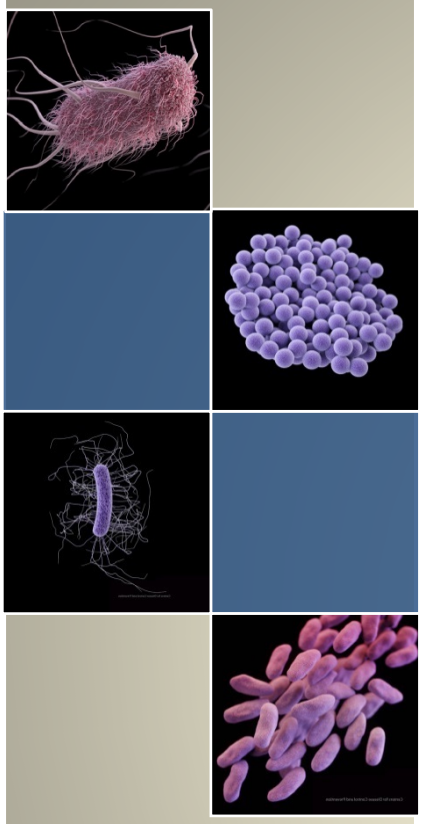
2015



# Virginia
# Healthcare-Associated Infections Report

For a Healthcare Provider Audience

**January 1, 2015 – December 31, 2015**

Virginia Department of Health
Healthcare-Associated Infections Program
November 2016

VDH VIRGINIA DEPARTMENT OF HEALTH

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Cover Images: U.S. Centers for Disease Control and Prevention – Medical Illustrator, James Archer 2013

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## ABBREVIATIONS

**A/R** – Admission/Readmission

**ASA** – American Society of Anesthesiologists

**CAUTI** – Catheter-associated urinary tract infection

**CCN** – CMS certification number

**CDC** – Centers for Disease Control and Prevention

**CDI** – *Clostridium difficile* infection

**CI** – Confidence interval

**CLABSI** – Central line-associated bloodstream infection

**CLD** – Central line days

**CMS** – Centers for Medicare and Medicaid Services

**COLO** – Colon procedures

**CSTE** – Council of State and Territorial Epidemiologists

**DIP** – Deep incisional primary SSI

**DIS** – Deep incisional secondary SSI

**ED** – Emergency department

**HAI** – Healthcare-associated infection

**HHS** – Department of Health and Human Services

**HYST** – Abdominal hysterectomy

**ICU** – Intensive care unit

**LabID** – Laboratory-identified

**LTACH** – Long-term acute care hospital

**MRSA** – Methicillin-resistant *Staphylococcus aureus*

**NHSN** – National Healthcare Safety Network

**NICU** – Neonatal intensive care unit

**SIP** – Superficial incisional primary SSI

**SIR** – Standardized infection ratio

**SIS** – Superficial incisional secondary SSI

**SSI** – Surgical site infection

**VA** – Virginia

**VDH** – Virginia Department of Health

## EXECUTIVE SUMMARY

Healthcare-associated infections (HAIs) are a public health concern that continue to pose a threat to patient safety. According to the Centers for Disease Control and Prevention (CDC), an estimated 722,000 HAIs occurred nationally in 2011, affecting approximately 1 in 25 hospital patients. In 2015, all HAIs reported to the Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Reporting Program were required to also be reported to the Virginia Department of Health (VDH). This annual report summarizes the performance of Virginia's acute care hospitals on HAIs in 2015, and healthcare worker influenza vaccination for the 2014-2015 influenza season.

### Key Findings

- In 2015, there were 48% fewer central line-associated bloodstream infections (CLABSIs) in Virginia hospitals than predicted based on the national experience from 2006-2008.
- In 2015, there were 42% fewer catheter-associated urinary tract infections (CAUTIs) in Virginia hospitals than predicted based on the national experience from 2009.
- In 2015, there were 24% more surgical site infections (SSIs) following abdominal hysterectomies and about the same number of SSIs following colon surgeries in Virginia hospitals based on the national experience from 2006-2008.
- In 2015, there were 14% fewer hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia laboratory-identified events in Virginia hospitals than predicted based on the national experience from 2010-2011.
- In 2015, there were about the same number of hospital-onset *Clostridium difficile* laboratory-identified events in Virginia hospitals as predicted based on the national experience from 2010-2011.
- For the 2014-2015 influenza season, over half (52%) of Virginia hospitals met the Department of Health and Human Services Healthy People 2020 goal of 90% vaccination of healthcare workers.

Overall, Virginia acute care hospitals have shown progress in preventing CLABSI and MRSA bacteremia laboratory-identified events in 2015 when compared to the national experience. Improvement was also noted for CAUTIs, however, this was likely due to a change in the surveillance definition. Further action is needed to reduce other HAIs, especially for SSIs following abdominal hysterectomies, which showed a significant increase in 2015. Prevention of *Clostridium difficile* infections also remains a priority for Virginia, as hospitals did not show any significant changes in 2015 from the national baseline.

The Virginia HAI program continues to work with partner organizations, key stakeholders, and healthcare facilities to improve existing programs and develop new strategies to reduce the number of HAIs in Virginia hospitals and to ultimately protect patients from harm.

## BACKGROUND

Every year, an estimated 1 in 25 hospitalized patients in the United States, or approximately 722,000 people, acquire a healthcare-associated infection (HAI) while receiving medical treatment[1]. This report summarizes the performance of Virginia hospitals with respect to HAIs in 2015, specifically focusing on the performance of acute care hospitals [and three of seven critical access[2] hospitals that report data to the Virginia Department of Health (VDH)]. Data from long-term acute care hospitals (LTACHs), children's hospitals, inpatient psychiatric hospitals, inpatient rehabilitation hospitals, and military hospitals are not reported to VDH, and are not included in this report.

### What is the purpose of the report?

This report is meant to enable readers to view hospital-specific HAI performance, understand the entire state's HAI performance as a whole, and to compare a hospital's HAI performance to that of the rest of the country. This version is intended for those interested in detailed HAI and healthcare worker influenza vaccination data for Virginia as a whole or for specific hospitals. The hospital-specific tables assume a working knowledge of HAI metrics and may be most appropriate for healthcare providers, administrators, and quality improvement and public health professionals.

This report focuses on the following HAIs:

1. Central line-associated bloodstream infections (CLABSIs)
2. Catheter-associated urinary tract infections (CAUTIs)
3. Surgical site infections (SSIs) following colon and abdominal hysterectomy procedures
4. Positive laboratory results for methicillin-resistant *Staphylococcus aureus* (MRSA) in the bloodstream
5. Positive laboratory results for *Clostridium difficile* (*C. difficile*) in stool

The report also shares information on healthcare worker influenza vaccination rates. It is recommended by the Centers for Disease Control and Prevention (CDC) and VDH that all personnel who work in a healthcare setting receive the influenza vaccine each year to help prevent its spread[3].

These measures do not represent all possible HAIs. They were selected by the federal government and VDH because they give a good overview of how a hospital is doing in preventing HAIs. HAIs are largely preventable when healthcare providers use infection prevention steps recommended by the CDC and VDH.

*For a guide to understanding healthcare worker influenza vaccination data, see Appendix A.*

*For information about things healthcare workers can do to prevent infections, see Appendix B.*

[1] Magill *et al*. (2014). Multistate Point-Prevalence Survey of Healthcare–Associated Infections. *New England Journal of Medicine*, 370:1198–1208.

[2] Critical access hospitals have ≤25 inpatient beds, maintain an annual average length of stay of ≤96 hours for acute inpatient care, offer 24-hour emergency care, and are located in rural area ≥35 miles away from any other hospital.

[3] Influenza Vaccination Information for Health Care Workers. (2016, May 26). Retrieved from http://www.cdc.gov/flu/healthcareworkers.htm.

# METHODS

## Virginia HAI Reporting Requirements

In September 2015, the VDH HAI reporting regulations aligned with those of the CMS Hospital Inpatient Quality Reporting Program. Hospitals are required to report HAIs from particular units or procedures, as well as healthcare worker influenza vaccination rates to VDH (as specified in Table 1). More information about Virginia's mandatory reporting can be found on the VDH website.

**Table 1. Virginia HAI Reporting Requirements**

| HAI Event | Applicable Units | Reporting Start Date | National Baseline |
|---|---|---|---|
| Central line-associated bloodstream infections (CLABSIs) | Adult, pediatric, and neonatal intensive care units | July 2008 (VDH); January 2011 (CMS) | 2006-2008 |
| CLABSIs | Adult and pediatric medical, surgical, and medical/surgical inpatient wards* | January 2015 | 2006-2008 |
| Catheter-associated urinary tract infections (CAUTIs) | Adult and pediatric intensive care units | January 2012 | 2009 |
| CAUTIs | Adult and pediatric medical, surgical, and medical/surgical inpatient wards* | January 2015 | 2009 |
| Surgical site infections (SSIs) following colon procedures | Inpatient procedures | January 2012 | 2006-2008 |
| SSIs following abdominal hysterectomy procedures | Inpatient procedures | January 2012 | 2006-2008 |
| Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia laboratory-identified events | Facility wide inpatients (FacWideIN) including emergency department, 24-hour observation | January 2013 | 2010-2011 |
| *Clostridium difficile* (CDI) laboratory-identified events | Facility wide inpatients (FacWideIN) including emergency department, 24-hour observation | January 2013 | 2010-2011 |
| Healthcare personnel influenza vaccination | All inpatient healthcare personnel | January 2013 | N/A |
| *Pediatric surgical ward data were excluded from the national baselines, and were excluded from the device-associated SIR calculations in this report | | | |

## Hospital Data Submission

Hospitals self-report HAI data to the CDC and to VDH using a free, web-based software system called the National Healthcare Safety Network (NHSN). CDC and the VDH HAI Program provide training to hospital staff on the appropriate use of this system, and provide guidance on how to track infections in a standardized way.

The 2015 NHSN Hospital Survey was used to gather information on hospital characteristics (e.g., hospital bedsize and medical school affiliation).

Data collected from January 1, 2015 to December 31, 2015 and downloaded from NHSN on June 30, 2016 are covered in this report; any changes made to the data after this date are not reflected in the results. Tables for this report were created using SAS 9.3 (Cary, North Carolina).

More information about NHSN can be found on the NHSN website.

## Data Metrics

### Standardized Infection Ratio (SIR)

The *standardized infection ratio* (SIR) was used to characterize hospital HAI performance. The SIR shows whether a hospital had significantly more HAIs, fewer HAIs, or about the same number of HAIs compared to the number predicted for that hospital based on national baseline data.

$$\text{SIR} = \frac{\text{Number of observed infections}}{\text{Number of predicted infections}}$$

The SIR is a summary measure that can be used to track HAIs over time and can be calculated on a variety of levels, such as unit, facility, state, and nation. The SIR adjusts for differences between hospitals, such as types of patients and procedures, as well as other factors (see Risk Adjustment and Data Exclusions). The measure compares the number of infections reported in a given time period to the number of infections that would be predicted using data from a baseline time period, which varies for different infection types (Table 1). A lower SIR indicates better performance.

The SIR value can be interpreted as follows:

- An SIR **less than 1.0** indicates that there were fewer infections reported during the surveillance period than would have been predicted given the baseline data.
- An SIR **equal to 1.0** indicates that the number of infections reported during the surveillance period is the same as the number of infections predicted given the baseline data.
- An SIR **greater than 1.0** indicates that there were more infections reported during the surveillance period than would have been predicted given the baseline data.

It is important not only to consider the SIR interpretation for each hospital, but to also look at the total number of procedures performed and the total number of infections observed in the surveillance time period.

### Number of Observed Infections

The number of observed infections for each infection type is the number of infections that a hospital detected during 2015. If the number of observed infections is zero (0), then the lower bound of the 95% confidence interval of the SIR will not be calculated.

If a hospital has zero observed infections, it does not mean that the hospital failed to report infections. When evaluating the performance of a hospital that observed zero infections, it may be important to consider the size of the hospital, the total number of procedures performed, device days or patient days, and the total number of infections that were predicted (shown in the data tables).

### Number of Predicted Infections

The number of predicted infections for each infection type is an estimate based on infections reported to NHSN by participating hospitals nationwide during the baseline time periods specified in Table 1.

CDC plans to update the national baselines for each HAI type by the end of calendar year 2016. This will involve an update of the HAI risk models by which SIRs are currently calculated, and will include new risk-adjustment methods for CLABSI and CAUTI. Nationwide NHSN data from calendar year 2015 will be used as the new baseline. Once updated, Virginia will be able to publish SIRs that compare infections to a more recent baseline.

If the number of predicted infections is less than 1, an SIR will not be calculated because the number of device days or surgical procedures is too low to calculate a precise SIR and comparative statistics. In these situations, the "SIR Interpretation" column says "*No Conclusion*". This does not mean the hospital failed to report data; it only means that during the specified time period, the number of patients, devices (central lines or urinary catheters), and/or procedures that were seen at this hospital did not meet the established threshold (minimum value) for calculating an SIR.

### Healthcare Worker Influenza Vaccination

The healthcare worker influenza vaccination data show the percentage of healthcare workers in each hospital who were vaccinated during the 2014-2015 influenza season (October 1, 2014 – March 31, 2015). Hospitals are required to submit vaccination data for healthcare workers from inpatient departments; starting with the 2014-2015 influenza season hospitals were also required to submit vaccination data for healthcare workers from outpatient departments. Healthcare workers are defined as employees, licensed independent practitioners (LIPs), and adult students/trainees and volunteers. Contract personnel are excluded from all categories.

The report indicates whether a hospital had a statistically higher percentage, lower percentage, or similar percentage of vaccinated healthcare workers compared to the Department of Health and Human Services (HHS) Healthy People 2020 goal of 90%. Hospitals were indicated to have met the 90% goal if percentage of all hospital workers vaccinated was greater than or equal to 90.0%. The calculation of the percentage of all hospital workers vaccinated across all Virginia hospitals (state benchmark) is a pooled

mean calculated by summing the numerator counts (number vaccinated) across all hospitals divided by the sum of denominator counts (number of workers) from all hospitals in the state.

### Statistical Significance

The p-value and 95% confidence interval (CI) are statistical measures that describe the likelihood that what was observed was due to random chance.

The 95% CI is a range of values used to describe statistical significance when reporting the SIR. There is a high degree of confidence (in this case, 95%) that the true SIR lies within this range. The upper and lower limits are used to determine the significance and precision of the SIR. If the confidence interval includes the value of 1, then the SIR is *not significant* (i.e., the number of observed events is not significantly different than the number predicted). If the confidence interval does not include the value of 1, then the SIR *is significant* (i.e., the number of observed events is significantly different than the number predicted). When the SIR is zero (0), the lower bound of the 95% CI cannot be calculated. However, for ease of interpretation, it can be considered zero. A narrow CI (i.e., numbers close together) indicates that there is a greater chance of obtaining an SIR within that interval, therefore increasing the precision of the SIR. Consistent with CDC/NHSN methodology, exact mid-p confidence intervals were used when observed and predicted numbers of events were less than or equal to 100; otherwise, the Byar approximation method was used[4].

For healthcare personnel influenza vaccination rates, the p-value is used to compare the observed vaccination percentage to the Healthy People 2020 goal (90%)[5]. If the p-value is less than or equal to 0.05, it can be concluded that the hospital vaccination percentage is significantly different than the 90% goal. If the p-value is greater than 0.05, it can be concluded that the hospital vaccination percentage is not statistically different than 90%.

[4] Geoffrey *et al*. (1994). Mid-p confidence intervals for the poisson expectation. Statistics in Medicine. 13, 2189-2203

[5] NHSN Mid-P test for Single Sample Proportions. Retrieved from: http://www.cdc.gov/nhsn/sas/proportionci.sas

## Risk Adjustment and Data Exclusions

The SIRs are adjusted for risk factors that may impact the risk of developing an HAI and/or hospital-level characteristics that may influence the number of infections reported by a hospital. This ensures that every unit, hospital, or state can be compared to the baseline population in the same standardized way. Different individual-level risk-adjustment methods are used for different types of HAIs.

### Device-Associated Infections

The SIRs for CLABSI[6] and CAUTI[7] are adjusted for:

- Type of patient care location
- Medical school affiliation (for some units)
- Bedsize of the patient care location (for some units)

Adult and pediatric inpatient ward data were included for 2015 and forward only, per CMS reporting requirements. Pediatric surgical ward data were excluded from the national baselines (Table 1), and were excluded from the device-associated SIR calculations in this report.

### Surgical Site Infections

In 2015, procedures in NHSN were defined using ICD-9[8] codes, including codes for abdominal hysterectomy procedures (HYST) and colon procedures (COLO).

SSI SIRs are presented using the CDC Complex Admission/Readmission (A/R) model. Only deep incisional primary and organ/space infections detected during the same admission as the surgical procedure or upon readmission to the same hospital that performed the surgical procedure are included in the reported SIR. Superficial incisional primary (SIP), superficial incisional secondary (SIS) and deep incisional secondary (DIS) SSIs, as well as any SSI identified on post discharge surveillance, are excluded. The model only includes procedures and associated SSIs that were reported with primary closure technique. More details on the Complex A/R model, as well as definitions for the different types of SSIs, can be found in the NHSN SSI Protocol[9]. For information about additional SSI models, see Appendix I.

The SIR for surgical site infections[10] (SSIs) following colon surgeries (COLO) is adjusted for:

- Hospital bedsize
- Medical school affiliation
- Duration of surgery

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[6] Edwards *et al*. (2009). National Healthcare Safety Network (NHSN) Report: Data Summary for 2006 through 2008, issued December 2009. *American Journal of Infection Control*, 37(10), 783–805.

[7] Dudeck *et al*. (2011). National Healthcare Safety Network (NHSN) Report, Data Summary for 2009, Device-Associated Module. *American Journal of Infection Control*, 39(5), 349–367.

[8] http://www.cdc.gov/nhsn/xls/icd-9-cmcodescurrent.xlsx

[9] Surgical Site Infection (SSI) Event

[10] Mu *et al*. (2011). Improving risk-adjusted measures of surgical site infection for the National Healthcare Safety Network. *Infection Control & Hospital Epidemiology*, 32(10), 970–986.

- Surgical wound class
- Use of endoscope(s)
- Patient age
- Patient assessment at time of surgery (ASA score)

The SIR for surgical site infections (SSIs)[10] following abdominal hysterectomies (HYST) is adjusted for:

- Hospital bedsize
- Duration of surgery
- Patient age
- Patient assessment at time of surgery (ASA score)

### Laboratory-Identified Events

SIRs for MRSA bacteremia and *C. difficile* LabID events are calculated for inpatient facility-wide hospital-onset events (i.e., those that occur after day 3 of hospital admission). For 2015 and forward, MRSA and *C. difficile* LabID events reported from rehabilitation wards and behavioral health/psychiatric wards that have a CMS Certification Number (CCN) that is different from the hospital are excluded from analyses. *C. difficile* SIRs exclude data from units that serve infants (e.g., neonatal intensive care units, well-baby nurseries, well-baby clinics, infants in labor and delivery units, and special care nursery units).

If the community-onset *C. difficile* prevalence rate in a hospital exceeds 1.78 for a quarter, the number of predicted infections and SIR will not be calculated for that quarter. For MRSA bacteremia, if the community-onset prevalence rate in a hospital exceeds 0.88 for a quarter, the number of predicted infections and SIR will not be calculated. MRSA and *C. difficile* LabID SIR calculations exclude months where patient days and/or admissions are missing, and where *C. difficile* laboratory test method data are missing.

More information about LabID definitions and exclusions can be found in the NHSN Multidrug-Resistant Organism and *C. difficile* Infection Module protocol[11].

The SIRs for hospital-onset *C. difficile* and MRSA bacteremia LabID events[12] are adjusted for:

- Hospital bedsize
- Medical school affiliation
- The number of patients admitted to the hospital who already have *C. difficile* or a MRSA bacteremia LabID event ("community-onset" cases)
- For hospital-onset *C. difficile*, the SIR is adjusted for the type of test the hospital laboratory used to identify *C. difficile* from patient specimens (hospitals self-report quarterly)

[11] NHSN Multidrug-Resistant Organism and *C.difficile* Infection Module protocol

[12] Dudeck *et al*. Risk Adjustment for Healthcare Facility-Onset *C. difficile* and MRSA Bacteremia Laboratory-identified Event Reporting in NHSN. Published March 12, 2013.

## Quality Assurance and Data Validation

The NHSN system has a number of built-in validation steps and point-of-entry checks to reduce common data entry errors. Hospitals have the ability to enter the system and view, edit, and analyze their data at any time.

For further quality assurance, the VDH HAI program sent a hospital-specific Data Cleaning Report to all acute care and critical access hospitals in the state that share their data with VDH. The report contained lists of data elements from 2014 and 2015 that were identified as missing, questionable, inconsistent, or duplicative. Hospitals were given two weeks to review the report and make data corrections in NHSN as appropriate. The purpose of the Data Cleaning Report was to ensure that the NHSN data are accurately reflected in this annual report.

Although efforts were made by hospitals and the VDH HAI Program to ensure that the data are accurate and complete, a formal validation of the data (i.e., validation with on-site chart review) was not performed. However, some hospitals conduct their own validation studies. Ongoing monitoring, education and training are provided to ensure integrity of the data reported to VDH.

## Data Caveats and Limitations

### Laboratory-Identified Events

*Clostridium difficile* infection (CDI) and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia LabID event definitions use laboratory and limited admission data. LabID Event reporting allows laboratory testing data to be used without clinical evaluation of the patient.

There are certain caveats in using and interpreting LabID event data. For example, experience in other states has shown that CDI rates tend to be higher when using LabID event data compared to clinical case definitions[13]. Reasons for this may include differences in how individual hospitals define and classify clinical disease, and timing of specimen collection. LabID events may detect colonization, which is asymptomatic carriage of the bacteria, and which does not represent true infection. LabID events should be considered a 'proxy' measure used to estimate the number of CDI and MRSA bacteremia infections that occurred in a given time period.

Despite these caveats, there are benefits to using LabID criteria. LabID events do not depend on clinical interpretation by providers, and thus offer a more standardized and consistent method of collecting and reporting CDI and MRSA bacteremia surveillance data. The SIR adjusts for CDI test type to account for differences in test sensitivity and specificity. Moreover, LabID events are being used by CMS for quality reporting programs. Hospitals are required to follow the NHSN Multidrug-Resistant Organism & *Clostridium difficile* Infection Module protocol, which is updated each year with LabID event surveillance

[13] Gase *et al*. (2013). Comparison of 2 *Clostridium difficile* surveillance methods National Healthcare Safety Network's laboratory-identified event reporting module versus clinical infection surveillance. *Infection Control & Hospital Epidemiology*, 34(03), 284–290.

definitions and reporting instructions. Improving prevention practices (as described in existing clinical guidelines) should result in a decrease in the number of observed CDI and MRSA bacteremia LabID events, as well as a decrease in the number of clinical infections.

### National Healthcare Safety Network (NHSN) Definition Changes

Since establishing the national baseline periods, NHSN has changed the surveillance definitions for a number of HAIs. NHSN definition changes are important to consider when evaluating HAI summary tables; definitions directly affect the reported number of infections observed in a hospital and the SIR calculation. For example, the 2015 update to the CAUTI definition excludes urine cultures that are positive only for yeast and other non-bacterial pathogens, and urine cultures with colony counts <100,000 CFU/ml (colony-forming units per milliliter). Due to these exclusions, the number of CAUTIs reported from hospitals in 2015 and forward may be lower than in previous years.

More information regarding 2015 CAUTI definition changes and NHSN definition changes for other HAIs can be found on the NHSN website.

### Other Data Limitations

Although efforts were made through education and training to improve the standardization and understanding of NHSN surveillance guidelines, definitions, and criteria, there can be variability in interpretation and application, leading to differences in reporting practices among hospitals. Furthermore, hospitals with more financial or personnel resources for HAI surveillance may be able to identify and report more infections compared to a hospital with fewer resources.

While NHSN collects information on many important factors that may put a patient at risk for an HAI, the system is not able to collect data about all potential risks. Each patient and healthcare location has a different set of risks that may not be fully accounted for in the calculation of the SIR.

There may be variations between results published by VDH and results published elsewhere (e.g., CMS Hospital Compare or CDC). Hospitals have the ability to modify their data at any time once entered, thus results may vary if other sources use different data collection periods or include different hospitals.

It is important to understand that the numbers alone will not show how well a hospital is preventing HAIs. This report shows how hospitals performed during a single year (2015) and compares each hospital's performance to the national baseline. Appendix F and Appendix G contain some historic data for reference; however tracking hospital performance over time is not the primary purpose of this report.

# RESULTS

## Virginia Hospital Characteristics

Characteristics of hospitals reporting HAI data to VDH in 2015 are displayed below (Table 2), including hospital type, Virginia health planning region, medical school affiliation, and bedsize. Individual hospital characteristics can be found in Appendix C (Table 12). Nearly one in three (30%) of Virginia hospitals were located in the Southwest region of the state, and about half (46%) were affiliated with a medical school. The average number of hospital beds was 194, with the largest hospital containing 984 beds and the smallest containing 15.

**Table 2. Characteristics of Virginia Hospitals (n=81), January – December 2015**

| | Number of Hospitals | Percent |
|---|---|---|
| **Total Virginia** | 81 | - |
| **Hospital Type** | | |
| Acute Care | 78 | 96.3% |
| Critical Access | 3 | 3.7% |
| **Region**[a] | | |
| Central | 16 | 19.7% |
| Eastern | 18 | 22.2% |
| Northern | 10 | 12.3% |
| Northwest | 13 | 16.0% |
| Southwest | 24 | 29.6% |
| **Total Number of Beds**[b] | | |
| ≤100 | 31 | 38.3% |
| 101-200 | 24 | 29.6% |
| >200 | 26 | 32.1% |
| **Medical School Affiliation**[c] | | |
| Yes | 37 | 45.7% |
| No | 44 | 54.3% |

[a] For Virginia regional divisions see Figure 7

[b] Bedsize is defined as the number of beds set up and staffed in all inpatient locations[14].

[c] Medical School Affiliation equals 'Yes' if hospital answered 'Yes' to the following question on the NHSN Patient Safety Component Annual Hospital Survey: Is your hospital a teaching hospital for physicians and/or physicians-in-training? Includes major teaching (facility has a program for medical students and post-graduate medical training), graduate teaching (facility has a program for post-graduate medical training, i.e., residency and/or fellowships), or undergraduate (facility has a program for medical students only).

[14] Instructions for Completion of the Patient Safety Component – Annual Hospital Survey. http://www.cdc.gov/nhsn/forms/instr/57_103-TOI.pdf

## Summary of Healthcare-Associated Infections in Virginia

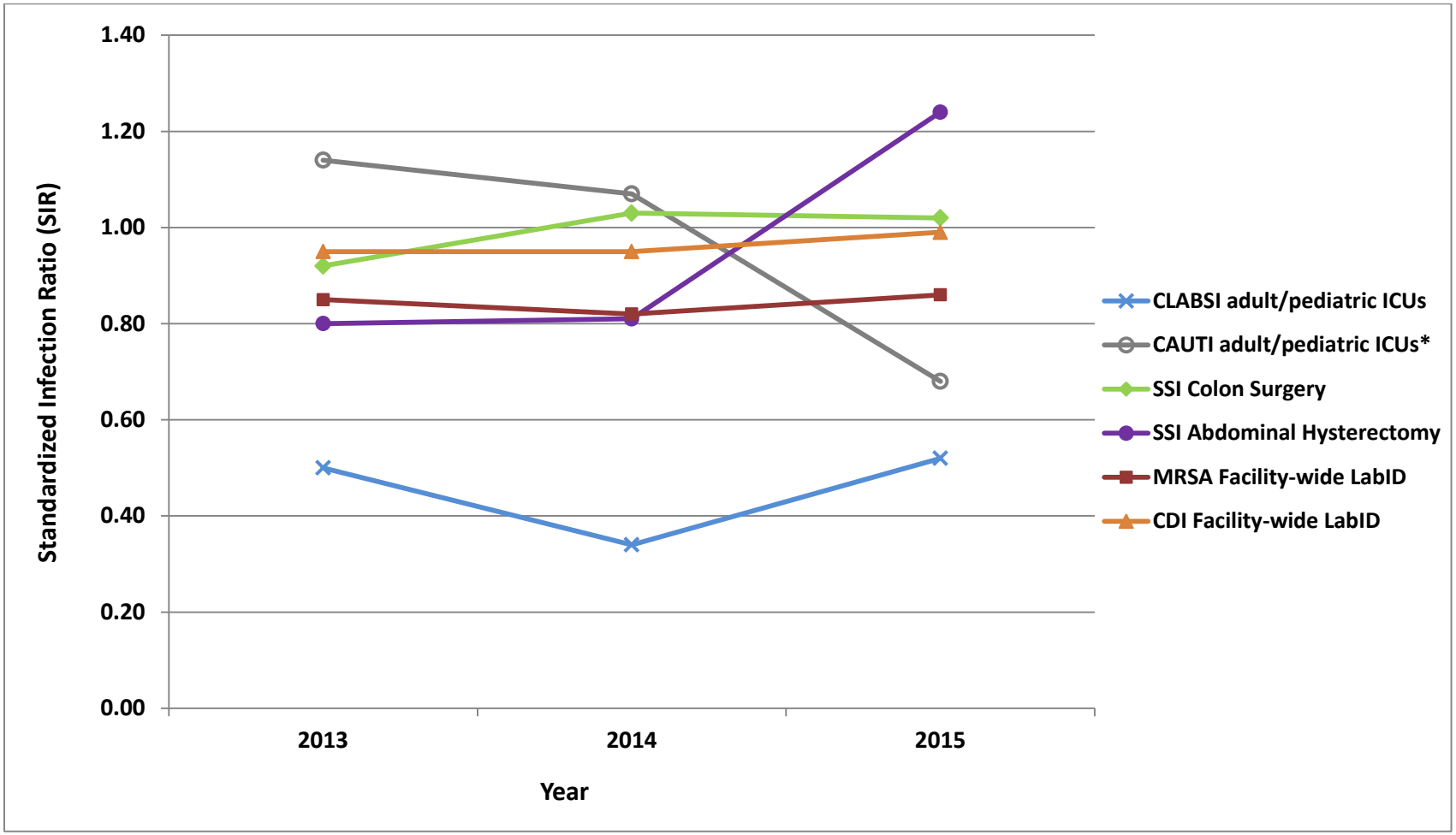
Table 3 shows the statewide summary of SIRs for all reportable HAIs in 2015. Overall, statistically significant reductions from the national baseline were observed for CLABSIs, CAUTIs and MRSA bacteremia. A statistically significant increase from the national baseline was reported for SSIs following abdominal hysterectomies in 2015. No significant differences were noted for CDI or SSIs following colon procedures. For a summary of statewide HAI data from 2014 and 2013, see Appendix F.

