grand Junction	237	4	1.7	Worse	266	0	0	Same	295	2	0.7	Same
Parker Kidney Center	Parker	375	8	2.1	Worse	458	10	2.2	Worse	567	0	0	Same
Platte Valley Dialysis	Brighton	---	---	---	---	6	***	***	***	148	0	0	Same
Thornton Kidney Center	Thornton	590	4	0.7	Same	623	11	1.8	Worse	608	1	0.2	Same

Rates are per 100 patient-months. NOTE: These rates are not adjusted for risk.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Data include all access types.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 50 patient-months in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

# Surgical-site infections

## Overview

Surgical site infections (SSIs) are infections directly related to a surgical procedure. In a recent point prevalence survey of healthcare-associated infections (HAIs) in US hospitals, SSIs were the third most common HAI pathogen (approximately 16 percent).<sup>6</sup> SSIs can lead to longer facility stays, additional treatment, and higher costs. Overall in the US, SSI can cost consumers and health care payers from three to 10 billion dollars each year.<sup>1</sup>

A surgical procedure involves at least one incision to a patient within an operating room; please see Appendix A for the definition used by the National Healthcare Safety Network (NHSN). Surgical procedures required for SSI reporting are selected based on several factors: (1) the volume of surgeries performed, (2) the variety of facilities at which the surgeries are performed, and (3) the association with increased SSIs. The surgeries monitored for SSI in Colorado include: breast surgeries (acute care hospitals, critical access hospitals, and ambulatory surgery centers); colon surgeries (acute care hospitals and critical access hospitals); hernia repairs (ambulatory surgery centers); hip replacements (acute care hospitals, critical access hospitals, and ambulatory surgery centers); abdominal (acute care hospitals, critical access hospitals, and ambulatory surgery centers) and vaginal (ambulatory surgery centers) hysterectomies; and knee replacements (acute care hospitals, critical access hospitals, and ambulatory surgery centers). Colorado selects which surgical procedures are reportable per facility type. Surgeries are performed as either inpatient or outpatient procedures. Surgical procedures and SSIs reported in Colorado include only adult patients (at least 18 years of age) for acute care hospitals and critical access hospitals. Surgical procedures reported by ambulatory surgery centers include patients of all ages; however, only adult data is presented in this report for ambulatory surgery centers as current NHSN analysis only includes adult patients.

In Colorado, three types of SSIs are reportable (superficial, deep, and organ space) for the surgery types listed above; see Appendix A for brief definitions. Each table presenting SSI data lists each facility in Colorado that performed the designated procedure, the city where the facility is located, the number of procedures performed, and number of infections. Tables that list individual facilities (**Tables 23 - 48**) are divided by facility type, type of procedure, and inpatient or outpatient; all tables include the standardized infection ratio (SIR) and a comparison to national infection data, except hip replacements, abdominal hysterectomies, and vaginal hysterectomies in ambulatory surgery centers, for which standardized infection ratio (SIR) values and national comparisons are not available.

## Limitations

**Table 37** (hip replacements in ambulatory surgery centers), **Table 42** (abdominal hysterectomies in ambulatory surgery centers), and **Table 43** (vaginal hysterectomies in ambulatory surgery centers) present rates without a comparison to national baseline, as this analysis is not available at the time of this report. Unlike SIRs, rates are not risk-adjusted. Caution should be applied when interpreting a comparison of rates. See Appendix C for a detailed discussion of SIRs and rates, as well as the section “Data format and cautions” for additional limitations (page 11). This is the first year that national baseline comparisons have been available for outpatient procedures in all facility types. Information on validations of SSIs in health care facilities may be requested. National baseline comparisons cannot be made for pediatric outpatient data at this time. Data validation is performed on select healthcare-associated infections condition each year. In 2016, validation was performed for surgical site infections following abdominal hysterectomies in acute care hospitals. No other surgical site infection data was validated in the last three years.

## Surgical-site infections in breast surgeries

In 2018, statewide surgical site infections following inpatient or outpatient breast surgeries in acute care hospitals were the same as the national baseline.

### Overview

Breast surgeries involve at least one incision to the breast skin in either male or female patients. Acute care hospitals, critical access hospitals, and ambulatory surgery centers report surgical site infections (SSIs) following breast procedures. There are 36 types of breast procedures that are reportable into the National Healthcare Safety Network (NHSN) and can include an open biopsy of the breast, local excision of a lesion of the breast, insertion and removal of breast implants and radical mastectomies, among others. Breast surgeries are monitored for 30 days for a superficial SSI and 90 days for all other SSIs. Further explanation of the three types of SSIs is available in Appendix A.

Acute care hospitals are facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. Ambulatory surgery centers are surgery centers that provide outpatient surgical procedures. A detailed explanation of Centers for Medicare and Medicaid Services (CMS) and Colorado guidelines for facility classification are in Appendix C.

All breast surgeries are reportable through NHSN to the state of Colorado for acute care hospitals, critical access hospitals, and ambulatory surgery centers. Data are presented by facility type and inpatient versus outpatient status. NHSN defines an inpatient operative procedure as a procedure on a patient whose date of admission to the health care facility and the date of discharge are different calendar days. An outpatient operative procedure occurs when a patient is admitted and discharged on the same calendar day.

The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

### Results: acute care hospitals

Forty-eight acute care hospitals reported 3,713 inpatient breast surgeries. Following inpatient breast surgeries in 2018, three hospitals had SSI counts worse compared to the national baseline and one hospital had an SSI counts better than the national baseline (**Table 23**). Statewide, SSIs following inpatient breast surgeries in Colorado were the same as the national baseline in 2018 (**Table 9**).

Forty-eight acute care hospitals reported 7,962 outpatient breast surgeries. Following outpatient breast surgeries in 2018, one hospital had SSI counts worse than the national baseline and one hospital had SSI counts better than the national baseline (**Table 24**). Statewide, SSIs following outpatient breast surgeries were the same as the national baseline in 2018 (**Table 9**).

## Results: critical access hospitals

In 2018, Colorado surgical site infections following inpatient or outpatient breast surgeries in critical access hospitals could not be compared to the national baseline.

Six critical access hospitals reported 32 breast inpatient surgeries in 2012. Most facilities reported no infections (Table 25).

Nine critical access hospitals reported 101 outpatient breast surgeries (Table 26). National comparisons were suppressed due to a low procedure count and a predicted number of infections less than one (Table 10).

## Results: ambulatory surgery centers

In 2018, statewide surgical site infections following outpatient breast surgeries in ambulatory surgery centers were the same as the national baseline.

Thirty-four ambulatory surgery centers reported 5,903 outpatient breast surgeries in 2018 (Table 27). Most facilities reported no infections and the statewide SSIs following outpatient breast surgeries in ambulatory surgery centers were similar (statistically the same) as the national baseline in 2018 (Table 11).

Table 23: Surgical Site Infections for Inpatient Breast Surgeries in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	26	0	***	***	20	0	***	***	21	1	***	***
Avista Adventist Hospital	Louisville	117	1	0.7	Same	146	0	0	Same	142	5	2.8	Worse
Banner Fort Collins Medical Center	Fort Collins	16	***	***	***	13	***	***	***	6	***	***	***
Boulder Community Hospital, Foothills	Boulder	85	0	0	Same	64	1	***	***	60	1	***	***
Castle Rock Adventist Hospital	Castle Rock	54	0	***	***	81	0	0	Same	71	3	***	***
Colorado Plains Medical Center	Fort Morgan	3	***	***	***	2	***	***	***	1	***	***	***
Community Hospital	Grand Junction	72	0	0	Same	57	4	***	***	34	0	***	***
Delta County Memorial Hospital	Delta	0	***	***	***	1	***	***	***	22	0	***	***
Denver Health Medical Center	Denver	52	3	2.1	Same	42	2	1.9	Same	43	1	0.9	Same
Exempla Good Samaritan Medical Center	Lafayette	120	0	0	Same	137	3	1.5	Same	127	2	1.2	Same
Exempla St. Joseph Hospital	Denver	452	7	1.0	Same	536	4	0.5	Same	503	3	0.3	Better
Littleton Adventist Hospital	Littleton	228	2	0.7	Same	196	1	0.4	Same	109	0	0	Same
Longmont United Hospital	Longmont	34	0	***	***	80	1	1.0	Same	52	1	***	***
Longs Peak Hospital	Longmont	---	---	---	---	0	***	***	***	7	***	***	***
Lutheran Medical Center	Wheat Ridge	138	1	0.5	Same	136	2	0.9	Same	141	0	0	Same
McKee Medical Center	Loveland	37	0	***	***	37	0	***	***	32	0	***	***
Medical Center of the Rockies	Loveland	80	3	2.3	Same	108	1	0.7	Same	83	3	2.1	Same
Memorial Health System	Colorado Springs	1	***	***	***	10	***	***	***	23	0	***	***
Memorial Hospital North	Colorado Springs	15	***	***	***	181	2	0.8	Same	296	3	0.7	Same
Mercy Regional Medical Center	Durango	45	0	***	***	52	0	***	***	52	0	***	***
Montrose Memorial Hospital	Montrose	11	***	***	***	12	***	***	***	18	***	***	***



Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
North Colorado Medical Center	Greeley	73	2	***	***	78	0	0	Same	96	0	0	Same
North Suburban Medical Center	Thornton	41	1	***	***	34	0	***	***	48	0	***	***
Parker Adventist Hospital	Parker	39	0	***	***	40	2	***	***	50	2	***	***
Parkview Medical Center	Pueblo	100	2	1.3	Same	71	0	0	Same	12	***	***	***
Penrose St. Francis Health Services	Colorado Springs	109	1	0.7	Same	172	0	0	Same	132	4	1.9	Same
Platte Valley Medical Center	Brighton	18	***	***	***	21	0	***	***	6	***	***	***
Porter Adventist Hospital	Denver	50	1	***	***	22	1	***	***	24	0	***	***
Poudre Valley Health System	Fort Collins	117	0	0	Same	132	4	2.1	Same	176	8	3.1	Worse
Presbyterian St. Luke's Medical Center	Denver	55	1	***	***	65	2	***	***	106	0	0	Same
Rose Medical Center	Denver	416	2	0.4	Same	457	1	0.2	Better	449	3	0.5	Same
Sky Ridge Medical Center	Lone Tree	372	4	0.7	Same	367	13	2.3	Worse	373	4	0.8	Same
St. Anthony Hospital	Lakewood	125	0	0	Same	161	1	0.5	Same	184	2	0.8	Same
St. Anthony North Health Campus	Westminster	12	***	***	***	49	1	***	***	56	1	0.8	Same
St. Anthony Summit Medical Center	Frisco	0	***	***	***	8	***	***	***	2	***	***	***
St. Francis Medical Center	Colorado Springs	9	***	***	***	22	0	***	***	11	***	***	***
St. Mary Corwin Medical Center	Pueblo	37	1	***	***	55	2	***	***	40	0	***	***
St. Mary's Hospital	Grand Junction	83	0	0	Same	89	1	0.8	Same	89	2	1.7	Same
St. Thomas More Hospital	Canon City	3	***	***	***	3	***	***	***	1	***	***	***
Sterling Regional Medical Center	Sterling	5	***	***	***	5	***	***	***	3	***	***	***
Swedish Medical Center	Englewood	45	0	***	***	124	2	0.7	Same	134	1	0.5	Same
The Medical Center of Aurora	Aurora	110	0	0	Same	119	2	1.2	Same	133	0	0	Same
UHealth Broomfield Hospital	Broomfield	0	***	***	***	0	***	***	***	0	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	0	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	13	***	***	***	7	***	***	***	6	***	***	***
University of Colorado Hospital	Aurora	215	7	1.4	Same	137	10	2.5	Worse	307	15	2.2	Worse
Vail Valley Medical Center	Vail	40	1	***	***	31	1	***	***	29	0	***	***
Valley View Hospital	Glenwood Springs	27	0	***	***	22	0	***	***	24	0	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

