

Missouri Nosocomial Infection Reporting Data:

Report to the Governor and General Assembly
December 2018



Missouri Department of Health and Senior Services
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TABLE OF CONTENTS

Executive Summary.....	2
2017 Data Report.....	4
Background.....	4
Data Collection	4
National Healthcare Safety Network (NHSN)	5
Coming Changes.....	5
Reporting to the Public	6
Figure 1. Missouri Healthcare-Associated Infection Reporting	6
Figure 2. Abdominal Hysterectomy Comparison, Southwest Region.....	7
Figure 3. Mercy Hospital Springfield Hospital Profile	8
Figure 4. Surgical Site Infection (SSI) Rates for Abdominal Hysterectomy, Mercy Hospital Springfield	9
Data Summary	10
Figure 5. 2017 Central Line-Associated Blood Stream Infections (CLABSI) by Intensive Care Unit (ICU) Type	10
Figure 6. 2017 CLABSI Comparison to Missouri Baseline	11
Figure 7. Missouri Adult CLABSI Rates, 2011-2017	12
Figure 8. Missouri Child CLABSI Rates, 2011-2017	12
Figure 9. 2017 CLDs by ICU Type	13
Figure 10. 2017 Total Infections by ICU Type	13
Surgical Site Infections (SSIs).....	14
Figure 11. 2017 Reporting Hospitals by Surgery Type.....	14
Figure 12. 2017 SSI Comparison to Missouri Baseline (Hospitals).....	15
Figure 13. Abdominal Hysterectomy SSI Rates, 2011-2017	16
Figure 14. Hip Prosthesis SSI Rates, 2011-2017.....	17
Figure 15. Coronary Artery Bypass Graft SSI Rates, 2011-2017	17
Figure 16. 2017 Reporting ASCs by Surgery Type.....	18
Figure 17. 2017 SSI Comparison to Missouri Baseline (ASCs)	18
Figure 18. Hernia Repair SSI Rates, 2011-2017	19
Figure 19. Hernia Repair Infection Frequencies, 2006-2017	20
Figure 20. Breast Surgery SSI Rates, 2011-2017	20
Figure 21. Breast Surgery Infection Frequencies, 2006-2017	21
Cautions	21
Endnotes	23

Executive Summary

Background

In 2004, the Missouri legislature passed Senate Bill 1279, establishing the “Missouri Nosocomial Infection Reporting Act of 2004”. The law requires hospitals and ambulatory surgical centers (ASCs) to report specific categories of healthcare-associated infections (HAIs) to the Department of Health and Senior Services (DHSS). This report is published annually and includes summary data for the calendar year 2017 for central line-associated bloodstream infections (CLABSI) and surgical site infections (SSIs). Statewide rates from calendar year 2011 were used throughout the report as a baseline for comparison. The 2011 baseline was first adopted in the 2015 Governor’s report. This has provided a consistent data point for tracking changes to infection indicators over time. All significance tests were run at 95% confidence levels.



Reporting Hospital ICUs

- Coronary
- Surgical
- Medical/
Surgical
- Medical
- Pediatric
- Neonatal

Data Collection

CLABSI are reported by hospitals for the six intensive care unit (ICU) types listed to the right. SSIs are reported by facility, instead of ICU type. Hospitals report SSIs associated with abdominal hysterectomy, hip prosthesis, and coronary artery bypass graft surgery. ASCs report SSIs associated with hernia repair and breast surgery.

Reporting to the Public

The DHSS has developed a public website to report healthcare-associated infection rates to the public. The site provides the most current four quarters of data for viewing. At the time this report was prepared, SSI and CLABSI data for January 1, 2017 - December 31, 2017 were available on that website (http://health.mo.gov/data/hai/drive_noso.php). Historical data is housed at a separate web address (<https://mhirs.dhss.mo.gov/haihistory/default.aspx>) and shows data for calendar years 2006-2016.

Data Summary

Hospitals submit central line data for each ICU that meets DHSS reporting requirements. In all, 103 ICUs from 65 hospitals reported CLABSI data for calendar year 2017. Statewide infection rates for

CLABSI were lowest in medical/surgical ICUs (0.6/1,000 central line-days). Pediatric ICUs again like last year have the highest statewide CLABSI rate, with a value of 1.6/1,000 central line-days.

Fifty hospitals and 19 ASCs reported SSI data during the same time period. The lowest SSI rate for hospitals overall was for hip prosthesis procedures (1.0/100 surgeries). The highest SSI rate for hospitals was associated with coronary artery bypass graft surgery (1.9/100). The SSI rates for breast surgeries and hernia repair were both low (0.25/100 for breast and 0.31/100 for hernia repair).

**Statewide CLABSI Rates
by ICU Type**

Coronary	1.5 per 1,000
Surgical	1.4 per 1,000
Med/Surgical	0.6 per 1,000
Medical	1.0 per 1,000
Pediatric	1.6 per 1,000
Neonatal	1.0 per 1,000

Statewide SSI Rates for Hospitals

Abdominal Hysterectomy	1.1 per 100
Hip Prosthesis	1.0 per 100
Coronary Artery Bypass Graft Surgery	1.9 per 100

Statewide SSI Rates for ASCs

Hernia Repair	0.31 per 100
Breast Surgery	0.25 per 100

Cautions

Infection rates are affected by a facility’s level of resources and commitment to infection control, the severity of the illnesses treated, and the care with which it collects and reports data. A consumer who is choosing a facility for healthcare should consider the advice of their physician, the experience of facility staff, and all the other factors that are unique to his or her situation, in addition to the infection data reported on the DHSS website.

“...patients who were older, had been in the hospital longer at the time of the survey, were in a large hospital, had a central catheter in place, were receiving mechanical ventilator support, or were in a critical care unit had an increased risk of healthcare-associated infection.”¹ -Magill, S.S., et al.

2017 Data Report

Background

Healthcare-associated infections (HAIs), also known as nosocomial infections, are infections that occur while patients are in a healthcare setting. Because of the seriousness of their conditions, patients treated in intensive care units (ICUs) have an especially high risk of HAIs. HAIs can severely aggravate an illness, lengthen hospital stays, and spread to other individuals. HAIs continue to be a major public health problem in the United States and worldwide. “Guidance on Public Reporting of Healthcare-Associated Infections...” published by the Healthcare Infection Control Practices Advisory Committee (HICPAC) in 2005², reported that in hospitals alone, HAIs accounted for an estimated 2 million infections, 90,000 deaths, and \$4.5 billion in excess healthcare costs annually. A 2010 study reported that adverse events cost Medicare an estimated \$324 million in October 2008.³ Roughly 1 in every 25 U.S. hospital patients will acquire at least one healthcare-associated infection.¹

Data Collection

Surgical procedures and HAIs are reported to DHSS according to 19 CSR 10-33.050, which became effective July 30, 2005. The reporting rule was promulgated under the authority of the revised statute that mandates data reporting by hospitals and ambulatory surgery centers (ASCs) (Section 192.667, RSMo). Infections and procedures of a more serious nature and those that occur in a variety of hospitals and ASCs were considered for mandatory reporting.

Hospitals and ASCs differ in what they report. Hospitals are required to report central line-associated bloodstream infections (CLABSIs) and surgical site infections (SSIs). The SSIs reported are those associated with procedures for abdominal hysterectomy, hip prosthesis, and coronary artery bypass surgery. ASCs report only SSI data, and are limited to reporting infections associated with procedures for hernia repair and breast surgery. To provide denominators for the infection rates, hospitals and ASCs report every surgery performed in these selected procedure categories, whether or not the surgery resulted in an infection. Because patients in intensive care units are particularly at risk for HAIs, hospital reporting of CLABSIs is done for six specific intensive care units: medical, surgical, medical/surgical, coronary, neonatal, and pediatric. SSIs are reported by facility rather than by ICU type.