**Table 3. Statewide Standardized Infection Ratios (SIRs) for Central Line-Associated Bloodstream Infection (CLABSI), Catheter-Associated Urinary Tract Infection (CAUTI), Surgical Site Infection (SSI) and Laboratory-Identified Hospital-Onset Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia and *Clostridium difficile* (CDI) Laboratory-Identified Events, Virginia Hospitals, 2015**

| | | | | Number of Infections | | Standardized Infection Ratio (SIR)* and 95% CI | | |
|---|---|---|---|---|---|---|---|---|
| **HAI** | **Unit/Type** | **No. of Facilities** | **Device Days/ Procedures Performed/ Patient Days** | **Observed** | **Predicted** | **SIR** | **Lower** | **Upper** |
| **CLABSI** | **All ICUs and Wards (total)** | 81 | 447,204 | 411 | 783.62 | 0.52 | 0.48 | 0.58 |
| | **Adult and Pediatric ICUs (only)** | 78 | 197,508 | 203 | 394.00 | 0.52 | 0.45 | 0.59 |
| | **Adult and Pediatric Wards (only)** | 81 | 218,643 | 177 | 318.83 | 0.56 | 0.48 | 0.64 |
| | **Neonatal ICUs (only)** | 25 | 31,053 | 31 | 70.80 | 0.44 | 0.30 | 0.61 |
| **CAUTI** | **All ICUs and Wards (total)** | 81 | 464,584 | 510 | 877.65 | 0.58 | 0.53 | 0.63 |
| | **Adult and Pediatric ICUs (only)** | 78 | 231,684 | 319 | 472.65 | 0.68 | 0.60 | 0.75 |
| | **Adult and Pediatric Wards (only)** | 81 | 232,900 | 191 | 404.99 | 0.47 | 0.41 | 0.54 |
| **SSI*** | **Colon Surgery** | 77 | 7,158 | 226 | 221.03 | 1.02 | 0.90 | 1.16 |
| | **Abdominal Hysterectomy** | 68 | 8,384 | 84 | 67.61 | 1.24 | 1.00 | 1.53 |
| **MRSA** | **Facility-wide LabID** | 81 | 3,475,556 | 178 | 207.84 | 0.86 | 0.74 | 0.99 |
| **CDI** | **Facility-wide LabID** | 81 | 3,153,506 | 2,542 | 2556.14 | 0.99 | 0.96 | 1.03 |

Green highlighting indicates an SIR significantly LOWER than the national baseline (CLABSI, SSI - 2006-2008; CAUTI - 2009; MRSA, CDI - 2010-2011).
Red highlighting indicates an SIR significantly HIGHER than the national baseline.
* SSI SIRs are based on the complex admission/readmission model.

**Figure 1. Statewide Standardized Infection Ratios (SIRs) by Infection Type, Virginia, 2013-2015**




*NHSN definition for CAUTIs changed in 2015.
For national baseline and reporting requirement information see Table 1. For accurate trend analysis, device-associated data (CLABSI and CAUTI) is included for adult and pediatric ICUs only. Reporting for inpatient wards began in 2015.
SSI SIRs are based on the complex admission/readmission model.
2013 did not undergo quality assurance with the exception of CLABSI data reported from adult ICUs.

| Legend | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. | N/A | Hospital did not perform that surgical procedure or had no eligible procedures** in 2015 |

*National experience contains data from 2006-2008 for CLABSI and SSI, 2009 for CAUTI, and 2010-2011 for MRSA and *C. difficile* Laboratory-Identified Events.
**Eligible procedures are those that fit the Complex Admission/Readmission SSI model.

**Table 4. Infections in Virginia Compared to the National Experience, Virginia Hospitals, 2015**

| Hospital Name | Bloodstream Infections (CLABSIs)[a] | Urinary Tract Infections (CAUTIs)[a] | Surgical Site Infections (SSIs) from Colon Surgeries | SSIs from Abdominal Hysterectomies | Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events | *Clostridium difficile* LabID Events |
|---|---|---|---|---|---|---|
| **All Virginia Hospitals (n=81)** | ★ | ★ | = | ✖ | ★ | = |
| Augusta Health | = | = | = | **No Conclusion** | = | ★ |
| Bon Secours DePaul Medical Center | ★ | = | **No Conclusion** | = | = | = |
| Bon Secours Mary Immaculate Hospital | = | ★ | **No Conclusion** | = | = | = |
| Bon Secours Maryview Medical Center | = | ★ | = | **No Conclusion** | = | ★ |
| Bon Secours Memorial Regional Medical Center | ★ | = | = | = | = | = |
| Bon Secours Rappahannock General Hospital | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | = |
| Bon Secours Richmond Community Hospital | **No Conclusion** | **No Conclusion** | N/A | N/A | **No Conclusion** | ★ |
| Bon Secours St. Francis Medical Center | ★ | ★ | = | = | = | ★ |
| Bon Secours St. Mary's Hospital | ★ | ★ | = | = | = | ★ |
| Buchanan General Hospital | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | = |
| Carilion Franklin Memorial Hospital | **No Conclusion** | **No Conclusion** | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Carilion Giles Community Hospital | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | = |

| Hospital Name | Bloodstream Infections (CLABSIs)[a] | Urinary Tract Infections (CAUTIs)[a] | Surgical Site Infections (SSIs) from Colon Surgeries | SSIs from Abdominal Hysterectomies | Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events | *Clostridium difficile* LabID Events |
|---|---|---|---|---|---|---|
| **All Virginia Hospitals (n=81)** | ★ | ★ | = | ✖ | ★ | = |
| Carilion Medical Center | ★ | ✖ | = | = | = | ✖ |
| Carilion New River Valley Medical Center | ★ | ★ | = | **No Conclusion** | = | = |
| Carilion Stonewall Jackson Hospital | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | ✖ |
| Carilion Tazewell Community Hospital | **No Conclusion** | = | N/A | N/A | **No Conclusion** | = |
| Centra Bedford Memorial Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Centra Lynchburg General Hospital | = | = | = | N/A | = | ★ |
| Centra Southside Community Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Centra Virginia Baptist Hospital | **No Conclusion** | = | **No Conclusion** | = | **No Conclusion** | ★ |
| Chesapeake Regional Medical Center | = | = | = | = | = | = |
| Clinch Valley Medical Center | = | ★ | **No Conclusion** | **No Conclusion** | **No Conclusion** | ★ |
| Danville Regional Medical Center | = | ★ | = | **No Conclusion** | = | = |
| Fauquier Health | ★ | ★ | **No Conclusion** | **No Conclusion** | **No Conclusion** | ★ |
| HCA CJW Medical Center Chippenham Hospital | = | = | = | **No Conclusion** | = | ✖ |
| HCA CJW Medical Center Johnston-Willis Hospital | = | = | = | = | = | = |
| HCA Henrico Doctors' Hospital | = | ★ | ✖ | = | = | ✖ |
| HCA John Randolph Medical Center | = | = | **No Conclusion** | N/A | **No Conclusion** | = |
| HCA LewisGale Hospital Alleghany | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| HCA LewisGale Hospital Montgomery | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| HCA LewisGale Hospital Pulaski | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | ✖ |

| Hospital Name | Bloodstream Infections (CLABSIs)[a] | Urinary Tract Infections (CAUTIs)[a] | Surgical Site Infections (SSIs) from Colon Surgeries | SSIs from Abdominal Hysterectomies | Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events | *Clostridium difficile* LabID Events |
|---|---|---|---|---|---|---|
| **All Virginia Hospitals (n=81)** | ★ | ★ | = | ✖ | ★ | = |
| HCA LewisGale Medical Center | ★ | = | = | = | = | ✖ |
| HCA Parham Doctors' Hospital | = | = | **No Conclusion** | N/A | **No Conclusion** | ★ |
| HCA Reston Hospital Center | = | ★ | = | **No Conclusion** | = | = |
| HCA Retreat Doctors' Hospital | = | = | = | **No Conclusion** | **No Conclusion** | = |
| HCA Spotsylvania Regional Medical Center | = | = | = | **No Conclusion** | = | = |
| Inova Alexandria Hospital | = | = | = | **No Conclusion** | = | = |
| Inova Fair Oaks Hospital | ★ | = | = | **No Conclusion** | = | = |
| Inova Fairfax Medical Campus | ★ | = | = | = | = | = |
| Inova Loudoun Hospital | = | ★ | = | **No Conclusion** | = | = |
| Inova Mount Vernon Hospital | = | = | **No Conclusion** | **No Conclusion** | = | = |
| Mary Washington Hospital | = | ★ | = | **No Conclusion** | = | ✖ |
| Memorial Hospital of Martinsville & Henry County | = | ★ | = | **No Conclusion** | = | = |
| MSHA Johnston Memorial Hospital | = | ★ | = | **No Conclusion** | = | = |
| MSHA Norton Community Hospital | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| MSHA Russell County Medical Center | **No Conclusion** | = | N/A | N/A | **No Conclusion** | = |
| MSHA Smyth County Community Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Novant Health UVA Health System Culpeper Medical Center | = | ★ | **No Conclusion** | **No Conclusion** | = | = |
| Novant Health UVA Health System Haymarket Medical Center | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | ★ |

| Hospital Name | Bloodstream Infections (CLABSIs)[a] | Urinary Tract Infections (CAUTIs)[a] | Surgical Site Infections (SSIs) from Colon Surgeries | SSIs from Abdominal Hysterectomies | Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events | *Clostridium difficile* LabID Events |
|---|---|---|---|---|---|---|
| **All Virginia Hospitals (n=81)** | ★ | ★ | = | ✖ | ★ | = |
| Novant Health UVA Health System Prince William Medical Center | = | = | ✖ | **No Conclusion** | = | ★ |
| Riverside Doctors' Hospital Williamsburg | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Riverside Regional Medical Center | ★ | ★ | ✖ | = | = | = |
| Riverside Shore Memorial Hospital | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Riverside Tappahannock Hospital | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | = |
| Riverside Walter Reed Hospital | = | = | = | **No Conclusion** | **No Conclusion** | = |
| Sentara CarePlex Hospital | = | = | ★ | **No Conclusion** | = | = |
| Sentara Halifax Regional Hospital | = | = | = | **No Conclusion** | **No Conclusion** | = |
| Sentara Leigh Hospital | = | ★ | = | ✖ | = | ★ |
| Sentara Martha Jefferson Hospital | ★ | = | = | **No Conclusion** | = | = |
| Sentara Norfolk General Hospital | ★ | ★ | ✖ | **No Conclusion** | = | ★ |
| Sentara Northern Virginia Medical Center | ★ | ★ | = | **No Conclusion** | = | = |
| Sentara Obici Hospital | = | = | = | **No Conclusion** | = | ★ |
| Sentara Princess Anne Hospital | ★ | ★ | = | **No Conclusion** | = | = |
| Sentara RMH Medical Center | ★ | ★ | = | **No Conclusion** | = | = |
| Sentara Virginia Beach General Hospital | ★ | ★ | = | **No Conclusion** | = | = |
| Sentara Williamsburg Regional Medical Center | ★ | ★ | = | **No Conclusion** | = | = |
| Shenandoah Memorial Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Southampton Memorial Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |

| Hospital Name | Bloodstream Infections (CLABSIs)[a] | Urinary Tract Infections (CAUTIs)[a] | Surgical Site Infections (SSIs) from Colon Surgeries | SSIs from Abdominal Hysterectomies | Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events | *Clostridium difficile* LabID Events |
|---|---|---|---|---|---|---|
| **All Virginia Hospitals (n=81)** | ★ | ★ | = | ✖ | ★ | = |
| Southern Virginia Regional Medical Center | **No Conclusion** | = | N/A | N/A | **No Conclusion** | = |
| Southside Regional Medical Center | ★ | ★ | = | **No Conclusion** | = | = |
| Stafford Hospital | = | ★ | = | **No Conclusion** | **No Conclusion** | = |
| Twin County Regional Healthcare | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| UVA Medical Center | ★ | = | = | = | = | ✖ |
| VCU Community Memorial Hospital | = | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| VCU Medical Center | ★ | ★ | ✖ | = | = | ✖ |
| Virginia Hospital Center | ★ | = | = | = | = | ★ |
| Warren Memorial Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Wellmont Lonesome Pine Hospital | **No Conclusion** | **No Conclusion** | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |
| Wellmont Mountain View Regional Medical Center | **No Conclusion** | = | **No Conclusion** | N/A | **No Conclusion** | = |
| Winchester Medical Center | ★ | ★ | = | **No Conclusion** | = | ✖ |
| Wythe County Community Hospital | **No Conclusion** | = | **No Conclusion** | **No Conclusion** | **No Conclusion** | = |

[a] Aggregate data includes ICU and inpatient ward (adult and pediatric medical, surgical, medical/surgical) data.

## Reading Guide for HAI Data Tables

This column is only shown in tables summarizing LabID events (i.e., MRSA & *C. difficile*)

**Observed** = Number of infections (or events) identified
**Predicted** = Number of infections (or events) predicted based on NHSN national baseline data

Statewide aggregate data are found in the first row.

**Standardized Infection Ratio (SIR):**

$$SIR = \frac{\text{Number of infections observed}}{\text{Number of infections predicted}}$$

SIR= 1.5 means **50% more** infections than predicted
SIR= 0.5 means **50% fewer** infections than predicted

| Hospital Name | Months Included | Device Days/ No. of Procedures/ Patient Days | Number of Infections | | SIR and 95% Confidence Interval | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals** | 12 | 447,204 | 411 | 783.62 | 0.52 | (0.48, 0.58) | ★Better |
| Hospital A | 12 | 1,270 | 2 | 1.72 | 1.16 | (0.19, 3.84) | = Same |
| Hospital B | 9 | 1,794 | 0 | 3.08 | 0.51 | (0.41, 0.54) | ★Better |
| Hospital C | 12 | 374 | 0 | 0.60 | N/A | N/A | **No Conclusion** |
| Hospital D | 12 | 3,659 | 11 | 5.07 | 2.17 | (1.14, 3.77) | ✖ Worse |

**Example: Hospital A**

| Device Days | Obs. | Pred. | SIR | 95% CI | Interpretation |
|---|---|---|---|---|---|
| 1,270 | 2 | 1.72 | 1.16 | (0.19, 3.84) | = Same |

**Hospital A reported:**

- 1,270 denominator days
- Observed 2 infections
- Predicted 1.72 infections

**Hospital A SIR:**

- Not statistically significantly different from baseline SIR of 1 (CI crosses 1.0).
- 16% more infections than predicted.

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience. | = | About the **same** number of infections as predicted based on the national experience. | ✖ | More infections (**worse**) than predicted based on the national experience. | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |

**For an explanation of each variable, see Appendix E. Variable Definitions.**

# Central Line-Associated Bloodstream Infections (CLABSIs)

## Central Line-Associated Bloodstream Infections (CLABSI) – Adult, Neonatal, and Pediatric Intensive Care Units and Adult and Pediatric Medical, Surgical, and Medical/Surgical Inpatient Wards

The SIR for CLABSIs in ICUs and NICUs has remained significantly lower than the national baseline over the past five years (Appendix G.). In 2015, 81 Virginia hospitals reported CLABSI data for adult and pediatric medical, surgical and medical/surgical inpatient wards. Seventy-eight hospitals reported CLABSI data for adult and pediatric intensive care units (ICUs), and 25 hospitals reported data for neonatal ICUs (NICUs).

The 2015 overall CLABSI SIR for Virginia hospitals (SIR=0.52; 95% CI: 0.48, 0.58) was statistically significantly lower than the national baseline. This SIR indicates that the number of CLABSIs in Virginia was 48% lower than predicted, based on the national experience from 2006-2008. Nearly half (46%, n=37) of Virginia hospitals reported zero CLABSIs in 2015 from their ICUs and inpatient wards. Among the 59 hospitals that had a calculated CLABSI SIR for all reportable ICUs and inpatient wards, 23 (39%) experienced significant reductions from the national baseline; none had significant increase.

Additional information about specific unit types is contained in Appendix H.

- Among the hospitals that had a calculated CLABSI SIR for adult and pediatric ICUs, 13 (26%) reported a statistically significantly lower SIR than the national baseline (Table 18). The 2015 state SIR for adult and pediatric ICUs was 0.52 (95% CI: 0.45, 0.59) and was also statistically significantly lower compared to the national baseline. This indicates that the number of CLABSIs seen for these units was 48% lower than predicted.

- Among hospitals that had a calculated CLABSI SIR for NICUs, two (14%) reported a statistically significantly lower SIR than the national baseline (Table 19). The 2015 state SIR for NICUs was 0.44 (95% CI: 0.30, 0.61) and was also a statistically significant reduction from the national baseline. This indicates that the number of CLABSIs seen for these units was 56% lower than predicted.

- Among the hospitals that had a calculated CLABSI SIR for adult and pediatric inpatient wards, eight (16%) reported an SIR statistically significantly lower than the national baseline (Table 20). Two hospitals (4%) reported a statistically significant increase from the national baseline. The 2015 state SIR for wards was 0.56 (95% CI: 0.48, 0.64) and was also a statistically significant reduction from the national baseline. This indicates that the number of CLABSIs seen for these units was 44% lower than predicted.

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for CLABSI. | | | | | | | |

**Table 5. Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratio (SIR) Report by Facility, All Reportable Intensive Care Units and Inpatient Wards, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81 )** | **447,204** | **411** | **783.62** | **0.52** | **(0.48, 0.58)** | **★Better** |
| Augusta Health | 2,252 | 3 | 3.32 | 0.90 | (0.23, 2.46) | = Same |
| Bon Secours DePaul Medical Center | 3,551 | 0 | 6.30 | 0.00 | (., 0.48) | ★Better |
| Bon Secours Mary Immaculate Hospital | 2,518 | 3 | 3.77 | 0.80 | (0.20, 2.16) | = Same |
| Bon Secours Maryview Medical Center | 6,129 | 11 | 9.04 | 1.22 | (0.64, 2.12) | = Same |
| Bon Secours Memorial Regional Medical Center | 8,471 | 5 | 12.40 | 0.40 | (0.15, 0.89) | ★Better |
| Bon Secours Rappahannock General Hospital | 267 | 0 | 0.37 | N/A | N/A | **No Conclusion** |
| Bon Secours Richmond Community Hospital | 358 | 0 | 0.49 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 5,203 | 2 | 7.64 | 0.26 | (0.04, 0.87) | ★Better |
| Bon Secours St. Mary's Hospital | 14,684 | 11 | 25.71 | 0.43 | (0.23, 0.74) | ★Better |
| Buchanan General Hospital | 79 | 0 | 0.10 | N/A | N/A | **No Conclusion** |
| Carilion Franklin Memorial Hospital | 336 | 0 | 0.40 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 328 | 0 | 0.46 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 23,059 | 22 | 49.97 | 0.44 | (0.28, 0.66) | ★Better |
| Carilion New River Valley Medical Center | 3,360 | 1 | 5.21 | 0.19 | (0.01, 0.95) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **447,204** | **411** | **783.62** | **0.52** | **(0.48, 0.58)** | **★Better** |
| Carilion Stonewall Jackson Hospital | 281 | 0 | 0.39 | N/A | N/A | **No Conclusion** |
| Carilion Tazewell Community Hospital | 213 | 0 | 0.26 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 135 | 0 | 0.18 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 16,588 | 19 | 26.43 | 0.72 | (0.45, 1.10) | = Same |
| Centra Southside Community Hospital | 415 | 0 | 0.53 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 450 | 0 | 0.71 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 7,733 | 12 | 11.39 | 1.05 | (0.57, 1.79) | = Same |
| Clinch Valley Medical Center | 2,173 | 1 | 2.69 | 0.37 | (0.02, 1.83) | = Same |
| Danville Regional Medical Center | 2,836 | 1 | 4.92 | 0.20 | (0.01, 1.00) | = Same |
| Fauquier Health | 3,435 | 0 | 4.50 | 0.00 | (., 0.67) | ★Better |
| HCA CJW Medical Center Chippenham Hospital | 12,840 | 24 | 21.40 | 1.12 | (0.74, 1.64) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 4,627 | 6 | 9.62 | 0.62 | (0.25, 1.30) | = Same |
| HCA Henrico Doctors' Hospital | 7,463 | 11 | 13.95 | 0.79 | (0.42, 1.37) | = Same |
| HCA John Randolph Medical Center | 1,557 | 1 | 2.15 | 0.46 | (0.02, 2.29) | = Same |
| HCA LewisGale Hospital Alleghany | 723 | 0 | 1.14 | 0.00 | (., 2.62) | = Same |
| HCA LewisGale Hospital Montgomery | 1,064 | 2 | 1.53 | 1.31 | (0.22, 4.33) | = Same |
| HCA LewisGale Hospital Pulaski | 788 | 0 | 1.02 | 0.00 | (., 2.93) | = Same |
| HCA LewisGale Medical Center | 14,595 | 11 | 25.89 | 0.43 | (0.22, 0.74) | ★Better |
| HCA Parham Doctors' Hospital | 2,050 | 4 | 3.40 | 1.18 | (0.37, 2.84) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **447,204** | **411** | **783.62** | **0.52** | **(0.48, 0.58)** | **★Better** |
| HCA Reston Hospital Center | 7,171 | 7 | 10.69 | 0.66 | (0.29, 1.30) | = Same |
| HCA Retreat Doctors' Hospital | 2,643 | 4 | 3.64 | 1.10 | (0.35, 2.65) | = Same |
| HCA Spotsylvania Regional Medical Center | 1,801 | 1 | 2.41 | 0.41 | (0.02, 2.04) | = Same |
| Inova Alexandria Hospital | 9,522 | 22 | 14.50 | 1.52 | (0.98, 2.26) | = Same |
| Inova Fair Oaks Hospital | 3,152 | 0 | 4.87 | 0.00 | (., 0.62) | ★Better |
| Inova Fairfax Medical Campus | 32,231 | 48 | 68.10 | 0.71 | (0.53, 0.93) | ★Better |
| Inova Loudoun Hospital | 2,980 | 1 | 4.13 | 0.24 | (0.01, 1.19) | = Same |
| Inova Mount Vernon Hospital | 2,370 | 4 | 3.81 | 1.05 | (0.33, 2.53) | = Same |
| Mary Washington Hospital | 13,745 | 16 | 22.22 | 0.72 | (0.43, 1.14) | = Same |
| Memorial Hospital of Martinsville & Henry County | 2,200 | 0 | 2.99 | 0.00 | (., 1.00) | = Same |
| MSHA Johnston Memorial Hospital | 2,432 | 1 | 3.16 | 0.32 | (0.02, 1.56) | = Same |
| MSHA Norton Community Hospital | 1,438 | 0 | 1.90 | 0.00 | (., 1.58) | = Same |
| MSHA Russell County Medical Center | 134 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 200 | 0 | 0.25 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 721 | 0 | 1.17 | 0.00 | (., 2.56) | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 755 | 0 | 1.03 | 0.00 | (., 2.92) | = Same |
| Novant Health UVA Health System Prince William Medical Center | 2,285 | 2 | 3.12 | 0.64 | (0.11, 2.12) | = Same |
| Riverside Doctors' Hospital Williamsburg | 492 | 0 | 0.71 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 12,492 | 0 | 22.49 | 0.00 | (., 0.13) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **447,204** | **411** | **783.62** | **0.52** | **(0.48, 0.58)** | **★Better** |
| Riverside Shore Memorial Hospital | 859 | 1 | 2.11 | 0.47 | (0.02, 2.34) | = Same |
| Riverside Tappahannock Hospital | 339 | 0 | 0.45 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 1,618 | 0 | 2.16 | 0.00 | (., 1.39) | = Same |
| Sentara CarePlex Hospital | 3,196 | 1 | 4.46 | 0.22 | (0.01, 1.11) | = Same |
| Sentara Halifax Regional Hospital | 952 | 0 | 1.35 | 0.00 | (., 2.23) | = Same |
| Sentara Leigh Hospital | 6,964 | 6 | 11.88 | 0.51 | (0.21, 1.05) | = Same |
| Sentara Martha Jefferson Hospital | 4,150 | 1 | 6.38 | 0.16 | (0.01, 0.77) | ★Better |
| Sentara Norfolk General Hospital | 36,984 | 14 | 62.04 | 0.23 | (0.13, 0.37) | ★Better |
| Sentara Northern Virginia Medical Center | 3,679 | 0 | 5.00 | 0.00 | (., 0.60) | ★Better |
| Sentara Obici Hospital | 2,973 | 2 | 3.91 | 0.51 | (0.09, 1.69) | = Same |
| Sentara Princess Anne Hospital | 7,432 | 4 | 11.41 | 0.35 | (0.11, 0.85) | ★Better |
| Sentara RMH Medical Center | 6,645 | 2 | 8.74 | 0.23 | (0.04, 0.76) | ★Better |
| Sentara Virginia Beach General Hospital | 7,195 | 0 | 10.48 | 0.00 | (., 0.29) | ★Better |
| Sentara Williamsburg Regional Medical Center | 1,895 | 0 | 3.10 | 0.00 | (., 0.97) | ★Better |
| Shenandoah Memorial Hospital | 349 | 0 | 0.44 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 446 | 1 | 0.59 | N/A | N/A | **No Conclusion** |
| Southern Virginia Regional Medical Center | 464 | 0 | 0.64 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 5,796 | 1 | 8.65 | 0.12 | (0.01, 0.57) | ★Better |
| Stafford Hospital | 2,577 | 3 | 3.47 | 0.87 | (0.22, 2.35) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **447,204** | **411** | **783.62** | **0.52** | **(0.48, 0.58)** | **★Better** |
| Twin County Regional Healthcare | 719 | 0 | 0.96 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 34,646 | 44 | 70.86 | 0.62 | (0.46, 0.83) | **★Better** |
| VCU Community Memorial Hospital | 1,043 | 0 | 1.38 | 0.00 | (., 2.17) | **= Same** |
| VCU Medical Center | 42,857 | 59 | 95.86 | 0.62 | (0.47, 0.79) | **★Better** |
| Virginia Hospital Center | 8,660 | 6 | 14.13 | 0.43 | (0.17, 0.88) | **★Better** |
| Warren Memorial Hospital | 164 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 227 | 0 | 0.28 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 428 | 0 | 0.72 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 14,580 | 10 | 23.20 | 0.43 | (0.22, 0.77) | **★Better** |
| Wythe County Community Hospital | 42 | 0 | 0.06 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

# Catheter-Associated Urinary Tract Infections (CAUTIs)

## Catheter-Associated Urinary Tract Infection (CAUTI) – Adult and Pediatric Intensive Care Units and Medical, Surgical, and Medical/Surgical Inpatient Wards

In 2015, 81 Virginia hospitals reported CAUTI data for all adult and pediatric medical, surgical, and medical/surgical inpatient wards. Seventy-eight hospitals reported CAUTI data for adult and pediatric intensive care units (ICUs).

The 2015 overall CAUTI SIR for Virginia hospitals (SIR=0.58; 95% CI: 0.53, 0.63) was statistically significantly lower than the national baseline. This SIR indicates that the number of CAUTIs in Virginia was 42% lower than predicted, based on the national experience from 2009. Eighteen hospitals (22%) reported zero CAUTIs in 2015 from their ICUs and inpatient wards. Among the 78 hospitals that had a calculated SIR for all reportable ICUs and inpatient wards, 27 (35%) experienced significant reductions from the national baseline. Only one hospital reported a statistically significant increase.

Additional information about specific unit types is contained in Appendix H.

- Among the hospitals that had a calculated CAUTI SIR for adult and pediatric ICUs, 11 (19%) reported a statistically significant decrease from the national baseline (Table 21). Two hospitals (3%) reported a statistically significantly higher SIR than the national baseline. The 2015 state SIR for adult and pediatric ICUs was 0.68 (95% CI: 0.60, 0.75) and was also statistically significantly lower compared to the national baseline. This indicates that the number of CAUTIs seen for these units was 32% lower than predicted.

