



**West Virginia Health Care Authority**

# **Healthcare-Associated Infection Public Reporting Program**

**2014 Annual Report**

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Governor

**James L. Pitrolo, Board Chair**  
West Virginia Health Care Authority

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**Healthcare-Associated Infection Public Reporting Program**  
**2014 Annual Report**

**West Virginia Health Care Authority Board**

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## Introduction

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Healthcare-associated infections (HAIs) can be acquired from any healthcare setting, but patients receiving medical or surgical care in a hospital are particularly vulnerable. According to the Centers for Disease Control and Prevention (CDC), HAIs rank as one of the top 10 leading causes of death in the U.S.<sup>1</sup> with mortality rates of 12%-25%.<sup>2</sup> It is estimated that there were approximately 1.7 million HAIs in U.S. hospitals in 2002, resulting in nearly 99,000 deaths.<sup>3</sup> Direct medical costs of HAIs on the healthcare system are estimated to be \$28-\$45 billion annually.<sup>4</sup> While age and underlying risk factors increase the risk of patients developing infections, 20%-70% of HAIs are often preventable through adherence to infection prevention guidelines. Infection prevention and control activities in healthcare settings are an integral component of patient safety programs.

In 2008, the West Virginia Legislature created §16-5B-17 to make HAI data available to the public and to promote quality improvement initiatives to reduce HAIs in West Virginia hospitals. The legislation mandated hospitals to report HAI data and required the West Virginia Health Care Authority (WVHCA) to create a HAI Control Advisory Panel to assist in performing the following activities:

- Provide guidance to hospitals in their collection of information regarding healthcare-associated infections;
- Provide evidence-based practices in the control and prevention of healthcare-associated infections;
- Establish reasonable goals to reduce the number of healthcare-associated infections;
- Develop plans for analyzing infection-related data from hospitals;
- Develop healthcare-associated advisories for hospital distribution; and
- Determine a manner in which reporting of healthcare-associated infections is made available to the public in an understandable fashion.

The HAI Control Advisory Panel was initially convened by the WVHCA in January 2009. The Panel consists of representatives from hospitals, the West Virginia Hospital Association, public health, professionals with expertise in infectious disease control and prevention, biostatistics, microbiology, and health policy. The Panel members are listed on page 2.

The WVHCA has been mandated by the West Virginia Legislature to annually summarize and report progress of the HAI Control Advisory Panel and results of required reporting to the Legislative Oversight Committee on Health and Human Resources Accountability.

## HAI Measures and Reporting

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Annually, the HAI Control Advisory Panel reviews and updates the hospital HAI public reporting requirements. When choosing the measures required for reporting, the Panel considers the impact of HAIs on patient outcomes and the ability for hospitals to collect and report the data. Reporting guidance is developed and distributed to infection control contacts at each hospital. Hospitals submit data to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). NHSN was developed as a voluntary surveillance system for hospitals to identify and monitor HAIs, but is now being used by multiple states for mandatory HAI reporting. Hospitals

give permission for the WVHCA to access the data submitted to NHSN.

West Virginia HAI reporting requirements began in July 2009. In January 2011, the Centers for Medicare and Medicaid Services (CMS) implemented HAI reporting requirements for hospitals participating in the Hospital Inpatient Quality Reporting Program. To reduce the reporting burden on hospitals, the Panel decided to adopt the CMS requirements as West Virginia’s reporting requirements. **Table 1** summarizes the measures required to be submitted for West Virginia’s HAI Public Reporting Program in 2013.

This report summarizes data reported on central line-associated blood stream infections (CLABSIs), catheter-associated urinary tract infections (CAUTI), surgical site infections for colon surgeries and abdominal hysterectomies and healthcare personnel seasonal influenza vaccinations for the 2012-2013 reporting period. Due to the data collection and processing schedule, this report does not include any healthcare-associated infection data submitted in 2013; 2013 data will be summarized in future reports.

**Table 1**  
**West Virginia HAI Public Reporting**  
**Required Measures**

Measure	Reporting Unit/Facility	Start Date
Healthcare Personnel Seasonal Influenza Vaccinations	All hospitals, excluding state psychiatric hospitals and rehabilitation hospitals	Sept. 2009
	Rehabilitation hospitals	Sept. 2010
Central Line-Associated Blood Stream Infections (CLABSI)	Medical, Surgical, Medical/Surgical ICUs	July 2009
	All ICUs*	January 2012
	Long Term Acute Care Hospitals*	October 2012
Catheter-Associated Urinary Tract Infections (CAUTI)	All adult and pediatric ICUs*	January 2012
	Medical, Surgical, and Adult Mixed Acuity Units in Acute Care and Critical Access Hospitals without an ICU	January 2012
	Rehabilitation Hospitals/Units and Long Term Acute Care Hospitals.*	October 2012
	Medical/Surgical Wards in Acute Care and Critical Access Hospitals without an ICU	January 2013
Surgical Site Infections (SSI)	Colon and Abdominal Hysterectomy Procedures in Acute Care Hospitals*	January 2012

MRSA Bacteremia LabID Event	Acute Care Hospitals*	January 2013
<i>Clostridium difficile</i> LabID Event	Acute Care Hospitals*	January 2013

\*This measure is required by the CMS Hospital Inpatient Quality Reporting Program

Note: All data are reported monthly (except Healthcare Personnel Seasonal Influenza Vaccinations data, which are reported annually) to NHSN.

## Central Line-Associated Blood Stream Infections (CLABSI)

A central line is a tube inserted into a large vein in the neck, chest, arm, or groin and is used to administer fluids and medications and to withdraw blood. Central line-associated blood stream infections (CLABSIs) occur when microorganisms enter the blood through the tube.

The Centers for Disease Control and Prevention (CDC) estimates that 12,400 central line-associated bloodstream infections (CLABSIs) occurred in U.S. hospitals in 2011<sup>5</sup> causing serious complications including longer inpatient stays, increased costs, and higher risk of death. The cost of a CLABSI is estimated to be approximately \$26,000 per infection.<sup>5</sup> CLABSIs can often be prevented by adherence to evidence based guidelines for the insertion, use, and maintenance of central lines.

