West Virginia Health Care Authority

Healthcare-Associated Infection Public Reporting Program

Annual Report 2017

For Data Reported CY 2015

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Introduction

Healthcare-associated infections (HAIs) are infections that are acquired by patients while seeking treatment in a healthcare setting. In a study conducted in 2011, and the most recent comprehensive study to date, the Centers for Disease Control and Prevention (CDC) estimated that approximately 722,000 HAIs occurred nationally, which equated to 4% of inpatients in U.S. acute care facilities. As many as 75,000 deaths were attributable to HAIs. It is estimated that at any one time in the U.S., one out of every 25 hospitalized patients are affected by an HAI.[1]

Not only are HAIs costly in terms of patient morbidity and mortality, they also increase the cost of healthcare substantially. A study of 1.69 million admissions from 77 hospitals in 2006 found that overall net inpatient margins were decreased by $286 million or $5,018 per infected patient.[2] Although the study was conducted 10 years ago, it shows how facility margins are eroded by the high cost of HAIs. Margins will erode even further as reimbursement methodologies change to bundled payments, value-based care models, or some other form of reimbursement other than historical fee-for-service payment if HAIs are not addressed. As a result of the human and financial impact associated with an HAI, healthcare facilities and major public health governments focus on reducing them since they are a preventable cost.

In 2013, researchers conducted a meta-analysis using a large CDC database to identify not only the five most common infections that patients acquire after they've been admitted to the hospital, but the additional costs associated with HAI; those costs equated to nearly $10 billion a year to the U.S. health care system.[3]

The research found the following associated costs for hospital acquired infections, which probably underestimated the true cost of treating health care-associated infections;

- Central line-associated bloodstream infections averaged about $45,000 per case.
- Pneumonia infections that strike patients who are put on ventilators to help them breathe cost about $40,000 per case.

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[1] Magill SS, Edwards JR, Bamberg W, et al. Multistate point-prevalence survey of health care-associated infections. *N Engl J Med*. Mar 2014;370:1198-208. Doi: 10.1056/NEJMoa1306801 available at: http://www.cdc.gov/media/dpk/2014/docs/hai/Multistate-Point-Prevalence.pdf

[2] Murphy, Denise, RN, BSN, MPH, CIC, Whiting, Joseph, MBA, FACHE, Hollenbeak, Christopher, PhD, Dispelling the Myths: The True Cost of Healthcare-Associated Infections. *An APIC Briefing*. February, 2007.

[3] Goodman, Brenda, National Nurses United, Hospital-acquired Infections Cost $10 Billion a Year, Sept. 3, 2013, available at: http://www.nationalnursesunited.org/news/entry/hospital-acquired-infections-cost-10-billion-a-year/

- Surgical site infections, which occur in about one out of every 50 operations, cost around $21,000 each to treat.
- *C. difficile* infections, which occur in about four for every 1,000 patients who spend a day in the hospital and the second most common kind of infection, cost about $11,000 each to treat.
- Urinary tract infections associated with the use of catheters cost about $900 each.[3]

In order to address this serious problem within the healthcare system, many national and state agencies have been working towards understanding the full extent of HAIs and how to prevent them from occurring. While elimination of HAIs is a long term goal nationwide,[4] prevention is the focus of short term intervention strategies. In a joint call to action, the Association of Professionals in Infection Control and Epidemiology (APIC), the Society for Healthcare Epidemiology of America (SHEA), and the CDC, along with other public health associations, called for the elimination of HAIs by:

- Promoting adherence to evidence-based practices through partnering, educating, implementing, and investing;
- Increasing sustainability through the alignment of financial incentives and reinvestment in successful strategies;
- Filling knowledge gaps to respond to emerging threats through basic, translational, and epidemiological research;
- Collecting data to target prevention efforts and to measure progress; and
- Sufficient investment underpinning these efforts.[4]

Because HAIs place a large financial burden on the healthcare system, these key principles call upon financial and interagency support to be effective. Understanding the prevalence of HAIs and the potential risk factors for contracting HAIs are the major goals of HAI surveillance and reporting. As a result, effective control and prevention measures can be designed and implemented for improving the incidence of HAIs while reducing associated financial burdens on facilities. The costs associated with HAI treatment are substantial with the annual cost of treating HAIs in U.S. hospitals estimated to be $28 to $33 billion dollars.[5]

HAIs are considered preventable; however, discussions regarding how many of these HAIs are truly preventable have stemmed from the 2008 Medicare decision to stop payment on eight preventable conditions, three of which are considered "reasonably preventable" HAIs: central line associated blood stream infection (CLABSI), catheter associated urinary tract infection (CAUTI), and surgical site

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[4] Cardo D, Dennehy PH, Halverson P, et al. Moving towards elimination of healthcare-associated infections: A call to action. *Am J Infect Control*. 2010;1-5. Doi: 10.1016/j.ajic.2010.09.001.

[5] Scott RD. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention, March 2009, available at: http://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf

infections (SSI).[6] There was a systematic review conducted in 2011 to determine the proportion of HAIs that are preventable under the current intervention practices. The study determined that up to 70% of CLABSI and CAUTI cases, and 55% of SSI cases, are preventable.[5] By instituting prevention measures that reduce HAIs by 20%, it is predicted the cost of treating HAIs would save U.S. hospitals $5.7 to $6.8 billion dollars a year.[4]

A recent report from the U.S. Department of Health and Human Services (DHHS) shows similar outcomes. In a press release published in December 2014, improved patient safety initiatives to reduce hospital-acquired conditions saved an estimated 50,000 patient lives, prevented 1.3 million hospital acquired infections and saved approximately $12 billion dollars in healthcare costs between 2010 and 2013, which was a 17% reduction in hospital acquired conditions over that time period.[7]

DHHS and the Centers for Medicare & Medicaid Services (CMS) has led a concerted effort to improve patient safety. CMS increased the focus on patient safety through Medicare payment incentives, Which caused hospitals throughout the country to reduce adverse events. The nationwide Hospital-Acquired Condition Reduction Program (HAC), established by Section 3008 of the Patient Protection And Affordable Care Act (ACA) instituted in 2010, is a mandatory pay-for-performance program that penalizes hospitals with the highest rates of infections in the nation with a 1% loss to every Medicare payment for one year.[8, 9]

As of fiscal year 2016, approximately 724 hospitals, nationally, were subject to an estimated payment reduction of $364 million dollars in penalties. In WV, four general acute care hospitals (14%) in SFY 2016 fell into the 75th quartile of hospitals with high total HAC scores and will have their payments reduced to 99 percent of what would have been paid for such discharges.[9]

The growing pressure of penalties, coupled with the concern over patient safety, place the prevention of healthcare-associated infections as one of the highest priorities for healthcare facilities across the nation.

HAI Reporting in West Virginia

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

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[6] Umscheid CA, Mitchell MD, Doshi JA, et al. Estimating the Proportion of Healthcare-Associated Infections that are Reasonably Preventable and the Related Mortality and Costs. *Infect Control Hosp. Epidemiol.* Feb. 2011;32(2):101-114. Doi: 10.1086/657912.

[7] US Department of Health and Human Services, *HHS News* (press release). December 2, 2014, available at: http://www.hhs.gov/news/press/2014pres/12/20141202a.html.

[8] Rau, Jordan. Hospitals to Pay Big Fines for Infections, Avoidable Injuries. *NPR News.* June 23, 2014, available at: http://www.npr.org/blogs/health/2014/06/23/323998618/hospitals-to-pay-big-fines-for-infections-avoidable-injuries.

[9] US Department of Health and Human Services, Centers for Medicare and Medicaid Services. Fiscal Year (FY) 2016 Results for the CMS Hospital-Acquired Conditions (HAC) Reduction Program. December 10, 2015, available at: https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2015-Fact-sheets-items/2015-12-10-2.html

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 the results of required reporting to the Legislative Oversight Committee on Health and Human Resources Accountability.

For the purposes of this report, a hospital has been defined in West Virginia §16-29B-3 as "any facility subject to licensure as such under the provisions of article five-b of this chapter, and any acute care facility operated by the state government which is primarily engaged in providing to inpatients, by or under the supervision of physicians, diagnostic and therapeutic services for medical diagnosis, treatment and care of injured, disabled or sick persons, and does not include state mental health facilities or state long-term care facilities."[10] Although the terms hospital and facility have differing definitions, in this report the use of facility and hospital is used interchangeably to refer to a hospital as previously defined. In 2015, sixty-five (65) West Virginia facilities fell under that definition and are represented in this report; twenty-nine (29) general acute care hospitals, twenty-one (21) critical access hospitals, four (4) long term acute care hospitals, three (3) psychiatric hospitals, five (5) rehabilitation hospitals, and three (3) rehabilitation units within general acute care hospitals.

HAI Surveillance and Reporting Requirements

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

[10] West Virginia Legislature, West Virginia Code §16-29B-3, available at: http://www.legis.state.wv.us/legisdocs/code/16/WVC%2016%20%20-%2029%20B-%20%20%203%20%20.htm.

of HAIs on patient outcomes and ability for hospitals to collect and report the data. Once reporting guidance is developed, it is distributed to infection control contacts at each hospital. As a requirement of WV State Statute §16-5B-17, hospitals must submit data to the CDC's National Healthcare Safety Network (NHSN), which was developed as a voluntary surveillance system for hospitals to identify and monitor HAIs, but has evolved as the tool for mandatory HAI reporting by many states and the federal government.

West Virginia HAI reporting requirements began in July 2009. In January 2011, 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 CMS requirements as West Virginia's reporting requirements. In addition, the HAI Control Advisory Panel recommended that Critical Access Hospitals (CAHs) also report State specific HAI since the Hospital Inpatient Quality Reporting Program is voluntary and not required for CAHs by CMS at this time. Healthcare personnel influenza vaccination data was also required of non-state run psychiatric facilities. These additional requirements were approved by the WVHCA Board in August 2012. **Table 1**, pages 10-11, summarizes the measures required to be submitted for West Virginia's HAI Public Reporting Program in the 2015 data collection period.

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 the results are disseminated to the HAI Control Advisory Panel for review and approval prior to release.

This report summarizes data reported on central line associated blood stream infections (CLABSI), catheter associated urinary tract infections (CAUTI), surgical site infections (SSI) for colon surgeries and abdominal hysterectomies, Methicillin-Resistant *Staphylococcus aureus* (MRSA) bacteremia, *Clostridium difficile* infections (CDI), as well as healthcare personnel seasonal influenza vaccinations for the 2015-2016 reporting period. Due to the data collection and processing schedule, this report only includes healthcare-associated infection data submitted in calendar year 2015, and does not include any data from calendar year 2016. The 2016 data will be summarized in future reports.

Report Limitations

It is important to note that there are limitations to the data presented. The 2015 data in this report is pulled directly from the CDC's NHSN and input by the individual facility after following the NHSN protocol and procedures outlined in the "West Virginia Healthcare-Association Infection 2015 Reporting Guide" provided to each facility and available on the WVHCA website. The data was not validated, but was analyzed by the WVHCA for completeness.

There is also great variability in the internal surveillance methods used by facilities for HAI detection, and these methods are not standardized across facilities. Finally, the actual case definition for these HAI events changes on an almost annual basis, so a comparison of different years of data should be interpreted with these changes in mind. The calendar year 2016 reporting requirements will be outlined in the "Advisory Panel Accomplishments and Future Directions" section of this report.

TABLE 1: WEST VIRGINIA HAI REQUIRED PUBLIC REPORTING MEASURES, CALENDAR YEAR 2015

Reporting Requirement	Facility Type	HAI Event	Reporting Specifications
CMS Requirement	General Acute Care Hospitals Only (Non-Critical Access)	CLABSI	Adult, Pediatric/Neonatal ICUs
			NEW Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		CAUTI	Adult and Pediatric ICUs Medical/Surgical Wards if no ICU
			NEW Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		SSI: COLO	Inpatient COLO Procedures
		SSI: HYST	Inpatient HYST Procedures
		MRSA Bacteremia LabID Event	Facility Wide Inpatient
			NEW Emergency Dept. and Observation Stays
		C. *difficile* LabID Event	Facility Wide Inpatient
			NEW Emergency Dept. and Observation Stays
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
	Long-Term Acute Care Hospitals	CLABSI	Adult & Pediatric LTAC ICUs & Wards
		CAUTI	Adult & Pediatric LTAC ICUs & Wards
		NEW MRSA Bacteremia LabID Event	Facility Wide Inpatient
		NEW C. *difficile* LabID Event	Facility Wide Inpatient
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel

	Inpatient Rehabilitation Facility	CAUTI	Adult and Pediatric Wards
		NEW MRSA Bacteremia LabID Event	Facility Wide Inpatient
		NEW C. *difficile* LabID Event	Facility Wide Inpatient
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
State Requirement	Critical Access Hospitals	CAUTI	Medical, Surgical, Medical/Surgical, ICUs
			NEW Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
	Psychiatric Hospitals (Excluding State-Run Facilities)	Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel

How to Read the HAI Report Graphs

The outcome of each hospital is depicted and coded based on performance. Those hospitals that exceeded the national baseline (i.e. performed better than expected) are noted with a green checkmark. Those hospitals that met expectations are noted with the yellow "equal" sign, and those that performed worse than expected are noted with a red "yield" sign. Some hospitals do not have enough data available to calculate standardized infection ratio (SIR) accurately and are noted with the "N/P" symbol and the reporting measure is indicated as "Too Small to Calculate".

I. Central Line Associated Blood Stream Infections (CLABSI)

A central line, also known as a central catheter, is a tube that is inserted into a large vein, usually in the neck, chest, arm, or groin and is commonly used to administer fluids and medications as well as draw blood. Depending on its use in the patient, it may be left in place for days to weeks in order to help facilitate treatment. Central line-associated blood stream infections (CLABSIs) occur when microorganisms, like bacteria, enter into the blood stream via the tube.

CLABSIs are a serious HAI. The CDC estimates CLABSIs have a mortality rate of 12 to 25 percent, with an estimated cost per patient of more than $16,000, adding more than a billion dollars annually to the costs of the healthcare system.[11]

Although there has been a 46% decrease in CLABSIs in hospitals across the U.S. from 2008-2013, an estimated 30,100 CLABSIs still occur in intensive care units and wards of U.S. acute care facilities each year.[12] CLABSIs can also lead to serious complications including an increased number of inpatient stays, increased costs and increased risk of death. The aggregate attributable patient hospital cost of a CLABSI is approximately $45,000 per case,[3] while also causing thousands of deaths per year. CLABSIs can often be prevented by adherence to evidence-based guidelines for the insertion, use, and maintenance of central lines.

Since January 2011, West Virginia General Acute Care Hospitals have been required to report data On CLABSIs that occur among patients in all ICUs. Beginning in October 2012, Long Term Acute Care Hospitals were also required to report facility data on CLABSIs.

Key Findings for CLABSI: General Acute Care Hospitals (Figure 1)

- In 2015, 135 CLABSIs were reported in all ICUs, adult/pediatric medical, surgical and medical/surgical wards in West Virginia General Acute Care Hospitals. In 2014, CLABSIs were only reported from ICUs.
- Significantly fewer CLABSIs occurred in West Virginia General Acute Care Hospitals than were expected based on national baselines set by NHSN. The West Virginia SIR was 0.46, indicating that 54% fewer CLABSI events occurred than the NHSN baseline expected.
- Of 29 General Acute Care Hospitals, 10 (34%) General Acute Care Hospitals had zero CLABSIs.
- Of those facilities that had a sufficient number of central line days to calculate a reliable SIR, all West Virginia General Acute Care Hospitals met or exceeded national standards of CLABSI events by having as many or fewer events than expected.

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[11] The Joint Commission, New Monograph Aims to Decrease Central Line-Associated Bloodstream Infections (CLABSIs) International Project to Address Preventable Infections, May 2012, available at: http://www.pwrnewmedia.com/2012/joint_commission/clabsi/.

[12] CDC National and State Healthcare-Associated Infections Progress Report, published March 2014, available at: http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf.

