MISSOURI NOSOCOMIAL INFECTION REPORTING DATA

Report to the Governor and General Assembly 2008



Missouri Nosocomial Infection Reporting Data Report to the Governor and General Assembly - 2008

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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 summarizes April 2007- March 2008 data on central line-associated bloodstream (CLAB) infections and surgical site infections (SSIs).

Data Collection

The infections selected for reporting include ventilator-associated pneumonias (VAPs), CLAB infections, and SSIs. CLAB infections are reported by hospitals for six ICUs--coronary, surgical, medical/surgical, medical, neonatal and pediatric. SSIs are reported by facility and not ICU. Hospitals report SSIs associated with procedures for abdominal hysterectomy, hip repair and coronary artery bypass surgery. ASCs report SSIs associated with hernia repair and breast surgery. In lieu of monitoring VAP, hospitals are reporting data on head-of-bed (HOB) elevation. HOB elevation lowers the risk of developing VAP.

Public Reporting

The DHSS has developed a public website to report infection rates. As each new quarter of SSI and CLAB data become available, the earliest quarter is deleted and the latest quarter is added to form the most current 12 months of data for viewing. At the time this report was prepared, SSI and CLAB infection data for April 2007-March 2008 were on the website. Data for the July 2007-June 2008 time period are scheduled to be on the website by December 2008. The first HOB data to be reported will be included in that update.

Data Summary

Hospitals can report data from more than one ICU. In all, 106 ICUs from 72 hospitals reported CLAB infection data for April 2007-March 2008. Statewide infection rates were lowest in the coronary ICUs (1.2/1000 central line-days) and highest in the pediatric ICUs (4.2/1000). Rates for all types of ICUs except pediatric were lower than U.S. rates published by the Centers for Disease Control and Prevention (CDC). Compared to the January 2006-December 2006 rates published in the 2007 report, the rates for April 2007-March 2008 were lower in each of the six ICUs.

Sixty-five hospitals and 26 ASCs reported SSI data. The lowest SSI rates for hospitals were for hip repair and abdominal hysterectomy (1.3/100 surgeries), the highest rate was for coronary artery bypass surgery (2.0/100). All three rates were lower than those published for earlier years by the CDC. The ASCs had infection rates lower than 1/100 surgeries.

Cautions

Infection rates are affected by a facility's level of resources and commitment to infection control, the severity of the illnesses it treats, 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.

Next Steps

Adding data to the DHSS website on head-of-bed elevation for ventilator patients will enhance the consumer's ability to make good choices about their healthcare. Currently, hospitals in Missouri are voluntarily reporting their HOB elevation data, pending an amendment to the state reporting law to mandate reporting of important process measures, such as HOB elevation, that are known to be effective in reducing healthcare-associated infections.



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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. "The Guidance on Public Reporting of Healthcare-Associated Infections...," published by the Healthcare Infection Control Practices Advisory Committee (HICPAC) in 2005, 1 reported that in hospitals alone, HAIs accounted for an estimated 2 million infections, 90,000 deaths and \$4.5 billion dollars in excess healthcare costs annually.

In 2004, the Missouri legislature passed Senate Bill 1279, establishing the "Missouri Nosocomial Infection Reporting Act of 2004." The intent of the law is to establish conditions that lead to a decrease in HAIs in Missouri. The law requires hospitals and ambulatory surgical centers (ASCs) to report specific categories of HAIs to the Department of Health and Senior Services (DHSS).

The law also requires the DHSS to publish reports on the department's Internet website and to submit an annual report to the Governor and members of the General Assembly. Rather than including copies of every table from the website, this report summarizes the data and presents and explains representative tables.

Data Collection

Procedures and HAIs are reported to the 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 ASCs (Section 192.667, RSMo). The data that are collected follow the recommendations of the infection control advisory panel established by the law. This panel includes a statistician, a microbiologist and representatives of consumers, physicians, infection control professionals and regulators.