Table 24: Surgical Site Infections for Outpatient Breast Surgeries in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	223	0	0	Same	173	2	1.6	Same	149	1	0.9	Same
Avista Adventist Hospital	Louisville	728	2	0.7	Same	837	1	0.3	Same	876	3	1.7	Same
Banner Fort Collins Medical Center	Fort Collins	32	0	***	***	23	0	***	***	21	0	***	***
Boulder Community Hospital, Foothills	Boulder	96	2	***	***	91	2	***	***	94	1	***	***
Castle Rock Adventist Hospital	Castle Rock	194	1	***	***	256	0	0	Same	321	0	0	Same
Colorado Plains Medical Center	Fort Morgan	6	***	***	***	4	***	***	***	4	***	***	***
Community Hospital	Grand Junction	220	4	3.7	Worse	83	0	***	***	60	1	***	***
Delta County Memorial Hospital	Delta	38	0	***	***	55	0	***	***	62	0	***	***
Denver Health Medical Center	Denver	169	2	1.2	Same	158	0	0	Same	155	1	0.5	Same
Exempla Good Samaritan Medical Center	Lafayette	270	0	0	Same	268	1	0.8	Same	267	0	0	Same
Exempla St. Joseph Hospital	Denver	595	10	2.6	Worse	555	7	1.8	Same	495	1	0.3	Same
Littleton Adventist Hospital	Littleton	137	0	***	***	132	0	***	***	214	0	0	Same
Longmont United Hospital	Longmont	85	1	***	***	90	0	***	***	107	1	***	***
Longs Peak Hospital	Longmont	---	---	---	---	2	***	***	***	9	***	***	***
Lutheran Medical Center	Wheat Ridge	328	3	1.3	Same	347	5	1.8	Same	346	0	0	Same
McKee Medical Center	Loveland	84	1	***	***	83	0	***	***	71	0	***	***
Medical Center of the Rockies	Loveland	144	0	***	***	100	0	***	***	133	1	***	***
Memorial Health System	Colorado Springs	27	2	***	***	6	***	***	***	34	0	***	***
Memorial Hospital North	Colorado Springs	290	2	1.1	Same	157	1	***	***	228	0	0	Same
Mercy Regional Medical Center	Durango	72	2	***	***	102	1	***	***	105	0	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Montrose Memorial Hospital	Montrose	37	2	***	***	28	0	***	***	28	0	***	***
North Colorado Medical Center	Greeley	114	2	***	***	111	1	***	***	115	0	***	***
North Suburban Medical Center	Thornton	25	0	***	***	28	1	***	***	65	0	***	***
Parker Adventist Hospital	Parker	68	1	***	***	61	0	***	***	95	0	***	***
Parkview Medical Center	Pueblo	103	0	***	***	90	0	***	***	50	0	***	***
Penrose St. Francis Health Services	Colorado Springs	265	1	***	***	317	0	***	***	357	2	1.1	Same
Platte Valley Medical Center	Brighton	53	2	***	***	57	0	***	***	21	0	***	***
Porter Adventist Hospital	Denver	60	0	***	***	62	0	***	***	27	0	***	***
Poudre Valley Health System	Fort Collins	131	0	***	***	109	1	***	***	105	3	***	***
Presbyterian St. Luke's Medical Center	Denver	126	0	***	***	117	1	***	***	180	0	***	***
Rose Medical Center	Denver	920	1	0.2	Better	1,130	1	0.2	Better	1,202	2	0.3	Better
Sky Ridge Medical Center	Lone Tree	264	0	0	Same	202	1	0.8	Same	281	6	3.0	Worse
St. Anthony Hospital	Lakewood	128	0	***	***	129	0	***	***	151	0	***	***
St. Anthony North Health Campus	Westminster	43	1	***	***	71	1	***	***	75	1	***	***
St. Anthony Summit Medical Center	Frisco	12	***	***	***	12	***	***	***	20	0	***	***
St. Francis Medical Center	Colorado Springs	153	0	***	***	121	0	***	***	95	0	***	***
St. Mary Corwin Medical Center	Pueblo	72	0	***	***	110	0	***	***	73	1	***	***
St. Mary's Hospital	Grand Junction	70	0	***	***	91	1	***	***	90	1	***	***
St. Thomas More Hospital	Canon City	13	***	***	***	12	***	***	***	4	***	***	***
Sterling Regional Medical Center	Sterling	10	***	***	***	8	***	***	***	17	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Swedish Medical Center	Englewood	13	***	***	***	36	0	***	***	45	0	***	***
The Medical Center of Aurora	Aurora	49	0	***	***	66	0	***	***	65	1	***	***
UCHealth Broomfield Hospital	Broomfield	---	---	---	---	10	***	***	***	7	***	***	***
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	2	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	34	4	***	***	51	0	***	***	47	0	***	***
University of Colorado Hospital	Aurora	668	6	1.0	Same	960	3	0.4	Same	797	6	1.0	Same
Vail Valley Medical Center	Vail	52	0	***	***	78	0	***	***	63	0	***	***
Valley View Hospital	Glenwood Springs	106	0	***	***	98	3	***	***	106	1	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 25: Surgical Site Infections for Inpatient Breast Surgeries in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	0	***	***	***	2	***	***	***	0	***	***	***
Aspen Valley Hospital	Aspen	2	***	***	***	4	***	***	***	9	***	***	***
Colorado Canyons Hospital And Medical Center	Fruita	---	---	---	---	0	***	***	***	0	***	***	***
East Morgan County Hospital	Brush	3	***	***	***	2	***	***	***	2	***	***	***
Estes Park Medical Center	Estes Park	0	***	***	***	0	***	***	***	0	***	***	***
Grand River Medical Center	Rifle	7	***	***	***	6	***	***	***	5	***	***	***
Gunnison Valley Hospital	Gunnison	4	***	***	***	0	***	***	***	0	***	***	***
Heart of the Rockies Regional Medical Center	Salida	4	***	***	***	15	***	***	***	11	***	***	***
Melissa Memorial Hospital	Holyoke	0	***	***	***	0	***	***	***	4	***	***	***
Mount San Rafael Hospital	Trinidad	0	***	***	***	0	***	***	***	0	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	0	***	***	***	0	***	***	***	0	***	***	***
Pioneers Medical Center	Meeker	0	***	***	***	1	***	***	***	0	***	***	***
Prowers Medical Center	Lamar	0	***	***	***	0	***	***	***	0	***	***	***
Southeast Colorado Hospital	Springfield	0	***	***	***	0	***	***	***	---	---	---	---
Southwest Memorial Hospital	Cortez	6	***	***	***	6	***	***	***	1	***	***	***
Spanish Peaks Regional Health Center	Walsenburg	0	***	***	***	0	***	***	***	0	***	***	***
UCHealth Pikes Peak Regional Hospital	Woodland Park	---	---	---	---	---	---	---	---	0	***	***	***
Wray Community District Hospital	Wray	3	***	***	***	2	***	***	***	0	***	***	***
Yuma District Hospital	Yuma	0	***	***	***	0	***	***	***	0	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients  $\geq 18$  years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 26: Surgical Site Infections for Outpatient Breast Surgeries in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	1	***	***	***	2	***	***	***	---	---	---	---
Aspen Valley Hospital	Aspen	13	***	***	***	13	***	***	***	24	0	***	***
Colorado Canyons Hospital And Medical Center	Fruita	16	***	***	***	10	***	***	***	14	***	***	***
East Morgan County Hospital	Brush	10	***	***	***	4	***	***	***	12	***	***	***
Estes Park Medical Center	Estes Park	3	***	***	***	1	***	***	***	3	***	***	***
Grand River Medical Center	Rifle	13	***	***	***	12	***	***	***	15	***	***	***
Gunnison Valley Hospital	Gunnison	2	***	***	***	---	---	---	---	---	---	---	---
Heart of the Rockies Regional Medical Center	Salida	14	***	***	***	28	0	***	***	16	***	***	***
Melissa Memorial Hospital	Holyoke	---	---	---	---	1	***	***	***	1	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	1	***	***	***	---	---	---	---	---	---	---	---
Pioneers Medical Center	Meeker	1	***	***	***	---	---	---	---	---	---	---	---
Southwest Memorial Hospital	Cortez	11	***	***	***	20	1	***	***	14	***	***	***
Yuma District Hospital	Yuma	6	***	***	***	---	---	---	---	2	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.



**Table 27: Surgical Site Infections for Outpatient Breast Surgeries in Ambulatory Surgery Centers – Colorado, January 1, 2016 - December 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Aberdeen Ambulatory Surgical Center	Pueblo	356	0	***	***	321	0	***	***	342	0	0	Same
Arkansas Valley Surgery	Canon City	---	---	---	---	1	***	***	***	---	---	---	---
Ascent Surgery	Colorado Springs	397	0	***	***	444	0	0	Same	325	0	***	***
Audubon Ambulatory Surgery	Colorado Springs	50	0	***	***	65	0	***	***	18	***	***	***
Audubon Ambulatory Surgery At St. Francis Medical Center	Colorado Springs	3	***	***	***	2	***	***	***	---	---	---	---
Black Canyon Surgical Center	Montrose	7	***	***	***	5	***	***	***	8	***	***	***
Canyon View Surgery	Grand Junction	3	***	***	***	17	***	***	***	10	***	***	***
Centrum Surgery Center	Greenwood	336	0	***	***	434	0	***	***	457	0	***	***
Clear Creek Surgery Center	Wheat Ridge	5	***	***	***	---	---	---	---	2	***	***	***
Coal Creek Ambulatory Surgery	Lafayette	---	---	---	---	---	---	---	---	24	0	***	***
Crown Point Surgery	Parker	259	0	***	***	237	0	***	***	214	0	***	***
Grand Valley Surgical Center	Grand Junction	276	0	***	***	274	0	0	Same	362	2	1.7	Same
Harmony Surgery Center	Fort Collins	531	0	0	Same	601	1	0.5	Same	367	1	0.7	Same
Insight Surgery	Lone Tree	449	0	***	***	466	0	***	***	313	0	***	***
Kaiser Permanente Ambulatory Surgery	Denver	421	2	1.4	Same	528	4	2.1	Same	531	3	1.7	Same
Kaiser Permanente Ambulatory Surgery Center, Lone Tree	Lone Tree	183	2	***	***	160	0	***	***	345	1	0.9	Same
Midtown Surgical	Denver	90	0	***	***	145	0	***	***	59	0	***	***
Mountain Vista Orthopaedic Surgery Center	Greeley	6	***	***	***	9	***	***	***	5	***	***	***
Musculoskeletal Surgery	Thornton	80	0	***	***	174	0	***	***	84	0	***	***
North Suburban Surgery	Thornton	24	0	***	***	5	***	***	***	---	---	---	---

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Northwest Regional Ambulatory Surgery	Westminster	72	0	***	***	41	0	***	***	2	***	***	***
Park Meadows Outpatient	Lone Tree	395	2	2.0	Same	497	1	0.7	Same	558	0	0	Same
Parkwest Surgery Center	Pueblo	3	***	***	***	1	***	***	***	1	***	***	***
Peak One Surgery Center	Frisco	---	---	---	---	---	---	---	---	1	***	***	***
Pueblo Surgery Center	Pueblo	1	***	***	***	---	---	---	---	---	---	---	---
Red Rocks Surgery Center	Golden	113	0	***	***	80	0	***	***	53	0	***	***
Rocky Mountain Surgery Center	Englewood	1	***	***	***	---	---	---	---	---	---	---	---
Rose Surgical Center	Denver	91	0	***	***	215	1	***	***	170	0	***	***
Sky Ridge Surgical Center	Lone Tree	12	***	***	***	165	0	***	***	188	0	***	***
Skyline Surgery	Loveland	343	0	***	***	312	0	***	***	354	0	***	***
Summit View Surgery Center	Littleton	123	0	***	***	90	0	***	***	63	0	***	***
Surgery Center At Lutheran	Wheat Ridge	15	***	***	***	---	---	---	---	9	***	***	***
Surgery Center of Fort Collins	Fort Collins	2	***	***	***	---	---	---	---	2	***	***	***
Surgery Center of the Rockies	Aurora	90	1	***	***	124	0	***	***	124	0	***	***
Surgical Center of the Rockies	Colorado Springs	238	0	***	***	204	1	***	***	143	0	***	***
UCHealth Longs Peak Surgery	Longmont	---	---	---	---	5	***	***	***	15	***	***	***
UCHealth Printers Park Surgery Center	Colorado Springs	660	4	1.5	Same	676	4	1.5	Same	696	3	1.0	Same
University of Colorado Hospital Lone Tree Surgery Center	Lone Tree	116	0	***	***	88	0	***	***	57	0	***	***
Vail Valley Surgery Center	Edwards	21	0	***	***	10	***	***	***	1	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Surgical-site infections in colon surgeries

### Overview

Colon procedures involve surgery of the large intestines. The intestines, which are muscular tubes that extend from the end of the stomach to the rectum, carry food, products of digestion and bacteria that help break down food in the digestive process. Since the intestines house bacteria, colon surgeries have a high risk for contamination and infection. Colon surgeries are monitored for 30 days for all SSIs. Further explanation of the three types of SSIs is available in Appendix A.

Colorado facilities that are required to report colon surgeries include acute care hospitals and critical access hospitals. Acute care hospitals are facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. A detailed explanation of facility classification are in Appendix C.

All colon surgeries are reportable through NHSN to the state of Colorado for acute care hospitals and critical access hospitals. Data are presented by facility type and inpatient versus outpatient status. NHSN defines an inpatient operative procedure as a procedure on a patient whose date of admission to the health care facility and the date of discharge are different calendar days. An outpatient operative procedure occurs when a patient is admitted and discharged in the same calendar day.

A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

### Results: acute care hospitals

**Statewide, surgical site infections following inpatient colon surgeries among acute care hospitals was 14percent lower (statistically better) than the national baseline in 2018.**

In 2018, 46 hospitals reported 5,113 inpatient colon surgeries among adult patients in 2018; three hospitals reported no SSIs following inpatient colon surgeries. Among inpatient surgeries performed in adult patients, five hospitals had colon SSI rates better than the national rate, and two had a rate that was worse; all others had rates similar to the national rate (**Table 28**). When combining data across all Colorado hospitals, SSIs following colon surgeries was 14percent lower (statistically better) in 2018 than the national baseline (**Table 9**).

In 2018, 20 acute care hospitals reported 47 colon surgeries among adult outpatients (**Table 29**). No national comparisons using SIR could be calculated at the facility or state levels due to data suppression (**Table 9**).

### Results: critical access hospitals

**Statewide, surgical site infections following inpatient colon surgeries among critical access hospitals was the same as the national baseline from 2016–2018**

Eight critical access hospitals reported 52 colon surgeries among adult patients; however, SIR could not be calculated for any facilities because the facility performed fewer than 20 procedures in calendar year or the predicted number of infections was less than one (**Table 30**). The statewide SIR has been same as the national baseline from 2016-2018 (**Table 10**).

One critical access hospital reported one outpatient colon surgery among adult patients; SIR could not be calculated for the facility or state as the predicted number of infections was less than one (**Table 31** and **Table 10**, respectively).