- Among the hospitals that had a calculated CAUTI SIR for adult and pediatric inpatient wards, 19 (27%) reported a statistically significant decrease from the national baseline (Table 22). One hospital (1%) reported a statistically significantly higher SIR than the national baseline. The 2015 state SIR for wards was 0.47 (95% CI: 0.41, 0.54) and was also statistically significantly lower compared to the national baseline. This indicates that the number of CAUTIs seen for these units was 53% lower than predicted.

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2009 for CAUTI. | | | | | | | |

**Table 6. Catheter-Associated Urinary Tract Infection (CAUTI) Standardized Infection Ratio (SIR) Report by Facility, All Reportable Intensive Care Units and Inpatient Wards, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **464,584** | **510** | **877.65** | **0.58** | **(0.53, 0.63)** | ★Better |
| Augusta Health | 4,842 | 4 | 8.14 | 0.49 | (0.16, 1.19) | = Same |
| Bon Secours DePaul Medical Center | 4,794 | 7 | 11.03 | 0.63 | (0.28, 1.26) | = Same |
| Bon Secours Mary Immaculate Hospital | 3,099 | 1 | 5.12 | 0.20 | (0.01, 0.96) | ★Better |
| Bon Secours Maryview Medical Center | 6,199 | 3 | 9.27 | 0.32 | (0.08, 0.88) | ★Better |
| Bon Secours Memorial Regional Medical Center | 6,566 | 7 | 9.55 | 0.73 | (0.32, 1.45) | = Same |
| Bon Secours Rappahannock General Hospital | 1,390 | 3 | 2.00 | 1.50 | (0.38, 4.09) | = Same |
| Bon Secours Richmond Community Hospital | 224 | 0 | 0.31 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 4,955 | 2 | 8.07 | 0.25 | (0.04, 0.82) | ★Better |
| Bon Secours St. Mary's Hospital | 8,669 | 5 | 14.18 | 0.35 | (0.13, 0.78) | ★Better |
| Buchanan General Hospital | 1,683 | 0 | 2.52 | 0.00 | (., 1.19) | = Same |
| Carilion Franklin Memorial Hospital | 544 | 0 | 0.87 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 657 | 1 | 1.25 | 0.80 | (0.04, 3.95) | = Same |
| Carilion Medical Center | 19,220 | 69 | 43.08 | 1.60 | (1.26, 2.02) | ✖Worse |
| Carilion New River Valley Medical Center | 5,297 | 0 | 9.89 | 0.00 | (., 0.30) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **464,584** | **510** | **877.65** | **0.58** | **(0.53, 0.63)** | **★Better** |
| Carilion Stonewall Jackson Hospital | 856 | 0 | 1.49 | 0.00 | (., 2.01) | = Same |
| Carilion Tazewell Community Hospital | 753 | 1 | 1.20 | 0.83 | (0.04, 4.09) | = Same |
| Centra Bedford Memorial Hospital | 819 | 2 | 1.17 | 1.71 | (0.29, 5.65) | = Same |
| Centra Lynchburg General Hospital | 13,769 | 19 | 27.92 | 0.68 | (0.42, 1.04) | = Same |
| Centra Southside Community Hospital | 2,978 | 1 | 4.56 | 0.22 | (0.01, 1.08) | = Same |
| Centra Virginia Baptist Hospital | 659 | 1 | 1.05 | 0.95 | (0.05, 4.68) | = Same |
| Chesapeake Regional Medical Center | 10,960 | 19 | 18.40 | 1.03 | (0.64, 1.58) | = Same |
| Clinch Valley Medical Center | 2,718 | 0 | 4.02 | 0.00 | (., 0.74) | ★Better |
| Danville Regional Medical Center | 6,708 | 1 | 12.51 | 0.08 | (0.00, 0.39) | ★Better |
| Fauquier Health | 4,622 | 0 | 7.00 | 0.00 | (., 0.43) | ★Better |
| HCA CJW Medical Center Chippenham Hospital | 17,449 | 25 | 32.20 | 0.78 | (0.51, 1.13) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 5,472 | 8 | 14.80 | 0.54 | (0.25, 1.03) | = Same |
| HCA Henrico Doctors' Hospital | 7,720 | 3 | 15.52 | 0.19 | (0.05, 0.53) | ★Better |
| HCA John Randolph Medical Center | 3,071 | 2 | 4.49 | 0.45 | (0.08, 1.47) | = Same |
| HCA LewisGale Hospital Alleghany | 1,252 | 0 | 2.42 | 0.00 | (., 1.24) | = Same |
| HCA LewisGale Hospital Montgomery | 1,415 | 2 | 2.05 | 0.98 | (0.16, 3.23) | = Same |
| HCA LewisGale Hospital Pulaski | 2,402 | 6 | 3.60 | 1.67 | (0.68, 3.47) | = Same |
| HCA LewisGale Medical Center | 15,417 | 22 | 31.31 | 0.70 | (0.45, 1.05) | = Same |
| HCA Parham Doctors' Hospital | 3,241 | 3 | 6.28 | 0.48 | (0.12, 1.30) | = Same |
| HCA Reston Hospital Center | 10,278 | 3 | 16.43 | 0.18 | (0.05, 0.50) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **464,584** | **510** | **877.65** | **0.58** | **(0.53, 0.63)** | **★Better** |
| HCA Retreat Doctors' Hospital | 2,256 | 1 | 3.98 | 0.25 | (0.01, 1.24) | = Same |
| HCA Spotsylvania Regional Medical Center | 3,234 | 2 | 4.78 | 0.42 | (0.07, 1.38) | = Same |
| Inova Alexandria Hospital | 8,431 | 14 | 12.58 | 1.11 | (0.63, 1.82) | = Same |
| Inova Fair Oaks Hospital | 3,351 | 7 | 5.22 | 1.34 | (0.59, 2.65) | = Same |
| Inova Fairfax Medical Campus | 20,560 | 49 | 51.12 | 0.96 | (0.72, 1.26) | = Same |
| Inova Loudoun Hospital | 4,259 | 1 | 6.05 | 0.17 | (0.01, 0.82) | ★Better |
| Inova Mount Vernon Hospital | 2,705 | 4 | 5.07 | 0.79 | (0.25, 1.90) | = Same |
| Mary Washington Hospital | 16,558 | 6 | 32.05 | 0.19 | (0.08, 0.39) | ★Better |
| Memorial Hospital of Martinsville & Henry County | 4,163 | 1 | 5.80 | 0.17 | (0.01, 0.85) | ★Better |
| MSHA Johnston Memorial Hospital | 6,004 | 2 | 9.03 | 0.22 | (0.04, 0.73) | ★Better |
| MSHA Norton Community Hospital | 2,786 | 1 | 4.10 | 0.24 | (0.01, 1.20) | = Same |
| MSHA Russell County Medical Center | 937 | 0 | 1.80 | 0.00 | (., 1.66) | = Same |
| MSHA Smyth County Community Hospital | 839 | 0 | 1.31 | 0.00 | (., 2.28) | = Same |
| Novant Health UVA Health System Culpeper Medical Center | 1,827 | 0 | 3.46 | 0.00 | (., 0.87) | ★Better |
| Novant Health UVA Health System Haymarket Medical Center | 1,164 | 1 | 1.69 | 0.59 | (0.03, 2.92) | = Same |
| Novant Health UVA Health System Prince William Medical Center | 2,375 | 2 | 3.34 | 0.60 | (0.10, 1.98) | = Same |
| Riverside Doctors' Hospital Williamsburg | 1,210 | 0 | 2.12 | 0.00 | (., 1.42) | = Same |
| Riverside Regional Medical Center | 13,266 | 15 | 27.21 | 0.55 | (0.32, 0.89) | ★Better |
| Riverside Shore Memorial Hospital | 1,539 | 3 | 2.65 | 1.13 | (0.29, 3.08) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **464,584** | **510** | **877.65** | **0.58** | **(0.53, 0.63)** | ★Better |
| Riverside Tappahannock Hospital | 1,225 | 2 | 1.82 | 1.10 | (0.18, 3.63) | = Same |
| Riverside Walter Reed Hospital | 2,495 | 1 | 3.70 | 0.27 | (0.01, 1.34) | = Same |
| Sentara CarePlex Hospital | 3,576 | 2 | 5.00 | 0.40 | (0.07, 1.32) | = Same |
| Sentara Halifax Regional Hospital | 2,131 | 3 | 3.29 | 0.91 | (0.23, 2.48) | = Same |
| Sentara Leigh Hospital | 10,493 | 4 | 20.72 | 0.19 | (0.06, 0.47) | ★Better |
| Sentara Martha Jefferson Hospital | 4,037 | 6 | 7.57 | 0.79 | (0.32, 1.65) | = Same |
| Sentara Norfolk General Hospital | 25,645 | 36 | 55.20 | 0.65 | (0.46, 0.89) | ★Better |
| Sentara Northern Virginia Medical Center | 4,272 | 1 | 6.58 | 0.15 | (0.01, 0.75) | ★Better |
| Sentara Obici Hospital | 2,271 | 1 | 3.22 | 0.31 | (0.02, 1.53) | = Same |
| Sentara Princess Anne Hospital | 6,315 | 4 | 9.66 | 0.41 | (0.13, 0.99) | ★Better |
| Sentara RMH Medical Center | 14,361 | 8 | 21.81 | 0.37 | (0.17, 0.70) | ★Better |
| Sentara Virginia Beach General Hospital | 8,467 | 3 | 13.00 | 0.23 | (0.06, 0.63) | ★Better |
| Sentara Williamsburg Regional Medical Center | 2,765 | 0 | 5.26 | 0.00 | (., 0.57) | ★Better |
| Shenandoah Memorial Hospital | 931 | 2 | 1.39 | 1.44 | (0.24, 4.77) | = Same |
| Southampton Memorial Hospital | 1,267 | 2 | 1.87 | 1.07 | (0.18, 3.53) | = Same |
| Southern Virginia Regional Medical Center | 1,237 | 0 | 2.14 | 0.00 | (., 1.40) | = Same |
| Southside Regional Medical Center | 7,841 | 4 | 12.30 | 0.33 | (0.10, 0.78) | ★Better |
| Stafford Hospital | 2,676 | 0 | 4.23 | 0.00 | (., 0.71) | ★Better |
| Twin County Regional Healthcare | 2,325 | 1 | 3.41 | 0.29 | (0.02, 1.44) | = Same |
| UVA Medical Center | 22,100 | 40 | 48.80 | 0.82 | (0.59, 1.11) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **464,584** | **510** | **877.65** | **0.58** | **(0.53, 0.63)** | **★Better** |
| VCU Community Memorial Hospital | 3,612 | 2 | 5.41 | 0.37 | (0.06, 1.22) | = Same |
| VCU Medical Center | 27,468 | 38 | 71.70 | 0.53 | (0.38, 0.72) | ★Better |
| Virginia Hospital Center | 7,765 | 8 | 14.93 | 0.54 | (0.25, 1.02) | = Same |
| Warren Memorial Hospital | 1,471 | 1 | 2.10 | 0.48 | (0.02, 2.35) | = Same |
| Wellmont Lonesome Pine Hospital | 569 | 0 | 0.93 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 943 | 0 | 1.91 | 0.00 | (., 1.57) | = Same |
| Winchester Medical Center | 16,875 | 12 | 30.41 | 0.40 | (0.21, 0.67) | ★Better |
| Wythe County Community Hospital | 1,289 | 0 | 2.21 | 0.00 | (., 1.36) | = Same |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

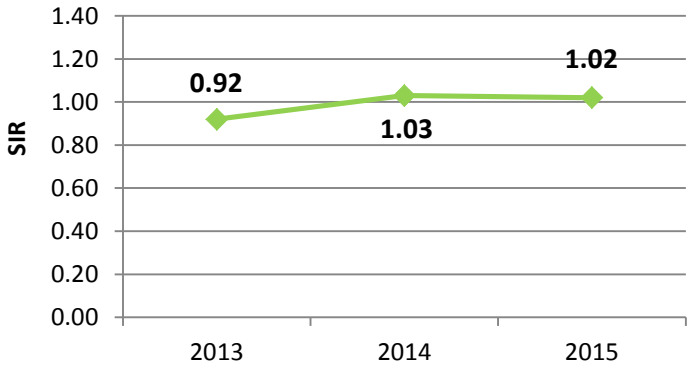
# Surgical Site Infections (SSIs)

## Surgical Site Infections – Colon (COLO) Procedures – Complex A/R Model

In 2015, 77 Virginia hospitals reported performing colon procedures. The 2015 overall COLO SIR for Virginia hospitals (SIR=1.02; 95% CI: 0.90, 1.16) was not statistically significantly different from the 2006-2008 national baseline.

- Thirty-two hospitals (41%) reported zero SSIs following COLO procedures in 2015.
- SIRs were calculated for 44 (57%) of the hospitals reporting colon procedures in 2015; for 33 hospitals, the SIR was not calculated because the number of predicted infections was less than 1.
- Among the hospitals that had a calculated COLO SIR, only one hospital (2%) reported a statistically significantly lower SIR than the national baseline.
- Among the hospitals that had a calculated COLO SIR, five (11.4%) reported a statistically significantly higher SIR than the national baseline.

**Figure 2. SSI SIRs, Colon Procedures, Virginia, 2013-2015**




| Legend | | | | | |
|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* |
| **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. | | | | |
| *National experience contains data from 2006-2008 for SSIs. | | | | | |

**Table 7. Surgical Site Infection (SSI) SIR Report by Facility, Colon Procedures, Virginia Hospitals, 2015**

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,158** | **226** | **221.03** | **1.02** | **(0.90, 1.16)** | = Same |
| Augusta Health | 111 | 4 | 2.76 | 1.45 | (0.46, 3.49) | = Same |
| Bon Secours DePaul Medical Center | 32 | 0 | 0.91 | N/A | N/A | **No Conclusion** |
| Bon Secours Mary Immaculate Hospital | 41 | 0 | 0.91 | N/A | N/A | **No Conclusion** |
| Bon Secours Maryview Medical Center | 58 | 0 | 2.16 | 0.00 | (., 1.38) | = Same |
| Bon Secours Memorial Regional Medical Center | 175 | 2 | 6.26 | 0.32 | (0.05, 1.06) | = Same |
| Bon Secours Rappahannock General Hospital | 9 | 0 | 0.24 | N/A | N/A | **No Conclusion** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,158** | **226** | **221.03** | **1.02** | **(0.90, 1.16)** | = Same |
| Bon Secours St. Francis Medical Center | 68 | 0 | 1.59 | 0.00 | (., 1.88) | = Same |
| Bon Secours St. Mary's Hospital | 182 | 6 | 5.88 | 1.02 | (0.41, 2.12) | = Same |
| Buchanan General Hospital | 1 | 0 | 0.04 | N/A | N/A | **No Conclusion** |
| Carilion Franklin Memorial Hospital | 6 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 7 | 0 | 0.21 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 390 | 19 | 13.57 | 1.40 | (0.87, 2.15) | = Same |
| Carilion New River Valley Medical Center | 87 | 0 | 2.58 | 0.00 | (., 1.16) | = Same |
| Carilion Stonewall Jackson Hospital | 10 | 0 | 0.23 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 10 | 0 | 0.23 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 230 | 5 | 6.80 | 0.74 | (0.27, 1.63) | = Same |
| Centra Southside Community Hospital | 17 | 0 | 0.55 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 31 | 0 | 0.60 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 209 | 7 | 5.90 | 1.19 | (0.52, 2.35) | = Same |
| Clinch Valley Medical Center | 19 | 0 | 0.56 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 58 | 1 | 1.30 | 0.77 | (0.04, 3.78) | = Same |
| Fauquier Health | 29 | 2 | 0.77 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 72 | 2 | 1.98 | 1.01 | (0.17, 3.34) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 171 | 7 | 4.61 | 1.52 | (0.66, 3.00) | = Same |
| HCA Henrico Doctors' Hospital | 189 | 14 | 6.50 | 2.16 | (1.23, 3.5) | ✖Worse |
| HCA John Randolph Medical Center | 28 | 0 | 0.89 | N/A | N/A | **No Conclusion** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,158** | **226** | **221.03** | **1.02** | **(0.90, 1.16)** | = Same |
| HCA LewisGale Hospital Alleghany | 8 | 0 | 0.19 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 32 | 0 | 0.74 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 14 | 0 | 0.34 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 171 | 6 | 5.14 | 1.17 | (0.47, 2.43) | = Same |
| HCA Parham Doctors' Hospital | 37 | 3 | 0.91 | N/A | N/A | **No Conclusion** |
| HCA Reston Hospital Center | 105 | 1 | 3.06 | 0.33 | (0.02, 1.61) | = Same |
| HCA Retreat Doctors' Hospital | 66 | 3 | 1.55 | 1.94 | (0.49, 5.28) | = Same |
| HCA Spotsylvania Regional Medical Center | 44 | 0 | 1.14 | 0.00 | (., 2.62) | = Same |
| Inova Alexandria Hospital | 136 | 8 | 4.10 | 1.95 | (0.91, 3.70) | = Same |
| Inova Fair Oaks Hospital | 126 | 3 | 3.09 | 0.97 | (0.25, 2.65) | = Same |
| Inova Fairfax Medical Campus | 571 | 21 | 18.35 | 1.15 | (0.73, 1.72) | = Same |
| Inova Loudoun Hospital | 74 | 2 | 1.80 | 1.11 | (0.19, 3.68) | = Same |
| Inova Mount Vernon Hospital | 32 | 0 | 0.87 | N/A | N/A | **No Conclusion** |
| Mary Washington Hospital | 253 | 5 | 9.79 | 0.51 | (0.19, 1.13) | = Same |
| Memorial Hospital of Martinsville & Henry County | 59 | 0 | 1.45 | 0.00 | (., 2.07) | = Same |
| MSHA Johnston Memorial Hospital | 80 | 1 | 2.24 | 0.45 | (0.02, 2.20) | = Same |
| MSHA Norton Community Hospital | 16 | 0 | 0.32 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 9 | 0 | 0.29 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 15 | 0 | 0.36 | N/A | N/A | **No Conclusion** |

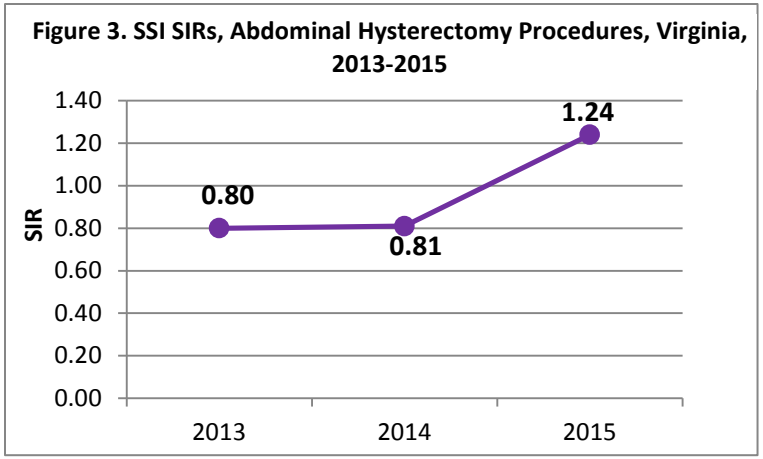
| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,158** | **226** | **221.03** | **1.02** | **(0.90, 1.16)** | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 33 | 1 | 0.76 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 70 | 5 | 1.73 | 2.89 | (1.06, 6.41) | ✖Worse |
| Riverside Doctors' Hospital Williamsburg | 17 | 0 | 0.42 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 196 | 11 | 5.49 | 2.00 | (1.05, 3.48) | ✖Worse |
| Riverside Shore Memorial Hospital | 14 | 0 | 0.41 | N/A | N/A | **No Conclusion** |
| Riverside Tappahannock Hospital | 16 | 1 | 0.63 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 50 | 0 | 1.17 | 0.00 | (., 2.56) | = Same |
| Sentara CarePlex Hospital | 129 | 1 | 5.11 | 0.20 | (0.01, 0.97) | ★Better |
| Sentara Halifax Regional Hospital | 38 | 1 | 1.14 | 0.88 | (0.04, 4.35) | = Same |
| Sentara Leigh Hospital | 172 | 3 | 5.16 | 0.58 | (0.15, 1.58) | = Same |
| Sentara Martha Jefferson Hospital | 99 | 4 | 2.47 | 1.62 | (0.52, 3.91) | = Same |
| Sentara Norfolk General Hospital | 147 | 11 | 5.22 | 2.11 | (1.11, 3.67) | ✖Worse |
| Sentara Northern Virginia Medical Center | 96 | 1 | 2.33 | 0.43 | (0.02, 2.11) | = Same |
| Sentara Obici Hospital | 57 | 2 | 1.67 | 1.20 | (0.20, 3.95) | = Same |
| Sentara Princess Anne Hospital | 93 | 4 | 2.31 | 1.74 | (0.55, 4.19) | = Same |
| Sentara RMH Medical Center | 70 | 3 | 2.44 | 1.23 | (0.31, 3.34) | = Same |
| Sentara Virginia Beach General Hospital | 177 | 3 | 5.89 | 0.51 | (0.13, 1.39) | = Same |
| Sentara Williamsburg Regional Medical Center | 43 | 1 | 1.11 | 0.90 | (0.05, 4.45) | = Same |
| Shenandoah Memorial Hospital | 13 | 0 | 0.30 | N/A | N/A | **No Conclusion** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,158** | **226** | **221.03** | **1.02** | **(0.90, 1.16)** | = Same |
| Southampton Memorial Hospital | 17 | 1 | 0.49 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 82 | 1 | 2.60 | 0.39 | (0.02, 1.90) | = Same |
| Stafford Hospital | 44 | 2 | 1.33 | 1.51 | (0.25, 4.98) | = Same |
| Twin County Regional Healthcare | 18 | 1 | 0.56 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 400 | 12 | 16.51 | 0.73 | (0.39, 1.24) | = Same |
| VCU Community Memorial Hospital | 18 | 0 | 0.52 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 189 | 17 | 6.86 | 2.48 | (1.49, 3.89) | ✖ **Worse** |
| Virginia Hospital Center | 360 | 6 | 10.27 | 0.58 | (0.24, 1.22) | = Same |
| Warren Memorial Hospital | 2 | 0 | 0.05 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 4 | 0 | 0.08 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 14 | 0 | 0.33 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 374 | 11 | 11.36 | 0.97 | (0.51, 1.68) | = Same |
| Wythe County Community Hospital | 18 | 1 | 0.49 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.
If a hospital is not listed in the table, then the hospital did not perform any procedures in 2015, or the procedures were excluded from the complex A/R model.

## Surgical Site Infections – Abdominal Hysterectomy (HYST) Procedures – Complex A/R Model

In 2015, 68 Virginia hospitals reported performing abdominal hysterectomies. The 2015 overall HYST SIR for Virginia hospitals (SIR=1.24; 95% CI: 1.00, 1.53) was statistically significantly greater than the national baseline. This SIR indicates that number of SSIs following abdominal hysterectomies in Virginia was 24% higher than predicted, based on the national experience from 2006-2008.




- Thirty-eight hospitals (56%) reported zero SSIs following HYST procedures in 2015.
- SIRs were calculated for 17 (25%) of the hospitals that reported abdominal hysterectomies in 2015; for 51 hospitals, the SIR was not calculated because the number of predicted infections was less than 1.
- Among the hospitals that had a calculated HYST SIR, only one hospital (6%) reported a statistically significantly higher SIR than the national baseline.

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience*. | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for SSIs. | | | | | | | |

**Table 8. Surgical Site Infection (SSI) SIR Report by Facility, Abdominal Hysterectomy Procedures, Virginia Hospitals, 2015**

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,384** | **84** | **67.61** | **1.24** | **(1.00, 1.53)** | **✖Worse** |
| Augusta Health | 65 | 0 | 0.57 | N/A | N/A | **No Conclusion** |
| Bon Secours DePaul Medical Center | 277 | 1 | 2.26 | 0.44 | (0.02, 2.18) | **= Same** |
| Bon Secours Mary Immaculate Hospital | 140 | 2 | 1.13 | 1.78 | (0.30, 5.87) | **= Same** |
| Bon Secours Maryview Medical Center | 76 | 0 | 0.71 | N/A | N/A | **No Conclusion** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,384** | **84** | **67.61** | **1.24** | **(1.00, 1.53)** | **✖Worse** |
| Bon Secours Memorial Regional Medical Center | 140 | 3 | 1.18 | 2.54 | (0.65, 6.92) | = Same |
| Bon Secours St. Francis Medical Center | 192 | 1 | 1.52 | 0.66 | (0.03, 3.25) | = Same |
| Bon Secours St. Mary's Hospital | 416 | 2 | 2.88 | 0.70 | (0.12, 2.30) | = Same |
| Carilion Franklin Memorial Hospital | 7 | 0 | 0.07 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 307 | 1 | 2.24 | 0.45 | (0.02, 2.20) | = Same |
| Carilion New River Valley Medical Center | 111 | 0 | 0.93 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 3 | 0 | 0.03 | N/A | N/A | **No Conclusion** |
| Centra Southside Community Hospital | 17 | 0 | 0.17 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 168 | 1 | 1.41 | 0.71 | (0.04, 3.51) | = Same |
| Chesapeake Regional Medical Center | 427 | 4 | 3.39 | 1.18 | (0.38, 2.85) | = Same |
| Clinch Valley Medical Center | 61 | 0 | 0.43 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 46 | 1 | 0.38 | N/A | N/A | **No Conclusion** |
| Fauquier Health | 36 | 0 | 0.32 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 98 | 2 | 0.77 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Johnston-Willis Hospital | 534 | 3 | 4.62 | 0.65 | (0.17, 1.77) | = Same |
| HCA Henrico Doctors' Hospital | 567 | 6 | 4.44 | 1.35 | (0.55, 2.81) | = Same |
| HCA LewisGale Hospital Alleghany | 3 | 0 | 0.02 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 23 | 1 | 0.23 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 3 | 0 | 0.03 | N/A | N/A | **No Conclusion** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,384** | **84** | **67.61** | **1.24** | **(1.00, 1.53)** | **✖Worse** |
| HCA LewisGale Medical Center | 173 | 1 | 1.70 | 0.59 | (0.03, 2.91) | = Same |
| HCA Reston Hospital Center | 99 | 1 | 0.75 | N/A | N/A | **No Conclusion** |
| HCA Retreat Doctors' Hospital | 17 | 0 | 0.20 | N/A | N/A | **No Conclusion** |
| HCA Spotsylvania Regional Medical Center | 25 | 0 | 0.18 | N/A | N/A | **No Conclusion** |
| Inova Alexandria Hospital | 104 | 0 | 0.72 | N/A | N/A | **No Conclusion** |
| Inova Fair Oaks Hospital | 47 | 0 | 0.43 | N/A | N/A | **No Conclusion** |
| Inova Fairfax Medical Campus | 1268 | 12 | 7.90 | 1.52 | (0.82, 2.58) | = Same |
| Inova Loudoun Hospital | 104 | 0 | 0.96 | N/A | N/A | **No Conclusion** |
| Inova Mount Vernon Hospital | 4 | 0 | 0.05 | N/A | N/A | **No Conclusion** |
| Mary Washington Hospital | 51 | 0 | 0.53 | N/A | N/A | **No Conclusion** |
| Memorial Hospital of Martinsville & Henry County | 42 | 0 | 0.46 | N/A | N/A | **No Conclusion** |
| MSHA Johnston Memorial Hospital | 31 | 0 | 0.23 | N/A | N/A | **No Conclusion** |
| MSHA Norton Community Hospital | 12 | 0 | 0.10 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 15 | 0 | 0.11 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 10 | 0 | 0.06 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Haymarket Medical Center | 26 | 0 | 0.20 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 32 | 1 | 0.32 | N/A | N/A | **No Conclusion** |
| Riverside Doctors' Hospital Williamsburg | 29 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 175 | 5 | 2.16 | 2.32 | (0.85, 5.14) | = Same |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,384** | **84** | **67.61** | **1.24** | **(1.00, 1.53)** | **✖Worse** |
| Riverside Shore Memorial Hospital | 6 | 0 | 0.06 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 12 | 0 | 0.13 | N/A | N/A | **No Conclusion** |
| Sentara CarePlex Hospital | 78 | 0 | 0.67 | N/A | N/A | **No Conclusion** |
| Sentara Halifax Regional Hospital | 51 | 0 | 0.38 | N/A | N/A | **No Conclusion** |
| Sentara Leigh Hospital | 424 | 13 | 3.34 | 3.89 | (2.16, 6.48) | **✖Worse** |
| Sentara Martha Jefferson Hospital | 77 | 0 | 0.53 | N/A | N/A | **No Conclusion** |
| Sentara Norfolk General Hospital | 93 | 2 | 0.83 | N/A | N/A | **No Conclusion** |
| Sentara Northern Virginia Medical Center | 96 | 0 | 0.79 | N/A | N/A | **No Conclusion** |
| Sentara Obici Hospital | 112 | 3 | 1.00 | N/A | N/A | **No Conclusion** |
| Sentara Princess Anne Hospital | 39 | 1 | 0.42 | N/A | N/A | **No Conclusion** |
| Sentara RMH Medical Center | 52 | 1 | 0.47 | N/A | N/A | **No Conclusion** |
| Sentara Virginia Beach General Hospital | 87 | 0 | 0.72 | N/A | N/A | **No Conclusion** |
| Sentara Williamsburg Regional Medical Center | 44 | 0 | 0.38 | N/A | N/A | **No Conclusion** |
| Shenandoah Memorial Hospital | 21 | 0 | 0.15 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 20 | 1 | 0.22 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 46 | 0 | 0.41 | N/A | N/A | **No Conclusion** |
| Stafford Hospital | 5 | 1 | 0.04 | N/A | N/A | **No Conclusion** |
| Twin County Regional Healthcare | 33 | 0 | 0.21 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 470 | 7 | 4.27 | 1.64 | (0.72, 3.24) | **= Same** |

| Hospital Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,384** | **84** | **67.61** | **1.24** | **(1.00, 1.53)** | **✖Worse** |
| VCU Community Memorial Hospital | 8 | 0 | 0.07 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 150 | 4 | 1.35 | 2.96 | (0.94, 7.14) | **= Same** |
| Virginia Hospital Center | 290 | 1 | 2.56 | 0.39 | (0.02, 1.93) | **= Same** |
| Warren Memorial Hospital | 10 | 0 | 0.09 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 22 | 0 | 0.23 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 110 | 1 | 0.93 | N/A | N/A | **No Conclusion** |
| Wythe County Community Hospital | 47 | 1 | 0.36 | N/A | N/A | **No Conclusion** |

[a]When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.
If a hospital is not listed in the table, then the hospital did not perform any procedures in 2015, or the procedures were excluded from the complex A/R model.