Infections and procedures that are serious and that occur in a variety of hospitals were considered for mandatory reporting. Hospitals and ASCs differ in what they report. Hospitals are required to report ventilator-associated pneumonia (VAP), central line-associated bloodstream (CLAB) infections, and surgical site infections (SSIs). The SSIs reported are those associated with procedures for abdominal hysterectomy, hip repair and coronary artery bypass surgery. ASCs must report SSIs associated with procedures for hernia repair and breast surgery. To provide denominators for the infection rates, facilities must report every one of the selected procedures regardless of whether the procedure results in an infection. Because patients in intensive care units are particularly at risk for HAIs, hospital reporting of CLAB infections is done for six specific intensive care units (ICUs): medical, surgical, medical/surgical, coronary, neonatal and pediatric. SSIs are reported by facility rather than ICU.

To ensure that the data being collected are reliable, the DHSS established reporting requirements for the facilities. Following the lead of the Centers for Disease Control and Prevention (CDC), DHSS required that only hospitals 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 Infection 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 on a monthly basis.

Registration for reporting by hospitals and ASCs occurs annually in March-April. Facilities report the number of central line-days per ICU and the number of reportable surgeries during the preceding calendar year. This information determines which facilities will be required to report infection data for each of the specified ICUs and surgeries.

Hospitals have been reporting CLAB infections to the department since July 2005. Recording of SSI data by hospitals and ASCs began in January 2006. Data for the 12- month period of April 2007-March 2008 were on the website at the time this report was prepared and are the subject of this report.

Reporting of VAPs has been postponed. Because hospitals do not use a standard method of diagnosing VAPs, the internal advisory control panel, with input from an expert panel convened to study the issue, recommended that a process measure, elevation of the head of the bed (HOB), be reported instead. The risk of contracting a VAP is substantially reduced for patients on ventilators if they have their heads elevated at least 30 degrees. This measure has been included in a group of VAP measures endorsed by the Joint Commission on Accreditation of Healthcare Organizations. At the request of DHSS, Missouri hospitals began voluntarily reporting HOB elevation in November 2007.

Public Reporting

Figure 1 depicts the main page of the public reporting site. This page introduces users to the site and presents a brief overview of HAIs. A number of useful links are displayed: "Related Links" connects the user to other sites that have information on HAIs; "Healthcare-Associated Infections" provides expanded information on HAIs; "Instructions for Using this Site" helps the user interpret the selection page and data tables; "Definition of Terms" is a list of technical terms and their definitions; "Frequently Asked Questions" presents background information in an easy-to-read format; "Laws, Regulations and Manuals" links the user to Section 192.667, RSMo and related chapters and regulations, and allows the user to view the manuals and forms used by the facilities to report their data.

In Figure 2, the main selection page is shown. Users can choose to compare hospitals (or ASCs) to selected comparison groups, or to view a facility profile that includes all data reported by the facility. If a user wants to view comparison data, they can choose to view CLAB infection or SSI data. For CLAB infections, they choose a specific type of ICU and region of the state. For SSIs, they choose a facility type (hospital or ASC), a surgery type and a region of the state. Passing the computer mouse over a map of Missouri produces a list of the reporting facilities by region. A link at the bottom of the page explains that facilities do not appear on the list if they had too few central line-days or surgeries to meet the reporting requirements.

Table 1 shows the web display version of a Hospital Comparison table for SSIs regarding coronary artery bypass graft (CABG) procedures. The symbols (♠, ♠, ♠) indicate whether the SSI rate was similar to, higher than, or lower than that of a comparison group. Hospitals can be compared to three different comparison groups: hospitals of a similar size (under 100 staffed beds, 100-299 staffed beds, or 300+ staffed beds), all reporting hospitals, and hospitals nationwide that report to the CDC.² As shown in Table 1, Boone Hospital Center had lower coronary artery bypass-related infection rates than U.S. hospitals reporting to the CDC.