**Table 28: Surgical Site Infections for Inpatient Colon Surgeries in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	0	***	***	***	0	***	***	***	1	***	***	***
Avista Adventist Hospital	Louisville	40	1	0.6	Same	55	3	1.5	Same	39	1	0.6	Same
Banner Fort Collins Medical Center	Fort Collins	7	***	***	***	6	***	***	***	7	***	***	***
Boulder Community Hospital, Foothills	Boulder	94	5	1.6	Same	89	9	2.6	Worse	105	5	1.3	Same
Castle Rock Adventist Hospital	Castle Rock	40	2	1.2	Same	21	0	***	***	27	0	0	Same
Colorado Plains Medical Center	Fort Morgan	8	***	***	***	9	***	***	***	5	***	***	***
Community Hospital	Grand Junction	49	5	2.4	Same	53	3	1.4	Same	49	1	0.5	Same
Delta County Memorial Hospital	Delta	54	1	0.4	Same	61	0	0	Same	50	0	0	Same
Denver Health Medical Center	Denver	129	13	1.5	Same	137	9	1.0	Same	121	5	0.6	Same
Exempla Good Samaritan Medical Center	Lafayette	206	14	1.5	Same	202	10	1.0	Same	199	14	1.5	Same
Exempla St. Joseph Hospital	Denver	266	12	0.8	Same	260	15	1.0	Same	251	9	0.6	Same
Littleton Adventist Hospital	Littleton	88	4	1.0	Same	95	2	0.5	Same	108	1	0.2	Same
Longmont United Hospital	Longmont	68	1	0.4	Same	85	2	0.5	Same	74	0	0	Better
Longs Peak Hospital	Longmont	---	---	---	---	0	***	***	***	55	3	0.9	Same
Lutheran Medical Center	Wheat Ridge	166	9	1.2	Same	156	6	0.8	Same	143	3	0.5	Same
McKee Medical Center	Loveland	50	0	0	Same	57	1	0.4	Same	58	1	0.3	Same
Medical Center of the Rockies	Loveland	150	7	0.9	Same	161	15	1.9	Worse	181	17	1.8	Worse
Memorial Health System	Colorado Springs	227	5	0.5	Same	217	8	0.7	Same	250	10	0.7	Same
Memorial Hospital North	Colorado Springs	95	1	0.2	Same	87	1	0.2	Same	66	3	0.9	Same
Mercy Regional Medical Center	Durango	45	2	1.1	Same	47	0	0	Same	41	1	0.6	Same
Montrose Memorial Hospital	Montrose	34	3	2.5	Same	51	4	2.1	Same	32	1	0.7	Same
North Colorado Medical Center	Greeley	166	15	1.9	Worse	164	12	1.6	Same	123	16	2.9	Worse
North Suburban Medical Center	Thornton	59	4	1.8	Same	78	2	0.6	Same	64	2	0.7	Same

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Parker Adventist Hospital	Parker	131	3	0.5	Same	159	1	0.2	Better	129	2	0.3	Same
Parkview Medical Center	Pueblo	244	11	1.0	Same	171	16	2.0	Worse	163	9	1.0	Same
Penrose St. Francis Health Services	Colorado Springs	189	7	1.0	Same	252	11	1.0	Same	256	10	0.9	Same
Platte Valley Medical Center	Brighton	60	4	1.9	Same	100	4	1.1	Same	96	4	1.1	Same
Porter Adventist Hospital	Denver	62	0	0	Same	68	1	0.3	Same	47	3	1.6	Same
Poudre Valley Health System	Fort Collins	155	3	0.4	Same	163	4	0.6	Same	138	8	1.3	Same
Presbyterian St. Luke's Medical Center	Denver	93	3	0.6	Same	133	2	0.3	Better	124	6	1.0	Same
Rose Medical Center	Denver	174	7	1.1	Same	189	11	1.6	Same	178	1	0.2	Better
Sky Ridge Medical Center	Lone Tree	237	4	0.4	Better	278	8	0.6	Same	251	2	0.2	Better
St. Anthony Hospital	Lakewood	166	5	0.7	Same	154	7	1.0	Same	192	2	0.2	Better
St. Anthony North Health Campus	Westminster	67	5	1.4	Same	61	6	1.8	Same	71	3	0.8	Same
St. Anthony Summit Medical Center	Frisco	7	***	***	***	12	***	***	***	11	***	***	***
St. Francis Medical Center	Colorado Springs	90	1	0.3	Same	90	2	0.6	Same	77	2	0.6	Same
St. Mary Corwin Medical Center	Pueblo	48	2	0.9	Same	55	1	0.4	Same	35	1	0.6	Same
St. Mary's Hospital	Grand Junction	178	5	0.7	Same	135	6	1.1	Same	172	2	0.2	Better
St. Thomas More Hospital	Canon City	37	1	0.6	Same	30	1	0.8	Same	29	1	0.7	Same
Sterling Regional Medical Center	Sterling	3	***	***	***	13	***	***	***	6	***	***	***
Swedish Medical Center	Englewood	335	19	1.4	Same	343	14	1.0	Same	330	16	1.1	Same
The Medical Center of Aurora	Aurora	141	3	0.5	Same	139	4	0.7	Same	111	2	0.4	Same
UCHealth Broomfield Hospital	Broomfield	0	***	***	***	1	***	***	***	0	***	***	***
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	0	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	16	***	***	***	16	***	***	***	16	***	***	***
University of Colorado Hospital	Aurora	399	35	1.2	Same	599	44	1.0	Same	546	48	1.2	Same
Vail Valley Medical Center	Vail	7	***	***	***	15	***	***	***	8	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Valley View Hospital	Glenwood Springs	37	1	0.6	Same	28	1	0.8	Same	46	2	1.0	Same

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

Table 29: Surgical Site Infections for Outpatient Colon Surgeries in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Boulder Community Hospital, Foothills	Boulder	6	***	***	***	1	***	***	***	3	***	***	***
Colorado Plains Medical Center	Fort Morgan	---	---	---	---	1	***	***	***	---	---	---	---
Community Hospital	Grand Junction	2	***	***	***	---	---	---	---	---	---	---	---
Denver Health Medical Center	Denver	1	***	***	***	---	---	---	---	---	---	---	---
Exempla Good Samaritan Medical Center	Lafayette	2	***	***	***	1	***	***	***	---	---	---	---
Exempla St. Joseph Hospital	Denver	2	***	***	***	1	***	***	***	---	---	---	---
Littleton Adventist Hospital	Littleton	1	***	***	***	---	---	---	---	1	***	***	***
Longmont United Hospital	Longmont	2	***	***	***	---	---	---	---	---	---	---	---
Lutheran Medical Center	Wheat Ridge	1	***	***	***	---	---	---	---	1	***	***	***
McKee Medical Center	Loveland	---	---	---	---	1	***	***	***	1	***	***	***
Medical Center of the Rockies	Loveland	1	***	***	***	2	***	***	***	---	---	---	---
Memorial Health System	Colorado Springs	3	***	***	***	1	***	***	***	3	***	***	***
Memorial Hospital North	Colorado Springs	6	***	***	***	2	***	***	***	---	---	---	---
Montrose Memorial Hospital	Montrose	---	---	---	---	---	---	---	---	1	***	***	***
North Colorado Medical Center	Greeley	1	***	***	***	2	***	***	***	---	---	---	---
North Suburban Medical Center	Thornton	1	***	***	***	1	***	***	***	---	---	---	---
Parker Adventist Hospital	Parker	---	---	---	---	---	---	---	---	1	***	***	***
Parkview Medical Center	Pueblo	---	---	---	---	2	***	***	***	4	***	***	***
Penrose St. Francis Health Services	Colorado Springs	2	***	***	***	1	***	***	***	---	---	---	---



Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Platte Valley Medical Center	Brighton	1	***	***	***	1	***	***	***	---	---	---	---
Poudre Valley Health System	Fort Collins	4	***	***	***	---	---	---	---	3	***	***	***
Presbyterian St. Luke's Medical Center	Denver	---	---	---	---	1	***	***	***	2	***	***	***
Rose Medical Center	Denver	1	***	***	***	1	***	***	***	1	***	***	***
Sky Ridge Medical Center	Lone Tree	1	***	***	***	1	***	***	***	4	***	***	***
St. Anthony Hospital	Lakewood	---	---	---	---	---	---	---	---	2	***	***	***
St. Anthony Summit Medical Center	Frisco	2	***	***	***	---	---	---	---	1	***	***	***
St. Mary Corwin Medical Center	Pueblo	---	---	---	---	---	---	---	---	1	***	***	***
St. Mary's Hospital	Grand Junction	2	***	***	***	---	---	---	---	---	---	---	---
St. Thomas More Hospital	Canon City	1	***	***	***	1	***	***	***	1	***	***	***
Swedish Medical Center	Englewood	5	***	***	***	4	***	***	***	7	***	***	***
The Medical Center of Aurora	Aurora	3	***	***	***	---	---	---	---	1	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	1	***	***	***	3	***	***	***	1	***	***	***
University of Colorado Hospital	Aurora	3	***	***	***	7	***	***	***	8	***	***	***
Vail Valley Medical Center	Vail	---	---	---	---	3	***	***	***	---	---	---	---
Valley View Hospital	Glenwood Springs	1	***	***	***	1	***	***	***	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

Table 30: Surgical Site Infections for Inpatient Colon Surgeries in Critical Access Hospitals— Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	2	***	***	***	11	***	***	***	0	***	***	***
Aspen Valley Hospital	Aspen	21	1	***	***	6	***	***	***	6	***	***	***
East Morgan County Hospital	Brush	0	***	***	***	0	***	***	***	0	***	***	***
Estes Park Medical Center	Estes Park	3	***	***	***	0	***	***	***	4	***	***	***
Grand River Medical Center	Rifle	0	***	***	***	5	***	***	***	5	***	***	***
Gunnison Valley Hospital	Gunnison	3	***	***	***	10	***	***	***	3	***	***	***
Heart of the Rockies Regional Medical Center	Salida	21	0	***	***	14	***	***	***	23	0	***	***
Melissa Memorial Hospital	Holyoke	---	---	---	---	0	***	***	***	0	***	***	***
Mount San Rafael Hospital	Trinidad	0	***	***	***	3	***	***	***	0	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	1	***	***	***	0	***	***	***	3	***	***	***
Pioneers Medical Center	Meeker	4	***	***	***	2	***	***	***	0	***	***	***
Prowers Medical Center	Lamar	5	***	***	***	2	***	***	***	2	***	***	***
Southwest Memorial Hospital	Cortez	13	***	***	***	6	***	***	***	6	***	***	***
Spanish Peaks Regional Health Center	Walsenburg	0	***	***	***	0	***	***	***	---	---	---	---
UCHealth Pikes Peak Regional Hospital	Woodland Park	0	***	***	***	0	***	***	***	0	***	***	***
Wray Community District Hospital	Wray	1	***	***	***	0	***	***	***	0	***	***	***
Yuma District Hospital	Yuma	0	***	***	***	0	***	***	***	0	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 31: Surgical Site Infections for Outpatient Colon Surgeries in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Melissa Memorial Hospital	Holyoke	1	***	***	***	---	---	---	---	1	***	***	***
Pioneers Medical Center	Meeker	1	***	***	***	---	---	---	---	---	---	---	---
Southwest Memorial Hospital	Cortez	---	---	---	---	2	***	***	***	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Surgical-site infections in hernia repairs

### Overview

A hernia procedure involves the repair of a hernia, which is a bulging of internal organs or tissues that protrude through an abnormal opening in the muscle wall. Reportable NHSN hernia procedures include inguinal, femoral, umbilical or anterior abdominal wall repairs. Hernia repairs are monitored for 30 days for superficial SSIs and 90 days for all other SSIs. The three types of SSIs are further described in Appendix A.

SSIs following hernia repairs are reportable by ambulatory surgery centers. Ambulatory surgery centers are surgery centers that provide outpatient surgical procedures. An outpatient operative procedure occurs when a patient is admitted and discharged in the same calendar day. A detailed explanation of facility classification are in Appendix C.

A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

### Results: ambulatory surgery centers

*In Colorado, surgical site infections following hernia surgeries have been the same as the national baseline for the last three years.*

**Table 32** shows facility specific data for SSIs following hernia repairs performed in ambulatory surgery centers during the 2016, 2017, and 2018 calendar years.

In 2018, 39 ambulatory surgery centers reported 4,884 hernia repairs. Two facilities were the same as the national baseline in 2018; all other facilities had their data suppressed because either the facility performed less than 20 procedures in the calendar year or the predicted number of infections was less than 1 (**Table 32**). During 2016-2018, SSIs following hernia surgeries statewide were the same as the national baseline (**Table 11**).

Table 32: Surgical Site Infections for Outpatient Hernia Surgeries in Ambulatory Surgery Centers – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Aberdeen Ambulatory Surgical Center	Pueblo	1	***	***	***	18	***	***	***	25	0	***	***
Arkansas Valley Surgery	Canon City	106	0	***	***	76	0	***	***	57	0	***	***
Audubon Ambulatory Surgery	Colorado Springs	4	***	***	***	---	---	---	---	---	---	---	---
Audubon Ambulatory Surgery At St. Francis Medical Center	Colorado Springs	470	1	***	***	463	0	***	***	436	0	***	***
Black Canyon Surgical Center	Montrose	42	0	***	***	49	0	***	***	93	0	***	***
Canyon View Surgery	Grand Junction	42	0	***	***	102	0	***	***	133	0	***	***
Centrum Surgery Center	Greenwood	12	***	***	***	20	1	***	***	8	***	***	***
Cherry Creek Surgery Center	Denver	1	***	***	***	---	---	---	---	1	***	***	***
Children's North Surgery Center	Broomfield	68	0	***	***	88	0	***	***	94	0	***	***
Clear Creek Surgery Center	Wheat Ridge	248	1	***	***	268	1	***	***	351	0	***	***
Crown Point Surgery	Parker	328	0	***	***	255	0	***	***	314	0	***	***
Grand Valley Surgical Center	Grand Junction	182	1	***	***	195	2	***	***	165	1	***	***
Harmony Surgery Center	Fort Collins	498	0	***	***	512	2	***	***	435	2	***	***
Harvard Park Surgery Center	Denver	38	0	***	***	43	0	***	***	31	0	***	***
Insight Surgery	Lone Tree	3	***	***	***	2	***	***	***	5	***	***	***
Kaiser Permanente Ambulatory Surgery	Denver	460	0	0	Better	569	1	0.5	Same	493	1	0.8	Same
Kaiser Permanente Ambulatory Surgery Center, Lone Tree	Lone Tree	368	3	***	***	377	0	***	***	367	2	1.9	Same
Lincoln Surgery Center	Parker	---	---	---	---	---	---	---	---	1	***	***	***
Midtown Surgical	Denver	171	0	***	***	175	0	***	***	58	0	***	***
Midvalley Ambulatory Surgery Center	Basalt	---	---	---	---	---	---	---	---	2	***	***	***
Mile High Surgery Center	Greenwood	86	0	***	***	120	0	***	***	101	0	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Mountain Vista Orthopaedic Surgery Center	Greeley	10	***	***	***	8	***	***	***	20	0	***	***
Musculoskeletal Surgery	Thornton	1	***	***	***	6	***	***	***	4	***	***	***
North Suburban Surgery	Thornton	104	0	***	***	63	0	***	***	48	0	***	***
Parkwest Surgery Center	Pueblo	15	***	***	***	4	***	***	***	---	---	---	---
Peak One Surgery Center	Frisco	76	0	***	***	45	0	***	***	59	0	***	***
Pueblo Surgery Center	Pueblo	9	***	***	***	8	***	***	***	9	***	***	***
Red Rocks Surgery Center	Golden	248	0	***	***	171	0	***	***	128	0	***	***
Rocky Mountain Surgery Center	Englewood	417	0	***	***	405	0	***	***	282	0	***	***
Rose Surgical Center	Denver	253	0	***	***	292	0	***	***	237	0	***	***
Sky Ridge Surgical Center	Lone Tree	217	0	***	***	252	0	***	***	188	0	***	***
Skyline Surgery	Loveland	210	0	***	***	158	0	***	***	192	1	***	***
Southwest Colorado Surgical Center	Cortez	6	***	***	***	6	***	***	***	16	***	***	***
Summit View Surgery Center	Littleton	383	0	***	***	371	0	***	***	265	0	***	***
Surgery Center At Lutheran	Wheat Ridge	24	0	***	***	12	***	***	***	12	***	***	***
Surgery Center of Fort Collins	Fort Collins	2	***	***	***	---	---	---	---	3	***	***	***
Surgery Center of the Rockies	Aurora	13	***	***	***	45	0	***	***	53	0	***	***
Surgicenter of Castle Rock	Castle Rock	16	***	***	***	10	***	***	***	5	***	***	***
UCHealth Longs Peak Surgery	Longmont	---	---	---	---	12	***	***	***	25	0	***	***
UCHealth Printers Park Surgery Center	Colorado Springs	250	1	***	***	294	0	***	***	166	1	***	***
Vail Valley Surgery Center	Edwards	8	***	***	***	1	***	***	***	1	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Surgical-site infections in hip replacements

### Overview

A total or partial hip replacement is a surgery for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis, or other degenerative processes involving the hip joint. The surgical procedure for a hip replacement involves removing the damaged cartilage and bone from the hip joint and replacing them with an artificial device. The procedure consists of placing a cup, which is typically plastic, ceramic, or metal, to replace the hip socket, a metal or ceramic ball to replace the head of the femur (thigh bone), and a metal stem to attach to the bone. Hip replacements are monitored for 30 days for a superficial SSI and 90 days for all other SSIs. Further explanation of the three types of SSIs is available in Appendix A.