FIGURE 1: 2015 CLABSI DATA, GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Central Line Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Monongalia General Hospital	✓	1	5780	8.45	0.12	0.006, 0.583
West Virginia University Hospital (WVUH)	✓	13	24914	48.69	0.27	0.148, 0.445
Raleigh General Hospital	✓	4	10045	14.63	0.27	0.087, 0.659
Cabell Huntington Hospital	✓	25	19762	40.10	0.62	0.412, 0.907
Charleston Area Medical Center (CAMC)	✓	39	45871	84.34	0.46	0.333, 0.626
Berkeley Medical Center	✓	2	5055	7.21	0.28	0.047, 0.917
CAMC- Teays Valley Hospital	✓	0	2684	3.65	0.00	0, 0.822
Beckley Appalachian Regional Hospital	✓	0	3196	4.16	0.00	0, 0.720
Bluefield Regional Medical Center	✓	0	2304	3.08	0.00	0, 0.972
United Hospital Center	✓	2	5237	7.66	0.26	0.044, 0.863
Wheeling Hospital	✓	0	5415	7.74	0.00	0, 0.387
Fairmont Regional Medical Center	=	3	1922	2.47	1.21	0.309, 3.303
Thomas Memorial Hospital	=	6	5154	7.40	0.81	0.329, 1.687
Logan Regional Medical Center	=	0	1807	2.68	0.00	0, 1.116
Ohio Valley Medical Center	=	2	2987	4.80	0.42	0.070, 1.378
Davis Medical Center	=	1	1033	1.38	0.73	0.036, 3.574
Weirton Medical Center	=	5	3366	4.47	1.12	0.410, 2.482
Princeton Community Hospital	=	6	3706	5.76	1.04	0.422, 2.167
Camden Clark Medical Center	=	2	4109	5.90	0.34	0.057, 1.119
Greenbrier Valley Medical Center	=	1	1573	2.09	0.48	0.024, 2.359
St. Mary's Medical Center	=	20	12613	25.84	0.77	0.486, 1.174
Wetzel County Hospital	N/P	0	74	0.10	Too small to Calculate	
Summersville Regional Medical Center	N/P	0	404	0.54	Too small to Calculate	
Stonewall Jackson Memorial Hospital	N/P	1	597	0.78	Too small to Calculate	
Williamson Memorial Hospital	N/P	0	188	0.30	Too small to Calculate	
Pleasant Valley Hospital	N/P	0	616	0.78	Too small to Calculate	
Reynolds Memorial Hospital	N/P	1	466	0.62	Too small to Calculate	
Welch Community Hospital	N/P	1	159	0.24	Too small to Calculate	
Saint Francis Hospital	N/P	0	589	0.88	Too small to Calculate	
WV Overall SIR	✓	**135**	**171626**	**296.76**	**0.46**	**0.383, 0.537**

Legend:	
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▽	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few central line days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Key Findings for CLABSI: Long Term Acute Care Facilities (Figure 2)

- In 2015, one new Long Term Acute Care Health System, that includes 2 hospitals in WV, began reporting.
- In 2015, 13 CLABSIs were reported for Long Term Acute Care Facilities in West Virginia.
- Significantly fewer CLABSIs occurred in Long Term Acute Care Hospitals than were expected based on national baselines set by NHSN. The West Virginia SIR was 0.70, indicating that 30% fewer CLABSI events occurred than the NHSN baseline expected.
- Two West Virginia Long Term Acute Care facilities met CLABSI event national standards by having as many or fewer events than expected; one facility exceeded expectations, while one stem system had 38% more events than expected. Statewide, the number of infections were similar to the number predicted.

FIGURE 2: 2015 CLABSI DATA, LONG TERM ACUTE CARE FACILITIES

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Central Line Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Select Specialty Hospital, Charleston	=	3	6463	5.82	0.52	0.131, 1.404
***Acuity Specialty Hospital**	=	9	7273	6.55	1.38	0.671, 2.523
Cornerstone Hospital of Huntington	✓	1	6779	6.10	0.16	0.008, 0.808
WV Overall SIR	=	**13**	**20515**	**18.46**	**0.70**	**0.392, 1.174**

Legend:	*Acuity Specialty Hospital includes 2 Ohio facilities in 2015
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	Long-Term Acute Care Hospitals had too few central line days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

II. Catheter Associated Urinary Tract Infection (CAUTI)

Urinary tract infections are infections of any part of the urinary system, which includes the bladder and the kidneys. Catheter associated urinary tract infections (CAUTI) arise in those hospitalized patients who have had a urinary catheter placed, which is a tube that is inserted into the bladder to drain urine into a connected bag. In the same way that central lines can introduce microorganisms, urinary catheters provide an access point for these infections to spread into the body, in this case the urinary tract.

Per the CDC, CAUTIs are the most common type of healthcare-associated infection. They account for more than 30% of acute care hospital infections, with medical costs of more than $758 per CAUTI and an aggregate cost of greater than $340 million in the U.S. each year.[13]

CAUTIs can often be prevented using evidence-based guidelines for insertion, use, and maintenance, just as with all other HAIs, and the costs associated with a CAUTI avoided. Because the incidence and cost of avoidable CAUTIs is substantial, all General Acute Care Hospitals and Critical Access Hospitals with an ICU have been required to report CAUTI for all adult and pediatric ICUs since January 2012. Those General Acute Care Hospitals and Critical Access Hospitals without an ICU were required to report CAUTI for inpatient medical wards. Long Term Acute Care Hospitals and Inpatient Rehabilitation Facilities began reporting CAUTI in October 2012.

Beginning in 2013, General Acute Care Hospitals and Critical Access Hospitals that did not have an adult/pediatric ICU were required to report CAUTI events for inpatient Medical/Surgical units as well. Additional reportable units within General Acute Care and Critical Access Hospital sites were added in 2015 to include all adult and pediatric medical, surgical and combination medical/surgical wards in addition to the previously reportable sites.

Key Findings for CAUTI: General Acute Care Facilities (Figure 3)

- In 2015, there were 156 CAUTIs reported for all West Virginia General Acute Care Hospitals, down from 162 in 2014.
- Significantly fewer CAUTIs occurred in West Virginia General Acute Care Hospitals than were expected based on the national baseline set by NHSN. The West Virginia SIR was 0.43, indicating that 57% fewer CAUTIs occurred than were expected.
- Of those facilities that had a sufficient number of urinary catheter days to calculate a reliable SIR, national standards were met or exceeded.
- Of 29 General Acute Care Hospitals, 9 (31%) General Acute Care Hospitals had zero CAUTIs.

[13] Centers for Disease Control and Prevention, National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure, available at: http://www.hospitalsafetyscore.org/media/file/CAUTI.pdf.

FIGURE 3: 2015 CAUTI DATA FOR GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Catheter Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Monongalia General Hospital	✓	0	6969	10.96	0.00	0, 0.273
West Virginia University Hospital (WVUH)	✓	6	16415	34.59	0.17	0.070, 0.361
Raleigh General Hospital	✓	5	11004	20.53	0.24	0.089, 0.540
Ohio Valley Medical Center	✓	2	3782	7.41	0.27	0.045, 0.891
Princeton Community Hospital	✓	2	5665	10.76	0.19	0.031, 0.614
Camden Clark Medical Center	✓	1	8416	13.14	0.08	0.004, 0.375
Charleston Area Medical Center (CAMC)	✓	46	39472	86.99	0.53	0.392, 0.699
Beckley Appalachian Regional Hospital	✓	0	5024	7.44	0.00	0, 0.402
Logan Regional Medical Center	✓	3	10646	17.68	0.17	0.043, 0.462
Greenbrier Valley Medical Center	✓	0	4120	6.05	0.00	0, 0.495
Wheeling Hospital	✓	5	9167	13.20	0.38	0.139, 0.840
Fairmont Regional Medical Center	=	0	1477	2.14	0.00	0, 1.399
Thomas Memorial Hospital	=	5	5493	8.62	0.58	0.212, 1.285
Williamson Memorial Hospital	=	0	1007	1.96	0.00	0, 1.527
Pleasant Valley Hospital	=	1	1695	2.56	0.39	0.020, 1.924
Reynolds Memorial Hospital	=	1	1212	1.74	0.58	0.029, 2.840
Cabell Huntington Hospital	=	35	19191	41.26	0.85	0.600, 1.167
Davis Medical Center	=	2	1822	2.63	0.76	0.128, 2.516
Summersville Regional Medical Center	=	0	1385	2.09	0.00	0, 1.436
Stonewall Jackson Memorial Hospital	=	0	770	1.10	0.00	0, 2.712
Berkeley Medical Center	=	7	6544	12.28	0.57	0.249, 1.127
Weirton Medical Center	=	3	3481	5.69	0.53	0.134, 1.435
CAMC- Teays Valley Hospital	=	1	2793	4.02	0.25	0.012, 1.227
Bluefield Regional Medical Center	=	2	3894	5.43	0.37	0.062, 1.217
United Hospital Center	=	6	6302	8.76	0.69	0.278, 1.424
St. Mary's Medical Center	=	22	13414	29.64	0.74	0.477, 1.105
Saint Francis Hospital	=	1	1062	1.38	0.72	0.036, 3.572
Wetzel County Hospital	N/P	0	255	0.43	Too Small to Calculate	
Welch Community Hospital	N/P	0	489	0.64	Too Small to Calculate	
WV Overall SIR	✓	**156**	**192966**	**361.12**	**0.43**	**0.368, 0.504**

Legend:	
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▽	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few catheter days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Key Findings for CAUTI: Long Term Acute Care Hospitals (Figure 4)

- In 2015, 26 CAUTIs were reported for Long Term Acute Care Facilities in West Virginia.
- The 2015 CAUTI SIR for West Virginia Long Term Acute Care Facilities was not significantly different than the national rate, with 16% fewer CAUTIs than expected.
- One facility exceeded expectations, while all other West Virginia Long Term Acute Care Facilities met national standards for CAUTI events by having a similar number of CAUTI events compared to what was expected.

FIGURE 4: 2015 CAUTI DATA FOR LONG TERM ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Urinary Catheter Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Select Specialty Hospital, Charleston	=	17	5740	11.48	1.48	0.891, 2.323
***Acuity Specialty Hospital**	=	8	4286	8.57	0.93	0.433, 1.772
Cornerstone Hospital of Huntington	✓	1	5475	10.95	0.09	0.005, 0.450
WV Overall SIR	=	**26**	**15501**	**31.00**	**0.84**	**0.560, 1.211**

Legend:	*Acuity Specialty Hospital includes 2 Ohio facilities in 2015
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	Long-Term Acute Care Hospitals had too few catheter days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Key Findings for CAUTI: Critical Access Hospitals (Figure 5)

- In 2015, there were 2 CAUTIs reported for all West Virginia Critical Access Hospitals.
- The number of CAUTIs that occurred in West Virginia Critical Access Hospitals in 2015 were significantly less than expected based on the national baseline.
- Overall, the West Virginia SIR was 0.14, indicating that 86% fewer CAUTIs occurred than the NHSN baseline expected.
- Of those facilities that had a sufficient number of catheter days to calculate a reliable SIR, all West Virginia Critical Access Hospitals met national standards by having the number of events similar to those expected.
- Of 20 Critical Access Hospitals, 19 (95%) had zero CAUTIs.

FIGURE 5: 2015 CAUTI DATA FOR CRITICAL ACCESS HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Catheter Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Preston Memorial Hospital	=	0	755	1.16	0	0, 2.575
Summers County ARH	=	0	573	1.09	0	0, 2.752
Jackson General Hospital	=	0	661	1.02	0	0, 2.924
Plateau Medical Center	=	0	1281	1.97	0	0, 1.519
Jefferson Medical Center	=	0	581	1.15	0	0, 2.602
Grant Memorial Hospital	=	1	790	1.20	0.83	0.042, 4.107
Sistersville General Hospital	N/P	0	14	0.02	Too Small to Calculate	
Braxton County Memorial Hospital	N/P	0	332	0.53	Too Small to Calculate	
Roane General Hospital	N/P	0	517	0.83	Too Small to Calculate	
Minnie Hamilton Health System	N/P	0	95	0.15	Too Small to Calculate	
Potomac Valley Hospital	N/P	0	359	0.69	Too Small to Calculate	
Montgomery General Hospital	N/P	0	223	0.42	Too Small to Calculate	
St. Joseph's Hospital of Buckhannon	N/P	1	610	0.91	Too Small to Calculate	
Hampshire Memorial Hospital	N/P	0	343	0.65	Too Small to Calculate	
Broaddus Hospital	N/P	0	183	0.35	Too Small to Calculate	
Pocahontas Memorial Hospital	N/P	0	75	0.12	Too Small to Calculate	
War Memorial Hospital	N/P	0	275	0.44	Too Small to Calculate	
Webster County Memorial Hospital	N/P	0	0	0.00	Too Small to Calculate	
Grafton City Hospital	N/P	0	605	0.98	Too Small to Calculate	
Boone Memorial Hospital	N/P	0	99	0.16	Too Small to Calculate	
Overall WV SIR	✓	2	8371	13.85	0.14	0.024, 0.477

Legend:	
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	Critical Access Hospitals had too few catheter days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Key Findings for CAUTI: Inpatient Rehabilitation Hospitals, Freestanding and Units within a Hospital (Figure 6)

- In 2015, a total of 2 CAUTIs were reported for Freestanding Inpatient Rehabilitation Hospitals and Rehabilitation Units within Hospitals in West Virginia, down from 7 in 2014.
- The number of CAUTIs that occurred in West Virginia facilities overall in 2015 were significantly less than expected based on the national baseline.
- Of those facilities that had a sufficient number of catheter days to calculate a reliable SIR, all West Virginia Freestanding and Hospital Inpatient Rehabilitation facilities met national standards by having as many or fewer events than expected.
- Overall, the West Virginia SIR was 0.19, indicating that 81% fewer CAUTIs occurred than the NHSN baseline expected.

- Overall, the West Virginia SIR was 0.19, indicating that 81% fewer CAUTIs occurred than the NHSN baseline expected.
- Of the 8 Inpatient Rehabilitation Hospitals and Units in West Virginia, 6 (75%) had zero CAUTIs.

FIGURE 6: 2015 CAUTI DATA FOR INPATIENT REHABILITATION HOSPITALS, WITHIN HOSPITALS AND FREESTANDING

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Catheter Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
HealthSouth Western Hills Regional Rehabilitation Hospital	=	0	783	2.04	0	0, 1.472
HealthSouth Rehabilitation Hospital of Huntington	=	1	755	1.59	0.63	0.032, 3.111
HealthSouth Southern Hills Rehabilitation Hospital	=	0	1080	2.27	0	0, 1.321
HealthSouth Mountain View Regional Rehabilitation Hospital	=	0	1408	2.96	0	0, 1.013
Weirton Medical Center	**N/P**	1	106	0.28	Too Small to Calculate	
Charleston Area Medical Center	**N/P**	0	305	0.79	Too Small to Calculate	
Logan Regional Medical Center	**N/P**	0	116	0.30	Too Small to Calculate	
Peterson Rehabilitation Hospital	**N/P**	0	86	0.40	Too Small to Calculate	
WV Overall SIR	√	2	4639	10.62	0.19	0.032, 0.622

Legend:	
√	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	Rehabilitation Hospitals and General Acute Care Hospital Rehabilitation Units had too few catheter days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

III. Surgical Site Infections (SSI)

Surgical site infections (SSI) are infections that occur at the site where a surgical procedure was performed and may be superficial or involve tissue, organs or implanted material.[14] In 2010, the CDC estimated 16 million operative procedures were performed in acute care hospitals in the United States.

The CDC healthcare-associated infection (HAI) prevalence survey found that there were an estimated 157,500 surgical site infections associated with inpatient surgeries in 2011. NHSN data included 16,147 SSIs following 849,659 operative procedures in all groups reported, for an overall SSI rate of 1.9% from 2006-2008. Efforts to improve the rates of SSI have proven successful; SSI related to 10 select procedures have decreased 19% between 2008 and 2013. [15]

CMS requirements for HAI reporting target two types of surgeries: colon procedures and abdominal hysterectomies. Colon procedures are surgeries that involve the colon, or large intestine, but do not include any procedure involving the rectum. An abdominal hysterectomy is a surgery that removes the uterus by entering and exiting via an abdominal incision. Adherence to proper sterilization procedures throughout the surgical process help reduce the risk of SSIs.

Since January 2012, General Acute Care Hospitals are required to report SSIs for colon procedures and abdominal hysterectomies. The following data has been broken down by the procedure type.

Key Findings for SSI: General Acute Care Hospitals for Colon Procedures

- In 2015, there were 90 SSIs for colon procedures reported for all West Virginia General Acute Care Hospitals, up from 87 in 2014.
- A higher number of SSIs for colon procedures occurred in West Virginia General Acute Care Hospitals in 2015 than were expected based on the national baseline.
- The West Virginia SIR was 1.40, indicating that 40% more SSIs for colon procedures occurred than were expected.
- Of the 29 General Acute Care Hospitals, 11 (38%) had zero SSIs for colon procedures.

Key Findings for SSI: General Acute Care Hospitals for Abdominal Hysterectomy Procedures

- In 2015, there were 23 SSIs for abdominal hysterectomy procedures reported for all West Virginia General Acute Care Hospitals, up from 22 in 2014.
- A similar number of SSIs for abdominal hysterectomy procedures occurred in West Virginia General Acute Care Hospitals in 2015 as expected based on the national baseline.
- The West Virginia SIR was 1.15, indicating that 15% more SSIs for abdominal hysterectomy procedures occurred than the NHSN baseline expected.

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[14] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Surgical Site Infections*, available at: http://www.cdc.gov/HAI/ssi/ssi.html.

[15] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Surgical Site Infection (SSI) Event,* January 2016, available at: http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf

- Of those facilities that had a sufficient number of abdominal hysterectomy procedures to calculate a reliable SIR, all West Virginia General Acute Care Hospitals met national standards.
- Of the 29 General Acute Care Hospitals, 18 (62%) of had zero SSIs for abdominal hysterectomy procedures.