Facilities vary according to the seriousness of the procedures they undertake and the kinds of illnesses they treat. To make comparisons among hospitals fairer, infection rates are adjusted for the level of procedure risk and the underlying condition of the patient. Factors that are taken into account in adjusting the rates are 1) the degree of contamination of the wound at the time of the operation, 2) the duration of the procedure and 3) the American Society of Anesthesiologists' physical status classification system. When the Data is selected from a Hospital Comparison table, infection rates are shown according to the risk factor group. This can be seen in Table 2 for Boone Hospital Center. It reported 344 coronary artery bypass procedures and two infections in risk group 1, and 32 procedures and 0 infections in risk group 2. These represent rates of 0.6 and 0.0 infections per 100 procedures, respectively.

Users can also select a particular hospital to profile. Table 3 shows the profile for Boone Hospital Center. Boone Hospital reported CLAB infection data for three ICUs and SSI data for all three of the reportable surgeries. The pattern of circles indicates that it had lower CLAB infection rates than hospitals nationwide for each of the three reporting ICUs, lower SSIs for abdominal hysterectomy and coronary artery bypass relative to hospitals nationwide, and lower SSIs for abdominal hysterectomy compared to all reporting hospitals in Missouri.

Data Summary

Central Line-Associated Bloodstream (CLAB) Infections

Some hospitals have only one or two ICUs, while some may have all six that are required to report to the DHSS. Thus the total number of ICUs reporting will exceed the number of hospitals reporting. A total of 106 ICUs from 72 hospitals reported CLAB infection data for April 2007-March 2008. Ten hospital ICUs in eight hospitals had rates that were significantly higher than the state or national rate. Seventeen ICUs in 12 hospitals had rates that were significantly lower than the state or national rate.

CLAB infection data for all reporting hospital ICUs are summarized in Table 4. The statewide infection rates varied from 1.2/1000 central line-days for coronary ICUs to 4.2/1000 for pediatric ICUs. Compared to the national rates reported by the CDC for 2006, all ICUs except the pediatric ICU had significantly lower rates. It should be noted that the CDC rates represent hospitals that voluntarily submitted data to the CDC's nosocomial infection surveillance system. Rates from a representative national sample might well be different.

In Table 5, the April 2007-March 2008 rates are compared to rates analyzed in the 2007 report—rates for January 2006-December 2006. CLAB rates reported from all six ICUs have decreased since the earlier period. Coronary and Surgical ICU rates have dropped the most—40 percent

and 39 percent respectively. Rates for the medical/surgical, medical and pediatric ICUs have also dropped substantially, from 20-29 percent.

Surgical Site Infections (SSIs)

Hospitals

A total of 65 hospitals out of the 130 acute care hospitals in Missouri reported SSI data. By virtue of having performed at least 20 of the specific surgeries, 56 hospitals qualified to report on hip repair surgeries, 52 reported on abdominal hysterectomy surgeries, and 33 reported on coronary artery bypass graft (CABG) surgeries. Ten hospitals had infection rates that were significantly lower than the state or U.S. rate, or the rate for hospitals of the same size. Six hospitals had rates that were significantly higher than one of these comparison groups.

Summary SSI data for the hospitals are presented in Table 6. The statewide infection rate varied from 1.3/100 surgeries, for both hip repair and abdominal hysterectomy, to 3.1/100 for CABG surgery. All three statewide rates, after adjusting for severity of surgery, were significantly lower than the U.S. infection rates reported by the CDC in 2004.⁴

Ambulatory Surgery Centers (ASCs)

Twenty-six out of 107 ASCs in Missouri reported SSI data. Twenty ASCs qualified to report on hernia repair surgeries and 16 reported on breast surgeries. Table 7 shows that the average SSI rate per ASC and the statewide rate per 100 surgeries were less than 1 for both types of surgeries. ASCs tend to perform less serious surgeries and have generally healthier patient populations than inpatient facilities. The relatively brief length of stay in the ambulatory setting reduces the patient risk for infection; it also lessens the possibility of detecting post-surgical infections.