Since July 2009, West Virginia hospitals have been required to report data on CLABSIs that occur among patients in medical, surgical, and medical/surgical ICUs.

### Key Findings

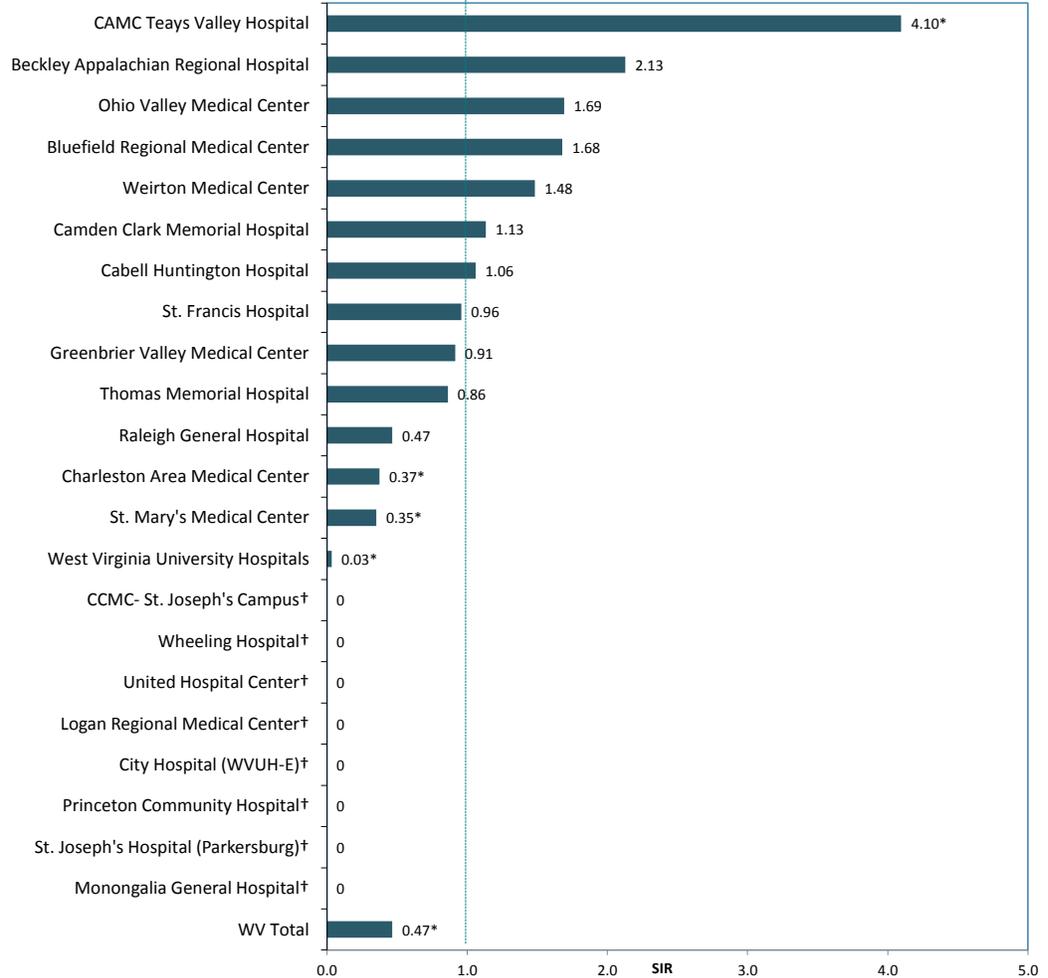
- In 2012, 52 CLABSIs in medical, surgical, and medical/surgical ICUs were reported by West Virginia hospitals.
- Significantly fewer CLABSIs occurred in West Virginia medical, surgical, and medical/surgical ICUs in 2012 than what were expected based on national averages. The West Virginia SIR was 0.47, indicating that 53% fewer CLABSIs occurred than were expected.
- Among West Virginia hospitals, the 2012 CLABSI SIR ranged from a low of 0.0 (no CLABSIs reported) to a high of 4.10.
- In 2012, central lines were used in approximately 39.9% of patient days spent in a medical, surgical, or medical/surgical ICU in West Virginia (79,509 of the 199,099 patient days).
- Among West Virginia hospitals, the central line utilization ratio ranged from a low of 0% to a high of 90% of patient days. Central line use is expected to differ based on the type of ICU and patient risk factors.
- WV's SIR of .47 falls below the 2013 national SIR prevention target of .50.<sup>6</sup>

\* See the Technical Notes section on page 16 for a detailed explanation of the Standard Infection Ratio (SIR).

**Figure 1** below provides CLABSI standardized infection ratios (SIRs)\* for all ICUs in West Virginia by facility.

Figure 1

West Virginia Healthcare-Associated Infection Public Reporting  
 Central Line-Associated Blood Stream Infection Standardized Infection Ratio  
 For all ICUs within WV Hospitals  
 Calendar Year 2012



Note: The SIR is a summary measure that compares the actual number of CLABSI reported by the hospital to the number of CLABSI that were expected to occur, based on NHSN aggregate data for 2006-2008 and adjusted for several risk factors associated with HAI incidence. A SIR greater than 1.0 indicates that more HAIs were observed than expected, accounting for difference in the types of patients; a SIR less than 1.0 indicates that fewer HAIs were observed than expected. For example, a SIR of 1.20 indicates that the hospital had 20% more CLABSIs than expected; a SIR of 0.80 indicates that the hospital had 20% fewer CLABSIs than expected. The SIR is only calculated if the number of expected CLABSIs is  $\geq 1$ . When the number expected is  $< 1$ , the number of procedures performed is too low to calculate a precise SIR and comparative statistics. The following hospitals had an expected CLABSI  $< 1$ : Davis Memorial Hospital, Fairmont General Hospital, Grafton City Hospital, Grant Memorial Hospital, Jackson General Hospital, Jefferson Memorial Hospital, Plateau Medical Center, Pleasant Valley Hospital, Potomac Valley Hospital, Preston Memorial Hospital, Reynolds Memorial Hospital, St. Joseph's Hospital of Buckhannon, Stonewall Jackson Memorial Hospital, Summersville Regional Medical Center, Welch Community Hospital, Wetzel County Hospital, Williamson Memorial Hospital

\*Significance difference between hospital SIR vs. NHSN 2006-2008 average.