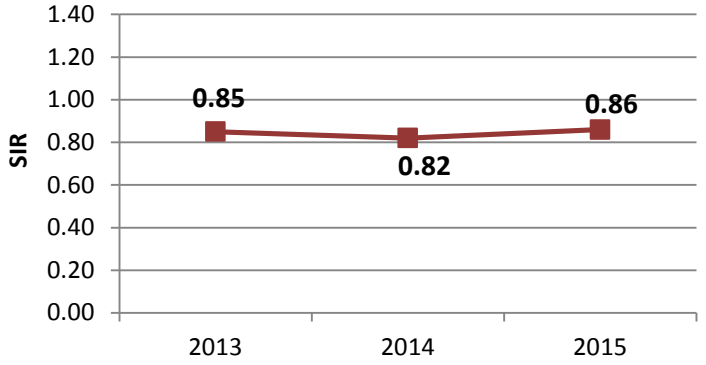
# Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia

## Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia LabID Events

In 2015, 81 Virginia hospitals reported data for hospital-onset laboratory-identified MRSA bacteremia events. The 2015 overall MRSA SIR for Virginia hospitals (SIR=0.86; 95% CI: 0.74, 0.99) was statistically significantly lower than the national baseline. This SIR indicates that the number of MRSA events in Virginia was 14% lower than predicted, based on the national experience from 2010-2011.

- Thirty-seven hospitals (46%) reported zero MRSA bacteremia LabID events in 2015.
- Among the hospitals that had a calculated MRSA bacteremia SIR, all hospitals reported an SIR that was similar to the national baseline.

**Figure 4. MRSA SIR, Facility Wide LabID Events Virginia, 2013-2015**




| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2010-2011 for MRSA bacteremia laboratory-identified events. | | | | | | | |

**Table 9. Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia SIR Report by Facility, Hospital-Onset Laboratory-Identified Events, Virginia Hospitals, 2015**

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,475,556** | **178** | **207.84** | **0.86** | **(0.74, 0.99)** | **★Better** |
| Augusta Health | 12 | 44,570 | 0 | 2.13 | 0.00 | (., 1.40) | = Same |
| Bon Secours DePaul Medical Center | 12 | 28,854 | 3 | 1.12 | 2.67 | (0.68, 7.27) | = Same |
| Bon Secours Mary Immaculate Hospital | 12 | 28,507 | 1 | 1.17 | 0.85 | (0.04, 4.20) | = Same |
| Bon Secours Maryview Medical Center | 12 | 48,350 | 5 | 2.59 | 1.93 | (0.71, 4.28) | = Same |
| Bon Secours Memorial Regional Medical Center | 12 | 62,518 | 2 | 3.79 | 0.53 | (0.09, 1.75) | = Same |
| Bon Secours Rappahannock General Hospital | 12 | 5,747 | 1 | 0.21 | N/A | N/A | **No Conclusion** |
| Bon Secours Richmond Community Hospital | 12 | 11,307 | 0 | 0.52 | N/A | N/A | **No Conclusion** |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,475,556** | **178** | **207.84** | **0.86** | **(0.74, 0.99)** | **★Better** |
| Bon Secours St. Francis Medical Center | 12 | 41,654 | 0 | 1.75 | 0.00 | (., 1.71) | = Same |
| Bon Secours St. Mary's Hospital | 12 | 88,186 | 5 | 3.55 | 1.41 | (0.52, 3.12) | = Same |
| Buchanan General Hospital | 12 | 6,753 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Carilion Franklin Memorial Hospital | 12 | 5,178 | 0 | 0.34 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 12 | 5,825 | 0 | 0.29 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 12 | 189,712 | 14 | 15.85 | 0.88 | (0.50, 1.45) | = Same |
| Carilion New River Valley Medical Center | 12 | 22,807 | 1 | 2.03 | 0.49 | (0.03, 2.43) | = Same |
| Carilion Stonewall Jackson Hospital | 12 | 5,202 | 0 | 0.19 | N/A | N/A | **No Conclusion** |
| Carilion Tazewell Community Hospital | 12 | 2,882 | 0 | 0.10 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 12 | 4,704 | 0 | 0.17 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 12 | 89,391 | 2 | 3.71 | 0.54 | (0.09, 1.78) | = Same |
| Centra Southside Community Hospital | 12 | 12,455 | 2 | 0.64 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 12 | 24,203 | 0 | 0.87 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 12 | 75,502 | 5 | 2.77 | 1.80 | (0.66, 3.99) | = Same |
| Clinch Valley Medical Center | 12 | 14,228 | 0 | 0.51 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 12 | 31,096 | 2 | 5.59 | 0.36 | (0.06, 1.18) | = Same |
| Fauquier Health | 12 | 19,765 | 0 | 0.83 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 12 | 84,631 | 5 | 7.21 | 0.69 | (0.25, 1.54) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 12 | 57,035 | 3 | 2.95 | 1.02 | (0.26, 2.77) | = Same |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,475,556** | **178** | **207.84** | **0.86** | **(0.74, 0.99)** | **★Better** |
| HCA Henrico Doctors' Hospital | 12 | 75,277 | 1 | 2.94 | 0.34 | (0.02, 1.68) | = Same |
| HCA John Randolph Medical Center | 12 | 22,758 | 0 | 0.82 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Alleghany | 12 | 12,306 | 0 | 0.88 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 12 | 15,695 | 0 | 0.56 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 12 | 7,638 | 2 | 0.32 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 12 | 82,227 | 7 | 3.66 | 1.91 | (0.84, 3.79) | = Same |
| HCA Parham Doctors' Hospital | 12 | 18,196 | 0 | 0.69 | N/A | N/A | **No Conclusion** |
| HCA Reston Hospital Center | 12 | 56,265 | 1 | 2.15 | 0.46 | (0.02, 2.29) | = Same |
| HCA Retreat Doctors' Hospital | 12 | 10,140 | 1 | 0.44 | N/A | N/A | **No Conclusion** |
| HCA Spotsylvania Regional Medical Center | 12 | 25,583 | 1 | 1.02 | 0.98 | (0.05, 4.82) | = Same |
| Inova Alexandria Hospital | 12 | 79,622 | 2 | 3.17 | 0.63 | (0.11, 2.09) | = Same |
| Inova Fair Oaks Hospital | 12 | 46,372 | 0 | 1.72 | 0.00 | (., 1.75) | = Same |
| Inova Fairfax Medical Campus | 12 | 231,531 | 20 | 19.17 | 1.04 | (0.66, 1.58) | = Same |
| Inova Loudoun Hospital | 12 | 45,844 | 1 | 1.85 | 0.54 | (0.03, 2.67) | = Same |
| Inova Mount Vernon Hospital | 12 | 30,300 | 1 | 1.30 | 0.77 | (0.04, 3.79) | = Same |
| Mary Washington Hospital | 12 | 107,594 | 6 | 7.24 | 0.83 | (0.34, 1.73) | = Same |
| Memorial Hospital of Martinsville & Henry County | 12 | 21,884 | 1 | 1.06 | 0.95 | (0.05, 4.67) | = Same |
| MSHA Johnston Memorial Hospital | 12 | 36,336 | 2 | 1.42 | 1.41 | (0.24, 4.67) | = Same |
| MSHA Norton Community Hospital | 12 | 12,871 | 2 | 0.51 | N/A | N/A | **No Conclusion** |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,475,556** | **178** | **207.84** | **0.86** | **(0.74, 0.99)** | **★Better** |
| MSHA Russell County Medical Center | 12 | 3,904 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 12 | 6,642 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 12 | 16,085 | 0 | 1.35 | 0.00 | (., 2.22) | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 12 | 7,090 | 0 | 0.41 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 12 | 32,522 | 0 | 1.84 | 0.00 | (., 1.63) | = Same |
| Riverside Doctors' Hospital Williamsburg | 12 | 4,992 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 12 | 88,232 | 6 | 3.89 | 1.54 | (0.62, 3.20) | = Same |
| Riverside Shore Memorial Hospital | 12 | 10,967 | 0 | 0.39 | N/A | N/A | **No Conclusion** |
| Riverside Tappahannock Hospital | 12 | 6,167 | 1 | 0.25 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 12 | 12,370 | 0 | 0.57 | N/A | N/A | **No Conclusion** |
| Sentara CarePlex Hospital | 12 | 38,752 | 2 | 1.55 | 1.29 | (0.22, 4.26) | = Same |
| Sentara Halifax Regional Hospital | 12 | 16,017 | 0 | 0.64 | N/A | N/A | **No Conclusion** |
| Sentara Leigh Hospital | 12 | 63,955 | 1 | 3.60 | 0.28 | (0.01, 1.37) | = Same |
| Sentara Martha Jefferson Hospital | 12 | 40,019 | 0 | 1.43 | 0.00 | (., 2.09) | = Same |
| Sentara Norfolk General Hospital | 12 | 156,637 | 10 | 14.34 | 0.70 | (0.35, 1.24) | = Same |
| Sentara Northern Virginia Medical Center | 12 | 43,580 | 2 | 2.04 | 0.98 | (0.16, 3.23) | = Same |
| Sentara Obici Hospital | 12 | 37,724 | 2 | 1.45 | 1.38 | (0.23, 4.56) | = Same |
| Sentara Princess Anne Hospital | 12 | 58,429 | 3 | 2.23 | 1.35 | (0.34, 3.66) | = Same |
| Sentara RMH Medical Center | 12 | 53,015 | 2 | 3.16 | 0.63 | (0.11, 2.09) | = Same |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,475,556** | **178** | **207.84** | **0.86** | **(0.74, 0.99)** | **★Better** |
| Sentara Virginia Beach General Hospital | 12 | 58,116 | 1 | 2.69 | 0.37 | (0.02, 1.83) | = Same |
| Sentara Williamsburg Regional Medical Center | 12 | 25,979 | 0 | 1.09 | 0.00 | (., 2.75) | = Same |
| Shenandoah Memorial Hospital | 12 | 6,985 | 0 | 0.27 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 12 | 6,122 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Southern Virginia Regional Medical Center | 12 | 7,180 | 0 | 0.45 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 12 | 56,696 | 2 | 3.26 | 0.61 | (0.10, 2.03) | = Same |
| Stafford Hospital | 12 | 17,787 | 0 | 0.67 | N/A | N/A | **No Conclusion** |
| Twin County Regional Healthcare | 12 | 11,371 | 0 | 0.41 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 12 | 169,139 | 12 | 13.89 | 0.86 | (0.47, 1.47) | = Same |
| VCU Community Memorial Hospital | 12 | 14,943 | 0 | 0.89 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 12 | 211,451 | 24 | 17.46 | 1.37 | (0.90, 2.01) | = Same |
| Virginia Hospital Center | 12 | 100,595 | 5 | 5.91 | 0.85 | (0.31, 1.88) | = Same |
| Warren Memorial Hospital | 12 | 8,783 | 0 | 0.39 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 9 | 2,413 | 0 | 0.16 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 12 | 2,733 | 0 | 0.44 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 12 | 120,321 | 5 | 7.44 | 0.67 | (0.25, 1.49) | = Same |
| Wythe County Community Hospital | 12 | 8,342 | 1 | 0.42 | N/A | N/A | **No Conclusion** |

[a]When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

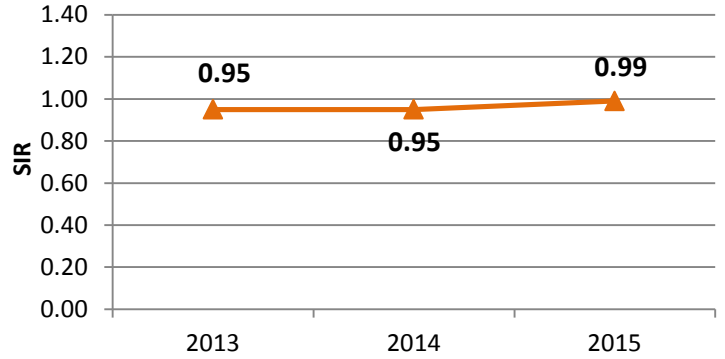
# *Clostridium difficile*

## *Clostridium difficile* Hospital-Onset LabID Events

In 2015, 81 Virginia hospitals reported data for hospital-onset laboratory-identified *Clostridium difficile* events (CDI). The 2015 overall CDI SIR for Virginia hospitals (SIR=0.99; 95% CI: 0.96, 1.03) was not statistically significantly different than the national baseline from 2010-2011.

- Nine hospitals (11%) reported zero CDI laboratory-identified events in 2015.
- Among the hospitals that had a calculated CDI SIR, 16 (19.8%) reported an SIR statistically significantly lower than the national baseline.
- Among the hospitals that had a calculated CDI SIR, 10 (12.3%) reported an SIR statistically significantly higher than the national baseline.

**Figure 5. CDI SIR, Facility Wide LabID Events, Virginia, 2013-2015**




| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2010-2011 for *C. difficile* laboratory-identified events. | | | | | | | |

**Table 10. *Clostridium difficile* SIR Report by Facility, Hospital-Onset Laboratory-Identified Events, Virginia Hospitals, 2015**

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,153,506** | **2,542** | **2556.14** | **0.99** | **(0.96, 1.03)** | = Same |
| Augusta Health | 12 | 41,766 | 18 | 32.81 | 0.55 | (0.34, 0.85) | ★Better |
| Bon Secours DePaul Medical Center | 12 | 25,885 | 14 | 17.13 | 0.82 | (0.47, 1.34) | = Same |
| Bon Secours Mary Immaculate Hospital | 12 | 24,560 | 15 | 16.00 | 0.94 | (0.55, 1.51) | = Same |
| Bon Secours Maryview Medical Center | 12 | 46,277 | 25 | 38.81 | 0.64 | (0.43, 0.94) | ★Better |
| Bon Secours Memorial Regional Medical Center | 12 | 59,137 | 36 | 41.98 | 0.86 | (0.61, 1.17) | = Same |
| Bon Secours Rappahannock General Hospital | 12 | 5,747 | 4 | 2.72 | 1.47 | (0.47, 3.55) | = Same |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,153,506** | **2,542** | **2556.14** | **0.99** | **(0.96, 1.03)** | = Same |
| Bon Secours Richmond Community Hospital | 12 | 11,248 | 0 | 7.42 | 0.00 | (., 0.40) | ★Better |
| Bon Secours St. Francis Medical Center | 12 | 35,689 | 15 | 26.81 | 0.56 | (0.33, 0.90) | ★Better |
| Bon Secours St. Mary's Hospital | 12 | 88,186 | 53 | 75.20 | 0.71 | (0.53, 0.92) | ★Better |
| Buchanan General Hospital | 12 | 6,753 | 0 | 2.94 | 0.00 | (., 1.02) | = Same |
| Carilion Franklin Memorial Hospital | 9 | 3,989 | 0 | 2.78 | 0.00 | (., 1.08) | = Same |
| Carilion Giles Community Hospital | 12 | 5,825 | 1 | 3.88 | 0.26 | (0.01, 1.27) | = Same |
| Carilion Medical Center | 12 | 167,611 | 193 | 151.45 | 1.27 | (1.10, 1.46) | ✖Worse |
| Carilion New River Valley Medical Center | 12 | 20,898 | 15 | 18.41 | 0.82 | (0.47, 1.31) | = Same |
| Carilion Stonewall Jackson Hospital | 12 | 5,202 | 9 | 2.74 | 3.29 | (1.60, 6.04) | ✖Worse |
| Carilion Tazewell Community Hospital | 12 | 2,882 | 0 | 1.26 | 0.00 | (., 2.38) | = Same |
| Centra Bedford Memorial Hospital | 12 | 4,704 | 4 | 3.25 | 1.23 | (0.39, 2.97) | = Same |
| Centra Lynchburg General Hospital | 12 | 89,391 | 59 | 81.73 | 0.72 | (0.55, 0.93) | ★Better |
| Centra Southside Community Hospital | 12 | 11,749 | 4 | 7.99 | 0.50 | (0.16, 1.21) | = Same |
| Centra Virginia Baptist Hospital | 12 | 14,787 | 0 | 9.20 | 0.00 | (., 0.33) | ★Better |
| Chesapeake Regional Medical Center | 12 | 69,034 | 58 | 55.90 | 1.04 | (0.80, 1.33) | = Same |
| Clinch Valley Medical Center | 12 | 13,600 | 0 | 6.51 | 0.00 | (., 0.46) | ★Better |
| Danville Regional Medical Center | 3 | 6,697 | 6 | 8.17 | 0.73 | (0.30, 1.53) | = Same |
| Fauquier Health | 12 | 17,798 | 5 | 11.12 | 0.45 | (0.17, 0.99) | ★Better |
| HCA CJW Medical Center Chippenham Hospital | 12 | 79,422 | 99 | 77.58 | 1.28 | (1.04, 1.55) | ✖Worse |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,153,506** | **2,542** | **2556.14** | **0.99** | **(0.96, 1.03)** | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 12 | 50,598 | 41 | 48.17 | 0.85 | (0.62, 1.14) | = Same |
| HCA Henrico Doctors' Hospital | 12 | 59,047 | 61 | 45.49 | 1.34 | (1.04, 1.71) | ✖Worse |
| HCA John Randolph Medical Center | 12 | 22,758 | 9 | 13.78 | 0.65 | (0.32, 1.20 | = Same |
| HCA LewisGale Hospital Alleghany | 9 | 9,468 | 7 | 7.59 | 0.92 | (0.40, 1.83) | = Same |
| HCA LewisGale Hospital Montgomery | 12 | 15,695 | 9 | 13.39 | 0.67 | (0.33, 1.23) | = Same |
| HCA LewisGale Hospital Pulaski | 12 | 7,638 | 22 | 5.89 | 3.73 | (2.40, 5.56) | ✖Worse |
| HCA LewisGale Medical Center | 12 | 82,227 | 104 | 71.84 | 1.45 | (1.19, 1.75) | ✖Worse |
| HCA Parham Doctors' Hospital | 12 | 18,196 | 5 | 12.27 | 0.41 | (0.15, 0.90) | ★Better |
| HCA Reston Hospital Center | 12 | 45,369 | 40 | 33.78 | 1.18 | (0.86, 1.60) | = Same |
| HCA Retreat Doctors' Hospital | 12 | 10,140 | 7 | 6.67 | 1.05 | (0.46, 2.08) | = Same |
| HCA Spotsylvania Regional Medical Center | 12 | 23,637 | 13 | 16.51 | 0.79 | (0.44, 1.31) | = Same |
| Inova Alexandria Hospital | 12 | 69,762 | 65 | 54.77 | 1.19 | (0.92, 1.50) | = Same |
| Inova Fair Oaks Hospital | 12 | 44,363 | 32 | 31.21 | 1.03 | (0.71, 1.43) | = Same |
| Inova Fairfax Medical Campus | 12 | 202,831 | 188 | 184.16 | 1.02 | (0.88, 1.18) | = Same |
| Inova Loudoun Hospital | 12 | 38,575 | 33 | 27.59 | 1.20 | (0.84, 1.66) | = Same |
| Inova Mount Vernon Hospital | 12 | 30,300 | 17 | 21.64 | 0.79 | (0.47, 1.23) | = Same |
| Mary Washington Hospital | 12 | 97,653 | 124 | 87.66 | 1.42 | (1.18, 1.68) | ✖Worse |
| Memorial Hospital of Martinsville & Henry County | 12 | 21,038 | 16 | 16.88 | 0.95 | (0.56, 1.51) | = Same |
| MSHA Johnston Memorial Hospital | 12 | 34,420 | 15 | 20.52 | 0.73 | (0.43, 1.18) | = Same |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,153,506** | **2,542** | **2556.14** | **0.99** | **(0.96, 1.03)** | = Same |
| MSHA Norton Community Hospital | 12 | 12,289 | 6 | 8.48 | 0.71 | (0.29, 1.47) | = Same |
| MSHA Russell County Medical Center | 12 | 3,904 | 1 | 2.14 | 0.47 | (0.02, 2.30) | = Same |
| MSHA Smyth County Community Hospital | 12 | 6,642 | 2 | 3.69 | 0.54 | (0.09, 1.79) | = Same |
| Novant Health UVA Health System Culpeper Medical Center | 12 | 14,763 | 5 | 10.94 | 0.46 | (0.17, 1.01) | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 12 | 5,839 | 0 | 3.40 | 0.00 | (., 0.88) | ★Better |
| Novant Health UVA Health System Prince William Medical Center | 12 | 27,978 | 5 | 16.98 | 0.29 | (0.11, 0.65) | ★Better |
| Riverside Doctors' Hospital Williamsburg | 12 | 4,992 | 0 | 2.92 | 0.00 | (., 1.03) | = Same |
| Riverside Regional Medical Center | 12 | 79,297 | 46 | 59.89 | 0.77 | (0.57, 1.02) | = Same |
| Riverside Shore Memorial Hospital | 12 | 10,249 | 2 | 5.59 | 0.36 | (0.06, 1.18) | = Same |
| Riverside Tappahannock Hospital | 12 | 6,167 | 3 | 2.92 | 1.03 | (0.26, 2.80) | = Same |
| Riverside Walter Reed Hospital | 12 | 12,370 | 2 | 5.66 | 0.35 | (0.06, 1.17) | = Same |
| Sentara CarePlex Hospital | 12 | 38,752 | 37 | 26.80 | 1.38 | (0.99, 1.88) | = Same |
| Sentara Halifax Regional Hospital | 12 | 15,113 | 8 | 12.51 | 0.64 | (0.30, 1.21) | = Same |
| Sentara Leigh Hospital | 12 | 59,331 | 29 | 54.50 | 0.53 | (0.36, 0.75) | ★Better |
| Sentara Martha Jefferson Hospital | 12 | 35,781 | 15 | 23.22 | 0.65 | (0.38, 1.04) | = Same |
| Sentara Norfolk General Hospital | 12 | 138,495 | 96 | 125.17 | 0.77 | (0.63, 0.93) | ★Better |
| Sentara Northern Virginia Medical Center | 12 | 39,165 | 28 | 24.86 | 1.13 | (0.76, 1.61) | = Same |
| Sentara Obici Hospital | 12 | 34,565 | 14 | 25.72 | 0.54 | (0.31, 0.89) | ★Better |
| Sentara Princess Anne Hospital | 12 | 49,861 | 33 | 37.80 | 0.87 | (0.61, 1.21) | = Same |

| Hospital Name | Months Included | Patient Days | Number of Events | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|---|
| | | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **12** | **3,153,506** | **2,542** | **2556.14** | **0.99** | **(0.96, 1.03)** | = Same |
| Sentara RMH Medical Center | 12 | 49,765 | 47 | 37.48 | 1.25 | (0.93, 1.65) | = Same |
| Sentara Virginia Beach General Hospital | 12 | 58,116 | 42 | 45.84 | 0.92 | (0.67, 1.23) | = Same |
| Sentara Williamsburg Regional Medical Center | 12 | 23,800 | 9 | 16.23 | 0.55 | (0.27, 1.02) | = Same |
| Shenandoah Memorial Hospital | 12 | 6,985 | 6 | 4.36 | 1.38 | (0.56, 2.86) | = Same |
| Southampton Memorial Hospital | 12 | 6,122 | 2 | 2.98 | 0.67 | (0.11, 2.22) | = Same |
| Southern Virginia Regional Medical Center | 12 | 7,180 | 4 | 3.19 | 1.25 | (0.40, 3.02) | = Same |
| Southside Regional Medical Center | 12 | 56,594 | 49 | 44.41 | 1.10 | (0.83, 1.45) | = Same |
| Stafford Hospital | 12 | 15,644 | 16 | 11.45 | 1.40 | (0.83, 2.22) | = Same |
| Twin County Regional Healthcare | 12 | 10,751 | 2 | 6.52 | 0.31 | (0.05, 1.01) | = Same |
| UVA Medical Center | 12 | 154,723 | 170 | 139.34 | 1.22 | (1.05, 1.41) | ✖Worse |
| VCU Community Memorial Hospital | 12 | 14,943 | 4 | 7.29 | 0.55 | (0.17, 1.32) | = Same |
| VCU Medical Center | 12 | 196,121 | 226 | 176.13 | 1.28 | (1.12, 1.46) | ✖Worse |
| Virginia Hospital Center | 12 | 82,072 | 55 | 76.39 | 0.72 | (0.55, 0.93) | ★Better |
| Warren Memorial Hospital | 12 | 8,418 | 2 | 5.21 | 0.38 | (0.06, 1.27) | = Same |
| Wellmont Lonesome Pine Hospital | 12 | 3,175 | 1 | 1.95 | 0.51 | (0.07, 2.53) | = Same |
| Wellmont Mountain View Regional Medical Center | 12 | 2,733 | 0 | 1.64 | 0.00 | (., 1.83) | = Same |
| Winchester Medical Center | 12 | 110,045 | 133 | 93.99 | 1.42 | (1.19, 1.67) | ✖Worse |
| Wythe County Community Hospital | 12 | 8,214 | 1 | 4.91 | 0.20 | (0.01, 1.01) | = Same |

[a]When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

# Healthcare Personnel Influenza Vaccination

## Reading Guide for the Influenza Vaccination Table

Percentage of healthcare personnel for each hospital that received the influenza vaccination (includes employees, licensed independent practitioners, and adult students/trainees and volunteers)

Statewide aggregate data are found in the first row of each page.

| Hospital Name | Percentage of All Hospital Workers Vaccinated[a] | Comparison P-value[b] | How Does This Hospital Compare to the Healthy People 2020 Goal?[c] |
|---|---|---|---|
| **All Virginia Hospitals[d]** | **87.5%** | 0.038 | ✖ Worse |
| Hospital A | 93.0% | 0.024 | ★ Better |
| Hospital B | 75.5% | 0.001 | ✖ Worse |
| Hospital C | 90.0% | 0.132 | = Same |
| Hospital D | 91.5% | 0.043 | ★ Better |

*The 2014-2015 flu season was from October 1, 2014 – March 31, 2015.

[a] All hospital workers is defined as all employees, licensed independent practitioners, and adult students/trainees and volunteers. Contract personnel are excluded from all categories.

[b] P-value ≤ 0.05 is considered statistically significant.

[c] The Healthy People 2020 goal for healthcare worker vaccination in the United States is 90%. For more information about the healthcare worker vaccination goal, see Appendix A.

[d] The statewide healthcare worker vaccination percentage was calculated using pooled means. For further explanation of the calculation see the Healthcare Worker Influenza Vaccination section in the methods.

**Example: Hospital B**

| Percent Vaccinated | P-value | Healthy People 2020 Goal |
|---|---|---|
| 75.5% | 0.001 | ✖ Worse |

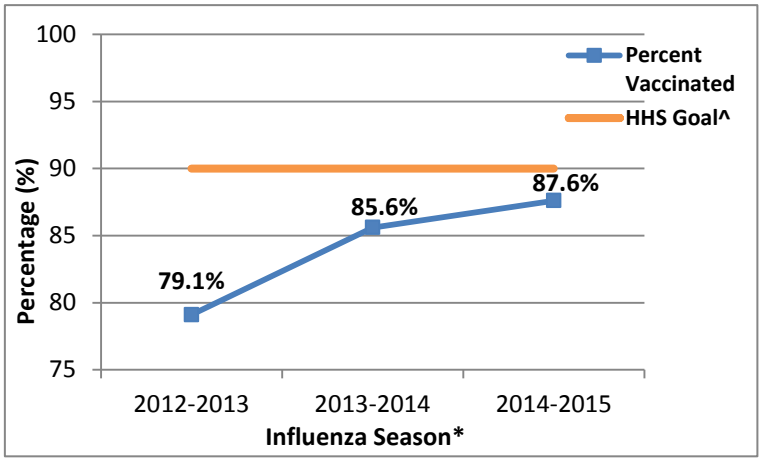
- 75.5% received influenza vaccination during this flu season.
- Did not reach Healthy People 2020 Goal (90%).
- Hospital B's vaccination percentage was significantly lower than Healthy People 2020 Goal (p-value <0.05).

| Legend | | |
|---|---|---|
| ★ Vaccination is higher (**better**) than the Healthy People 2020 Goal. | = Vaccination is **similar** to the Healthy People 2020 Goal. | ✖ Vaccination is lower (**worse**) than the Healthy People 2020 Goal. |

**For an explanation of each variable, see: Appendix E. Variable Definitions.**

## Influenza Vaccination Data

**Figure 6. Virginia Healthcare Worker Vaccination by Influenza Season**




*An influenza season is from October 1st through March 31st of the following year.