SSIs following hip replacement surgeries are reportable by acute care hospitals, critical access hospitals, and ambulatory surgery centers. Acute care hospitals are facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. Ambulatory surgery centers are surgery centers that provide outpatient surgical procedures. A detailed explanation of CMS and Colorado guidelines for facility classification are in Appendix C.

Data are presented by facility type and inpatient versus outpatient status. NHSN defines an inpatient operative procedure as a procedure on a patient whose date of admission to the health care facility and the date of discharge are different calendar days. An outpatient operative procedure occurs when a patient is admitted and discharged in the same calendar day.

A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

Rates were calculated for SSIs following hip replacement surgeries in ambulatory surgery centers, as SIR calculations are not available at the time of publication.

### Results: acute care hospitals

**Statewide in 2018, surgical site infections following inpatient hip replacements in acute care hospitals were the same as the national baseline.**

In 2018, 48 acute care hospitals performed 11,679 hip replacement surgeries in adults. Two hospitals had a hip replacement SSI count among adult patients better than the national baseline (**Table 33**). Excluding suppressed data, in 2018, 15 hospitals reported no SSIs following hip replacements. In 2018 statewide, SSIs following inpatient hip replacements in Colorado acute care hospitals is the same as the national baseline (**Table 9**).

In 2018, 25 acute care hospitals performed 267 outpatient hip replacement surgeries in adults (**Table 34**). All SIR calculations by facility and state are suppressed due to the total number of procedures being less than 5 or a predicted number of infections less than 1 (**Table 9**).

## Results: critical access hospitals

Statewide in 2018, SSIs following inpatient or outpatient hip replacements in critical access hospitals could not be compared to the national baseline.

Fifteen critical access hospitals performed 231 inpatient hip replacements in adult inpatients. SSI data among critical access hospitals was largely suppressed as very few inpatient hip replacements are performed in their facilities (Table 35). No statewide comparison to the national baseline could be made (Table 10).

Two critical access hospitals performed two outpatient hip replacements in adults. Between 2016 and 2018, six facilities performed at least one outpatient hip surgery (Table 36). No statewide comparison to the national baseline could be made (Table 10).

## Results: ambulatory surgery centers

Statewide in 2018, only one surgical site infection following a hip replacement in an ambulatory surgery center was reported.

Seventeen ambulatory surgery centers performed 692 outpatient hip replacements in adults in 2018. Only one SSI following hip replacement was reported in 2018, for a total of five in the last three years (Table 37). No statewide comparison to the national baseline could be made because risk-adjustment models were not available at the time of this report (Table 12).



Table 33: Surgical Site Infections for Inpatient Hip Replacements (Total or Partial) in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	111	0	0	Same	143	1	0.8	Same	131	0	0	Same
Avista Adventist Hospital	Louisville	97	2	***	***	96	2	***	***	101	1	***	***
Banner Fort Collins Medical Center	Fort Collins	34	0	***	***	62	0	***	***	74	1	***	***
Boulder Community Hospital, Foothills	Boulder	389	2	0.9	Same	406	1	0.4	Same	402	2	0.9	Same
Castle Rock Adventist Hospital	Castle Rock	30	0	***	***	63	1	***	***	48	1	***	***
Colorado Plains Medical Center	Fort Morgan	24	0	***	***	10	***	***	***	18	***	***	***
Community Hospital	Grand Junction	80	1	***	***	84	1	***	***	117	0	0	Same
Delta County Memorial Hospital	Delta	25	0	***	***	25	0	***	***	65	2	***	***
Denver Health Medical Center	Denver	109	2	1.2	Same	92	3	2.6	Same	143	2	1.0	Same
Exempla Good Samaritan Medical Center	Lafayette	518	7	1.6	Same	476	4	1.0	Same	560	6	1.2	Same
Exempla St. Joseph Hospital	Denver	752	3	0.4	Same	686	2	0.3	Same	521	5	1.1	Same
Littleton Adventist Hospital	Littleton	182	3	1.5	Same	161	3	2.1	Same	276	2	0.7	Same
Longmont United Hospital	Longmont	94	1	0.9	Same	112	0	0	Same	103	2	2.0	Same
Longs Peak Hospital	Longmont	---	---	---	---	0	***	***	***	31	0	***	***
Lutheran Medical Center	Wheat Ridge	206	5	2.1	Same	243	2	0.8	Same	198	1	0.5	Same
McKee Medical Center	Loveland	101	2	***	***	112	0	***	***	141	0	0	Same
Medical Center of the Rockies	Loveland	192	4	2.1	Same	238	2	0.9	Same	267	6	2.5	Worse
Memorial Health System	Colorado Springs	139	0	0	Same	156	2	1.15	Same	186	1	0.5	Same
Memorial Hospital North	Colorado Springs	162	1	0.63	Same	163	0	0	Same	121	3	2.5	Same
Mercy Regional Medical Center	Durango	109	1	***	***	97	0	***	***	119	0	0	Same
Montrose Memorial Hospital	Montrose	78	0	***	***	87	0	***	***	89	1	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
North Colorado Medical Center	Greeley	157	1	0.6	Same	149	0	0	Same	140	0	0	Same
North Suburban Medical Center	Thornton	63	0	***	***	92	2	***	***	71	0	***	***
Ortho Colorado	Lakewood	575	2	0.5	Same	668	6	1.3	Same	672	0	0	Better
Parker Adventist Hospital	Parker	154	6	3.6	Worse	143	3	2.2	Same	233	3	1.0	Same
Parkview Medical Center	Pueblo	214	1	0.3	Same	173	3	1.2	Same	205	2	0.6	Same
Penrose St. Francis Health Services	Colorado Springs	555	0	0	Better	609	1	0.2	Better	641	0	0	Better
Platte Valley Medical Center	Brighton	79	2	***	***	75	0	***	***	73	0	***	***
Porter Adventist Hospital	Denver	854	9	1.3	Same	774	6	0.9	Same	709	10	1.4	Same
Poudre Valley Health System	Fort Collins	670	5	1.0	Same	659	8	1.7	Same	667	4	0.9	Same
Presbyterian St. Luke's Medical Center	Denver	197	11	2.8	Worse	175	5	1.7	Same	158	5	2.0	Same
Rose Medical Center	Denver	277	0	0	Same	308	3	1.5	Same	365	3	1.0	Same
Sky Ridge Medical Center	Lone Tree	963	10	1.1	Same	1,034	7	0.8	Same	1,069	9	1.1	Same
St. Anthony Hospital	Lakewood	116	1	0.6	Same	110	2	1.3	Same	103	0	0	Same
St. Anthony North Health Campus	Westminster	67	1	***	***	89	1	***	***	120	1	0.7	Same
St. Anthony Summit Medical Center	Frisco	35	0	***	***	42	0	***	***	33	2	***	***
St. Francis Medical Center	Colorado Springs	349	3	0.9	Same	358	4	1.1	Same	446	4	0.8	Same
St. Mary Corwin Medical Center	Pueblo	225	2	0.7	Same	231	2	0.8	Same	184	4	1.9	Same
St. Mary's Hospital	Grand Junction	325	0	0	Same	390	3	0.9	Same	347	1	0.3	Same
St. Thomas More Hospital	Canon City	39	1	***	***	70	1	***	***	58	0	***	***
Sterling Regional Medical Center	Sterling	40	0	***	***	40	1	***	***	27	0	***	***
Swedish Medical Center	Englewood	307	5	1.5	Same	358	6	1.5	Same	341	6	1.4	Same
The Medical Center of Aurora	Aurora	207	3	1.3	Same	223	1	0.4	Same	228	2	0.9	Same

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
UCHealth Broomfield Hospital	Broomfield	0	***	***	***	---	---	---	---	0	***	***	***
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	101	2	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	76	1	***	***	85	1	***	***	96	0	***	***
University of Colorado Hospital	Aurora	384	6	1.2	Same	461	10	1.7	Same	545	11	1.7	Same
Vail Valley Medical Center	Vail	25	0	***	***	105	1	***	***	170	0	***	***
Valley View Hospital	Glenwood Springs	124	1	***	***	95	2	***	***	104	1	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2015.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

Table 34: Surgical Site Infections for Outpatient Hip Replacements (Total or Partial) in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	6	***	***	***	9	***	***	***	4	***	***	***
Avista Adventist Hospital	Louisville	1	***	***	***	---	---	---	---	---	---	---	---
Banner Fort Collins Medical Center	Fort Collins	---	---	---	---	1	***	***	***	---	---	---	---
Boulder Community Hospital, Foothills	Boulder	---	---	---	---	---	---	---	---	18	***	***	***
Castle Rock Adventist Hospital	Castle Rock	2	***	***	***	1	***	***	***	6	***	***	***
Colorado Plains Medical Center	Fort Morgan	1	***	***	***	1	***	***	***	---	---	---	---
Exempla Good Samaritan Medical Center	Lafayette	---	---	---	---	1	***	***	***	1	***	***	***
Exempla St. Joseph Hospital	Denver	1	***	***	***	---	---	---	---	13	***	***	***
Longmont United Hospital	Longmont	---	---	---	---	---	---	---	---	3	***	***	***
Lutheran Medical Center	Wheat Ridge	2	***	***	***	5	***	***	***	11	***	***	***
McKee Medical Center	Loveland	---	---	---	---	---	---	---	---	1	***	***	***
Memorial Hospital North	Colorado Springs	1	***	***	***	---	---	---	---	---	---	---	---
Mercy Regional Medical Center	Durango	---	---	---	---	---	---	---	---	1	***	***	***
Montrose Memorial Hospital	Montrose	3	***	***	***	---	---	---	---	1	***	***	***
North Suburban Medical Center	Thornton	---	---	---	---	1	***	***	***	2	***	***	***
Ortho Colorado	Lakewood	2	***	***	***	3	***	***	***	1	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Parker Adventist Hospital	Parker	43	0	***	***	47	2	***	***	66	0	***	***
Parkview Medical Center	Pueblo	---	---	---	---	1	***	***	***	1	***	***	***
Penrose St. Francis Health Services	Colorado Springs	15	***	***	***	17	***	***	***	2	***	***	***
Platte Valley Medical Center	Brighton	1	***	***	***	---	---	---	---	---	---	---	---
Porter Adventist Hospital	Denver	---	---	---	---	---	---	---	---	14	***	***	***
Poudre Valley Health System	Fort Collins	1	***	***	***	1	***	***	***	---	---	---	---
Presbyterian St. Luke's Medical Center	Denver	---	---	---	---	---	---	---	---	6	***	***	***
Rose Medical Center	Denver	---	---	---	---	2	***	***	***	1	***	***	***
Sky Ridge Medical Center	Lone Tree	3	***	***	***	18	***	***	***	55	0	***	***
St. Anthony North Health Campus	Westminster	3	***	***	***	3	***	***	***	15	***	***	***
St. Francis Medical Center	Colorado Springs	20	0	***	***	6	***	***	***	---	---	---	---
St. Mary Corwin Medical Center	Pueblo	1	***	***	***	---	---	---	---	---	---	---	---
Swedish Medical Center	Englewood	---	---	---	---	---	---	---	---	25	0	***	***
The Medical Center of Aurora	Aurora	1	***	***	***	3	***	***	***	1	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	1	***	***	***	---	---	---	---	1	***	***	***
University of Colorado Hospital	Aurora	---	---	---	---	---	---	---	---	1	***	***	***
Vail Valley Medical Center	Vail	---	---	---	---	1	***	***	***	17	***	***	***
Valley View Hospital	Glenwood Springs	1	***	***	***	---	---	---	---	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2015.

Analysis includes adult patients  $\geq 18$  years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 35: Surgical Site Infections for Inpatient Hip Replacements (Total or Partial) in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	1	***	***	***	20	0	***	***	15	***	***	***
Aspen Valley Hospital	Aspen	10	***	***	***	10	***	***	***	10	***	***	***
Colorado Canyons Hospital And Medical Center	Fruita	1	***	***	***	14	***	***	***	11	***	***	***
East Morgan County Hospital	Brush	0	***	***	***	1	***	***	***	1	***	***	***
Estes Park Medical Center	Estes Park	7	***	***	***	9	***	***	***	15	***	***	***
Grand River Medical Center	Rifle	13	***	***	***	32	0	***	***	23	0	***	***
Gunnison Valley Hospital	Gunnison	14	***	***	***	19	***	***	***	30	0	***	***
Heart of the Rockies Regional Medical Center	Salida	29	0	***	***	18	***	***	***	28	0	***	***
Melissa Memorial Hospital	Holyoke	---	---	---	---	2	***	***	***	7	***	***	***
Mount San Rafael Hospital	Trinidad	---	---	---	---	---	---	---	---	0	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	11	***	***	***	19	***	***	***	17	***	***	***
Pioneers Medical Center	Meeker	15	***	***	***	20	0	***	***	13	***	***	***
San Luis Valley Health Conejos County Hospital	La Jara	---	---	---	---	3	***	***	***	---	---	---	---
Southwest Memorial Hospital	Cortez	19	***	***	***	15	***	***	***	15	***	***	***
The Memorial Hospital at Craig	Craig	26	0	***	***	---	---	---	---	24	0	***	***
UC Health Pikes Peak Regional Hospital	Woodland Park	10	***	***	***	10	***	***	***	14	***	***	***
Wray Community District Hospital	Wray	1	***	***	***	15	***	***	***	8	***	***	***
Yuma District Hospital	Yuma	---	---	---	---	---	---	---	---	0	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 36: Surgical Site Infections for Outpatient Hip Replacements (Total or Partial) in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Aspen Valley Hospital	Aspen	1	***	***	***	---	---	---	---	---	---	---	---
Colorado Canyons Hospital And Medical Center	Fruita	1	***	***	***	---	---	---	---	---	---	---	---
Heart of the Rockies Regional Medical Center	Salida	---	---	---	---	1	***	***	***	---	---	---	---
Melissa Memorial Hospital	Holyoke	1	***	***	***	---	---	---	---	---	---	---	---
The Memorial Hospital at Craig	Craig	---	---	---	---	---	---	---	---	1	***	***	***
UCHealth Pikes Peak Regional Hospital	Woodland Park	---	---	---	---	---	---	---	---	1	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.