†Hospitals with an SIR of 0 did not report CLABSI events for the reporting period.

West Virginia Health Care Authority, August 2012

In fall 2012, APIC Consulting Services, Inc. (ACSI) was contracted by the the West Virginia Hospital Association, with a grant from the West Virginia Health Care Authority, to develop and perform an audit of healthcare-associated infection data reported by acute care hospitals to the National Healthcare Safety Network (NHSN).

The major program objective was to audit CLABSI data reported to NHSN including: assessing the accuracy and completeness of reporting CLABSIs for patients in hospital medical, surgical and medical/surgical intensive care units between July 1, 2011 and December 31, 2011; determining whether cases reported to NHSN met the criteria established by the CDC; evaluating current surveillance methods to detect infections and report associated denominator data; and, after existing gaps are determined, providing on-site education on NHSN case definitions, surveillance mechanisms, and the use of the NHSN system.

ACSI visited 30 hospitals to review procedures for collecting and reporting CLABSI data. Data auditors reviewed eight randomly selected patient charts to determine if the NHSN CLABSI case definition was appropriately applied. They also conducted an interview with individuals from each hospital who collect HAI surveillance data, including infections and associated denominator data.

### **CLABSI Audit Findings**

The results of the CLABSI audit were published in August 2013. The results are as follows:

- Of the 240 audited records there were 13 CLABSIs reported to NHSN by West Virginia hospitals.
- A total of 9 cases were found by the ACSI audit process to be reported incorrectly or inaccurately.
- After extensive review of the patients' records, the audit identified 12 (92%) of the 13 reported CLABSIs as HAIs. The remaining 1 (8%) reported CLABSI did not meet the NHSN HAI CLABSI criteria.
- A total of 227 reviewed records had positive blood cultures that were not reported to NHSN as CLABSIs. These cases appeared on a positive blood culture list submitted to ACSI. Of these 227 cases, 8 (3.5%) were determined by the audit to meet the NHSN HAI CLABSI criteria and should have been reported, while 219 (96.5%) did not meet CLABSI criteria and were appropriately not reported by the hospitals.

The findings of this study suggest that there were under-and over-reporting of central line-associated infections to NHSN.

- Many (8/20) of the CLABSIs identified in the audit were not reported to NHSN by the hospitals. This under-reporting is reflected in a sensitivity of 60%.
- Nearly all (219/220) patients who did not meet the criteria for CLABSI during the audit were, correctly, not reported to NHSN, yielding a specificity of 99.5%.
- The positive predictive value (PPV) for the data in this study was 92% which is the probability that a patient with a reported CLABSI, actually has a CLABSI, using NHSN definitions.
- The negative predictive value (NPV) was 96%. This means that 96% of the time, a person who is not reported as having a CLABSI, does not actually have a CLABSI.

- Five of the CLABSI errors identified in the audit were due to misinterpretation of CDC/NHSN definitions (i.e., secondary BSI and present on admission criteria).
- Four errors were due to cases that were missed during the surveillance process.

The results of this audit suggest a continuing need for ongoing training and reinforcement of surveillance definitions and methods. Although all hospitals are required to complete training in NHSN definitions and protocols, it is recommended that these educational offerings be repeated periodically for CLABSIs. There were also gaps in technology found during the preparation phase of the audit. More than one hospital reported difficulties in obtaining positive blood culture lists in spreadsheet format. As greater responsibility is placed on hospitals to report and validate data, hospitals may want to consider expanding their technology resources for easier review and reporting.

## **Catheter-Associated Urinary Tract Infections (CAUTI)**

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Urinary tract infection (UTI), an infection of any part of the urinary system, is the most common type of healthcare-associated infection reported to NHSN. Between 15-25% of hospitalized patients receive urinary catheters, which is a tube inserted into the bladder to drain urine. Of those UTIs acquired in the hospital, 75% are associated with a urinary catheter. Prolonged use of urinary catheters is the most important risk factor for developing a UTI.<sup>7</sup>

Since January 2012, West Virginia hospitals have been reporting CAUTIs that occur in all adult and pediatric ICUs and medical/surgical wards in acute care and critical access hospitals. In October 2012, rehabilitation and long-term acute care hospitals began reporting CAUTIs as well.