^The HHS Healthy People 2020 goal for healthcare worker influenza vaccination in the United States is 90%.

**2014-2015 (n=81 hospitals)**

- The 2014-2015 overall healthcare worker vaccination percentages for Virginia was **87.6%**, which was significantly lower than the Healthy People 2020 goal.
    - Thirty-five (43%) of Virginia hospitals had a healthcare worker vaccination percentage significantly higher than the Healthy People 2020 goal.
    - Thirty-five (43%) of Virginia hospitals had a healthcare worker vaccination percentage significantly lower than the Healthy People 2020 goal.
- In Virginia, 42 hospitals (52%) met or exceeded the Healthy People 2020 goal (90.0%) for the 2014-2015 influenza season.

**2013-2014 (n=79 hospitals)**

- The 2013-2014 overall healthcare worker vaccination percentage for Virginia was **85.6%**, which was significantly lower than the Healthy People 2020 goal.
- In Virginia, 32 hospitals (41%) met or exceeded the Healthy People 2020 goal (90.0%) for the 2013-2014 influenza season.

**2012-2013 (n=77 hospitals)**

- The 2012-2013 overall healthcare worker vaccination percentage for Virginia was **79.1%**, which was significantly lower than the Healthy People 2020 goal.
- In Virginia, 16 hospitals (21%) met or exceeded the Healthy People 2020 goal (90.0%) for the 2012-2013 influenza season.

| Legend | | |
|---|---|---|
| ★ Vaccination is higher (**better**) than the Healthy People 2020 Goal. | = Vaccination is **similar** to the Healthy People 2020 Goal. | ✖ Vaccination is lower (**worse**) than the Healthy People 2020 Goal. |

**Table 11. Healthcare Worker Influenza Vaccination Percentages, Virginia Hospitals, 2014-2015 Influenza Season***

| Hospital Name | Percentage (%) of All Hospital Workers Vaccinated[a] | Comparison P-value[b] | How Does This Hospital Compare to the Healthy People 2020 Goal?[c] |
|---|---|---|---|
| **All Virginia Hospitals[d] (n=81)** | **87.6%** | <0.001 | ✖Worse |
| Augusta Health | 86.7% | <0.001 | ✖Worse |
| Bon Secours DePaul Medical Center | 95.7% | <0.001 | ★Better |
| Bon Secours Mary Immaculate Hospital | 70.5% | <0.001 | ✖Worse |
| Bon Secours Maryview Medical Center | 87.1% | <0.001 | ✖Worse |
| Bon Secours Memorial Regional Medical Center | 96.4% | <0.001 | ★Better |
| Bon Secours Rappahannock General Hospital | 97.1% | 0.020 | ★Better |
| Bon Secours Richmond Community Hospital | 93.7% | <0.001 | ★Better |
| Bon Secours St. Francis Medical Center | 97.0% | <0.001 | ★Better |
| Bon Secours St. Mary's Hospital | 97.8% | 0.220 | ★Better |
| Buchanan General Hospital | 87.8% | <0.001 | = Same |
| Carilion Franklin Memorial Hospital | 78.5% | <0.001 | ✖Worse |
| Carilion Giles Community Hospital | 73.3% | <0.001 | ✖Worse |
| Carilion Medical Center | 72.1% | <0.001 | ✖Worse |
| Carilion New River Valley Medical Center | 62.6% | <0.001 | ✖Worse |
| Carilion Stonewall Jackson Hospital | 75.3% | <0.001 | ✖Worse |
| Carilion Tazewell Community Hospital | 74.2% | <0.001 | ✖Worse |
| Centra Bedford Memorial Hospital | 98.6% | <0.001 | ★Better |
| Centra Lynchburg General Hospital | 99.4% | <0.001 | ★Better |
| Centra Southside Community Hospital | 98.6% | <0.001 | ★Better |
| Centra Virginia Baptist Hospital | 98.9% | <0.001 | ★Better |
| Chesapeake Regional Medical Center | 97.7% | <0.001 | ★Better |
| Clinch Valley Medical Center | 97.7% | <0.001 | ★Better |
| Danville Regional Medical Center | 92.7% | <0.001 | ★Better |
| Fauquier Health | 92.5% | <0.001 | ★Better |
| HCA CJW Medical Center Chippenham Hospital | 66.0% | <0.001 | ✖Worse |
| HCA CJW Medical Center Johnston-Willis Hospital | 65.7% | <0.001 | ✖Worse |
| HCA Henrico Doctors' Hospital | 74.3% | 0.310 | ✖Worse |
| HCA John Randolph Medical Center | 91.2% | <0.001 | = Same |

| Hospital Name | Percentage (%) of All Hospital Workers Vaccinated[a] | Comparison P-value[b] | How Does This Hospital Compare to the Healthy People 2020 Goal?[c] |
|---|---|---|---|
| **All Virginia Hospitals[d] (n=81)** | **87.6%** | <0.001 | ✖Worse |
| HCA LewisGale Hospital Alleghany | 69.0% | <0.001 | ✖Worse |
| HCA LewisGale Hospital Montgomery | 72.4% | 0.220 | ✖Worse |
| HCA LewisGale Hospital Pulaski | 91.6% | <0.001 | = Same |
| HCA LewisGale Medical Center | 92.6% | <0.001 | ★Better |
| HCA Parham Doctors' Hospital | 67.0% | <0.001 | ✖Worse |
| HCA Reston Hospital Center | 71.4% | <0.001 | ✖Worse |
| HCA Retreat Doctors' Hospital | 77.7% | <0.001 | ✖Worse |
| HCA Spotsylvania Regional Medical Center | 64.7% | <0.001 | ✖Worse |
| Inova Alexandria Hospital | 97.1% | <0.001 | ★Better |
| Inova Fair Oaks Hospital | 98.4% | <0.001 | ★Better |
| Inova Fairfax Medical Campus | 98.2% | <0.001 | ★Better |
| Inova Loudoun Hospital | 99.1% | <0.001 | ★Better |
| Inova Mount Vernon Hospital | 98.0% | 0.650 | ★Better |
| Mary Washington Hospital | 90.2% | 0.010 | = Same |
| Memorial Hospital of Martinsville & Henry County | 92.4% | <0.001 | ★Better |
| MSHA Johnston Memorial Hospital | 98.6% | <0.001 | ★Better |
| MSHA Norton Community Hospital | 97.5% | <0.001 | ★Better |
| MSHA Russell County Medical Center | 96.6% | <0.001 | ★Better |
| MSHA Smyth County Community Hospital | 98.8% | 0.140 | ★Better |
| Novant Health UVA Health System Culpeper Medical Center | 91.3% | <0.001 | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 98.5% | <0.001 | ★Better |
| Novant Health UVA Health System Prince William Medical Center | 94.4% | <0.001 | ★Better |
| Riverside Doctors' Hospital Williamsburg | 80.2% | <0.001 | ✖Worse |
| Riverside Regional Medical Center | 98.7% | <0.001 | ★Better |
| Riverside Shore Memorial Hospital | 96.5% | <0.001 | ★Better |
| Riverside Tappahannock Hospital | 97.6% | <0.001 | ★Better |
| Riverside Walter Reed Hospital | 96.7% | <0.001 | ★Better |
| Sentara CarePlex Hospital | 78.1% | 0.310 | ✖Worse |
| Sentara Halifax Regional Hospital | 89.0% | <0.001 | = Same |
| Sentara Leigh Hospital | 78.9% | 0.880 | ✖Worse |
| Sentara Martha Jefferson Hospital | 89.9% | <0.001 | = Same |
| Sentara Norfolk General Hospital | 85.4% | <0.001 | ✖Worse |
| Sentara Northern Virginia Medical Center | 84.8% | <0.001 | ✖Worse |

| Hospital Name | Percentage (%) of All Hospital Workers Vaccinated[a] | Comparison P-value[b] | How Does This Hospital Compare to the Healthy People 2020 Goal?[c] |
|---|---|---|---|
| **All Virginia Hospitals[d] (n=81)** | **87.6%** | <0.001 | ✖Worse |
| Sentara Obici Hospital | 80.7% | <0.001 | ✖Worse |
| Sentara Princess Anne Hospital | 83.6% | 0.640 | ✖Worse |
| Sentara RMH Medical Center | 90.2% | <0.001 | = Same |
| Sentara Virginia Beach General Hospital | 83.1% | <0.001 | ✖Worse |
| Sentara Williamsburg Regional Medical Center | 84.4% | 0.020 | ✖Worse |
| Shenandoah Memorial Hospital | 86.3% | <0.001 | ✖Worse |
| Southampton Memorial Hospital | 72.5% | <0.001 | ✖Worse |
| Southern Virginia Regional Medical Center | 70.4% | <0.001 | ✖Worse |
| Southside Regional Medical Center | 67.4% | 0.620 | ✖Worse |
| Stafford Hospital | 89.5% | <0.001 | = Same |
| Twin County Regional Healthcare | 75.3% | <0.001 | ✖Worse |
| UVA Medical Center | 93.2% | <0.001 | ★Better |
| VCU Community Memorial Hospital | 86.6% | <0.001 | ✖Worse |
| VCU Medical Center | 77.6% | <0.001 | ✖Worse |
| Virginia Hospital Center | 94.3% | 0.720 | ★Better |
| Warren Memorial Hospital | 90.4% | <0.001 | = Same |
| Wellmont Lonesome Pine Hospital | 97.8% | <0.001 | ★Better |
| Wellmont Mountain View Regional Medical Center | 99.4% | <0.001 | ★Better |
| Winchester Medical Center | 83.8% | 0.610 | ✖Worse |
| Wythe County Community Hospital | 90.7% | <0.001 | = Same |

*The 2014-2015 influenza season was from October 1, 2014 – March 31, 2015.

[a] All hospital workers is defined as all employees, licensed independent practitioners, and adult students/trainees and volunteers. Contract personnel are excluded from all categories.

[b] P-value ≤ 0.05 is considered statistically significant.

[c] The Healthy People 2020 goal for healthcare worker vaccination in the United States is 90%. For more information about the healthcare worker vaccination goal, see Appendix A.

[d] The statewide healthcare worker vaccination percentage was calculated using pooled means. For further explanation of the calculation see the Healthcare Worker Influenza Vaccination section in the methods.

## CONCLUSIONS

This publication summarizes the HAI data reported to the Virginia Department of Health from 81 of Virginia's acute care and critical access hospitals. These healthcare facilities account for over 3,000,000 patient days annually and over 15,000 inpatient beds. The analyses in this report revealed that in 2015, Virginia's hospitals showed improvement in preventing HAIs, as compared to national historical baseline data.

In aggregate, Virginia hospitals reported statistically significantly fewer CLABSI, CAUTI, and MRSA bacteremia laboratory-identified events in 2015 than were predicted; the greatest reductions from baseline were observed for CLABSI (48% decrease) and CAUTI (42% decrease). This is largely consistent with performance of prior years, when CLABSI and MRSA SIRs were statistically significantly lower than the national baseline. The statistically significant reduction in CAUTI (SIR=0.58), due in part to surveillance definition changes but likely also to increased emphasis on implementing prevention strategies, is a marked change from 2013, when Virginia hospitals reported 14% more infections than were predicted. In 2015, most hospitals demonstrated significant improvement from the national baseline for one or more HAI types. For each HAI, many hospitals in Virginia observed zero infections in 2015. More than half of Virginia's hospitals met the Department of Health and Human Services Healthy People 2020 goal for healthcare worker influenza vaccination. These are accomplishments to be celebrated.

However, despite these successes, room for improvement remains. Although the 2015 CLABSI state SIR is well below the national baseline, the SIR increased for the first time in recent years to 0.52, the highest it has been since 2011. Compared to the national baseline, no significant change in SSIs following colon surgery or CDI was observed. Additionally, performance for SSIs following abdominal hysterectomy surgeries was moving in the *wrong* direction; a statistically significant increase was observed in 2015 for the state as a whole as compared to the national baseline.

As previously mentioned, 2015 is the last year that SIRs will be calculated using the current national baselines. In addition to updated baselines, changes to NHSN definitions will be considered when interpreting HAI data. Hospitals should take these changes into consideration when measuring incidence of an infection in their facility, reviewing their data and reporting to various entities, and when trending hospital HAI data over time. For example, SIRs calculated under two different baseline periods should not be compared to each other, as each of those SIRs were calculated using different national incidence and risk adjustment methods. SIRs from 2016 onward will be calculated using baseline national data from 2015.

In 2015, the Virginia HAI Advisory Group identified CAUTI and CDI as the two infection priority areas for the state due to their morbidity, preventability and the opportunity for improvement. The HAI Advisory Group's members represent multidisciplinary organizations that span the continuum of healthcare. The group meets quarterly to assure that Virginia is working toward state and federal HAI prevention goals and that Virginia's healthcare facilities have the education and tools to implement evidence-based strategies to prevent HAIs. This work is accomplished by focusing on initiatives that address the promotion of antibiotic stewardship, communication and education, and using data for action.

In addition to working within the HAI Advisory Group to drive change, the VDH HAI Program continues to conduct HAI surveillance, investigation, and prevention activities in partnership with internal and external stakeholders. This includes tracking and publishing HAI data, implementing HAI prevention collaboratives with organizations such as the Virginia Hospital & Healthcare Association and Health Quality Innovators (the state Quality Innovation Network/Quality Improvement Organization), developing educational materials for healthcare consumers and providers, communicating directly with infection prevention staff to share the latest evidence-based guidelines and recommendations, and targeting prevention efforts using the "Targeted Assessment for Prevention" strategy.

Although this report only includes information on a subset of HAIs in the state, the information provided in this report can be used as an important indicator of healthcare quality and infection prevention progress in Virginia hospitals. It is hoped that the data in this report will be used by healthcare providers, administrators, public health professionals, and other organizations, to target and improve infection prevention efforts in hospitals throughout the Commonwealth. Preventing HAIs requires a coordinated, team approach; data can be an important catalyst to drive action and ultimately help save lives and make our healthcare facilities safer.

For a more concise version of this report and for informational resources for patients, family members, and other healthcare consumers, please see the 2015 Virginia HAI Report for Consumers.

For questions regarding the data presented or to provide feedback on the report, please contact the VDH HAI team at hai@vdh.virginia.gov .

## ACKNOWLEDGMENTS

The Virginia HAI Program would like to acknowledge the following groups that contributed to the content, data analysis, and/or review of this report:

- **The Virginia HAI Advisory Group**
  - Organizations:
    - Association for Professionals in Infection Control and Epidemiology, Virginia Chapter (APIC-VA)
    - Mid-Atlantic Renal Coalition
    - Health Quality Innovators (HQI)
    - Virginia Department of Behavioral Health and Developmental Services
    - Virginia Department of Health (VDH) – representatives with expertise in epidemiology, emergency preparedness, and licensure and certification
    - Virginia Department of Social Services
    - Virginia Hospital & Healthcare Association (VHHA)
    - Virginia Rural Health Association
  - Healthcare professionals representing diverse settings and populations:
    - Hospital administrators
    - Infection Preventionists
    - Pharmacists
    - Physicians with expertise in infectious disease epidemiology
    - Quality improvement experts
    - Representatives from long-term care facilities

- **The CDC/CSTE HAI Data Analysis and Presentation Standardization Workgroup**
- **Virginia Infection Preventionists**
- **Tennessee Department of Health**
- **VHQC Patient and Family Advisory Council**
- **VDH Division of Surveillance and Investigation, Enhanced Surveillance Program**

This report was supported in part by an appointment to the CSTE Applied Epidemiology Fellowship Program administered by the Council of State and Territorial Epidemiologists (CSTE) and funded by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement Number 1U38OT000143-03.

# APPENDICES

## Appendix A. Guide to Understanding Healthcare Worker Influenza Vaccination

Influenza, or "the flu," is a mild to severe respiratory illness caused by the influenza virus. It is a contagious illness, spread from person to person through droplets. If healthcare workers (also known as healthcare personnel) become infected with the flu, they can spread this illness to their coworkers and patients. Some patients in a hospital are at high risk for complications from the flu, such as the elderly, very young, or those with severe chronic illnesses or immunosuppressive conditions. Extra care should be taken to prevent the spread of the flu among healthcare workers and patients.

The best way to prevent influenza is by getting vaccinated. The Centers for Disease Control and Prevention (CDC) recommends that all healthcare personnel who work in a healthcare setting receive the flu vaccine each year to help prevent the spread of influenza within the workplace. Healthcare personnel include all facility employees, licensed independent practitioners, adult students/trainees, and volunteers regardless of full time/part time status, clinical responsibility or patient contact. **Studies show that patients benefit when healthcare workers get vaccinated.**

Many hospitals choose to provide the flu vaccine to their employees, and some hospitals even have policies requiring mandatory vaccination. Currently, there no state regulations requiring vaccination of healthcare workers in Virginia, and healthcare workers are able to decline the flu vaccine.

This report shows the percentage of all healthcare workers in each hospital who received the flu vaccine. Higher percentages are better, because this indicates that a greater number of healthcare workers are protected against the flu. For the 2014-2015 flu season, Virginia's overall vaccination percentage was 87.6%. The Department of Health and Human Services (HHS) Healthy People 2020 goal for healthcare worker flu vaccination in the United States is 90%. In Virginia, 52% of hospitals met this goal for the 2014-2015 flu season.

*For more information about the CDC recommendations and the national trends of influenza vaccination coverage, see here: http://www.cdc.gov/flu/healthcareworkers.htm*

*For more information about the HHS Healthy People 2020 goal for healthcare worker flu vaccination, see: https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives*

## Appendix B. What Healthcare Providers Can Do to Prevent Infections

**To prevent *all* infections**:

- Follow standard and transmission-based precautions meticulously, use appropriate personal protective equipment, and perform hand hygiene as indicated.
- Ensure that all medical devices and equipment are cleaned, disinfected, sterilized, and/or discarded appropriately.
- Ensure the environment of care is maintained appropriately.
- Speak up if you see co-workers who are not following appropriate infection prevention measures.
- Ensure that information about infection and colonization is communicated during transitions of care.

**To prevent central line-associated bloodstream infections (CLABSIs) and catheter-associated urinary tract infections (CAUTIs)**:

- Follow recommended device insertion practices.
- Follow recommended device maintenance practices.
- Every day, evaluate whether the device is still needed. Ensure it is removed as soon as it is no longer needed.

**To prevent surgical site infections**:

- Follow a safe surgery checklist before, during, and after surgery.
- When indicated, give an antibiotic before surgery. Make sure the dose is appropriate and the drug is discontinued in a timely manner.
- Follow recommendations for hand hygiene, personal protective equipment, and antiseptic skin preparation.
- Post-discharge, provide the patient with wound care instructions and education on symptoms of infection.

**To prevent *Clostridium difficile* infections**:

- Use antibiotics judiciously.
- Implement contact precautions for patients with known or suspected *C. difficile* infection.
- Ensure proper cleaning and disinfection of the environment.

**To prevent methicillin-resistant *Staphylococcus aureus* (MRSA) infections**:

- Ensure compliance with contact precautions for MRSA-colonized and infected patients.
- Ensure proper cleaning and disinfection of the environment.
- Implement an alert system to enable prompt notification of laboratory-identified or readmitted patients with MRSA to allow timely initiation of control measures.

**To prevent influenza infections**:

- Promote good respiratory hygiene practices.
- Encourage people in common areas who have respiratory symptoms to distance themselves from others or wear a surgical mask, if they are able to tolerate it.
- Implement droplet precautions for patients with influenza.
- Administer antiviral treatment and chemoprophylaxis to patients and healthcare personnel when appropriate.
- If sick with flu-like illness, stay home for at least 24 hours after fever subsides and limit contact with other people.

For more information on HAI prevention strategies, see: http://www.vdh.virginia.gov/surveillance-and-investigation/healthcare-associated-infections-hais/ and www.cdc.gov/hai

## Appendix C. Hospital Characteristics

A summary of all Virginia hospital characteristics and descriptions of characteristics can be found in Table 2.

**Table 12. Hospital-Specific Characteristics for all Virginia Hospitals, January – December 2015**

| Hospital Name | Hospital System | Hospital Type | Region | Bedsize Category | Medical School Affiliation |
|---|---|---|---|---|---|
| Augusta Health | None | Acute Care | Northwest | 101-200 | No |
| Bon Secours DePaul Medical Center | Bon Secours | Acute Care | Eastern | 101-200 | No |
| Bon Secours Mary Immaculate Hospital | Bon Secours | Acute Care | Eastern | 101-200 | No |
| Bon Secours Maryview Medical Center | Bon Secours | Acute Care | Eastern | >200 | Yes |
| Bon Secours Memorial Regional Medical Center | Bon Secours | Acute Care | Central | >200 | No |
| Bon Secours Rappahannock General Hospital | Bon Secours | Acute Care | Eastern | ≤100 | No |
| Bon Secours Richmond Community Hospital | Bon Secours | Acute Care | Central | 101-200 | No |
| Bon Secours St. Francis Medical Center | Bon Secours | Acute Care | Central | 101-200 | Yes |
| Bon Secours St. Mary's Hospital | Bon Secours | Acute Care | Central | >200 | Yes |
| Buchanan General Hospital | None | Acute Care | Southwest | ≤100 | No |
| Carilion Franklin Memorial Hospital | Carilion Clinic | Acute Care | Southwest | ≤100 | Yes |
| Carilion Giles Community Hospital | Carilion Clinic | Critical Access | Southwest | ≤100 | Yes |
| Carilion Medical Center | Carilion Clinic | Acute Care | Southwest | >200 | Yes |
| Carilion New River Valley Medical Center | Carilion Clinic | Acute Care | Southwest | 101-200 | Yes |
| Carilion Stonewall Jackson Hospital | Carilion Clinic | Critical Access | Northwest | ≤100 | No |
| Carilion Tazewell Community Hospital | Carilion Clinic | Acute Care | Southwest | ≤100 | No |
| Centra Bedford Memorial Hospital | Centra Health | Acute Care | Southwest | ≤100 | No |
| Centra Lynchburg General Hospital | Centra Health | Acute Care | Southwest | >200 | Yes |
| Centra Southside Community Hospital | Centra Health | Acute Care | Central | ≤100 | Yes |
| Centra Virginia Baptist Hospital | Centra Health | Acute Care | Southwest | ≤100 | Yes |
| Chesapeake Regional Medical Center | None | Acute Care | Eastern | >200 | No |
| Clinch Valley Medical Center | LifePoint | Acute Care | Southwest | 101-200 | Yes |
| Danville Regional Medical Center | LifePoint | Acute Care | Southwest | 101-200 | Yes |
| Fauquier Health | LifePoint | Acute Care | Northwest | ≤100 | No |

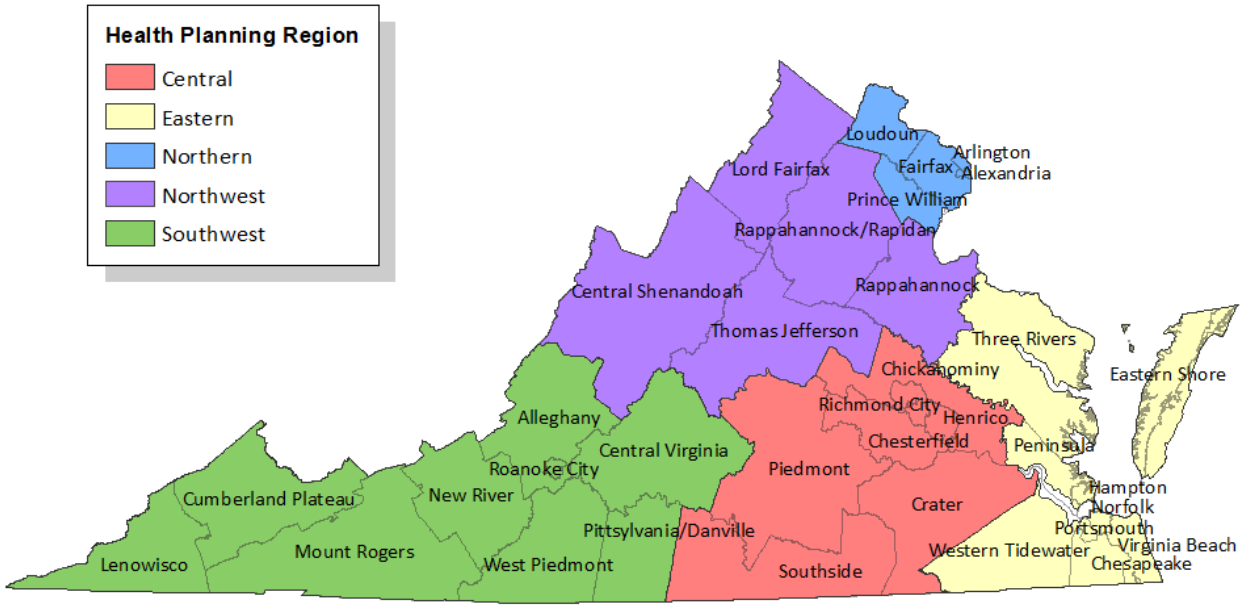
| Hospital Name | Hospital System | Hospital Type | Region | Bedsize Category | Medical School Affiliation |
|---|---|---|---|---|---|
| HCA CJW Medical Center Chippenham Hospital | HCA | Acute Care | Central | >200 | Yes |
| HCA CJW Medical Center Johnston-Willis Hospital | HCA | Acute Care | Central | >200 | Yes |
| HCA Henrico Doctors' Hospital | HCA | Acute Care | Central | >200 | No |
| HCA John Randolph Medical Center | HCA | Acute Care | Central | 101-200 | No |
| HCA LewisGale Hospital Alleghany | HCA | Acute Care | Southwest | ≤100 | Yes |
| HCA LewisGale Hospital Montgomery | HCA | Acute Care | Southwest | 101-200 | Yes |
| HCA LewisGale Hospital Pulaski | HCA | Acute Care | Southwest | ≤100 | Yes |
| HCA LewisGale Medical Center | HCA | Acute Care | Southwest | >200 | Yes |
| HCA Parham Doctors' Hospital | HCA | Acute Care | Central | 101-200 | No |
| HCA Reston Hospital Center | HCA | Acute Care | Northern | >200 | No |
| HCA Retreat Doctors' Hospital | HCA | Acute Care | Central | ≤100 | No |
| HCA Spotsylvania Regional Medical Center | HCA | Acute Care | Northwest | 101-200 | No |
| Inova Alexandria Hospital | Inova | Acute Care | Northern | >200 | No |
| Inova Fair Oaks Hospital | Inova | Acute Care | Northern | 101-200 | No |
| Inova Fairfax Medical Campus | Inova | Acute Care | Northern | >200 | Yes |
| Inova Loudoun Hospital | Inova | Acute Care | Northern | 101-200 | No |
| Inova Mount Vernon Hospital | Inova | Acute Care | Northern | >200 | Yes |
| Mary Washington Hospital | Mary Washington Healthcare | Acute Care | Northwest | >200 | No |
| Memorial Hospital of Martinsville & Henry County | LifePoint | Acute Care | Southwest | 101-200 | No |
| MSHA Johnston Memorial Hospital | Mountain States Health Alliance | Acute Care | Southwest | 101-200 | No |
| MSHA Norton Community Hospital | Mountain States Health Alliance | Acute Care | Southwest | ≤100 | Yes |
| MSHA Russell County Medical Center | Mountain States Health Alliance | Acute Care | Southwest | ≤100 | No |
| MSHA Smyth County Community Hospital | Mountain States Health Alliance | Acute Care | Southwest | ≤100 | No |
| Novant Health UVA Health System Culpeper Medical Center | Novant Health/ UVA Health System | Acute Care | Northwest | ≤100 | Yes |
| Novant Health UVA Health System Haymarket Medical Center | Novant Health/ UVA Health System | Acute Care | Northern | ≤100 | No |
| Novant Health UVA Health System Prince William Medical Center | Novant Health/ UVA Health | Acute Care | Northern | 101-200 | No |

| Hospital Name | Hospital System | Hospital Type | Region | Bedsize Category | Medical School Affiliation |
|---|---|---|---|---|---|
| | System | | | | |
| Riverside Doctors' Hospital Williamsburg | Riverside Health System | Acute Care | Eastern | ≤100 | No |
| Riverside Regional Medical Center | Riverside Health System | Acute Care | Eastern | >200 | Yes |
| Riverside Shore Memorial Hospital | Riverside Health System | Acute Care | Eastern | ≤100 | No |
| Riverside Tappahannock Hospital | Riverside Health System | Acute Care | Eastern | ≤100 | No |
| Riverside Walter Reed Hospital | Riverside Health System | Acute Care | Eastern | ≤100 | No |
| Sentara CarePlex Hospital | Sentara Healthcare | Acute Care | Eastern | >200 | No |
| Sentara Halifax Regional Hospital | Sentara Healthcare | Acute Care | Central | 101-200 | No |
| Sentara Leigh Hospital | Sentara Healthcare | Acute Care | Eastern | >200 | Yes |
| Sentara Martha Jefferson Hospital | Sentara Healthcare | Acute Care | Northwest | 101-200 | No |
| Sentara Norfolk General Hospital | Sentara Healthcare | Acute Care | Eastern | >200 | Yes |
| Sentara Northern Virginia Medical Center | Sentara Healthcare | Acute Care | Northern | 101-200 | No |
| Sentara Obici Hospital | Sentara Healthcare | Acute Care | Eastern | 101-200 | Yes |
| Sentara Princess Anne Hospital | Sentara Healthcare | Acute Care | Eastern | 101-200 | Yes |
| Sentara RMH Medical Center | Sentara Healthcare | Acute Care | Northwest | >200 | No |
| Sentara Virginia Beach General Hospital | Sentara Healthcare | Acute Care | Eastern | >200 | No |
| Sentara Williamsburg Regional Medical Center | Sentara Healthcare | Acute Care | Eastern | 101-200 | Yes |
| Shenandoah Memorial Hospital | Valley Health | Critical Access | Northwest | ≤100 | No |
| Southampton Memorial Hospital | Community Health Systems | Acute Care | Eastern | ≤100 | Yes |
| Southern Virginia Regional Medical Center | Community Health Systems | Acute Care | Central | ≤100 | No |
| Southside Regional Medical Center | Community Health Systems | Acute Care | Central | >200 | No |
| Stafford Hospital | Mary Washington Healthcare | Acute Care | Northwest | ≤100 | No |
| Twin County Regional Healthcare | LifePoint | Acute Care | Southwest | ≤100 | No |
| UVA Medical Center | UVA Health System | Acute Care | Northwest | >200 | Yes |
| VCU Community Memorial Hospital | VCU Health | Acute Care | Central | ≤100 | No |
| VCU Medical Center | VCU Health | Acute Care | Central | >200 | Yes |

| Hospital Name | Hospital System | Hospital Type | Region | Bedsize Category | Medical School Affiliation |
|---|---|---|---|---|---|
| Virginia Hospital Center | None | Acute Care | Northern | >200 | Yes |
| Warren Memorial Hospital | Valley Health | Acute Care | Northwest | ≤100 | Yes |
| Wellmont Lonesome Pine Hospital | Wellmont Health System | Acute Care | Southwest | ≤100 | Yes |
| Wellmont Mountain View Regional Medical Center | Wellmont Health System | Acute Care | Southwest | 101-200 | Yes |
| Winchester Medical Center | Valley Health | Acute Care | Northwest | >200 | Yes |
| Wythe County Community Hospital | LifePoint | Acute Care | Southwest | ≤100 | Yes |

## Appendix D. Virginia Health Planning Regions

**Figure 7. Health Districts and Health Planning Regions, Virginia Department of Health**



## Appendix E. Variable Definitions

### Variables in the HAI Data Tables

- **Title**: The title of the table provides information about the HAI type, time period, geographic location, and facility type included in the table.