Typically a patient does not stay very long in an ASC and will not discover an infection until sometimes days after the surgery. In this situation, the patient is likely to seek care in an emergency room or a physician's office, and the ASC may never become aware of the infection.

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 the illnesses it treats, and the care with which it collects and reports its data. Beyond checking for obvious errors, the DHSS is not able to verify the numbers that the facilities submit each month, and it is likely that some facilities do a better 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 higher risk for HAIs. In order to mitigate this effect, CLAB infection data are reported separately for each type of ICU and as a rate per 1000 central-line days. 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 these adjustments help to make the data between facilities more comparable, users of the data should understand that these adjustments are imperfect, and HAI rates should not be the sole basis for making a judgment or a choice regarding 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.

Next Steps

The DHSS was advised by both its advisory committee and an expert panel to collect head-of-bed (HOB) elevation data in place of incidence data for ventilator-associated pneumonia. Fifty nine hospitals reported at least 100 ventilator-days during 2006, and all but two agreed to voluntarily⁵ submit HOB data to the DHSS. These data are now being collected by the hospitals and will be available on the DHSS website by the time this report is published. Voluntary reporting cannot be depended upon for full compliance, however, and a change in the law is needed to ensure that all hospitals report their HOB data and any other future designated measures that are determined to be effective in reducing healthcare associated infections.

Endnotes:

- 1. Guidance on public reporting of healthcare-associated infections: recommendations of the Healthcare Infection Control Practices Advisory Committee. McKibben L, Horan T, Tokars JI, Fowler G, Cardo DM, Pearson ML, Brennan PJ and the Healthcare Infection Control Practices Advisory Committee. Am J Infect Control 2005; 3(4):217-226.
- 2. National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007. Am J Infect Control 2007; 35:290-301.
- 3. Fung HC, Lim YW, Soeren M, Damberg C, Shekelle PG. Systematic review: the evidence that publishing patient care performance data improves quality of care. Ann Intern Med 2008; 148: 111-123.
- 4. National rates published by CDC were available for 2006 for CLABs but not for SSIs. SSI rates from the 2004 publication were used for the U.S. comparison groups for hospital SSIs; National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004. Am J Infect Control 2004; 32:470-485.
- 5. Hospitals currently are not required by statute or regulation to submit data related to head of bed (HOB) elevation. It is anticipated that the next legislative session (2009) will address an amendment to the statute to allow for mandatory reporting of process measures such as HOB elevation.

Figure 1: Missouri Healthcare-Associated Infection Reporting

<u>Home</u>

Healthcare-

Associated Infections

Instructions for Using this Site

<u>Infection Reporting</u>
<u>Data</u>

Definition of Terms

<u>Frequently Asked</u> Questions

<u>Laws, Regulations &</u>
Manuals

Publications & Reports

Information for Providers

MRSA

Related Links

Your comments on this site

Contact Us

<u>Healthcare-Associated Infections (HAIs)</u>, also known as nosocomial infections, continue to be a major health problem in the United States. HAIs can be very serious, increasing the cost and length of your hospital stay and even threatening your life.

In Missouri, hospitals and ambulatory surgery centers (ASCs) are required by **state law and regulation** to report selected HAI data. The reported infection data are available, by facility, on this web site. Currently, data are reported for central line-associated bloodstream (CLAB) infections and surgical site infections (SSIs). In the future, information on head of bed elevation (HOB) will be added. HOB is a process measure related to ventilator-associated pneumonia.