FIGURE 7: 2015 SSI FOR COLON PROCEDURES DATA, GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Colon Procedures	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Berkeley Medical Center	✓	0	98	3.22	0.00	0, 0.930
Monongalia General Hospital	=	6	86	2.66	2.26	0.914, 4.690
West Virginia University Hospital (WVUH)	=	4	174	6.37	0.63	0.200, 1.515
Thomas Memorial Hospital	=	2	72	2.42	0.83	0.139, 2.735
Summersville Regional Medical Center	=	0	31	1.09	0.00	0, 2.761
Ohio Valley Medical Center	=	2	72	2.45	0.82	0.137, 2.698
Weirton Medical Center	=	1	69	2.29	0.44	0.022, 2.154
Princeton Community Hospital	=	2	68	2.20	0.91	0.152, 3.002
Charleston Area Medical Center (CAMC)	=	14	312	11.15	1.26	0.715, 2.056
CAMC- Teays Valley Hospital	=	0	36	1.13	0.00	0, 2.645
Beckley Appalachian Regional Hospital	=	0	40	1.40	0.00	0, 2.139
Bluefield Regional Medical Center	=	1	32	1.02	0.98	0.049, 4.816
United Hospital Center	=	3	89	2.81	1.07	0.272, 2.910
Greenbrier Valley Medical Center	=	2	30	1.03	1.94	0.325, 6.403
Wheeling Hospital	=	3	116	3.90	0.77	0.196, 2.092
Saint Francis Hospital	=	0	37	1.27	0.00	0, 2.366
Raleigh General Hospital	▼	6	71	2.34	2.57	1.042, 5.345
Cabell Huntington Hospital	▼	18	124	4.27	4.22	2.579, 6.540
Camden Clark Medical Center	▼	8	106	3.36	2.38	1.106, 4.522
St. Mary's Medical Center	▼	13	157	4.97	2.62	1.455, 4.363
Fairmont Regional Medical Center	N/P	1	24	0.79	Too Small to Calculate	
Williamson Memorial Hospital	N/P	0	0	0.00	Too Small to Calculate	
Pleasant Valley Hospital	N/P	0	15	0.53	Too Small to Calculate	
Reynolds Memorial Hospital	N/P	1	3	0.09	Too Small to Calculate	
Davis Medical Center	N/P	3	22	0.69	Too Small to Calculate	
Stonewall Jackson Memorial Hospital	N/P	0	18	0.65	Too Small to Calculate	
Wetzel County Hospital	N/P	0	0	0.00	Too Small to Calculate	
Logan Regional Medical Center	N/P	0	8	0.30	Too Small to Calculate	
Welch Community Hospital	N/P	0	1	0.02	Too Small to Calculate	
WV Overall SIR	▼	**90**	**1911**	**64.40**	**1.40**	**1.130, 1.710**

Legend:	
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few colon procedures to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

FIGURE 8: 2015 SSI FOR ABDOMINAL HYSTERECTOMY PROCEDURES, GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of HYST Procedures	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
Monongalia General Hospital	=	2	132	1.33	1.51	0.253, 4.988
West Virginia University Hospital (WVUH)	=	3	184	2.10	1.43	0.364, 3.894
Thomas Memorial Hospital	=	0	191	2.42	0.00	0, 1.239
Cabell Huntington Hospital	=	7	386	4.51	1.55	0.678, 3.068
Camden Clark Medical Center	=	1	151	1.38	0.73	0.036, 3.582
Charleston Area Medical Center (CAMC)	=	2	249	2.74	0.73	0.122, 2.408
Raleigh General Hospital	N/P	0	13	0.12	Too Small to Calculate	
Fairmont Regional Medical Center	N/P	0	8	0.08	Too Small to Calculate	
Williamson Memorial Hospital	N/P	0	0	0.00	Too Small to Calculate	
Pleasant Valley Hospital	N/P	1	14	0.15	Too Small to Calculate	
Reynolds Memorial Hospital	N/P	0	18	0.21	Too Small to Calculate	
Davis Medical Center	N/P	0	34	0.32	Too Small to Calculate	
Summersville Regional Medical Center	N/P	0	3	0.06	Too Small to Calculate	
Stonewall Jackson Memorial Hospital	N/P	0	5	0.05	Too Small to Calculate	
Ohio Valley Medical Center	N/P	0	56	0.63	Too Small to Calculate	
Weirton Medical Center	N/P	0	73	0.62	Too Small to Calculate	
Princeton Community Hospital	N/P	2	28	0.26	Too Small to Calculate	
Wetzel County Hospital	N/P	0	0	0.00	Too Small to Calculate	
Berkeley Medical Center	N/P	0	21	0.24	Too Small to Calculate	
CAMC- Teays Valley Hospital	N/P	0	9	0.08	Too Small to Calculate	
Beckley Appalachian Regional Hospital	N/P	0	10	0.10	Too Small to Calculate	
Bluefield Regional Medical Center	N/P	0	4	0.05	Too Small to Calculate	
Logan Regional Medical Center	N/P	0	7	0.08	Too Small to Calculate	
United Hospital Center	N/P	2	72	0.67	Too Small to Calculate	
Welch Community Hospital	N/P	1	10	0.13	Too Small to Calculate	
Greenbrier Valley Medical Center	N/P	0	27	0.25	Too Small to Calculate	
St. Mary's Medical Center	N/P	1	92	0.82	Too Small to Calculate	
Wheeling Hospital	N/P	1	59	0.60	Too Small to Calculate	
Saint Francis Hospital	N/P	0	1	0.01	Too Small to Calculate	
WV Overall SIR	=	**23**	**1857**	**19.98**	**1.15**	**0.747, 1.700**

Legend:	
√	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few hysterectomy procedures to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

IV. Methicillin-Resistant Staphylococcus aureus (MRSA) Bacteremia

While *Staphylococcus aureus* is a common bacteria found both in the environment and on humans, it normally does not adversely affect them. MRSA, however, is a variant of the bacteria that is resistant to antibiotics. MRSA is spread via direct contact and can cause serious complications, including wound infections or blood stream infections (bacteremia), which makes hospitals and other healthcare facilities at a high risk of spreading the infection to patients and healthcare workers.[16]

Each year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics. It is estimated that at least 23,000 people die each year as a direct result of these infections, while many more die from other conditions complicated by an antibiotic-resistant infection.[17]

Beginning in January 2013, West Virginia General Acute Care Hospitals were required to report MRSA Bacteremia LabID events for facility-wide inpatient areas. LabID events are those that are positive or meet positive guidelines using either standard susceptibility testing or other Food and Drug Administration (FDA) approved testing.[18]

In Acute Care General Hospitals, the 2015 reporting requirements changed to include Emergency Department and Observation Stays, in addition to the facility-wide inpatient reporting.

Long Term Acute Care Hospitals and Inpatient Rehabilitation Hospitals were also required to report all facility-wide inpatient stays for the first time in 2015.

Key Findings for MRSA Bacteremia LabID Events: General Acute Care Hospitals (Figure 9)

- In 2015, there were 84 MRSA Bacteremia LabID events reported for all West Virginia General Acute Care Hospitals, up from 74 in 2014.
- A similar number of MRSA Bacteremia LabID events occurred in West Virginia General Acute Care Hospitals in 2015 as expected based on the national baseline.
- The West Virginia SIR was 1.06 in 2015, indicating that there were 6% more MRSA Bacteremia LabID events occurring than the NHSN baseline expected. In 2014, the SIR was 0.84, indicating that 16% fewer events occurred than expected.
- Of those facilities that had a sufficient number of patient days to calculate a reliable SIR, all but three West Virginia General Acute Care Hospitals met or exceeded national standards; only one facility exceeded expectations.
- Of the 29 General Acute Care Hospitals, 11 (38%) had zero infections.

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[16] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Methicillin-Resistant Staphylococcus aureus (MRSA) Infections*, available at: http://www.cdc.gov/mrsa/healthcare/index.html.
[17] US Department of Health and Human Services, Centers for Disease Control and Prevention, Antibiotic Resistance Threats in the United States, 2013, available at: http://www.cdc.gov/drugresistance/threat-report-2013.
[18] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Multi-drug Resistant Organism & Clostridium difficile Infection (MDRO/CDI) Module,* available at: http://www.cdc.gov/nhsn/PDFs/pscManual/12pscMDRO_CDADcurrent.pdf.

FIGURE 9: 2015 MRSA BACTEREMIA LABID EVENTS, GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Patient Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
West Virginia University Hospital (WVUH)	√	5	143178	15.63	0.32	0.117, 0.709
Monongalia General Hospital	=	2	37835	1.91	1.05	0.175, 3.454
Thomas Memorial Hospital	=	2	45426	2.26	0.89	0.149, 2.930
Ohio Valley Medical Center	=	0	24601	1.48	0.00	0, 2.023
Weirton Medical Center	=	1	33683	1.66	0.60	0.030, 2.970
Princeton Community Hospital	=	4	31302	1.55	2.58	0.821, 6.232
Camden Clark Medical Center	=	0	54266	2.92	0.00	0, 1.026
Charleston Area Medical Center (CAMC)	=	15	183647	17.04	0.88	0.511, 1.419
Berkeley Medical Center	=	0	40723	2.02	0.00	0, 1.484
Beckley Appalachian Regional Hospital	=	4	27169	2.90	1.38	0.438, 3.326
Bluefield Regional Medical Center	=	1	13647	1.17	0.86	0.043, 4.226
Logan Regional Medical Center	=	1	21972	1.07	0.93	0.047, 4.608
United Hospital Center	=	4	60984	2.69	1.49	0.473, 3.587
Greenbrier Valley Medical Center	=	1	19368	1.28	0.78	0.039, 3.839
Wheeling Hospital	=	2	51179	2.16	0.93	0.155, 3.055
Cabell Huntington Hospital	▼	16	100737	7.77	2.06	1.219, 3.273
Raleigh General Hospital	▼	8	49723	3.34	2.40	1.114, 4.553
St. Mary's Medical Center	▼	13	94221	5.56	2.34	1.300, 3.895
Fairmont Regional Medical Center	N/P	0	15346	0.79	Too Small to Calculate	
Williamson Memorial Hospital	N/P	0	4609	0.17	Too Small to Calculate	
Pleasant Valley Hospital	N/P	1	6790	0.44	Too Small to Calculate	
Reynolds Memorial Hospital	N/P	0	8446	0.30	Too Small to Calculate	
Davis Medical Center	N/P	0	11534	0.72	Too Small to Calculate	
Summersville Regional Medical Center	N/P	1	8899	0.36	Too Small to Calculate	
Stonewall Jackson Memorial Hospital	N/P	0	6769	0.38	Too Small to Calculate	
Wetzel County Hospital	N/P	0	2156	0.08	Too Small to Calculate	
CAMC- Teays Valley Hospital	N/P	0	9689	0.40	Too Small to Calculate	
Welch Community Hospital	N/P	0	2793	0.23	Too Small to Calculate	
Saint Francis Hospital	N/P	3	18910	0.97	Too Small to Calculate	
WV Overall SIR	=	**84**	**1129602**	**79.26**	**1.06**	**0.851, 1.305**

Legend:	
√	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few patient days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Because data collection of MRSA Bacteremia LabID Events began in the 2015 data collection year for Long Term Acute Care Hospitals and Inpatient Rehabilitation facilities, there is no baseline data for comparison purposes, including SIRs. However, data was collected for future national baseline development. Outcomes are available in the tables below for both long term acute care hospitals, freestanding rehabilitation hospitals and units within hospitals.

Key Findings for MRSA Bacteremia LabID Events: Long Term Acute Care Hospitals (Figure 10)

- There were 3 MRSA events in 2015.
- The incidence of MRSA blood stream infections were 0.0728/1,000 patient days.

FIGURE 10: 2015 MRSA LABID EVENT RATES, LONG TERM ACUTE CARE HOSPITALS

Facility Name	MRSA Blood Incident LabID Count	Patient Days	MRSA Blood Stream Infection LabID Rate Incidence (per 1,000 patient days)
Select Specialty Hospital, Charleston	1	11195	0.089
*Acuity Specialty Hospital	1	21588	0.046
Cornerstone Hospital of Huntington	1	8372	0.119
WV Totals	3	41155	0.0728

* Acuity Specialty Hospital includes 2 Ohio facilities in 2015

Key Findings for MRSA Bacteremia LabID Events: Inpatient Rehabilitation Facilities, Within Hospitals and Freestanding (Figure 11)

- There was 1 MRSA Bacteremia LabID event in 2015.
- The incidence of MRSA blood stream infections were 0.134/1,000 patient days.

FIGURE 11: 2015 MRSA LABID EVENT RATES, INPATIENT REHABILITATION FACILITIES, WITHIN HOSPITALS AND FREESTANDING (FIGURE 11)

Facility Name	MRSA Blood Incident LabID Count	Patient Days	LabID Rate (per 1,000 patient days)
HealthSouth Western Hills Regional Rehabilitation Hospital	0	13149	0
HealthSouth Rehabilitation Hospital of Huntington	0	16624	0
HealthSouth Southern Hills Rehabilitation Hospital	0	10869	0
HealthSouth Mountain View Regional Rehabilitation Hospit	0	25524	0
Peterson Rehabilitation Hospital	0	17	0
Weirton Medical Center	0	1580	0
Charleston Area Medical Center	1	5788	0.173
Logan Regional Medical Center	0	1133	0
WV Totals	1	74684	0.134

V. Clostridium difficile Infection (CDI)

Clostridium difficile is a bacteria that can cause diarrhea and large intestine inflammation, usually in those patients with a recent history of antibiotic use. *Clostridium difficile* is spread through direct contact with contaminated surfaces and can live outside the body in a hardy spore form for a long time.[18] Therefore, environmental control in healthcare settings is one of the most critical forms of prevention, along with proper hygiene and adherence to evidence-based practices.[19]

In a study conducted in 2011, *Clostridium difficile* infection (CDI) is estimated to have caused almost half a million infections in the United States. Of those, an estimated 83,000 of the patients with such infections had at least one recurrence, and approximately 29,000 died within 30 days after the initial diagnosis. The 2011 study estimated the incidence of community-associated CDI as 51.9 per 100,000 population after accounting for age, sex, race and other factors. For health care–associated infections, the estimated incidence of health care–associated CDI infection was 95.3 per 100,000. The incidence of infection estimates showed higher rates among females than among males, whites more than nonwhites, and in persons 65 years of age or older compared with those under the age of 65 years. Of the 293,300 health care–associated cases in the study, it was estimated that 107,600 had a hospital onset, 104,400 had a nursing home onset, and 81,300 had a community onset associated with a health care facility. Of the patients with healthcare–associated infection, the rate of first recurrence was estimated at 20.9%, and the rate of death within 30 days was 9.3%, resulting in an estimated 61,400 recurrences and 27,300 deaths nationally. Recurrence and death were more commonly observed among the health care–associated infections than among community-associated infections.[20]

Because continued surveillance for CDI is needed to monitor progress toward prevention, CMS and the WVHCA requires hospitals to report CDI to NHSN. As a result, the WVHCA can track whether or not a facility has higher or lower rates of infection than expected based on a national baseline set by NHSN.

Improvements in CDI at acute care facilities have been made since data collection first began in 2013, but increased slightly since 2014. After reviewing the 2014 data outcomes for CDI among WV hospitals, the HAI Advisory Panel developed the premise that rates of CDI may be lower or higher based upon the testing and laboratory procedures being utilized for diagnosing the infection, since various testing modalities provide differing specificities and sensitivities to *C. diff.*

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[19] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Healthcare-Associated Infections: Frequently Asked Questions about Clostridium difficile for Healthcare Providers,* available at: http://www.cdc.gov/HAI/organisms/cdiff/Cdiff_faqs_HCP.html.

[20] Fernanda C. Lessa, M.D., M.P.H., Yi Mu, Ph.D., Wendy M. Bamberg, M.D., Zintars G. Beldavs, M.S., Ghinwa K. Dumyati, M.D., John R. Dunn, D.V.M., Ph.D., Monica M. Farley, M.D., Stacy M. Holzbauer, D.V.M., M.P.H., James I. Meek, M.P.H., Erin C. Phipps, D.V.M., M.P.H., Lucy E. Wilson, M.D., Lisa G. Winston, M.D., Jessica A. Cohen, M.P.H., Brandi M. Limbago, Ph.D., Scott K. Fridkin, M.D., Dale N. Gerding, M.D., and L. Clifford McDonald, M.D., *Burden of Clostridium difficile Infection in the United States*, N Engl J Med 2015; 372:825-834 February 26, 2015 DOI: 10.1056/NEJMoa1408913, available at: http://www.nejm.org/doi/full/10.1056/NEJMoa1408913#t=articleDiscussion.

The Panel requested the WVHCA send a short survey to WV hospitals to obtain data on the lab testing utilized to identify a CDI, symptoms exhibited by the patient that triggers testing, treatment modalities hospitals were providing after CDI confirmation and other treatments provided for those who are infected.