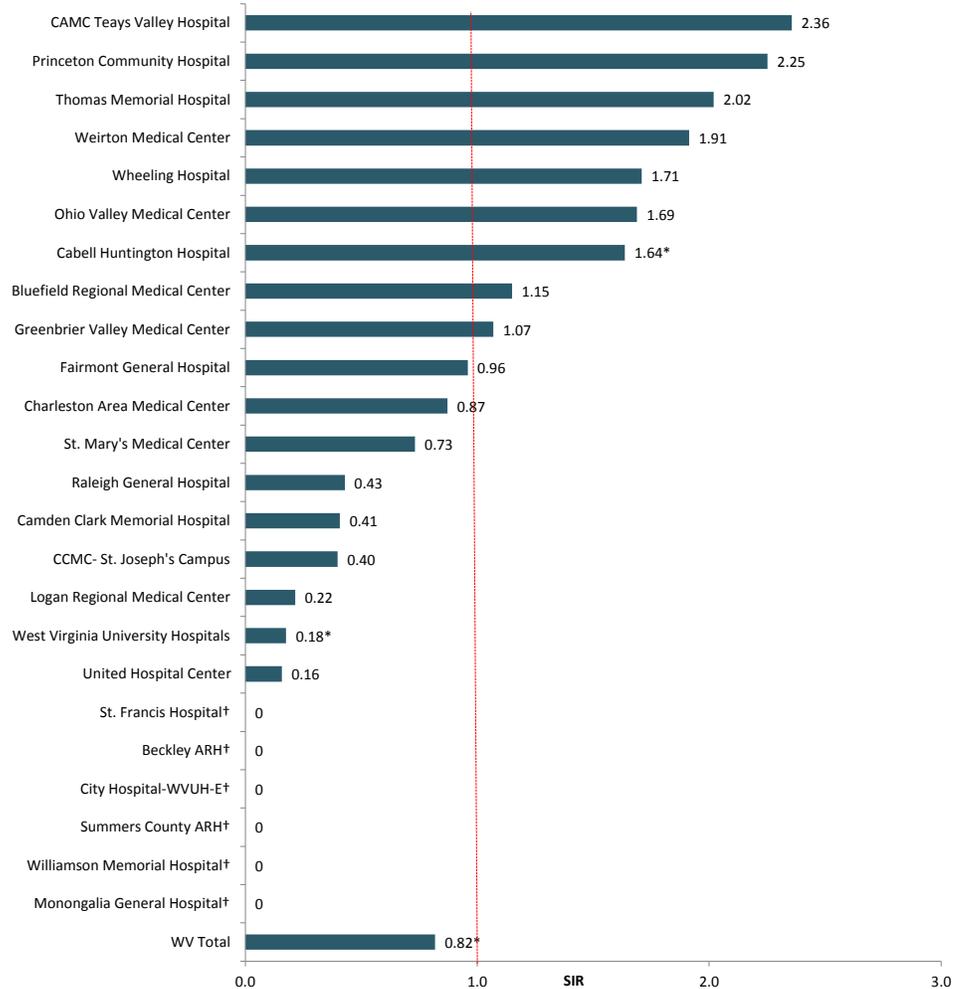
### **Key Findings**

- In 2012, the CAUTI SIR for WV hospitals ranged from a low of 0.00 to a high of 2.36.
- The average CAUTI SIR is 0.82, above the 2013 national target for CAUTI of 0.75.<sup>6</sup>

**Figure 2** below provides CAUTI SIRs for West Virginia hospitals by facility.

Figure 2

**West Virginia Healthcare-Associated Infection Public Reporting  
Catheter Associated Urinary Tract Infection Standardized Infection Ratio  
For WV Hospitals  
Calendar Year 2012**



Note: The SIR is a summary measure that compares the actual number of CAUTI reported by the hospital to the number of CAUTI that were expected to occur, based on NHSN aggregate data for 2006-2008 and adjusted for several risk factors associated with HAI incidence. A SIR greater than 1.0 indicates that more HAIs were observed than expected, accounting for difference in the types of patients; a SIR less than 1.0 indicates that fewer HAIs were observed than expected. For example, a SIR of 1.20 indicates that the hospital had 20% more CAUTIs than expected; a SIR of 0.80 indicates that the hospital had 20% fewer CAUTIs than expected. The SIR is only calculated if the number of expected CAUTIs is  $\geq 1$ . When the number expected is  $< 1$ , the number of procedures performed is too low to calculate a precise SIR and comparative statistics. The following hospitals had an expected CLABSI  $< 1$ : Davis Memorial Hospital, Grafton City Hospital, Grant Memorial Hospital, Jackson General Hospital, Jefferson Memorial Hospital, Plateau Medical Center, Pleasant Valley Hospital, Potomac Valley Hospital, Preston Memorial Hospital, Reynolds Memorial Hospital, St. Joseph's Hospital of Buckhannon, Stonewall Jackson Memorial Hospital, Summersville Regional Medical Center, Welch Community Hospital, Wetzel County Hospital.

\*Significance difference between hospital SIR vs. NHSN 2006-2008 average.

†Hospitals with an SIR of 0 did not report CAUTI events for the reporting period.

West Virginia Health Care Authority, August 2012

## Surgical Site Infections (SSI)

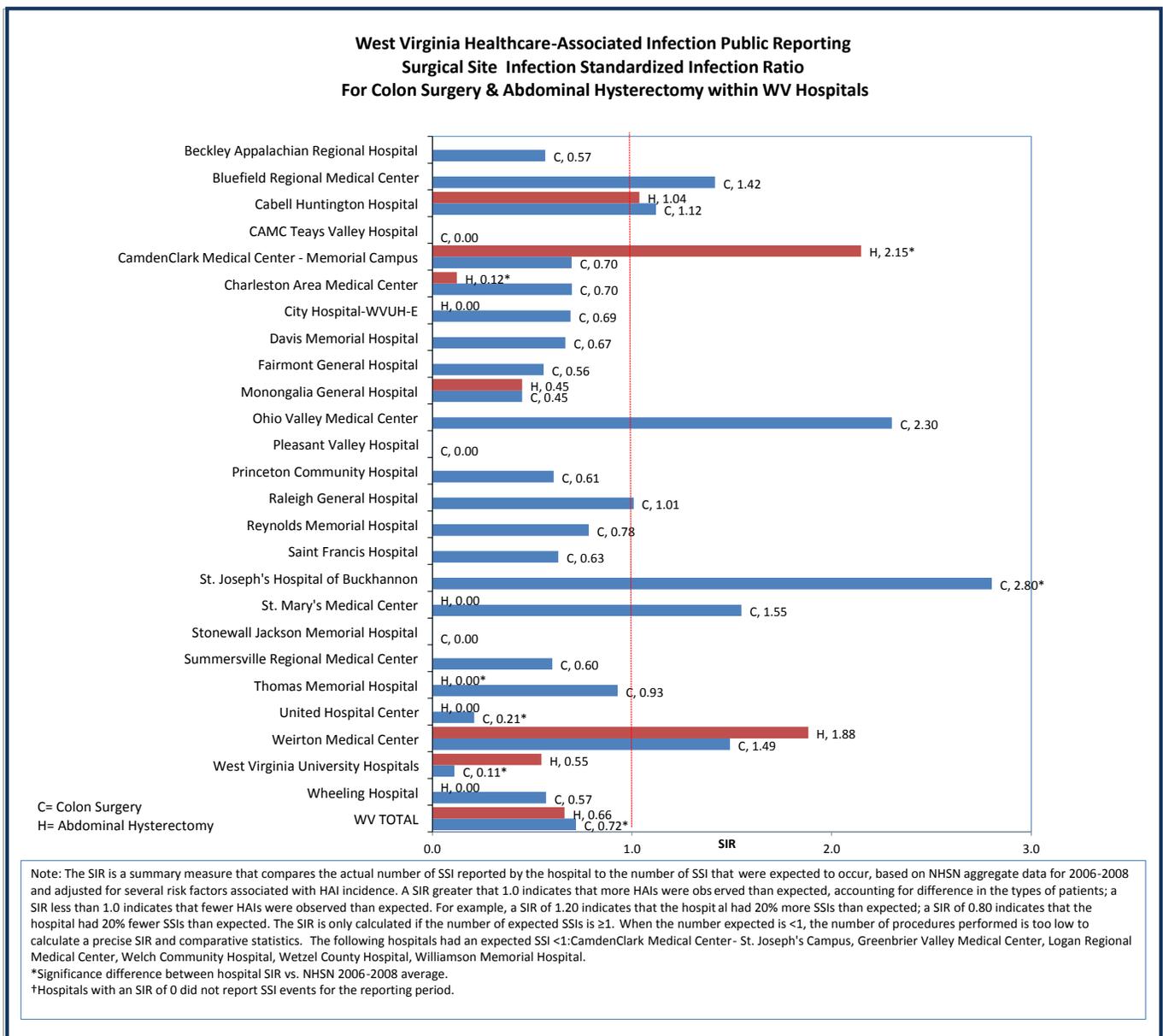
Surgical site infections are infections that occur at the site where a surgery occurred and may be superficial or may involve tissue, organs or implanted material.<sup>8</sup> Since January 2012, West Virginia hospitals have been reporting colon surgeries and abdominal hysterectomy procedures that occur in acute care hospitals.