**Table 37: Surgical Site Infections for Outpatient Hip Replacements (Total or Partial) in Ambulatory Surgery Centers  
Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016			2017			2018		
		No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate
Audubon Ambulatory Surgery at Penrose St. Francis	Colorado Springs	12	***	***	25	0	0	30	0	0
Boulder Surgery Center	Boulder	---	---	---	---	---	---	44	0	0
Cherry Creek Surgery Center	Denver	65	0	0	82	0	0	37	0	0
Crown Point Surgery	Parker	13	***	***	15	***	***	24	0	0
Flatirons Surgery Center	Louisville	20	0	0	16	***	***	23	0	0
Front Range Orthopedic Surgery Center	Longmont	---	---	---	---	---	---	11	***	***
Hampden Surgery Center	Denver	1	***	***	1	***	***	3	***	***
Kaiser Permanente Ambulatory Surgery Center, Lone Tree	Lone Tree	---	---	---	---	---	---	26	0	0
Lincoln Surgery Center	Parker	122	1	0.8	108	1	0.9	147	0	0
Midtown Surgical	Denver	---	---	---	---	---	---	3	***	***
Mile High Surgery Center	Greenwood	28	0	0	30	0	0	23	0	0
Orthopaedic and Spine Center of the Rockies	Fort Collins	10	***	***	15	***	***	12	***	***
Orthopaedic and Spine Center of Southern Colorado	Colorado Springs	---	---	---	66	0	0	98	1	1
Rocky Mountain Surgery Center	Englewood	---	---	---	---	---	---	7	***	***
Rose Surgical Center	Denver	1	***	***	---	---	---	---	---	---
Surgery Center at Lutheran	Wheat Ridge	26	0	0	27	0	0	23	0	0
Vail Valley Surgery Center	Edwards	---	---	---	81	0	0	178	0	0
	Vail	---	---	---	---	---	---	3	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Surgical-site infections in hysterectomies

### Overview

In the past, hysterectomies were performed by making a large abdominal incision to access the uterus and surrounding anatomy. This traditional, open abdominal surgery often causes significant pain, threat to surrounding organs and nerves, long recovery periods, and a higher risk of bleeding and infection.<sup>7</sup> Surgeons now typically use less invasive techniques such as vaginal hysterectomies and abdominal hysterectomies using smaller incisions and scopes. In vaginal hysterectomies, the procedure is completed through the vagina with no abdominal incisions. Compared to traditional, open abdominal hysterectomies, vaginal hysterectomies have been shown to result in fewer surgical complications and infections.<sup>8</sup> Surgical site infections (SSIs) following abdominal hysterectomies are reportable by acute care hospitals, critical access hospitals, and ambulatory surgery centers; only ambulatory surgery centers are required to report vaginal hysterectomies. This report presents SSI data for both abdominal and vaginal hysterectomies. Abdominal and vaginal hysterectomies are monitored for 30 days for all SSIs. Further explanation of the three types of SSIs is available in Appendix A.

Acute care hospitals are facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. Ambulatory surgery centers are surgery centers that provide outpatient surgical procedures. A detailed explanation of CMS and Colorado guidelines for facility classification are in Appendix C.

Data in **Tables 38-43** are presented by facility type and inpatient versus outpatient status. NHSN defines an inpatient operative procedure as a procedure on a patient whose date of admission to the health care facility and the date of discharge are different calendar days. An outpatient operative procedure occurs when a patient is admitted and discharged in the same calendar day.

A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

No SIR can be calculated for SSIs following hysterectomies in ambulatory surgery centers, as this analysis was not available at the time of this report. Rates presented are not risk-adjusted for ambulatory surgery centers.

### Results: acute care hospitals

**In 2018, statewide surgical site infections following inpatient abdominal hysterectomies in acute care hospitals were 31percent lower (statistically better) than the national baseline.**

In 2018, 45 hospitals reported 5,402 inpatient abdominal hysterectomies among adult patients in acute care hospitals (**Table 38**). One hospital had a count of SSIs following inpatient abdominal hysterectomies that was better than the national baseline. Fifteen hospitals reported no SSIs following inpatient abdominal hysterectomies. Statewide in 2018 the count of SSIs for abdominal hysterectomies was 31percent lower (statistically better) than the national baseline for adult patients in acute care hospitals (**Table 9**).

In 2018, 40 acute care hospitals reported 1,846 outpatient abdominal hysterectomies among adults (Table 39). Only three hospitals could have an SIR calculated; they were all the statistically the same as the national baseline. Fourteen hospitals reported no SSIs following abdominal hysterectomies when excluding suppressed data. In 2018, SSIs following outpatient abdominal hysterectomies was the same as the national baseline for adults in acute care hospitals (Table 9).

## Results: critical access hospitals

*In 2018, surgical site infections following inpatient or outpatient abdominal hysterectomies in critical access hospitals could not be compared to the national baseline.*

Eight critical access hospitals reported 43 inpatient abdominal hysterectomies among adults in 2018 (Table 40). No national comparison could be made for the facilities or the state (Table 10).

Only one critical access hospital reported one outpatient abdominal hysterectomy in 2018 (Table 41). Four facilities have performed at least one abdominal hysterectomy between 2016 and 2018. No statewide comparison to the national baseline could be made (Table 10).

## Results: ambulatory surgery centers

*From 2016 to 2018, no surgical site infections have been reported following an outpatient vaginal hysterectomy or an outpatient abdominal hysterectomy at an ambulatory surgery center.*

Five ambulatory surgery centers reported 85 outpatient abdominal hysterectomies (Table 42), with no SSIs following a procedure reported in 2018 when excluding suppressed data. Data is suppressed for facilities that performed less than 20 or the predicted number of infections was less than one. No statewide comparison to the national baseline could be made (Table 12).

Four ambulatory surgery centers reported 66 outpatient vaginal hysterectomies with one facility reporting 56 (Table 43). No SSIs have been reported following an outpatient vaginal hysterectomy at an ambulatory surgery center from 2016-2018 when excluding suppressed data. Data is suppressed for facilities that performed less than 20 or the predicted number of infections was less than one. No statewide comparison to the national baseline could be made (Table 12).

**Table 38: Surgical Site Infections for Inpatient Abdominal Hysterectomies in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	8	***	***	***	2	***	***	***	13	***	***	***
Avista Adventist Hospital	Louisville	156	1	0.5	Same	148	0	0	Same	139	1	0.6	Same
Banner Fort Collins Medical Center	Fort Collins	33	0	***	***	30	0	***	***	22	0	***	***
Boulder Community Hospital, Foothills	Boulder	76	0	***	***	77	0	***	***	85	0	***	***
Castle Rock Adventist Hospital	Castle Rock	27	0	***	***	16	***	***	***	14	***	***	***
Colorado Plains Medical Center	Fort Morgan	18	***	***	***	22	0	***	***	22	0	***	***
Community Hospital	Grand Junction	72	3	2.9	Same	80	1	0.6	Same	71	0	0	Same
Delta County Memorial Hospital	Delta	5	***	***	***	7	***	***	***	21	0	***	***
Denver Health Medical Center	Denver	74	1	0.5	Same	76	4	1.9	Same	79	1	0.5	Same
Exempla Good Samaritan Medical Center	Lafayette	106	0	0	Same	90	0	***	***	83	1	***	***
Exempla St. Joseph Hospital	Denver	372	2	0.3	Better	327	3	0.5	Same	203	0	0	Better
Littleton Adventist Hospital	Littleton	337	3	0.7	Same	392	2	0.7	Same	313	1	0.4	Same
Longmont United Hospital	Longmont	40	0	***	***	141	2	1.9	Same	51	0	***	***
Longs Peak Hospital	Longmont	---	---	---	---	3	***	***	***	68	2	1.7	Same
Lutheran Medical Center	Wheat Ridge	225	3	1.3	Same	218	1	0.4	Same	189	0	0	Same
McKee Medical Center	Loveland	277	5	2.1	Same	282	3	1.3	Same	256	0	0	Same
Medical Center of the Rockies	Loveland	79	1	0.7	Same	149	1	0.4	Same	156	3	1.4	Same
Memorial Health System	Colorado Springs	31	2	***	***	155	1	0.4	Same	180	6	2.0	Same
Memorial Hospital North	Colorado Springs	16	***	***	***	74	0	0	Same	105	0	0	Same
Mercy Regional Medical Center	Durango	63	1	0.9	Same	62	1	***	***	53	1	***	***
Montrose Memorial Hospital	Montrose	101	1	***	***	80	0	***	***	34	1	***	***
North Colorado Medical Center	Greeley	70	3	***	***	47	0	***	***	81	1	0.9	Same
North Suburban Medical Center	Thornton	154	1	0.7	Same	158	1	0.7	Same	168	1	0.7	Same

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Parker Adventist Hospital	Parker	198	1	0.4	Same	237	4	1.8	Same	173	1	0.6	Same
Parkview Medical Center	Pueblo	264	0	0	Better	153	1	0.6	Same	62	0	0	Same
Penrose St. Francis Health Services	Colorado Springs	253	1	0.4	Same	322	3	0.7	Same	307	3	0.9	Same
Platte Valley Medical Center	Brighton	75	2	***	***	49	1	***	***	48	0	***	***
Porter Adventist Hospital	Denver	60	0	***	***	29	0	***	***	13	***	***	***
Poudre Valley Health System	Fort Collins	240	4	1.1	Same	239	1	0.3	Same	207	1	0.3	Same
Presbyterian St. Luke's Medical Center	Denver	121	0	0	Same	155	1	0.5	Same	111	1	0.7	Same
Rose Medical Center	Denver	272	1	0.3	Same	221	2	0.7	Same	226	5	1.6	Same
Sky Ridge Medical Center	Lone Tree	250	0	0	Same	323	1	0.3	Same	493	4	0.9	Same
St. Anthony Hospital	Lakewood	18	***	***	***	34	0	***	***	14	***	***	***
St. Anthony North Health Campus	Westminster	74	5	4.2	Worse	88	0	0	Same	100	2	1.7	Same
St. Anthony Summit Medical Center	Frisco	19	***	***	***	23	0	***	***	31	1	***	***
St. Francis Medical Center	Colorado Springs	237	5	2.1	Same	293	1	0.4	Same	321	2	0.7	Same
St. Mary Corwin Medical Center	Pueblo	43	0	***	***	22	0	***	***	0	***	***	***
St. Mary's Hospital	Grand Junction	150	0	0	Same	159	1	0.6	Same	190	2	1.0	Same
St. Thomas More Hospital	Canon City	46	1	***	***	28	0	***	***	45	0	***	***
Sterling Regional Medical Center	Sterling	4	***	***	***	2	***	***	***	1	***	***	***
Swedish Medical Center	Englewood	325	3	0.7	Same	262	0	0	Same	229	0	0	Same
The Medical Center of Aurora	Aurora	78	1	***	***	98	1	0.7	Same	74	2	1.9	Same
UCHealth Broomfield Hospital	Broomfield	0	***	***	***	0	***	***	***	0	***	***	***
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	0	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	6	***	***	***	6	***	***	***	20	0	***	***
University of Colorado Hospital	Aurora	213	13	2.2	Worse	199	15	2.6	Worse	268	4	0.5	Same
Vail Valley Medical Center	Vail	12	***	***	***	6	***	***	***	3	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Valley View Hospital	Glenwood Springs	42	0	***	***	45	0	***	***	48	1	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 39: Surgical Site Infections for Outpatient Abdominal Hysterectomies in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	---	---	---	---	---	---	---	---	1	***	***	***
Avista Adventist Hospital	Louisville	2	***	***	***	2	***	***	***	4	***	***	***
Banner Fort Collins Medical Center	Fort Collins	---	---	---	---	1	***	***	***	---	---	---	---
Boulder Community Hospital, Foothills	Boulder	2	***	***	***	2	***	***	***	2	***	***	***
Castle Rock Adventist Hospital	Castle Rock	3	***	***	***	4	***	***	***	2	***	***	***
Colorado Plains Medical Center	Fort Morgan	---	---	---	---	---	---	---	---	1	***	***	***
Community Hospital	Grand Junction	8	***	***	***	6	***	***	***	7	***	***	***
Delta County Memorial Hospital	Delta	2	***	***	***	8	***	***	***	---	---	---	---
Denver Health Medical Center	Denver	5	***	***	***	6	***	***	***	4	***	***	***
Exempla Good Samaritan Medical Center	Lafayette	172	0	***	***	190	2	2.0	Same	185	0	0	Same
Exempla St. Joseph Hospital	Denver	149	0	***	***	193	2	1.8	Same	254	0	0	Same
Littleton Adventist Hospital	Littleton	8	***	***	***	12	***	***	***	23	0	***	***
Longmont United Hospital	Longmont	152	1	***	***	1	***	***	***	6	***	***	***
Longs Peak Hospital	Longmont	---	---	---	---	5	***	***	***	68	0	***	***
Lutheran Medical Center	Wheat Ridge	132	1	***	***	126	0	***	***	154	0	***	***
McKee Medical Center	Loveland	---	---	---	---	---	---	---	---	1	***	***	***
Medical Center of the Rockies	Loveland	33	0	***	***	1	***	***	***	33	0	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Memorial Health System	Colorado Springs	138	2	***	***	1	***	***	***	2	***	***	***
Memorial Hospital North	Colorado Springs	125	1	***	***	124	1	***	***	156	2	***	***
Mercy Regional Medical Center	Durango	---	---	---	---	2	***	***	***	---	---	---	---
Montrose Memorial Hospital	Montrose	4	***	***	***	39	0	***	***	90	0	***	***
North Colorado Medical Center	Greeley	89	2	***	***	37	0	***	***	31	0	***	***
North Suburban Medical Center	Thornton	35	0	***	***	29	0	***	***	29	0	***	***
Parker Adventist Hospital	Parker	45	0	***	***	22	0	***	***	19	***	***	***
Parkview Medical Center	Pueblo	12	***	***	***	40	0	***	***	44	0	***	***
Penrose St. Francis Health Services	Colorado Springs	57	0	***	***	12	***	***	***	2	***	***	***
Platte Valley Medical Center	Brighton	1	***	***	***	2	***	***	***	7	***	***	***
Porter Adventist Hospital	Denver	60	0	***	***	36	0	***	***	52	0	***	***
Poudre Valley Health System	Fort Collins	92	0	***	***	1	***	***	***	7	***	***	***
Presbyterian St. Luke's Medical Center	Denver	---	---	---	---	6	***	***	***	4	***	***	***
Rose Medical Center	Denver	144	1	***	***	150	0	***	***	201	2	***	***
Sky Ridge Medical Center	Lone Tree	163	0	***	***	158	1	***	***	197	1	1.0	Same
St. Anthony Hospital	Lakewood	3	***	***	***	1	***	***	***	1	***	***	***
St. Anthony North Health Campus	Westminster	2	***	***	***	3	***	***	***	---	---	---	---
St. Anthony Summit Medical Center	Frisco	1	***	***	***	4	***	***	***	3	***	***	***



Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
St. Francis Medical Center	Colorado Springs	170	1	***	***	29	0	***	***	19	***	***	***
St. Mary Corwin Medical Center	Pueblo	46	0	***	***	38	0	***	***	---	---	---	---
St. Mary's Hospital	Grand Junction	3	***	***	***	4	***	***	***	7	***	***	***
St. Thomas More Hospital	Canon City	---	---	---	---	1	***	***	***	1	***	***	***
Sterling Regional Medical Center	Sterling	1	***	***	***	---	---	---	---	---	---	---	---
Swedish Medical Center	Englewood	9	***	***	***	10	***	***	***	41	0	***	***
The Medical Center of Aurora	Aurora	12	***	***	***	18	***	***	***	30	0	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	62	0	***	***	49	1	***	***	33	0	***	***
University of Colorado Hospital	Aurora	154	2	1.8	Same	180	4	3.5	Worse	122	4	***	***
Vail Valley Medical Center	Vail	2	***	***	***	---	---	---	---	2	***	***	***
Valley View Hospital	Glenwood Springs	4	***	***	***	1	***	***	***	1	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 40: Surgical Site Infections for Inpatient Abdominal Hysterectomies in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	0	***	***	***	0	***	***	***	0	***	***	***
Aspen Valley Hospital	Aspen	6	***	***	***	6	***	***	***	8	***	***	***
Colorado Canyons Hospital And Medical Center	Fruita	---	---	---	---	0	***	***	***	0	***	***	***
East Morgan County Hospital	Brush	7	***	***	***	0	***	***	***	0	***	***	***
Estes Park Medical Center	Estes Park	2	***	***	***	4	***	***	***	6	***	***	***
Grand River Medical Center	Rifle	2	***	***	***	5	***	***	***	1	***	***	***
Gunnison Valley Hospital	Gunnison	2	***	***	***	5	***	***	***	1	***	***	***
Heart of the Rockies Regional Medical Center	Salida	9	***	***	***	3	***	***	***	6	***	***	***
Melissa Memorial Hospital	Holyoke	0	***	***	***	0	***	***	***	0	***	***	***
Mount San Rafael Hospital	Trinidad	4	***	***	***	5	***	***	***	6	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	0	***	***	***	0	***	***	***	0	***	***	***
Pioneers Medical Center	Meeker	0	***	***	***	0	***	***	***	0	***	***	***
Prowers Medical Center	Lamar	1	***	***	***	5	***	***	***	4	***	***	***
SLV Conejos County Hospital	La Jara	---	---	---	---	1	***	***	***	---	---	---	---
Southeast Colorado Hospital	Springfield	0	***	***	***	0	***	***	***	0	***	***	***
Southwest Memorial Hospital	Cortez	7	***	***	***	13	***	***	***	11	***	***	***
Spanish Peaks Regional Health Center	Walsenburg	0	***	***	***	0	***	***	***	0	***	***	***
The Memorial Hospital at Craig	Craig	2	***	***	***	---	---	---	---	---	---	---	---
UCHealth Pikes Peak Regional Hospital	Woodland Park	0	***	***	***	0	***	***	***	0	***	***	***
Wray Community District Hospital	Wray	0	***	***	***	0	***	***	***	0	***	***	***
Yuma District Hospital	Yuma	0	***	***	***	0	***	***	***	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 41: Surgical Site Infections for Outpatient Abdominal Hysterectomies in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Colorado Canyons Hospital And Medical Center	Fruita	4	***	***	***	1	***	***	***	---	---	---	---
Gunnison Valley Hospital	Gunnison	2	***	***	***	---	---	---	---	---	---	---	---
Southwest Memorial Hospital	Cortez	---	---	---	---	---	---	---	---	1	***	***	***
The Memorial Hospital at Craig	Craig	1	***	***	***	---	---	---	---	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 42: Surgical Site Infections for Outpatient Abdominal Hysterectomies in Ambulatory Surgery Centers – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016			2017			2018		
		No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate
Harvard Park Surgery Center	Denver	6	***	***	1	***	***	---	---	---
Kaiser Permanente Ambulatory Surgery Center, Lone Tree	Lone Tree	21	0	0	21	0	0	31	0	0
Kaiser Permanente Ambulatory Surgery	Denver	38	0	0	26	0	0	48	0	0
Peak One Surgery Center	Frisco	---	---	---	1	***	***	---	---	---
Pueblo Surgery Center	Pueblo	---	---	---	1	***	***	1	***	***
Red Rocks Surgery Center	Golden	---	---	---	---	---	---	2	***	***
Sky Ridge Surgical Center	Lone Tree	6	***	***	6	***	***	---	---	---
Surgery Center of Fort Collins	Fort Collins	---	---	---	---	---	---	3	***	***
UHealth Printers Park Surgery Center	Colorado Springs	6	***	***	---	---	---	---	---	---
Vail Valley Surgery Center	Edwards	1	***	***	---	---	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 43: Surgical Site Infections for Outpatient Vaginal Hysterectomies in Ambulatory Surgery Centers – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016			2017			2018		
		No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate	No. of Procedures	No. of Infections	Rate
Kaiser Permanente Ambulatory Surgery	Denver	---	---	---	---	---	---	5	***	***
Pueblo Surgery Center	Pueblo	1	***	***	1	***	***	4	***	***
Red Rocks Surgery Center	Golden	---	---	---	---	---	---	1	***	***
Summit View Surgery Center	Littleton	1	***	***	---	---	---	---	---	---
Surgery Center of Fort Collins	Fort Collins	77	0	0	45	0	0	56	0	0

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

## Surgical-site infections in knee replacements

### Overview

A total or partial knee replacement is a surgery for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis or traumatic arthritis. A total knee replacement involves removing the damaged cartilage and bone from the surface of the knee joint and replacing them with an artificial device. In this procedure, the patella (kneecap) is removed, the femur (thighbone) and tibia (shinbone) are cut down, and a metal, ceramic, or plastic prosthesis is put in place. Knee replacements are monitored for 30 days for a superficial SSI and 90 days for all other SSIs. Further explanation of the three types of SSIs is available in Appendix A.

SSIs following knee replacement surgeries are reportable by acute care hospitals, critical access hospitals, and ambulatory surgery centers. Acute care hospitals are facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Critical access hospitals are rural hospitals that maintain 24-hour emergency care services 7 days a week and have less than 25 inpatient beds. Ambulatory surgery centers are surgery centers that provide outpatient surgical procedures. A detailed explanation of Centers for Medicare and Medicaid Services (CMS) and Colorado guidelines for facility classification are in Appendix C.

Data are presented by facility type and inpatient versus outpatient status. NHSN defines an inpatient operative procedure as a procedure on a patient whose date of admission to the health care facility and the date of discharge are different calendar days. An outpatient operative procedure occurs when a patient is admitted and discharged in the same calendar day.

A detailed explanation of how the SIR is calculated is in Appendix B. The three categories summarizing how a Colorado facility compares to the national infection baseline are:

- Statistically lower infections than the national baseline (better);
- Statistically similar infections as the national baseline (same); or
- Statistically higher infections than the national baseline (worse).

### Results: acute care hospitals

**Statewide in 2018, surgical site infections following inpatient or outpatient knee replacements in acute care hospitals were the same as the national baseline.**

In 2018, 49 acute care hospitals performed 17,281 inpatient knee replacements in adults. Four acute care hospitals had SSIs following inpatient knee replacements that were statistically worse than the national baseline (**Table 44**). Excluding suppressed data, in 2018, 10 hospitals reported no SSIs following inpatient knee replacements. Statewide, SSIs following inpatient knee replacements were statistically the same as the national baseline for adults in acute care hospitals (**Table 9**).

In 2018, 30 acute care hospitals performed 686 outpatient knee replacements in adults. One acute care hospital had a knee replacement SSI count among adult patients similar to the national baseline; no other facility specific SIRs could be calculated in 2018 (**Table 45**). In acute care hospitals in 2018, SSI counts following outpatient knee replacements were similar (statistically the same) to the national baseline (**Table 9**).

## Results: critical access hospitals

In 2018, a comparison between surgical site infections following inpatient or outpatient knee replacements in critical access hospitals could not be drawn to the national baseline.

Seventeen critical access hospitals reported 431 inpatient knee replacements in 2018. SSI data in critical access hospitals was largely suppressed as very few knee replacements were performed in most facilities (Table 46). No statewide comparison to the national baseline could be made among inpatient procedures (Table 10).

Six critical access hospitals performed 10 outpatient knee replacements on adults in 2018. SSI data among adult outpatients in critical access hospitals was suppressed as very few knee replacements were performed in most facilities (Table 47). No statewide comparison to the national baseline could be made among outpatient procedures (Table 10).

## Results: ambulatory surgery centers

In 2018, three surgical site infections following outpatient knee replacement were reported in ambulatory surgery centers.

Nineteen ambulatory surgery centers performed 1,396 outpatient knee replacements in adults in 2018 (Table 48). Facility and statewide SIR SSI data is suppressed due to a low number of procedures or a predicted number of infections less than 1 (Table 11). Three SSIs were reported in 2018.

Table 44: Surgical Site Infections for Inpatient Knee Replacements (Total or Partial) in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	202	0	0	Same	233	0	0	Same	236	0	0	Same
Avista Adventist Hospital	Louisville	177	2	***	***	190	1	***	***	150	0	***	***
Banner Fort Collins Medical Center	Fort Collins	32	0	***	***	75	0	***	***	74	0	***	***
Boulder Community Hospital, Foothills	Boulder	400	4	2.8	Same	406	0	0	Same	477	0	0	Same
Castle Rock Adventist Hospital	Castle Rock	82	1	***	***	105	2	***	***	97	1	***	***
Colorado Plains Medical Center	Fort Morgan	58	0	***	***	45	0	***	***	33	1	***	***
Community Hospital	Grand Junction	147	2	***	***	165	0	***	***	200	1	0.9	Same
Delta County Memorial Hospital	Delta	131	0	***	***	124	0	***	***	135	1	***	***
Denver Health Medical Center	Denver	160	1	1.0	Same	103	1	***	***	156	2	1.8	Same
Exempla Good Samaritan Medical Center	Lafayette	653	3	1.1	Same	740	6	1.9	Same	676	9	3.3	Worse
Exempla St. Joseph Hospital	Denver	983	3	0.6	Same	965	2	0.4	Same	920	8	1.7	Same
Littleton Adventist Hospital	Littleton	233	2	1.5	Same	230	1	0.7	Same	380	2	0.8	Same
Longmont United Hospital	Longmont	211	1	0.9	Same	278	0	0	Same	203	1	0.9	Same
Longs Peak Hospital	Longmont	---	---	---	---	0	***	***	***	17	***	***	***
Lutheran Medical Center	Wheat Ridge	157	1	***	***	256	2	1.6	Same	236	1	0.9	Same
McKee Medical Center	Loveland	148	1	***	***	137	0	***	***	185	1	0.8	Same
Medical Center of the Rockies	Loveland	338	7	3.6	Worse	328	3	1.7	Same	352	8	4.1	Worse
Memorial Health System	Colorado Springs	117	0	***	***	117	0	***	***	161	4	3.5	Worse
Memorial Hospital North	Colorado Springs	510	0	0	Same	435	2	1.0	Same	320	1	0.6	Same
Mercy Regional Medical Center	Durango	159	0	***	***	139	1	***	***	106	1	***	***
Montrose Memorial Hospital	Montrose	131	1	***	***	143	0	***	***	174	1	***	***



Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
North Colorado Medical Center	Greeley	327	2	0.9	Same	289	2	0.9	Same	325	4	1.6	Same
North Suburban Medical Center	Thornton	78	0	***	***	135	0	***	***	111	0	***	***
Ortho Colorado	Lakewood	1,276	5	0.9	Same	1,282	5	0.9	Same	1,397	3	0.5	Same
Parker Adventist Hospital	Parker	276	1	0.8	Same	237	3	2.0	Same	286	5	2.3	Same
Parkview Medical Center	Pueblo	369	1	0.3	Same	394	5	1.5	Same	437	3	0.6	Same
Penrose St. Francis Health Services	Colorado Springs	478	2	0.8	Same	641	3	0.9	Same	689	2	0.5	Same
Platte Valley Medical Center	Brighton	174	2	2	Same	184	3	***	***	148	0	***	***
Porter Adventist Hospital	Denver	1,417	5	0.8	Same	1,208	5	0.8	Same	863	2	0.4	Same
Poudre Valley Health System	Fort Collins	1,163	5	1.0	Same	1,336	4	0.8	Same	1,248	6	1.0	Same
Presbyterian St. Luke's Medical Center	Denver	264	9	2.6	Worse	231	12	4.0	Worse	224	5	2.1	Same
Rose Medical Center	Denver	450	4	1.3	Same	576	4	1.2	Same	643	2	0.5	Same
Sky Ridge Medical Center	Lone Tree	1,348	8	0.9	Same	1,567	8	0.9	Same	1,474	8	0.9	Same
St. Anthony Hospital	Lakewood	60	2	***	***	38	0	***	***	33	0	***	***
St. Anthony North Health Campus	Westminster	67	0	***	***	120	0	***	***	176	1	0.6	Same
St. Anthony Summit Medical Center	Frisco	48	0	***	***	58	0	***	***	36	0	***	***
St. Francis Medical Center	Colorado Springs	708	2	0.5	Same	712	5	1.3	Same	839	2	0.4	Same
St. Mary Corwin Medical Center	Pueblo	408	2	0.9	Same	444	0	0	Same	402	1	0.4	Same
St. Mary's Hospital	Grand Junction	445	0	0	Same	484	0	0	Same	425	3	1.5	Same
St. Thomas More Hospital	Canon City	92	2	***	***	120	2	***	***	97	0	***	***
Sterling Regional Medical Center	Sterling	23	0	***	***	32	0	***	***	46	2	***	***
Swedish Medical Center	Englewood	442	2	0.7	Same	506	4	1.3	Same	539	3	0.9	Same
The Medical Center of Aurora	Aurora	334	7	3.6	Worse	285	5	2.5	Same	279	6	2.8	Worse
UCHealth Broomfield Hospital	Broomfield	---	---	---	---	---	---	---	---	10	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
UCHealth Grandview Hospital	Colorado Springs	---	---	---	---	---	---	---	---	216	1	0.9	Same
UCHealth Yampa Valley Medical Center	Steamboat Springs	139	1	***	***	112	1	***	***	141	1	***	***
University of Colorado Hospital	Aurora	364	4	1.5	Same	401	3	1.0	Same	496	4	1.0	Same
Vail Valley Medical Center	Vail	84	2	***	***	271	1	***	***	155	0	***	***
Valley View Hospital	Glenwood Springs	168	3	2.9	Same	147	0	***	***	126	1	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

Table 45: Surgical Site Infections for Outpatient Knee Replacements (Total or Partial) in Acute Care Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	9	***	***	***	1	***	***	***	4	***	***	***
Avista Adventist Hospital	Louisville	---	---	---	---	2	***	***	***	2	***	***	***
Banner Fort Collins Medical Center	Fort Collins	---	---	---	---	1	***	***	***	---	---	---	---
Boulder Community Hospital, Foothills	Boulder	2	***	***	***	8	***	***	***	24	1	***	***
Castle Rock Adventist Hospital	Castle Rock	1	***	***	***	---	---	---	---	---	---	---	---
Colorado Plains Medical Center	Fort Morgan	---	---	---	---	3	***	***	***	7	***	***	***
Community Hospital	Grand Junction	---	---	---	---	---	---	---	---	1	***	***	***
Denver Health Medical Center	Denver	1	***	***	***	---	---	---	---	1	***	***	***
Exempla Good Samaritan Medical Center	Lafayette	---	---	---	---	1	***	***	***	2	***	***	***
Exempla St. Joseph Hospital	Denver	---	---	---	---	4	***	***	***	15	***	***	***
Littleton Adventist Hospital	Littleton	---	---	---	---	1	***	***	***	5	***	***	***
Lutheran Medical Center	Wheat Ridge	3	***	***	***	5	***	***	***	27	0	***	***
Medical Center of the Rockies	Loveland	4	***	***	***	---	---	---	---	---	---	---	---
Memorial Hospital North	Colorado Springs	3	***	***	***	1	***	***	***	---	---	---	---
Mercy Regional Medical Center	Durango	---	---	---	---	---	---	---	---	1	***	***	***
Montrose Memorial Hospital	Montrose	3	***	***	***	1	***	***	***	4	***	***	***
North Colorado Medical Center	Greeley	3	***	***	***	5	***	***	***	4	***	***	***
North Suburban Medical Center	Thornton	---	---	---	---	---	---	---	---	8	***	***	***
Ortho Colorado	Lakewood	---	---	---	---	3	***	***	***	2	***	***	***
Parker Adventist Hospital	Parker	97	0	***	***	135	3	***	***	147	1	0.7	Same
Parkview Medical Center	Pueblo	---	---	---	---	1	***	***	***	5	***	***	***
Penrose St. Francis Health Services	Colorado Springs	---	---	---	---	3	***	***	***	1	***	***	***
Porter Adventist Hospital	Denver	---	---	---	---	---	---	---	---	33	0	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Poudre Valley Health System	Fort Collins	2	***	***	***	---	---	---	---	---	---	---	---
Presbyterian St. Luke's Medical Center	Denver	---	---	---	---	---	---	---	---	2	***	***	***
Rose Medical Center	Denver	2	***	***	***	---	---	---	---	8	***	***	***
Sky Ridge Medical Center	Lone Tree	5	***	***	***	29	1	***	***	98	1	***	***
St. Anthony North Health Campus	Westminster	9	***	***	***	3	***	***	***	30	1	***	***
St. Anthony Summit Medical Center	Frisco	3	***	***	***	5	***	***	***	---	---	---	---
St. Francis Medical Center	Colorado Springs	5	***	***	***	---	---	---	---	2	***	***	***
St. Mary Corwin Medical Center	Pueblo	---	---	---	---	---	---	---	---	3	***	***	***
Swedish Medical Center	Englewood	1	***	***	***	2	***	***	***	9	***	***	***
The Medical Center of Aurora	Aurora	9	***	***	***	7	***	***	***	10	***	***	***
UCHealth Yampa Valley Medical Center	Steamboat Springs	7	***	***	***	3	***	***	***	9	***	***	***
University of Colorado Hospital	Aurora	1	***	***	***	4	***	***	***	2	***	***	***
Vail Valley Medical Center	Vail	1	***	***	***	2	***	***	***	220	0	***	***
Valley View Hospital	Glenwood Springs	4	***	***	***	---	---	---	---	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 46: Surgical Site Infections for Inpatient Knee Replacements (Total or Partial) in Critical Access Hospitals – Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	9	***	***	***	32	0	***	***	31	1	***	***
Aspen Valley Hospital	Aspen	68	0	***	***	74	5	***	***	64	0	***	***
Colorado Canyons Hospital And Medical Center	Fruita	7	***	***	***	20	0	***	***	11	***	***	***
East Morgan County Hospital	Brush	1	***	***	***	9	***	***	***	2	***	***	***
Estes Park Medical Center	Estes Park	9	***	***	***	23	0	***	***	18	***	***	***
Grand River Medical Center	Rifle	12	***	***	***	24	0	***	***	16	***	***	***
Gunnison Valley Hospital	Gunnison	36	0	***	***	56	1	***	***	45	0	***	***
Heart of the Rockies Regional Medical Center	Salida	62	0	***	***	31	0	***	***	32	0	***	***
Melissa Memorial Hospital	Holyoke	1	***	***	***	2	***	***	***	10	***	***	***
Middle Park Medical Center, Grandby	Granby	0	***	***	***	---	---	---	---	2	***	***	***
Mount San Rafael Hospital	Trinidad	---	---	---	---	---	---	---	---	3	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	37	0	***	***	45	0	***	***	39	0	***	***
Pioneers Medical Center	Meeker	28	1	***	***	26	0	***	***	24	0	***	***
Rio Grande Hospital	Del Norte	---	---	---	---	---	---	---	---	0	***	***	***
Southwest Memorial Hospital	Cortez	31	0	***	***	16	***	***	***	28	0	***	***
The Memorial Hospital at Craig	Craig	27	0	***	***	---	---	---	---	35	0	***	***
UCHealth Pikes Peak Regional Hospital	Woodland Park	30	0	***	***	38	0	***	***	34	0	***	***
Wray Community District Hospital	Wray	4	***	***	***	27	1	***	***	37	0	***	***
Yuma District Hospital	Yuma	2	***	***	***	0	***	***	***	0	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 47: Surgical Site Infections for Outpatient Knee Replacements (Total or Partial) in Critical Access Hospitals  
Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional Medical Center	La Junta	1	***	***	***	---	---	---	---	---	---	---	---
Aspen Valley Hospital	Aspen	2	***	***	***	1	***	***	***	---	---	---	---
Colorado Canyons Hospital And Medical Center	Fruita	1	***	***	***	---	---	---	---	---	---	---	---
Estes Park Medical Center	Estes Park	---	---	---	---	---	---	---	---	1	***	***	***
Grand River Medical Center	Rifle	---	---	---	---	---	---	---	---	1	***	***	***
Gunnison Valley Hospital	Gunnison	---	---	---	---	1	***	***	***	3	***	***	***
Pagosa Springs Medical Center	Pagosa Springs	1	***	***	***	---	---	---	---	1	***	***	***
Pioneers Medical Center	Meeker	---	---	---	---	---	---	---	---	3	***	***	***
Rio Grande Hospital	Del Norte	---	---	---	---	---	---	---	---	1	***	***	***
Southwest Memorial Hospital	Cortez	---	---	---	---	3	***	***	***	---	---	---	---

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.

**Table 48: Surgical Site Infections for Outpatient Knee Replacements (Total or Partial) in Ambulatory Surgery Centers  
Colorado, Jan. 1, 2016 - Dec. 31, 2018**

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Audubon Ambulatory Surgery	Colorado Springs	1	***	***	***	---	---	---	---	---	---	---	---
Audubon Ambulatory Surgery At St. Francis Medical Center	Colorado Springs	20	0	***	***	41	0	***	***	64	0	***	***
Boulder Surgery Center	Boulder	---	---	---	---	---	---	---	---	8	***	***	***
Cherry Creek Surgery Center	Denver	49	0	***	***	52	0	***	***	25	0	***	***
Crown Point Surgery	Parker	37	0	***	***	10	***	***	***	35	0	***	***
Flatirons Surgery Center	Louisville	33	0	***	***	21	0	***	***	19	***	***	***
Front Range Orthopedic Surgery Center	Longmont	---	---	---	---	---	---	---	---	22	0	***	***
Grand Valley Surgical Center	Grand Junction	1	***	***	***	1	***	***	***	2	***	***	***
Hampden Surgery Center	Denver	11	***	***	***	16	***	***	***	28	1	***	***
Kaiser Permanente Ambulatory Surgery Center, Lone Tree	Lone Tree	---	---	---	---	1	***	***	***	99	2	***	***
Lincoln Surgery Center	Parker	57	0	***	***	94	0	***	***	84	0	***	***
Midtown Surgical	Denver	---	---	---	---	---	---	---	---	4	***	***	***
Mile High Surgery Center	Greenwood	37	1	***	***	43	1	***	***	39	0	***	***
Musculoskeletal Surgery	Thornton	1	***	***	***	---	---	---	---	---	---	---	---
Orthopaedic & Spine Center of the Rockies	Fort Collins	540	0	***	***	572	0	***	***	517	0	***	***
Orthopaedic And Spine Center of Southern Colorado	Colorado Springs	---	---	---	---	90	0	***	***	136	0	***	***
Rocky Mountain Surgery Center	Englewood	---	---	---	---	---	---	---	---	2	***	***	***

Facility Name and City		2016				2017				2018			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Rose Surgical Center	Denver	2	***	***	***	5	***	***	***	8	***	***	***
Surgery Center At Lutheran	Wheat Ridge	41	0	***	***	39	0	***	***	34	0	***	***
UCHealth Printers Park Surgery Center	Colorado Springs	---	---	---	---	1	***	***	***	---	---	---	---
Vail Valley Surgery Center	Edwards	4	***	***	***	154	0	***	***	263	0	***	***
	Vail	3	***	***	***	1	***	***	***	7	***	***	***

The standardized infection ratio (SIR) is the quotient of the numbers of observed and predicted infections.

National comparisons based on data collected and reported by facilities participating in the National Healthcare Safety Network (NHSN) from January-December, 2018.

Analysis includes adult patients >=18 years of age.

\*\*\* Indicates suppression of data, because either the predicted number of infections was less than one or the facility had fewer than 20 procedures of this type in this year. These facilities have met the NHSN reporting requirements.

--- Indicates that the facility was not operating or reporting data in this year.

Data source: NHSN Database.

Prepared by: Colorado Healthcare-Associated Infections and Antimicrobial Resistance Program, Colorado Department of Public Health and Environment.



# References

- <sup>1</sup>Scott II, RD. “The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention.” (2009) Division of Healthcare Quality Promotion, National Center for Preparedness, Detection, and Control of Infectious Diseases, Coordinating Center for Infectious Diseases, CDC. Available at: <https://stacks.cdc.gov/view/cdc/11550/> (Accessed June 17, 2019.)
- <sup>2</sup>Healthcare-Associated Infections Disclosure Statute. Colorado Revised Statutes §25-3-601. Available at: <https://www.lexisnexis.com/hottopics/michie/> (Accessed June 17, 2019.)
- <sup>3</sup>National Healthcare Safety Network. Available at: <http://www.cdc.gov/nhsn> (Accessed June 17, 2019.)
- <sup>4</sup>Passaretti, CL, Barclay, P, Pronovost, P, Perl TM. Public reporting of health care-associated infections: approach for choosing HAI measures. *Infect Control and Hosp Epidemiol* 2011;32(8):768-774.
- <sup>5</sup>Certification Board of Infection Control and Epidemiology, Inc. Available at: <http://www.cbic.org> (Accessed May 18, 2018.)
- <sup>6</sup>Magill SS, O’Leary E, Janelle SJ, Thompson DL, Dumyati G, *et. al.* Changes in Prevalence of Health Care-Associated Infections in U.S. Hospitals. *N Engl J Med* 2018;379(18):1732-1744.
- <sup>7</sup>Kayastha S, Tuladhar H. Vaginal hysterectomy vs. abdominal hysterectomy. *Nepal Med Coll J.* 2006;8(4):259-62.
- <sup>8</sup>Gendy R, Walsh CA, Walsh SR, Karantanis E. Vaginal hysterectomy versus total laparoscopic hysterectomy for benign disease: a meta-analysis of randomized controlled trials. *Am J Obstet and Gynecol* 2011;204(5):388e1-8.
- <sup>9</sup>Advani S, Reich NG, Sengupta A, Gosey L, Milstone AM. Central line-associated bloodstream infection in hospitalized children with peripherally inserted central venous catheters: Extending risk analyses outside the intensive care unit. *Clin Infect Dis* 2011;52(9):1108-1115.
- <sup>10</sup>Mollee P, Jones M, Stackelroth J, van Kuilenburg R, Joubert W, Faoagali J, Looke D, Harper J, Clements A. Catheter-associated bloodstream infection incidence and risk factors in adults with cancer: A prospective cohort study. *J Hosp Infect* 2011;78(1):26-30.
- <sup>11</sup>Wylie MC, Graham DA, Potter-Bynoe G, Kleinman ME, Randolph AG, Costello JM, Sandora TJ. Risk factors for central line-associated bloodstream infection in pediatric intensive care units. *Infect Control Hosp Epidemiol* 2010;31(10):1049-1056.
- <sup>12</sup>National Institute of Diabetes and Digestive and Kidney Diseases. Kidney and Urologic Diseases Statistics for the United States. Available at: <https://www.niddk.nih.gov/health-information/health-statistics/kidney-disease> (Accessed June 17, 2019.)
- <sup>13</sup>Centers for Disease Control and Prevention. Frequently asked questions about *Clostridioides difficile* for healthcare providers. Available at: [https://www.cdc.gov/hai/organisms/cdiff/cdiff\\_faqs\\_hcp.html](https://www.cdc.gov/hai/organisms/cdiff/cdiff_faqs_hcp.html) (Accessed June 17, 2019.)
- <sup>14</sup>Bignardi GE. Risk factors for *Clostridium difficile* infection. *J Hosp Infect* 1998; 40(1):1-15.
- <sup>15</sup>Vital Signs: Preventing *Clostridium difficile* infections. *MMWR* 2012;61(9):157-162.
- <sup>16</sup>Lin MY, Hota B, Khan YM, Woeltje KF, Borlawsky TB, *et. al.* Quality of traditional surveillance for public reporting of nosocomial bloodstream infection rates. *JAMA* 2010;304(18):2035-2041.