To ensure that the data being collected are reliable, the DHSS established reporting requirements for facilities. DHSS requires that only the hospital ICUs that had at least 50 central line-days in the prior year must report during the current year. Both hospitals and ASCs must report SSIs if they performed at least 20 of the specified surgeries in the prior year. Reporting is done through the Missouri

Healthcare-Associated Reporting System (MHIRS), a web-based system developed by DHSS staff and the Information Technology Support Division of the Office of Administration. MHIRS allows facilities to enter HAI data directly into a DHSS database.

Registration for reporting by hospitals and ASCs occurs annually. Facilities report the number of central line-days per ICU and the number of relevant surgeries. This information determines which facilities will be required to report the selected indicators to the DHSS.

National Health Safety Network (NHSN)

In 2012, the Center for Medicare and Medicaid Services (CMS) began requiring that qualifying hospitals submit certain reports to them through NHSN, a national HAI tracking system maintained by the Centers for Disease Control and Prevention. Beginning in September 2012, the DHSS developed a way to download infection data for facilities which participate in the CMS program and submit data to NHSN. The DHSS developed a method by which department staff could query the NHSN system and download that data for inclusion in the MHIRS data tables for the quarterly public reports. This option allows facilities to only report infection data once instead of reporting separately to both NHSN and the DHSS. The NHSN data downloaded into MHIRS include information for both CLABSIs and SSIs. Currently, all inpatient hospitals have the option of meeting state reporting requirements by reporting through NHSN.

Coming Changes

Beginning in 2018, HAI reporting requirements will again be changing. State statute (Section 192.667, RSMo) and the state code of regulations (19 CSR 10-33.050) were modified to reflect more current national practices for reporting of HAI. Beginning with calendar year 2018 data, all acute care hospitals will be required to report to NHSN to meet state requirements, not just those meeting certain thresholds as in the past. This will allow for a more consistent and more modern approach to infection reporting and will include the state providing Standardized Infection Ratio (SIR) rates. Colon surgeries are added to the list of SSI types that are required for hospitals to report. In addition, catheter-assisted urinary tract infections (CAUTIs) will be required. Missouri will collect CLABSIs and CAUTIs detected in both ICU and ward settings, instead of only those reported in an ICU.

Reporting to the Public

Figure 1 shows the main page of the public reporting site. This page introduces users to the site with a brief overview of the data collected and links to features useful to those researching HAIs in Missouri. From this main page, a user can query infection reporting data by region, look at grouped comparisons of facilities, or view a facility profile. Additional information, such as definitions, frequently asked questions, and links to manuals, laws, and regulations associated with infection reporting in Missouri are also accessible from this main page.

Figure 1. Missouri Healthcare-Associated Infection Reporting

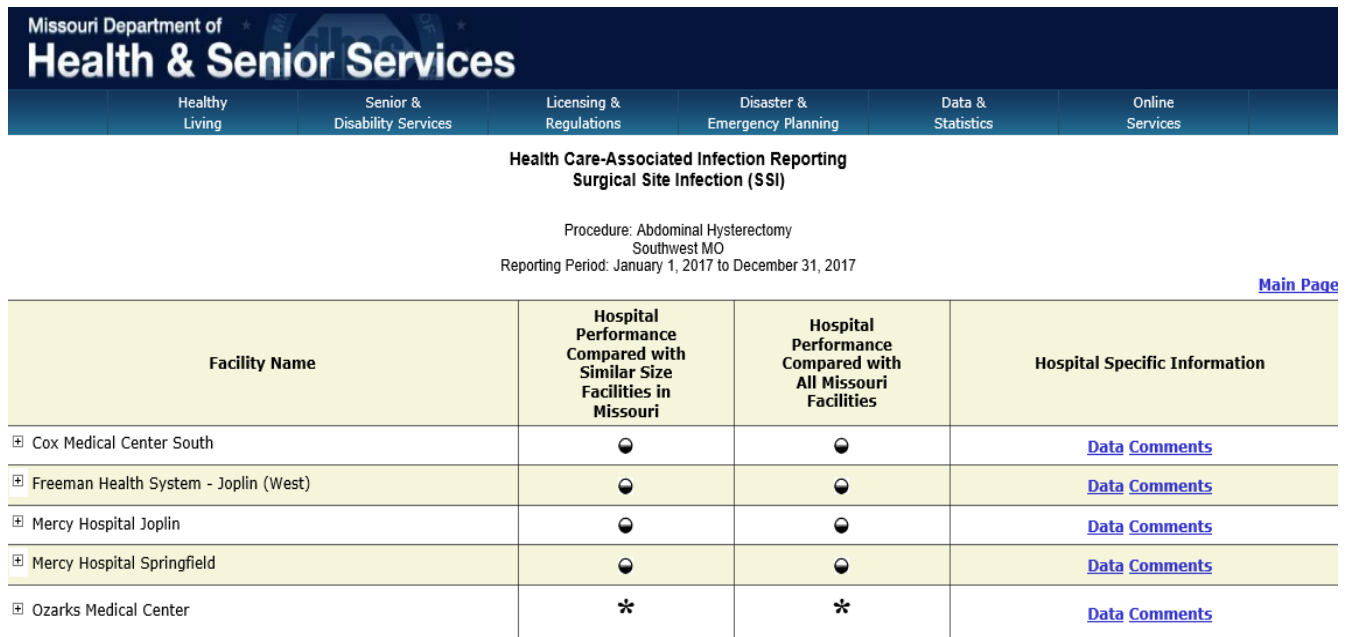
The screenshot displays the Missouri Department of Health & Senior Services (DHSS) website for Healthcare-Associated Infection Reporting. The header includes the DHSS logo, navigation links for various services, and a search bar. The main content area is titled "Missouri Health Care-Associated Infection Reporting" and contains several sections:

- Navigation:** Healthy Living, Senior & Disability Services, Licensing & Regulations, Disaster & Emergency Planning, Data & Statistics.
- Main Content:**
 - Navigation:** DHSS Home > Data & Statistics > hai > Home
 - Left Column:**
 - Infection Reporting Data (Search Here)
 - Historical Infection Reporting Data
 - Instructions for Using this Site
 - About HAI Infections
 - Definition of Terms
 - Frequently Asked Questions
 - Right Column:**
 - Laws, Regulations & Manuals
 - Reports
 - Information for Providers
 - MRSA
 - Related Links
 - Video:** "Stopping Infections - Begins with the Hands" with a play button overlay.
 - Text:** "This site displays data on Healthcare-Associated Infections (HAIs) as reported to the Department of Health and Senior Services (DHSS) by hospitals and ambulatory surgery centers. These facilities are required by state law and regulation to report data on selected HAIs, also known as nosocomial infections. Currently, data are reported for central line-associated bloodstream (CLAB) infections and surgical site infections (SSIs). Data on head-of-bed elevation (HOB) is also displayed. HOB is a process measure related to care in preventing ventilator-associated pneumonia. Such infections as methicillin-resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile*, vancomycin-resistant enterococcus (VRE), ventilator-associated pneumonia and others, are not included on this site. Click here for further information on these infections. HAIs continue to be a major health problem in the United States. HAIs can be very serious, increasing the cost and length of hospital stays and even threatening lives. As a consumer, you should be proactive in your healthcare. The information on this site can help you to:
 - Understand more about HAIs - what they are and why they occur.
 - Be informed about hospital and ASC infection rates in Missouri.
 - Learn what you, as a patient, can do to lower your risk of an HAI.Keep in mind that a facility's experience with HAIs is only one thing to consider when choosing a facility. The advice of your physician, the experience of facility staff, and other factors unique to your situation should be considered as well. (Note: some facilities may not appear on this site because they did not perform enough procedures to make their infection rates meaningful.) Please review the Instructions for Using this Site, Definition of Terms, Frequently Asked Questions, and other information listed on the left bar of this page for help in understanding the tables displayed on this site.
- Right Column (Data & Statistics):**
 - Missouri Public Health Information Management System (MOPHIMS)
 - Profiles
 - MICA
 - Priorities MICA
 - Community Health Improvement Resources (CHIR)
 - Intervention MICA
 - Births
 - Deaths
 - Patient Abstract System (PAS)
 - Behavioral Risk Factor Surveillance System (BRFSS)
 - County-Level Study (CLS)
 - Healthcare-Associated Infection Reporting (HAI)
 - ESSENCE
- Bottom Right (Related Links):**
 - Cancer Registry
 - Communicable Disease Reporting & Surveillance
 - Birth Defects Registry

Missouri Nosocomial Infection Reporting Data: Report to the Governor and General Assembly December 2018

Figure 2 shows the type of data that is available to users wishing to compare infection data of facilities within the same region. Significance tests, based on 95% confidence intervals, determine whether a facility has infection rates that are significantly higher, significantly lower, or not significantly different than other facilities of similar size (categories include under 100 staffed beds, 100-299 staffed beds, and 300+ staffed beds). The same tests are run to compare individual facilities to statewide infection rates. Users can view more specific data, including HAI counts and rates, for each facility and unedited comments submitted by facility administrators by clicking on the hyperlinks included on this webpage.