- **Hospital Name:** This is the name of the facility. Facilities with multiple campuses will have each campus identified separately.

- **Months Included**: This is the number of months that were included in the SIR calculation.

- **Number of Procedures:** This is the total number of surgeries performed by a facility during 2015.

- **Device Days:** This is the number of device days that were reported by the facility for device-associated infections. A device day is a daily count of the number of patients with a specific device in the patient care location during a time period. These are central line days for CLABSI and urinary catheter days for CAUTI.

- **Patient Days**: This is a daily count of the number of patients in a patient care location during a time period. Patient days are calculated by recording the number of patients each day at the same time in a specific patient care location. At the end of each month, the daily counts are added together. This is displayed for LabID events only (MRSA bacteremia and *Clostridium difficile*).

- **Observed Infections:** This is the number of infections (or events, for LabID measures) that were reported by the facility.

- **Predicted Infections:** This is a calculated value that reflects the number of infections (or events, for LabID measures) that we have "predicted" to occur in this facility, based on the national experience during the baseline time period.

- **Standardized Infection Ratio (SIR)**: This measure divides the number of observed infections (or events) by the number of predicted infections (or events). A value of 1 indicates that the facility observed the same number of infections (or events) as were predicted. Lower SIR values are better.

- **95% Confidence Interval (CI)**: Indicates that there is a high degree of confidence (95%) that the true SIR lies within this range of values. If this range includes the value of 1, then the SIR is *not statistically significant* (i.e., the number of observed infections or events is not significantly different than the number predicted). A confidence interval cannot be calculated if the SIR is not calculated. When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However, for ease of interpretation, it can be considered 0.

- **SIR Interpretation**: Colors and symbols are used to help the reader quickly understand and interpret the statistical significance of the SIR. This is the "take-home message" about the facility's performance on this HAI measure.

  **★ Indicates that the facility had significantly fewer infections than were predicted (better than the national baseline)**

  **= Indicates that the facility had about the same number of infections as were predicted (same as the national baseline)**

  **✖ Indicates that the facility had significantly more infections than were predicted (worse than the national baseline)**

  **No Conclusion:** Indicates that this facility reported data, but there was not enough information to make a reliable comparison to the national baseline (number of predicted infections was less than 1).

## Variables in the Healthcare Worker Influenza Vaccination Table

- **Title**: The title of the table provides information about the time period (flu season), geographic location, and facility type included in the table.

- **Hospital Name:** This is the name of the facility. Facilities with multiple campuses will have each campus identified separately.

- **Percentage of Healthcare Workers Vaccinated:** This is calculated as a percentage (how many per hundred) of all healthcare workers in the hospital who received the flu vaccine. This includes all facility employees, licensed independent practitioners, and adult students/trainees and volunteers. Contract personnel are excluded from the calculation.

    - **Employees** – Persons who receive a direct paycheck from the hospital (i.e., on the hospital's payroll), regardless of clinical responsibility or patient contact.

    - **Licensed Independent Practitioners (LIPs)** – Physicians (MD, DO), advanced practice nurses, and physician assistants who are affiliated with the healthcare facility, but are not directly employed by it (i.e., they do not receive a paycheck from the hospital), regardless of clinical responsibility or patient contact. Post-residency fellows are also included in this category if they are not on a hospital's payroll.

    - **Adult Students/Trainees and Volunteers** – Medical, nursing, or other health professional students, interns, medical residents or volunteers aged 18 or older that are affiliated with the hospital, but are not directly employed by it, regardless of clinical responsibility or patient contact.

    - **Contract Personnel** – Persons providing care, treatment, or services at the hospital through a contract, regardless of clinical responsibility or patient contact, who do not meet the definition of employees, LIPs, or adult students/trainees and volunteers.

$$\frac{\textbf{Number of healthcare workers vaccinated}}{\textbf{Total number of healthcare workers at the hospital}} \times 100\%$$

- **Comparison P-Value**: If the p-value is less than or equal to 0.05, we can conclude that the healthcare worker influenza vaccination percentage is *significantly different* than the comparison group's value (i.e., 90%). If the p-value is greater than 0.05, we can conclude that the healthcare worker influenza vaccination percentage *is not significantly different* than the comparison group.

- **"How Does This Facility Compare to the Healthy People 2020 Goal"?**

    1. Vaccination is significantly higher (**better**) than the Healthy People 2020 Goal: ★ **Better**
    2. Vaccination is **similar** to the Healthy People 2020 Goal: **= Same**
    3. Vaccination is significantly lower (**worse**) than the Healthy People 2020 Goal: ✖ **Worse**
    4. Data were not reported from this facility: **not reported** (no affiliated symbol)

## Appendix F. Summary of Healthcare-Associated Infections in Virginia from 2013 and 2014

The following tables summarize the statewide standardized infection ratios for 2014 and 2013. Summary of 2015 statewide SIRs can be found in Table 3. Device-associated infection SIRs for inpatient wards are not shown in the tables below, as reporting from wards did not start until 2015.

**Table 13. Statewide Standardized Infection Ratios (SIRs) for Central Line-Associated Bloodstream Infection (CLABSI), Catheter-Associated Urinary Tract Infection (CAUTI), Surgical Site Infection (SSI) and Laboratory-Identified Hospital-Onset Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia and Clostridium *difficile* (CDI) Events, Virginia Hospitals, 2014**

| | | | | Number of Infections | | Standardized Infection Ratio (SIR) and 95% CI | | |
|---|---|---|---|---|---|---|---|---|
| HAI | Unit/Type | No. of Facilities | Device Days/ Procedures Performed/ Patient Days | Observed | Predicted | SIR | Lower | Upper |
| CLABSI | All ICUs (total) | 79 | 238,506 | 157 | 480.72 | 0.33 | 0.29 | 0.38 |
| | Adult and Pediatric ICUs (only) | 78 | 205,018 | 139 | 405.24 | 0.34 | 0.29 | 0.40 |
| | Neonatal ICUs (only) | 24 | 33,488 | 18 | 75.48 | 0.24 | 0.15 | 0.37 |
| CAUTI | Adult and Pediatric ICUs (total) | 78 | 249,240 | 535 | 502.37 | 1.07 | 0.98 | 1.16 |
| SSI* | Colon Surgery | 77 | 7,218 | 221 | 214.2 | 1.03 | 0.90 | 1.18 |
| | Abdominal Hysterectomy | 70 | 8,120 | 53 | 65.83 | 0.81 | 0.61 | 1.05 |
| MRSA | Facility-wide LabID | 81 | 3,658,197 | 201 | 245.49 | 0.82 | 0.71 | 0.94 |
| CDI | Facility-wide LabID | 81 | 3,312,061 | 2,431 | 2554.85 | 0.95 | 0.91 | 0.99 |

Green highlighting indicates an SIR significantly LOWER than the national baseline (CLABSI, SSI - 2006-2008; CAUTI - 2009; MRSA, CDI - 2010-2011).
Red highlighting indicates an SIR significantly HIGHER than the national baseline.
* SSI SIRs are based on the complex admission/readmission model.

**Table 14. Statewide Standardized Infection Ratios (SIRs) for Central Line-Associated Bloodstream Infection (CLABSI), Catheter-Associated Urinary Tract Infection (CAUTI), Surgical Site Infection (SSI) and Laboratory-Identified Hospital-Onset Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia and Clostridium *difficile* (CDI) Events, Virginia Hospitals, 2013[1]**

| | | | | Number of Infections | | Standardized Infection Ratio (SIR)* and 95% CI | | |
|---|---|---|---|---|---|---|---|---|
| **HAI** | **Unit/Type** | **No. of Facilities** | **Device Days/ Procedures Performed/ Patient Days** | **Observed** | **Predicted** | **SIR** | **Lower** | **Upper** |
| **CLABSI** | **All ICUs (total)** | 77 | 227,424 | 216 | 456.48 | 0.47 | 0.41 | 0.54 |
| | **Adult and Pediatric ICUs (only)** | 77 | 193,817 | 190 | 380.88 | 0.50 | 0.43 | 0.57 |
| | **Neonatal ICUs (only)** | 23 | 33,607 | 26 | 75.60 | 0.34 | 0.23 | 0.50 |
| **CAUTI** | **Adult and Pediatric ICUs (total)** | 76 | 239,782 | 559 | 489.62 | 1.14 | 1.05 | 1.24 |
| **SSI*** | **Colon Surgery** | 74 | 7,113 | 196 | 213.09 | 0.92 | 0.80 | 1.06 |
| | **Abdominal Hysterectomy** | 66 | 7,887 | 50 | 62.24 | 0.80 | 0.60 | 1.05 |
| **MRSA** | **Facility-wide LabID** | 78 | 3,681,666 | 204 | 239.01 | 0.85 | 0.74 | 0.98 |
| **CDI** | **Facility-wide LabID** | 78 | 3,328,050 | 2,468 | 2612.97 | 0.95 | 0.91 | 0.98 |

Green highlighting indicates an SIR significantly LOWER than the national baseline (CLABSI, SSI - 2006-2008; CAUTI - 2009; MRSA, CDI - 2010-2011).
Red highlighting indicates an SIR significantly HIGHER than the national baseline.
* SSI SIRs are based on the complex admission/readmission model.
[1] 2013 data did not undergo quality assurance with the exception of CLABSI data reported from adult intensive care units.

## Appendix G. Device-Associated Data, Virginia, 2011-2015

### Central Line-Associated Bloodstream Infections (CLABSIs)

Central line-associated bloodstream infections (CLABSIs) in adult intensive care units (ICUs) have been reportable to VDH since July 2008. More information on CLABSI data in Virginia hospitals from 2008-2011 can be found on the VDH website. CLABSI data from prior years can also be found in annual Reportable Disease Surveillance in Virginia reports. Acute care hospitals have been required by CMS to report CLABSIs from adult, pediatric, and neonatal critical care units to CMS since January 2011 (Table 1). Device days are number of central line days.

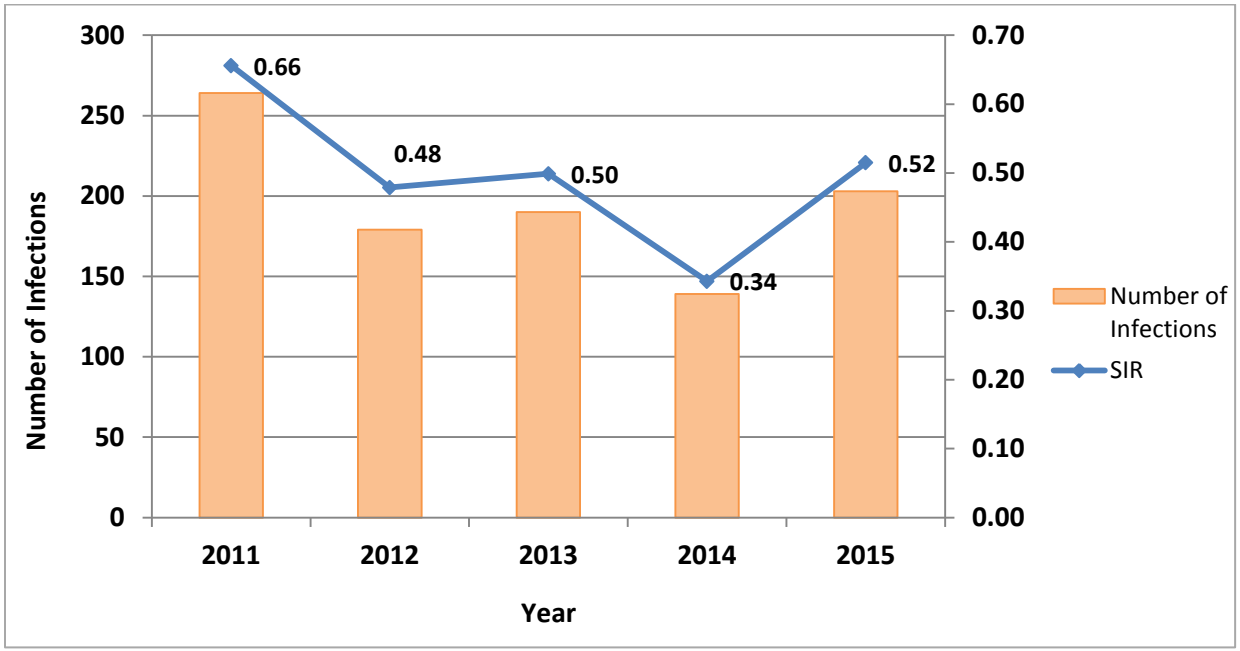
The SIR for CLABSIs in adult and pediatric ICUs has remained significantly lower than the national baseline over the past five years (Table 15). However, the SIR for CLABSIs in adult and pediatric ICUs increased in 2015 to 0.52, the highest it has been since 2011 (Figure 8). One reason for the increase is hypothesized to be due to a change in surveillance definitions in January 2015. At that time, the NHSN definition for catheter-associated urinary tract infections (CAUTIs) was changed to exclude fungal organisms (yeasts and molds). The organisms excluded from the CAUTI definition could no longer be assigned as secondary bloodstream infection pathogens for UTIs, thus fungi had to be attributed as a secondary bloodstream infection to another primary specific site infection or identified as a primary bloodstream infection.

**Table 15. CLABSI Standardized Infection Ratio (SIR) by Year, Adult and Pediatric Intensive Care Units (ICUs), Virginia, 2011-2015**

| | | | Number of Infections | | Standardized Infection Ratio (SIR) and 95% CI | | | SIR Interpretation |
|---|---|---|---|---|---|---|---|---|
| Year | No. of Facilities | Device Days | Observed | Predicted | SIR | Lower | Upper | |
| 2011 | 78 | 203,353 | 264 | 402.38 | 0.66 | 0.58 | 0.74 | ★Better |
| 2012 | 77 | 190,825 | 179 | 373.67 | 0.48 | 0.41 | 0.55 | ★Better |
| 2013 | 77 | 193,817 | 190 | 380.88 | 0.50 | 0.43 | 0.57 | ★Better |
| 2014 | 78 | 205,018 | 139 | 405.24 | 0.34 | 0.29 | 0.40 | ★Better |
| 2015 | 78 | 197,508 | 203 | 394.00 | 0.52 | 0.45 | 0.59 | ★Better |

Green highlighting indicates an SIR significantly LOWER than the national baseline (CLABSI - 2006-2008).
Red highlighting indicates an SIR significantly HIGHER than the national baseline.

**Figure 8. CLABSI Standardized Infection Ratio (SIR) by Year, Adult and Pediatric Intensive Care Units (ICUs), Virginia, 2011-2015 (n=975 infections)**



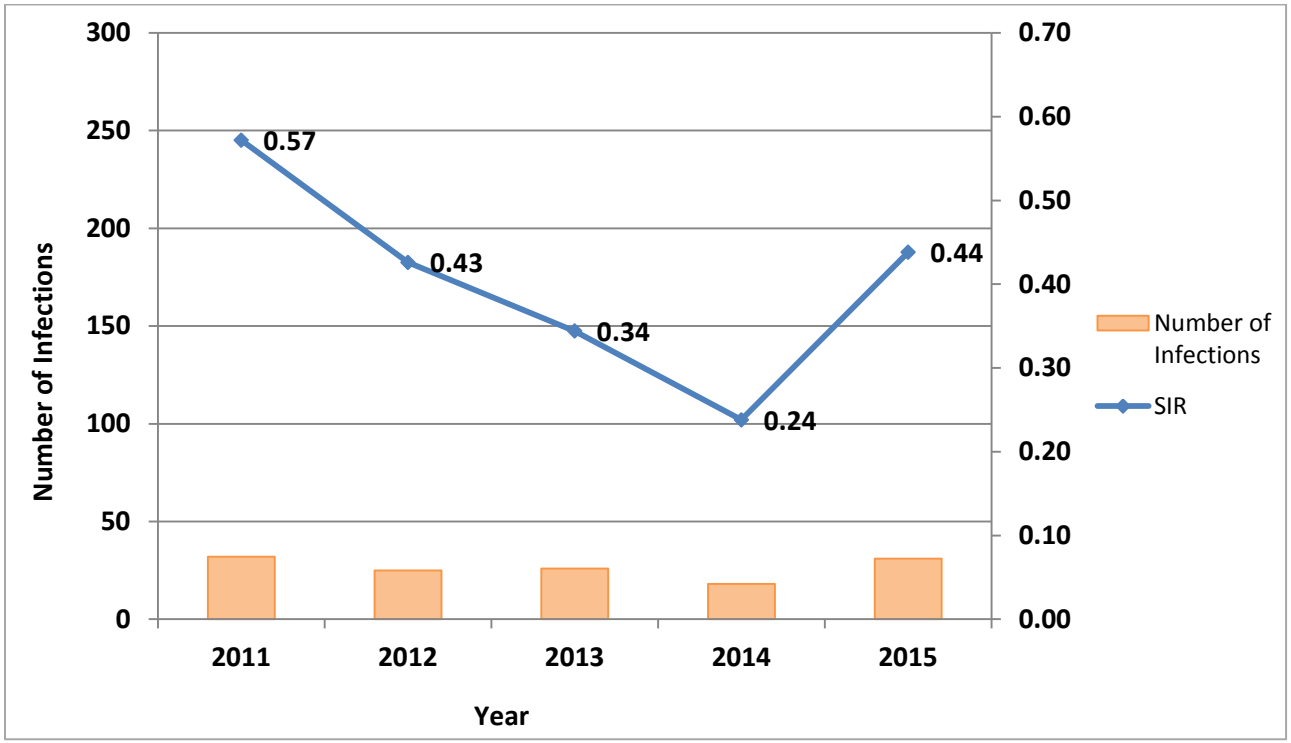

Like adult and pediatric ICUs, the SIR for CLABSIs in NICUs remained significantly lower than the national baseline over the past five years (Table 16). However, the SIR for CLABSIs in NICUs also increased in 2015 to 0.44, the highest it has been since 2011 (Figure 9).

**Table 16. CLABSI Standardized Infection Ratio (SIR) by Year, Neonatal Intensive Care Units (NICUs), Virginia, 2011-2015**

| | | | Number of Infections | | Standardized Infection Ratio (SIR) and 95% CI | | | SIR Interpretation |
|---|---|---|---|---|---|---|---|---|
| Year | No. of Facilities | Device Days | Observed | Predicted | SIR | Lower | Upper | |
| 2011 | 23 | 24,530 | 32 | 55.91 | 0.57 | 0.40 | 0.80 | ★Better |
| 2012 | 23 | 26,155 | 25 | 58.75 | 0.43 | 0.28 | 0.62 | ★Better |
| 2013 | 23 | 33,607 | 26 | 75.60 | 0.34 | 0.23 | 0.50 | ★Better |
| 2014 | 24 | 33,488 | 18 | 75.48 | 0.24 | 0.15 | 0.37 | ★Better |
| 2015 | 25 | 31,053 | 31 | 70.80 | 0.44 | 0.30 | 0.61 | ★Better |

Green highlighting indicates an SIR significantly LOWER than the national baseline (CLABSI - 2006-2008).
Red highlighting indicates an SIR significantly HIGHER than the national baseline.

**Figure 9. CLABSI Standardized Infection Ratio (SIR) by Year, Neonatal Intensive Care Units (NICUs), Virginia, 2011-2015 (n=132 infections)**



## Catheter-Associated Urinary Tract Infections (CAUTIs)

Catheter-associated urinary tract infections (CAUTIs) in adult and pediatric intensive care units (ICUs) have been reportable to CMS since January 2012 (Table 1). Device days are number of urinary catheter days.

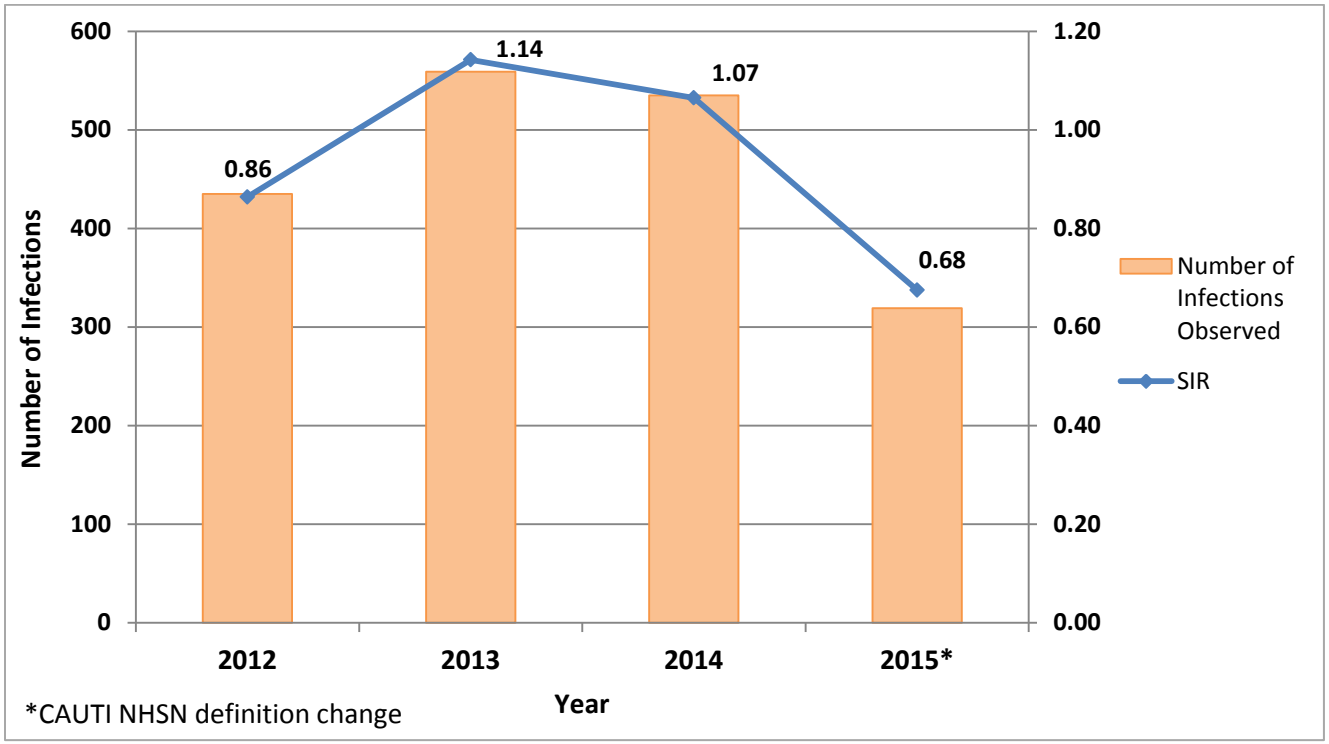
The SIR for CAUTIs in adult and pediatric ICUs has decreased since 2013 and dropped significantly in 2015 to 0.68 (Figure 10). One reason for the decrease in 2015 was a change in surveillance definitions in January 2015. The NHSN definition for CAUTIs was changed to exclude fungal organisms (yeasts and molds) because those infections were clinically determined to be due to colonization, not true urinary tract infections (UTIs). In order to increase specificity, starting in 2015, only bacteria were accepted as the causative organisms of UTIs.