The ultimate goal for performing the survey and quality improvement project was not only to assist hospitals in understanding the testing procedures and the treatments provided by other hospitals across the state, but to also provide information that could lead to improvements in testing and treatment for those hospitals that may be struggling to improve their rates of CDI. At the conclusion of the project at least one hospital, anecdotally, found that lab tests were not appropriately documented in NHSN.

The entire report, ***"West Virginia Healthcare-Associated Infections C. difficile Lab Testing: A Survey of WV Hospital Testing and Treatment Practices,"*** can be found in **Appendix A.**

Beginning in January 2013, all General Acute Care Hospitals were required to report facility wide, inpatient CDI LabID Events. For General Acute Care Hospitals, the 2015 reporting requirements changed to include Emergency Department and Observation Stays in addition to the facility-wide inpatient reporting. As with MRSA, LabID events are those that are positive or meet positive guidelines using either standard susceptibility testing or other Food and Drug Administration (FDA) approved testing.[18]

Long-term Acute Care Hospitals and Inpatient Rehabilitation Hospitals were also required to report on all facility-wide inpatient stays for the first time in 2015.

Key Findings for CDI LabID Events: General Acute Care Hospitals (Figure 12)

- In 2015, there were 807 CDI LabID events reported for all West Virginia General Acute Care Hospitals, down 3 from 2014.
- A similar number of CDI LabID events occurred in West Virginia General Acute Care Hospitals in 2015 as were expected based on the national baseline.
- The West Virginia SIR was 0.98, indicating that 2% fewer CDI LabID events occurred than the NHSN baseline expected.
- Of those facilities that had a sufficient number of patient days to calculate a reliable SIR, all but 6 West Virginia General Acute Care Hospitals met or exceeded national standards.
- In 2015, 6 facilities had a higher number of infections than expected, up from 2 facilities in 2014.
- Of the 29 General Acute Care Hospitals, 2 (6.9%) had zero CDI LabID Events.

FIGURE 12: 2015 CDI LABID EVENTS, GENERAL ACUTE CARE HOSPITALS

Hospital	Hospital Performance Compared to the National Baseline	Number of Infections	Number of Patient Days	Number of Predicted Infections	Standardized Infection Ratio (SIR)	95% Confidence Interval for SIR
West Virginia University Hospital (WVUH)	✓	73	128326	113.93	0.64	0.506, 0.801
Thomas Memorial Hospital	✓	11	39888	21.18	0.52	0.273, 0.903
Cabell Huntington Hospital	✓	35	78894	71.16	0.49	0.348, 0.677
Davis Medical Center	✓	0	11534	6.32	0.00	0, 0.474
Camden Clark Medical Center	✓	20	51268	32.64	0.61	0.385, 0.929
United Hospital Center	✓	29	60984	53.51	0.54	0.370, 0.768
Monongalia General Hospital	=	27	40699	28.08	0.96	0.647, 1.379
Fairmont Regional Medical Center	=	9	14843	10.44	0.86	0.420, 1.582
Williamson Memorial Hospital	=	1	4609	2.01	0.50	0.025, 2.454
Pleasant Valley Hospital	=	2	6073	3.09	0.65	0.108, 2.137
Stonewall Jackson Memorial Hospital	=	3	6769	3.35	0.90	0.228, 2.439
Ohio Valley Medical Center	=	13	23584	18.09	0.72	0.400, 1.198
Weirton Medical Center	=	16	32750	23.73	0.67	0.399, 1.071
Princeton Community Hospital	=	26	29294	23.93	1.09	0.725, 1.569
Berkeley Medical Center	=	30	39299	34.55	0.87	0.597, 1.224
Beckley Appalachian Regional Hospital	=	19	27169	22.31	0.85	0.528, 1.305
Bluefield Regional Medical Center	=	11	13647	7.19	1.53	0.805, 2.660
Logan Regional Medical Center	=	12	21597	12.13	0.99	0.536, 1.682
Welch Community Hospital	=	2	2696	1.52	1.32	0.221, 4.351
Greenbrier Valley Medical Center	=	15	18040	14.12	1.06	0.617, 1.713
Wheeling Hospital	=	35	47980	26.76	1.31	0.925, 1.799
Saint Francis Hospital	=	6	18910	10.67	0.56	0.228, 1.169
Raleigh General Hospital	▼	69	46457	34.74	1.99	1.557, 2.498
Reynolds Memorial Hospital	▼	12	8446	5.33	2.25	1.220, 3.829
Summersville Regional Medical Center	▼	13	6553	3.48	3.74	2.080, 6.236
Charleston Area Medical Center (CAMC)	▼	184	169246	152.69	1.21	1.040, 1.389
CAMC- Teays Valley Hospital	▼	24	9689	7.01	3.42	2.244, 5.015
St. Mary's Medical Center	▼	110	93371	76.39	1.44	1.189, 1.729
Wetzel County Hospital	N/P	0	2156	0.94	Too Small to Calculate	
WV Overall SIR	=	**807**	**1054771**	**821.31**	**0.98**	**0.917, 1.052**

Legend:	
✓	The number of infections was **significantly lower (better)** than predicted
=	The number of infections was **similar (not significantly different)** than predicted
▼	The number of infections was **significantly higher (worse)** than predicted
No Comparison Possible (N/P)	General Acute Care Hospitals had too few patient days to calculate a reliable SIR. When SIR cannot be calculated, a comparison to national data is not possible.
Too Small to Calculate	The expected number of infections was below 1

Because data collection of CDI LabID Events began in the 2015 data collection year for Long Term Acute Care Hospitals and Inpatient Rehabilitation facilities, there is no baseline data for comparison purposes, including SIRs. However, data was collected for future national baseline development. Outcomes are available in the tables below for both long term acute care hospitals, freestanding rehabilitation hospitals and units within hospitals.

Key Findings for CDI LabID Events: Long Term Acute Care Hospitals (Figure 13)

- There were 62 CDI events in 2015.
- The incidence of CDI was 15.064/10,000 patient days.

FIGURE 13: 2015 CDI LABID EVENTS, LONG TERM ACUTE CARE HOSPITALS

Facility Name	CDIF Facility Incident Healthcare Facility-Onset LabID Event Count	Patient Days	Facility CDIF Healthcare Facility-Onset Incidence Rate (per 10,000 patient days)
Select Speciality Hospital, Charleston	26	11195	23.225
Acuity Specialty Hospital	26	21588	12.044
Cornerstone Hospital of Huntington	10	8372	11.945
WV Totals	62	41155	15.064

*Acuity Specialty Hospital includes 2 Ohio facilities in 2015

Key Findings for CDI LabID Events: Inpatient Rehabilitation Facilities, within Hospitals and Freestanding (Figure 14)

- There were 33 CDI events in 2015.
- The incidence of CDI was 4.42/10,000 patient days.
- There were 2 facilities that had zero events.

Figure 14: 2015 CDI LabID Events, Inpatient Rehabilitation Facilities, Within Hospitals and Freestanding

Facility Name	CDIF Facility Incident Healthcare Facility-Onset LabID Event Count	Patient Days	Facility CDIF Healthcare Facility-Onset Incidence Rate (per 10,000 patient days)
HealthSouth Western Hills Regional Rehabilitation Hospital	1	13149	0.761
HealthSouth Rehabilitation Hospital of Huntington	11	16624	6.617
HealthSouth Southern Hills Rehabilitation Hospital	3	10869	2.76
HealthSouth Mountain View Regional Rehabilitation Hospital	16	25524	6.269
Peterson Rehabilitation Hospital	0	26	0
Weirton Medical Center	1	1580	6.329
Charleston Area Medical Center	1	5788	1.728
Logan Regional Medical Center	0	1133	0
WV Totals	33	74693	4.42

VI. Healthcare Personnel Influenza Vaccinations

Influenza vaccinations are important for healthcare personnel as they not only safeguard the individual, they also help protect patients who are vulnerable from becoming infected. The CDC, the Advisory Committee on Immunization Practices (ACIP), and the Healthcare Infection Control Practices Advisory Committee (HICPAC) recommends that all healthcare workers receive a seasonal influenza vaccination.[21]

Hospitals are required to report the number of personnel, including employees, licensed independent practitioners, and student volunteers, who received the vaccination during the influenza season (October to March). All 65 West Virginia facilities (general acute care, critical access, long term acute care, non-state run psychiatric hospitals, and inpatient rehabilitation hospitals and units) that were required to report, did so for the 2015-2016 influenza season.

Beginning January 2012, all non-federal hospitals (excluding state run psychiatric facilities) were required to report personnel vaccination status. Beginning October 2014, all non-federal hospitals (excluding state-run psychiatric facilities) were required to report both inpatient and outpatient personnel who worked in the healthcare facility for at least one day during the reporting season. Additionally, inpatient rehabilitation units within hospitals were required to report personnel influenza vaccination status separately from the rest of the affiliated general acute care hospital.

For the 2015-2016 influenza season, the percent of personnel vaccinated was split into two population categories, hospital employees (paid by the facility) and all healthcare workers (which includes employees, licensed independent practitioners, student volunteers, etc.). Individual facilities can now determine how many non-employee workers in the healthcare facility did not receive a vaccination, potentially putting patients at risk for contracting influenza while receiving care. By separating employees from non-employees working in the facility, hospitals can easily review their progress in both areas from year to year.

A two year, side-by-side comparison was also completed for each facility and for each population group to show changes in vaccination percentages and trends over time, which is useful to monitor if a facility institutes new policies or guidelines regarding influenza vaccination. A combined graph of all hospitals and units was also created for both employees and healthcare workers for the 2015-2016 influenza season.

Key Findings for Healthcare Personnel Influenza Vaccinations, by Hospital Type and Healthcare Personnel Population (Figures 15-26)

- On average, 79.52% of all healthcare workers (including employees, licensed independent practitioners, student volunteers, etc.) in all West Virginia inpatient facilities received a seasonal influenza vaccination during the 2015-2016 influenza season, up from 78.4% from last year; the average number of healthcare workers has steadily increased year-after-year.

[21] US Department of Health and Human Services, Centers for Disease Control and Prevention, *Influenza Vaccination Information for Health Care Workers.* Website: http://www.cdc.gov/flu/healthcareworkers.htm. November 2014.

- The percentage of healthcare employees in West Virginia that received a seasonal influenza vaccination ranged from a low of 27% for a newly reporting facility to a high of 100% by several facilities for the 2015-2016 season, with an average of 82.06% of hospital employees vaccinated, up from 81.1% in the 2014-2015 influenza season.
- In the federally run program Healthy People 2020, which gives health related goals for the nation to meet by the year 2020, the goal for healthcare worker influenza vaccination is 90% in each facility.[22] In the 2015-2016 season, 31 of 65 (47.7%) reporting facilities have exceeded this goal, up from 20 hospitals in the 2014-2015 influenza season.
- During the 2015-2016 seasons, 100% (65) of facilities provided the seasonal influenza vaccine to all employees at no cost; one facility offered the vaccination to non-employees at a cost of $25.00.
- Methods facilities utilized for vaccinating employees and workers included: vaccination in wards, clinics, cafeterias, and/or common areas (72.3%), mobile vaccination carts (75.3%), vaccinations at meetings or grand rounds (63.0%), vaccination during nights and weekends (90.8%), and vaccination through occupational/employee health (86.2%). Other methods included community events and drive through clinics.
- For declinations, 72.3% (47) of hospitals require a completed form from the employee, and 3.1% (2) of hospitals do not require any documentation from employees who refuse the vaccination.
- Vaccination strategies of hospitals included 69.2% (45) plan to provide feedback of vaccination rates to administration, 84.6% (55) had vaccination campaigns, including posters, flyers, buttons, and/or fact sheets, 30.8% (20) of hospitals coordinate vaccinations with other annual programs, 86.2% (56) of hospitals provide education on benefits and risks of vaccination, 27.7% (18) require receipt of vaccination as condition of employment, 30.8% (20) provide incentives for vaccination, and 76.9% (50) send reminders by mail, email, and/or pager.
- 53.8% (35) of hospitals track unit-based vaccination rates for some units, while 56.9% (37) of hospitals track vaccination rates on a regular basis for targeting purposes.
- Vaccination campaigns of hospitals include: 100% (65) of hospitals target full-time and part-time employees, 84.6% (55) of hospitals target non-employee physicians, 78.5% (51) of hospitals targeted a campaign to students and trainees, and 76.9% (50) of hospitals targeted adult volunteers.
- Of 65 facilities, 58 (89.2%) required documentation for off-site vaccinations.
- 27.7% of facilities require the influenza vaccination as a condition of employment.

[22] US Department of Health and Human Services, Healthy People 2020, *Immunization and Infectious Disease.* Goal IID-12.13, available at: https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives.

FIGURE 15: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, GENERAL ACUTE CARE HOSPITALS

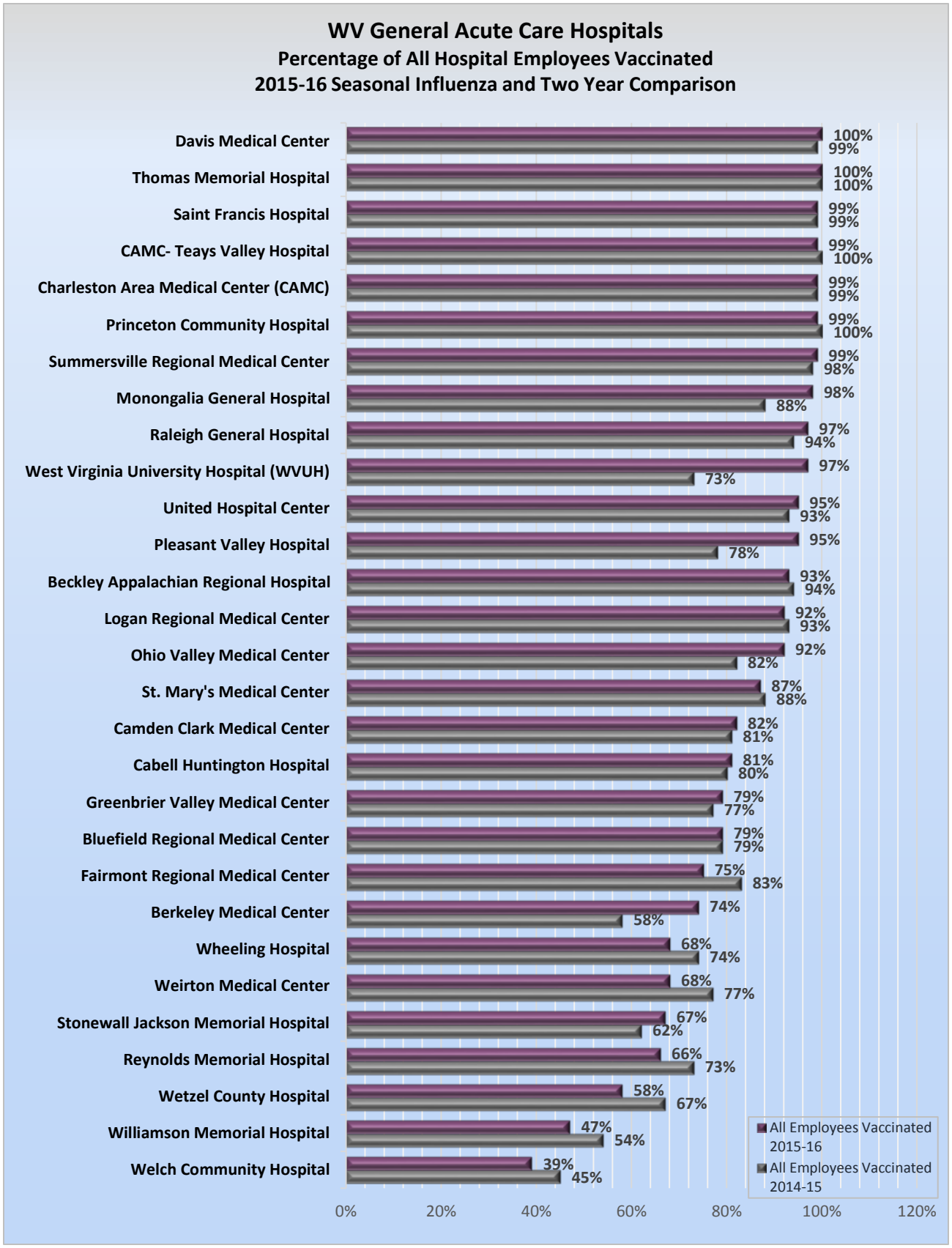


FIGURE 16: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, GENERAL ACUTE CARE HOSPITALS