Figure 2. Abdominal Hysterectomy Comparison, Southwest Region



☒ = Click on this symbol to expand or close information on the facility.

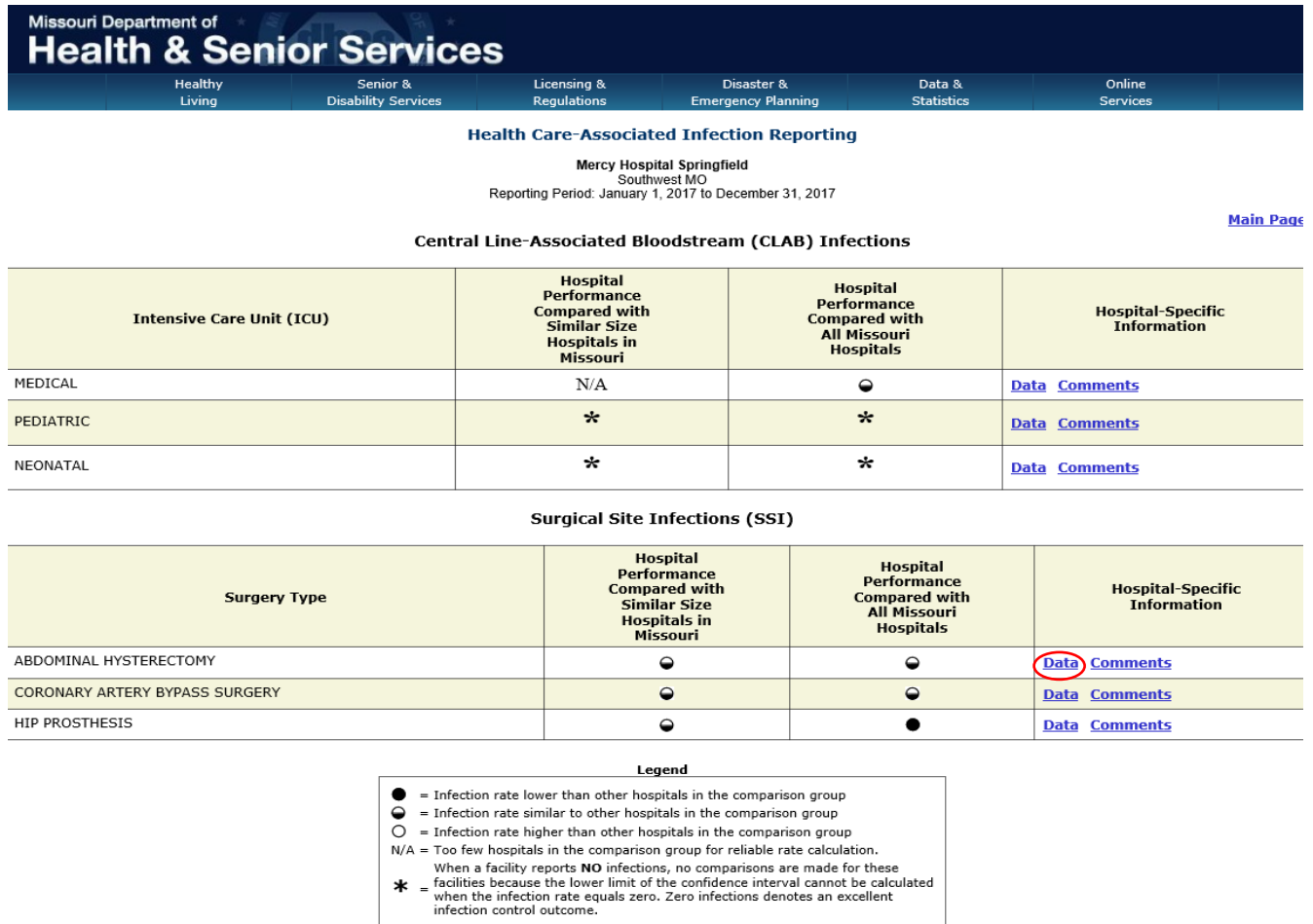
Legend

- = Infection rate lower than other hospitals in the comparison group
- = Infection rate similar to other hospitals in the comparison group
- = Infection rate higher than other hospitals in the comparison group
- N/A = Too few hospitals in the comparison group for reliable rate calculation.
- When a facility reports **NO** infections, no comparisons are made for these facilities because the lower limit of the confidence interval cannot be calculated when the infection rate equals zero. Zero infections denotes an excellent infection control outcome.
- * =

Note: The above comparisons are based on [significance tests](#).

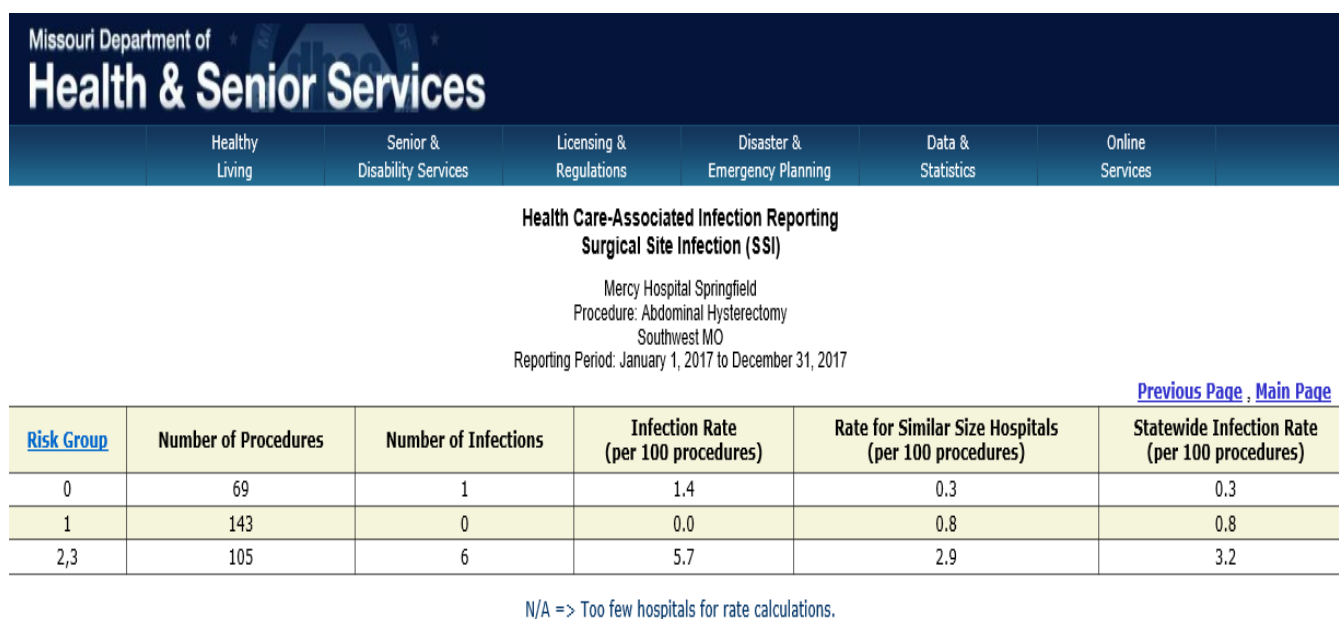
Users also have the option to view a specific facility’s profile as shown in Figure 3. This allows users to view both CLABSI and SSI data, as determined by annual reporting requirements. If users choose an ASC Profile they can view data for each procedure type for which the facility is required to report.