### Key Findings

- The West Virginia SSI ratio for colon surgery and abdominal hysterectomies is 0.72 and 0.66, respectively, as compared to the 2013 national target for SSI of 0.75.<sup>6</sup>
- The West Virginia SSI SIR for colon surgery ranged from a low of 0.00 to a high of 2.80.
- The West Virginia SSI SIR for abdominal hysterectomy ranged from a low of 0.00 to a high of 2.15.

Figure 3 below provides surgical infection SIRs for both colon surgeries and abdominal hysterectomies in West Virginia hospitals by facility.

Figure 3



## **Healthcare Personnel Influenza Vaccinations**

Healthcare workers play an important role in protecting public health. Influenza vaccinations safeguard healthcare workers from infection but also protect patients from becoming infected. The Centers for Disease Control and Prevention (CDC) recommends that all healthcare workers get an annual influenza vaccination.<sup>9</sup> Several national professional organizations endorse mandatory policies for influenza vaccination as a condition of employment within healthcare facilities, and 87 facilities in 30 states and D.C. have implemented mandatory vaccination requirements.<sup>10</sup>

### **Healthcare Personnel Seasonal Influenza Vaccinations**

Hospitals are required to report the number of personnel directly employed by the hospital (excluding contract employees, volunteers, etc.) that received a seasonal influenza vaccination each season (September to March). All 60 acute care, critical access, long-term acute care, and psychiatric hospitals (excluding state psychiatric hospitals) reported during the 2012-2013 influenza season. Annually, each hospital completes the NHSN Hospital Seasonal Influenza Vaccination Survey to summarize details of its hospital vaccination program, which allows for aggregate reporting.

The WVHCA monitors reporting compliance and provides technical assistance to infection control contacts to ensure timely and accurate data submission. Submitted data are managed and analyzed by the WVHCA and results are disseminated to the HAI Control Advisory Panel for review and approval prior to release.