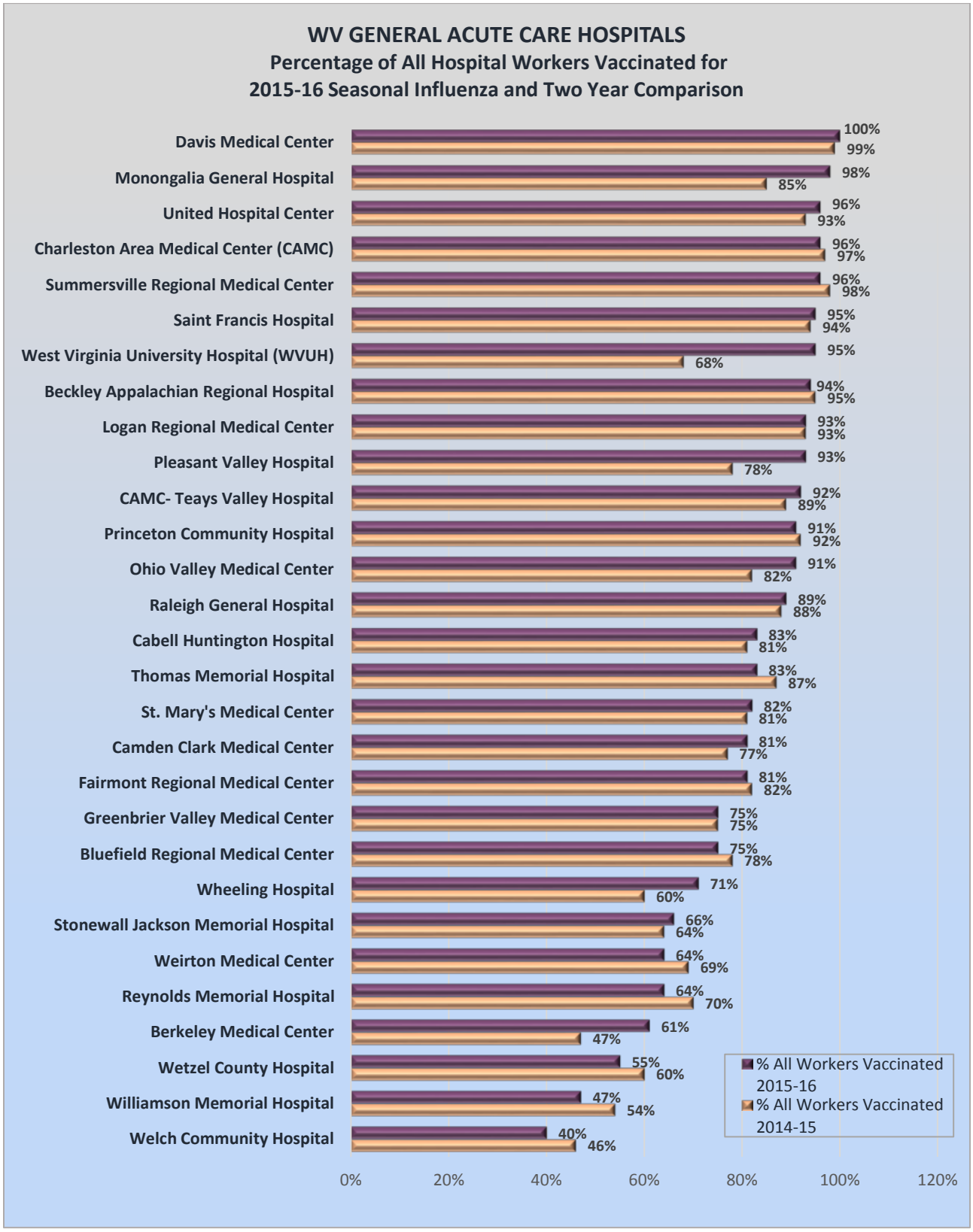


FIGURE 17: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, CRITICAL ACCESS HOSPITALS

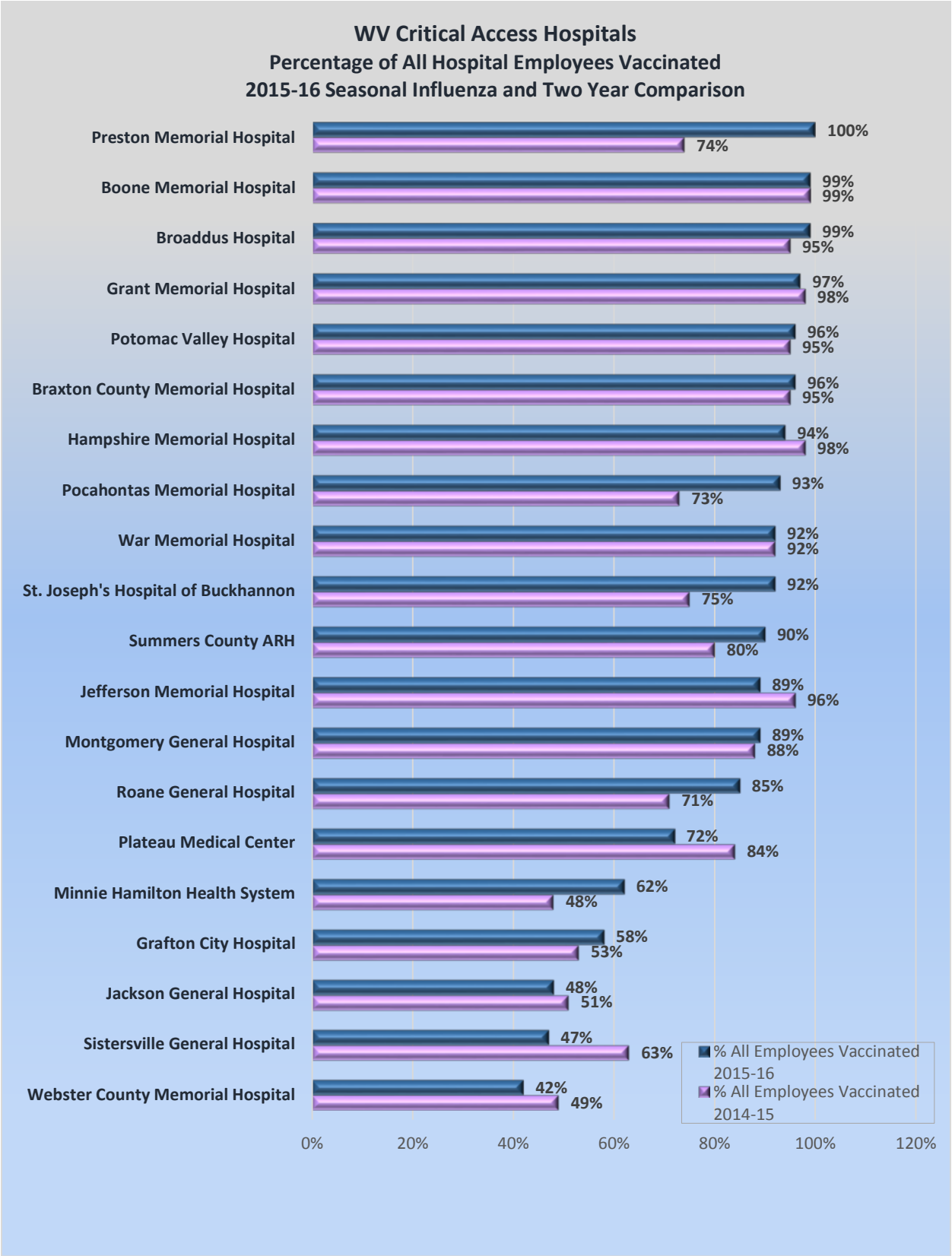


FIGURE 18: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, CRITICAL ACCESS HOSPITALS