**Table 17. CAUTI Standardized Infection Ratio (SIR) by Year, Adult and Pediatric Intensive Care Units (ICUs), Virginia, 2012-2015**

| | | | Number of Infections | | Standardized Infection Ratio (SIR) and 95% CI | | | SIR Interpretation |
|---|---|---|---|---|---|---|---|---|
| Year | No. of Facilities | Device Days | Observed | Predicted | SIR | Lower | Upper | |
| 2012 | 76 | 247,155 | 435 | 503.20 | 0.86 | 0.79 | 0.95 | ★Better |
| 2013 | 76 | 239,782 | 559 | 489.62 | 1.14 | 1.05 | 1.24 | ✖Worse |
| 2014 | 78 | 249,240 | 535 | 502.37 | 1.07 | 0.98 | 1.16 | = Same |
| 2015* | 78 | 231,684 | 319 | 472.65 | 0.68 | 0.60 | 0.75 | ★Better |

*CAUTI NHSN definition change

**Figure 10. CAUTI Standardized Infection Ratio (SIR) by Year, Adult and Pediatric Intensive Care Units (ICUs), Virginia, 2012-2015 (n=1,848 infections)**



## Appendix H. Unit-Specific Device-Associated Infection Tables

### CLABSI – Adult and Pediatric Intensive Care Units (ICUs)

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for CLABSI. | | | | | | | |

**Table 18. CLABSI SIR Report by Facility, Adult and Pediatric Intensive Care Units, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **197,508** | **203** | **394.00** | **0.52** | **(0.45, 0.59)** | **★Better** |
| Augusta Health | 853 | 0 | 1.28 | 0.00 | (., 2.34) | = Same |
| Bon Secours DePaul Medical Center | 2,246 | 0 | 4.39 | 0.00 | (., 0.68) | **★Better** |
| Bon Secours Mary Immaculate Hospital | 958 | 1 | 1.44 | 0.70 | (0.04, 3.43) | = Same |
| Bon Secours Maryview Medical Center | 3,208 | 6 | 4.77 | 1.26 | (0.51, 2.62) | = Same |
| Bon Secours Memorial Regional Medical Center | 4,391 | 3 | 6.59 | 0.46 | (0.12, 1.24) | = Same |
| Bon Secours Rappahannock General Hospital | 165 | 0 | 0.25 | N/A | N/A | **No Conclusion** |
| Bon Secours Richmond Community Hospital | 187 | 0 | 0.28 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 1,544 | 1 | 2.32 | 0.43 | (0.02, 2.13) | = Same |
| Bon Secours St. Mary's Hospital | 5,929 | 3 | 10.32 | 0.29 | (0.07, 0.79) | **★Better** |
| Buchanan General Hospital | 28 | 0 | 0.04 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 73 | 0 | 0.15 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 14,653 | 11 | 32.02 | 0.34 | (0.18, 0.60) | **★Better** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **197,508** | **203** | **394.00** | **0.52** | **(0.45, 0.59)** | **★Better** |
| Carilion New River Valley Medical Center | 1,168 | 1 | 2.45 | 0.41 | (0.02, 2.01) | = Same |
| Carilion Stonewall Jackson Hospital | 82 | 0 | 0.16 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 55 | 0 | 0.08 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 5,893 | 7 | 11.20 | 0.63 | (0.27, 1.24) | = Same |
| Centra Southside Community Hospital | 111 | 0 | 0.17 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 2,026 | 5 | 3.04 | 1.65 | (0.60, 3.65) | = Same |
| Clinch Valley Medical Center | 290 | 1 | 0.44 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 1,682 | 1 | 3.53 | 0.28 | (0.01, 1.40) | = Same |
| Fauquier Health | 1,267 | 0 | 1.90 | 0.00 | (., 1.58) | = Same |
| HCA CJW Medical Center Chippenham Hospital | 6,627 | 12 | 12.70 | 0.95 | (0.51, 1.61) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 2,521 | 2 | 6.46 | 0.31 | (0.05, 1.02) | = Same |
| HCA Henrico Doctors' Hospital | 3,839 | 2 | 7.12 | 0.28 | (0.05, 0.93) | ★Better |
| HCA John Randolph Medical Center | 953 | 1 | 1.43 | 0.70 | (0.04, 3.45) | = Same |
| HCA LewisGale Hospital Alleghany | 150 | 0 | 0.29 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 833 | 1 | 1.25 | 0.80 | (0.04, 3.95) | = Same |
| HCA LewisGale Hospital Pulaski | 252 | 0 | 0.38 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 7,313 | 4 | 15.24 | 0.26 | (0.08, 0.63) | ★Better |
| HCA Parham Doctors' Hospital | 800 | 1 | 1.52 | 0.66 | (0.03, 3.25) | = Same |
| HCA Reston Hospital Center | 2,973 | 4 | 4.46 | 0.90 | (0.29, 2.16) | = Same |
| HCA Retreat Doctors' Hospital | 398 | 1 | 0.76 | N/A | N/A | **No Conclusion** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **197,508** | **203** | **394.00** | **0.52** | **(0.45, 0.59)** | **★Better** |
| HCA Spotsylvania Regional Medical Center | 842 | 0 | 1.26 | 0.00 | (., 2.37) | = Same |
| Inova Alexandria Hospital | 5,309 | 10 | 7.81 | 1.28 | (0.65, 2.28) | = Same |
| Inova Fair Oaks Hospital | 729 | 0 | 1.09 | 0.00 | (., 2.74) | = Same |
| Inova Fairfax Medical Campus | 16,321 | 34 | 37.09 | 0.92 | (0.65, 1.27) | = Same |
| Inova Loudoun Hospital | 1,319 | 1 | 1.98 | 0.51 | (0.03, 2.49) | = Same |
| Inova Mount Vernon Hospital | 1,100 | 2 | 2.09 | 0.96 | (0.16, 3.16) | = Same |
| Mary Washington Hospital | 4,327 | 3 | 9.07 | 0.33 | (0.08, 0.90) | ★Better |
| Memorial Hospital of Martinsville & Henry County | 1,173 | 0 | 1.76 | 0.00 | (., 1.70) | = Same |
| MSHA Johnston Memorial Hospital | 817 | 0 | 1.23 | 0.00 | (., 2.44) | = Same |
| MSHA Norton Community Hospital | 581 | 0 | 0.87 | N/A | N/A | **No Conclusion** |
| MSHA Russell County Medical Center | 43 | 0 | 0.08 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 24 | 0 | 0.04 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 338 | 0 | 0.71 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Haymarket Medical Center | 405 | 0 | 0.61 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 1,216 | 1 | 1.82 | 0.55 | (0.03, 2.70) | = Same |
| Riverside Doctors' Hospital Williamsburg | 177 | 0 | 0.34 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 7,334 | 0 | 14.80 | 0.00 | (., 0.20) | ★Better |
| Riverside Shore Memorial Hospital | 502 | 1 | 1.00 | 1.00 | (0.05, 4.91) | = Same |
| Riverside Tappahannock Hospital | 128 | 0 | 0.19 | N/A | N/A | **No Conclusion** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **197,508** | **203** | **394.00** | **0.52** | **(0.45, 0.59)** | **★Better** |
| Riverside Walter Reed Hospital | 726 | 0 | 1.09 | 0.00 | (., 2.75) | = Same |
| Sentara CarePlex Hospital | 1,653 | 1 | 2.48 | 0.40 | (0.02, 1.99) | = Same |
| Sentara Halifax Regional Hospital | 370 | 0 | 0.56 | N/A | N/A | **No Conclusion** |
| Sentara Leigh Hospital | 2,672 | 2 | 5.61 | 0.36 | (0.06, 1.18) | = Same |
| Sentara Martha Jefferson Hospital | 533 | 1 | 1.01 | 0.99 | (0.05, 4.87) | = Same |
| Sentara Norfolk General Hospital | 12,549 | 7 | 26.09 | 0.27 | (0.12, 0.53) | ★Better |
| Sentara Northern Virginia Medical Center | 1,390 | 0 | 2.09 | 0.00 | (., 1.44) | = Same |
| Sentara Obici Hospital | 1,140 | 0 | 1.71 | 0.00 | (., 1.75) | = Same |
| Sentara Princess Anne Hospital | 2,220 | 1 | 3.33 | 0.30 | (0.02, 1.48) | = Same |
| Sentara RMH Medical Center | 2,541 | 0 | 3.81 | 0.00 | (., 0.79) | ★Better |
| Sentara Virginia Beach General Hospital | 4,168 | 0 | 6.85 | 0.00 | (., 0.44) | ★Better |
| Sentara Williamsburg Regional Medical Center | 553 | 0 | 1.11 | 0.00 | (., 2.71) | = Same |
| Shenandoah Memorial Hospital | 62 | 0 | 0.09 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 199 | 1 | 0.30 | N/A | N/A | **No Conclusion** |
| Southern Virginia Regional Medical Center | 118 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 2,256 | 0 | 3.38 | 0.00 | (., 0.89) | ★Better |
| Stafford Hospital | 695 | 1 | 1.04 | 0.96 | (0.05, 4.73) | = Same |
| Twin County Regional Healthcare | 339 | 0 | 0.51 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 16,131 | 28 | 36.55 | 0.77 | (0.52, 1.09) | = Same |
| VCU Community Memorial Hospital | 428 | 0 | 0.64 | N/A | N/A | **No Conclusion** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **197,508** | **203** | **394.00** | **0.52** | **(0.45, 0.59)** | ★Better |
| VCU Medical Center | 21,554 | 36 | 57.44 | 0.63 | (0.45, 0.86) | ★Better |
| Virginia Hospital Center | 2,041 | 1 | 3.84 | 0.26 | (0.01, 1.29) | = Same |
| Warren Memorial Hospital | 61 | 0 | 0.09 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 3 | 0 | 0.01 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 229 | 0 | 0.48 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 6,695 | 4 | 11.36 | 0.35 | (0.11, 0.85) | ★Better |
| Wythe County Community Hospital | 29 | 0 | 0.04 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

## CLABSI – Neonatal Intensive Care Units (NICUs)

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for CLABSI. | | | | | | | |

**Table 19. CLABSI SIR Report by Facility, Neonatal Intensive Care Units, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=25)** | **31,053** | **31** | **70.80** | **0.44** | **(0.30, 0.61)** | **★Better** |
| Bon Secours Mary Immaculate Hospital | 85 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| Bon Secours Memorial Regional Medical Center | 119 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 151 | 0 | 0.20 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Mary's Hospital | 2,194 | 3 | 5.39 | 0.56 | (0.14, 1.52) | = Same |
| Carilion Medical Center | 3,968 | 8 | 10.41 | 0.77 | (0.36, 1.46) | = Same |
| Centra Virginia Baptist Hospital | 373 | 0 | 0.62 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 767 | 0 | 1.89 | 0.00 | (., 1.58) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 966 | 1 | 1.79 | 0.56 | (0.03, 2.76) | = Same |
| HCA Henrico Doctors' Hospital | 1,629 | 2 | 3.88 | 0.52 | (0.09, 1.70) | = Same |
| HCA Reston Hospital Center | 325 | 0 | 0.48 | N/A | N/A | **No Conclusion** |
| Inova Alexandria Hospital | 554 | 1 | 1.62 | 0.62 | (0.03, 3.04) | = Same |
| Inova Fair Oaks Hospital | 590 | 0 | 1.17 | 0.00 | (., 2.56) | = Same |
| Inova Fairfax Medical Campus | 7,371 | 5 | 16.67 | 0.30 | (0.11, 0.67) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=25)** | **31,053** | **31** | **70.80** | **0.44** | **(0.30, 0.61)** | **★Better** |
| Inova Loudoun Hospital | 203 | 0 | 0.35 | N/A | N/A | **No Conclusion** |
| Mary Washington Hospital | 607 | 1 | 1.54 | 0.65 | (0.03, 3.21) | **= Same** |
| Novant Health UVA Health System Prince William Medical Center | 28 | 0 | 0.05 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 443 | 0 | 0.97 | N/A | N/A | **No Conclusion** |
| Sentara Norfolk General Hospital | 1,607 | 0 | 2.69 | 0.00 | (., 1.11) | **= Same** |
| Sentara Northern Virginia Medical Center | 95 | 0 | 0.15 | N/A | N/A | **No Conclusion** |
| Sentara Princess Anne Hospital | 339 | 0 | 0.99 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 89 | 0 | 0.16 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 3,750 | 2 | 8.63 | 0.23 | (0.04, 0.77) | **★Better** |
| VCU Medical Center | 3,061 | 7 | 7.00 | 1.00 | (0.44, 1.98) | **= Same** |
| Virginia Hospital Center | 1,228 | 0 | 2.65 | 0.00 | (., 1.13) | **= Same** |
| Winchester Medical Center | 511 | 1 | 1.15 | 0.87 | (0.04, 4.30) | **= Same** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

## CLABSI – Adult and Pediatric Medical, Surgical and Medical/Surgical Inpatient Wards

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for CLABSI. | | | | | | | |

**Table 20. CLABSI SIR Report by Facility, Adult and Pediatric Medical, Surgical and Medical/Surgical Inpatient Wards, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **218,643** | **177** | **318.83** | **0.56** | **(0.48, 0.64)** | ★Better |
| Augusta Health | 1,399 | 3 | 2.05 | 1.47 | (0.37, 3.99) | = Same |
| Bon Secours DePaul Medical Center | 1,305 | 0 | 1.90 | 0.00 | (., 1.57) | = Same |
| Bon Secours Mary Immaculate Hospital | 1,475 | 2 | 2.19 | 0.91 | (0.15, 3.01) | = Same |
| Bon Secours Maryview Medical Center | 2,921 | 5 | 4.27 | 1.17 | (0.43, 2.60) | = Same |
| Bon Secours Memorial Regional Medical Center | 3,961 | 2 | 5.59 | 0.36 | (0.06, 1.18) | = Same |
| Bon Secours Rappahannock General Hospital | 102 | 0 | 0.12 | N/A | N/A | **No Conclusion** |
| Bon Secours Richmond Community Hospital | 171 | 0 | 0.21 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 3,508 | 1 | 5.12 | 0.20 | (0.01, 0.96) | ★Better |
| Bon Secours St. Mary's Hospital | 6,561 | 5 | 10.00 | 0.50 | (0.18, 1.11) | = Same |
| Buchanan General Hospital | 51 | 0 | 0.06 | N/A | N/A | **No Conclusion** |
| Carilion Franklin Memorial Hospital | 336 | 0 | 0.40 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 255 | 0 | 0.31 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 4,438 | 3 | 7.55 | 0.40 | (0.10, 1.08) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **218,643** | **177** | **318.83** | **0.56** | **(0.48, 0.64)** | ★Better |
| Carilion New River Valley Medical Center | 2,192 | 0 | 2.75 | 0.00 | (., 1.09) | = Same |
| Carilion Stonewall Jackson Hospital | 199 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Carilion Tazewell Community Hospital | 213 | 0 | 0.26 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 80 | 0 | 0.10 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 10,695 | 12 | 15.23 | 0.79 | (0.43, 1.34) | = Same |
| Centra Southside Community Hospital | 304 | 0 | 0.36 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 77 | 0 | 0.09 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 5,707 | 7 | 8.35 | 0.84 | (0.37, 1.66) | = Same |
| Clinch Valley Medical Center | 1,883 | 0 | 2.26 | 0.00 | (., 1.33) | = Same |
| Danville Regional Medical Center | 1,154 | 0 | 1.38 | 0.00 | (., 2.16) | = Same |
| Fauquier Health | 2,168 | 0 | 2.60 | 0.00 | (., 1.15) | = Same |
| HCA CJW Medical Center Chippenham Hospital | 5,446 | 12 | 6.81 | 1.76 | (0.96, 2.99) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 1,140 | 3 | 1.37 | 2.19 | (0.56, 5.97) | = Same |
| HCA Henrico Doctors' Hospital | 1,995 | 7 | 2.95 | 2.37 | (1.04, 4.69) | ✖Worse |
| HCA John Randolph Medical Center | 604 | 0 | 0.72 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Alleghany | 573 | 0 | 0.86 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 231 | 1 | 0.28 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 536 | 0 | 0.64 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 7,282 | 7 | 10.65 | 0.66 | (0.29, 1.30) | = Same |
| HCA Parham Doctors' Hospital | 1,250 | 3 | 1.88 | 1.60 | (0.41, 4.36) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **218,643** | **177** | **318.83** | **0.56** | **(0.48, 0.64)** | ★Better |
| HCA Reston Hospital Center | 3,873 | 3 | 5.75 | 0.52 | (0.13, 1.42) | = Same |
| HCA Retreat Doctors' Hospital | 2,245 | 3 | 2.89 | 1.04 | (0.26, 2.83) | = Same |
| HCA Spotsylvania Regional Medical Center | 959 | 1 | 1.15 | 0.87 | (0.04, 4.29) | = Same |
| Inova Alexandria Hospital | 3,659 | 11 | 5.07 | 2.17 | (1.14, 3.77) | ✖Worse |
| Inova Fair Oaks Hospital | 1,833 | 0 | 2.61 | 0.00 | (., 1.15) | = Same |
| Inova Fairfax Medical Campus | 8,539 | 9 | 14.34 | 0.63 | (0.31, 1.15) | = Same |
| Inova Loudoun Hospital | 1,458 | 0 | 1.80 | 0.00 | (., 1.66) | = Same |
| Inova Mount Vernon Hospital | 1,270 | 2 | 1.72 | 1.16 | (0.20, 3.84) | = Same |
| Mary Washington Hospital | 8,811 | 12 | 11.61 | 1.03 | (0.56, 1.76) | = Same |
| Memorial Hospital of Martinsville & Henry County | 1,027 | 0 | 1.23 | 0.00 | (., 2.43) | = Same |
| MSHA Johnston Memorial Hospital | 1,615 | 1 | 1.94 | 0.52 | (0.03, 2.55) | = Same |
| MSHA Norton Community Hospital | 857 | 0 | 1.03 | 0.00 | (., 2.91) | = Same |
| MSHA Russell County Medical Center | 91 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 176 | 0 | 0.21 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 383 | 0 | 0.46 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Haymarket Medical Center | 350 | 0 | 0.42 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 1,041 | 1 | 1.25 | 0.80 | (0.04, 3.95) | = Same |
| Riverside Doctors' Hospital Williamsburg | 315 | 0 | 0.38 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 4,715 | 0 | 6.73 | 0.00 | (., 0.45) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **218,643** | **177** | **318.83** | **0.56** | **(0.48, 0.64)** | ★Better |
| Riverside Shore Memorial Hospital | 357 | 0 | 1.11 | 0.00 | (., 2.71) | = Same |
| Riverside Tappahannock Hospital | 211 | 0 | 0.25 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 892 | 0 | 1.07 | 0.00 | (., 2.80) | = Same |
| Sentara CarePlex Hospital | 1,543 | 0 | 1.98 | 0.00 | (., 1.52) | = Same |
| Sentara Halifax Regional Hospital | 582 | 0 | 0.79 | N/A | N/A | **No Conclusion** |
| Sentara Leigh Hospital | 4,292 | 4 | 6.27 | 0.64 | (0.20, 1.54) | = Same |
| Sentara Martha Jefferson Hospital | 3,617 | 0 | 5.37 | 0.00 | (., 0.56) | ★Better |
| Sentara Norfolk General Hospital | 22,828 | 7 | 33.26 | 0.21 | (0.09, 0.42) | ★Better |
| Sentara Northern Virginia Medical Center | 2,194 | 0 | 2.77 | 0.00 | (., 1.08) | = Same |
| Sentara Obici Hospital | 1,833 | 2 | 2.20 | 0.91 | (0.15, 3.00) | = Same |
| Sentara Princess Anne Hospital | 4,873 | 3 | 7.09 | 0.42 | (0.11, 1.15) | = Same |
| Sentara RMH Medical Center | 4,104 | 2 | 4.92 | 0.41 | (0.07, 1.34) | = Same |
| Sentara Virginia Beach General Hospital | 3,027 | 0 | 3.63 | 0.00 | (., 0.83) | ★Better |
| Sentara Williamsburg Regional Medical Center | 1,342 | 0 | 1.99 | 0.00 | (., 1.51) | = Same |
| Shenandoah Memorial Hospital | 287 | 0 | 0.34 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 247 | 0 | 0.30 | N/A | N/A | **No Conclusion** |
| Southern Virginia Regional Medical Center | 346 | 0 | 0.42 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 3,451 | 1 | 5.10 | 0.20 | (0.01, 0.97) | ★Better |
| Stafford Hospital | 1,882 | 2 | 2.43 | 0.82 | (0.14, 2.72) | = Same |
| Twin County Regional Healthcare | 380 | 0 | 0.46 | N/A | N/A | **No Conclusion** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **218,643** | **177** | **318.83** | **0.56** | **(0.48, 0.64)** | **★Better** |
| UVA Medical Center | 14,765 | 14 | 25.68 | 0.55 | (0.31, 0.89) | **★Better** |
| VCU Community Memorial Hospital | 615 | 0 | 0.74 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 18,242 | 16 | 31.42 | 0.51 | (0.30, 0.81) | **★Better** |
| Virginia Hospital Center | 5,391 | 5 | 7.64 | 0.65 | (0.24, 1.45) | **= Same** |
| Warren Memorial Hospital | 103 | 0 | 0.12 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 224 | 0 | 0.27 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 199 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 7,374 | 5 | 10.69 | 0.47 | (0.17, 1.04) | **= Same** |
| Wythe County Community Hospital | 13 | 0 | 0.02 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

## CAUTI – Adult and Pediatric Intensive Care Units (ICUs)

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2009 for CAUTI. | | | | | | | |

**Table 21. CAUTI SIR Report by Facility, Adult and Pediatric Intensive Care Units, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **231,684** | **319** | **472.65** | **0.68** | **(0.60, 0.75)** | ★Better |
| Augusta Health | 1,389 | 0 | 1.81 | 0.00 | (., 1.66) | = Same |
| Bon Secours DePaul Medical Center | 2,703 | 6 | 7.21 | 0.83 | (0.34, 1.73) | = Same |
| Bon Secours Mary Immaculate Hospital | 1,158 | 0 | 1.51 | 0.00 | (., 1.99) | = Same |
| Bon Secours Maryview Medical Center | 3,781 | 3 | 4.81 | 0.62 | (0.16, 1.70) | = Same |
| Bon Secours Memorial Regional Medical Center | 3,773 | 4 | 4.53 | 0.88 | (0.28, 2.13) | = Same |
| Bon Secours Rappahannock General Hospital | 752 | 0 | 0.98 | N/A | N/A | **No Conclusion** |
| Bon Secours Richmond Community Hospital | 164 | 0 | 0.21 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 1,674 | 1 | 2.01 | 0.50 | (0.03, 2.46) | = Same |
| Bon Secours St. Mary's Hospital | 4,625 | 2 | 7.12 | 0.28 | (0.05, 0.93) | ★Better |
| Buchanan General Hospital | 572 | 0 | 0.74 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 283 | 1 | 0.65 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 17,036 | 61 | 39.36 | 1.55 | (1.20, 1.98) | ✖Worse |
| Carilion New River Valley Medical Center | 1,643 | 0 | 3.78 | 0.00 | (., 0.79) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **231,684** | **319** | **472.65** | **0.68** | **(0.60, 0.75)** | ★Better |
| Carilion Stonewall Jackson Hospital | 305 | 0 | 0.61 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 469 | 0 | 0.61 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 6,015 | 7 | 14.16 | 0.49 | (0.22, 0.98) | ★Better |
| Centra Southside Community Hospital | 684 | 1 | 0.89 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 3,134 | 10 | 4.07 | 2.45 | (1.25, 4.38) | ✖Worse |
| Clinch Valley Medical Center | 1,082 | 0 | 1.41 | 0.00 | (., 2.13) | = Same |
| Danville Regional Medical Center | 2,534 | 1 | 5.83 | 0.17 | (0.01, 0.85) | ★Better |
| Fauquier Health | 1,332 | 0 | 1.73 | 0.00 | (., 1.73) | = Same |
| HCA CJW Medical Center Chippenham Hospital | 8,100 | 15 | 17.19 | 0.87 | (0.51, 1.41) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 3,619 | 7 | 11.83 | 0.59 | (0.26, 1.17) | = Same |
| HCA Henrico Doctors' Hospital | 4,213 | 1 | 9.14 | 0.11 | (0.01, 0.54) | ★Better |
| HCA John Randolph Medical Center | 1,403 | 0 | 1.82 | 0.00 | (., 1.64) | = Same |
| HCA LewisGale Hospital Alleghany | 405 | 0 | 0.81 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 719 | 2 | 0.93 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 813 | 1 | 1.06 | 0.95 | (0.05, 4.67) | = Same |
| HCA LewisGale Medical Center | 7,745 | 15 | 17.13 | 0.88 | (0.51, 1.41) | = Same |
| HCA Parham Doctors' Hospital | 1,222 | 1 | 2.44 | 0.41 | (0.02, 2.02) | = Same |
| HCA Reston Hospital Center | 3,586 | 3 | 4.30 | 0.70 | (0.18, 1.90) | = Same |
| HCA Retreat Doctors' Hospital | 531 | 1 | 1.06 | 0.94 | (0.05, 4.64) | = Same |
| HCA Spotsylvania Regional Medical Center | 1,320 | 0 | 1.72 | 0.00 | (., 1.75) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **231,684** | **319** | **472.65** | **0.68** | **(0.60, 0.75)** | ★Better |
| Inova Alexandria Hospital | 5,160 | 7 | 6.88 | 1.02 | (0.45, 2.01) | = Same |
| Inova Fair Oaks Hospital | 1,117 | 3 | 1.45 | 2.07 | (0.53, 5.62) | = Same |
| Inova Fairfax Medical Campus | 15,014 | 35 | 40.95 | 0.86 | (0.61, 1.18) | = Same |
| Inova Loudoun Hospital | 2,528 | 1 | 3.29 | 0.30 | (0.02, 1.50) | = Same |
| Inova Mount Vernon Hospital | 1,361 | 2 | 2.72 | 0.74 | (0.12, 2.43) | = Same |
| Mary Washington Hospital | 6,092 | 2 | 13.80 | 0.15 | (0.02, 0.48) | ★Better |
| Memorial Hospital of Martinsville & Henry County | 2,160 | 1 | 2.59 | 0.39 | (0.02, 1.91) | = Same |
| MSHA Johnston Memorial Hospital | 1,925 | 0 | 2.50 | 0.00 | (., 1.20) | = Same |
| MSHA Norton Community Hospital | 1,184 | 0 | 1.54 | 0.00 | (., 1.95) | = Same |
| MSHA Russell County Medical Center | 216 | 0 | 0.43 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 103 | 0 | 0.13 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 762 | 0 | 1.75 | 0.00 | (., 1.71) | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 569 | 0 | 0.74 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 1,550 | 2 | 2.02 | 0.99 | (0.17, 3.28) | = Same |
| Riverside Doctors' Hospital Williamsburg | 453 | 0 | 0.91 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 8,997 | 11 | 19.47 | 0.57 | (0.30, 0.98) | ★Better |
| Riverside Shore Memorial Hospital | 934 | 3 | 1.87 | 1.61 | (0.41, 4.37) | = Same |
| Riverside Tappahannock Hospital | 472 | 0 | 0.61 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 989 | 0 | 1.29 | 0.00 | (., 2.33) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **231,684** | **319** | **472.65** | **0.68** | **(0.60, 0.75)** | ★Better |
| Sentara CarePlex Hospital | 2,106 | 2 | 2.53 | 0.79 | (0.13, 2.62) | = Same |
| Sentara Halifax Regional Hospital | 1,025 | 2 | 1.33 | 1.50 | (0.25, 4.96) | = Same |
| Sentara Leigh Hospital | 3,342 | 3 | 7.69 | 0.39 | (0.10, 1.06) | = Same |
| Sentara Martha Jefferson Hospital | 683 | 1 | 1.37 | 0.73 | (0.04, 3.61) | = Same |
| Sentara Norfolk General Hospital | 13,720 | 23 | 33.22 | 0.69 | (0.45, 1.02) | = Same |
| Sentara Northern Virginia Medical Center | 1,763 | 1 | 2.29 | 0.44 | (0.02, 2.15) | = Same |
| Sentara Obici Hospital | 1,368 | 1 | 1.78 | 0.56 | (0.03, 2.77) | = Same |
| Sentara Princess Anne Hospital | 3,051 | 1 | 3.66 | 0.27 | (0.01, 1.35) | = Same |
| Sentara RMH Medical Center | 2,924 | 1 | 3.51 | 0.29 | (0.01, 1.41) | = Same |
| Sentara Virginia Beach General Hospital | 5,084 | 2 | 7.58 | 0.26 | (0.04, 0.87) | ★Better |
| Sentara Williamsburg Regional Medical Center | 871 | 0 | 1.74 | 0.00 | (., 1.72) | = Same |
| Shenandoah Memorial Hospital | 348 | 1 | 0.45 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 519 | 1 | 0.67 | N/A | N/A | **No Conclusion** |
| Southern Virginia Regional Medical Center | 414 | 0 | 0.83 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 3,538 | 1 | 4.25 | 0.24 | (0.01, 1.16) | = Same |
| Stafford Hospital | 882 | 0 | 1.15 | 0.00 | (., 2.61) | = Same |
| Twin County Regional Healthcare | 1,019 | 0 | 1.32 | 0.00 | (., 2.26) | = Same |
| UVA Medical Center | 14,129 | 26 | 34.66 | 0.75 | (0.50, 1.08) | = Same |
| VCU Community Memorial Hospital | 1,235 | 0 | 1.61 | 0.00 | (., 1.87) | = Same |
| VCU Medical Center | 19,719 | 35 | 57.83 | 0.61 | (0.43, 0.83) | ★Better |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=78)** | **231,684** | **319** | **472.65** | **0.68** | **(0.60, 0.75)** | ★Better |
| Virginia Hospital Center | 2,624 | 1 | 5.70 | 0.18 | (0.01, 0.87) | ★Better |
| Warren Memorial Hospital | 849 | 1 | 1.10 | 0.91 | (0.05, 4.47) | = Same |
| Wellmont Lonesome Pine Hospital | 34 | 0 | 0.08 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 569 | 0 | 1.31 | 0.00 | (., 2.29) | = Same |
| Winchester Medical Center | 9,154 | 6 | 16.16 | 0.37 | (0.15, 0.77) | ★Better |
| Wythe County Community Hospital | 344 | 0 | 0.45 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

## CAUTI – Adult and Pediatric Medical, Surgical and Medical/Surgical Inpatient Wards

| Legend | | | | | |
|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2009 for CAUTI. | | | | | | | |

**Table 22. CAUTI SIR Report by Facility, Adult and Pediatric Medical, Surgical and Medical/Surgical Inpatient Wards, Virginia Hospitals, 2015**