As a consumer, you should be proactive in your healthcare. The information on this site can help you to:

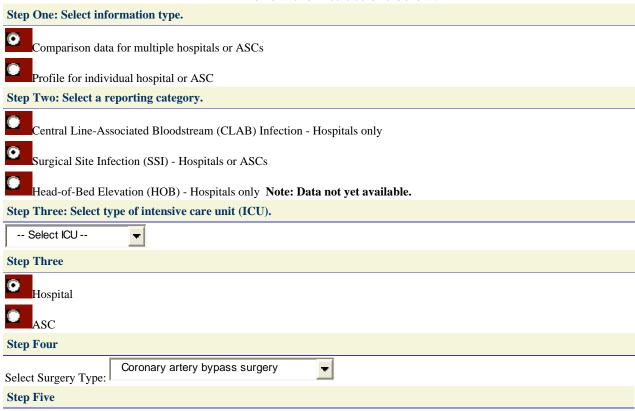
- Understand more about HAIs what they are and why they occur.
- Be informed about hospital and ASC infection rates in Missouri.
- Learn what you, as a patient, can do to lower your risk of a HAI.

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 the facilities and surgeons, and other factors unique to your situation should be considered as well.

Please review the <u>Instructions for Using this Site</u>, <u>Definition of Terms</u>, and other information listed on the left bar of this page to help you understand the data tables displayed on this site. If you have been to this site previously, you may want to go directly to the <u>Infection Reporting Data</u>.

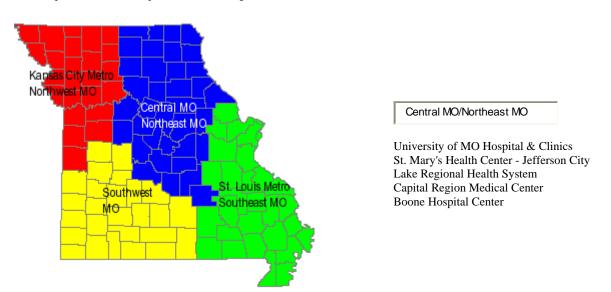
Figure 2: Main Selection Page

For information on hospitals or ambulatory surgery centers (ASCs), follow the instructions below:



To view a list of reporting facilities, place mouse over a region below.

To view performance of hospitals, click on a region.



Note: If your Hospital/ASC does not appear in any region, Click here.

Table 1: Healthcare-Associated Infection Reporting

Surgical Site Infection (SSI) Hospital Comparison

Procedure: Coronary Artery Bypass Graft Region: Central MO - Northeast MO Reporting Period: 04/01/2007 - 03/31/2008

Main Page

Facility Name	Hospital Performance Compared with Similar Size Facilities in Missouri	Hospital Performance Compared with All Missouri Facilities	Hospital Performance Compared with Facilities in U.S.	Hospital Specific Information
Boone Hospital Center	•	•	•	Data Comments
E Capital Region Medical Center	•	•	•	Data Comments
± Lake Regional Health System	•	•	•	Data Comments
St. Mary's Health Center – Jefferson City	•	•	•	Data Comments
University of MO Hospital & Clinics	•	•	•	Data Comments

- ■= Infection rate lower than other hospitals in the comparison group
- Θ = Infection rate similar to other hospitals in the comparison group
- O= Infection rate higher than other hospitals in the comparison group.

N/A = Too few hospitals in the comparison group for reliable rate calculation

Note: The above comparisons are based on **significance tests**.

 $^{^{\}scriptsize{f \pm}}$ = Click on this symbol to expand or close information on the facility.

Table 2: Healthcare-Associated Infection Reporting

Surgical Site Infection (SSI) Hospital Infection Rates

Facility Name: Boone Hospital Center Procedure: Coronary Artery Bypass Graft Region: Central MO - Northeast MO Reporting Period: 04/01/2007 - 03/31/2008

Previous Page, Main Page

Risk Group	Number of Procedures	Number of Infections	Infection Rate (per 100 procedures)	Rate for Similar Size Hospital (per 100 procedures)	Statewide Infection Rate (per 100 procedures)	National Infection Rate (per 100 procedures)
1	344	2	0.6	1.5	1.7	3.4
2	32	0	0.0	3.1	3.3	5.4

N/A => Too few hospitals for rate calculations.