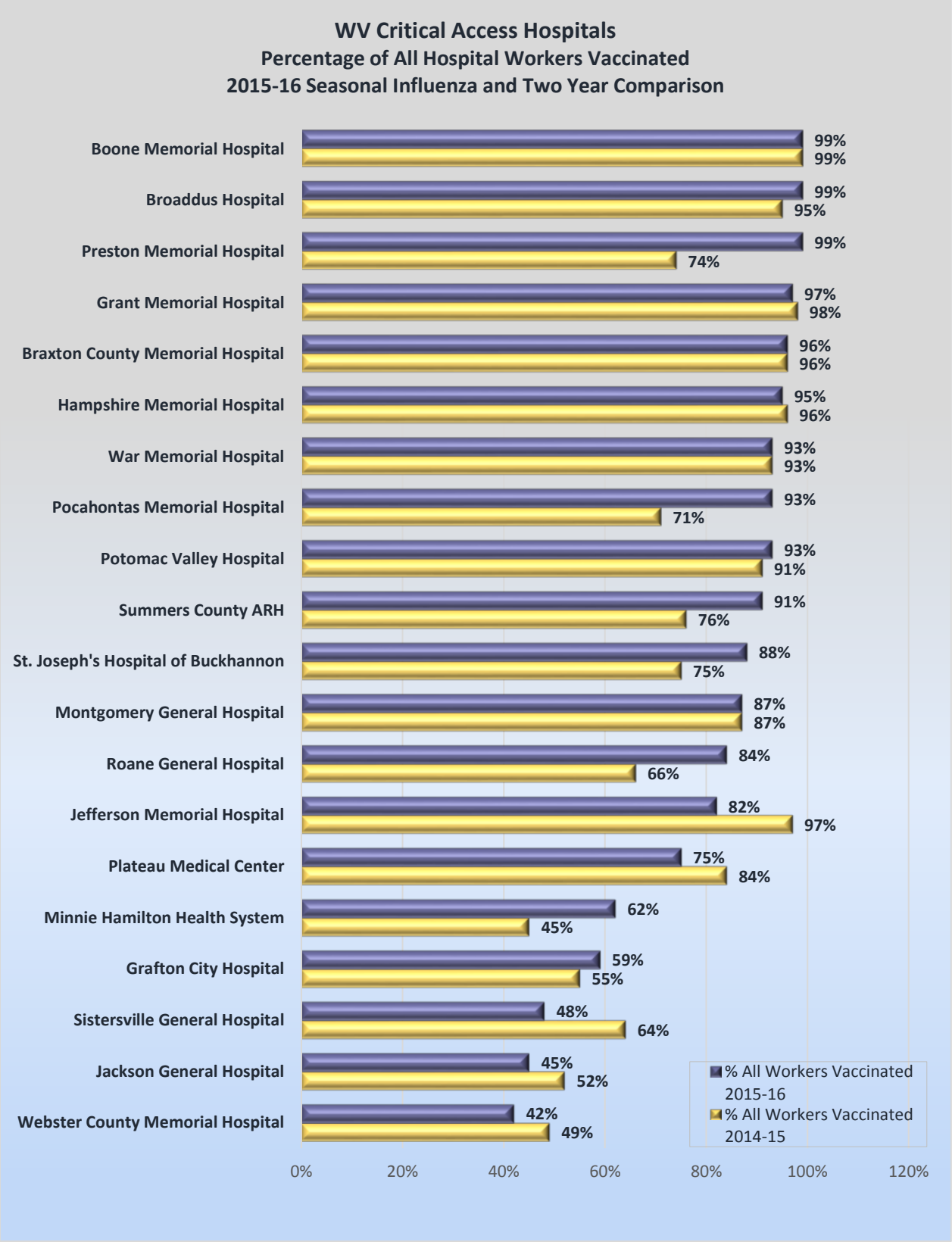


FIGURE 19: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, INPATIENT REHABILITATION HOSPITALS AND WARDS

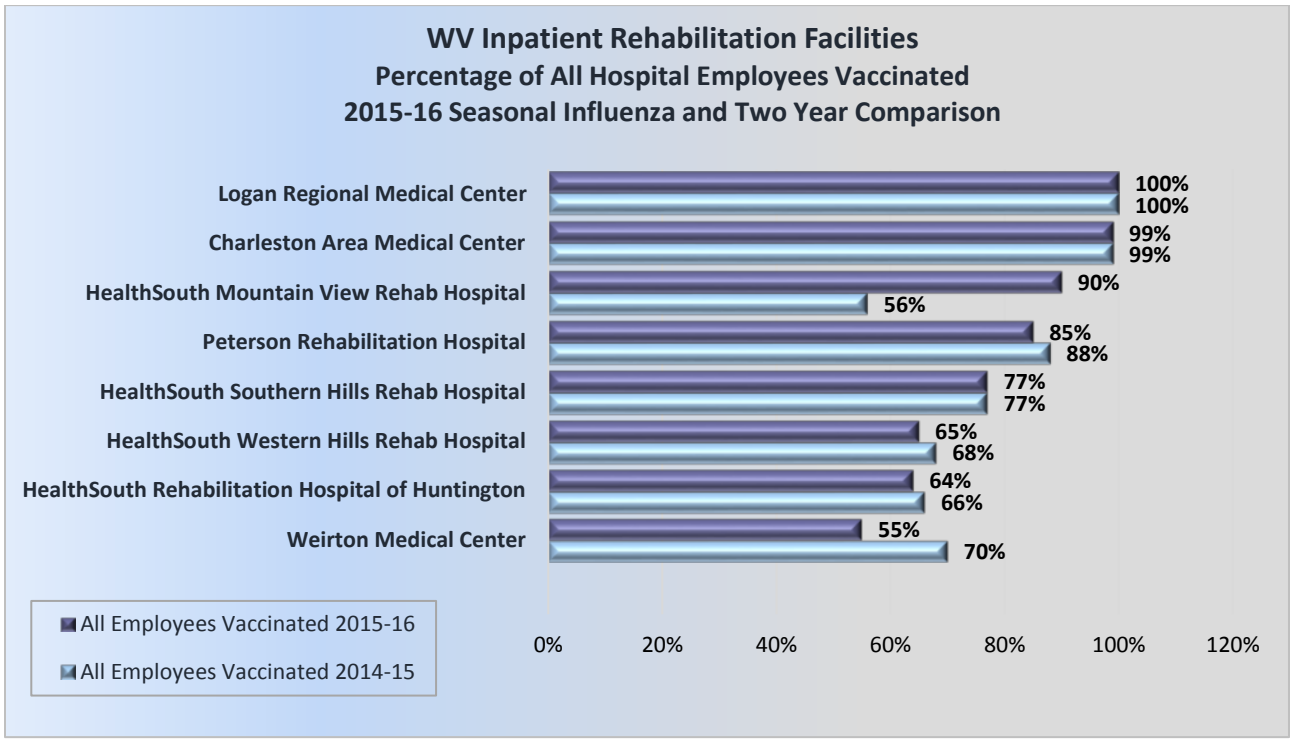


FIGURE 20: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, INPATIENT REHABILITATION HOSPITALS AND WARDS

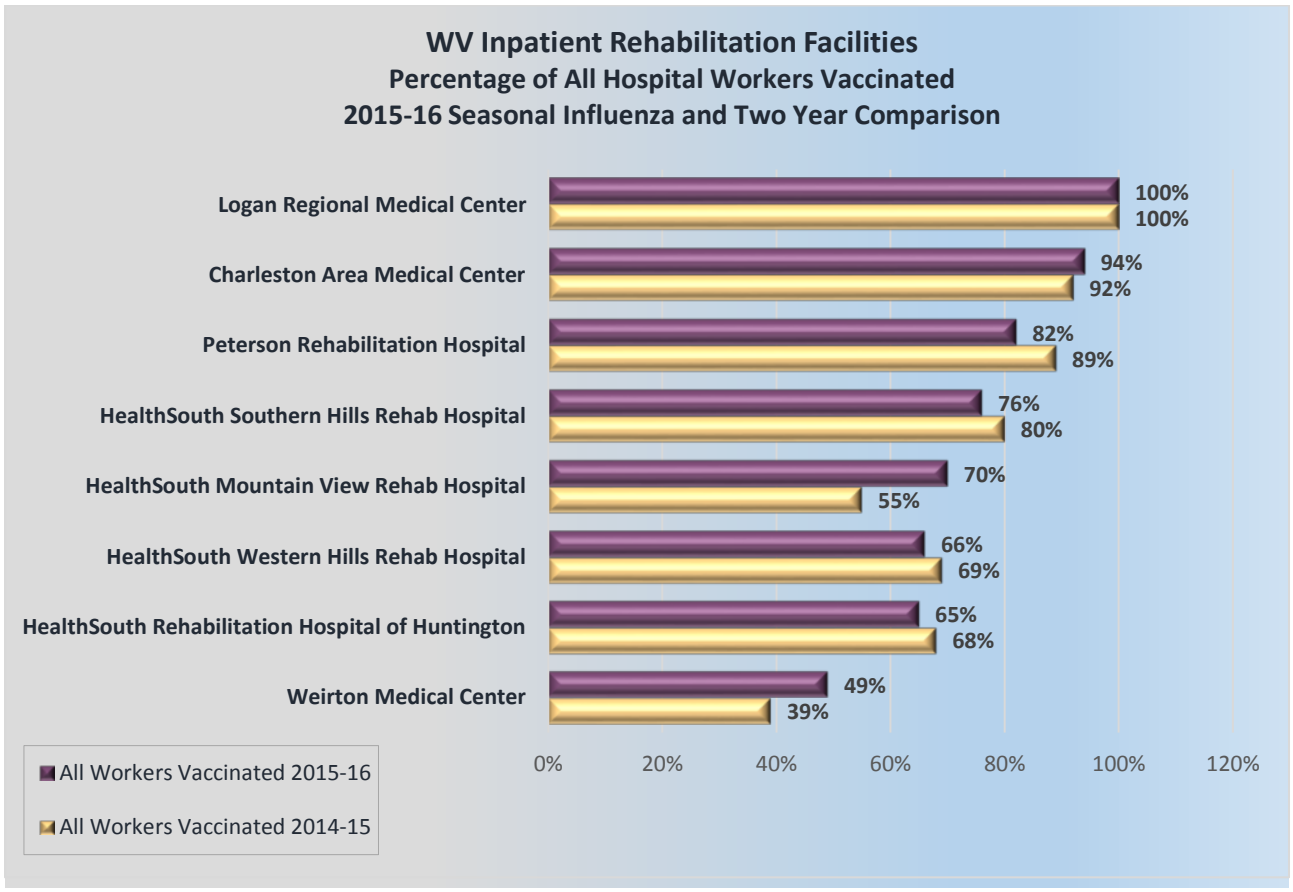
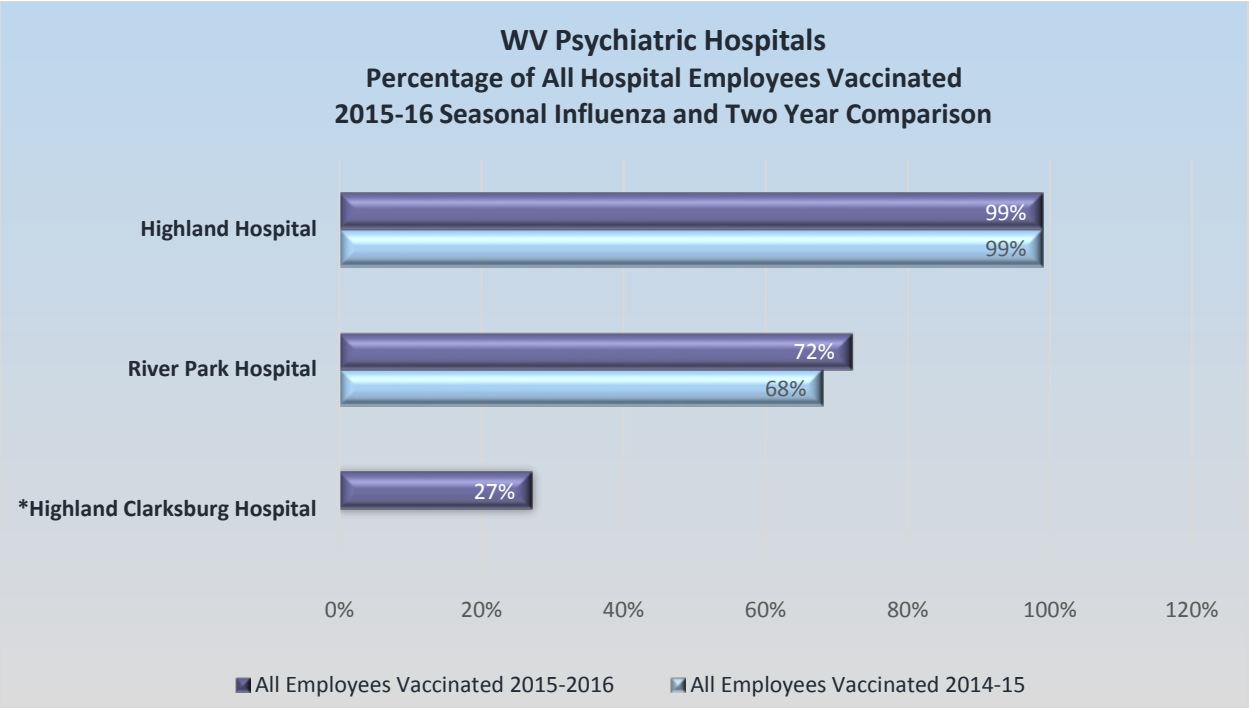
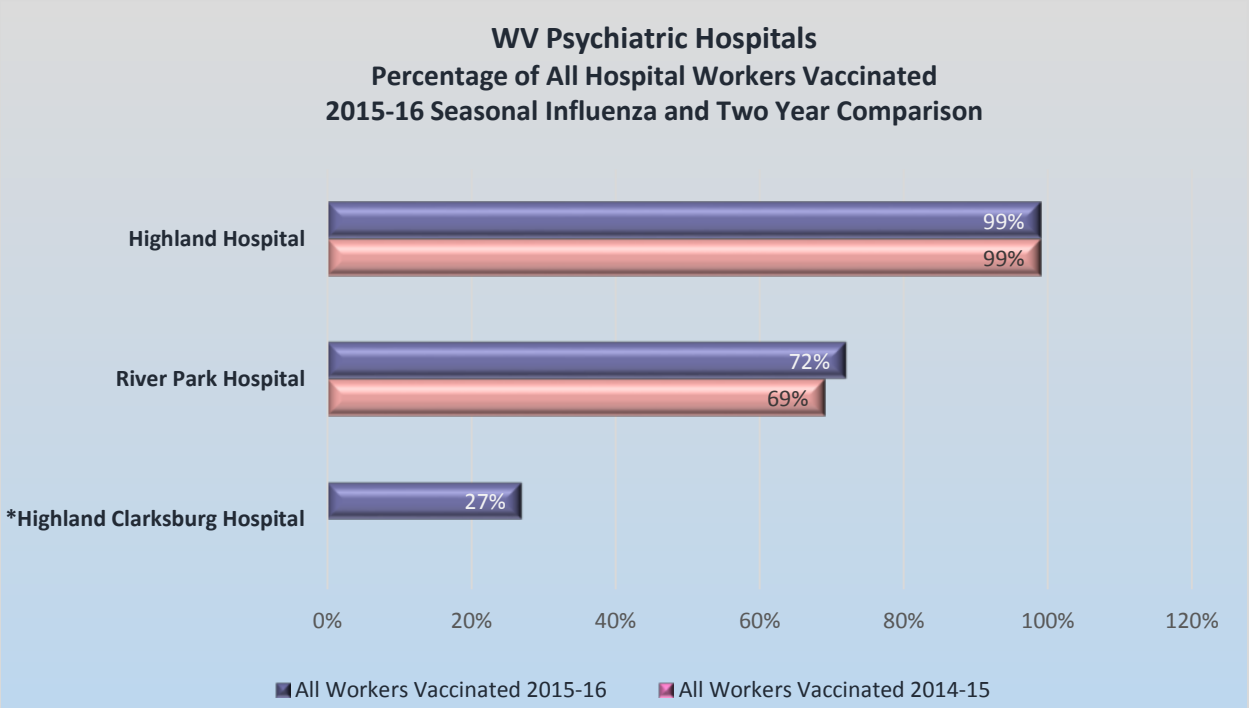


FIGURE 21: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, PSYCHIATRIC HOSPITALS



*No data available for the 2014-2015 influenza season

FIGURE 22: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, PSYCHIATRIC HOSPITALS



*No data available for the 2014-2015 influenza season

FIGURE 23: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, LONG TERM ACUTE CARE HOSPITALS

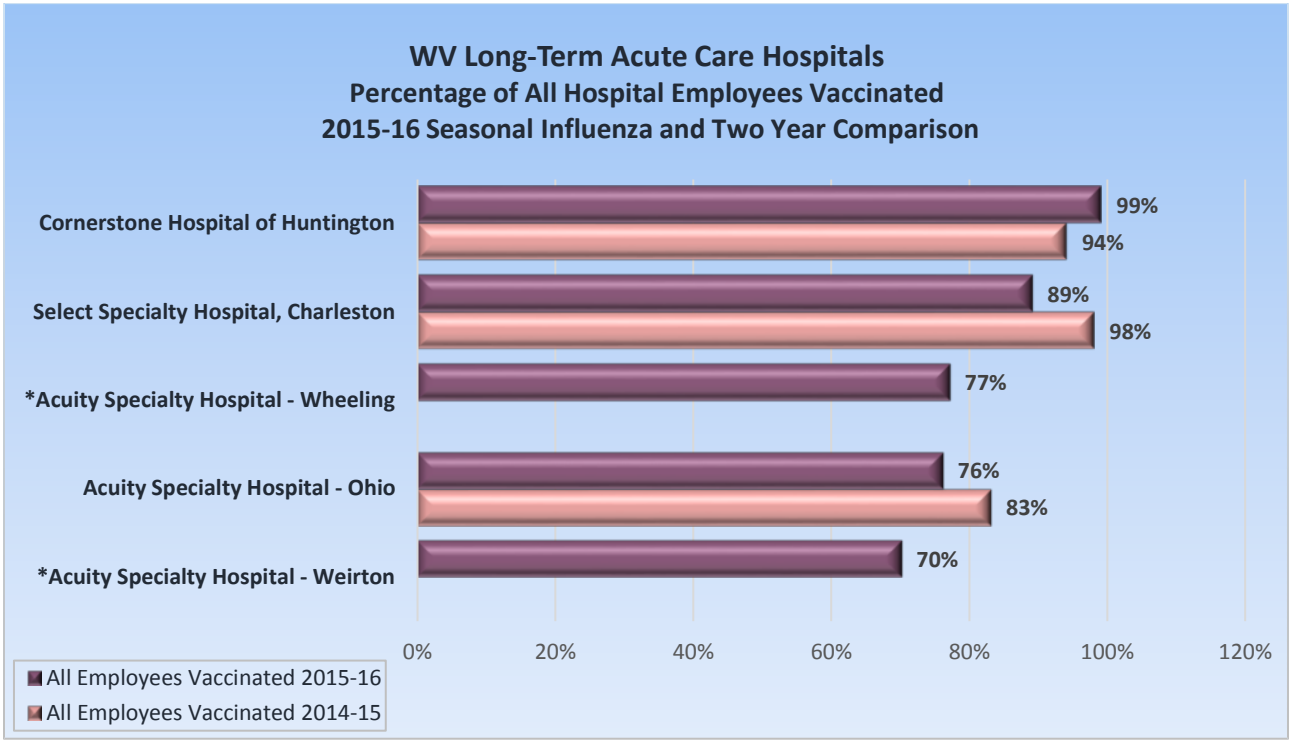


FIGURE 24: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, LONG TERM ACUTE CARE HOSPITALS

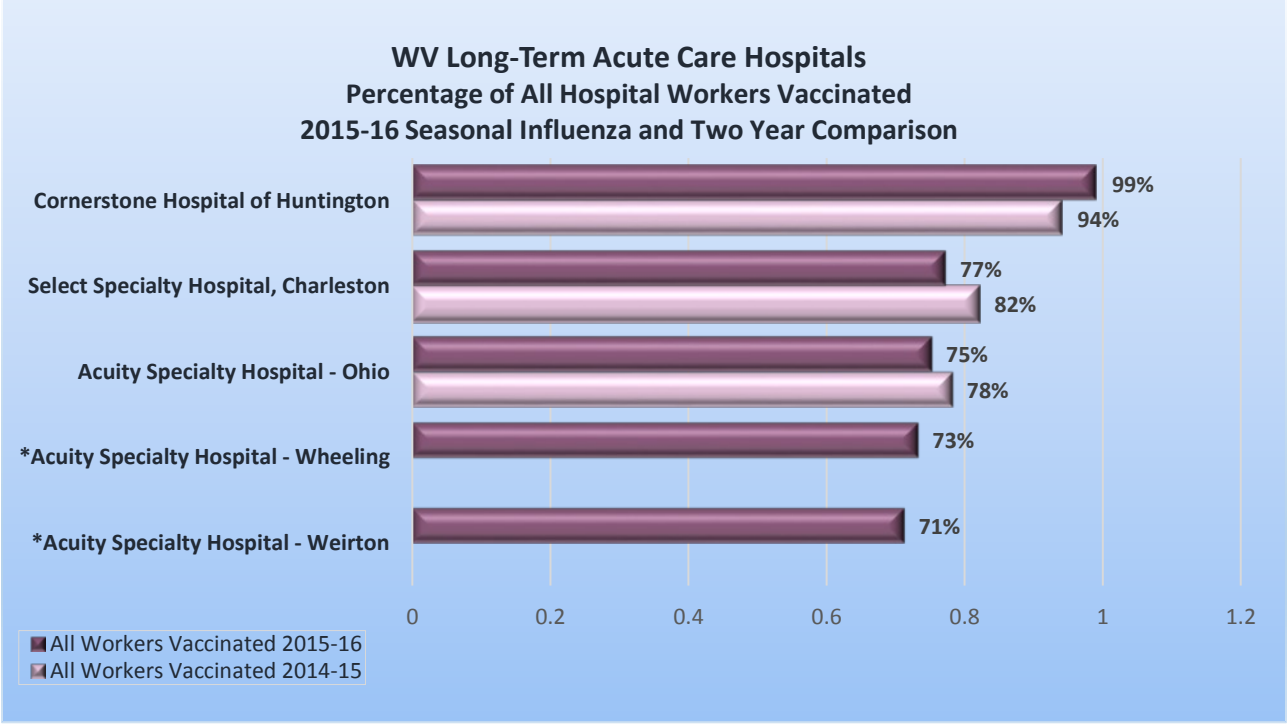


FIGURE 25: 2015-2016 INFLUENZA SEASON, HOSPITAL EMPLOYEES, ALL WV HOSPITALS (WV AVERAGE: 82.06%)