# Appendix A

## Glossary of terms and abbreviations

**Access-related bloodstream infection (ARB):** The presence of bacteria in the blood verified by culture with the source identified as the vascular access site or is unknown.

**Bloodstream infection (BSI):** An infection of the blood.

**Central line (CL):** A flexible tube (intravascular catheter) that terminates at or close to the heart or in one of the great vessels.

**Central line-associated bloodstream infection (CLABSI):** A primary bloodstream infection (BSI) in a patient that had a central line within the 48-hour period before the development of the BSI.

**Central line-associated bloodstream infection (CLABSI) rate:** The total number of central line-associated bloodstream infections divided by the number of central line days multiplied by 1,000.

**Central line days (device days):** A daily count of patients with a central line in place is performed at the same time each day.

**Coronary artery bypass graft surgery (CABG):** A surgical treatment for heart disease in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart bypassing a blocked artery.

**Critical care unit (CCU):** A nursing care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill.

**Dialysis event:** An event for a dialysis patient involving any one of three possible scenarios: 1) hospitalization; 2) intravenous (IV) antimicrobial start; or 3) a positive blood culture. Dialysis event reporting involves *outpatient* facilities only.

**Fascia:** A thin layer of connective tissue covering, supporting, or connecting the muscles or inner organs of the body.

**Great vessel:** Based on NHSN criteria for reporting central line BSI, the following are considered great vessels: aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, common femoral veins, and in neonates, the umbilical artery and vein.

**Healthcare-associated infection (HAI):** An infection of a patient that occurs in a health care setting which was not present or incubating at the time of admission and is not related to a previous admission.

**Hip replacement surgery:** An elective procedure for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis or other degenerative processes involving the hip joint.

**Implant:** A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operation. Examples include heart valves, metal rods, mesh, wires, screws, cements, hip replacements and other devices.

**Infection:** An invasion of the body tissues by an infectious agent.

**Infection preventionist (IP):** A health professional that has special training in infection prevention.

**Inpatient:** A patient whose date of admission to a health care facility and the date of discharge are different calendar days.

**IV antimicrobial start:** The first dose of a medication given intravenously to kill microscopic infectious organisms such as bacteria and viruses in the body.

**Knee replacement surgery (arthroplasty):** An elective procedure for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis, and traumatic arthritis.

**Local access infection (LAI):** Pus, redness, or swelling of the vascular access site without the presence of access-associated bacteremia, patient hospitalization, or initiation of IV antimicrobials.

**Location of attribution:** The inpatient location where the patient was assigned on the date of the bloodstream infection (BSI) event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the BSI criteria was collected, whichever came first.

**Metric:** A measurement for calculating health outcomes. There are both process metrics that measure adherence to standard health care quality processes, and outcome metrics that measure the number of patients affected by specific medical treatments.

**National Healthcare Safety Network (NHSN):** NHSN is a secure, internet-based surveillance (monitoring and reporting) system managed by the Centers for Disease Control and Prevention (CDC) Division of Healthcare Quality Promotion.

**NHSN operative procedure:** A procedure that meets the following criteria: 1) performed on a patient who is a NHSN inpatient or outpatient; 2) takes place during an operation; and 3) included in the NHSN operative procedure categories.

**NHSN reportable surgical procedure:** an operation that takes place in an operating room, where at least one incision (including laparoscopic approach and cranial Burr holes) is made through the skin or mucous membrane, or reoperation via an incision that was left open during a prior operative procedure that is included in the ICD-10-PCS or CPT NHSN operative procedure code mapping.

**Neonate:** An infant less than or up to 30 days of age.

**Neonatal critical care unit (NCCU):** Patient care area providing care to most critically ill infants.

**Outpatient:** Patient whose date of admission to the facility and date of discharge are the same day (definition for the National Healthcare Safety Network reporting purposes).

**Patient-days:** The total number of inpatients for a particular unit determined at the same time each day for every day of the month recorded as a total sum for the month.

**Permanent central line:** A catheter that is tunneled under the skin on the chest wall and includes certain dialysis catheters (e.g., Hickman, Groshong, and Broviac) and implantable venous access ports (e.g., Port-a-Cath). Some dialysis patients may still have a port used for dialysis; however, most do not use this type of access due to the increased risk of infection.

**Population:** The total number of inhabitants of a geographic area or the total number of persons in a particular group (e.g., the number of persons engaged in a certain occupation).

**Prevalence:** The number or proportion of cases, events or attributes among a given population.

**Rate:** An expression of the relative frequency with which an event occurs among a defined population and specific time-period calculated as the number of new cases or deaths during a specified period divided by either person-time or the average (mid-interval) population.

**Risk:** The probability that an adverse event will occur (e.g., that a person will be affected by, or die from, an illness, injury, or other health condition within a specified time or age span).

**Risk adjustment:** Accounts for differences in patient populations, enabling hospital comparisons.

**Risk-adjusted rate:** For surgical site infections, the risk-adjusted rate is based on a comparison of the actual (observed) rate and the predicted rate if nationwide the patients had the same distribution of risk factors as the hospital. For CLABSI, the adjusted rate is a comparison of the actual rate and the predicted rate based on national rates for each ICU or within birth weight categories for neonates.

**Risk factor:** An aspect of personal behavior/lifestyle, environmental exposure, or hereditary characteristic associated with an increased occurrence of a disease, injury, or other health condition.

**Standardized infection ratio (SIR):** A risk-adjusted summary measure that accounts for the type of procedure and risk category. The SIR provides an overall score for a procedure at each health facility based on the predicted number of infections after adjusting for the risk category.

**Surgical site infection (SSI):** Infections that are directly related to an operative procedure. Some SSI are minor and only involve the skin or subcutaneous tissue. Other SSI may be deeper and more serious.

*Superficial incision infection:* involves only the top layers of the skin.

*Deep incision infection:* involves deeper soft tissues (e.g., fascia and muscle layers)

*Organ space infection:* involves any part of the body that is opened or manipulated during the surgical procedure, excluding the top layers of skin, fascia or muscle layers.

**Surgical site infection rate:** Surgical site infection rates per 100 operative procedures are found by dividing the number of SSI by the total number of specific operative procedures within a given reporting period. The results are then multiplied by 100. These calculations are performed separately for each type of surgical procedure. These are not risk adjusted and no comparison between facilities, states, or nation can be made.

**Symptom:** Any indication of disease noticed or felt by a patient.

**Temporary central line:** A central line that is not tunneled.

**Trend:** Movement or change in frequency over time, usually upwards or downwards.

**Validation:** A method of assessing the completeness and accuracy of reported HAI data.

**Vascular access infection:** An infection that is either a local access infection or access-related bloodstream infection.

**Wound class:** An assessment of the likelihood and degree of contamination of a surgical wound at the time of the operation. The four classes are clean, clean contaminated, contaminated, and dirty.

# Appendix B

## Standardized infection ratio

The standardized infection ratio (SIR) is a risk-adjusted summary measure used throughout this report. The SIR describes a facility's performance, taking into account individual facility's patient population risk. The SIR is the number of infections reported by the facility divided by the predicted number of infections. The predicted number of infections is determined by historical data collected by the NHSN as well as an individual facility's patient population, and is set by the Centers for Disease Control and Prevention.

Interpretation of the SIR is done by comparing a facility's value to one (observed and predicted number of SSI are the same). In other words, the number of infections is what was predicted based on the national rate. If the SIR value is greater than one, there are more infections than predicted, and if the SIR value is less than one, there are fewer infections than predicted.

The statistical significance of the difference between the observed and predicted SSI based on the national rate is tested using a Poisson test. A p-value is computed from the test and helps determine if the difference in the HAI rate is due to chance alone. If the p-value is greater than or equal to 0.05, then there is no significant difference between the facility's HAI count and the predicted count based on the national rate. If the p-value is less than 0.05, then the difference is statistically significant, and the value of the SIR determines whether the facility is better than or worse than the national rate. If the SIR is greater than one, then the facility has significantly more CLABSI than were predicted based on the national rate (worse). The converse also applies where if the SIR is less than one, the hospital has significantly fewer CLABSI than were predicted (better).

Most tables present a standardized infection ratio (SIR), which is a summary measure that describes the infection prevention performance of a facility or region while considering the risk of that facility or region's patient population. The SIR is a ratio that compares a facility's observed number of infections to the predicted number of infections. This adjusts for some risk factors that could affect differences in infection numbers. The National Healthcare Safety Network (NHSN) calculates predicted number of infections during a baseline period. In this report, the baseline period is 2015. This is the second report to use the 2015 baseline. Reports from 2017 and before used a 2009 baseline; comparisons should not be made between reports that use different baselines. A SIR of one means that a facility's observed number of infections is equal to the predicted number of infections. If the SIR value is greater than one, there are more infections than expected, and if the SIR is less than one, there are fewer infections than expected. For a more detailed explanation of how the SIR is calculated, see NHSN's SIR guide (<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>).

In this report, national comparisons using SIRs are reported for all infection types for which national benchmark data during 2015 baseline period are not yet available. This is the first report that will be using the new outpatient procedure modeling for SSIs in ambulatory surgery centers and acute care hospitals. SIRs are not reported for SSIs following hip replacements or hysterectomies in ambulatory surgery centers or dialysis-related infections in dialysis facilities; SIRs are available for most SSIs, CLABSIs, and *C. difficile*.

## Rates

Rates are reported when risk-adjusted analysis is not available through NHSN. Rates are used with a national comparison for dialysis events; rates without a national comparison are used for selected surgical site infections (following hip replacements and hysterectomies) among ambulatory surgery centers.

### Dialysis

National comparisons using rates are used for dialysis events. For each dialysis event type, the rates are ranked, and a statistical test is applied to calculate what is known as a p-value.

- If the p-value is greater than or equal to 0.05, and regardless of the percentile ranking, the difference between the facility's rate and the NHSN aggregate rate is not statistically significant, and the facility's infection rate is designated as "same."
- If the p-value is less than 0.05 and the percentile is low, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as "better."
- If the p-value is less than 0.05 and the percentile is high, the difference between the facility's rate and the NHSN aggregate rate is statistically significant, and the facility's infection rate is designated as "worse."

Infection rates among dialysis facilities in this report were calculated using NHSNs 2015 updated baseline data. NHSN updates baselines, which affect national comparisons, every few years; the last updated baseline prior to 2015 was in 2009, which was used in reports prior to 2018.

### Surgical-site infections

Rates for surgical site infections (SSIs) are simply calculated by dividing the number of SSI events by the number of procedures reported in that year. This number is then multiplied by 100 to have the rate per 100 procedures. No comparison between facilities, states, or to the nation can be made, as there is no risk adjustment for differences between facilities. These differences can include number of beds, patient population, and more. Rates are used in place of SIR (risk adjustment) for SSIs following hip replacements and hysterectomies that occur in ambulatory surgery centers only; all other SSIs in this report use the SIR calculation and are compared to national baselines.

# Appendix C

## Facility types

Certain health care facility types in Colorado must report healthcare-associated infections by Colorado law (CRS 25-3-601). A detailed list of the current reportable conditions can be found on the CDPHE website (<https://www.colorado.gov/pacific/cdphe/hai-professionals>) under “HAI Reportable Conditions”.

**Acute care hospitals:** Facilities that primarily provide inpatient services including diagnostic, therapeutic, or rehabilitation services. Details on acute care hospital reporting can be found on the acute care hospital NHSN webpage (<https://www.cdc.gov/nhsn/acute-care-hospital/index.html>).

**Ambulatory surgery center:** A facility, which operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization. Details on ambulatory surgery center reporting can be found on the ambulatory surgery center NHSN webpage (<https://www.cdc.gov/nhsn/ambulatory-surgery/index.html>).

**Critical access hospital:** A designation given to certain rural hospitals by the Centers for Medicare and Medicaid Services (CMS) to reduce financial vulnerability and improve access to health care by keeping essential services in rural communities. A critical access hospital must have 25 or fewer acute care inpatient beds, be more than 35 miles from another hospital, maintain an average length of stay of 96 hours or less for acute care patients, and provide 24/7 emergency care services. Details on critical access hospitals can be found on the critical access hospitals CMS webpage (<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/CAHs.html>).

**Dialysis facility:** A facility which operates exclusively for the purpose of providing dialysis services to patients not requiring hospitalization. Details on dialysis facility reporting can be found on the outpatient dialysis NHSN webpage (<https://www.cdc.gov/nhsn/dialysis/index.html>).

**Inpatient rehabilitation facility:** Inpatient rehabilitation facilities and inpatient rehabilitation wards in hospitals care for patients who have lost function due to an injury or medical condition. Details on inpatient rehabilitation facility reporting can be found on the inpatient rehabilitation facility NHSN webpage (<https://www.cdc.gov/nhsn/inpatient-rehab/index.html>).

**Long-term acute care hospital:** A specialty care hospital that cares for patients with serious medical conditions that require intense, special treatment for long periods of time (an average length of stay is 25 days). Details on long-term acute care hospital reporting can be found on the long-term acute care hospital NHSN webpage (<https://www.cdc.gov/nhsn/ltach/index.html>).