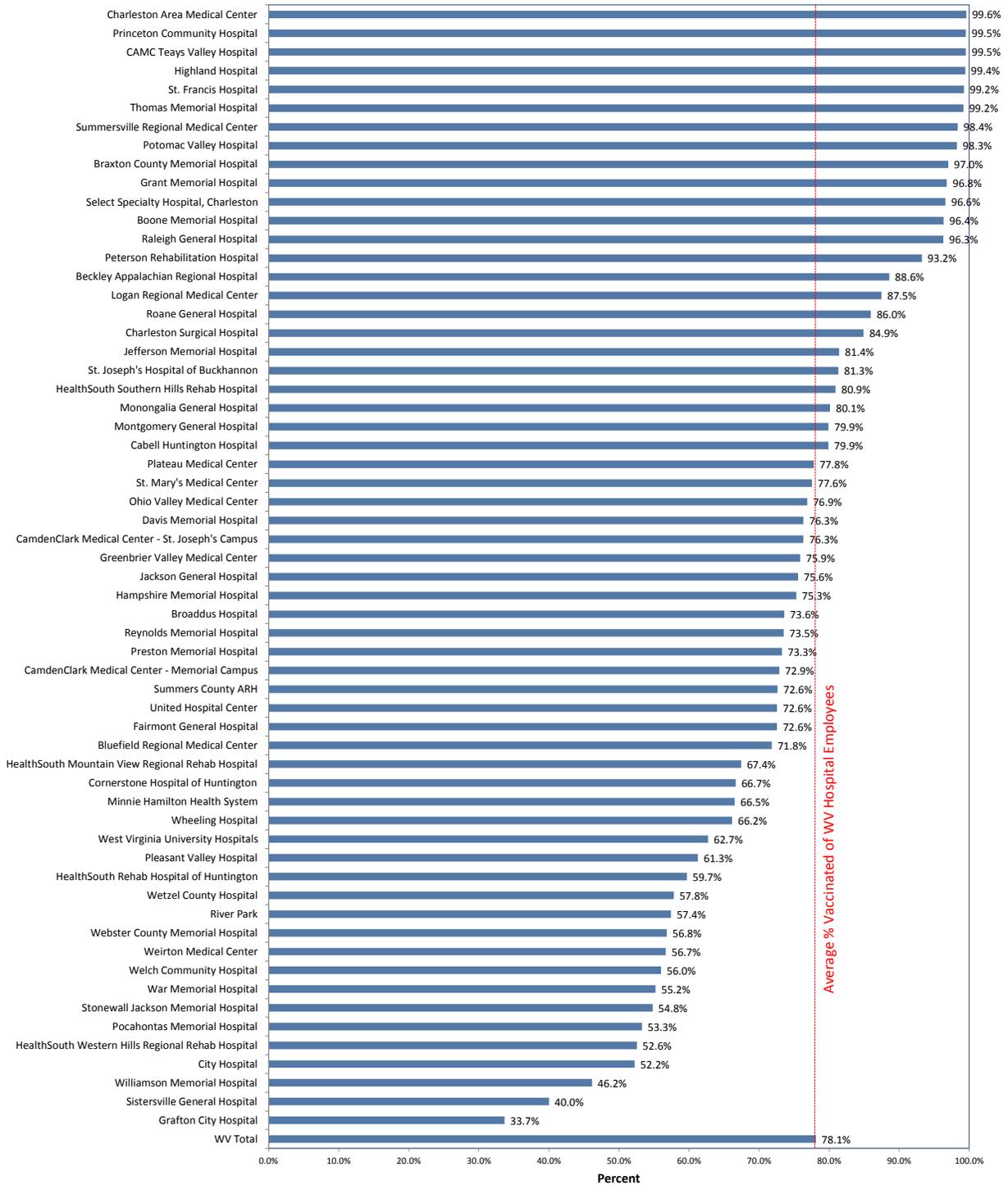
### **Key Findings**

- 78.1% of all hospital employees in West Virginia received a seasonal influenza vaccination during the 2012-2013 influenza season, up from 72.2% last year, and slightly greater than the national rate of 72%.<sup>11</sup>
- The influenza vaccination rate was significantly higher in long-term acute care hospitals (84.7%) than psychiatric, rehabilitation, critical access, and acute care hospitals.
- The percentage of healthcare personnel that received an influenza vaccination ranged from a low of 33.7% to a high of 99.6% in West Virginia hospitals.
- During the 2012-2013 influenza season, 98% (59) hospitals provided the seasonal influenza vaccine to all employees at no cost, and 92% (57) of hospitals provided the vaccine during all work shifts.
- Hospitals utilized a variety of strategies to promote influenza vaccination to employees. The most common strategies were: A vaccination campaign, including posters, flyers, buttons, or fact sheets (95%); Education on the benefits and risks of vaccination (95%); Reminders by mail, email, or pager (85%); Incentives (38%); Coordination of vaccination with other annual programs (33%).
- 87% of hospitals require documentation that an employee has been vaccinated offsite for seasonal influenza.

See **Figure 4** below for the percent of hospital employees vaccinated for seasonal influenza by facility.

Figure 4

**West Virginia Healthcare-Associated Infection Public Reporting  
Percent of Hospital Employees Vaccinated For Seasonal Influenza  
September 2012 - March 2013**



Note: Results may not be directly comparable across time due to differences in data reporting methodologies. The 2010-2011 and 2011-2012 data represent vaccinations among personnel employed at any time during the influenza season, regardless of length of employment. Personnel that terminated employment prior to being vaccinated are included in the results. The 2012-2013 data was collected through and using NHSN methodologies. Therefore, the results may not represent the vaccination rate among current personnel.  
West Virginia Healthcare Authority, August 2013