Figure 3. Mercy Hospital-Springfield Profile



The Profiles page displays significance columns for two comparison groups. Clicking on the ‘Data’ hyperlink (circled in red on the previous page) allows users to view the specific number of infections, denominator data (total number of procedures), and infection rate for the defined reporting period (as shown in Figure 4).

Figure 4. SSI Rates for Abdominal Hysterectomy, Mercy Hospital Springfield



Note: When the infection rate for a hospital is higher/lower than a comparison group rate, the difference may not be [statistically significant](#). Return to previous page to view performance of the hospital.

“Poor outcomes among patients with nosocomial infections have been linked to higher rates of polymicrobial/multiple sites of infection, higher APACHE II scores, acute respiratory distress syndrome, and co-illnesses.”⁴ - Dabar, G., et al.

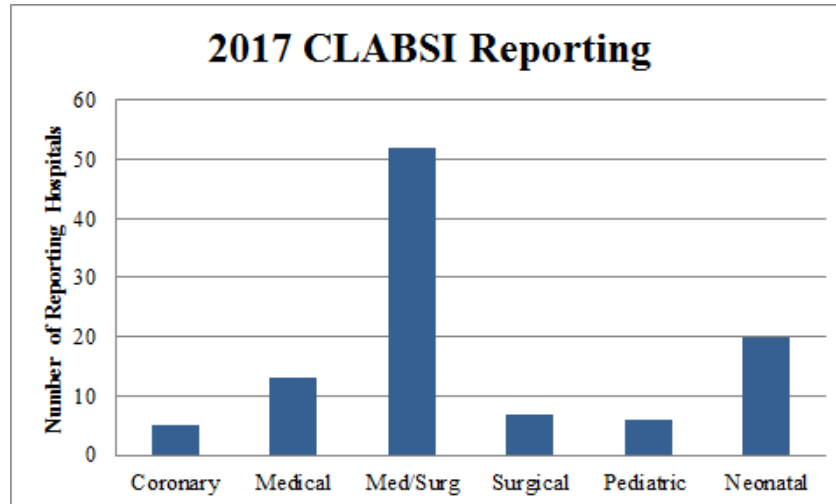
Data Summary

Central Line-Associated Bloodstream Infections (CLABSIs)

Some hospitals have only one or two ICUs required to report to the DHSS, while some may have all six ICU types. As such, the total number of reporting ICUs exceeds the total number of hospitals that report. A total of 103 ICUs from 65 hospitals reported CLABSI data for the January 1, 2017 - December 31, 2017 time period. A total of 176 CLABSIs were reported from an aggregate 176,299 central line-days (CLDs). This does represent a decrease in infection counts from 2016 when there were 181 infections. However, the overall CLABSI rate of 1.0 per 1,000 central line days was unchanged because the total central line-days had also decreased (from 181,587).

Figure 5 shows the number of ICUs reporting to MHIRS in 2017 by type. The medical/surgical ICU type has nearly three times as many facilities reporting as the next largest ICU type.







Figure 5. 2017 CLABSI Reporting by ICU Type



"...trauma patients with sepsis had a 6-fold higher risk of mortality, whereas patients with other HAIs had a nearly 1.5-2-fold higher mortality compared with patients without an HAI. Furthermore, patients with HAIs had...inpatient costs that were approximately 2-fold higher than patients without HAIs."⁵ -Glance, L.G., et al.

Figure 6 compares CLABSI rates for 2017 and the baseline year of 2011. The percentage differences between the 2017 rate and the baseline ranged from a 50% decrease in pediatric ICUs to a sharp 133% increase in CLABSI rates for surgical ICUs.

Figure 6. 2017 CLABSI Comparison to Missouri Baseline

Missouri Central Line-Associated Bloodstream Infections (CLABSIs)			
ICU Type	Missouri Baseline Rate	2017 Infection Rate	Percentage Difference
Coronary	0.9	1.5	 67%
Medical	1.3	1.0	 -23%
Medical/Surgical	0.9	0.6	 -33%
Surgical	0.6	1.4	 +133%
Pediatric	3.2	1.6	 -50%
Neonatal	1.1	1.5	 36%

Rates are reported per 1,000 central line-days.

Figures 7 and 8 reflect CLABSI rates for ICUs that primarily serve adults and children, respectively. Figure 7 displays infection rates for the last seven years for coronary, medical, medical/surgical and surgical ICUs. Rates for most adult ICU types increased in 2017 compared to 2016. The only decrease was seen in medical/surgical ICUs, where statewide rates declined from 0.7 to 0.6 (per 1,000 central line days). Coronary ICUs experienced both the highest rate (1.5) and the largest percentage increase compared to 2016. The 2017 rate for coronary ICUs more than doubled from 0.7 to 1.5 (114% increase). The surgical ICUs and medical ICUs both saw approximately 20% increases from 2016.

Figure 8 presents CLABSI rates for pediatric and neonatal ICUs. Trends for ICU types treating Missouri's youth were similar to those seen in adult ICUs. The pediatric ICU rate declined slightly from 2016. Compared to the 2011 baseline year, rates are cut precisely in half (3.2 to 1.6). Pediatric ICU infection rates have been consistently higher than neonatal ICU rates during the seven-year comparison period graphed here. The neonatal ICU infection rate experienced a 29% decline between 2016 and 2017. However, the 2016 rate was the seven-year high for this type of ICU and the 2017 rate is near the average rate observed over the past seven years. Overall, neonatal ICU infection rates have been relatively stable over the 2011-2017 period.