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **232,900** | **191** | **404.99** | **0.47** | **(0.41, 0.54)** | ★Better |
| Augusta Health | 3,453 | 4 | 6.34 | 0.63 | (0.20, 1.52) | = Same |
| Bon Secours DePaul Medical Center | 2,091 | 1 | 3.83 | 0.26 | (0.01, 1.29) | = Same |
| Bon Secours Mary Immaculate Hospital | 1,941 | 1 | 3.62 | 0.28 | (0.01, 1.36) | = Same |
| Bon Secours Maryview Medical Center | 2,418 | 0 | 4.45 | 0.00 | (., 0.67) | ★Better |
| Bon Secours Memorial Regional Medical Center | 2,793 | 3 | 5.02 | 0.60 | (0.15, 1.63) | = Same |
| Bon Secours Rappahannock General Hospital | 638 | 3 | 1.02 | 2.94 | (0.75, 7.99) | = Same |
| Bon Secours Richmond Community Hospital | 60 | 0 | 0.10 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 3,281 | 1 | 6.06 | 0.17 | (0.01, 0.81) | ★Better |
| Bon Secours St. Mary's Hospital | 4,044 | 3 | 7.06 | 0.43 | (0.11, 1.16) | = Same |
| Buchanan General Hospital | 1,111 | 0 | 1.78 | 0.00 | (., 1.69) | = Same |
| Carilion Franklin Memorial Hospital | 544 | 0 | 0.87 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 374 | 0 | 0.60 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 2,184 | 8 | 3.72 | 2.15 | (1.00, 4.08) | ✖Worse |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **232,900** | **191** | **404.99** | **0.47** | **(0.41, 0.54)** | **★Better** |
| Carilion New River Valley Medical Center | 3,654 | 0 | 6.11 | 0.00 | (., 0.49) | **★Better** |
| Carilion Stonewall Jackson Hospital | 551 | 0 | 0.88 | N/A | N/A | **No Conclusion** |
| Carilion Tazewell Community Hospital | 753 | 1 | 1.20 | 0.83 | (0.04, 4.09) | **= Same** |
| Centra Bedford Memorial Hospital | 350 | 2 | 0.56 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 7,754 | 12 | 13.76 | 0.87 | (0.47, 1.48) | **= Same** |
| Centra Southside Community Hospital | 2,294 | 0 | 3.67 | 0.00 | (., 0.82) | **★Better** |
| Centra Virginia Baptist Hospital | 659 | 1 | 1.05 | 0.95 | (0.05, 4.68) | **= Same** |
| Chesapeake Regional Medical Center | 7,826 | 9 | 14.33 | 0.63 | (0.31, 1.15) | **= Same** |
| Clinch Valley Medical Center | 1,636 | 0 | 2.62 | 0.00 | (., 1.14) | **= Same** |
| Danville Regional Medical Center | 4,174 | 0 | 6.68 | 0.00 | (., 0.45) | **★Better** |
| Fauquier Health | 3,290 | 0 | 5.26 | 0.00 | (., 0.57) | **★Better** |
| HCA CJW Medical Center Chippenham Hospital | 9,349 | 10 | 15.01 | 0.67 | (0.34, 1.19) | **= Same** |
| HCA CJW Medical Center Johnston-Willis Hospital | 1,853 | 1 | 2.96 | 0.34 | (0.02, 1.66) | **= Same** |
| HCA Henrico Doctors' Hospital | 3,507 | 2 | 6.38 | 0.31 | (0.05, 1.04) | **= Same** |
| HCA John Randolph Medical Center | 1,668 | 2 | 2.67 | 0.75 | (0.13, 2.48) | **= Same** |
| HCA LewisGale Hospital Alleghany | 847 | 0 | 1.61 | 0.00 | (., 1.86) | **= Same** |
| HCA LewisGale Hospital Montgomery | 696 | 0 | 1.11 | 0.00 | (., 2.69) | **= Same** |
| HCA LewisGale Hospital Pulaski | 1,589 | 5 | 2.54 | 1.97 | (0.72, 4.36) | **= Same** |
| HCA LewisGale Medical Center | 7,672 | 7 | 14.19 | 0.49 | (0.22, 0.98) | **★Better** |
| HCA Parham Doctors' Hospital | 2,019 | 2 | 3.84 | 0.52 | (0.09, 1.72) | **= Same** |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **232,900** | **191** | **404.99** | **0.47** | **(0.41, 0.54)** | ★Better |
| HCA Reston Hospital Center | 6,692 | 0 | 12.13 | 0.00 | (., 0.25) | ★Better |
| HCA Retreat Doctors' Hospital | 1,725 | 0 | 2.91 | 0.00 | (., 1.03) | = Same |
| HCA Spotsylvania Regional Medical Center | 1,914 | 2 | 3.06 | 0.65 | (0.11, 2.16) | = Same |
| Inova Alexandria Hospital | 3,271 | 7 | 5.70 | 1.23 | (0.54, 2.43) | = Same |
| Inova Fair Oaks Hospital | 2,234 | 4 | 3.77 | 1.06 | (0.34, 2.56) | = Same |
| Inova Fairfax Medical Campus | 5,546 | 14 | 10.18 | 1.38 | (0.78, 2.25) | = Same |
| Inova Loudoun Hospital | 1,731 | 0 | 2.77 | 0.00 | (., 1.08) | = Same |
| Inova Mount Vernon Hospital | 1,344 | 2 | 2.35 | 0.85 | (0.14, 2.82) | = Same |
| Mary Washington Hospital | 10,466 | 4 | 18.25 | 0.22 | (0.07, 0.53) | ★Better |
| Memorial Hospital of Martinsville & Henry County | 2,003 | 0 | 3.20 | 0.00 | (., 0.94) | ★Better |
| MSHA Johnston Memorial Hospital | 4,079 | 2 | 6.53 | 0.31 | (0.05, 1.01) | = Same |
| MSHA Norton Community Hospital | 1,602 | 1 | 2.56 | 0.39 | (0.02, 1.92) | = Same |
| MSHA Russell County Medical Center | 721 | 0 | 1.37 | 0.00 | (., 2.19) | = Same |
| MSHA Smyth County Community Hospital | 736 | 0 | 1.18 | 0.00 | (., 2.54) | = Same |
| Novant Health UVA Health System Culpeper Medical Center | 1,065 | 0 | 1.70 | 0.00 | (., 1.76) | = Same |
| Novant Health UVA Health System Haymarket Medical Center | 595 | 1 | 0.95 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 825 | 0 | 1.32 | 0.00 | (., 2.27) | = Same |
| Riverside Doctors' Hospital Williamsburg | 757 | 0 | 1.21 | 0.00 | (., 2.47) | = Same |
| Riverside Regional Medical Center | 4,269 | 4 | 7.74 | 0.52 | (0.16, 1.25) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **232,900** | **191** | **404.99** | **0.47** | **(0.41, 0.54)** | **★Better** |
| Riverside Shore Memorial Hospital | 605 | 0 | 0.79 | N/A | N/A | **No Conclusion** |
| Riverside Tappahannock Hospital | 753 | 2 | 1.20 | 1.66 | (0.28, 5.49) | = Same |
| Riverside Walter Reed Hospital | 1,506 | 1 | 2.41 | 0.42 | (0.02, 2.05) | = Same |
| Sentara CarePlex Hospital | 1,470 | 0 | 2.48 | 0.00 | (., 1.21) | = Same |
| Sentara Halifax Regional Hospital | 1,106 | 1 | 1.96 | 0.51 | (0.03, 2.52) | = Same |
| Sentara Leigh Hospital | 7,151 | 1 | 13.04 | 0.08 | (0.00, 0.38) | ★Better |
| Sentara Martha Jefferson Hospital | 3,354 | 5 | 6.21 | 0.81 | (0.30, 1.79) | = Same |
| Sentara Norfolk General Hospital | 11,925 | 13 | 21.98 | 0.59 | (0.33, 0.99) | ★Better |
| Sentara Northern Virginia Medical Center | 2,509 | 0 | 4.29 | 0.00 | (., 0.70) | ★Better |
| Sentara Obici Hospital | 903 | 0 | 1.44 | 0.00 | (., 2.07) | = Same |
| Sentara Princess Anne Hospital | 3,264 | 3 | 5.99 | 0.50 | (0.13, 1.36) | = Same |
| Sentara RMH Medical Center | 11,437 | 7 | 18.30 | 0.38 | (0.17, 0.76) | ★Better |
| Sentara Virginia Beach General Hospital | 3,383 | 1 | 5.41 | 0.19 | (0.01, 0.91) | ★Better |
| Sentara Williamsburg Regional Medical Center | 1,894 | 0 | 3.52 | 0.00 | (., 0.85) | ★Better |
| Shenandoah Memorial Hospital | 583 | 1 | 0.93 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 748 | 1 | 1.20 | 0.84 | (0.04, 4.12) | = Same |
| Southern Virginia Regional Medical Center | 823 | 0 | 1.32 | 0.00 | (., 2.28) | = Same |
| Southside Regional Medical Center | 4,303 | 3 | 8.06 | 0.37 | (0.10, 1.01) | = Same |
| Stafford Hospital | 1,794 | 0 | 3.08 | 0.00 | (., 0.97) | ★Better |
| Twin County Regional Healthcare | 1,306 | 1 | 2.09 | 0.48 | (0.02, 2.36) | = Same |

| Hospital Name | Device Days | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=81)** | **232,900** | **191** | **404.99** | **0.47** | **(0.41, 0.54)** | ★Better |
| UVA Medical Center | 7,971 | 14 | 14.14 | 0.99 | (0.56, 1.62) | = Same |
| VCU Community Memorial Hospital | 2,377 | 2 | 3.80 | 0.53 | (0.09, 1.74) | = Same |
| VCU Medical Center | 7,749 | 3 | 13.88 | 0.22 | (0.06, 0.59) | ★Better |
| Virginia Hospital Center | 5,141 | 7 | 9.24 | 0.76 | (0.33, 1.50) | = Same |
| Warren Memorial Hospital | 622 | 0 | 1.00 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 535 | 0 | 0.86 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 374 | 0 | 0.60 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 7,721 | 6 | 14.25 | 0.42 | (0.17, 0.88) | ★Better |
| Wythe County Community Hospital | 945 | 0 | 1.76 | 0.00 | (., 1.70) | = Same |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.

## Appendix I. Hospital-Specific SSI Data using the Complex 30-day SSI Model

There are three SSI models[15] available in NHSN by which SIRs can be calculated. Two models used in this report are briefly described below.

The Complex A/R SSI Model is used by CDC for publishing annual progress reports. For Virginia-specific data see Table 7 and Table 8. Parameters of the model include the following:

- Includes only deep incisional primary SSIs & organ/space SSIs
- Includes only SSIs identified on admission/readmission to hospital where procedure was performed
- Includes only inpatient procedures adjusted for variables in the A/R models, see pages 14-15.

**Complex 30-day SSI Model**

The Complex 30-day SSI model is used by CMS for the Hospital Inpatient Quality Reporting Program. Results of the Complex 30-day model are published below. Parameters of the model include the following:

- Includes only in-plan, inpatient colon and abdominal hysterectomy procedures in adult patients (i.e., ≥ 18 years of age)
- Includes only deep incisional primary SSIs and organ/space SSIs with an event date within 30 days of the procedure
- Uses only age and ASA score to determine risk

In 2015, 77 Virginia hospitals reported performing colon procedures. The 2015 overall COLO SIR for Virginia hospitals (SIR=1.08; 95% CI: 0.95, 1.22) was not statistically significantly different from the national baseline from 2006-2008.

- SIRs were calculated for 48 of the hospitals reporting colon procedures in 2015; for 29 hospitals, the SIR was not calculated because the number of predicted infections was less than 1.
- Thirty hospitals (39%) reported zero SSIs following COLO procedures in 2015.
- Among the hospitals that had a calculated COLO SIR, 3 (6.3%) reported an SIR statistically significantly higher than the national baseline.

[15] Mu, Y., Edwards, J. R., Horan, T. C., Berrios-Torres, S. I., & Fridkin, S. K. (2011). Improving risk-adjusted measures of surgical site infection for the National Healthcare Safety Network. *Infection Control & Hospital Epidemiology*, 32(10), 970–986. doi:10.1086/662016

| Legend | | | | | |
|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for SSIs. | | | | | | | |

**Table 23. Surgical Site Infection (SSI) Standardized Infection Ratio (SIR) Report by Facility, Colon Procedures, Virginia Hospitals, 2015 (30-day Complex SSI Model)**

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,089** | **243** | **226.02** | **1.08** | **(0.95, 1.22)** | = Same |
| Augusta Health | 111 | 4 | 3.31 | 1.21 | (0.38, 2.92) | = Same |
| Bon Secours DePaul Medical Center | 32 | 0 | 1.05 | 0.00 | (., 2.85) | = Same |
| Bon Secours Mary Immaculate Hospital | 41 | 0 | 1.21 | 0.00 | (., 2.49) | = Same |
| Bon Secours Maryview Medical Center | 58 | 0 | 1.94 | 0.00 | (., 1.55) | = Same |
| Bon Secours Memorial Regional Medical Center | 175 | 2 | 5.36 | 0.37 | (0.06, 1.23) | = Same |
| Bon Secours Rappahannock General Hospital | 9 | 0 | 0.25 | N/A | N/A | **No Conclusion** |
| Bon Secours St. Francis Medical Center | 68 | 1 | 1.99 | 0.50 | (0.03, 2.47) | = Same |
| Bon Secours St. Mary's Hospital | 173 | 8 | 5.15 | 1.56 | (0.72, 2.95) | = Same |
| Buchanan General Hospital | 1 | 0 | 0.04 | N/A | N/A | **No Conclusion** |
| Carilion Franklin Memorial Hospital | 6 | 0 | 0.18 | N/A | N/A | **No Conclusion** |
| Carilion Giles Community Hospital | 7 | 0 | 0.22 | N/A | N/A | **No Conclusion** |
| Carilion Medical Center | 388 | 19 | 12.51 | 1.52 | (0.94, 2.33) | = Same |
| Carilion New River Valley Medical Center | 87 | 0 | 2.80 | 0.00 | (., 1.07) | = Same |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,089** | **243** | **226.02** | **1.08** | **(0.95, 1.22)** | = Same |
| Carilion Stonewall Jackson Hospital | 10 | 0 | 0.31 | N/A | N/A | **No Conclusion** |
| Centra Bedford Memorial Hospital | 10 | 0 | 0.30 | N/A | N/A | **No Conclusion** |
| Centra Lynchburg General Hospital | 230 | 5 | 7.44 | 0.67 | (0.25, 1.49) | = Same |
| Centra Southside Community Hospital | 17 | 0 | 0.58 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 31 | 0 | 0.90 | N/A | N/A | **No Conclusion** |
| Chesapeake Regional Medical Center | 209 | 7 | 6.53 | 1.07 | (0.47, 2.12) | = Same |
| Clinch Valley Medical Center | 19 | 0 | 0.69 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 57 | 1 | 1.85 | 0.54 | (0.03, 2.67) | = Same |
| Fauquier Health | 29 | 2 | 0.97 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 68 | 2 | 2.21 | 0.90 | (0.15, 2.99) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 171 | 7 | 5.36 | 1.31 | (0.57, 2.58) | = Same |
| HCA Henrico Doctors' Hospital | 187 | 14 | 5.87 | 2.39 | (1.36, 3.91) | ✖Worse |
| HCA John Randolph Medical Center | 28 | 0 | 0.94 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Alleghany | 8 | 0 | 0.23 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 32 | 0 | 1.02 | 0.00 | (., 2.94) | = Same |
| HCA LewisGale Hospital Pulaski | 14 | 0 | 0.42 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 171 | 7 | 5.34 | 1.31 | (0.57, 2.59) | = Same |
| HCA Parham Doctors' Hospital | 37 | 3 | 1.12 | 2.67 | (0.68, 7.26) | = Same |
| HCA Reston Hospital Center | 104 | 1 | 3.14 | 0.32 | (0.02, 1.57) | = Same |
| HCA Retreat Doctors' Hospital | 66 | 4 | 1.97 | 2.03 | (0.65, 4.91) | = Same |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,089** | **243** | **226.02** | **1.08** | **(0.95, 1.22)** | = Same |
| HCA Spotsylvania Regional Medical Center | 44 | 0 | 1.40 | 0.00 | (., 2.14) | = Same |
| Inova Alexandria Hospital | 136 | 8 | 4.33 | 1.85 | (0.86, 3.51) | = Same |
| Inova Fair Oaks Hospital | 126 | 3 | 3.91 | 0.77 | (0.20, 2.09) | = Same |
| Inova Fairfax Medical Campus | 549 | 21 | 18.28 | 1.15 | (0.73, 1.73) | = Same |
| Inova Loudoun Hospital | 74 | 2 | 2.23 | 0.90 | (0.15, 2.97) | = Same |
| Inova Mount Vernon Hospital | 32 | 0 | 0.93 | N/A | N/A | **No Conclusion** |
| Mary Washington Hospital | 253 | 5 | 8.23 | 0.61 | (0.22, 1.35) | = Same |
| Memorial Hospital of Martinsville & Henry County | 59 | 1 | 2.01 | 0.50 | (0.03, 2.46) | = Same |
| MSHA Johnston Memorial Hospital | 80 | 1 | 2.49 | 0.40 | (0.02, 1.98) | = Same |
| MSHA Norton Community Hospital | 16 | 0 | 0.51 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 9 | 0 | 0.29 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 15 | 0 | 0.43 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Haymarket Medical Center | 33 | 1 | 0.99 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 70 | 5 | 2.16 | 2.32 | (0.85, 5.13) | = Same |
| Riverside Doctors' Hospital Williamsburg | 17 | 0 | 0.54 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 196 | 11 | 6.31 | 1.74 | (0.92, 3.03) | = Same |
| Riverside Shore Memorial Hospital | 14 | 0 | 0.40 | N/A | N/A | **No Conclusion** |
| Riverside Tappahannock Hospital | 16 | 1 | 0.55 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 50 | 0 | 1.52 | 0.00 | (., 1.97) | = Same |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,089** | **243** | **226.02** | **1.08** | **(0.95, 1.22)** | = Same |
| Sentara CarePlex Hospital | 129 | 6 | 4.14 | 1.45 | (0.59, 3.01) | = Same |
| Sentara Halifax Regional Hospital | 38 | 1 | 1.18 | 0.85 | (0.04, 4.18) | = Same |
| Sentara Leigh Hospital | 172 | 4 | 5.62 | 0.71 | (0.23, 1.72) | = Same |
| Sentara Martha Jefferson Hospital | 99 | 4 | 2.83 | 1.41 | (0.45, 3.41) | = Same |
| Sentara Norfolk General Hospital | 147 | 11 | 5.26 | 2.09 | (1.10, 3.64) | ✖Worse |
| Sentara Northern Virginia Medical Center | 96 | 2 | 2.99 | 0.67 | (0.11, 2.21) | = Same |
| Sentara Obici Hospital | 57 | 2 | 1.89 | 1.06 | (0.18, 3.50) | = Same |
| Sentara Princess Anne Hospital | 93 | 5 | 3.14 | 1.59 | (0.58, 3.53) | = Same |
| Sentara RMH Medical Center | 70 | 3 | 2.10 | 1.43 | (0.36, 3.89) | = Same |
| Sentara Virginia Beach General Hospital | 177 | 3 | 5.75 | 0.52 | (0.13, 1.42) | = Same |
| Sentara Williamsburg Regional Medical Center | 43 | 2 | 1.22 | 1.65 | (0.28, 5.44) | = Same |
| Shenandoah Memorial Hospital | 13 | 0 | 0.34 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 17 | 1 | 0.52 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 82 | 1 | 2.56 | 0.39 | (0.02, 1.93) | = Same |
| Stafford Hospital | 44 | 2 | 1.50 | 1.33 | (0.22, 4.41) | = Same |
| Twin County Regional Healthcare | 18 | 1 | 0.62 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 372 | 13 | 12.17 | 1.07 | (0.59, 1.78) | = Same |
| VCU Community Memorial Hospital | 18 | 0 | 0.61 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 189 | 18 | 6.74 | 2.67 | (1.63, 4.14) | ✖Worse |
| Virginia Hospital Center | 360 | 6 | 10.88 | 0.55 | (0.22, 1.15) | = Same |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=77)** | **7,089** | **243** | **226.02** | **1.08** | **(0.95, 1.22)** | **= Same** |
| Warren Memorial Hospital | 2 | 0 | 0.07 | N/A | N/A | **No Conclusion** |
| Wellmont Lonesome Pine Hospital | 4 | 0 | 0.13 | N/A | N/A | **No Conclusion** |
| Wellmont Mountain View Regional Medical Center | 14 | 0 | 0.42 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 374 | 11 | 12.19 | 0.90 | (0.48, 1.57) | **= Same** |
| Wythe County Community Hospital | 18 | 1 | 0.50 | N/A | N/A | **No Conclusion** |

*When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.
If a hospital is not listed in the table, then the hospital did not perform any procedures in 2015, or the procedures were excluded from the complex 30-day model.

In 2015, 68 Virginia hospitals reported performing abdominal hysterectomies. The 2015 overall HYST SIR for Virginia hospitals (SIR=1.20; 95% CI: 0.98, 1.46) was not statistically significantly different from the national baseline from 2006-2008.

- SIRs were calculated for 21 (27%) of the hospitals that reported abdominal hysterectomies in 2015; for 47 hospitals, the SIR was not calculated because the number of predicted infections was less than 1.
- Thirty-six hospitals (52%) reported zero SSIs following HYST procedures in 2015.
- Among the hospitals that had a calculated HYST SIR, only three (14%) reported an SIR statistically significantly higher than the national baseline.

| Legend | | | | | | | |
|---|---|---|---|---|---|---|---|
| ★ | Fewer infections (**better**) than predicted based on the national experience.* | = | About the **same** number of infections as predicted based on the national experience.* | ✖ | More infections (**worse**) than predicted based on the national experience.* | **No Conclusion** | When the number of predicted infections is less than 1, no conclusion can be made. |
| *National experience contains data from 2006-2008 for SSIs. | | | | | | | |

**Table 24. Surgical Site Infection (SSI) Standardized Infection Ratio (SIR) Report by Facility, Abdominal Hysterectomy Procedures, Virginia Hospitals, 2015 (30-day Complex SSI Model)**

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,383** | **95** | **79.21** | **1.20** | **(0.98, 1.46)** | = Same |
| Augusta Health | 65 | 0 | 0.67 | N/A | N/A | **No Conclusion** |
| Bon Secours DePaul Medical Center | 277 | 2 | 2.75 | 0.73 | (0.12, 2.40) | = Same |
| Bon Secours Mary Immaculate Hospital | 140 | 2 | 1.30 | 1.54 | (0.26, 5.09) | = Same |
| Bon Secours Maryview Medical Center | 76 | 0 | 0.86 | N/A | N/A | **No Conclusion** |
| Bon Secours Memorial Regional Medical Center | 140 | 3 | 1.32 | 2.28 | (0.58, 6.20) | = Same |
| Bon Secours St. Francis Medical Center | 191 | 1 | 1.72 | 0.58 | (0.03, 2.86) | = Same |
| Bon Secours St. Mary's Hospital | 416 | 3 | 3.65 | 0.82 | (0.21, 2.24) | = Same |
| Carilion Franklin Memorial Hospital | 7 | 0 | 0.09 | N/A | N/A | **No Conclusion** |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,383** | **95** | **79.21** | **1.20** | **(0.98, 1.46)** | = Same |
| Carilion Medical Center | 307 | 2 | 3.11 | 0.64 | (0.11, 2.12) | = Same |
| Carilion New River Valley Medical Center | 111 | 0 | 1.09 | 0.00 | (., 2.76) | = Same |
| Centra Bedford Memorial Hospital | 3 | 0 | 0.06 | N/A | N/A | **No Conclusion** |
| Centra Southside Community Hospital | 17 | 0 | 0.19 | N/A | N/A | **No Conclusion** |
| Centra Virginia Baptist Hospital | 168 | 1 | 1.69 | 0.59 | (0.03, 2.92) | = Same |
| Chesapeake Regional Medical Center | 427 | 4 | 3.82 | 1.05 | (0.33, 2.53) | = Same |
| Clinch Valley Medical Center | 61 | 0 | 0.51 | N/A | N/A | **No Conclusion** |
| Danville Regional Medical Center | 46 | 1 | 0.44 | N/A | N/A | **No Conclusion** |
| Fauquier Health | 36 | 0 | 0.40 | N/A | N/A | **No Conclusion** |
| HCA CJW Medical Center Chippenham Hospital | 98 | 2 | 1.05 | 1.91 | (0.32, 6.32) | = Same |
| HCA CJW Medical Center Johnston-Willis Hospital | 534 | 3 | 5.03 | 0.60 | (0.15, 1.62) | = Same |
| HCA Henrico Doctors' Hospital | 567 | 7 | 4.71 | 1.49 | (0.65, 2.94) | = Same |
| HCA LewisGale Hospital Alleghany | 3 | 0 | 0.02 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Montgomery | 23 | 1 | 0.25 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Hospital Pulaski | 3 | 0 | 0.03 | N/A | N/A | **No Conclusion** |
| HCA LewisGale Medical Center | 173 | 1 | 1.70 | 0.59 | (0.03, 2.90) | = Same |
| HCA Reston Hospital Center | 99 | 2 | 0.88 | N/A | N/A | **No Conclusion** |
| HCA Retreat Doctors' Hospital | 17 | 0 | 0.12 | N/A | N/A | **No Conclusion** |
| HCA Spotsylvania Regional Medical Center | 25 | 0 | 0.20 | N/A | N/A | **No Conclusion** |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,383** | **95** | **79.21** | **1.20** | **(0.98, 1.46)** | = Same |
| Inova Alexandria Hospital | 104 | 0 | 0.91 | N/A | N/A | **No Conclusion** |
| Inova Fair Oaks Hospital | 47 | 0 | 0.47 | N/A | N/A | **No Conclusion** |
| Inova Fairfax Medical Campus | 1268 | 13 | 12.11 | 1.07 | (0.60, 1.79) | = Same |
| Inova Loudoun Hospital | 104 | 0 | 0.90 | N/A | N/A | **No Conclusion** |
| Inova Mount Vernon Hospital | 4 | 0 | 0.05 | N/A | N/A | **No Conclusion** |
| Mary Washington Hospital | 51 | 0 | 0.47 | N/A | N/A | **No Conclusion** |
| Memorial Hospital of Martinsville & Henry County | 42 | 1 | 0.56 | N/A | N/A | **No Conclusion** |
| MSHA Johnston Memorial Hospital | 31 | 0 | 0.28 | N/A | N/A | **No Conclusion** |
| MSHA Norton Community Hospital | 12 | 0 | 0.16 | N/A | N/A | **No Conclusion** |
| MSHA Smyth County Community Hospital | 15 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Culpeper Medical Center | 10 | 0 | 0.06 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Haymarket Medical Center | 26 | 0 | 0.24 | N/A | N/A | **No Conclusion** |
| Novant Health UVA Health System Prince William Medical Center | 32 | 1 | 0.32 | N/A | N/A | **No Conclusion** |
| Riverside Doctors' Hospital Williamsburg | 29 | 0 | 0.26 | N/A | N/A | **No Conclusion** |
| Riverside Regional Medical Center | 175 | 5 | 1.79 | 2.80 | (1.02, 6.20) | ✖Worse |
| Riverside Shore Memorial Hospital | 6 | 0 | 0.05 | N/A | N/A | **No Conclusion** |
| Riverside Walter Reed Hospital | 12 | 0 | 0.14 | N/A | N/A | **No Conclusion** |
| Sentara CarePlex Hospital | 78 | 0 | 0.72 | N/A | N/A | **No Conclusion** |
| Sentara Halifax Regional Hospital | 51 | 0 | 0.49 | N/A | N/A | **No Conclusion** |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,383** | **95** | **79.21** | **1.20** | **(0.98, 1.46)** | = Same |
| Sentara Leigh Hospital | 424 | 13 | 4.18 | 3.11 | (1.73, 5.18) | ✖Worse |
| Sentara Martha Jefferson Hospital | 77 | 0 | 0.68 | N/A | N/A | **No Conclusion** |
| Sentara Norfolk General Hospital | 93 | 3 | 1.17 | 2.56 | (0.65, 6.96) | = Same |
| Sentara Northern Virginia Medical Center | 96 | 0 | 0.84 | N/A | N/A | **No Conclusion** |
| Sentara Obici Hospital | 112 | 4 | 1.06 | 3.79 | (1.20, 9.13) | ✖Worse |
| Sentara Princess Anne Hospital | 39 | 1 | 0.43 | N/A | N/A | **No Conclusion** |
| Sentara RMH Medical Center | 52 | 1 | 0.48 | N/A | N/A | **No Conclusion** |
| Sentara Virginia Beach General Hospital | 87 | 0 | 0.77 | N/A | N/A | **No Conclusion** |
| Sentara Williamsburg Regional Medical Center | 44 | 1 | 0.42 | N/A | N/A | **No Conclusion** |
| Shenandoah Memorial Hospital | 21 | 0 | 0.17 | N/A | N/A | **No Conclusion** |
| Southampton Memorial Hospital | 20 | 1 | 0.22 | N/A | N/A | **No Conclusion** |
| Southside Regional Medical Center | 46 | 0 | 0.41 | N/A | N/A | **No Conclusion** |
| Stafford Hospital | 5 | 1 | 0.04 | N/A | N/A | **No Conclusion** |
| Twin County Regional Healthcare | 33 | 0 | 0.29 | N/A | N/A | **No Conclusion** |
| UVA Medical Center | 470 | 7 | 4.14 | 1.69 | (0.74, 3.34) | = Same |
| VCU Community Memorial Hospital | 8 | 0 | 0.08 | N/A | N/A | **No Conclusion** |
| VCU Medical Center | 150 | 4 | 1.69 | 2.37 | (0.75, 5.72) | = Same |
| Virginia Hospital Center | 290 | 2 | 2.54 | 0.79 | (0.13, 2.60) | = Same |
| Warren Memorial Hospital | 10 | 0 | 0.11 | N/A | N/A | **No Conclusion** |

| Facility Name | Number of Procedures | Number of Infections | | SIR and 95% Confidence Interval (CI)[a] | | SIR Interpretation |
|---|---|---|---|---|---|---|
| | | Observed | Predicted | SIR | 95% CI (lower, upper) | |
| **All Virginia Hospitals (n=68)** | **8,383** | **95** | **79.21** | **1.20** | **(0.98, 1.46)** | = Same |
| Wellmont Lonesome Pine Hospital | 22 | 0 | 0.30 | N/A | N/A | **No Conclusion** |
| Winchester Medical Center | 110 | 1 | 0.99 | N/A | N/A | **No Conclusion** |
| Wythe County Community Hospital | 47 | 1 | 0.47 | N/A | N/A | **No Conclusion** |

[a] When the SIR is 0, the lower bound of the 95% confidence interval cannot be calculated. However for ease of interpretation, it can be considered 0.
If a hospital is not listed in the table, then the hospital did not perform any procedures in 2015, or the procedures were excluded from the complex 30-day model.

## Appendix J. References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