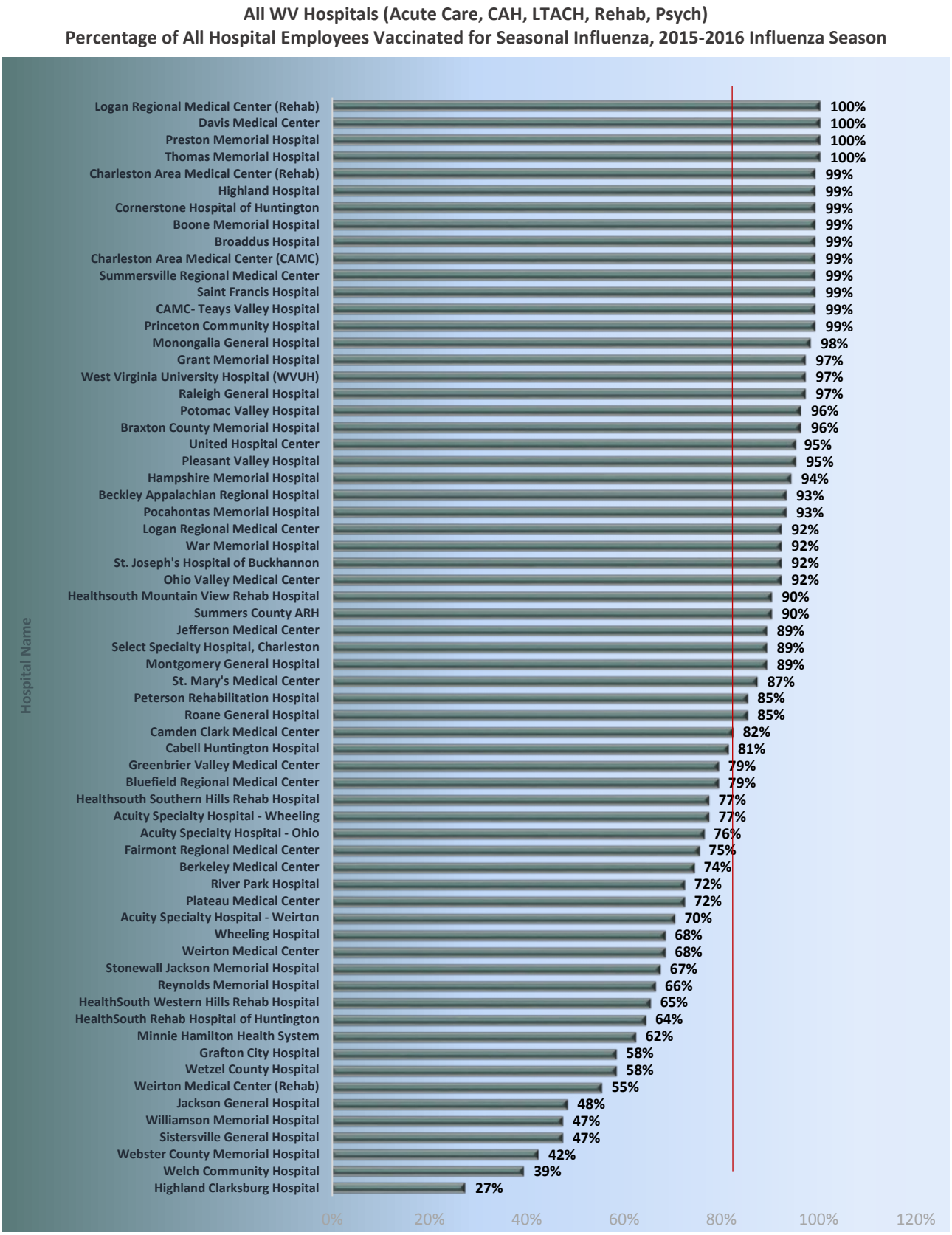
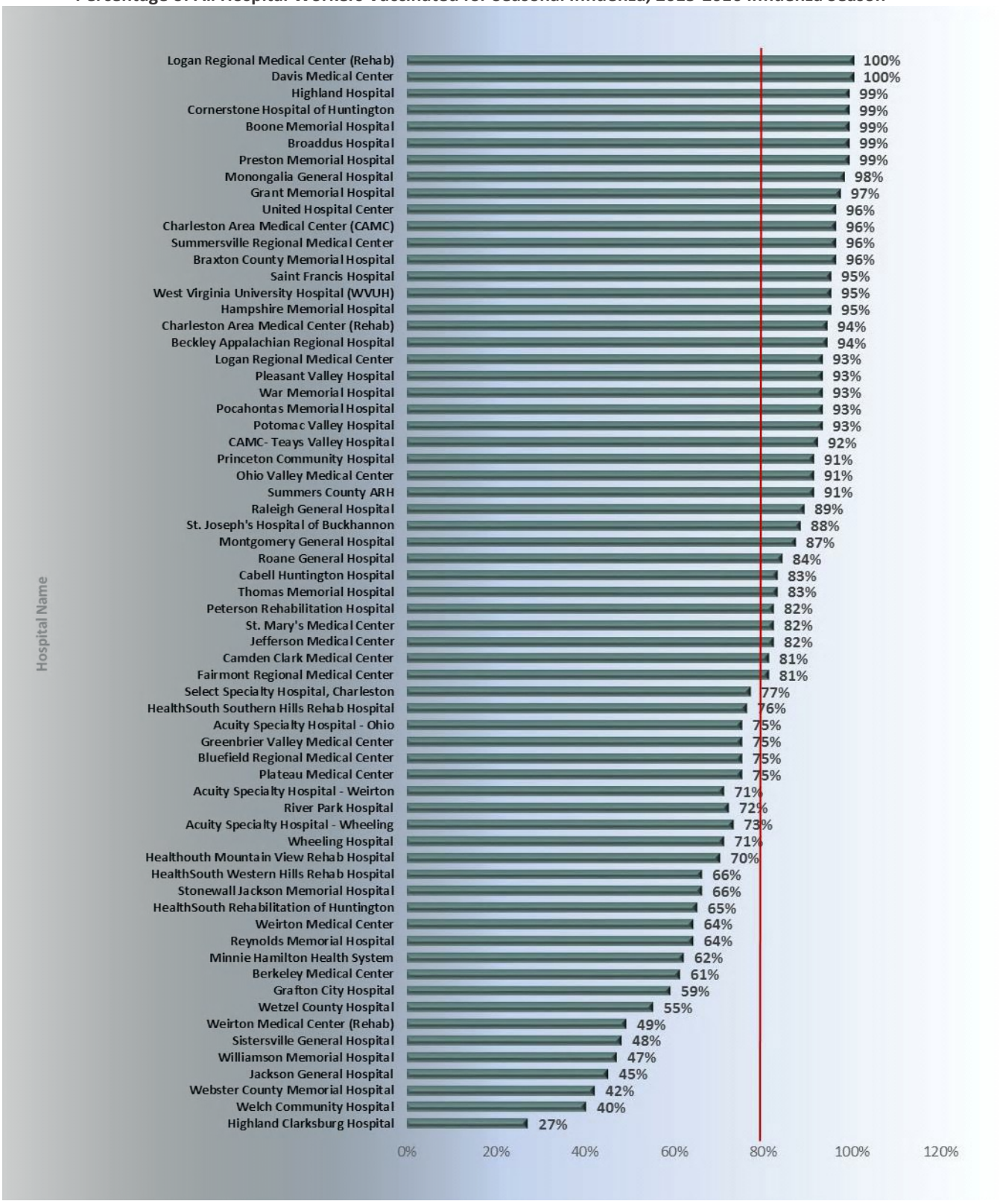


FIGURE 26: 2015-2016 INFLUENZA SEASON, ALL HOSPITAL WORKERS, ALL WV HOSPITALS (WV AVERAGE: 79.52%)



Advisory Panel Accomplishments and Future Directions

The HAI Control Advisory Panel continues to refine published hospital reporting to meet the changing data and stakeholder requirements and health care system evolution by continuing to redesign and simplify the HAI reports, including the addition of color-coded SIR graphs, expansion of the influenza graphs to include all hospital comparisons across influenza seasons, and the provision of hospital influenza survey data.

Due to the success of the HAI Data Submission Quality Review Schedule and Procedure on hospitals submitting data timely, the HAI Control Advisory Panel continues to utilize the procedure, which provides hospitals with data submission deadlines that may assist in avoiding state penalties, and potentially, federal penalties. All hospitals continue to submit the data timely and according to the schedule. The reporting requirements schedule can be found in **Appendix B**.

Continued surveillance and reporting of HAIs is imperative for implementing control and prevention strategies to ensure the safety of patients in healthcare facilities. As such, the HAI Control Advisory Panel and the WVHCA are committed to continually improving reporting strategies, interagency communication, and data quality reviews.

In the 2015 HAI Report, a set of future HAI initiatives were proposed for Calendar Year 2016. Below is a description of the Panel's goals and actions for meeting those goals:

2015 HAI Panel Goals	2016 Actions
Revise and update the data quality review schedule and procedure to ensure timely data submission	Updated and implemented the data quality review schedule. 100% of facilities were timely with data submissions
Assist healthcare facilities regarding data submissions and technical concerns regarding NHSN	Provided email and phone support for hospitals submitting data and assisted with technical concerns regarding NHSN; assisted 2 new facilities with NHSN access to meet reporting requirements
Explore potential areas of collaboration with other agencies and organizations to provide training, education, or other information regarding hospital reporting in NHSN	Collaborated with Thomas Rushton, MD, FACP, FIDSA, FHSEA, Infectious Diseases, St. Mary's Medical Center, to provide WV hospitals with recent research on testing and treating CDI that may assist in improving Clostridium *difficile* infections at the facilities and for NHSN data submission (**Appendix A)**
Revise reporting requirements and update reporting guide as needed to align with state and national priorities as directed by the HAI Control Advisory Panel and WVHCA Board of Directors	Reporting requirements were reviewed and the HAI Control Advisory Panel advised to continue following CMS reporting requirements into the next data year. In addition, the reporting guide was updated to reflect current reporting requirements

While these goals were met, the HAI Control Advisory Panel continues to work on improving procedures and lowering the rates of HAIs in West Virginia hospitals. As hospitals moved into the new data collection year, the goals for the HAI Program in Calendar Year 2016 have been updated as follows:

- Revise and update the data quality review schedule and procedure to ensure timely data submission
- Assist healthcare facilities regarding data submission and technical concerns regarding NHSN and investigate additional avenues to assist hospitals
- Explore opportunities to develop more meaningful influenza and patient safety reporting for public stakeholders
- Explore potential areas of collaboration with other agencies and organizations; provide training, education, or develop other projects regarding hospital reporting in NHSN
- Revise reporting requirements for the 2016 data collection year (**Table 2**) that begins in August of 2016 and the 2017 data collection year; update the reporting guide as needed to align with state and national priorities as directed by the HAI Control Advisory Panel and WVHCA Board of Directors.

TABLE 2: WEST VIRGINIA HAI PUBLIC REPORTING REQUIRED MEASURES, 2016

Reporting Requirement	Facility Type	HAI Event	Reporting Specifications
CMS Requirement	Acute Care Hospitals Only (Non-Critical Access)	CLABSI	Adult, Pediatric/Neonatal ICUs
			Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		CAUTI	Adult and Pediatric ICUs
			Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		SSI: COLO	Inpatient COLO Procedures
		SSI: HYST	Inpatient HYST Procedures
		MRSA Bacteremia LabID Event	Facility Wide Inpatient
			Emergency Dept. and Observation Stays
		C. *difficile* LabID Event	Facility Wide Inpatient
			Emergency Dept. and Observation Stays

CMS Requirement (continued)		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
	Long-Term Acute Care Hospitals (LTCH)	CLABSI	Adult & Pediatric LTCH ICUs & Wards
		CAUTI	Adult & Pediatric LTCH ICUs & Wards
		MRSA Bacteremia LabID Event	Facility Wide Inpatient
		C. *difficile* LabID Event	Facility Wide Inpatient
		NEW Ventilator-Assisted Events	Adult LTAC ICUs & Ward
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
	Inpatient Rehabilitation Facility	CAUTI	Adult and Pediatric Wards
		MRSA Bacteremia LabID Event	Facility Wide Inpatient
		C. *difficile* LabID Event	Facility Wide Inpatient
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
State Requirements	Critical Access Hospitals	CAUTI	Medical, Surgical, Medical/Surgical ICUs
			Adult/Pediatric Medical, Surgical and Medical/Surgical Wards
		Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel
	Psychiatric Hospitals (Excluding State-Run Facilities)	Healthcare Personnel Influenza Vaccination	All Inpatient Healthcare Personnel

For the 2016 calendar and data reporting years, there was only one new change; ventilator-assisted events were added to the required data to be collected and submitted for Long Term Acute Care Hospitals. Although the HAI Advisory Panel requires reporting Critical Access hospitals to report

CAUTI, they are not required to do so by CMS; however, CMS continues to review mandatory reporting for future years. If, or when this reporting requirement occurs at the national level, WV Critical Access Hospitals will already have the knowledge and skill for submitting data.

Technical Notes

Standardized Infection Ratio (SIR)

There are various statistics that can be used to summarize and report HAI data at a national, state, or local level. 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 national baseline (from the National Healthcare Safety Network (NHSN) aggregate data), adjusting for several risk factors that have been significantly associated with differences in infection incidence. A SIR greater than 1.0 indicates that more infections occurred in the hospital than were expected based on national averages for hospitals of that type and size. Conversely, a SIR less than 1.0 indicates that fewer infections occur than expected.[23] 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.

[23] Centers for Disease Control and Prevention. NHSN e-News: *SIRs Special Edition.* October 2010 (updated December 2010); 1.

Appendices

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Appendix A

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West Virginia Healthcare-Associated Infections C. *difficile* Lab Testing: A Survey of WV Hospital Testing and Treatment Practices

Pursuant to West Virginia Code §16-5B-17, West Virginia hospitals began collecting and reporting data on healthcare-associated infections (HAI) on July 1, 2009. In response to the requirements of the statute, the West Virginia Health Care Authority (WVHCA) convened the West Virginia Healthcare-Associated Infection Control Advisory Panel (Panel), whose duty is to assist the WVHCA 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;
- 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.

HAI data are to be submitted by non-federal hospitals, excluding state psychiatric facilities, to the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN), in accordance with reporting guidelines determined by the Infection Control Advisory Panel and protocols established by NHSN.

Cause, National Incidence and Burden of *C. difficile* Infection

Since 2013, general acute care hospitals have been required to report Clostridium *difficile,* also known as C. *diff.* infections, or CDI. CDI is a healthcare-associated infection that can be acquired by people receiving medical care; older adults who take antibiotics and receive medical care are at particular risk for contracting the bacteria.[1]

C. *diff.* is recognized as a major causative agent of antibiotic-associated diarrhea and nearly all cases of pseudomembranous colitis. Although it is estimated 20% of hospitalized patients test positive,

[1] Fernanda C. Lessa, M.D., M.P.H., Yi Mu, Ph.D., Wendy M. Bamberg, M.D., Zintars G. Beldavs, M.S., Ghinwa K. Dumyati, M.D., John R. Dunn, D.V.M., Ph.D., Monica M. Farley, M.D., Stacy M. Holzbauer, D.V.M., M.P.H., James I. Meek, M.P.H., Erin C. Phipps, D.V.M., M.P.H., Lucy E. Wilson, M.D., Lisa G. Winston, M.D., Jessica A. Cohen, M.P.H., Brandi M. Limbago, Ph.D., Scott K. Fridkin, M.D., Dale N. Gerding, M.D., and L. Clifford McDonald, M.D., *Burden of* Clostridium *difficile Infection in the United States*, N Engl J Med 2015; 372:825-834 February 26, 2015 DOI: 10.1056/NEJMoa1408913 Website: http://www.nejm.org/doi/full/10.1056/NEJMoa1408913#t=articleDiscussion April 28, 2016.

some will remain as asymptomatic carriers, while others will present with symptoms that include diarrhea, fever, abdominal pain and colitis.[2]

Because antibiotic use may result in the disruption of normal flora in the gut, the majority of positive cases occur in those recently treated with antibiotics. Those who are hospitalized are highly susceptible to the infection because C. *diff*. spore sources include areas frequently used and touched by patients and healthcare workers, such as bed rails and toilets.[2]

In a study conducted in 2011, CDI is estimated to have caused almost half a million infections in the United States. Of those, an estimated 83,000 of the patients with such infections had at least one recurrence, and approximately 29,000 died within 30 days after the initial diagnosis.[1]

The 2011 study estimated the incidence of community-associated C. *diff.* as 51.9 per 100,000 population after accounting for age, sex, race and other factors. For health care–associated infections, the estimated incidence of health care–associated C. *diff.* infection was 95.3 per 100,000. The incidence of infection estimates showed higher rates among females than among males, whites more than among nonwhites, and in persons 65 years of age or older compared with those under the age of 65 years.[1]

Of the 293,300 health care–associated cases in the study, it was estimated that 107,600 had a hospital onset, 104,400 had a nursing home onset, and 81,300 had a community onset associated with a health care facility. Of the patients with healthcare–associated infection, the rate of first recurrence was estimated at 20.9%, and the rate of death within 30 days was 9.3%, resulting in an estimated 61,400 recurrences and 27,300 deaths nationally. Recurrence and death were more commonly observed among the health care–associated infections than among community-associated infections.[1]

Because continued surveillance for CDI is needed to monitor progress toward prevention, the Centers for Medicare and Medicaid Services and the WVHCA requires hospitals to report CDI to NHSN. As a result, the WVHCA can track whether or not a facility has higher or lower rates of infection than expected based on a national baseline set by NHSN.

C. *difficile* Testing Methods

All C. *diff.* strains express the common antigen glutamate dehydrogenase, while the production of toxins A and B is restricted to the toxigenic strains. As a result, diagnosis of C. *diff.* is primarily accomplished by detecting toxins in the stools of individuals with suspected disease using cytotoxin assay (CTA), enzyme immunoassays (EIAs)[2] and polymerase chain reaction (PCR) tests.

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[2] Mujoomdar, Michelle, BSc, PhD, and Emmanuel Nkansah, BEng, MLS, MA, Canadian Agency for Drugs and Technologies in Health, *Rapid Response Testing for the Detection of Clostridium Difficile: A Review of the Diagnostic Accuracy*, July 28, 2009. Website: https://www.cadth.ca/media/pdf/L0104_Rapid_Tests_for_C_difficile_Detection_final.pdf. May 10, 2016.

Toxigenic C. *diff.* detection by cytotoxin assay is often considered the "gold standard." However, this assay is time consuming, as it implies an incubation period of at least 24 hours. Since rapid diagnosis is essential for timely patient treatment, prevention of cross contamination and avoidance of longer hospitalization, tests such as EIAs and PCRs, have been developed that provide faster results; these tests can be completed in approximately 1 hour. However, EIAs are prone to a lack of sensitivity, or true positive rate, (ranging from 54 to 76%) when compared to the gold standard cytotoxicity assay, while PCR assay provides greater sensitivity, but lacks specificity, or true negative rate.[3]

In a study conducted by Cynthia Essmyer, MD, medical pathologist at Saint Luke's Hospital in Kansas City, Missouri, the sensitivity of the A/B EIA test was compared to the PCR test. The study revealed that 179 of 204 samples showed concordant results between PCR and EIA testing. Of those samples that were discordant, the PCR result showed agreement with the reference laboratory outcome. Using Mayo's PCR as the gold standard, the PCR used in the study had 100% sensitivity and 97% specificity. PCR results also remained consistent for those patients who had multiple specimens with inconsistent results.[4]

It was concluded from the study that real-time PCR can improve the laboratory diagnosis of C. *difficile*-associated diarrhea compared with EIA, which generated both false-positive and false-negative results. The toxin assays were not as sensitive, while PCR detected DNA associated with the organism was much more sensitive. As a result of her study, Saint Luke's Hospital chose to switch from EIA testing to PCR, saving them considerable time in confirming whether the specimen was positive or negative.[4]

According to the WVHCA survey, hospitals in WV are using either the toxin assay, PCR test, or a combination of both.