Figure 7. Missouri Adult CLABSI Rates, 2011-2017

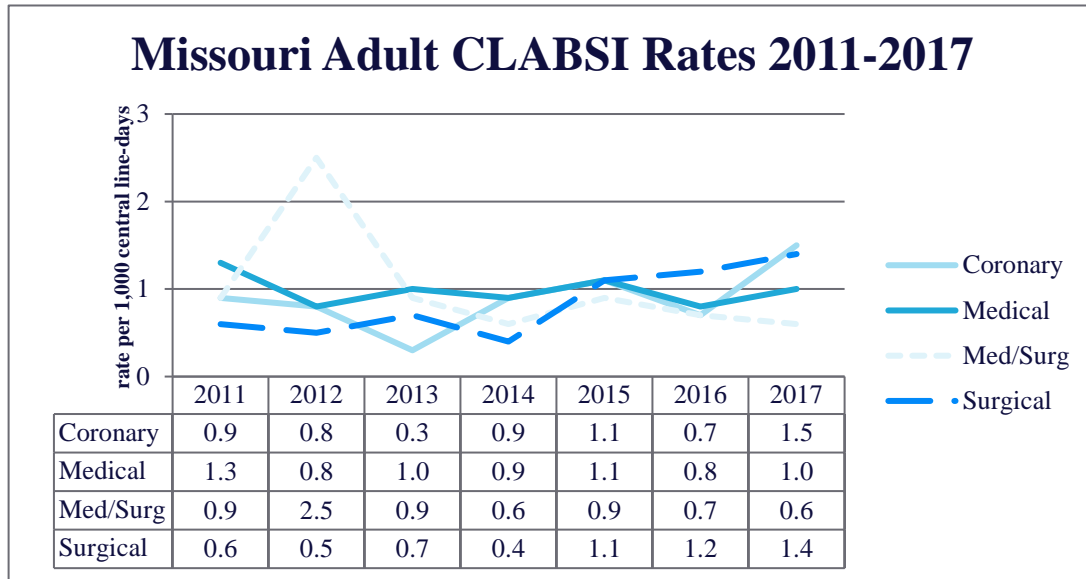


Figure 8. Missouri Child CLABSI Rates, 2011-2017

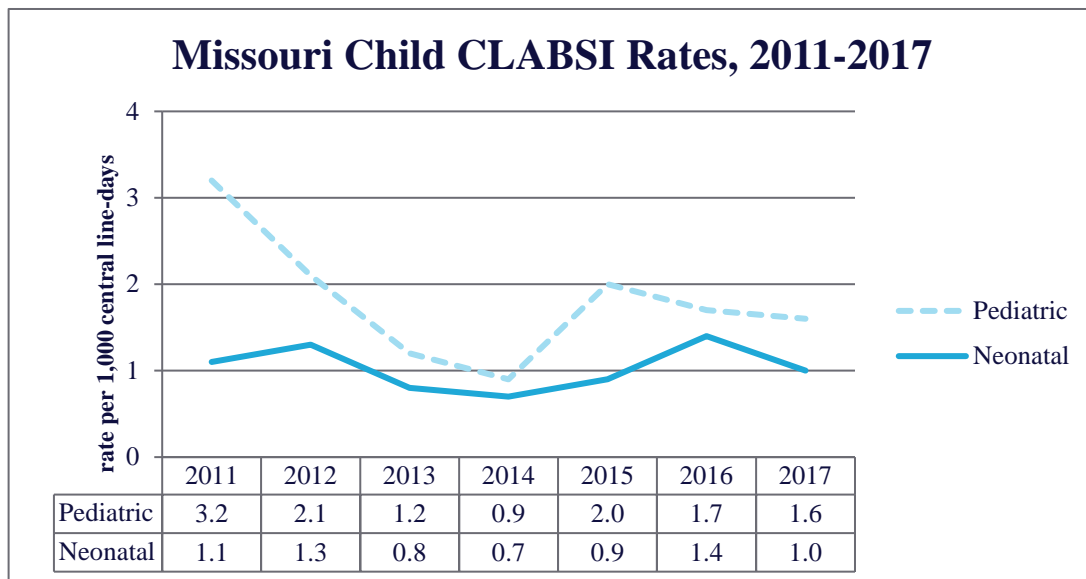


Figure 9 shows the total number of central line-days by ICU type. Medical/surgical ICUs had the highest total frequency (65,139 days), which was nearly double the second highest total, for medical ICUs (33,031 days). Coronary ICUs had the lowest total number of days at 10,535. Figure 10 displays the breakdown of the 181 CLABSIs reported in 2017 by ICU type. The largest percentage (24%) came from medical/surgical ICUs. This is to be expected since this ICU type also reported the largest

number of central line-days. Neonatal and pediatric ICUs had the second highest percentage of infections, at 18% each. The coronary ICU type had the lowest percentage of infections, accounting for only 9% of the aggregate in 2017.

Figure 9. 2017 CLDs by ICU Type

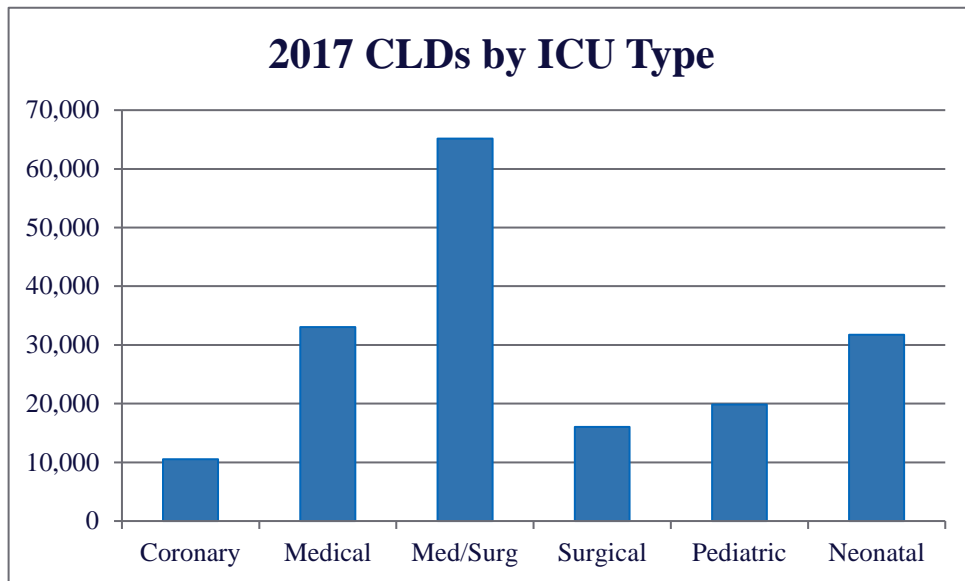
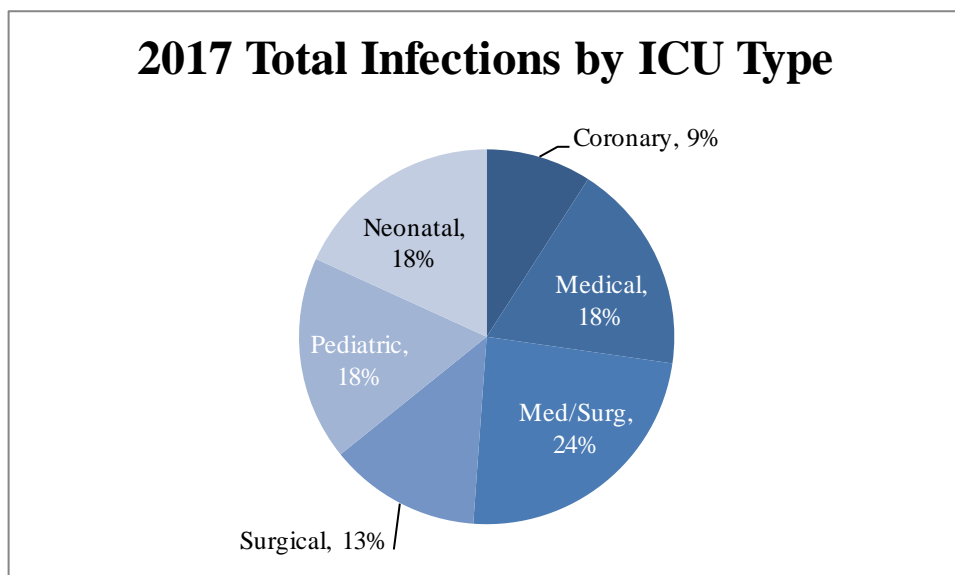


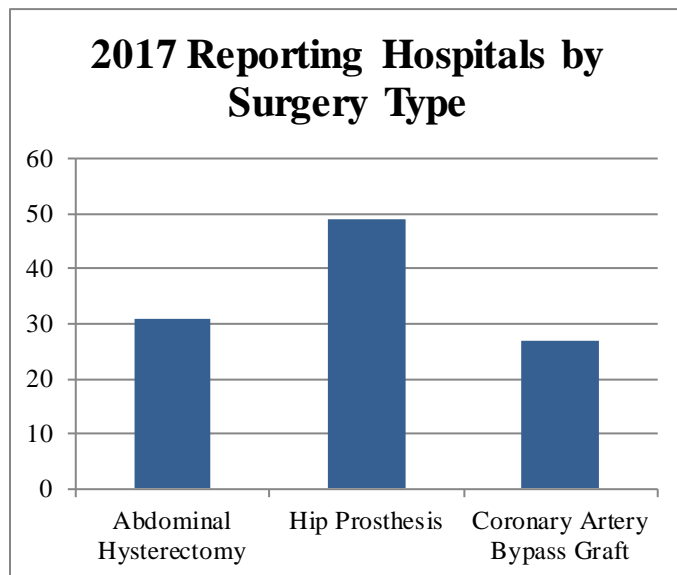
Figure 10. 2017 Total Infections by ICU Type



Surgical Site Infections (SSIs)

The SSIs reported by hospitals are those associated with procedures for abdominal hysterectomy, hip prosthesis, and coronary artery bypass surgery (with both chest and donor site incisions). Ambulatory surgery centers report only SSI data, and are limited to reporting infections associated with procedures for hernia repair and breast surgery. To provide denominators for the infection rates, hospitals and ASCs report every one of the selected procedures regardless of whether the procedure results in an infection. Both hospitals and ASCs must report SSIs if they performed at least 20 of the specified surgeries in the prior year. All data reported in this section comes from records submitted for the 2017 calendar year.