Note: When the infection rate for a hospital is higher/lower than a comparison group rate, the difference may not be <u>statistically significant</u>. Return to previous page to view performance of the hospital.



Table 3: Healthcare-Associated Infection Reporting

Boone Hospital Center Profile

Facility Name: Boone Hospital Center Region: Central MO - Northeast MO Reporting Period: 04/01/2007 - 03/31/2008

Main Page

Central Line-Associated Bloodstream (CLAB) Infections

Intensive Care Unit (ICU)	Hospital Performance Compared with Similar Size Hospitals in Missouri	Hospital Performance Compared with All Missouri Hospitals	Hospital Performance Compared with Hospitals in U.S.	Hospital-Specific Information
MEDICAL	N/A	•	•	Data Comments
SURGICAL	NA/	•	•	Data Comments
NEONATAL	N/A)		Data Comments

Surgical Site Infections (SSI)

Surgery Type	Hospital Performance Compared with Similar Size Hospitals in Missouri	Hospital Performance Compared with All Missouri Hospitals	Hospital Performance Compared with Hospitals in U.S.	Hospital-Specific Information
ABDOMINAL HYSTERECTOMY	N/A	•	•	Data Comments
CORONARY ARTERY BYPASS SURGERY	N/A	•	•	Data Comments
HIP PROSTHESIS	N/A	•	•	Data Comments

- = Infection rate lower than other hospitals in the comparison group
- Θ = Infection rate similar to other hospitals in the comparison group
- O= Infection rate higher than other hospitals in the comparison group

N/A = Too few hospitals in the comparison group for reliable rate calculation

Table 4: Central Line-Associated Bloodstream Infection Summary Data by Intensive Care Unit

April 2007-March 2008 Reporting Period

Intensive Care Unit (ICU)	Number of ICUs	Statewide Infection Rate	U.S. Infection Rate ¹
CORONARY	7	1.2*	2.8
SURGICAL	8	1.3*	2.7
MEDICAL/SURGICAL	58	1.7*	2.2
MEDICAL	12	1.8*	2.9
NEONATAL	14	2.6*	4.6
PEDIATRIC (U.S. rate is for pediatric/medical/surgical)	7	4.2	5.3

¹National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007.

Note: The state and national infection rates are the number of infections per 1000 central line-days. Intensive care units are in order by the statewide infection rate.

Table 5: Comparison of Statewide Central Line-Associated Bloodstream (CLAB) Infection Rates

January 2006-December 2006 vs. April 2007-March 2008

Intensive Care Unit	January 2006-December 2006 Reporting Period	April 2007-March 2008 Reporting Period
CORONARY	2.0	1.2
SURGICAL	2.1	1.3
MEDICAL/SURGICAL	2.4	1.7
MEDICAL	2.4	1.8
NEONATAL	3.0	2.6
PEDIATRIC	5.2	4.2

^{*} Significantly lower than the U.S. rate.

Table 6: Hospitals: Surgical Site Infection Summary Data by Surgery Type

April 2007-March 2008 Reporting Period

Procedure	Number of Facilities	Adjusted* Statewide Infection Rate (per 100 Surgeries)	U.S. Infection Rate (per 100 Surgeries)
HIP REPAIR	56	1.3**	1.5
ABDOMINAL HYSTERECTOMY	52	1.3**	1.9
CORONARY ARTERY BYPASS SURGERY	33	2.0**	3.7

¹National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004.

Note: Surgeries are in order by the adjusted statewide infection rate.

Table 7: Ambulatory Surgery Centers: Surgical Site Infection Summary Data by Surgery Type

April 2007-March 2008 Reporting Period

Procedure	Number of Facilities	Statewide Infection Rate (per 100 Surgeries)
HERNIA REPAIR	19	0.10
BREAST SURGERY	17	0.23

Note: National data for ASCs are not available.

^{*}Adjusted for surgery severity level using the U.S. rate as a standard.

^{**}Significantly lower than the U.S. rate.