Figure 5

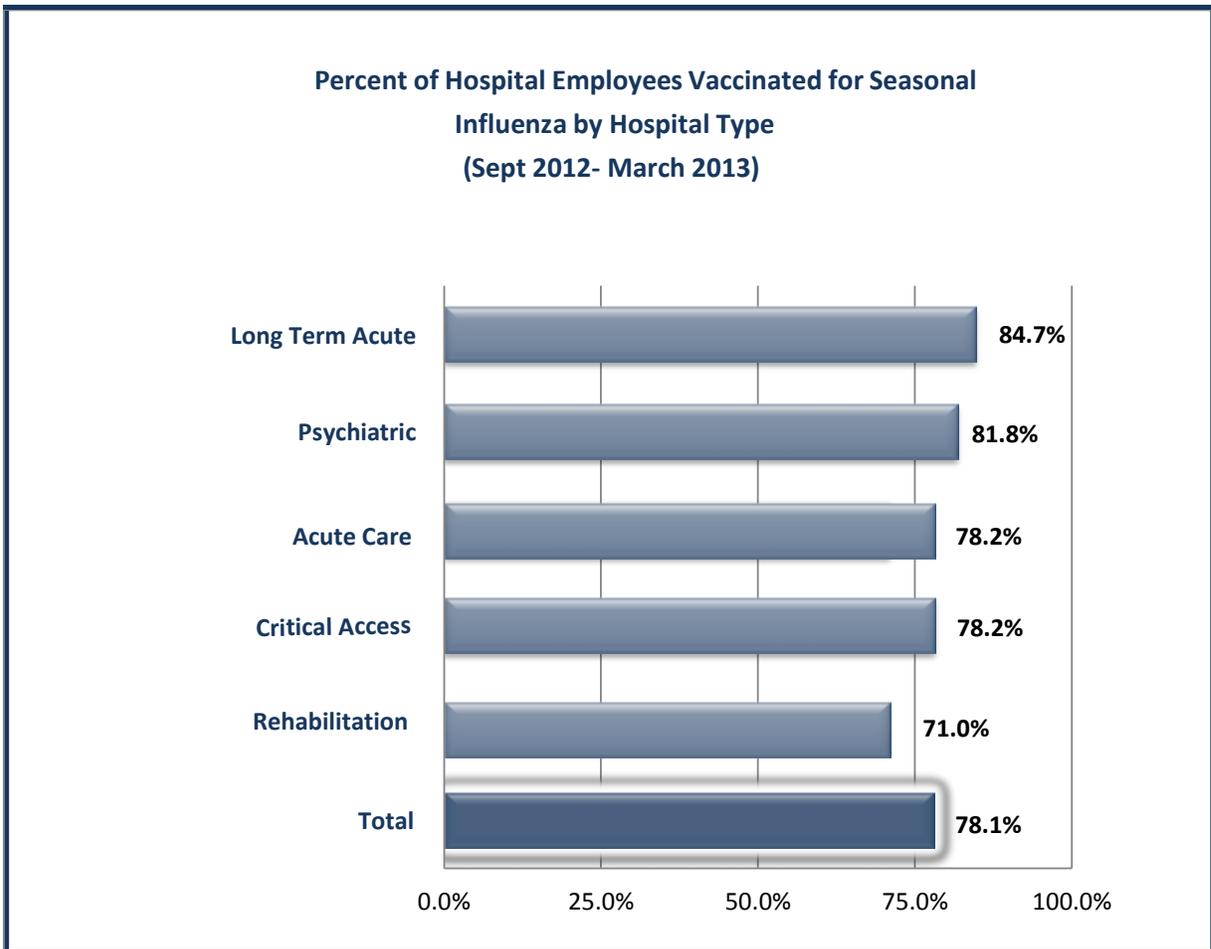


Figure 5 above shows the comparison of hospital employees vaccinated for seasonal influenza by hospital type.

The vaccination rate was significantly higher in long-term acute care hospitals (84.7%) during the 2012=2013 influenza season than psychiatric, rehabilitation, critical access, and acute care hospitals, and significantly higher than the West Virginia rate of 78.1%.

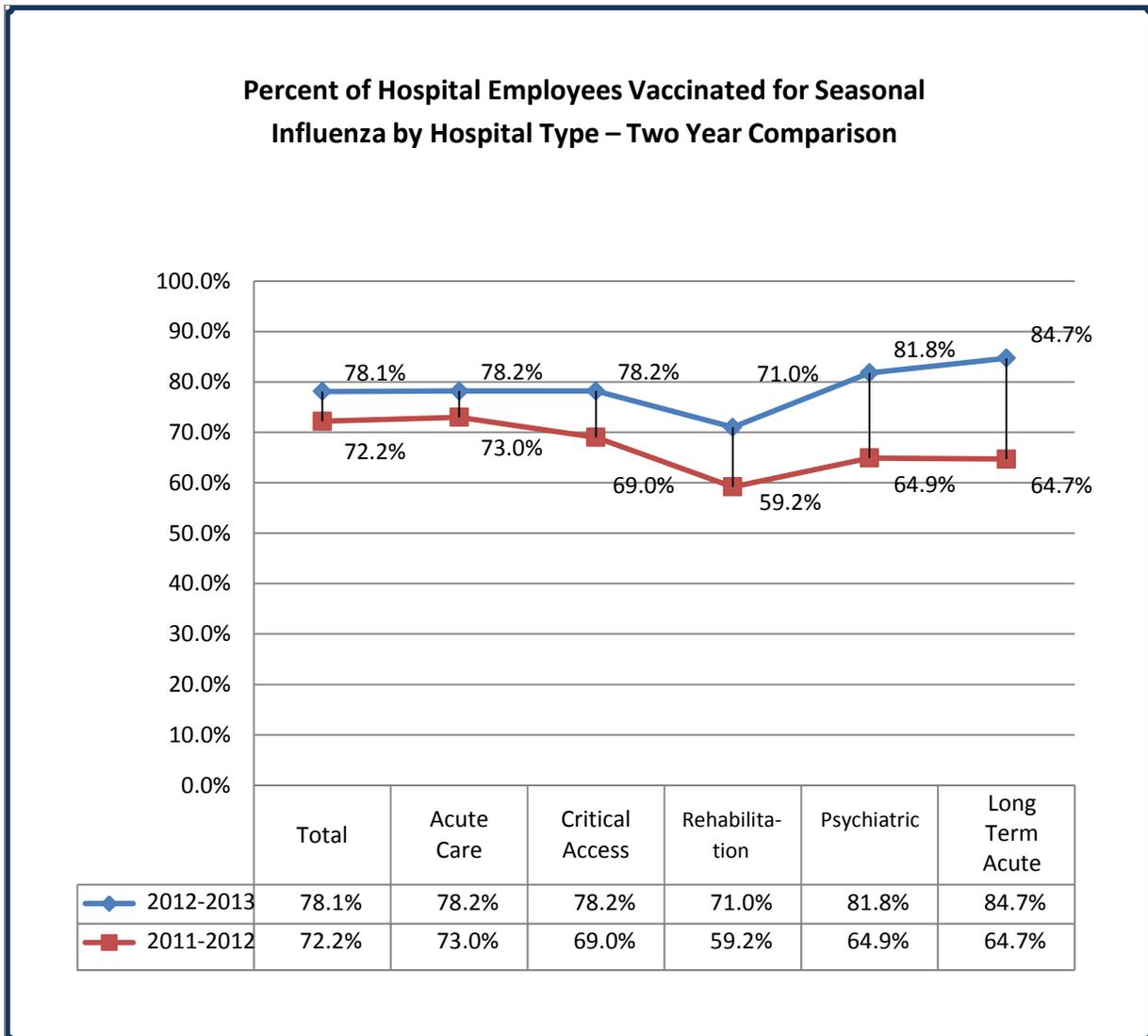
Table 2 below summarizes the seasonal influenza vaccination public reporting survey results of WV hospitals.