Figure 11. 2017 Reporting Hospitals by Surgery Type






Hospital SSI reporting by the numbers:

- 50/157 Missouri hospitals met SSI reporting requirements.
- 31 report on abdominal hysterectomies.
- 49 report on hip prosthesis.
- 27 report coronary artery bypass surgeries.

“The risk of CLABSI in ICU patients is high. Reasons for this include the frequent insertion of multiple catheters, the use of specific types of catheters that are almost exclusively inserted in ICU patients and associated with substantial risk (eg, arterial catheters), and the fact that catheters are frequently placed in emergency circumstances, repeatedly accessed each day, and often needed for extended periods.”⁶—Marschall, J., et al.

Figure 12. 2017 SSI Comparison to Missouri Baseline (Hospitals)

2017 SSI Comparison to Missouri Baseline (Hospitals)			
Surgery Type	Missouri Baseline Rate	2016 Infection Rate	Percentage Difference
Abdominal Hysterectomy	1.2	1.1	 -8%
Hip Prosthesis	1.5	1.0	 -33%
Coronary Artery Bypass Graft	1.8	1.9	 6%

Rates are reported per 100 procedures and are adjusted based on risk group.

Of hospitals reporting data in 2017, surgical site infection rates for two of the three surgery types were lower compared to the established 2011 baseline rate (Figure 12). Healthcare associated infections related to hip prosthesis procedures saw the greatest decrease (-33%) while the 2017 rate for coronary artery bypass graft (CBGB) procedures was slightly higher (6%) than the baseline.

Figure 13 displays the trend line in Missouri for abdominal hysterectomy SSI rates. In 2017 there were a total of 67 infections statewide. The 2017 rate was slightly lower than the 2016 rate and the Missouri baseline rate. However, it is slightly higher than the seven-year average observed rate. When comparing individual hospital infection rates to overall state HAI rates for abdominal hysterectomies, only one hospital had infection rates that were significantly higher than the 2017 overall state rate (1.1/100 surgeries). No hospital had an infection rate that was meaningfully lower than the state rate for this surgery type.

“In 2010 an estimated 16 million operative procedures were performed in acute care hospitals in the United States and an American prevalence study found that SSIs were the most common healthcare-associated infections, accounting for 31% of all HAIs among hospitalized patients.”⁷⁷ - Werra, C, et al.

Figure 13. Abdominal Hysterectomy SSI Rates, 2011-2017

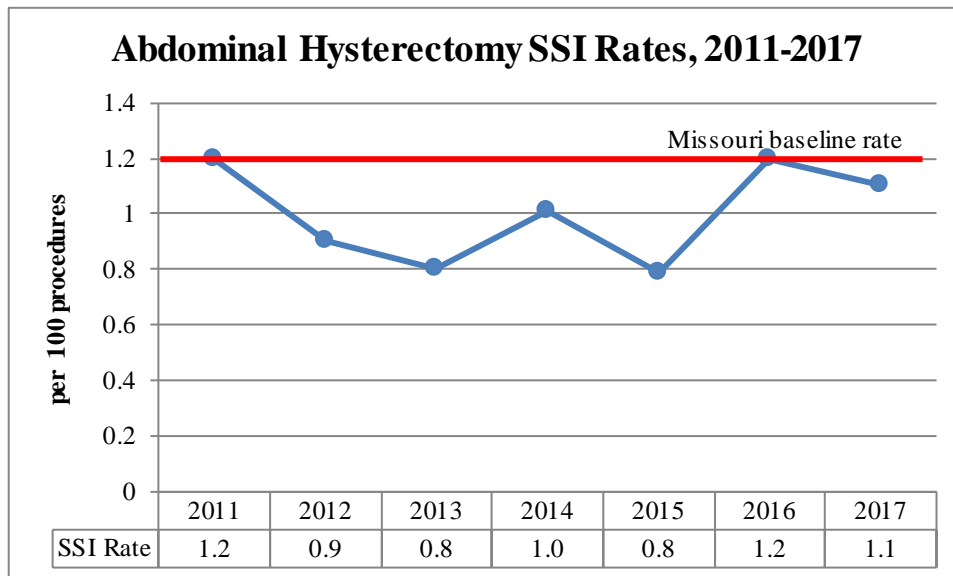
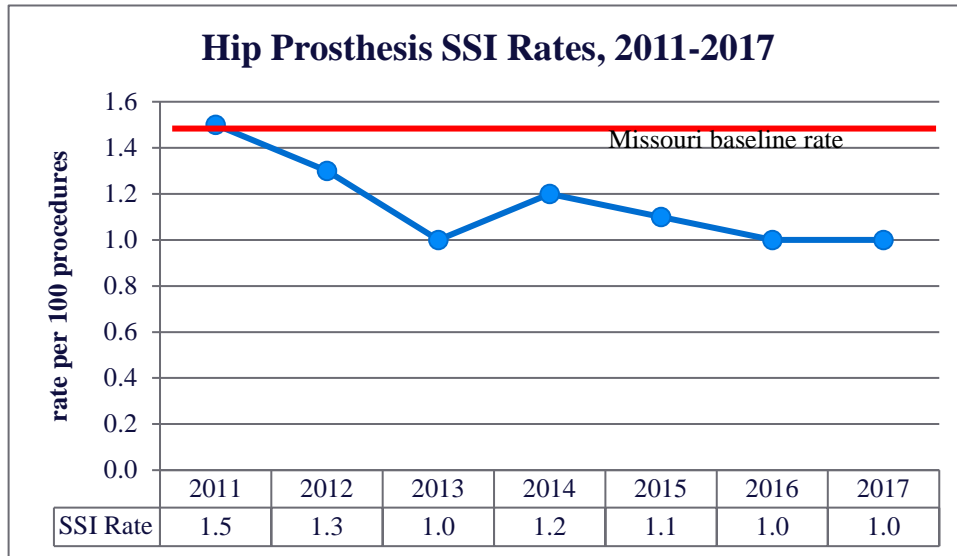