Intestinal Microbiota Transplantation for Recurrent C*. difficile* Infection

Once diagnosed with the infection, it is initially treated with an antibiotic that specifically targets the C. *difficile* organism. Antibiotics used for the treatment of this infection include metronidazole, vancomycin and fidaxomycin. In 30 percent of treated individuals, the infection returns within a few days or weeks after finishing the antibiotic course. For those individuals who continue to have recurrent C. *diff.* colitis, intestinal microbiota transplantation (IMT), also known as fecal microbiota transplant, is a potential alternative therapy that restores the natural intestinal flora to a compromised patient by transplanting fecal material from a donor. A recent study published in 2013 in the New England Journal of Medicine showed that IMT is more effective than oral vancomycin in preventing further recurrences in individuals who have already had recurrent C. *diff.* colitis.[5]

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[3] Eckert, Catherine, Jones, Grabrielle, and Frederic Barbut, *Diagnosis of Clostridium Difficile Infection,* Future Microbiology. 2013; 8(12); 1587-1598. Website: http://www.medscape.com/viewarticle/815147_7. May 11, 2016.
[4] Brauser, Deborah, *Sensitivity, Specificity Higher With PCR Than Conventional EIA in C Difficile-Associated Diarrhea, Medscape Medical News,* November 30, 2009. Website: http://www.medscape.com/viewarticle/713134. May 3, 2016
[5] Johns Hopkins Medicine, *Fecal Transplantation (Bacteriotherapy).* Website: http://www.hopkinsmedicine.org/gastroenterology_hepatology/clinical_services/advanced_endoscopy/fecal_transplantation.html. May 5, 2016.

IMT is usually performed by colonoscopy and less commonly by nasoduodenal tube. During colonoscopy the colonoscope is advanced through the entire colon. As the colonoscope is withdrawn, the donor stool is delivered through the colonoscopy into the colon.[5]

After a systematic literature search of IMT treatment for recurrent CDI was conducted in 2011, the following outcomes of patients treated for CDI using IMT were found and highlighted below:

- 92% of patients experienced resolution, 89% after a single treatment and 5% after retreatment;
- 4% experienced relapse;
- single treatments resulted in lower resolution;
- infusion by gastroscope or nasojejunostomy tube resulted in lowest resolution;
- related donors showed a slightly higher resolution rate;
- resolution rates were greater with water suspension rather than normal saline, but relapse rates were 2x greater;
- resolutions increased with the volume of IMT given.[6]

In patients with recurrent CDI, the infusion of donor feces, as compared with vancomycin therapy, resulted in better treatment outcomes. In particular, patients with multiple relapses of CDI benefited from this unconventional approach to treatment.[4]

Anecdotally, IMT has not been widely adopted in WV as a therapeutic tool due to concerns regarding dosage, acceptability and hospital department responsible for storage and disbursements, to name a few. Despite these concerns, the procedure is being performed throughout the world, treating CDI, and other conditions causally related to intestinal flora complications, such as pseudomembranous colitis, inflammatory bowel disease and irritable bowel syndrome.[6]

The Fecal Transplant Foundation, a group of clinicians, researchers and patients dedicated to providing education, research, and assistance to offset patient and donor costs, reports larger facilities in surrounding States, such as Ohio State University, Cleveland Clinic, and Temple University, are currently performing the procedure regularly.[7]

Although three institutions noted IMTs were provided at their facilities in WV via the survey, only two provided outcomes. Thomas Health Systems, inclusive of Thomas Hospital and St. Francis Hospital, reported that one gastroenterologist and one infectious disease physician practicing at the hospitals provided the procedure on a regular basis and performed the service for over 50 patients. Once the procedure was performed, the hospitals reported a 97% success rate.

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[6] Gough, Ethan, Shaikh, Henna, and Amee R. Manges, *Systematic Review of Intestinal Microbiota Transplantation (Fecal Bacteriotherapy) for Recurrent Clostridium difficile Infection,* Oxford Journals, Clinical Infectious Diseases, Vol. 53, Issue 10, Pp. 994-1002, 2011. Website: http://cid.oxfordjournals.org/content/53/10/994.full. May 11, 2016.
[7] The Fecal Transplant Foundation, Providers and Trials, May 28, 2015. Website: http://thefecaltransplantfoundation.org/providers-trials/. May 5, 2016.

Survey of Hospital Practices

After reviewing the 2014 data outcomes for CDI among WV hospitals, the Panel developed the premise that rates of CDI may be lower or higher based upon the testing and laboratory procedures being utilized for diagnosing the infection, since various testing modalities provide differing specificities and sensitivities to C. *diff.*

The Panel requested the WVHCA send a short survey to WV hospitals to obtain data on the lab testing utilized to identify a CDI, symptoms exhibited by the patient that triggers testing, treatment modalities hospitals were providing after CDI confirmation and other treatments provided for those who are infected. Respondents were not identified.

The standardized infection ratio (SIR) is the standardized measure used by the Centers for Medicare and Medicaid Services (CMS), the CDC's NHSN program and the WVHCA when reporting HAIs. The SIR is a summary measure used to track HAIs that adjusts for patient risk factors that have been found to be significantly associated with differences in infection incidence.[8]

In order to calculate an accurate LabID SIR for CDI from NHSN, hospitals must accurately reflect the overall patient days for the facility and provide on a quarterly basis the CDI primary testing method/test type used most often by the facility's laboratory. The laboratory test type is "weighted" in the calculation; when a less-sensitive laboratory test is used, fewer events are predicted to occur and SIR calculations are affected,[9] potentially increasing a facility's infection ratio higher than expected.

The ultimate goal for performing the survey and quality improvement project was not only to assist hospitals in understanding the testing procedures and the treatments provided by other hospitals across the state, but to also provide information that could lead to improvements in testing and treatment for those hospitals that may be struggling to improve their rates of CDI. At the conclusion of the project at least one hospital, anecdotally, found that lab tests were not appropriately documented in NHSN. Once documented, higher than expected SIR trends over the years were subsequently reduced.

Survey Response Summary

- The response rate was 48%.
- The majority of respondents test for C. *difficile* via toxin assay.
- For those that answered they use both toxin assay and PCR testing; 43% run a toxin assay then PCR if toxin assay is negative.
- 57% were unsure which test was used.

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[8] The Centers for Disease Control and Prevention, National Healthcare Safety Network, *NHSN e-News: SIRs Special Edition*, October 2010, Updated December 2010. Website: http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_Oct_2010SE_final.pdf. May 25, 2016.

[9] Aponte-Torres, Zuleika, Public Health Analyst, The Centers for Disease Control and Prevention, NHSN Training Course, *Advanced Analysis: Focus on LabID Data,* Atlanta, GA, March 1-4, 2016. Website: http://www.cdc.gov/nhsn/pdfs/training/2016/advanced-analysis-focus-on-labid-data-aponte-torres.pdf. May 25, 2016

- 69% reported multiple episodes of diarrhea in 24 hours triggers C. *diff.* testing.
- 31% use metronidazole by mouth to treat an infection; more than 24% were unsure of treatment modality.
- 89% do not perform fecal transplantation.
- 96% do not intend on performing fecal transplantation in the next 12 months.

The outcomes of the survey, questions and responses, can be found in Attachment 1.

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Attachment 1

Survey of WV Hospitals' C. *difficile* Testing and Treatment Practices

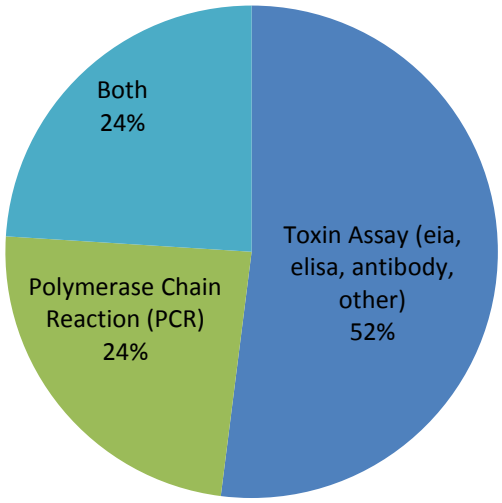
55

WVHAI C. *difficile* Lab Testing Survey Summary Report

Survey: WVHAI Hospital C. *difficile* Lab Testing Survey

Hospital Response Rate = 48%

1. How does your institution test for C. *difficile*?



Value	Percent	Count
Toxin Assay (eia, elisa, antibody, other)	51.7%	15
Polymerase Chain Reaction (PCR)	24.1%	7
Both	24.1%	7
Total		29

Statistics

Total Responses	29

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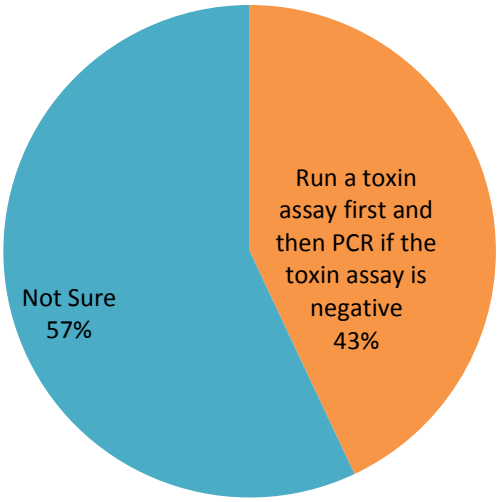
2. If you answered "both," in question 1, do you:

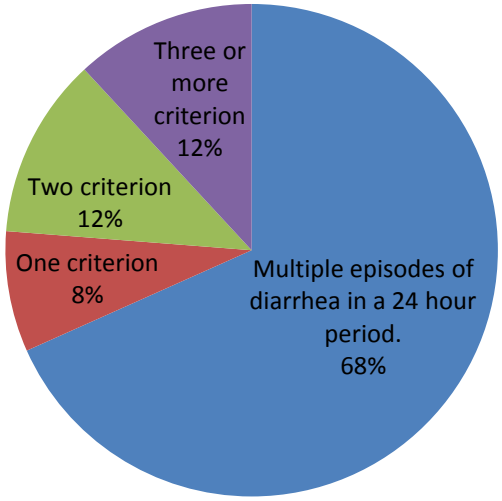


Value	Percent	Count
Run a toxin assay first and then PCR if the toxin assay is negative	42.9%	3
Run the PCR first and then the toxin assay if the PCR is negative	0.0%	0
Not Sure	57.1%	4
Total		7

Statistics

Total Responses	7

3. Which of the following triggers testing stool for C. *difficile*?

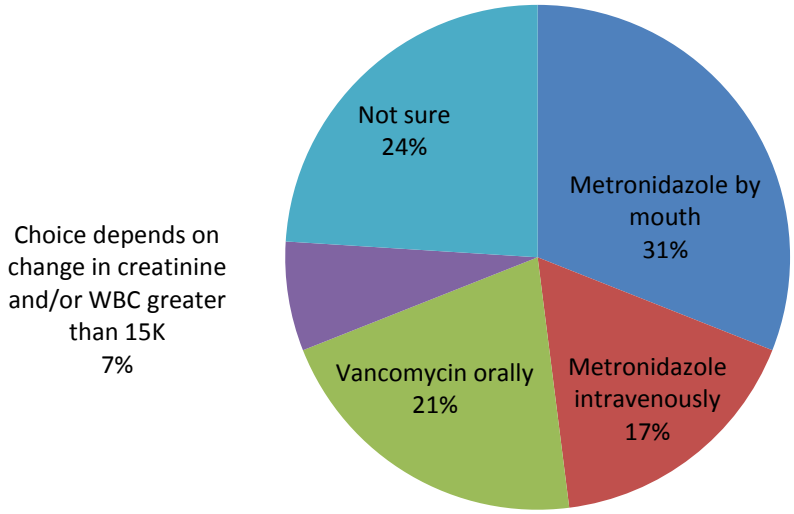


Value	Percent	Count
Multiple episodes of diarrhea in a 24 hour period.	69.2%	18
Fever (greater than or equal to 100.4 degrees F).	0.0%	0
Elevated White Blood Cell count (greater than or equal to 11K).	0.0%	0
Abdominal tenderness	0.0%	0
One criterion	7.7%	2
Two criterion	11.5%	3
Three or more criterion	11.5%	3
Total		26

Statistics

Total Responses	26

4. Which of the following agents is the preferred first agent for treatment at your institution?

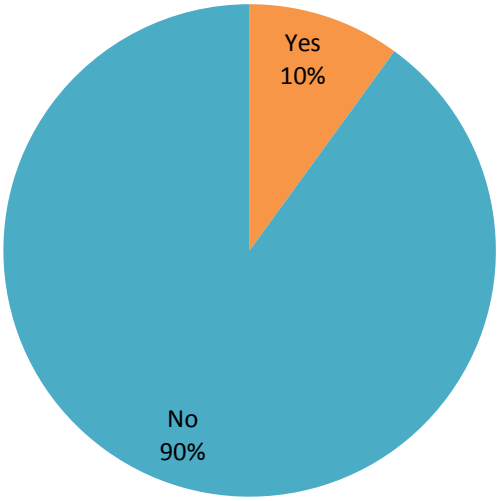


Value	Percent	Count
Metronidazole by mouth	31.0%	9
Metronidazole intravenously	17.2%	5
Vancomycin orally	20.7%	6
Vancomycin rectally	0.0%	0
Choice depends on change in creatinine and/or White Blood Cell count greater than 15K	6.9%	2
Other	0.0%	0
Not sure	24.1%	7
Total		29

Statistic

Total Responses	29

5. Does your institution routinely perform Fecal Microbiota Transplant (FMT)?

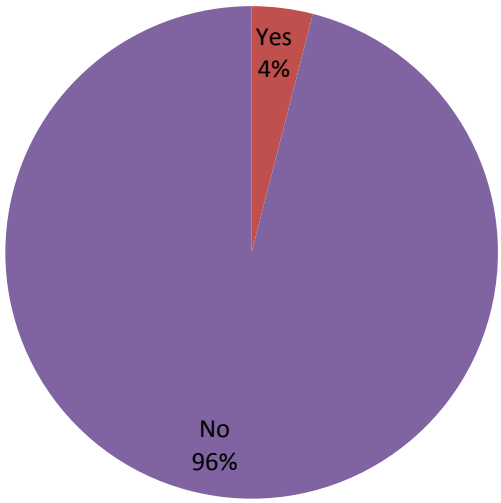


Value	Percent	Count
Yes	10.3%	3
No	89.7%	26
Total		29

Statistics

Total Responses	29

6. Do you anticipate that your institution will begin to perform FMT in the next twelve months?



Value	Percent	Count
Yes	3.9%	1
No	96.2%	25
Total		26

Statistics

Total Responses	26

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Appendix B

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West Virginia Hospital Healthcare-Associated Infection

2016 Data Submission and Quality Review Schedule/Procedure

General Acute, CAH, Inpatient Rehabilitation Facilities' Patient Safety Requirements		QUARTER 1 *January - March Events*	QUARTER 2 *April - June Events*	QUARTER 3 *July - September Events*	QUARTER 4 *October - December Events*
	DATA DUE TO NHSN	August 15	November 15	February 15	May 15
	WVHCA DATA QUALITY REVIEW	August 29	November 29	March 1	May 29
	REQUESTED REVISIONS COMPLETED BY HOSPITAL	September 30	December 31	March 31	June 30

Long-Term Acute Care Facilities' Patient Safety Requirements		QUARTER 1 *January - March Events*	QUARTER 2 *April - June Events*	QUARTER 3 *July - September Events*	QUARTER 4 *October - December Events*
	DATA DUE TO NHSN	May 15	August 15	November 15	February 15
	WVHCA DATA QUALITY REVIEW	May 29	August 29	November 29	March 1
	REQUESTED REVISIONS COMPLETED BY HOSPITAL	June 30	September 30	December 31	March 31

General Acute, CAH, Inpatient Rehabilitation, and LTAC Facilities' Healthcare Personnel Safety Requirements		QUARTER 4 *October - December*	QUARTER 1 *January - March*
	DATA DUE TO NHSN	**October**	**May 15**
	WVHCA DATA QUALITY REVIEW		**May 29**
	REQUESTED REVISIONS COMPLETED BY HOSPITAL		**June 30**

Review Process:

- 2 weeks after the data submission due date, a review of all hospitals will be complete to determine outstanding data submissions.
- Hospitals that have outstanding data submissions will be notified via email.
    - Data will be monitored for completeness and accepted, OR,
    - If after 2 weeks data remains incomplete, hospitals will be notified via email that data remains incomplete and giving the hospital 30 days to complete the data submission. Healthcare Personnel Safety, Patient Safety and Facility Administrator contacts within NHSN will be utilized for notifying hospitals of issues and delinquencies.
        - If NHSN issues arise and WVHCA cannot view the data submission, the hospital may fax/email NHSN reports as documentation of timely submission.
- If after 30 days the issues remain or the data is not available, the hospital will be notified via email that the data is due immediately or the issue must be resolved immediately.
    - If after 1 week the issue is not resolved or the data is not submitted, the appropriate hospital contact will be contacted via phone.
    - If after 2 weeks, a letter will be sent to the hospital contacts detailing the issue and timeline for correcting the issue.
    - If after 3 weeks the issue is not corrected, a letter to the CEO will be sent.
    - If after 1 month the issue is not corrected, hospitals who fail to report information on healthcare-associated infections in the manner and timeframe required by the West Virginia Health Care Authority shall be fined the sum of **$5,000.00** for each such failure in accordance with §16-5B-17.