**Table 2**  
**West Virginia Healthcare-Associated Infection Public Reporting**  
**Hospital Seasonal Influenza Vaccination Survey Results**

West Virginia Health Care Authority • August 15, 2013

Question	Response	2012-2013
		% (# Hospitals)
1. Which personnel groups are included in your facility's annual influenza vaccination campaign? <i>(check all that apply)</i>	Full-time employees	100% (60)
	Part-time employees	100% (60)
	Non -employee physicians	82% (49)
	Non -employee advanced practice nurses	73% (44)
	Non -employee physician assistants	70% (42)
	Students and trainees	75% (45)
	Adult volunteers	77% (46)
	Other, specify: _____	30% (18)
2. Are healthcare personnel at your facility required to pay out-of-pocket costs for influenza vaccination received at your facility?	Yes	2% (1)
	No	98% (59)
2a. If yes, how much do each of the following groups need to pay for influenza vaccination?	Full-time employees	\$0.00
	Part-time employees	\$0.00
	Non -employee physicians	\$25.00
	Non -employee advanced practice nurses	\$25.00
	Non -employee physician assistants	\$25.00
	Students and trainees	\$25.00
	Adult volunteers	\$0.00
	Other, specify: _____	\$0.00
3. Which of the following methods is your facility using this influenza season to deliver vaccine to your healthcare personnel? <i>(check all that apply)</i>	Have mobile vaccination carts	73% (44)
	Provide vaccination in Occupational/Employee Health	90% (54)
	Provide vaccination in wards, clinics, cafeterias, or common areas	82% (49)
	Provide vaccination during nights and weekends	92% (55)
	Provide vaccination at any meetings or grand rounds	57% (34)
	Provide visible vaccination of any key personnel/leadership	48% (29)
	Other, specify: _____	12% (7)
	None of the above	0
4. Which of the following strategies does your facility use to promote/enhance healthcare personnel influenza vaccination at your facility? <i>(check all that apply)</i>	Send vaccination reminders by mail, e-mail, and/or pager	85% (51)
	Coordinate vaccination with other annual programs(e.g. tuberculin skin testing)	33% (20)
	Require receipt of vaccination for credentialing (if no contraindications)	7% (4)
	Require receipt of vaccination as a condition of employment	17% (10)
	Advertise vaccination with a campaign including posters, flyers, buttons, and/or fact sheets	95% (57)
	Provide education on the benefits and risks of vaccination	95% (57)
	Track unit-based vaccination rates for some or all units/departments	60% (36)
	Plan to provide feedback on vaccination rates to facility administration	83% (50)
	Provide incentives for vaccination	38% (23)
	Track vaccination on a regular basis for targeting purposes	58% (35)
	Other, specify: _____	5% (3)
No formal promotional activities are planned	0	
5. Does your facility require healthcare personnel who receive off-site influenza vaccination to provide documentation of their vaccination status?	Yes	87% (52)
	No	13% (8)
5a. If yes, what type of documentation is acceptable? <i>(check all that apply)</i>	Receipt or other proof of purchase from pharmacy or other vaccinator	69% (36)
	Insurance claim for receipt of influenza vaccination	21% (11)
	Note from person or organization that administered the vaccination	77% (40)
	Handwritten statement or e-mail from healthcare worker	33% (17)
	Signature of healthcare worker on standard facility form attesting to vaccination	54% (28)
	Other, specify: _____	8% (4)
6. What does your facility require from healthcare personnel who refuse influenza vaccination? <i>(check one)</i>	Standardized paper or electronic declination form completed by healthcare worker	77% (46)
	Reading a statement about the risks of non-vaccination (no signature required)	3% (2)
	Verbal declination of vaccination by healthcare worker	5% (3)
	Facility does not track vaccine declinations	3% (2)
	Other, specify: _____	12% (7)

Figure 6



A two year comparison shows a significant improvement in all hospital types in the seasonal influenza vaccination rates for hospital employees as shown in **Figure 6** above.

**Key Findings**

- 78.1% of all hospital employees in West Virginia received a seasonal influenza vaccination during the 2012-2013 influenza season, up from 72.2% last year, and slightly greater than the national rate of 72%.
- In the 2011-2012 influenza vaccination season, acute care hospitals had the highest vaccination rates. Long-term acute care hospitals showed significant improvement in the 2012-2013 season and had the highest vaccination rates.
- Long-term acute care hospitals had the most significant improvement in vaccination rates between the 2011-2012 and 2012-2013 influenza seasons; rehabilitation and psychiatric hospitals also showed significant improvements.

## Future HAI Initiatives

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Over the next year, the WVHCA and the HAI Control Advisory Panel will:

- Continue the collection and quality review of HAI data.
- Develop guidelines for the public release of data.
- Revise reporting requirements as necessary to align with state and national priorities.
- Collaborate with the Bureau for Public Health, Office of Epidemiology and Prevention Service's HAI Program, to reduce HAIs by providing HAI data to the West Virginia Department of Health and Human Resources for consideration in their hospital oversight and epidemiology and disease surveillance programs.

## Technical Notes

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### Standard Infection Ratio (SIR)

There are various statistics that can be used to summarize and report HAI data at a national, state, or local level over time. The standardized infection ratio (SIR) is a commonly reported summary measure because it adjusts for patients of varying risk within each facility, which allows for valid comparisons between facilities. The SIR compares the actual number of infections reported by the hospital to the baseline U.S. experience (from the National Healthcare Safety Network aggregate data), adjusting for several risk factors that have been found to be significantly associated with differences in infection incidence. A SIR greater than 1.0 indicates that more infections occurred in the hospital than what was predicted based on national averages for a hospital of that type and size; conversely, a SIR less than 1.0 indicates that fewer infections occurred than were expected.<sup>12</sup> For example, a SIR of 1.20 indicates that the hospital had 20% more infections than expected; a SIR of 0.80 indicates that the hospital had 20% fewer infections than expected. When the number of expected infections are <1, the number of procedures performed is too low to calculate a precise SIR and comparative statistics.

### Healthcare Personnel Influenza Vaccinations

Results may not be directly comparable across time due to differences in data reporting methodologies. The 2012-2013 data represent vaccinations among personnel employed at any time during the influenza season, regardless of length of employment. Personnel that terminated employment prior to being vaccinated are included in the results. Therefore, the results may not represent the vaccination rate among current personnel.

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