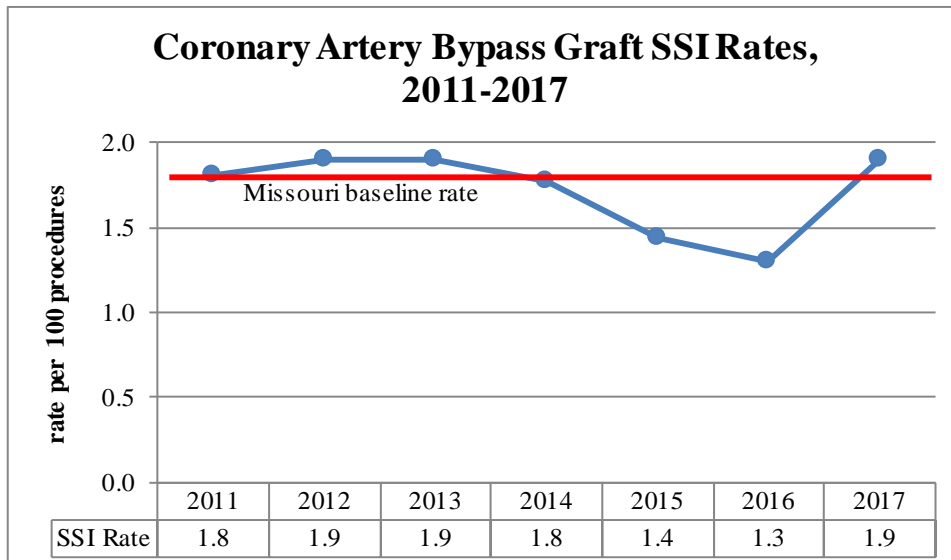
Figure 14 displays hip prosthesis SSI rates for Missouri hospitals. In 2017 there were a total of 118 infections for a state rate of 1.0 infections (per 100 procedures). As mentioned on page 15, hip prosthesis infections were 33% lower than the 2011 baseline in this most recent year. The 2017 rate was unchanged from the 2016 figure. The current rate is also slightly lower than the seven-year average observed Missouri rate. Hip prosthesis infection rates have been very stable, hovering between 1.2 and 1.0 for each of the last five years. Two Missouri hospitals had infection rates that were meaningfully higher than the state rate for hip prosthesis and two hospitals had rates significantly lower than that average in 2017.

Figure 14. Hip Prosthesis SSI Rates, 2011-2017



CBGB infection rates are displayed in Figure 15. There were a total of 82 infections reported in Missouri in 2017. The 2017 rate of 1.9/100 was both higher than the 2011 baseline rate and, notably, 46% higher than the 2016 rate for Missouri. The 2017 rate is similar to observed rates between 2011-2014 and in fact, matches the highest observed rates for this surgery type from 2012-2013. The 2017 rate is somewhat higher than the seven-year average observed rate in Missouri. Only one Missouri hospital had a CBGB rate significantly higher than the state rate and no hospital's infection rate was significantly lower than the state rate.

Figure 15. Coronary Artery Bypass Graft SSI Rates, 2011-2017



Infection rates for ASCs are usually lower than hospitals. ASCs tend to perform less serious surgeries and have generally healthier patient populations than inpatient facilities.⁷ The relatively brief stays in the ambulatory setting reduces a patient’s risk for infection; it also lessens the possibility of detecting post-surgical infections. A typical patient does not stay very long in an ASC (less than 24 hours) so an infection may not be discovered until days after the surgery. In this situation, the patient is more likely to seek care in an emergency room or a physician’s office, and the ASC may never become aware of the infection.

Figure 16. 2017 Reporting ASCs by Surgery Type

Ambulatory Surgical Center SSI reporting by the numbers:

- 19/122 operating Missouri ASCs met SSI reporting requirements.
- 14 report hernia repair procedures.
- 11 report on breast surgeries.

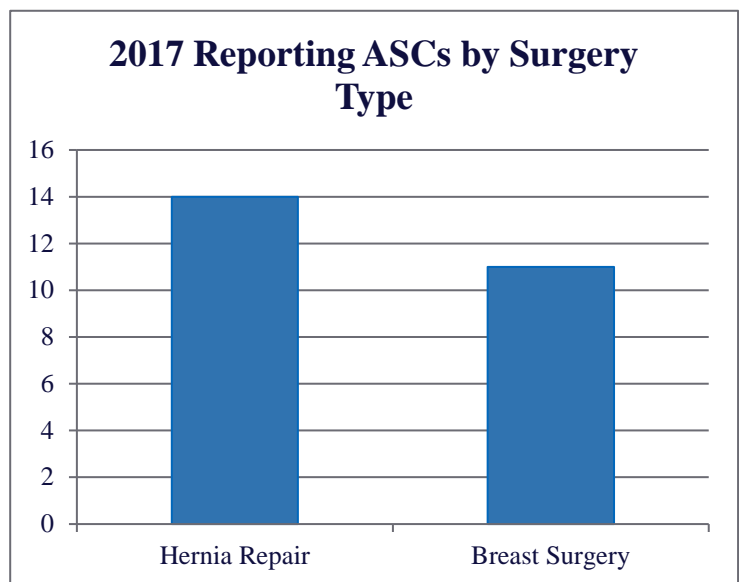


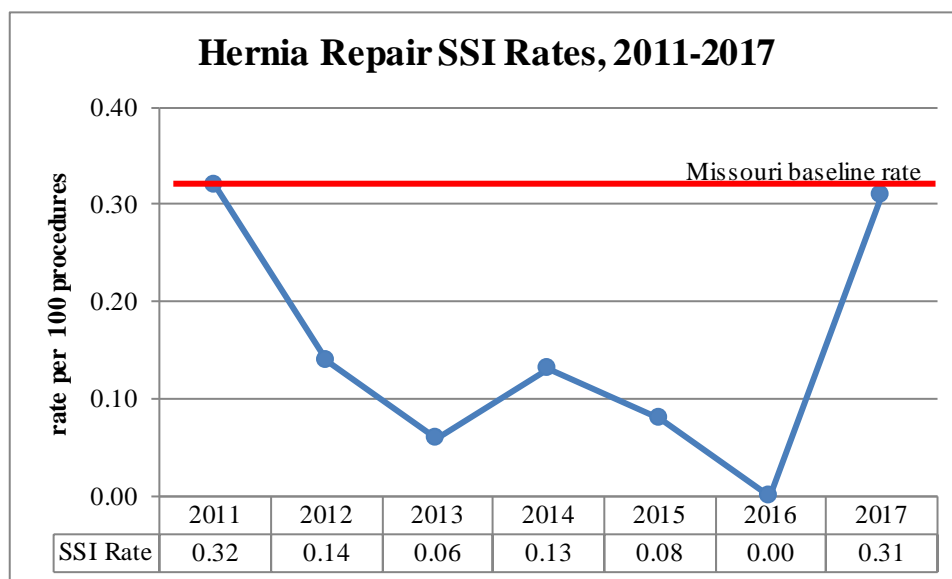
Figure 17. 2017 SSI Comparison to Missouri Baseline (ASCs)

2017 SSI Comparison to Missouri Baseline (ASCs)			
Surgery	Missouri Baseline Rate	2017 Infection Rate	
Hernia Repair	0.32	0.31	↓ -3%
Breast Surgery	0.18	0.25	↑ 25%

Rates are reported per 100 procedures and are adjusted based on risk group.

Of the 1,590 hernia repair procedures reported by qualifying ASCs in Missouri, five resulted in a healthcare associated infection. The hernia repair infection rate was 0.31 (per 100 procedures) in 2017 (Figure 18). This was similar to the 2011 Missouri baseline rate but a relatively large increase from 2016 when there were no reported hernia repair infections. It is also more than twice the average rate of the past seven years.

Figure 18. Hernia Repair SSI Rates, 2011-2016



However, the low frequency of infections associated with hernia repair surgery largely explain fluctuations in rates from year-to-year. Since Missouri began collecting data on this type of surgery in 2006, there have been only 32 healthcare-associated infections related to this procedure in facilities which met public reporting requirements. To put these frequencies into perspective, in 2011 (the year with the most reported infections), fifteen facilities reported 1,883 hernia repair surgeries (which resulted in six HAIs). A comparable number of procedures (1,757 from 16 facilities) were reported in 2013, with only one HAI associated with hernia repair procedures (Figure 19). Note that frequencies will also fluctuate based on how many facilities meet MHIRS reporting requirements each calendar year, as evidenced by the fact that in 2017 there were 14 facilities that met reporting requirements compared to only 9 in 2016. For instance, it is certainly possible that there were surgical site infections associated with hernia repair in Missouri in 2016, but they were simply not captured in this surveillance system because the infection occurred in a facility that didn't meet the minimum reporting threshold.

Figure 19. Hernia Repair Infection Frequencies, 2006-2017

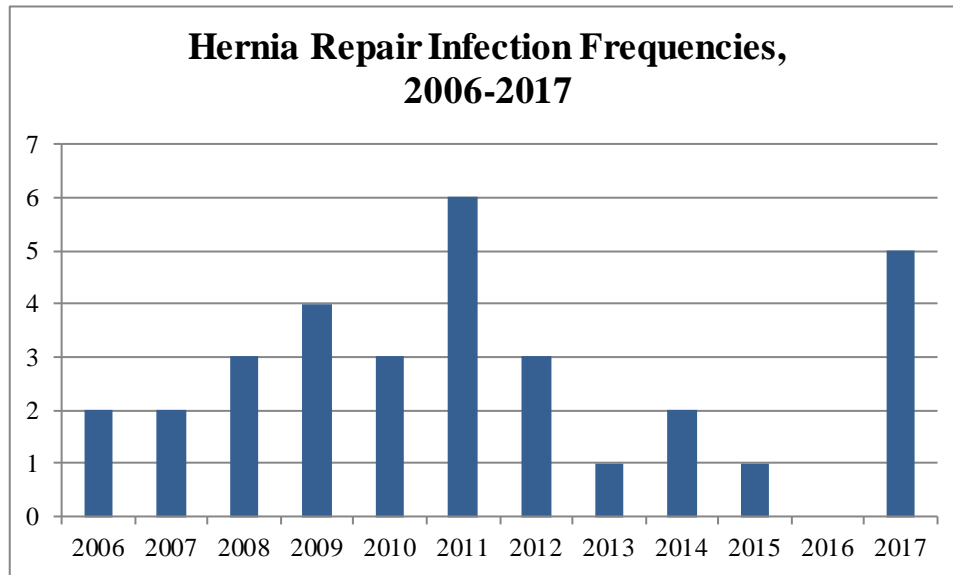
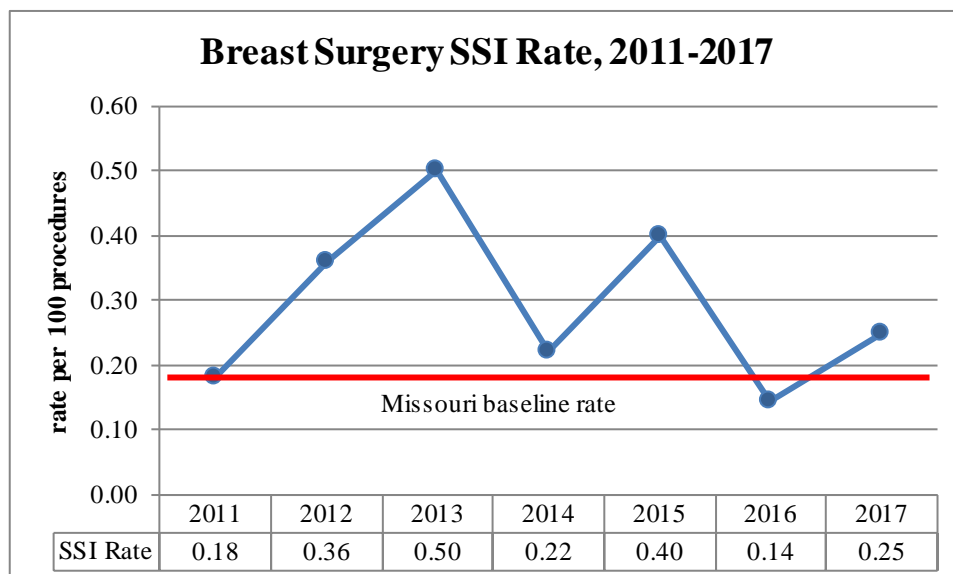


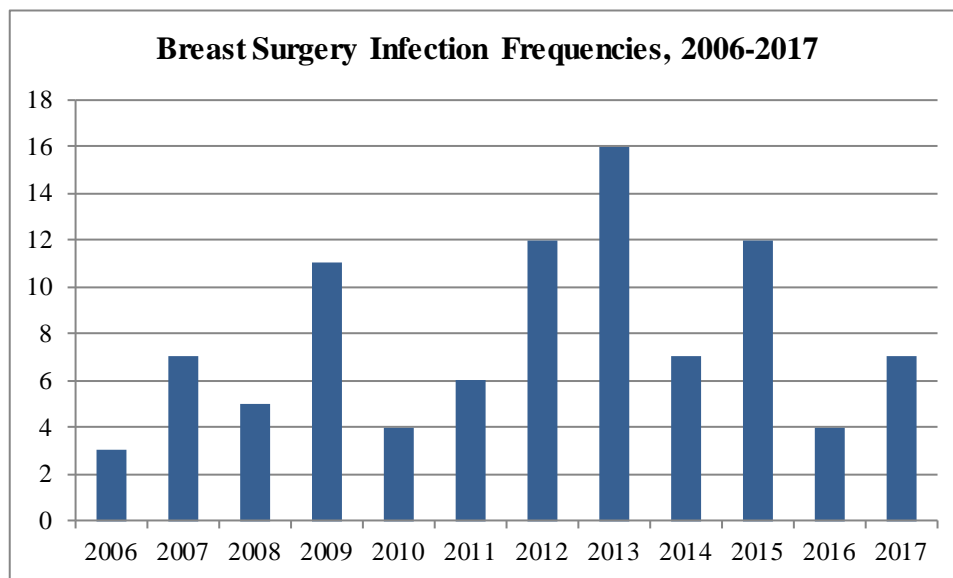
Figure 20 displays breast surgery SSI rates. There were seven breast surgery infections reported in 2017 and the infection rate was 0.25 (per 100 procedures). This represents an increase from the baseline rate of 0.18. It is also an increase compared to the 2016 rate of 0.14. However, it is below the seven-year average observed rate.

Figure 20. Breast Surgery SSI Rates, 2011-2017



Similar to hernia repair surgeries, the relative rareness of HAIs in conjunction with breast surgeries can cause SSI rates to fluctuate greatly from year-to-year. For the past eleven calendar years, qualifying ASCs in Missouri have averaged only 7.8 SSIs a year for this procedure (again, this represents only the infections from facilities meeting public reporting requirements). In 2006, seven facilities reported 986 breast surgeries—a relatively low number compared to the 3,230 surgeries reported by 12 facilities in 2013. Only four times in the past eleven years have reported infections for breast surgeries reached double digits.

Figure 21. Breast Surgery Infection Frequencies, 2006-2017



Cautions

The infection rates reported by the DHSS are affected by a facility’s level of resources and commitment to infection control, the severity of illnesses treated, and the care with which it collects and reports data. Beyond checking for obvious errors, the DHSS is not able to verify the data that the facilities submit each month, and it is likely that some facilities do a more accurate job of reporting than others. On the other hand, it is to each facility’s advantage to accurately diagnose and monitor all infections. We believe most, if not all, facilities are guided by this philosophy.

A further consideration is that hospitals and ASCs vary in the types of patients they treat. A facility that treats severely ill patients will be at a higher risk for HAIs. In order to mitigate this effect, CLABSIs are reported separately for each type of ICU and as a rate per 1,000 central-line days. On the public website, SSI comparisons are adjusted for the severity level of the surgery and the condition of the patient and reported as a rate per 100 surgeries. While those adjustments help make the data between facilities more comparable, users of the data should understand that these adjustments are

imperfect, and the rates on Missouri's website (and in this report) should not be the sole basis for choosing a healthcare facility. A consumer who is trying to select a facility for healthcare should also consider the experience of the staff, the advice of their physician, and all other factors that are unique to his or her situation.

Endnotes

1. Guidance on public reporting of healthcare-associated infections: recommendations of the Healthcare Infection Control Practices Advisory Committee. McKibben, L., Horan, T., Tokars, J.I., et al. and the Healthcare Infection Control Practices Advisory Committee. *American Journal of Infection Control* 2005; 3(4):217-226.
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7. SSIs in Italy: prevention and surveillance during the last five years. Werra, C., Aloia, S., Micco, R., et al. *Surgical Science* 2015; 6:383-394.